

**Ex-ante regulation in the Italian
Telecommunications Market:
Principles and Practice**

A Paper by Europe Economics

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1 INTRODUCTION

This paper seeks to contribute to the growing debate over the development of competition in the Italian telecommunications market. The first section of this paper considers the role of ex-ante regulation in the market, and the relevance of such measures for dynamic efficiency. This section of the paper concludes with a discussion about the nature of price squeezes and the role of a price floor in helping to sustain competitive entry and to inhibit anti-competitive behaviour by a dominant operator. The second section of the paper provides some insights into the development of price floors using formulae derived from principles set by the European Commission.¹ It must be stressed that, even at this early stage, such examples are illustrative and developing numbers that may be used for policy purposes would require considerable additional work.

The specific context of this paper draws on the current consultation being undertaken by the Italian NRA and the debate that has been initiated by a paper presented by Henry Ergas at a workshop in Milano in November 2000 (the BELTEL Workshop). In this paper, Ergas identifies the new forms of price competition that are being offered in a variety of telecommunications markets and raises important questions about what these forms of price competition may mean for the application of the imputation test, a common methodology for distinguishing a price squeeze from a competitive price cut.

The Ergas paper considers a vertically integrated firm that has both a wholesale and retail division (it does not discuss the issues that might arise if a firm jointly provides access and core networks with which other providers interconnect, although some of the arguments developed might also apply in those circumstances). The focus is on how a regulator should deal with price squeezes. The paper presents arguments to convince the regulator that:

- price reductions in the retail market by the vertically integrated firm should be permitted;
- ex-ante regulation is unnecessary; and
- a lock-step restriction is undesirable.

The paper proposes an ex-post form of regulation: the use of an imputation test to assess whether the incumbent has behaved anti-competitively. It also discusses the level of bundling at which the imputation test should take place.

It is clear that in Italy there is a growing competition in sectors of the telecommunications market and that new price structures are being introduced. These new forms of price competition are particularly prevalent in the business segment of the market, including government procurement contracts. In such cases, telecommunications companies offer prices that deviate from the standard published prices lists. This segment of the market has generated outcomes (in terms of offered prices) which are highly competitive. These new price offers to specific organisations in

¹ European Commission (1998) "Notice on the application of the competition rules to access agreements in the telecommunications sector. Framework, relevant markets and principles", *Official Journal*, C 265, 22 August, paragraphs 117-119.

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themselves raise the questions as to the extent to which it is possible, or even necessary, to distinguish between competitive price cuts and a price squeeze.

2 DISCUSSION

2.1 The Legislative Framework

The introduction of competition in the telecommunication markets has created policy challenges for policy makers, new entrants and incumbents alike. From each perspective the issues are different but the common thread is the transition from monopoly to competition. Inevitably this transition involves creating structures and incentives that can sustain the competitive development of the market over time. In policy terms this process is characterised by a transition from sector specific regulation through to the general application of competition law. Thus in terms of a regulatory framework this transition can be seen as a move from ex-ante policy measures through to an ex-post one, insofar as competition law is an ex-post framework. The questions, however, is over what period this transitional process should unfold and thus, at any moment what is the appropriate balance between ex-ante and ex-post regulation.

The regulatory framework which continues to provide the basic structure of national legislation is that designed by the European Commission and implemented by member states from the 1st January 1998. This framework is predicated on ex-ante regulation and imposes very clear obligations on operators with significant market power, generally the incumbent operators. In its review of the existing framework, the so-called 1999 Review, the European Commission has sought to define, given technological and market changes, the boundary between ex-ante and ex-post regulatory structures. From the 1999 Review the European Commission has proposed a common regulatory framework for electronic communications networks and services, recognising the continuing need for sector specific legislation. Thus the new regulatory framework makes clear that an undertaking with significant market power will remain subject to ex-ante regulation. It should be noted, however, that the definition of significant market power has changed fundamentally from a crude ex-ante assertion based on a 25 per cent market share to a test of dominance involving the clear definition of relevant markets and a dominant market share based on the tenets of competition law. The percentage market share that may be used to define SMP has yet to be established. However, despite changes in the detail of the regulatory framework it is clear that ex-ante regulation will be a feature in the regulatory landscape of Member States during the decade.

A key argument in this paper is that the market conditions in Italy, as elsewhere in Europe, still warrant ex-ante regulation. In part this argument rests on the observation that the benefits of dynamic efficiency outweigh those of allocative efficiency. For example, recent evidence from the UK shows that the productivity gap between firms in markets open to competition ranges from four to one.² The policy implications of this position is that it remains relevant for the regulator not only to nominate those operators with significant market power but also to place upon them appropriate obligations in terms of cost orientation, transparency, non discrimination and accounting separation. The obligations should be such that the NRA is able to satisfy its principles under proposed new directives (Com(2000)393), namely:

² (Carlin, W., et al (2001) 'Understanding the Essential Fact about Capitalism: Markets, Competition and Creative Destruction' *National Institute Economic Review*, January)

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- the NRA shall promote an open and competitive market for electronic communications networks, electronic communications services and associated facilities;
- the NRA shall contribute to the development of the internal market; and
- the NRA shall promote the interests of European Citizens.

2.2 The Scope for Anti-Competitive Practices

One of the themes emerging from the Ergas paper and the consultation document is the nature of the benefits that arise as a result of the fact that TI is a vertically integrated organisation. However, the nature of these benefits is not clear.

The benefits that result from vertical integration are, in this context and as we understand it, the cost savings that arise from operating both a network and a retail business. Such savings are likely to be made in areas such as customers service costs, IT costs, vehicles and other overheads.

We note that establishing that the benefits of vertical integration are small weakens the case for vertical integration, and by implication strengthen the arguments for full structural separation (as its competitive benefits would be more likely to outweigh its costs).

There is a range of potential anti-competitive practices in which organisations with significant market power (SMP) can engage.³ Apart from the potential for non-price discrimination as outlined above, such practices might include price squeeze, cross subsidies, leveraging market power from one market into another, predatory pricing, and excessive pricing.

As far as possible, the cost accounting system should therefore be designed in a way that can identify whether an SMP operator is engaging in any of these types of practices. At present the debate in Italy seems to be limited to whether TI are effecting a price squeeze rather than considering any other forms of anti-competitive conduct. The Ergas paper largely ignores other forms of conduct and focuses on the “imputation test” as a way of identifying whether there is a price squeeze.

