Retail Leased Lines, Wholesale Terminating Segments and Wholesale Trunk Segments of Leased Lines

**Identification and Analysis of Markets,
Determination of Market Power and Setting of Remedies.**

Consultation Document

3rd February 2006

Contents

Executive Summary

A new regulatory framework for electronic communications networks and services entered into force in Malta on the 14th September 2004. The framework is designed to create harmonised regulation across Europe and is aimed at reducing entry barriers and fostering prospects for effective competition to the benefit of consumers. The basis for the new regulatory framework is five new EU Communications Directives.

The new Directives require National Regulatory Authorities (NRAs), amongst other things, to carry out reviews of competition in communications markets to ensure that regulation remains appropriate in the light of changing market conditions. For a limited period, while those reviews are conducted and until the new Significant Market Power (SMP) conditions are imposed, some of the regulatory regime which existed prior to the 14th September 2004 continue to be in force in line with Article 39 and 40 of the Electronic Communications (Regulation) Act.

This review sets out the Malta Communications Authority's (MCA's) proposal for identifying a market and making a market power determination. Those likely to be effected may forward their comments within the period ending on the 3rd March 2006. Arrangements for submitting comments are explained in **Chapter 05**.

As required by Article 7 of the Framework Directive (as implemented by Article 4 of the Electronic Communications (Regulation) Act), the MCA's proposals will be subsequently notified to the European Commission and to other NRAs.

Summary of Proposals

Identification of Markets

The group of products and services under consideration in this document consists of retail leased lines and wholesale terminating and trunk segments of leased lines. Wholesale services are those sold and purchased by electronic communications providers rather than end-users.

In relation to these services, the MCA proposes to identify the following relevant markets in accordance with competition law principles and having utmost regard of the European Commission's *Recommendation on relevant product and service markets* adopted on 11 February 2003:

1) Retail traditional interface leased lines.

   This market incorporates the "minimum set of leased lines" up to and including 2 Mbit/s as identified by the Commission and is further segmented into two sub-markets:

   a) National leased lines;
   b) International leased lines.

2) Wholesale terminating segments of leased lines.

3) Wholesale trunk segments of leased lines.

   This market is further segmented into two sub-markets:

   a) National trunk segments of leased lines;
   b) International trunk segments of leased lines.

The details of the definition of these markets, and the approach taken by the MCA when identifying these markets, are contained in **Chapter 02** of this document.

Assessment of Market Power

Based on the evidence presently available to the MCA and after having analysed the operation of these markets, and taken due account of the Commission's 'Guidelines on market analysis and the assessment of SMP' (SMP Guidelines), the MCA proposes that Maltacom plc[1] should be designated as having significant market power in the above mentioned markets. The main reasons justifying the proposed designation are:

- a 100 per cent market share (volumes and revenues);
- vertically integrated provider;
- high economies of scale and scope; and
- barriers to switching.

Full details of the MCA's draft decision and reasoning are contained in **Chapter 03** of this document.

Regulatory Implications

Given the position of dominance held by Maltacom in all of the relevant markets under review – i.e. its ability to behave to an appreciable extent independently of competitors and consumers – the MCA proposes to impose conditions as follows:

Retail Obligations:

- Non-discrimination
- Cost Orientation for retail prices
- Cost accounting
- Accounting separation
- Transparency

[1] Hereafter referred to as "Maltacom". A reference in this report to Maltacom shall be deemed to include that undertaking, and any undertaking which is associated with, or is controlled by, or controls, directly or indirectly, the undertaking in question and which carries out business activities in Malta, where the activities engaged in (either directly or indirectly) are activities falling within the scope of the relevant markets defined above.

Wholesale Obligations:

- Access to/and use of specific network facilities
- Non- discrimination
- Transparency
- Price control & cost accounting
- Accounting Separation

Full details of these remedies, including their effect and the reasons for proposing to set these conditions, are contained in **Chapter 04** of this document.

Chapter 01 - Introduction

A new regulatory framework for electronic communications networks and services entered into force on the 25th July 2003. The framework is designed to create harmonised regulation across Europe and is aimed at reducing entry barriers and fostering prospects for effective competition to the benefit of consumers. The basis for the new regulatory framework is five new EU Communications Directives:

- Directive 2002/21/EC on a common regulatory framework for electronic communications networks and services ("the Framework Directive");
- Directive 2002/19/EC on access to, and interconnection of, electronic communications networks and associated facilities ("the Access Directive");
- Directive 2002/20/EC on the authorisation of electronic communications networks and services ("the Authorisation Directive");
- Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services ("the Universal Service Directive"); and
- Directive 2002/58/EC concerning the processing of personal data and the protection of privacy in the electronic communications sector ("the Privacy Directive").

The Framework Directive provides the overall structure for the new regulatory regime and sets out fundamental rules and objectives, which read across all the new directives. Article 8 of the Framework Directive sets out three key policy objectives, which have been taken into account in the preparation of this consultation document, namely promotion of competition, development of the internal market and the promotion of the interests of the citizens of the European Union.

The Authorisation Directive establishes a new system whereby any person will be generally authorised to provide electronic communications services and/or networks without prior approval. The general authorisation replaces the former licensing regime. The Universal Service Directive defines a basic set of services that must be provided to end-users. The Access and Interconnection Directive sets out the terms on which providers may access each others' networks and services with a view to providing publicly available electronic communications services.

These four Directives were implemented in Malta on the 14th September 2004. This was achieved via the entry into force of the Electronic Communications (Regulation) Act, 2004 (hereafter referred to "ECRA") and the Electronic Communications Networks and Services (General) Regulations, 2004 (hereafter referred to "ECNS"). The fifth Directive on Privacy establishes users' rights with regard to the privacy of their communications. This Directive was adopted slightly later than the other four Directives and has an implementation date of 10th January 2003 (Legal Notice 16 of 2003 under the Data Protection Act).

The new Directives require National Regulatory Authorities (NRAs) such as the MCA to carry out reviews of competition in communications markets to ensure that regulation remains appropriate in the light of changing market conditions.

Each market review is divided in three main parts:

- o definition of the relevant market or markets;
- o assessment of competition in each market, in particular whether any companies have Significant Market Power (SMP) in a given market; and
- o assessment of what are the appropriate regulatory obligations which should be imposed given the findings on SMP (NRAs are obliged to impose some form of regulation where there is SMP).

More detailed requirements and guidance concerning the conduct of market reviews are provided in the Directives, the ECRA, the ECNS, and in additional documents issued by the European Commission and the MCA. As required by the new regime, in conducting this review, the MCA has taken the utmost account of the two European Commission documents discussed below.

01.1 Market review methodology

The European Commission has identified in its Recommendation, a set of markets in which *ex ante* regulation may be warranted. The Recommendation seeks to promote harmonisation across the European Community by ensuring that the same product and service markets are subject to a market analysis in all Member States. However, NRAs are able to regulate markets that differ from those identified in the Recommendation where this is justified by national circumstances. Accordingly, NRAs are to define relevant markets appropriate to national circumstances, provided that the utmost account is taken of the product markets listed in the Recommendation (Regulation 6 of the ECNS).

The European Commission has also issued Guidelines on market analysis and the assessment of SMP (“SMP Guidelines"). The MCA has also published a document outlining the guidelines on the methodology to be used for assessing effective competition in the Maltese electronic communications sector[2]. The MCA is required to take these guidelines into utmost account when analysing a product or service market in order to access whether the market under investigation is effectively competitive or otherwise (refer to Regulation 8 of the ECNS).

As required by Article 7 of the Framework Directive and Regulation 6 of the ECNS, the results of these market reviews and the proposed draft measures need to be notified to the European Commission and to other NRAs. The Commission and other NRAs may make comments within the one month consultation period. If the Commission is of the opinion that the market definition, or proposals to designate an operator with SMP or proposals to designate no operator with SMP, would create a barrier to the single market or if the Commission has serious doubts as to its compatibility with Community law, and issues a notice under Article 7(4) of the Framework Directive, the MCA is required by Regulation 6 of the ECNS to delay adoption of these draft measures for a further period of 2 months while the Commission considers its position.

The MCA has collected market data from a variety of internal and external sources, including providers of electronic communications networks and services, in order to carry out

[2] Link to market review methodology: http://www.mca.org.mt/library/show.asp?id=513&lc=1

thoroughly its respective market definition and market analysis procedures based on established economic and legal principles, and taking the utmost account of the Relevant Markets Recommendation and the Guidelines.

01.2 Consultation

As required by Article 10 of the ECRA, the MCA is to publish the results of the market reviews and to provide operators the opportunity to comment on the findings prior to adopting the final proposals.

Furthermore, Regulation 6 of the ECNS establishes that prior to adopting the draft measures proposed in the market review the MCA is required to notify the Commission with the findings of the market reviews, the proposed remedies and the outcome of the national consultation process.

In line with our national consultation process, the consultation period will run from 3rd February 2006 to 3rd March 2006 during which the MCA welcomes written comments on any of the issues raised in this paper. Further details on the public consultation are provided in **Chapter 05**.

01.3 Liaison with Competition Authority

There is a requirement on the MCA under Regulation 10 of the ECNSR to carry out an analysis of a relevant market within the Electronic Communications sector. This analysis must be carried out in accordance, where appropriate, with an agreement with the National Competition Authorities (NCA) under Regulation 10 of the ECRA.

In line with the co-operation agreement signed on the 20th May 2005 between the MCA and the Office of Fair Competition (OFC)[3], the MCA has initiated a two week consultation process with the OFC. The MCA has forwarded and presented the results of this review to the OFC. To date the MCA did not receive any representations from the OFC and therefore the MCA is of the understanding that the OFC agrees with the findings of analysis. The official position of the OFC in writing is expected in the coming days, which will then be made available to the general public.

01.4 Scope of this review

This review considers the markets for retail leased lines, wholesale terminating segments and wholesale trunk segments of leased lines in Malta (also hereafter referred to as the "leased lines markets") i.e. dedicated connections and capacity required by end-users to construct networks or link locations, or required by undertakings that in turn provide services to end-users.

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3 Link to Memorandum of Understanding between MCA and OFC:
http://www.mca.org.mt/library/show.asp?id=656&lc=1

Q1. Do you agree with the scope of the MCA's review for retail leased lines, wholesale terminating segments and wholesale trunk segments of leased lines?

01.5 Structure of the document

The rest of the document is structured as follows:

Chapter 02 presents MCA's preliminary conclusions on the definition of the markets for retail leased lines, wholesale terminating segments and wholesale trunk segments of leased lines in Malta. This section consists of a review of the market definition procedure and its scope, as well as demand side and supply side assessments at the retail and wholesale levels.

Chapter 03 presents MCA's market analysis for the markets for retail leased lines, wholesale terminating segments and wholesale trunk segments of leased lines, and outlines a preliminary view on whether these markets are effectively competitive or those undertakings with significant market power.

Chapter 04 provides a discussion of the general principles associated with remedies and outlines the proposed remedies on SMP operators, under the new regulatory framework.

Chapter 05 provides details with regard to the submission of comments on this consultation document.

Chapter 02 - Market Definition

Regulation 10 of the ECNS provides that before a market power determination may be considered, the MCA must identify the markets which are, in its opinion, the ones which, in the circumstances of Malta are the markets in relation to which it is appropriate to consider such a determination and to analyse that market. In identifying the relevant markets, the MCA is required to take utmost account of all applicable guidelines and recommendations issued by the European Commission.

In formulating the MCA approach to market definition, the MCA has paid the utmost regard to the Commission's Recommendation of 11 February 2003.

Where the proposed market definition differs from the Commission's Recommendation the difference is identified and justification given in the light of the national circumstances which justify this departure, in the manner prescribed by the Recommendation.

Paragraph 3.1 of the Commission's Recommendation states that *'because market analysis is forward-looking, markets are defined prospectively taking account of expected or foreseeable technological or economic developments over a reasonable horizon linked to the timing of the next market review'*. The market analysis has been carried out on a forward looking basis and, where it is thought possible that market conditions may change significantly during the time of this review, these changes are identified and discussed.

The Recommendation states in Paragraph 4 that retail markets should be examined in a way which is independent of the infrastructure being used, as well as in accordance with the principles of competition law. Again this approach is at the heart of the MCA's analysis. The MCA's approach in assessing the markets is based on an analysis of competition levels and an assessment of the extent to which switching among services by consumers constrains prices, irrespective of the infrastructure used by the providers of those services.

In its Recommendation the Commission advises that the relevant leased lines market at the retail level should include the minimum set of leased lines (which comprises the specified types of leased lines up to and including 2 Mbit/s as referenced in Article 18 and Annex VII of the Universal Service Directive[4]).

In the *Explanatory Memorandum* to the Recommendation, the Commission further elaborates *"the minimum set of leased lines refers to specified leased circuits with harmonised characteristics that must be made available under particular conditions throughout the national territory. Therefore this minimum set of leased lines is identified in the Recommendation as a specific set of retail markets. It is not felt necessary to identify specific markets for each category of leased line in the minimum set since it is likely that the market structure will be similar for each sub-set. It is not necessary to expand the retail leased line categories to capacities beyond the minimum set since there must always be a presumption that an intervention at a wholesale level will be sufficient to address any problems that arise. There is no* a priori *reason to believe that this would not be the case in a leased line context."*

[4] Transposed by Malta in the *Electronic Communications Networks and Services (General) Regulations, 2004*.

In the Recommendation, the Commission also advises that the relevant leased lines markets at the wholesale level should include the wholesale terminating segments and wholesale trunk segments of leased lines. Together these two wholesale markets correspond to the markets for leased line interconnection and for wholesale provision of leased line capacity to other suppliers of electronic communications networks or services.