It is clear that a full debate is required to understand the potential for anti-competitive behaviour to be undertaken by the notified operator. The outcome of such a debate could be to inject additional detail into the requirements for the cost accounting system in order to identify when these practices are taking place. For example, the potential to “bundle” newer value-added services with the more traditional offerings may be a feature of competition in telecom markets in the future. Thus for example, there needs to be a degree of clarity which ensures that when

³ The Irish Times on February 6 2001, reports a dispute involving ESB, the incumbent electricity supplier in the Republic of Ireland and ePower, a new entrant. “ePower claim ESB Independent Energy (ESBIE) engaged in below cost selling and the poaching of customers through unfair practices. It claims the ESB subsidiary abused its dominant market position and used ESB information to put its competitors at a disadvantage”.

bundling services the notified operator is not attempting to leverage its market power from traditional services into more competitive markets for value added services.⁴

2.3 The Importance of Structural Separation

Regulatory policy towards industries that contain natural monopoly elements has increasingly favored measures of structural reform. Among these reforms, structural separation is the strongest instrument to ensure that the non-discrimination principle is respected. Structural separation can take two forms:

- **Legal separation** occurs where companies with separate legal personalities operate the separated activities. By requiring separate boards of directors, it therefore reinforces managerial separation by ensuring that directors' duties are owed to the separate business units rather than to the integrated company.
- **Ownership separation** is the ultimate split, where the activities are undertaken by two different companies under different ownership. Ownership separation is the *only* robust way of ensuring that the financial incentives faced by different business units do not depend on other business units' profits.

A key advantage of structural separation is the facilitation of more effective competition. Structural separation does not eliminate the need for price regulation (for example in terms of access networks), however it allows all rival firms the same condition since none is linked by ownership with the ex-monopolistic firm.

As far as the Italian telecom market is concerned, the vertically integrated structure of Telecom Italia (TI) could create concerns for other operators, and there could be benefits from structural separation to ensure that TI's commercial or retail business is treated by TI's network business in the same way as any other competitor.

Besides this type of price-discrimination, non-price discrimination may occur, for instance if the network business provides confidential information to the retail business about traffic patterns, growth rates, and network maintenance. This form of non-price discrimination may not be exposed by accounting separation and yet could well lead to anti-competitive behaviour or at least legitimate concerns from other operators.

Non-price discrimination was one of the key factors behind the managerial separation of the electricity distribution (network) and supply (retail) companies in the UK in 1999. The experience from that sector shows how regulators can and do impose strict managerial separation requirements on companies in order to minimise the potential for both price and non-price discrimination.⁵

⁴ In 2000 the ITC and OFTEL in the UK rejected a claim by BSkyB that the cable companies in the UK were acting anti-competitively by bundling their pay television and telephony offerings.

⁵ The requirements included different brand names and an end to the benefits of some scale economies (such as the sharing of IT systems) arising from vertical integration.

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Even if full structural separation (as has already happened in, *inter alia*, rail and gas in the UK) is not felt to be achievable at this stage, there could be merit in requiring managerial and information separation between TI's businesses. If the regulator is wary of the upheaval that would be required to achieve full structural separation, it might be attracted by such an approach.

Examples of structural separation

As mentioned above, there have been cases in other industries in which structural separation actually occurred. They are briefly listed below.

British Gas, privatised around 1985 as an integrated company, split itself up in 1997 between BG, the pipeline and exploration company, and British Gas Trading (aka Centrica), the gas trading and supply company, following long and hard regulatory pressure to provide access on fair terms to competing gas suppliers. BG has recently split again between new BG (offshore exploration) and Lattice Group (inland pipelines).

The UK electricity sectors offers more than one example. The first company to split was East Midlands, where the network part was retained by their American owners whilst the trading and supply arm was sold to National Power (now Innogy). Again this followed market opening and was perceived to allow management to focus on each part of the business and to meet regulatory requirements for separation of businesses and non-discriminatory access. Several other companies have followed suit, including SWALEC (supply arm sold to British Energy and then on to someone else), Norweb (supply arm sold to TXU), Swed (supply arm sold to EdF).

2.4 Ex-Ante Regulation

In principle ex-ante regulation set out the expected behavioural conditions that would exist in a competitive market and in doing so establishes a competitive market framework. This approach to establishing a regulatory framework has the advantage of certainty, transparency and non-discrimination. Moreover, such an approach can, in the first instance, minimise information asymmetries between, on the one hand, the incumbent and on the other hand both the NRA and the new entrants.

In contrast ex-post regulation can only have an ex-ante effect to the extent to which a firm believes that its behaviour will, at some future date, be observed by the competition authorities, deemed to be anti-competitive and that the cost of the fine, if found guilty, is sufficient to outweigh the transitory benefits of the anti-competitive behaviour. The power of ex-post competition legislation depends to a large extent on the risk profile of the firm (e.g. their assessment of the probability of being investigated) and the nature of the markets (i.e. the stability of the market over time). It is clear that individual firms will make independent assessments of the risks involved in specific behaviour and view the risks of these decisions differently. Thus ex-post regulation, whilst providing certainty in terms of the legal framework and outcomes, does not necessarily increase certainty in the market, in terms of the behaviour of individual firms. Furthermore, the delays unavoidably associated with ex-post regulation may mean that the remedial action is too late to be of benefit to those adversely affected. In situations where competition is characterised

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by relative few new entrants and a single dominant firm, ex-post regulation may seem to be at its most deficient.

In the telecommunications sector, the policy objective of an open and competitive market necessarily involves the transition from monopoly to competition. In such situations incentives exist for the dominant firm to frustrate competition. Such potential reinforces the argument for ex-ante regulation.

An important UK example of ex-ante regulation from the pay TV industry is the undertakings BSkyB was required to give to the Office of Fair Trading (“OFT”) as an outcome of the OFT’s competition review of BSkyB in 1996.⁶ In that review, BSkyB was found to have a dominant position in the market for the wholesale supply of premium programming (sports and movies) to cable operators, amongst others.

To ensure that BSkyB could not unfairly discriminate in favour of its own down-stream distribution business (“Disco”), it was required to publish a rate card, showing the prices it would charge both its own Disco and the cable operators. BSkyB was left to set its own prices. The OFT also required BSkyB to publish separate accounts for its Disco and for its broadcasting business (“Broadco”). This allowed the OFT to check that Disco was not enjoying any form of anti-competitive favouritism over its competitors.

At present, this ex-ante regulation is being reviewed by OFT, but it has operated relatively effectively for the past 5 years. It is an example of regulation focussing on the behaviour of the incumbent and its control of bottlenecks (in this case premium programming) that sets obligations for the dominant incumbent in terms of the transparency of its dealings with others.

Ex-ante regulation requires the regulatory authority to pre-determine which behaviours and/or assets should be subject to intervention. This requires the regulatory authority to anticipate market outcomes, and identify areas where market power may be sustained despite the pressure of new entrants activity. In making this choice, it is necessary for the regulator to exercise judgements about the nature of benefits that can accrue to consumers as a result of both static and dynamic efficiency.

It is well recognised that there are considerable informational asymmetries between players in the market and between the players and the regulator. The two approaches to developing a regulatory framework, ex-post and ex-ante, have substantial differentiated informational requirements. In the case of ex-post regulation, any intervention and subsequent regulatory action has to be based on actual information that pertained to the alleged abuse. This requirement means that the NRA is obliged to use actual historical data. Such a requirement exposes the NRA to considerable asymmetry and thus imposes on the NRA a substantial information-gathering task, a task that is only ameliorated to the extent that actual competition is occurring in the market and constraining the activity of the dominant firm. In an ex-ante world, the NRA is able to focus the necessary incentives to bring out an open and competitive market and

⁶ OFT (1996) *The Director General’s Review of BSkyB’s Position in the Wholesale Pay TV Market* December 1996.

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may thus chose to use proxy measures and in so doing reduce both the asymmetry and the gathering information requirement.

In terms of establishing price structures - the key signal in an ex-ante regime - the NRA has a number of options. In broad terms five options can be identified, namely;

- *Setting of actual prices*; the intention here is that the NRA determines the actual prices paid for inputs (in either wholesale or retail) and in this way directly sets the incentive structure. Thus, over the last few years, the practice of benchmarking has become widespread and as such NRAs have directly imported prices which they believe to represent the competitive outcome and thus give the appropriate signals to the market.
- *Setting of methodologies for prices*; here the intention is to set out the process by which prices are set. The argument is that by defining a methodology the NRA can create the impetus for competition in the market without having to actually determine individual prices.
- *Setting relationships between prices*; here the NRA is using a set of relationships, most notably between wholesale prices and retails prices thus defining an envelope within which the NRA believe an efficient operator could operate and achieve an acceptable return on capital.
- *Setting obligations on behaviour*; the intention here is that the NRA set the behavioural standards for the market but then leave the market players to rely on commercial negotiation. The behavioural norms may include items such as the obligation to trade, non-discrimination, and cost orientation.
- *Setting out arbitration procedures if commercial negotiations fail*; here the NRA relies on commercial negotiation between players and sets out the rules should agreements between the parties not be possible.

In short the NRA has a variety of policy options which it can deploy, each of which gives the market a different set of signals. Some of the signals are behavioural and others can be structural. The next section looks at some of the arguments surrounding structural remedies deployed by a NRA.

3 ESTIMATING PRICE FLOORS

The previous chapter made the argument for ex-ante regulation. This chapter considers the form that ex-ante regulation might take and provides some numerical examples of how a retail price floor might work.

The European Commission's two methods for identifying a price squeeze both make reference to costs. The principles underlying these ex-post tests for price squeezes could be used also to set the criteria for ex-ante regulation.

117. Where the operator is dominant in the product or services market, a price squeeze could constitute an abuse. A price squeeze could be demonstrated by showing that the dominant company's own downstream operations could not trade profitably on the basis of the upstream price charged to its competitors by the upstream operating arm of the dominant company. A loss-making downstream arm could be hidden if the dominant operator had allocated costs to its access operations which should properly be allocated to the downstream operations, or has otherwise improperly determined the transfer prices within the organisation. The Commission Recommendation on Accounting Separation in the context of Interconnection addresses this issue by recommending separate accounting for different business areas within a vertically integrated dominant operator. The Commission may, in appropriate case, require, the dominant firm to produce separated accounts dealing with all necessary aspects of the dominant company's business. However, the existence of separated accounts does not guarantee that no abuse exists: the Commission will, where appropriate, examines the facts on a case-by-case basis.

118. In appropriate circumstances a price squeeze could also be demonstrated by showing that the margin between the price charged to competitors on the downstream market (including the dominant company's own downstream operations, if any) for access and the price which the network operator charges in the downstream market is insufficient to allow a reasonably efficient service provider in the downstream market to obtain a normal profit (unless the dominant company can show that its downstream operation is exceptionally efficient.

119. If either of these scenarios were to arise, competitors on the downstream market would be faced with a price squeeze which could force them out of the market.⁷

3.1 Test 117

The first test proposed by the EC looks at whether the dominant company's own downstream operation could trade profitably on the basis of the upstream price charged to its competitors by

⁷ European Commission (1998) "Notice on the application of the competition rules to access agreements in the telecommunications sector. Framework, relevant markets and principles", *Official Journal*, C 265, 22 August, paragraphs 117-119.

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the upstream arm of the dominant firm. If the answer is no then a price squeeze has been demonstrated.⁸ This is similar to the test proposed by Ergas. As the Commission notes, there is a need for separated accounts as a first step to allowing it to determine whether the test is being satisfied. But even then there are problems with ensuring that the costs are correctly assigned.

Converting the principles underlying the first test into ex-ante regulation might lead to a price floor on the retail price that the incumbent can charge equal to

$$P(w) + C(N) + C(R)$$

where $P(w)$ is the price that rivals have to pay the incumbent for the network input, $C(N)$ is the cost of other network inputs, and $C(R)$ is the avoidable cost to the retail division of providing the retail service.⁹ The distinction between $C(N)$ and $P(w)$ will become clearer in the discussion that follows.