In the *Explanatory Memorandum* to the Recommendation, the Commission also elaborates that *"What constitutes a terminating segment will depend on the network topology specific to particular Member States and will be decided upon by the relevant NRA. In addition while many trunk segment markets on major routes are likely to be effectively competitive in certain geographic areas in Member States, trunk segments may not support alternative suppliers. For this reason trunk segments are also identified. Additional market segmentation is possible between high and low capacity leased lines."*

The MCA has conducted an assessment of the markets for retail leased lines, wholesale terminating segments and wholesale trunk segments of leased lines, in order to validate their appropriateness in the Maltese context, and as preparatory work for the assessment of SMP in these markets.

This chapter outlines the MCA's findings setting out the different markets that the MCA has identified, and giving reasoning for his proposed conclusions.

02.1 Background to the electronic communications and leased lines sectors in Malta

As at December 2004 the total population of Malta stood at approximately 400,000. According to the National Statistics Office (NSO) there are approximately 128,000 residential households. These figures indicate the small geographic size of Malta (*ca.* 315km²) and this is reflected in the relatively small-scale electronic communications services/networks available. Nonetheless, the electronic communications sector has in the past decade experienced an impressive growth both in terms of the number of operators and the variety of services offered. A perceptible amelioration in the quality of delivery of such services has also been recorded.

During the first nine months of 2004 the contribution of the electronic communications sector towards the Gross Domestic Product was just over 3 per cent, which shows a significant contribution to value added in the economy. For further details on the performance of the electronic communications sector in the Maltese economy and other relevant statistics, reference should be made to the latest Electronic Communications Market Review published by the MCA[5.]

National leased line services are generally used to provide connections within the Northern and Southern Harbour Districts, and from these districts to the rest of the island. According to the NSO just over half of the population resides in the Northern and Southern Harbour Districts, which have an average population density of around 4,140 persons per km² (compared to a national density of around 1,270 persons per km²). The Northern and Southern Harbour Districts correspondingly host a very high proportion of commercial activity in Malta.

[5] Link to documents on the MCA website: http://www.mca.org.mt/library/channel.asp?lc=1&ch=6&t=3

In all there were four public communications networks operational in Malta as at May 2005. These were Maltacom plc[6], Mobile Communications Limited[7], Vodafone Malta Limited[8], and Melita Cable plc[9]. Go Mobile and Vodafone operated their own GSM networks on the national territory. Maltacom - the incumbent fixed telephony operator - is the major undertaking that provides fixed access and calls over the public service telephone network (PSTN). Maltacom has over the past decade developed its ubiquitous network from one predominantly focused on fixed-line telephone services, to one which incorporates other types of electronic communications services including data communications (in conjunction with its fully owned subsidiary DataStream). Melita Cable launched its Cable TV service in June 1992 and currently provides services to over 100,000 homes, or more than 76 out of every 100 homes in Malta. Melita Cable also provides data services over its network using EuroDOCSIS modem technology.

Located just south of Italy in the Mediterranean Sea, the distance between the Maltese archipelago and the nearest point in Sicily is 93 km. As a result Malta relies, to a major extent, on two submarine cables for international connectivity. Maltacom inaugurated the first optic fibre submarine cable between Malta and Sicily in 1995. The second optic fibre submarine cable between Malta and Sicily was commissioned by Vodafone and became operational in 2004. Other international connectivity is also provided over satellite links and a long-distance microwave link to Sicily.

02.2 Market definition process

The purpose of the market definition process is to identify the competitive constraints that electronic communications service providers face. There are two dimensions to the definition of a relevant market: the relevant products to be included in the same market and the geographic extent of the market. The MCA's approach to market definition follows that identified in MCA's market review methodology.

Recital (7) of the Recommendation clearly states that the starting point for market definition is a characterisation of the retail market over a given time horizon, taking into account the possibilities for demand and supply-side substitution. The wholesale market is then identified subsequently to this exercise being carried out in relation to the retail market. This approach is repeated in paragraph 3.1 of the main Recommendation. With reference to wholesale leased lines Recital (8) of the Recommendation continues that these are defined as separate markets for wholesale terminating segments and wholesale trunk segments on the basis of both demand side and supply side characteristics. This approach is exactly that followed by the MCA in the following sections.

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[6] Hereafter referred to as "Maltacom".

[7] Operating under the trade name and hereafter referred to as "Go Mobile".

[8] Hereafter referred to as "Vodafone".

[9] Hereafter referred to as "Melita Cable".

A reference in this report to any of the above shall be deemed to include that undertaking, and any undertaking which is associated with, or is controlled by, or controls, directly or indirectly, the undertaking in question and which carries out business activities in Malta, where the activities engaged in (either directly or indirectly) are activities falling within the scope of the relevant markets defined above.

02.3 Delineation of the retail leased lines market

The delineation of the markets is based on an analysis of demand and supply substitutability between different products and services which could potentially form part of the market under investigation. This section provides an analysis of the degree of substitutability between available products and services in Malta, taking also a forward-looking approach with respect to possible developments in the market under review.

In the February 2003 *Relevant Markets Recommendation* the Commission has defined a retail market (number 7) consisting of the minimum set of leased lines (which comprises the specified types of leased lines up to and including 2 Mbit/s as referenced in Article 18 and Annex VII of the Universal Service Directive). Subsequently in its July 2003 *Decision on Minimum Set of Leased Lines* the Commission established that for the purposes of Article 18 of the Universal Services Directive the minimum set is defined according to specific harmonised characteristics and associated standards. The list of standards is reproduced in Appendix A to this document.

As part of the market definition process the delineation of the relevant markets is performed by examining a number of issues:

- whether different bandwidths of leased lines fall in the same retail market;
- whether analogue and digital leased lines fall in the same retail market;
- whether national and international leased lines fall in the same retail market;
- the functional characteristics of "traditional leased lines" are examined with respect to other managed point-to-point data services available in Malta. Where demand-side substitution is evident then the retail market may need to be broadened accordingly.

02.3.1 Different bandwidths of leased lines

Since retail leased lines are available in various bandwidths one issue that needs to be considered as part of the market definition exercise is whether different bandwidths fall within the same retail product market. The bandwidths currently available in Malta consist of the following:

- Speeds of up to 64 kbit/s [10];
- 64 kbit/s;
- Multiples of n x 64 kbit/s;
- 2 Mbit/s.

The above bandwidths include *inter alia* the leased lines with harmonised technical characteristics defined in the Commission's *Minimum Set of Leased Lines*. Although the previous regulatory framework[11] allowed for regulatory control over an extended set of leased lines with speeds of 34,368 kbit/s, 139,264 kbit/s and 155 Mbit/s (STM-1), no obligations related to these high bandwidth leased lines were imposed in Malta. The MCA

[10] For certain types of leased lines (e.g. analogue) an appropriate modem would need to be used.

[11] *vide* the ONP Leased Lines Directive (92/44/EC) as amended.

has considered the extent to which retail leased lines at different bandwidths are substitutes from an economic perspective.

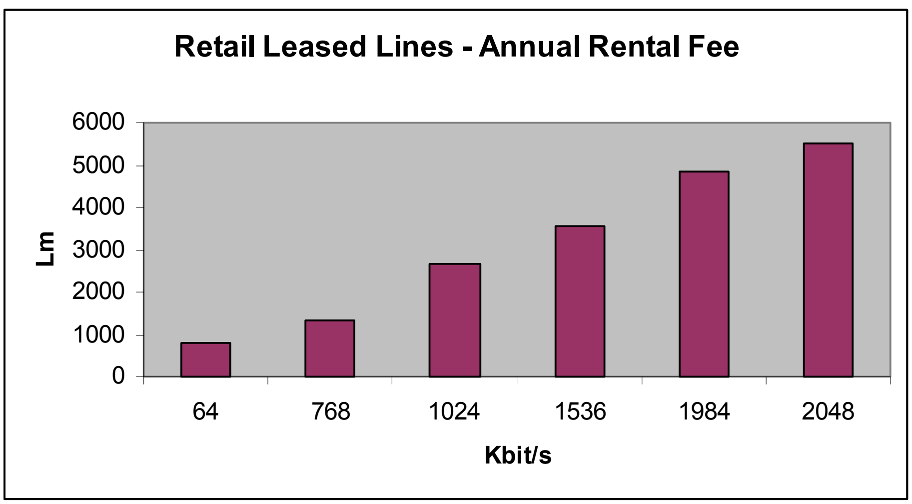
Demand-side substitutability

Functional substitutability

Retail leased lines are sold to customers in order to provide dedicated capacity at bandwidths depending on the application and volume requirements of the end-users. In terms of pure functionality it is generally possible[12] to use multiples of lower bandwidth leased lines as substitutes for higher bandwidth leased lines. Higher bandwidth will also meet lower capacity requirements. From a purely functional perspective, it appears that a chain of substitution exists for various bandwidths.

Prices

The hypothetical monopolist test contemplates demand and supply-side responses for a lasting price increase starting from competitive prices. The annual rental fees for retail leased lines of bandwidths between 64 kbit/s and 2 Mbit/s (currently regulated and cost-oriented) are outlined in the graph below[13]:



The MCA believes that the relative price differences between the various bandwidths of leased lines suggest that it is likely that end-users may respond to an increase in, for example, the price for 2 Mbit/s leased lines by buying multiple 1024 kbit/s configurations. Similarly, an end-user would be likely to respond to a small but significant increase in, for example, 1984 kbit/s leased lines by buying a 2 Mbit/s circuit.

This chain of substitution exists because a price increase by a hypothetical monopolist only at a particular bandwidth can be expected to induce customers to choose instead retail leased lines at other bandwidths, being either multiples of lower bandwidths or else the next

[12] Certain exceptions may exist depending on the end-user application.

[13] Bandwidths between 64 kbit/s and 2 Mbit/s are provided in configurations of n * 64 kbit/s.

highest bandwidth. The MCA recognises that there is a break in the chain of substitution at 2 Mbit/s above which, to date, no regulatory obligations have been imposed (including the obligation to provide service).

Supply substitutability

When assessing supply substitutability between different bandwidths of leased lines one has to consider whether a supplier would enter the market in response to a 5 to 10 per cent increase by a hypothetical monopolist.

Supply-side substitution would involve an alternative operator responding to a price increase by the hypothetical monopolist offering that service. The MCA considers that substitutability may exist if the customer's premises are already being served by an alternative supplier's network infrastructure for other services. Where this is not the case, it would be unlikely that a new entrant incurs the cost of constructing an access infrastructure to provide retail leased lines to a new site in response to a 5 to 10 per cent increase in the price.

The reason is that the costs of local access (including digging, ducting, reinstatement and wiring) to a new site are significantly high and are likely to involve a significant time delay in responding to the price increase. Whereas the potential for broadband wireless access (BWA) networks exists, the investment needed to enter the market for this type of access is also a substantial one and it would take a significant amount of time to deploy a network with nation-wide coverage. The MCA considers that the likelihood of quick and inexpensive entry is therefore not reasonably feasible on a scale sufficient to constrain the prices of a hypothetical monopolist. As a consequence there is there is limited supply-side substitutability.

Preliminary conclusion

The MCA concludes that there is a defined market for retail leased lines having bandwidths up to and including 2 Mbit/s. This view is consistent with the *Relevant Markets Recommendation* which states that it is not necessary to identify specific markets for each category of leased line in the minimum set since it is likely that the market structure will be similar for each subset.

The MCA recognises that there is a break in demand-side substitution at 2 Mbit/s and that higher-capacity leased lines would fall in a separate market. The MCA however considers that at present it is not necessary to expand the retail leased line categories to capacities beyond the minimum set, since there must always be a presumption that an intervention at a wholesale level will be sufficient to address any problems that arise. This principle will therefore be taken into account when framing the market analysis relating to the wholesale leased lines markets.

02.3.2 Analogue and digital leased lines

One issue to be addressed as part of the retail leased lines market definition exercise is whether there are two distinct retail markets for analogue leased lines and for digital leased lines. In view of the specific technical characteristics of analogue leased lines and the broad range of digital leased lines available, for the purpose of assessing substitutability between analogue and digital leased lines the analysis will refer principally to digital leased lines of comparable speeds to those achievable by analogue leased lines.

Demand-side substitutability

Functional substitutability

Analogue leased lines are typically used for the provision of voice and voice-band data connections. Analogue leased lines are provided using analogue technology, particularly analogue customer premises equipment and generally tend to be legacy installations. Analogue leased lines are capable of supporting direct voice transmission (a 64 kbit/s capacity for voice services). For data transmission, analogue leased lines can usually carry, at most, approximately 40-50 kbit/s (by using a modem). A digital leased line may offer more or less than 64 kbit/s for data (and can carry voice if digital phone end-user equipment is installed).

From a technical point of view, analogue and digital leased lines differ to a limited extent. Analogue and low bandwidth digital leased lines are normally provided using similar technology in the core network, if not the same core network. The access network is where the services usually differ as different equipment is installed at the serving exchange/node and the customer premises. It is fairly simple to adapt an analogue leased line to transmit digital data and to adapt a digital leased line to transmit analogue signals. An analogue leased line can be adapted to transmit digital information with the use of modems at either end. Likewise, a digital leased line can be converted to transmit analogue signals with the use of analogue to digital converters at either end. This can even be done by the end-user.

If offered at the same price, a 64 kbit/s digital leased line can be viewed as offering a better deal than an analogue line because it offers more flexibility in terms of voice and data usage. While a digital line guarantees 64 kbit/s for data and can definitely carry voice traffic if a digital phone is used, an analogue line guarantees voice but can only support speeds below 64 kbit/s for data (typically up to 40-50 kbit/s) with the use of modems.

Although the digital product offers a higher quality service than the analogue, analogue leased lines and 64 kbit/s digital leased lines appear to be substitutes in terms of functionality. The MCA does not believe that there is a significant functional difference between digital (at 64 kbit/s) and analogue leased lines, primarily because they can both support voice and data and the underlying network facilities are similar with the exception of the terminal equipment and the hardware required at the serving exchange/node.

Hypothetical Monopolist Test

As part of the demand-side substitution analysis, the hypothetical monopolist test assesses whether or not a hypothetical monopolist can profitably raise the price 5 to 10 per cent above its competitive level. The demand-side substitution analysis will look at whether or not digital leased lines can constrain analogue leased lines.

It would not be profitable for a hypothetical monopolist to raise the price of analogue leased lines 5 to 10 per cent above the competitive level if enough end-users switch away from analogue to digital leased lines in response to a small but significant lasting price increase.

It is believed that the price of an analogue leased line after a 5 to 10 per cent increase would still be about 15 per cent less expensive than that of a 64 kbit/s digital leased line. Existing customers of analogue leased lines would additionally face some switching costs due to changes in the end-user equipment and possibly a migration charge. Such barriers to switching are faced by existing end-users but not by purchasers of new leased lines. Nonetheless, because digital leased lines offer higher quality than analogue leased lines, it is believed that a hypothetical monopolist would not be able to raise its prices without incurring a reduction in profits due to a decline in the number of lines. Furthermore such a hypothetical monopolist would also significantly lose its share of new end-users, who would opt to buy a digital leased line instead of an analogue leased line. As a consequence, the MCA feels that there is sufficient demand substitutability to constrain the ability of a hypothetical monopolist to increase the price of analogue leased lines.

Supply substitutability

When assessing supply substitutability between analogue and digital leased lines one has to consider whether an existing supplier of one type would enter the market for the other type in response to a 5 to 10 per cent increase by a hypothetical monopolist.

Supply-side substitution would involve an alternative operator responding to a price increase by the hypothetical monopolist offering that service. Although it would be fairly easy for an existing operator to transform an existing digital leased line into an analogue leased line and vice versa, it is not considered feasible that entry by new suppliers would occur in the short term as a response to a 5 to 10 per cent increase in the price of analogue leased lines (especially to premises not already being served by the new supplier's network infrastructure for other services).

The reason is that the costs of local access (especially digging and ducting) to a new site are significant and are likely to involve a significant time delay in responding to the price increase. Whereas the potential for broadband wireless access (BWA) networks exists, the investment needed to enter the market for this type of access is also a substantial one and it would take a significant amount of time to deploy a network with nation-wide coverage. The MCA considers that the likelihood of quick and inexpensive entry is therefore not feasible on a scale sufficient to constrain the prices of a hypothetical monopolist. As a consequence there is limited supply-side substitution between analogue and digital leased lines.

Preliminary conclusion

The MCA takes the view that, overall, analogue and digital retail leased lines fall within the same relevant product market. This view is consistent with the *Relevant Market Recommendation* which states that it is not necessary to identify specific markets for each category of leased line in the minimum set since it is likely that the market structure will be similar for each subset.

02.3.3 Traditional leased lines and other data services

The *Relevant Markets Recommendation* in its title describing leased lines refers to "Dedicated connections and capacity". The *Recommendation* identifies the relevant retail market to comprise the leased lines forming part of the minimum set defined according to specific harmonised characteristics and associated standards (henceforth "traditional leased lines"). However, the MCA notes that within the Maltese market, capacity is also available over managed data services which may not necessarily be dedicated, but which could possibly enable services functionally equivalent to a "traditional leased line".

The MCA has identified the following specific managed data services which need to be examined from this perspective and that are currently available in Malta:

- IP-VPNs
- xDSL

- Cable data services
- ATM
- Ethernet

The purpose of this section is to assess the substitutability of these managed data services. The MCA has considered the extent to which retail traditional leased lines and such managed data services are substitutes from an economic perspective.

Demand substitutability

- **Functionality**

In order to define the market for leased lines, the MCA has assessed objective or functional characteristics that buyers seek when purchasing a leased line. The MCA understands that the functional characteristics[14] of leased lines are products which:

1. enable point-to-point connectivity between network termination points;
2. do not include 'on demand switching' or routing functions controlled by the user.
3. allow for transparent and symmetric transmission capacity;
4. present high levels of guaranteed availability of service;

Products with the above functional characteristics, but which do not necessarily conform to the harmonised technical characteristics defined in the Commission's Minimum Set of Leased Lines, could nonetheless be viewed as close substitutes to "traditional leased lines". Other products which do not exhibit all of the above characteristics may not be close substitutes to 'traditional' leased lines and as such would represent a lesser competitive constraint on the demand-side in the market, especially when provided over connections which are shared and contended between users.

In order to inform a view on the demand-side substitution effects, the MCA assesses each product in turn to identify those products that represent close or adequate substitutes to "traditional leased lines".

IP-VPNs

With IP solutions the destination point is associated with the IP address defined by the user. As a result IP circuits may be used for point-to-point or point-to-multipoint applications.

An IP solution which would allow an end-user to send data and choose to have that data arrive at different destinations on demand i.e. point-to-multipoint capacity does not offer the equivalent functional characteristics offered by a traditional leased line. The MCA is of the view that inherent additional flexibility is provided, as customers do not have to define specifically the point-to-point connectivity at the time of provisioning, and can adjust this easily and flexibly to suit their needs. Removing the functionality of on-demand switching which facilitates the point-to-multipoint capacity constrains the functional characteristics to simply capacity between two points. The MCA therefore concludes that services that allow

[14] Although there is no statutory definition for a "leased line" the defining characteristics can be inferred by referring to the text of the *Open Network Provisions* framework and the *Relevant Markets Recommendation*.

for on demand switching by end-users and are capable of multipoint connectivity are not functionally equivalent to a traditional leased line.

An IP network can however be configured to replicate point-to-point capacity via IP tunnelling over a private network that provides a permanent virtual path between two points. The MCA considers that this in itself does not guarantee that such an IP-VPN provides an equivalent service to a traditional leased line. In order to be deemed a functional substitute, other conditions must be met such as perceived availability of a defined symmetric bandwidth and high levels of guaranteed availability of service. These characteristics depend largely on the underlying layers (sometimes involving xDSL or cable data services) and the number of services contending the dimensioned resources. The MCA therefore holds that it is not possible to consider *a priori* IP-VPNs to be functionally equivalent to a traditional leased line unless such conditions are clearly met.

xDSL

Digital subscriber line (xDSL) technologies are based on copper loops that convert the copper pair into a digital line. Digital Subscriber Line Access Multiplexers (DSLAMs) at an exchange connect high-speed xDSL data traffic. xDSL lines may either be:

- asymmetric - meaning that it supports lower data rates for upstream traffic than for downstream traffic (e.g. ADSL), or

- symmetric - meaning that it supports the same data rates for upstream and downstream traffic (e.g. SDSL).

ADSL is one of the primary technologies used for the provision of broadband services in Malta. As explained above an ADSL customer can receive data at a higher data rate (e.g.1024 kbit/s) than can be sent (e.g.256 kbit/s). This means that even though traditional leased lines can also be used for Internet access, ADSL and traditional leased lines have functional differences that indicate they cannot be considered as functional substitutes.

Notwithstanding, a limited set of ADSL products with symmetric upload and download data rates are available. However, in this case the speed is limited to only 512 kbit/s and is generally implemented in multi-point solutions. Also the product has limited guaranteed availability of service when compared to leased lines.

The MCA does not consider these products to fall under the definition of SDSL, but simply a variant of the mainstream ADSL product. A true SDSL product would run at data rates up to 3 Mbit/s, and is normally only available over a dedicated Metallic Path Facility (MPF) with a dedicated network termination point at the end-user premises and cannot co-exist with other services on the same MPF e.g. PSTN service is not supported. Currently SDSL services are not available in Malta.

The MCA concludes that all ADSL products currently available in Malta have functional differences that indicate they cannot be considered to be functionally equivalent to a traditional leased line.

Cable Data Services

Melita Cable offers Wide Area Network (WAN) data services in Malta via its EuroDOCSIS (European Data Over Cable Service Interface Specifications) cable modem infrastructure using MPLS (Multi Protocol Label Switching) VPN technology. The EuroDOCSIS standard enables dedicated encrypted connections and guarantees committed data rates. Service availability is virtually nationwide in terms of homes passed. The MCA notes that these products are provided over a Hybrid Fibre Coax (HFC) network used primarily to provide cable TV. Some measure of guaranteed availability of service is provided only on a bespoke basis. Furthermore, information available to the MCA suggests that although the current commercial offering includes symmetric data services up to 2 Mbit/s, capacity on the upstream path is heavily contended and high constant data rates are inherently difficult to guarantee. Such services are also generally deployed in a point-to-multipoint configuration.

The MCA believes that, overall, the current HFC cable data services are not considered to be a functional substitute to traditional leased lines, since a number of conditions do not appear to be met.

ATM

ATM is a transmission protocol that is suited for traffic which has variable bandwidth requirements. ATM has the potential to be contended, depending on the solution design specified by network parameters or data priorities. The MCA considers that ATM circuits offer permanent virtual paths with the paths defined at the time of provision and this limits on-demand switching by the user. ATM can indeed provide a service level equivalent to dedicated capacity. The issue of transparency is a feature which can be customer/service specific and is addressed in the solution design by specifying network parameters or data priorities. ATM provides a functionally equivalent service to traditional leased lines. However, currently ATM circuits are only available at access speeds of 10 Mbit/s to 155 Mbit/s. For this reason ATM circuits are not regarded as functional substitutes for the minimum set of leased lines, since the minimum set is limited to 2 Mbit/s.

Ethernet

Ethernet technologies can be configured to offer an equivalent functional service to a high capacity traditional leased line. Currently Ethernet circuits are only available at access speeds of 10 Mbit/s or 100 Mbit/s. For this reason Ethernet circuits are not regarded as functional substitutes for the minimum set of leased lines, since the minimum set is limited to 2 Mbit/s.

- **Prices**

The MCA notes that there is an inherent difficultly in applying the hypothetical monopolist test to assess whether in fact this broad range of “managed data services” constrains the minimum set of leased lines. Pricing for these managed data services is generally based on a number of variable criteria, such as quality of service and capacity. Thus pricing is typically bespoke and will vary depending on the users requirements. It is therefore not possible to show that a relative price increase of either product would support demand-side substitution between the two markets.

- **Overall demand substitutability**

The MCA does recognise that there is a growth in “managed data services”. Data available to the MCA indicates that the number of circuits provided over such “managed data services” has experienced rapid growth and overtaken the number of traditional leased lines. Where traditionally some customers might have bought individual leased lines for a branch network, the market appears to be moving to use of other services. However it is also evident that the total number of circuits provided over these “managed data services” outstrips by far any reduction in the number of "traditional leased lines" services. The MCA considers that this phenomenon is a strong indication that the wide range of "managed data services" is indeed satisfying users' needs which are appreciably different from those accommodated by traditional leased line services and that the products should therefore fall in different markets.

In particular the above "managed data services" products are not usually provided with a high level of customer care as standard. Data available to the MCA indicates that 2 Mbit/s traditional leased lines have a typical repair time of approximately 6 hours and mean service availability of approximately 99.98 per cent. Although it might be possible for consumers of "managed data services" to purchase enhanced service levels on some products, it normally falls short of leased line service levels. In many instances they are contended/shared at some point, and thus do not provide guaranteed bandwidth. Furthermore, the end-user has less flexibility since certain end-use applications may be sensitive to variation in data rates and prioritisation, as there is more third party management by the provider. Due to their versatility leased lines can be used as inputs into other data services, however the reverse is not always the case. "Managed data services" are also commonly deployed in point-to-multipoint rather than point-to-point configurations, as opposed to leased lines. Considering all these factors, the MCA believes that "managed data services" offer a compromise between service level and cost, and therefore cannot be regarded as demand-side substitutes for leased lines.

From a purely functional point of view, ATM and Ethernet services over fibre offer equivalent functionality as a leased line, thereby also explaining part of the movement from "traditional leased lines" to managed data services. However, these products are used for the provision of high capacity data transmission (above 10 Mbit/s) and thus may not be considered substitutes for the minimum set of leased lines, since the minimum set is limited to 2 Mbit/s.

Supply substitutability

As a starting point, the MCA considers whether in the event of a lasting price increase of a traditional leased line by a hypothetical monopolist supplier, a provider of another managed data service product could potentially switch in the immediate to medium term to offer leased line services without incurring significant costs. The MCA notes that the significant elements of sunk costs associated with the provision of both managed data services products and traditional leased lines are incorporated into the underlying network infrastructure i.e. trenching, ducting, optical fibre. The MCA notes that the supply of the listed managed data services products are just differentiated by the network equipment utilised over the network infrastructure.

Thus the MCA considers that an established alternative operator providing managed data services could, following a hypothetical price increase, be able to utilise its own network to provide leased line services. The degree to which this is feasible however depends on the extent of investment in new network equipment required. Furthermore a completely new entrant would not be able to provide either managed or leased line services given the significant sunk costs (especially digging, ducting and wiring) involved.

Preliminary Conclusion

The MCA is clear that there are indications of demand and supply-side substitution for some elements of the product market. However at this point, the MCA does not consider that there is sufficient evidence to conclusively show significant demand-side substitution to justify broadening the retail market from the minimum set. In particular the MCA believes there are differences in flexibility, service guarantees and customer care. Nevertheless the MCA intends to closely monitor the market in the short term and to continuously assess the impact of these products. If appropriate the MCA will carry out a further market definition under the ECNS Regulations to extend the market and include other managed data service products other than the minimum set of leased lines.