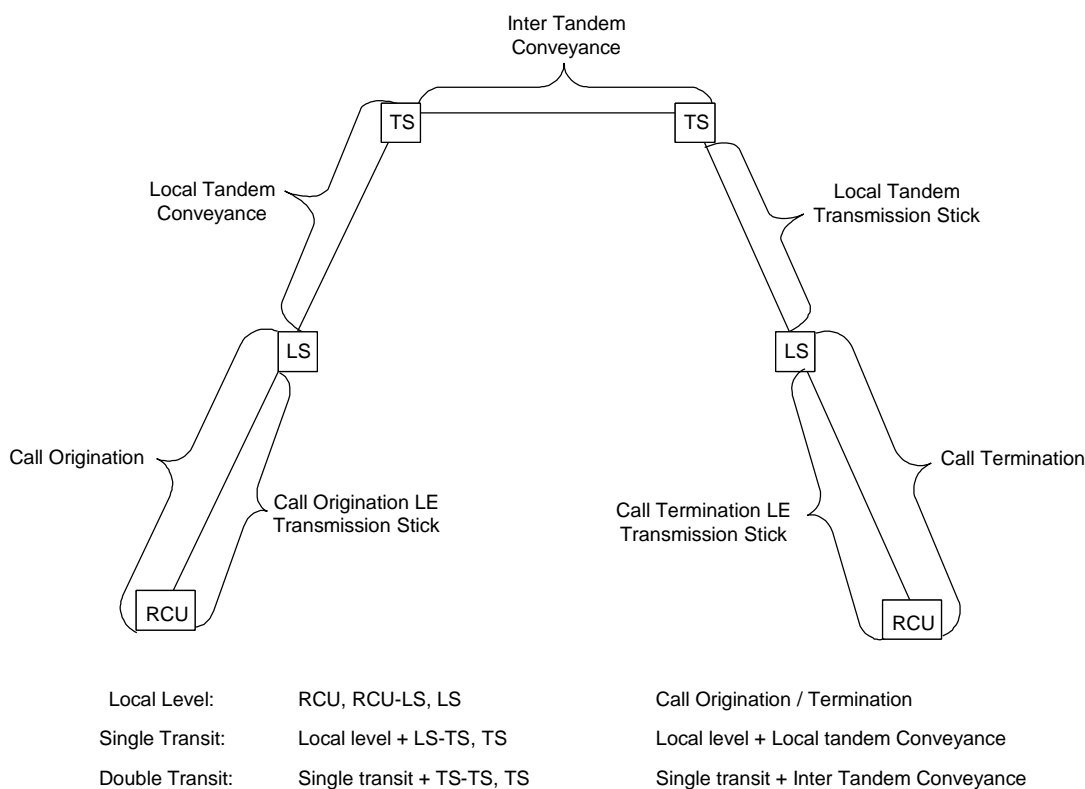
Figure 3.1 overleaf illustrates the network elements that might be involved in carrying a national call over the incumbent's core network, including identifying the various interconnection products that the upstream firm provides.

⁸ Paragraph 117, European Commission (1998).

⁹ The numerical examples following this section will make clearer why there are both network and retail costs, in addition to the price of the input supplied to rivals.

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Figure 3.1: Network elements and interconnection products



Not all the different network elements used by a given telephone call correspond to the interconnection products.¹⁰ To calculate the cost of a national call using just the interconnection product prices (the $P(w)$ s) is not possible, even if the interconnection product prices are cost based. For example, the cost of a national call cannot be estimated by adding the price of single transit and double transit interconnection since this would result in double counting the cost of a tandem switch. Instead, for a 117 test, there is a need to estimate some of the network costs ($C(N)$), in particular the transmission sticks.

In the case of a national call routed through two tandems, one approach would be to use the cost of two single transit interconnection products (in figure 3.1 call origination plus local tandem conveyance and call termination plus local tandem conveyance would correspond to $P(w)$) and then to estimate the cost of the transmission stick of inter-tandem conveyance ($C(N)$). Adding $P(w)$ and $C(N)$ will give the network costs of a call. To this, we will also have to add the costs of the retail division to establish a price floor based on rule 117.

Moreover, different telephone calls, even if classified in the same retail category, use different elements of the network. So, for example, two different national calls may be routed over the network in a very different way, one possibly making use of a double tandem, the other one of a single tandem interconnection. Given that retail prices do not distinguish between national calls using different network elements, appropriate information is needed to work out the average

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usage that different types of call make of different network elements. This information is not available from TI, so we have estimated a proxy measure using BT data.¹¹

The retail costs, C(R), of TI are also not available to us. We have estimated them by assuming that they represent the same mark-up on network costs as they do for BT, for whom more detailed accounts are available.

Given the common practice in the telecom sector of bundling services together and offering special packages with complicated and not always transparent discount schemes, it is often not easy to identify retail prices with which to compare the price floors.

3.1.1 The procedure – local and national calls

In order to understand the average usage that local and national calls make of TI network, we referred to the total number of minutes charged by BT Network to BT Retail for the usage of its own parts of the network. So, for example, for the financial year ended March 1999, BT Network charged BT Retail for the usage of its network elements (millions of minutes), as it is shown in the following table.

Table 3.1: Minutes of local calls using BT network elements

Network elements	Local Calls (mln minutes)	National Calls (mln minutes)
Call Termination	51,871	22,107
Call Origination	69,948	29,479
Local - Tandem Conveyance	40,623	28,698
Inter - Tandem Conveyance Short	5,693	8,117
Inter - Tandem Conveyance Medium	245	6,184
Inter - Tandem Conveyance Long	7	7,179
Call Origination LE transmission Stick	9,403	67
Call Termination LE transmission Stick	9,403	67
Local - Tandem Transmission Stick	42,468	22,042

Source: BT Current cost financial statements for the Businesses and Activities 1999

The accounts do not report the total number of local calls minutes billed by BT Retail. We assume that this corresponds to the number of calls originated on BT Network. This leads to the following average usage of network elements, for local and national calls.

¹⁰ The definition of interconnection products is set in the European Directive.

¹¹ Appendix two discusses the appropriateness of using BT accounts as a benchmark where TI figures are unavailable. Obviously, it would be more satisfactory in Italy to use only Italian numbers; this reinforces the importance of requiring detailed accounts from the incumbent.