02.3.4 National and international retail leased lines

In the *Relevant Markets Recommendation* the Commission defined a retail market which includes the minimum set as described in the Universal Services Directive. It does not distinguish between national and international leased lines. The MCA has considered whether and to what extent international leased lines (with one point in Malta and the other point outside Malta) and national leased lines (with both points within Malta) fall within the same market.

Demand-side substitutability

From the demand-side analysis a consumer of international leased lines will not respond to a small but significant non-transitory price increase by a hypothetical monopolist of international leased lines by switching to a national leased line (or vice-versa). Therefore the MCA considers that there is no demand substitutability between national leased lines and international leased lines.

Supply substitutability

The MCA has examined whether an operator of international leased lines would respond to a small but significant non-transitory price increase by a hypothetical monopolist supplier of national leased lines (and vice versa). The MCA believes that such a switch in production could not occur, sufficiently promptly or cost effectively in order to constrain the hypothetical monopolist. An international operator would need to acquire key network based inputs which are different and additional to those used to provide international leased lines. Conversely, it is also unlikely that a supplier of national leased lines would be able to switch its production into the international market promptly and at minimal cost given the high costs associated with the insularity of Malta.

Apart from the time and elevated costs of building international infrastructure, international leased lines are often provided as part of broader regional and international agreements, the dynamics of which are different from the national market. Thus it is unlikely that entry could occur within a timeframe to constrain a hypothetical monopolist. The MCA therefore concludes that no supply-side substitution exists.

Preliminary conclusion

The MCA considers that there are two sub-markets for retail national and retail international leased lines.

02.4 Delineation of the wholesale market

The delineation of the markets is based on an analysis of demand and supply substitutability between different products and services which could potentially form part of the market under investigation. This section provides an analysis of the degree of substitutability between available terminating segments and trunk segments of leased lines in Malta, taking also a forward looking approach with respect to possible developments in the market under review.

02.4.1 Wholesale traditional leased lines and other data services

In its retail analysis, the MCA has considered the extent to which retail traditional leased lines and managed data services are substitutes from an economic perspective. The conclusion on the retail market was that "managed data services" are not demand-side substitutes for leased lines. However, in the case of ATM and Ethernet it was concluded that these products offer equivalent functionality as a traditional leased line, and therefore were not included in the relevant retail market of the *Minimum Set of Leased Lines* only because they are used for the provision of high capacity data transmission (at and above 10 Mbit/s).

The MCA is of the opinion that, likewise, at the wholesale level, end-to-end ATM and Ethernet services are functionally equivalent to traditional leased lines.

Preliminary conclusion

The MCA considers that ATM and Ethernet products offer dedicated capacity and connectivity which are functionally equivalent to those provided by wholesale traditional leased lines and fall within the same relevant market.

02.4.2 Terminating segments and trunk segments of leased lines

The *Recommendation on Relevant Markets* defines distinct markets for trunk and terminating segments. Although both retail and wholesale leased lines in Malta are acquired on an end-to-end basis, this does not alter the inherent functional complementarity of terminating segments and trunk capacity. The *Recommendation* defines two separate markets for trunk and terminating segments and leaves it to the NRA to determine where the boundary lies in terms of national circumstances and national network topologies. The MCA has considered whether this distinction is appropriate for Malta or whether it would be better to define a single market encompassing both trunk and terminating segments.

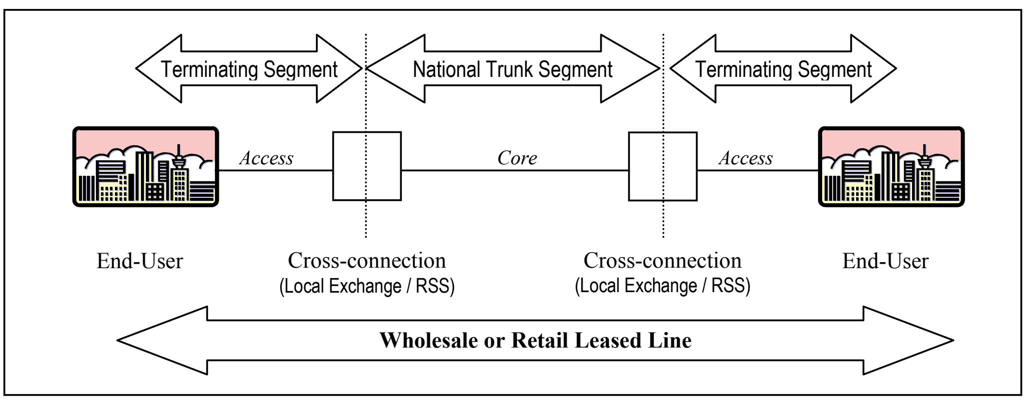


Figure 1 - Segments of an end-to-end leased line

Figure 1 above shows the construction of a wholesale (and retail) end-to end leased line given a split of trunk and terminating segments at the closest point of the core to the end-user location.

Demand substitutability

Initial consideration of trunk and terminating segments might seem to indicate that there is a single leased lines market. This is reflected by the products which are available in Malta, which are sold on an end-to-end basis (be they wholesale or retail leased lines). Currently, it is unlikely to discretely purchase either terminating or trunk capacity.

However, from the demand side trunk and terminating segments are complements rather than substitutes given that they relate to the provision of capacity across different parts of the underlying network.

Supply substitutability

From the supply side a hypothetical existing supplier of wholesale trunk capacity (or terminating segments) would not be in the position to respond to an increase of 5 to 10 per cent in the price for wholesale terminating segments (or wholesale trunk capacity) by a hypothetical monopolist supplier, given the significant investments required to construct the necessary infrastructure (many of them sunk costs for trenching and ducting) to provide such terminating segments (or trunk segments).

Boundary between terminating segments and trunk segments

As noted above, the terminating segments are dominated by local access infrastructure to which there are significant barriers to entry preventing competing operators from replicating competing infrastructure. The MCA believes, that over the period of the review, there is very little prospect of both the terminating and trunk segment markets becoming effectively competitive. Thus at this point in time, the definition of the boundary has little practical impact on the market analysis.

However, given the prospect of further infrastructure investment by competing operators over the longer term (especially in view of new technologies) the definition should be carried out, and monitored and reassessed in light of market developments.

In practical terms it should be logical to identify the boundary split based on the operator’s network hierarchy. In general, networks in larger countries are characterised by a hierarchical structure, where regional traffic is aggregated onto an inter-regional network. However, it is evident that the network topology of Malta is not characterised by such a structured hierarchical network and thus does not provide a clear guide to where the boundary between trunk and terminating markets should lie.

Having considered this issue, the MCA considers that the "boundary" between trunk capacity and terminating segments should be defined as occurring at the location of the core node closest to the end-user, for example, a cross-connection cabinet located either at the customer's serving exchange or RSS (as illustrated in Figure 1). Given the relatively flat network hierarchies used in Malta, and the high sunk costs entailed in network build-out, the MCA does not anticipate that this situation will change in the timeframe of this review.

Preliminary Conclusion

The MCA considers that, in accordance with the *Recommendation on Relevant Markets,* terminating and trunk segments of leased lines are separate markets. The MCA further considers that the "boundary" should be defined at the location of the core node closest to the end-user, for example, a cross-connection cabinet located either at the customer's serving exchange or RSS.

02.4.3 Delineation of the wholesale trunk segments market

The delineation of the markets is based on an analysis of demand and supply substitutability between different products and services which could potentially form part of the market under investigation. This section provides an analysis of the degree of substitutability between trunk segments of leased lines in Malta, taking also a forward looking approach with respect to possible developments in the market under review.

02.4.3.1 National and international trunk segments

In the *Relevant Markets Recommendation* the Commission defined a wholesale market for trunk segments of leased lines. It does not distinguish between national and international trunk segments of leased lines. The MCA has considered whether and to what extent international trunk segments of leased lines (with one point in Malta and the other point outside Malta) and national trunk segments of leased lines (with both points within Malta) fall within in the same market.

Demand-side substitutability

From the demand-side analysis an OAO purchasing international trunk segments of leased lines would not respond to a small but significant non-transitory price increase by a hypothetical monopolist of international trunk segments by switching to a national trunk segment (or vice-versa) because the intended use and characteristics of each product are not the same. Therefore the MCA considers that there is no demand substitutability between national trunk segments and international trunk segments.

It is also unlikely that OAOs will know or be concerned as to whether capacity is provided directly or indirectly (transiting through one or more jurisdictions), therefore the MCA does not consider that international trunk segments should be defined on a route-by-route basis.

Supply substitutability

The MCA has examined whether an operator of international trunk segments of leased lines would respond to a small but significant non-transitory price increase by a hypothetical monopolist supplier of national trunk segments of leased lines (and vice versa). The MCA believes from the supply-side that it is unlikely that a switch in production would occur, sufficiently promptly or cost effectively in order to constrain the hypothetical monopolist. An international operator would need to acquire key network based inputs which are different and additional to those used to provide international trunk segments of leased lines.

Conversely, it is also unlikely that a supplier of national trunk segments of leased lines would be able to switch its production into the international market promptly and at minimal cost given the high costs associated with the insularity of Malta. Apart from the time and elevated costs of building international infrastructure, international trunk segments of leased lines are often provided as part of broader regional and international agreements, the dynamics of which are different from the national market. Thus it is unlikely that entry could occur within a timeframe to constrain a hypothetical monopolist. The MCA therefore concludes that no supply-side substitution exists.

A supply side analysis suggests that the market should not be split on a route-by-route basis, especially since international leased lines are often provided as part of a broader regional or global contract.

The MCA also notes that it is clearly very important to identify the boundary split between national and international capacity. Currently an international half-circuit encompass a national segment charge and an international segment charge. The boundary between the national and international segment is defined as the 'international gateway'.

The 'international gateway' can be defined as the point at which capacity is no longer carried on infrastructure used also for national traffic. The international half-circuit would therefore comprise a local terminating segment and a national trunk segment up to the "international gateway", together with an international trunk segment. The international trunk segment includes connectivity from the undertaking's international gateway to the point of interconnection with the third party international facilities as shown in Figure 2 below.

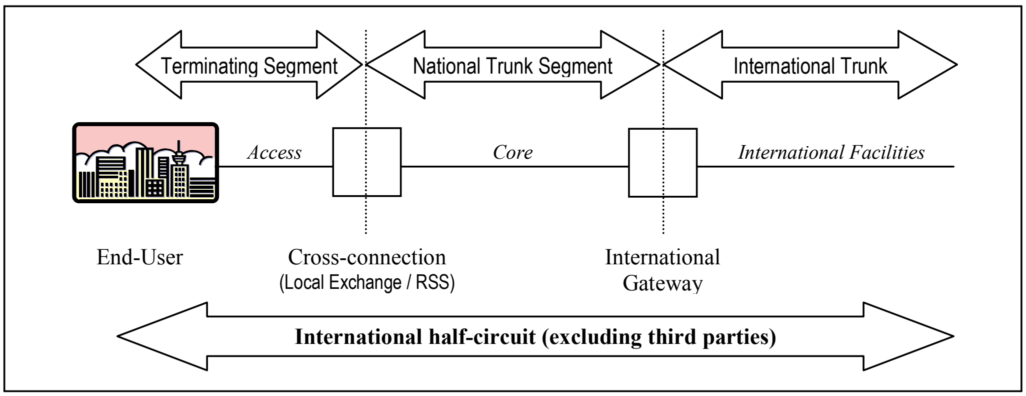


Figure 2 - Segments of an international half-circuit.

Preliminary conclusion

The MCA has formed the view that there are two sub-markets in Malta for national trunk segments of leased lines and international trunk segments of leased lines. The MCA has concluded that neither of these sub-markets is segmented on a route-by-route basis.

02.5 Different bandwidths of trunk and terminating segments

In its retail analysis, the MCA has considered the impact of bandwidth on market definition. The conclusion on the retail market was that there is a defined market for retail leased lines having bandwidths up to and including 2 Mbit/s. The MCA also considered that as specified in the *Relevant Markets Recommendation* it was not necessary to expand the retail leased line categories to capacities beyond the minimum set since there must always be a presumption that an intervention at a wholesale level will be sufficient to address any problems that arise.

In examining the markets for wholesale terminating and trunk segments, it is important to note that, while demand at the wholesale level is influenced by demand at the retail level, it is also derived from OAOs' own use. OAOs usually purchase leased lines as a wholesale input for own use rather than for simple resale. For example, an OAO may use leased lines as one of the wholesale inputs required to provide a voice telephony service. The MCA notes that generally operators have different requirements and require a greater capacity than retail end-users. Specifically, the MCA takes the view that wholesale segments are used as part of OAOs' core network to carry aggregated traffic. Aggregation both facilitates an operator in sharing the burden of sunk costs of construction, and provides incentives to install facilities to accommodate medium to long-term anticipated demand. The incentives are such that any existing supplier of wholesale capacity would respond to a lasting price increase for a particular bandwidth by switching supply to that market. In this context, the MCA has no evidence to suggest that there are either demand-side or supply-side factors that make it appropriate to break down the wholesale market into smaller bandwidth defined markets (i.e. to disaggregate capacity) or cap the market to a defined bandwidth.

Moreover, the *Relevant Markets Recommendation* defines markets for terminating and trunk segments which do not make a distinction between bandwidths. The MCA considers this to be appropriate to defining the market for wholesale segments of leased lines. The MCA does not see any evidence to suggest that the relevant product market should be differentiated by bandwidth.

Preliminary Conclusion

The MCA considers that the markets for wholesale terminating segments and for wholesale trunk segments should not be broken down into smaller bandwidth-defined markets or capped to a defined bandwidth.

02.6 Relevant geographic market

A relevant geographical market comprises the area in which the undertakings concerned are involved in the supply and demand of products and/or services, in relation to which the conditions of competition are sufficiently homogeneous and which can be distinguished from neighbouring areas because the conditions of competition are appreciably different to those areas.

According to the EU Guidelines, in the electronic communications sector, the definition of the geographical scope of the relevant market is generally determined with reference to the area covered by a network, and to the existence of legal and other regulatory instruments.

Based on the above characterisation of the geographical scope of a relevant market and the market conditions described earlier on, the MCA takes the view that the relevant geographic market for the following relevant product and service markets and sub-markets is the national territory of Malta:

- National Retail Leased Lines,
- Wholesale terminating segments of leased lines,
- Wholesale national trunk segments of leased lines.

The MCA takes the view that the relevant geographic market for the following relevant product and service sub-markets is from/to the national territory of Malta:

- International Retail Leased Lines,
- Wholesale international trunk segments of leased lines.

02.7 Preliminary markets

Following the analysis presented here the MCA found the following relevant leased lines markets in Malta:

1) Retail traditional interface leased lines.

   This market incorporates the “minimum set of leased lines” up to and including 2 Mbit/s as identified by the Commission and is further segmented into two sub-markets:

   a) National leased lines;
   b) International leased lines.

2) Wholesale terminating segments of leased lines.

3) Wholesale trunk segments of leased lines.

   This market is further segmented into two sub-markets:

   a) National trunk segments of leased lines;
   b) International trunk segments of leased lines.

Q2. Do you agree with the above preliminary conclusions regarding the market definition exercise?

Chapter 03 - Market Analysis

Having identified the relevant markets as discussed in **Chapter 02** the MCA is required to analyse the markets in order to assess whether any person or persons have significant market power as defined in Regulation 8 of the ECNS (Article 14 of the Framework Directive).

03.1 Method to assess Significant Market Power

Under the new EU Communications Directives and Article 4(8) of the ECRA, SMP has been newly defined so that it is equivalent to the competition law concept of dominance. Article 14(2) of the Framework Directive states that:

"An undertaking shall be deemed to have significant market power if, either individually or jointly with others, it enjoys a position equivalent to dominance, that is to say a position of economic strength affording it the power to behave to an appreciable extent independently of competitors, customers and ultimately consumers."

Further, Article 14(3) of the Framework Directive states that:

"Where an undertaking has significant market power on a specific market, it may also be deemed to have significant market power on a closely related market, where the links between the two markets are such as to allow the market power held in one market to be leveraged into the other market, thereby strengthening the market power of the undertaking".

Therefore, in the relevant market, one or more undertakings may be designated as having SMP where that undertaking, or undertakings, enjoys a position of dominance. Also, an undertaking may be designated as having SMP where it could lever its market power from a closely related market into the relevant market, thereby strengthening its market power in the relevant market.

In assessing whether an undertaking has SMP, this review takes the utmost account of the Commission's SMP Guidelines as well as the MCA's equivalent guidelines, as referred to in Chapter 01 above.

03.2 Assessment of SMP against relevant criteria

The remainder of this chapter considers whether dominance is likely to exist in the identified markets. In the MCA's view the assessment is fully compliant with the Commission's Guidelines. The SMP assessment set out is based on the evidence available to the MCA.

Single dominance can be assessed using a large number of criteria, as described in the Commission's and the MCA's guidelines on SMP assessment. In the MCA 's view, the most important ones are:

- Market share analysis;
- Barriers to entry and potential competition;
    - ◊ Economies of scale and scope;

- ◊ Sunk cost and infrastructure not easily replicable;
- ◊ Vertical integration;
- ◊ Potential competition;

- o Barriers to switching; and
- o Countervailing buyer power.

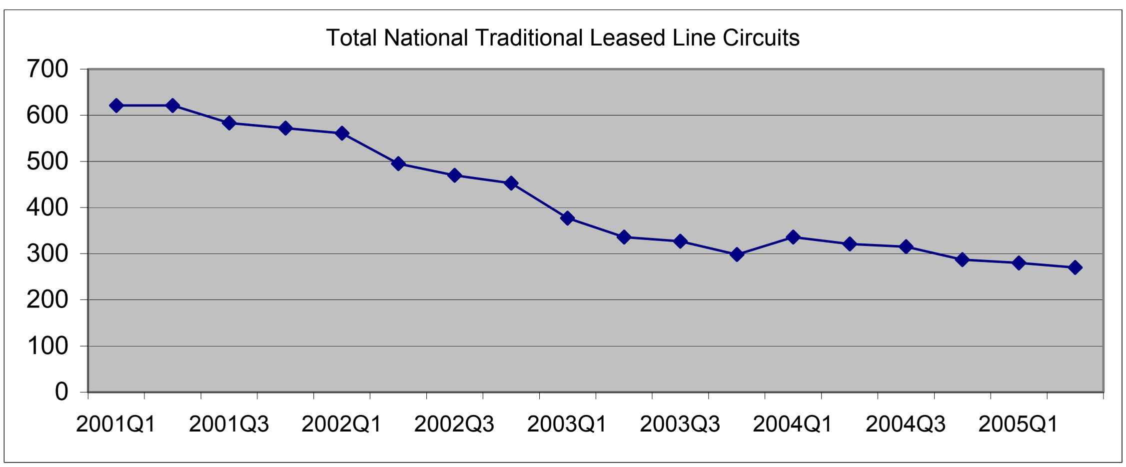
These are in turn discussed in detail below.

03.3 National retail leased lines

3.3.1 Analysis of market shares

Although, high market shares are not in themselves decisive as to whether an undertaking enjoys SMP in a market, the MCA is of the opinion that market shares higher than 50 per cent would be indicative of SMP. Paragraph 75 of the Commission Guidelines states that, "*according to established case-law, very large market shares – in excess of 50% - are in themselves, save in exceptional circumstances, evidence of the existence of dominant position.*"

As identified in the market definition above, currently Maltacom is the sole provider of the minimum set of leased lines. The chart below shows the total number of traditional retail leased lines available as at June 2005.



Although the number of national traditional leased lines has been registering a decline over time as shown in the diagram above, Maltacom holds 100 per cent market share in the provision of these services.

3.3.2 Barriers to entry and potential competition

Barriers to entry can take many forms such as significant sunk costs or economies of scale and scope resulting from the presence of a large undertaking in the market. The presence of entry barriers may create the necessary market conditions for an operator to exercise market power.

Conversely, potential competition refers to the prospect of new undertakings entering the market within a short period of time, therefore constraining incumbent firms. The threat of potential entry may prevent firms from raising prices above competitive levels, leading thereby to a situation in which no market power can be profitably exercised.

Economies of scale

As identified in Chapter 2 of this report, Maltacom's backbone network infrastructure is widespread in terms of coverage and reach. Given the ubiquity of its network, Maltacom enjoys economies of scale in the provision of retail leased lines. Given the high market share which Maltacom enjoys in the provision of the minimum set of leased lines, the cost of providing additional retail leased lines is likely to be much lower than that of any other alternative provider.

In addition the annual rental fee for retail leased lines is currently regulated and thus believed to be set at cost-oriented prices. This makes it very difficult for any other operator to offer retail leased lines at lower prices, unless it is more efficient in providing its services. Nonetheless in the absence of regulation Maltacom would still be able to offer low annual rental fees for retail leased lines due to the cost advantages it has over potential competitors as a result of its very large market share. Maltacom could potentially abuse of its longstanding position in the market and the cost advantages highlighted above by sustaining low levels of profits (or no profit at all) for a period of time so as to drive potential competition out of the national leased lines market.

Furthermore, Maltacom's ubiquitous network provides additional benefits, apart from lower prices, to customers at the retail end. These include simplified procurement management, through the purchasing of all retail leased lines from Maltacom.

Economies of scope

Economies of scope exist where average costs for one product are lower as a result of it being produced jointly with another product by the same firm. Cost savings may be made where common processes are used in the provision of a group of services. When an operator is present in a large number of markets it can share common costs over a greater range of services.

As noted earlier, Maltacom has over the past decade developed its ubiquitous network to offer other types of electronic communication services together with fixed-line telephone services. These other types of services include various forms of data communications.

Therefore factors such as the existing underlying infrastructure and the sharing of common inputs (such as the optical fibre) amongst the provision of various services, are likely to render the costs for Maltacom to provide retail leased lines much lower than those of any other provider. The ability to benefit from economies of scope may act as a barrier to entry for new competitors.

The ability of Maltacom to benefit from such economies of scope suggests that this undertaking is likely to enjoy SMP in the retail leased line market comprising the minimum set of leased lines.

Sunk costs

Sunk costs are those costs that a new entrant must incur to enter the market but which are not recovered on exit. As noted in the assessment of traditional leased lines and other data services, the significant elements of sunk costs associated with the provision of traditional leased lines arise due to trenching, ducting, rodding and optical fibre. These requirements are considered part of the underlying network infrastructure required for the provision of retail leased lines, which also involve a significant degree of capital expenditure.

A potential entrant will only seek to incur these costs if its expected return from such an investment would be sufficient to cover these costs. The incumbent on the other hand has already made its investment and would therefore be in a much better position to compete with the new entrant since it would already have recovered its sunk costs. This asymmetry would make it very difficult for a new entrant to effectively compete with the incumbent.

Therefore the MCA is of the view that it is unlikely to be economically feasible for any new entrant to replicate Maltacom's network infrastructure during the time frame of this review. Thus this is considered as a major barrier to entry for alternative operators in the retail leased lines market.

Vertical Integration

Vertical integration involves an undertaking operating in a given market, which is also present in a market that is at a higher or lower level in the chain of provision. Since vertically integrated operators are able to influence both upstream and downstream markets it would be more difficult for a new provider entering in one of these markets to compete effectively with the integrated operator.

Maltacom is an integrated provider and operates at a wholesale and retail level in all the electronic communications markets where it is present. The ability to lever market power from upstream to downstream markets may deter potential entry in these markets. An integrated provider can hypothetically make it difficult for new entrants at a retail level to obtain the necessary inputs at a competitive price (i.e. cost based). However an alternative option for the integrated provider would be to adopt a margin squeeze approach in the provision of retail leased lines. In both instances new entrants in the retail leased lines market would not be able to provide a retail product at a competitive price without affecting their profit margin. This would therefore create an entry barrier at retail level.

Potential Competition

As explained earlier part of the underlying infrastructure required for the provision of retail leased lines is the availability of trenches and ducts through which all the cabling/wiring required are passed. The MCA notes that in Malta the existing cable operator owns a number of ducts, whilst it also shares another number of ducts with the incumbent fixed operator. The MCA is of the view that the number of ducts available to Melita Cable are not enough for it to be able to provide a ubiquitous network for the provision of retail leased lines. In addition, the costs associated with the sharing of ducts would not allow Melita Cable to provide retail leased lines at the prices offered by the incumbent due to these additional costs. Alternatively the cable operator would have to bear the additional costs, eating away from its profit margins, to be able to offer the retail product at competitive prices. It is to be further noted however that although the possibility would exist for Melita Cable to share additional ducts with Maltacom, the cable operator would still require to pass fibre from these ducts prior to the provision of the retail product. This would therefore require additional outlays on the part of the potential new entrant in the market in addition to the costs associated with the sharing of ducts.

Furthermore, the MCA is of the opinion that during the timeframe of this review, it would be rather difficult for any new entrant to gain sufficient market share that would significantly change the current market structure and consequently the results of this analysis. However, given the dynamic nature of electronic communications markets, the MCA will monitor closely any developments in these markets and will revise its analysis accordingly should the necessity arise.

3.3.3 Countervailing buyer power

The existence of customers with a strong negotiating position, which can be exercised to produce a significant impact on competition, will tend to restrict the ability of providers to act independently of their customers. When buyers of a certain product or service are large and powerful, they can effectively stop an attempt to increase prices by service providers.

The extent of countervailing buyer power depends on the ability of large customers to switch to alternative providers or not to purchase the service or product from that particular provider within a short period of time.

The MCA has earlier assessed the market for a wide range of 'managed data services' provided by alternative providers. These services have however been found to be functionally different than the minimum set of leased lines in particular in relation to quality of service and capacity. This therefore renders Maltacom as the current sole provider of the minimum set of leased lines in Malta. This implies that even large companies which make use of leased line services and also purchase a suite of other services from Maltacom cannot exert sufficient countervailing buyer power to pose a serious price constrain on the price of retail leased lines in the absence of regulation.

3.3.4 Barriers to switching

Where customers have alternative suppliers to the incumbent, the market power may be reduced since the incumbent would face a competitive threat from alternative suppliers. Observed customer switching would indicate that barriers to switching would be low and therefore market power may not be profitably exerted.

As noted earlier a degree of investment or additional costs would need to be undertaken by a potential entrant in the retail leased lines market. In addition the complexities involved in building a ubiquitous network and/or the provision of retail leased lines services on the cable network would make market entry a lengthy process. The MCA therefore does not expect that within the timeframe of this review potential entrants would gain sufficient market share to erode the market power currently held by Maltacom.