Table 3.2: Local and national calls average usage of BT network elements

Network elements	Usage factors for local calls	Usage factors for national calls
Call Termination	0.742	0.750
Call Origination	1.000	1.000
Local - Tandem Conveyance	0.581	1.007
Inter - Tandem Conveyance Short	0.081	0.275
Inter - Tandem Conveyance Medium	0.004	0.210
Inter - Tandem Conveyance Long	0.000	0.244
Call Origination LE transmission Stick	0.134	0.002
Call Termination LE transmission Stick	0.134	0.002
Local - Tandem Transmission Stick	0.607	0.748

Source: BT Current cost financial statements for the Businesses and Activities 1999

The relative cost of a transmission 'stick' compared to the interconnection product is worked out with reference to BT costs. The following table shows the price in pence per minute of the different BT network elements and the relative cost of transmission sticks compared to the corresponding interconnection products.¹²

Table 3.3: Interconnection Product Prices and Ratios

Network elements	p/min	Ratios
Call Origination	0.412	
Call Termination	0.364	
Local - Tandem Conveyance	0.181	
Call Origination LE transmission Stick	0.232	0.563
Call Termination LE transmission Stick	0.231	0.635
Local - Tandem Transmission Stick	0.095	0.525

Source: BT Current cost financial statements for the Businesses and Activities 1999

¹² In subsequent calculations we make use of the ratios, applying these to the corresponding network elements for which we have Italian prices. For this reason, we do not need to make any assumptions about the exchange rate.

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The wholesale cost faced by TI Retail division is then worked out multiplying the average usage factors that local and national calls make of the network elements, as listed in table 3.2, with the costs of the network elements. These are derived from TI interconnection charges and the relevant ratios listed in table 3.3. These costs are listed in the following table.

Table 3.4: Network Charges (P(w) and C(N))

Network elements	Estimated charges peak / off peak (Lit/min)	Source of charges
Call origination/termination P(w)	14.5 / 10.2	Local level
Local tandem conveyance P(w)	11.3 / 7.9	(Single transit) – (Local level)
Inter tandem conveyance P(w)	9.1 / 6.4	(Double transit) – (Single transit)
Call origination transmission stick C(N)	8.2 / 5.7	(Local level) * (Call origination ratio factor)
Call termination transmission stick C(N)	9.2 / 6.5	(Local level) * (Call termination ratio factor)
Local – Tandem transmission stick C(N)	5.9 / 4.1	(Local tandem conveyance) * (Local tandem ratio factor)

Source: Condizioni economiche dell'offerta di interconnessione di riferimento di telecom Italia 2000

So, for example, the wholesale cost for local peak calls is obtained as shown in the table below.

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Table 3.5: Wholesale cost by network elements of a local call in peak time

Network element	Utilisation factors	Interconnection charges and cost of transmission sticks at peak time (Lit/min)	Network elements cost (Lit/min)
Call Origination	1.000	14.5	14.5
Call Termination	0.742	14.5	10.8
Local - Tandem Conveyance	0.581	11.3	6.6
Inter - Tandem Conveyance Short	0.081	9.1	0.74
Inter - Tandem Conveyance Medium	0.004	9.1	0.04
Inter - Tandem Conveyance Long	0.000	9.1	0.0
Call Origination LE transmission Stick	0.134	8.2	1.1
Call Termination LE transmission Stick	0.134	9.2	1.2
Local - Tandem Transmission Stick	0.607	5.9	3.6
Total			38.6

The wholesale costs for local and national calls during peak and off peak time, rounded to one decimal place, are listed in the table below.

Table 3.6: Total Network Charges (P(w) + C(N))

Lit/min	Wholesale
Local peak	38.6
Local off peak	27.1
National peak	47.9
National off peak	33.6

A mark-up is then added to the wholesale cost to work out the retail costs. Mark ups for local and national calls have been worked out looking at the costs incurred by BT Retail division. The regulatory accounts show separately, for each kind of call, the wholesale and retail costs. The mark ups for local and national calls and for private circuits are shown in the following table.

Table 3.7: Retail Mark-ups

Retail costs as a percentage of wholesale costs	
Local calls	34%
National calls	39%
Private circuits	23%

Source: BT Current cost financial statements for the Businesses and Activities 1999

Wholesale and retail costs are then added up to produce the total costs.

Table 3.8: Price Floors

Lit/min	Wholesale (P(w)+C(N))	Retail C(R)	Total
Local peak	39	13	52
Local off peak	27	9	36
National peak	48	18	66
National off peak	34	13	47

The numbers in the final column of table 3.8 illustrate what the price floors, for local and national calls in peak and off peak time, would be if the principles underlying paragraph 117 were used.¹³

3.2 Test 118

In a static environment, assuming no cost differences between supplying the rival and the vertically integrated firm's own downstream firm, it would be economically inefficient to force customers to pay more than $P(w) + C(N) + C(R)$, assuming a regulated wholesale price that reflects the costs of providing the service. If competitors cannot offer retail services at this price, then customers are best served by the vertically integrated firm providing them with the retail services at $P(w) + C(N) + C(R)$. This would bring about allocative efficiency. However, as Ergas notes "most economists believe that though competition brings both allocative and dynamic efficiencies, it is the latter that are the most important".¹⁴ A price floor based on $P(w) + C(N) + C(R)$ could well result in preventing competition from developing in the retail market, and consequently cause the Italian telecom market to miss out on the potential for dynamic efficiency gains that competition offers.

¹³ Given the assumptions we have made throughout the exercise.

¹⁴ Ergas, Henry (2000) "New forms of price competition: implications for regulatory authorities", paper presented at BELTEL workshop, Milan, 7 November.