The MCA however has considered other factors, which constitute barriers to switching, and these mainly relate to the costs a customer would have to pay Maltacom for terminating the service. As is stated in Maltacom's Leased Lines Retail Services Offer[15] the initial payments submitted by the customer together with the application form are not refunded upon termination of the contract, either before service is provided or for any reason not associated

[15] As referred to in Section 2.5 of the 'Maltacom Leased Lines Retail Services – Terms and Conditions'

with negligence on the part of Maltacom. In addition, Section 12 of the same document further refers to any costs that the customer may incur and which are due to Maltacom as a consequence of cancellation and hence removal of the service.

According to the MCA these kinds of costs impose a significant switching barrier for current Maltacom customers considering switching to another operator.

03.4 National wholesale terminating and trunk segments

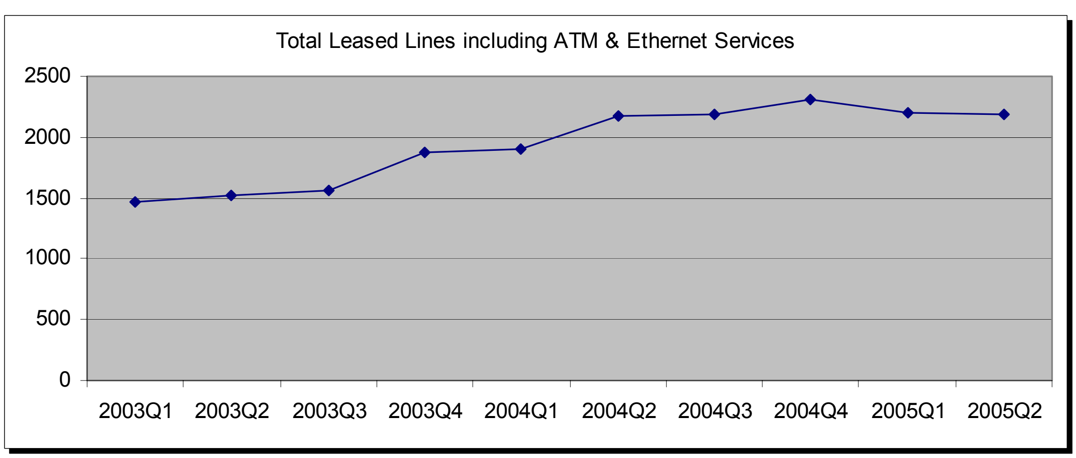
3.4.1 Analysis of market shares

Although, high market shares are not in themselves decisive as to whether an undertaking enjoys SMP in a market, the MCA is of the opinion that market shares higher than 50 per cent would indicate SMP. As stated in the market analysis for national retail leased lines, this is in line with the Guidelines provided by the Commission in relation to dominant positions.

Although in the context of the market definition of the wholesale market the MCA identified the boundary between terminating and trunk segments of leased lines, it has been stated that neither of these segments is in reality purchased in isolation. It has been identified that wholesale (and retail) leased lines are predominantly sold and purchased end-to-end. The MCA will as a result base its analysis of market shares in the wholesale terminating and trunk segments market of leased lines on the number of end-to-end circuits.

During the course of the delineation of the wholesale terminating and trunk segments of the leased lines market, the MCA has identified both ATM and Ethernet services as end-to-end products which offer dedicated capacity and connectivity and which are functionally equivalent to those provided by wholesale terminating and trunk segments of leased lines and that therefore they fall within the same relevant wholesale market. Thus the number of end-to-end circuits analysed in this section will also take into account ATM and Ethernet services. Maltacom through its subsidiary DataStream offers the ATM and Ethernet services currently available.

This therefore implies that Maltacom possesses 100 per cent market penetration in the wholesale market for national trunk and terminating segments of leased lines. The chart below illustrates the take up of wholesale (and retail) end-to-end leased lines, including ATM and Ethernet Services, from the first quarter of 2003 up to mid-2005.



3.4.2 Barriers to entry and potential competition

Economies of scope

The same infrastructure used for the provision of wholesale trunk and terminating segments of leased lines can be utilised for the provision of other services. This is especially so where the undertaking owning the infrastructure has a ubiquitous network and is in turn present in a number of markets as is the case with Maltacom. Thus the MCA therefore considers economies of scope as an added factor contributing to Maltacom's ability to provide wholesale terminating and trunk segments of leased lines at significantly lower costs than any other alternative provider.

The ability of Maltacom to take advantage from the combined benefits resulting from economies of scale and economies of scope suggests that this undertaking is likely to enjoy SMP in the provision of wholesale trunk and terminating segments of leased lines.

Sunk costs & vertical integration

Sunk costs are those costs that a new entrant must incur to enter the market but which are not recovered on exit. The significant sunk costs incurred by Maltacom associated with underlying network infrastructure over which wholesale trunk and terminating segments of leased lines are provided, have been identified in earlier sections of this report.

A potential entrant in the market for the provision of wholesale national trunk and terminating segments of leased lines will only seek to incur these costs if its expected return from such an investment would be sufficient to cover such costs.

The number of years the incumbent has been in operation together with the extent of its operations, allow Maltacom to be in a better position to compete with the new entrant as it would already have recovered its sunk costs. This asymmetry would make it very difficult for a new entrant to effectively compete with the incumbent. Thus it is the MCA's view that it is unlikely to be economically feasible for any new entrant to replicate Maltacom's network infrastructure for the provision of wholesale national trunk and terminating segments of leased lines during the time frame of this review.

In addition, Maltacom's sole presence in the market for the provision of wholesale national trunk and terminating segments of leased lines, and its 100 per cent market share in the retail national leased lines market makes it very difficult for any new entrant to enter the leased lines market.

Therefore the MCA is of the view that these factors present major barriers to entry for alternative operators in the market for wholesale national trunk and terminating segments of leased lines, thus limiting potential competition.

3.4.3 Countervailing buyer power

Maltacom has been identified as the sole provider of wholesale terminating and trunk segments for the provision of traditional national leased lines. This implies that any large company making use of wholesale trunk and terminating segments of leased lines and which also purchases a suite of other wholesale services from Maltacom cannot exert sufficient countervailing buyer power to pose a serious price constrain on the price of wholesale products in the absence of regulation.

3.4.4 Barriers to switching

Where customers have alternative suppliers to the incumbent, the market power may be reduced since the incumbent would face a competitive threat from alternative suppliers. As argued earlier a new entrant wanting to replicate Maltacom's network would find it very difficult due to various barriers to entry such as economies of scale and scope, as well as sunk costs. This in itself presents a barrier to switching for customers at the wholesale level hence the incumbent faces no competitive threat from alternative operators in terms of customer switching.

Nonetheless, the MCA has also considered the possibility of the existence of other barriers to switching such as the costs a customer of wholesale national trunk and terminating segments of leased lines would have to pay Maltacom for providing the required wholesale services. These costs are mentioned in the 'Maltacom Leased Lines Wholesale Services – Terms and Conditions' and refer to the ' the initial payments[16] submitted by the customer and to any costs that a customer may incur and which are due to Maltacom as a consequence of cancellation and hence removal of the service.

According to the MCA these kinds of costs impose a significant barrier for Maltacom's customers considering switching to an alternative provider of wholesale leased lines services.

03.5 The international leased lines market

In the market definition for the minimum set of leased lines the MCA has segmented a sub-market for international retail leased lines. Similarly the MCA recognised wholesale international trunk segments as a sub-market from national trunk segments. It has been further stated that international trunk segments include connectivity from the undertaking's international gateway to the point of interconnection with third party international facilities.

As is the case with wholesale trunk and terminating segments of leased lines at the national level, although the MCA identified a boundary between the international terminating and international trunk segments of leased lines, neither of these segments is in reality purchased in isolation. It has been identified that retail and wholesale international leased lines are predominantly sold and purchased end-to-end.

The boundary between international and national trunk segments has been identified as the international gateway. In Malta there currently are two international gateways in operation: one is owned by Maltacom whilst Vodafone owns the other. This implies that both network operators should be able to provide international retail and wholesale trunk segments of leased lines to their customers. Hence the international leased lines both at the retail and wholesale level, as defined in the market definition, is characterised by two operators as a point of departure.

[16] As referred to in Section 2.5 of the 'Maltacom Leased Lines Wholesale Services – Terms and Conditions'

The following is an analysis of the international retail and wholesale leased lines market using specific criteria in line with the Commission's and the MCA's SMP guidelines. In the MCA 's view, the most important and relevant criteria in relation to retail and wholesale international leased lines are:

- Market share analysis
- Barriers to entry and potential competition
  - Economies of scale and scope
  - Sunk cost and infrastructure not easily replicable
  - Vertical integration
  - Potential competition
- Barriers to switching
- Countervailing buyer power

3.5.1 Analysis of market shares

The graph below illustrates the number of retail (and wholesale) international leased lines services offered by the incumbent, Maltacom. Vodafone had no international leased line customers at the time of publication of this market review.

Although Vodafone has the ability – through the availability of its own international gateway – to also offer international leased lines services, it currently cannot provide end-to-end international retail leased lines. This is due to the fact that Vodafone does not own the national infrastructure required for the provision of such services entirely over its network.

Therefore the MCA is of the view that if Vodafone were to provide international retail end-to-end leased lines it would face significant competitive constraints due to the costs that it would have to incur in the provision of the national infrastructure. For this reason Maltacom's 100 per cent market share in the end-to-end retail international leased lines market is further sustained as Vodafone would not be able to effectively compete in this market.

As to the wholesale international leased lines services, Vodafone can only provide international trunk segments due to the lack of national infrastructure as identified above. For this reason the MCA is of the view that this factor further limits the ability of Vodafone's competitiveness even in the wholesale international leased lines market, as a wholesale customer might for various reasons prefer to buy all wholesale products from the same supplier.

Given these considerations the MCA is of the of the opinion that in the absence of regulation, Maltacom would be able to exert market power in both the upstream and downstream international leased lines markets.

In addition in view of the high market share enjoyed by Maltacom in the international leased line markets, the MCA does not expect that potential entry of alternative operators will erode its market power during the timeframe of this review. Moreover, the MCA is of the opinion that Maltacom is likely to continue enjoying significant market power in the near future, as Vodafone is not expected to gain enough market share during the timeframe of this review to be able to effectively constrain Maltacom's operations. However, the MCA will monitor closely any developments in these markets and will review its analysis accordingly if the structure of the markets changes significantly.

3.5.2 Barriers to entry and potential competition

Economies of scale

As already identified Maltacom's backbone network infrastructure is widespread in terms of coverage and reach. Given the ubiquity of its network, Maltacom enjoys economies of scale in the provision of end-to-end retail international leased lines and wholesale international trunk segments of leased lines. Given the 100 per cent market share, which Maltacom enjoys in the provision of end-to-end retail international leased lines and wholesale international trunk segments of leased lines, the cost of providing additional retail international leased lines is likely to be much lower than that of any other alternative provider. The same applies for additional wholesale international trunk segments of leased lines.

Such benefits accruing to Maltacom further sustain their competitive advantage versus Vodafone given the additional costs the latter would have to incur for it to be able to provide end-to-end international retail and national wholesale services as already specified above. Furthermore, it is not expected that Maltacom will pass on any cost benefits it enjoys to its wholesale customers, making it more difficult for Vodafone who would have to depend on Maltacom, in the absence of its own national infrastructure, for the provision of international end-to-end retail leased lines and wholesale international trunk segments, to match the pricing offered by the incumbent.

In addition the annual rental fee for retail leased lines is currently regulated and thus is believed to be set at cost-oriented prices. This makes it very difficult for any other operator to offer international retail and wholesale international trunk segments of leased lines at lower prices, unless it is more efficient in providing its services. In the absence of regulation Maltacom would still be able to offer low annual rental fees for end-to-end retail and wholesale international leased lines services given its 100 per cent market share. Maltacom could potentially abuse of its longstanding position in the market and the cost advantages highlighted above by sustaining low levels of profits (or no profit at all) for a period of time so as to drive potential competition out of the national leased lines market.

Economies of scope

Furthermore, economies of scope due to Maltacom's offerings of other types of services apart from fixed-line telephony are likely to render its costs of providing end-to-end retail international leased lines and wholesale international trunk segments of leased lines much lower than those of any other provider. The ability to benefit from economies of scope may act as a barrier to entry for new competitors.

The ability of Maltacom to benefit from such economies of scope suggests that this undertaking is likely to enjoy SMP in the retail international leased line market, as well as in the provision of wholesale international trunk segments.

Sunk costs

As noted in the market definition, an international half-circuit consists of three distinct parts, namely, a local terminating segment, a national trunk segment up to the "international gateway", and an international trunk segment. The provision of international trunk segments as the fundamental requirement for retail international leased lines depends on the ownership of an international gateway.

Both Maltacom and Vodafone have already incurred a significant amount of investment to provide their own international gateways. However, the number of years the international gateway of the fixed line incumbent has been in operation, together with the extent of Maltacom's operations, allow the latter to be in a better position to compete with Vodafone or any new entrant as it would already have recovered its sunk costs. This might not be the case for Vodafone whose international gateway is relatively recent, whilst any new entrant would require a number of years since its commercial launch of its operations to start recovering its sunk costs. This asymmetry would make it very difficult for Vodafone and/or a new entrant to effectively compete with the incumbent.

The provision of the local terminating and the national trunk segment parts of the international retail and wholesale leased line service requires the availability of relevant infrastructure, which is currently only owned by Maltacom. This requirement is considered part of the underlying network infrastructure required for the provision of international retail leased lines, which also involves a significant degree of capital expenditure. Thus the presence of these sunk costs and possibly their recovery on the part of the incumbent would further create an asymmetry which would make it very difficult for a new entrant to effectively compete with the incumbent.

Therefore the MCA is of the view that sunk costs associated with the network infrastructure present a major barrier to entry for alternative operators in the retail leased lines market, whilst still rendering Vodafone less competitive when compared to the incumbent.