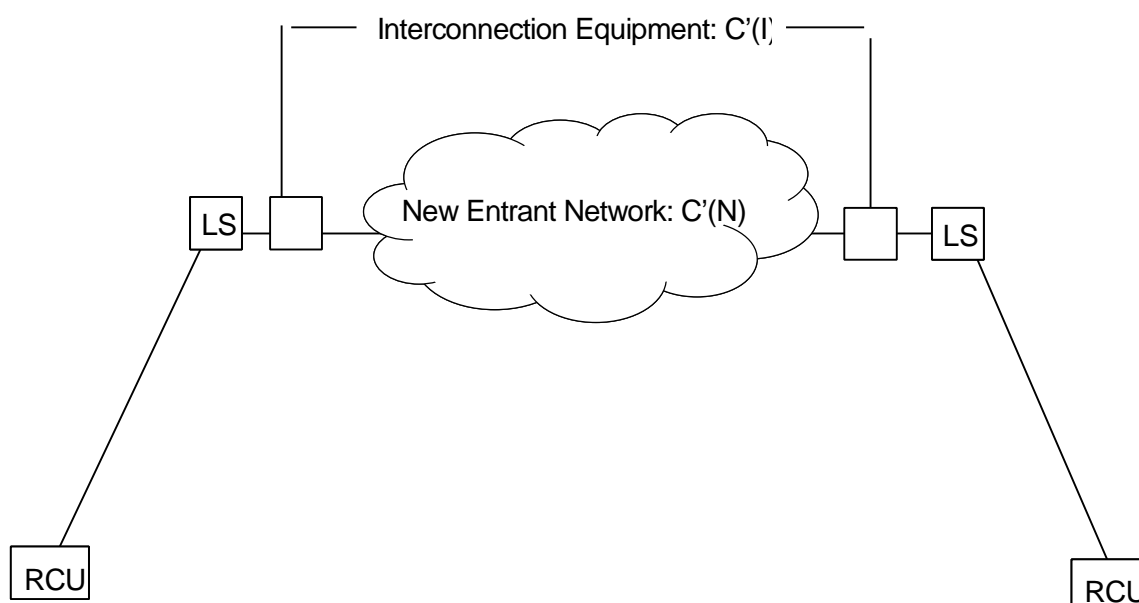
Errore. Lo stile non è definito.

For this reason, there might be merit in setting a retail price floor of

$$P(w) + C'(N) + C'(I) + C'(R)$$

where $C'(I)$ is the cost to the entrant of interconnecting the two networks. (The dashes in front of each of the costs are used to denote the fact that they would be costs borne by the entrant, not the incumbent). This price floor would be an ex-ante version of paragraph 118, the second test the European Commission proposes for price squeezes.

Figure 3.2: Interconnecting at the Local Level



The problem is that a customer using a new entrant for a voice call may give rise to four sets of costs: the costs to the incumbent's wholesale division of providing the input ($P(w)$), the network and retail costs of the entrant ($C'(N)+C'(R)$), and the costs involved in linking the entrant and the incumbent ($C'(I)$). Figure 3.2 shows the network costs involved in sending a national call via an entrant. In this example, the interconnection products bought from the incumbent would be call origination and call termination, then there would be the costs of the interconnection equipment necessary to transfer the calls to and from the entrant's network, and finally the network costs ($C'(N)$) that the entrant incurs in carrying the call over its network.

Who pays for the costs of interconnection has implications for ex-ante and ex-post rules that focus solely on the costs and prices of the incumbent, such as the price floor discussed in section 3.1. Yet it is not obvious why this should be the case. Why should the retail price that the incumbent is allowed to charge depend on the extent to which the incumbent pays the costs of permitting a retail competitor access to its wholesale input?

Who pays for these costs will depend on the regulatory framework and the bargaining strengths of the two parties. Normally, the incumbent will have the greater bargaining strength since, unlike the downstream rival, it can earn profits (more in fact) if no agreement is reached. Consequently,

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C'(I), as a proportion of the total additional costs arising because of the need to connect the incumbent and the entrant, is likely to be relatively large. The regulatory framework may also cause this outcome. For example, in Italy competitors in the retail market for voice in practice have to own their own exchange(s). Therefore, any competitor to the vertically integrated incumbent will have to incur costs in addition to the costs of retail.

Regulatory reforms may be able to eliminate some of these costs. But assuming there are costs that have to be incurred to permit other firms to compete in the retail market, how should the regulator proceed?

If the costs are small, the long-run benefits of competition will outweigh the short-run costs that customers will incur because of a price floor imposed on the vertically integrated incumbent. Competition between the retailers will encourage the firms to look for ways to reduce retail costs and to provide services that customers value, such as billing schemes that better suit their needs. There will also be competitive incentives to reduce the costs of providing the network elements that are not part of the interconnection product. A more dynamically efficient outcome will arise than if the incumbent was permitted to undercut a rival by taking advantage of the fact that it does not have to pay fees to connect with its upstream provider.

Consequently, as a short-run measure a price floor may be set that considers the costs that other operators will face, including C'(I). The cost of interconnecting the two networks, C'(I), is a service Telecom Italia provides, and for which the costs charged to the entrant are available. If we depreciate installation costs over five years,¹⁵ assume that the average length of the transmission link between TI's site and the new entrant's site is 3 kilometres, and that 180,000 minutes use a 2 Mbits channel in a month, then possible interconnection costs are shown in the table below.

Table 3.9: Interconnection Costs

Interconnection equipment	Lit/min
Installation kit	3.7
Transmission link	1.9
Total	5.6

Since the entrant has to interconnect with the entrant's network to receive the call, and again to permit call termination, these costs should be multiplied by two for the purposes of calculating C'(I).

Calculating the other costs entrants face presents the regulator with more problems. First, there are informational asymmetries. What are the costs of an efficient entrant? Different entrants will

¹⁵ Average depreciation times have been reduced, but five years seems to be an industry norm across Europe. In Italy the experience of many OLOs has been for shorter lives for installation products because of migration from tandem interconnection to local-level interconnection and the interconnection structure is changing in preparation for local loop unbundling's broad scale implementation.

Errore. Lo stile non è definito.

be targeting different segments of the market, and consequently will incur different retail and network costs. Calculating the entrants other network costs, $C'(N)$, would require assumptions about the configuration of an alternative network. Such a network will depend on the range of services carried on the hypothetical alternative network.

One solution that the regulator might consider is to assume that network and retail costs of the entrant are the same as those of the incumbent, ie $C'(R)=C(R)$ and $P(w)+C'(N)=P(w)+C(N)$.

The table below shows the cost categories needed to calculate price floors under the assumptions above. All the numbers have been rounded to the nearest integer. $P(w)$ has been estimated by multiplying local level interconnection charges by the usage factors that local and national calls are here assumed to make of the call origination/termination elements, respectively 1.742 and 1.750.