Vertical Integration

As noted above Maltacom owns additional infrastructure in the form of trenches and ducts required for the provision of the local terminating and national trunk segments required for the provision of the international retail and wholesale leased lines, which are currently not owned by any other alternative operator. This therefore renders Maltacom the sole vertically integrated provider of international end-to-end retail and wholesale leased lines.

An integrated provider can hypothetically make it difficult for new entrants at a retail level to obtain the necessary inputs for the provision of end-to-end international retail and wholesale leased lines at a competitive price (i.e. cost based). An alternative option for the integrated provider would be to apply a margin squeeze in the provision of inputs for end-to-end international retail and wholesale leased lines. In both instances new entrants would not be able to provide a retail/wholesale product at a competitive price without affecting their profit margin. This would therefore create an entry barrier at both the retail and wholesale level for the international leased lines.

Potential Competition

It is the MCA's view that given the costs considerations in relation to the provision of end-to-end retail international leased lines services, together with the notion that the incumbent will not likely pass on the benefits earned from its economies of scale to third parties, potential competition in the international retail leased lines market is expected to be limited during the timeframe of this review.

3.5.3 Countervailing buyer power

The existence of an alternative provider of end-to-end international retail and international trunk segments of leased lines may give large companies, making use of international leased line services and which could also purchase other services from their network provider, the possibility to exert some countervailing buyer power over Maltacom. However in the absence of regulation, benefits enjoyed by the incumbent would not be transferred to any alternative provider (both existing and potential new entrant) of such services, thus rendering such price negotiations ineffective in posing a serious price constrain on the price of end-to-end international retail and wholesale leased lines.

3.5.4 Barriers to switching

As identified earlier in relation to the national traditional leased lines market, barriers to switching mainly relate to the costs a customer would have to pay Maltacom for terminating the service, as well as non-refundable initial payments made for the provision of the service. These conditions stated in the 'Maltacom leased Lines Retail Services – Terms and Conditions' also apply for retail international leased lines.

The same costs apply for the provision of end-to-end wholesale international leased lines as specified in the 'Maltacom Lease Lines Wholesale Services – Terms and Conditions'.

According to the MCA such costs impose a significant switching barrier for current Maltacom's customers considering switching to another operator.

03.6 Preliminary conclusions

The evidence presented above indicates that Maltacom has significant market power in the following markets:

1) Retail traditional interface leased lines.

   The market incorporating the "minimum set of leased lines" up to and including 2 Mbit/s as identified by the Commission and segmented into the following two sub-markets:

   a) National leased lines;
   b) International leased lines.

2) Wholesale terminating segments of leased lines.

3) Wholesale trunk segments of leased lines.

   The market further segmented into the following two sub-markets:

   a) National trunk segments of leased lines;
   b) International trunk segments of leased lines.

This preliminary conclusion is supported by a number of factors including the 100 per cent market share in the provision of national and international retail and wholesale leased lines; Maltacom is a vertically integrated provider and has the ability to lever power from upstream to downstream markets; the existence of barriers to switching on the part of Maltacom's subscribers and the relative size of Maltacom makes it very difficult for a new entrant to attract a large number of customers during the timeframe of this review in order to gain sufficient economies of scale and scope in order to compete effectively.

Q3. Do you agree with the above preliminary conclusions regarding market analysis? Please provide a reasoned response.

Chapter 04 - Regulatory Implications

04.1 Competition problems

Leveraging may be exercised by operators having SMP in two forms:

Vertical leveraging is the practice of a dominant firm that denies proper access to an essential input that it provides with the intent of extending its power from one segment of the market (the bottleneck segment) to the other (the potentially competitive segment). Such practice may be both price-related and otherwise.

The MCA believes that there exists a potential for vertical leveraging with respect to the wholesale market under review.

Maltacom, as a vertically integrated operator which is dominant in an upstream market may, unless prohibited by effective regulatory intervention, engage in pricing that gives rise to a margin squeeze. Furthermore, since it is able to access economies of scale and scope that are not so readily available to potential operators competing at the downstream level, the said undertaking may bring extra pressure to bear on the margins available for competing downstream operators. Maltacom may also resort to other price leveraging strategies such as price discrimination, predatory pricing and cross-subsidisation.

The MCA believes that non-price leveraging strategies such as denial of access, the discriminatory use or withholding of information, delaying tactics, quality discrimination and the imposition of undue requirements on, and with respect to, potential alternative service providers at the downstream level, may contribute significantly to the creation of a non-competitive environment.

Horizontal leveraging involves the dominant undertaking using its position in one market to exert undue influence on other markets at the same level in the value chain. This form of leveraging can be exercised by Maltacom as it operates in a number of horizontal wholesale markets and can potentially leverage its power from one market to another.

The above competition problems are further accentuated by the fact that Maltacom has **single market dominance** in the relevant markets under review. This results in the possibility of Maltacom to exercise entry deterrence, exploitative behaviour and productive inefficiencies.

04.2 Selecting remedies – principles applied

Given the identified actual and potential competition problems arising from SMP in the relevant markets under review, the MCA is obliged to impose obligations on undertakings identified by it as having significant power in the said markets. Accordingly, the MCA proposes to impose on undertakings with SMP those appropriate obligations that it believes will encourage efficient investment and innovation and further promote competition in the markets under review.

In selecting the remedies to impose on the designated SMP operator(s), the MCA considers the nature of the problem identified and, in accordance with the principle of proportionality, where necessary, imposes those remedies which it considers to be the least burdensome, yet effective. The MCA also takes account of potential effects on any related markets. These principles are reflected in the remedies applied below.

Having said this, in view of the complexities of the competition problems discussed above, the MCA notes that it is unlikely that any single remedy can achieve the aim of ensuring effective competition. Hence, the need for a suite of remedies, as proposed below, that complement, support and reinforce each other.

04.3 Retail obligations

Regulation 38 of the ECNSR states that, where the Authority determines, as a result of the market analysis carried out in accordance with regulation 10 of these regulations, that the market for the provision of part or all of the minimum set of leased lines is not effectively competitive, the Authority shall, after identifying undertakings with significant market power in the provision of those specific elements of the minimum set of leased lines services in all or part of the national territory, impose upon said undertakings those remedies described in the Eighth Schedule to the said regulations.

In accordance with this provision, and in view of the MCA's finding of Maltacom as having SMP in the market for the minimum set of leased lines, the MCA proposes to impose upon Maltacom the following remedies:

04.3.1 Non-discrimination

In accordance with the Eighth Schedule to the ECNSR, Maltacom shall adhere to the principle of non-discrimination when providing leased lines. This means that Maltacom is to apply similar conditions in similar circumstances to persons providing similar services, and is to provide leased lines under the same conditions and of the same quality as it provides for its own services, or those of its subsidiaries or partners, where applicable. Hence when offering varying terms and conditions to different customers, Maltacom is to justify such variances objectively.

04.3.2 Cost orientation

In accordance with the Eighth Schedule to the ECNSR, Maltacom shall ensure that tariffs for the provision of the minimum set of leased lines follow the basic principles of cost orientation.

To this aim Maltacom's current cost orientation obligation is to be maintained. For the time being the prices currently in Maltacom's Leased Lines Retail Services Offer[17] will continue in force, until the conclusion of the forthcoming review of prices.

04.3.3 Cost accounting

The same Eighth Schedule to the ECNSR goes on to hold that for the purposes of ensuring that the operator with SMP in the retail market of the minimum set of leased lines lives up to his obligation of cost orientation, the Authority should establish a suitable cost accounting system which should be put in practice by the operator with SMP. Hence, Maltacom is being obliged to follow the cost accounting system identified by the MCA.

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[17] Link to document on the Maltacom website http://www.maltacom.com/library.asp?did=958

Maltacom is currently already obliged to support such a system by virtue of MCA decisions[18] which have been in place for some time. These decisions established that operators having a Dominant Market Position should implement cost-based accounting systems using a Fully Allocated Cost accounting methodology using a historic cost base. At that time the MCA had taken the view that this methodology was the most practical approach in the short term. However, mindful of the deficiencies inherent in a historic cost-based system, the MCA stated that it would review the need to move to a current cost regime during 2005. It has thus issued a consultative document[19] that examines the various issues that are relevant to a transition from a historic cost base to a current cost base. Up till the publication of this document the decision has not been published.

04.3.4 Accounting separation

Bearing in mind that the obligations imposed by it must be based on the competition problem identified, justifiable and proportionate, in order to ensure efficient and sustainable competition and must contribute towards maximizing consumer benefits, the MCA is of the opinion that an Accounting Separation obligation would be the best system to implement. Such an obligation on Maltacom will, in the belief of the MCA, ensure the fulfilment of the cost orientation and cost accounting obligations. The MCA will exercise its powers at law to request any pertinent information to ensure that Maltacom is abiding by its accounting separation obligation. Said obligation will finally ensure that Maltacom is not applying a margin squeeze.

Currently Maltacom is subject to the accounting separation obligation described in the MCA decision on Accounting Separation[20]. This level of obligation shall be maintained until further consultation is deemed necessary.

04.3.5 Transparency

Finally the Eighth Schedule to the ECNSR also lists information which the undertaking with SMP in the retail market of the minimum set of leased lines must publish. In accordance with this Schedule, Maltacom is obliged to published in an easily accessible form:

i. Technical characteristics, including the physical and electrical characteristics as well as the detailed technical and performance specifications that apply at the network termination point.

ii. Tariffs, including the initial connection charges, the periodic rental charges and other charges. Where tariffs are differentiated, this must be indicated. Where, in response to a particular request, Maltacom considers it unreasonable to provide a leased line in

[18] Implementation of Cost Based Accounting Systems for the Telecommunications Sector - Report on Consultation and Decision - July 2002.

Dominant Market Position in the Leased Lines Market - Determination of DMP - June 2003

[19] Current Cost Accounting Methodologies for the Electronic Communications Sector – July 2005

[20] Accounting Separation and Publication of Financial Information for Telecommunications Operators - Report on Consultation and Decision of October 2002, as amended in July 2003

the minimum set under its published tariffs and supply conditions, it must seek the agreement of the Authority to vary those conditions in that case. Maltacom would not be permitted to implement changes in the terms and conditions of any product, introduce any new product or service, or cease to offer any product or service, in this market for at least 30 working days after public notice and after having obtained regulatory approval.

iii. Supply conditions, including at least the following elements:

a) information concerning the ordering procedure;

b) the typical delivery period, which is the period, counted from the date when the user has made a firm request for a leased line, in which 95 per cent of all leased lines of the same type have been put through to the customers. This period will be established on the basis of the actual delivery periods of leased lines during a recent time interval of reasonable duration. The calculation must not include cases where late delivery periods were requested by users;

c) the contractual period, which includes the period which is in general laid down in the contract and the minimum contractual period which the user is obliged to accept;

d) the typical repair time, which is the period, counted from the time when a failure message has been given to the responsible unit within the undertaking identified as having significant market power pursuant to regulation 38 up to the moment in which 80 per cent of all leased lines of the same type have been re-established and in appropriate cases notified back in operation to the users. Where different classes of quality of repair are offered for the same type of leased lines, the different typical repair times shall be published;

e) any refund procedure.

In addition, the Eighth Schedule states that, where the Authority considers that the achieved performance for the provision of the minimum set of leased lines does not meet users' needs, it may define appropriate targets for the supply conditions listed above.

In accordance with the above, the MCA believes it necessary to mandate that all relevant information, such as delivery and repair times for leased lines, be published on Maltacom's website and be kept regularly updated.

The MCA considers the continuation of publication (and updating where necessary) by Maltacom of a list of tariffs and terms and conditions applicable to all retail customers as being essential.

04.4 Wholesale obligations

In proposing the below remedies, the MCA considered the various wholesale products that could be provided by Maltacom to OAOs. In particular, it was considered that Maltacom could provide both an end-to-end wholesale leased line product (composed of a terminating and trunk segment together), as well as Part Circuit products composed of either a terminating segment or a trunk segment of a leased line. It was further noted that the latter form of wholesale product has to date not been provided by Maltacom. (This may also be at least in part due to lack of request from OAOs)

The MCA is of the opinion that the remedies it is proposing to impose are based on the nature of the competition problems it has identified in the relevant market, and are proportionate and justified in light of the objectives set out in Article 4 of the Electronic Communications (Regulation) Act.

The MCA will however continue to monitor market developments and where appropriate may issue further directions refining these remedies.

04.4.1 Access

The MCA believes that the remedies being imposed herein must ensure that Maltacom offers OAOs sufficient access to its wholesale inputs, which access would not be offered if Maltacom had to be left unregulated.

In the first instance, it is being proposed that Maltacom be obliged to continue to offer access to its end-to-end wholesale leased lines products and to entertain reasonable requests for access to service variants. Coupled with this, Maltacom is to give OAOs access to specified network elements and, or facilities, where such access is not already provided. The provision of access by Maltacom to Part Circuit products (terminating segments and trunk segments of a leased line) is considered indispensable too. Furthermore, Maltacom is to negotiate in good faith with undertakings requesting access.

In accordance with Regulation 21(g) and (i) of the ECNSR Maltacom is to provide specified services needed to ensure interoperability of end-to-end services to users, as well as to interconnect network and network facilities.

In accordance with Regulation 15(1)(a) of the ECNSR, the Authority is also authorized, without prejudice to any measures that may be taken with respect to undertakings with significant market power, to impose, to the extent that is necessary to ensure end-to end connectivity, obligations on undertakings that control access to end-users including, in justified cases, the obligation to interconnect their networks where this is not already the case.