If all local and national calls were originated and terminated on the same network, then $P(w)$ would equal twice the local interconnection charges. The growth of the internet has meant that not all local/national calls terminate on the same network. This terminating pattern of calls is a critical element in estimating the average cost of a local or national call. Thus, in the case of Italy a key policy question is the extent to which local/national calls originating on one local network also terminate on the access network of the same company. Thus if it could be shown empirically that the terminating pattern in Italy is that 100 per cent of local/national calls which originate on one network also terminate on the same network, for example that of TI, then the condition where $P(w)$ would be equal to twice the local interconnection charges would have been met.

$C'(I)$ equals two times the interconnection equipment listed in Table 3.9. $C'(R)$ are taken from Table 3.8. $C'(N)$ has been computed as the difference between the total costs incurred by the retail division of the incumbent if subject to the same interconnection charges faced by the other operators (see Table 3.8) and $P(w) + C'(R)$.¹⁶ So, for example, for local calls in peak time: $14 = 52 - 13 - 25$.

Table 3.10: Possible price floors under test 118

Lit/min	P(w)	C'(I)	C'(N)	C'(R)	Possible price floors
Local calls peak	25	11	14	13	63
Local calls off peak	18	11	9	9	47
National call peak	25	11	23	18	77
National call off peak	18	11	16	13	58

A local call in peak time using the incumbent network priced at 52 (see the numerical example in section 3.1.1) would be allocatively efficient. Setting a higher price floor in the short run has to be

¹⁶ There is no direct relationship between $P(w)$ and $C'(N)$ other than that $P(w)$ is part of the market signalling mechanism which helps to define the entrant's make/buy decision for its own network and hence $C'(N)$.

Errore. Lo stile non è definito.

justified on the grounds that competition will realise dynamic efficiency gains so that in the long run consumers will face charges less than 52. These savings should more than exceed the short-run allocative inefficiency of pricing above 52. The regulator will need to decide where the price floor should be between 52 and 63; the difference of 11 is the cost of interconnection $C'(I)$. Early on the arguments for a number at the high end of the range will be stronger, but as the entrants have a chance to develop efficient networks, the floor should fall.

How reasonable would the assumptions about $C'(R)$ and $P(w)+C'(N)$ be?

For retail costs, assuming that $C'(R)$ equals $C(R)$ may underestimate the costs of the entrant, since it disregards the economy of scope between the network and the retail divisions of the vertically integrated firm, and other costs that may be incurred, such as the costs of building a brand name in the early years.

For network costs the issue is quite complicated. Assuming that they are equal to the incumbent's ones may overestimate the network costs, since the entrant can build a network that is tailored for the specific market it is targeting. Moreover, from a theoretical perspective, if there are no network cost savings, then it might be difficult for the regulator to justify increasing the price floor calculated under rule 117 by the cost of interconnection ($C'(I)$).

However, there are also reasons why assuming $C'(N)$ equals $C(N)$ may underestimate entrants network costs. Certainly care will be necessary to ensure that any government (or EU) subsidies that the incumbent received are not included when calculating the network costs that an efficient entrant would incur. Given that third party billing is not practical in the Italian market and that, therefore, the traffic originating on the incumbent's network is presumably handed over to the alternative operator network at each local exchange level, $C'(N)$ may be higher than $C(N)$. This is due to the duplication of local switching equipment; see the approach taken by the OLOs in building a parity of treatment grid.

This relationship in costs between the new entrant and the incumbent also depends on a set of assumptions, such as the technical and operational efficiencies built into the network vis-a-vis the network of the incumbent and the nature of the traffic, calls patterns and routing factors.

4 CONCLUDING COMMENTS

It is clear that a focus of dynamic efficiency will lead to increases in consumer welfare. However, in the telecommunications market where the dominant firm may have both advantages stemming from economics of scale and vertical integration there are powerful arguments, at any one moment to support prices that support allocative efficiency. In such circumstances the application of price floors may be an important adjunct to the armoury of the NRA in fostering long-term dynamic efficiency. However, in any advocacy of price floors it is important to recognise that the price signals must be such to encourage innovative activity by the new entrant in terms of all aspects of its activity, including both its retail operations and its network.

In this paper we demonstrate that a case can be made for price floors above the allocative efficient outcomes but that these price floors can only be sustained in the short term. The short term may be defined as that period where one operator continues to hold significant market power in the relevant markets, such as the access market. It is clear that the behaviour of the regulator in supporting entry cannot foster a competitive market by supporting pricing structures that are not in the long term interest of consumers.

A1 TWO MBITS LEASED LINES

In the Italian telecom market, there are no standardised wholesale products that the downstream arm of the vertically integrated company has to buy from its upstream division to provide leased lines. This lack of clarity between the wholesale and retail makes it difficult to apply either a 117 or a 118 test.

TI offers leased lines to end customers and other operators under the same conditions. This means that, in most occasions, other operators are not in a position to offer a better deal to customers than TI.

In addition, given the weight that private circuits have in the typical basket of services of the medium and large business customers, and, therefore, the possible long running negative effects that price squeezes may have on competition, there is merit in a costing exercise showing some proxies of the costs incurred by the downstream arm of the vertically integrated company in providing an end-to-end 2 Mbits circuit.

With this purpose in mind, these examples work out the cost of a 2 Mbits end-to-end connection, 50 km long, by adding two elements:

- 1 The cost of a 2 Mbits channel within the core network, 40 km long, worked out through TI charges for a 2 Mbits interconnection channel; and
- 2 The line rental of a 2 Mbits channel in the access network, as foreseen in the EU Recommendation and included in the Italian framework after the NRA Decision 10/00/CIR regarding RIO 2000 or, alternatively, applying TI xDSL offer to its end user customers (5 km each access line).

The numbers provided below are purely illustrative (even if coming from current price lists) and are merely suggestive of ways to estimate the costs of a 2 Mbits leased line.

A1.1.1 2 Mbits channel within the core network

Our approach is to look at the 2 Mbits channel that TI offers to other operators for Customer Sited Interconnection (CSI), ie when the incumbent and the other operator's interconnection equipment are located at different sites, linked through a dedicated transmission link.

Interconnection products are published in TI RIO and should be cost-oriented. The prices of these transmission links can, therefore, serve as a proxy for the costs of the corresponding transmission channels in the core network, although we recognise that the cost per Mbit incurred to connect two sites with the specific purpose of exchange the traffic between two networks may differ from the transmission costs of a 2 Mbits channel over different parts of the network.

The table below lists the cost categories included in providing a 2 Mbits transmission link and the price charged by TI in millions of lira.

Table A.1: TI charges for a 2 Mbits interconnection channel

Cost category	Transmission length	Price in Millions of lira
Installation	per 2Mbit/s	0.63
Yearly connection fee	per 2Mbit/s	1.78
Yearly transmission fees - fixed	per 2Mbit/s up to 20 Km	0
	per 2Mbit/s from 21 to 60 Km	8
	per 2Mbit/s from 61 to 300 Km	24.5
	per 2Mbit/s above 300 Km	37.19
Yearly transmission fees – per Km or fraction	per 2Mbit/s up to 20 Km	0.72
	per 2Mbit/s from 21 to 60 Km	0.32
	per 2Mbit/s from 61 to 300 Km	0.045
	per 2Mbit/s above 300 Km	0.0027

Source: Condizioni economiche dell'offerta di interconnessione di riferimento di telecom Italia 2000

Applying these charges, and assuming a five year depreciation period, the cost of a 40 km 2 Mbits channel would be 22,7 million lira per annum, i.e. 1,9 million per month.

A1.1.2 2 Mbits channel within the access network

The Commission Recommendation on Leased lines interconnection pricing in a liberalised telecommunications market¹⁷ recommends price ceilings for segments of different capacities for the access network (what is called part circuit). The recommended price ceiling for a 2 Mbits leased lines part circuit of length of up to five km is 350 Euro per month. We consider that two access ends are needed, while installation costs are not included. This proxy has been converted in Lira and shown in the Table A.2 under methodology A.¹⁸

Alternatively, we could look at the price that TI has offered to end user customers in the 2 Mbits xDSL RING package.¹⁹ Assuming a five year depreciation period and a 292,000 Mbits/year traffic (as assumed in NRA Decision 15/00/CIR), the cost adds up to 496,167 Lira/month for each end, corresponding to about 992,000 Lira/month for two ends. This is shown in the table below under methodology B.

¹⁷ C (1999) 3863, Brussels, 24.11.1999.

¹⁸ Methodologies A and B differ because of the different proxies used to estimate access costs.

¹⁹ the RING offer foresee the following economic conditions for a 2 Mbps access connection: activation 500,000 lira, monthly fee 2,350,000 Lira, price per transmitted Mbyte 12 Lira/Mbyte. TI is now modifying its offer, but the new one is still under examination towards the NRA.

A1.1.3 Total costs of 2 Mbits channel

The overall costs for a 2 Mbits leased lines, and the percentage difference with the retail price (computed from the pricing list published in the Delibera 711/00/CONS)²⁰, are shown in the table below.

Table A.2: Cost proxies and retail prices for a 2 Mbits channel 50 km long (Lit/month)

	Core cost	Access cost	Total wholesale cost (a)	Retail price (b)	(b-a)/a	(b-a)/b
Methodology A	1,900,000	1,355,000	3,255,000	4,862,000	49%	33%
Methodology B	1,900,000	992,000	2,892,000	4,862,000	68%	41%

Source: Europe Economics

In summary we observe that the difficulty in developing any illustrative example for leased lines centres on the absence of a well-developed wholesale market for leased line products. Given this caveat, however, the single most important observation from this 2 Mbits example is that a substantial retail mark up is being enjoyed by the retail arm of TI.

²⁰ The prices are taken from contracts worth up to 10 billion lira. Depreciation time for installation costs has been assumed to be five years.

A2 THE APPROPRIATENESS OF BT FIGURES

BT is obliged to produce regulatory accounts in the form of Financial Statements for different Businesses and Retail Activities, using both historical and current costs. The major principles of transparency and non-discrimination are observed, insofar as unit charges (in the form of interconnection charges and unit cost of transmission sticks) and products (in terms of minutes of usage of interconnection products and transmission sticks) exchanged between different Activities (ie local, national and international calls etc) of BT Retail and BT Network are clearly shown and charges for interconnection products are the same as the ones charged to other operators.

The ready availability of these documents and the unavailability of corresponding documentation from TI have prompted us to rely on UK figures. This is a limitation of our approach but, at the same time, it stresses the importance of requiring TI to produce and publish separated accounts, so that the minimum requirements implied by transparency and non-discrimination are respected.

BT figures have been used as a benchmark for the Italian market in three circumstances:

- 1 To work out the usage factors that different calls make of different network elements.
- 2 To work out the appropriate cost ratios between transmission sticks and the corresponding interconnection charges in order to estimate the price of transmission sticks
- 3 To work out retail mark-ups for local and national calls and private circuits.

In no circumstances, therefore, have we directly used BT costs to work out price floors for the Italian market. We now briefly discuss the possible consequences that these simplifications may have on the results of this exercise.

Using BT usage factors for TI products is only valid to the extent that network configurations and market conditions are similar. Different network configurations imply that voice calls make different usage of different network elements and therefore interconnection products. It is not possible to identify any obvious bias in either direction, without any information available on the structure of TI's network.

Different market conditions refer to the relative weight on local and national calls of those calls that are billed as local or national but that do not terminate on the network. The most relevant example is provided by Internet calls. They originate on a given network and are handed over to an Internet Service Provider's Point of Presence and, therefore, do not terminate on the same network. The lower the ratio of Internet calls over local and national calls, the bigger the average usage these calls make of the call termination element and therefore the higher the price floor.

We do not consider that assuming the same cost ratio between interconnection products and transmission sticks is a huge leap. Given that transmission sticks are excluded from the basket subject to price cap regulation in the UK, there is no obvious reason for BT not to provide a cost oriented estimate of these network elements. Moreover, BT numbers have been cross-checked

The appropriateness of BT figures

with the results of the adaptable bottom up model developed by Europe Economics for the European Commission,²¹ and there is a reasonable match. The final cost estimation should not suffer any obvious bias in either direction.

Having assumed the same retail mark-up for the services under consideration, we assume the same relative efficiency levels between TI wholesale and retail division as BT's. The final cost estimation should not suffer any obvious bias in either direction.

²¹ Study on the Preparation of an Adaptable Bottom-up Costing Model for Interconnection and Access Pricing in European Union Countries by Europe Economics; <http://europa.eu.int/ISPO/infosoc/telecompolicy/en/Study-en.htm>