It is also considered necessary that Maltacom continues to offer Interconnection Paths as under a Reference Interconnection Offer (RIO) upon a reasonable request for such access being made by OAOs.

Maltacom is not to withdraw facilities already granted. This allows OAOs to continue to provide current retail services uninterruptedly. This notwithstanding, the MCA recognises that in some instances providing such access may prove inefficient. In such case, Maltacom may request the MCA to waive this obligation and the final decision would be the MCA's.

The MCA believes that Maltacom ought to provide information relevant to the access obligation to OAOs. Therefore the need arises to oblige Maltacom to provide access to technical interfaces, protocols, or other key technologies indispensable for the interoperability of services, and to operational support systems or similar software necessary to ensure fair competition in the provision of services.

The provision of Service Level Agreements by Maltacom to OAOs is especially considered indispensable with respect to the provision of access to end-to-end wholesale leased lines, Part Circuit products and Interconnection Paths, as it provides OAOs with certainty as to the supply and repair of the wholesale input and hence allows them to compete on a downstream level.

All the above-mentioned access-related remedies must be provided by Maltacom in a fair, timely and reasonable fashion. The obligations of non-discrimination and transparency are considered imperative if OAOs are to compete with Maltacom's retail arm. The provision of access by Maltacom to these wholesale products also ought to be cost-oriented and accompanied by accounting separation and non-discrimination obligations.

04.4.2 Non-discrimination

A cardinal remedy aimed at defeating the competition problems resulting from vertical foreclosure is that of non-discrimination in the provision of access and, or interconnection. In accordance with Regulation 19 of the ECNSR, Maltacom, as the vertically integrated provider, would be obliged to:

a) apply equivalent conditions in equivalent circumstances to other undertakings providing equivalent services, and

b) provide services and information to others under the same conditions (including timescales, on a basis and of a quality) equivalent to that which it provides to its own services, or those of its subsidiaries or partners.

The current status whereby wholesale leased line offerings are the only means by which OAOs may provide certain services at a retail level leads the MCA to believe that the obligation of non-discrimination is essential for the uptake of wholesale products by OAOs during the lifespan of this review. In view of this, the imposition of a non-discrimination remedy obliging Maltacom to offer access to its wholesale product to OAOs under the same conditions as it provides to its retail arms is necessary.

This obligation relates both to access to wholesale leased line products (including end-to-end wholesale leased line and Part Circuit products) provided by Maltacom as well as to the provision of Service Level Agreements. This would diminish the possibilities of Maltacom exercising non-price discrimination. Penalties would be applied if such Service Level Agreements are not provided in a non-discriminatory fashion by Maltacom.

Notwithstanding the predominance in request for end-to end wholesale leased lines, access to part circuit products, too, should be provided by Maltacom on a non-discriminatory basis.

It is also considered essential that Maltacom be obliged not to make use of any information from OAOs at a downstream level.

The MCA considers that the obligation of non-discrimination ought to be accompanied by the remedies of transparency, price control and accounting separation in order to properly address the competition problems identified earlier in this document.

04.4.3 Transparency

Regulation 18(2) of the ECNSR states that where an operator with SMP has obligations of non-discrimination, the MCA may require it to publish a reference offer which shall be sufficiently unbundled to ensure that undertakings are not required to pay for facilities which are not necessary for the services requested, giving a description of the relevant offerings broken down into components according to market needs, and the associated terms and conditions including prices. In such instances, the MCA is able to impose changes to reference offers to give effect to the obligations imposed under the Act. The MCA may also specify the precise information to be made available, the level of detail required and the manner of publication.

The obligation of transparency, catered for by Regulation 18 of the ECNSR, is intended to ensure the provision of sufficient information and clear processes required for access to the mandated products by the operator with SMP.

Currently Maltacom is meeting its obligation[21] to publish leased lines pricing and terms and conditions as part of both its Leased Lines Wholesale Services Offer and its Reference Interconnection Offer[22]. By virtue of the obligation of transparency which the MCA is proposing to impose on Maltacom, the said operator will be obliged to continue publishing (and update where necessary) reference offers related to the various wholesale leased line products. Such offers are to be sufficiently unbundled, include pricing, terms and conditions and service level agreements, as established in the above access obligations and as may be directed by the MCA according to law. Furthermore Maltacom is to update its offers with additional products as appropriate in fulfilment of the access obligations imposed above.

The publication of the description of the relevant offerings should in particular apply to the end-to-end wholesale leased line product, to the Part Circuit products, to Interconnection Paths, as well as any new offerings offered by Maltacom. The MCA reserves the right to specify the level of detail to be published with respect to such information from time to time.

In order to better overcome the competition problems discussed above, the MCA is of the opinion that Maltacom should continue to provide and publish (and update where necessary) appropriate manuals, order forms and processes for services, the details of which are to be determined on a case–by-case basis. The publication of other information may be requested by the MCA from time to time. Furthermore, the MCA is of the opinion that Maltacom should provide detailed billing at the wholesale level.

The need to impose transparency obligations is felt in view of the need to ensure that Maltacom provides other operators with effective access to its wholesale inputs.

04.4.4 Price control and cost accounting

As indicated in this document the MCA has found Maltacom to have SMP in wholesale trunk and terminating segments markets, as well as in the retail minimum set of leased lines market. Due to the considerable entry barriers in the wholesale markets, it is not envisaged that Maltacom's SMP status in the said wholesale markets would change within the timeframe of this review. In this light it is believed that unless proper restraint is put on Maltacom by means of regulation, the exertion of a market squeeze by Maltacom to foreclose the downstream market is likely.

Regulation 22 of the ECNSR authorises the imposition on the undertaking with SMP (in this case Maltacom) of obligations relating to cost recovery and price controls, including obligations for cost orientation of prices and obligations concerning cost accounting systems, for the provision of specific types of interconnection and, or access.

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[21] This obligation was laid down in MCA's Report on Consultation and Decision entitled 'Dominant Market Position in the Leased Lines Market - Determination of DMP' published in June 2003.

[22] Link to documents on the Maltacom website http://www.maltacom.com/interconnect/docs.aspx

Such intervention is in itself deemed instrumental in supporting competition in the retail market to the benefit of end-users, whilst at the same time supporting the obligations of non-discrimination and transparency at a wholesale level.

Cost Orientation

In applying obligations relating to cost recovery or pricing, the MCA is obliged to ensure that any cost recovery mechanism or pricing methodology that is mandated serves to promote efficiency and sustainable competition as well as maximise consumer benefits.[23]

In view of the risk of excessive pricing being applied by Maltacom in the wholesale market under review, the MCA is of the opinion that cost orientation would prove efficient in curbing such possible abuses of dominance. By mandating that interconnection and access to wholesale services provided by Maltacom be cost oriented, the MCA believes that it would be in a position to ensure fair and efficient access to Maltacom's network and services.

In implementing this measure, the MCA will pay careful attention to those costs which are shared amongst a number of products, as well as to ensuring that only efficiently incurred costs will feature in Maltacom's charges.

The imposition of a price control may also alleviate the potential of a market squeeze being exercised by Maltacom.

To this aim Maltacom's current cost orientation obligation is to be maintained. For the time being the prices currently in Maltacom's Leased Lines Wholesale Services Offer and its Reference Interconnection Offer will continue in force, until the conclusion of the forthcoming review of prices. Furthermore Maltacom is to update its offers with additional products as appropriate in fulfilment of the access obligations imposed above.

In view of the differences in nature of the wholesale products, i.e. end-to-end wholesale leased lines, part circuit products and interconnection paths, the MCA reserves the right to revise and apply different methods of price control for the said wholesale products in accordance with law.

Cost Accounting

The MCA believes that, in order to effectively promote competition and curb possible abuse of dominance in the wholesale markets under review the imposition of a cost accounting system will be necessary to support cost orientation. It is therefore proposing to impose such obligation as a further remedy on Maltacom. The MCA does not consider that the imposition of a cost accounting obligation would constitute an unreasonable burden on Maltacom.

Such cost accounting system will provide the MCA with detailed information regarding Maltacom's product costs and ensure that fair, objective and transparent methodologies are followed by the operator in allocating costs to the proposed regulated products. Information from such system will be used by the MCA to complement the application of other regulatory measures such as transparency and non-discrimination.

Maltacom is currently already obliged to support such a system by virtue of MCA decisions[24] which have been in place for some time. These decisions established that operators having

[23] ECNSR, Reg. 22(2)

a Dominant Market Position should implement cost-based accounting systems using a Fully Allocated Cost accounting methodology using a historic cost base. At that time the MCA had taken the view that this methodology was the most practical approach in the short term. However, mindful of the deficiencies inherent in a historic cost-based system, the MCA stated that it would review the need to move to a current cost regime during 2005. It has thus issued a consultative document[25] that examines the various issues that are relevant to a transition from a historic cost base to a current cost base. Up till the publication of this document the decision has not been published.

04.4.5 Accounting separation

Accounting separation is instrumental in ensuring that the undertaking with SMP is not price discriminating between its retail arm and its competitors when providing access and interconnection at a wholesale level. By evidencing the wholesale and internal transfer prices of the products and services of the undertaking with SMP, accounting separation also supports the obligation of transparency discussed above.

The obligation of accounting separation is also important in the disclosure of possible market failures such as cross-subsidisation and the application of margin squeeze by an undertaking with SMP.

In view of the above and of the fact that the MCA is herein proposing the imposition of the obligations of non-discrimination and transparency on Maltacom, the MCA feels that the imposition of an accounting separation obligation on the same Maltacom is appropriate since it is justifiable and based upon the competition problems identified above.

Currently Maltacom is subject to the accounting separation obligation described in the MCA decision on Accounting Separation[26]. This level of obligation shall be maintained until further consultation is deemed necessary.

Q4. Do you agree with the proposed obligations to be imposed on the identified SMP operator?

04.5 Monitoring market developments

The MCA considers that it would be sensible to keep a reasonably close watch on market developments following this review. This would ensure that current and proposed obligations on the SMP operator identified earlier on would be justified throughout the duration of this market review. If the MCA deems necessary or appropriate a new market review would be undertaken at any time in response to changing market conditions.

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[24] Implementation of Cost Based Accounting Systems for the Telecommunications Sector - Report on Consultation and Decision - July 2002.

Dominant Market Position in the Leased Lines Market - Determination of DMP - June 2003

[25] Current Cost Accounting Methodologies for the Electronic Communications Sector – July 2005

[26] Accounting Separation and Publication of Financial Information for Telecommunications Operators - Report on Consultation and Decision of October 2002, as amended in July 2003

Chapter 05 - Submitting Comments

All comments are welcome; however it would make the task of analysing responses easier if comments were referenced to the relevant question numbers from this document. The consultation period will run from 3rd February 2006 to 3rd March 2006, during which the MCA welcomes written comments on any of the issues raised in this paper.

The MCA appreciates that many of the issues raised in this paper may require respondents to provide confidential information if their comments are to be meaningful. Respondents are requested to clearly identify confidential material and if possible to include it in a separate annex to the response.

Having analysed and considered the comments received, the MCA will review this analysis and publish a report on the consultation which will inter alia summarise the responses to the consultation.

In order to promote further openness and transparency the MCA will publish the names of all respondents. Moreover, in the interests of transparency, all representations will be published, except where respondents indicate that a response, or part of it, is confidential.[27] The MCA will take steps to protect the confidentiality of all such material from the moment that it is received at MCA's offices. In the interests of transparency, respondents should avoid applying confidential markings wherever possible.

All responses must arrive at the MCA no later than 16.00hrs of the 3rd March 2006. Submission received after this time will not be taken into account. Extensions of the consultation deadline will only be permitted where the Authority deems fit, following a written request made by the interested party.

All comments should be made in writing and where possible sent by email to info@mca.org.mt. However, copies may also be posted or faxed to the address below. If any parties are unable to respond in one of these ways, they should discuss alternatives with:

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Malta Communications Authority
''Il-Piazzetta'' Suite 43/44, Tower Road,
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[27] In accordance with the MCA's confidentiality guidelines and procedures.

Appendix A

The table below shows the minimum set of leased lines with harmonised characteristics and associated standards identified by the European Commission in Decision 2003/548/EC:

ANALOGUE LEASED LINES

Leased line type	Reference	Notes
Ordinary quality voice bandwidth (a)	— 2 wire: ETSI EN 300 448 or — 4 wire: ETSI EN 300 451	Connection characteristics and network interface presentation
Special quality voice bandwidth (b)	— 2 wire: ETSI EN 300 449 or — 4 wire: ETSI EN 300 452	Connection characteristics and network interface presentation

(a) Leased lines meeting the requirements of ETS 300 448 (2 wire) or ETS 300 451 (4 wire) are deemed to comply with the requirements for this type of leased line.

(b) Leased lines meeting the requirements of ETS 300 449 (2 wire) or ETS 300 452 (4 wire) are deemed to comply with the requirements for this type of leased line.

DIGITAL LEASED LINES

Leased line type	Reference	Notes
64 kbit/s (c)	— ETSI EN 300 288 — ETSI EN 300 289	Network interface presentation Connection characteristics
2 048 kbit/s — E1 (unstructured) (d)	— ETSI EN 300 418 — ETSI EN 300 247	Network interface presentation Connection characteristics
2 048 kbit/s — E1 (structured) (e)	— ETSI EN 300 418 — ETSI EN 300 419	Network interface presentation Connection characteristics

(c) Leased lines meeting the requirements of ETS 300 288, ETS 300 288/A1 and ETS 300 289 are deemed to comply with the requirements for this type of leased line.

(d) Leased lines meeting the requirements of ETS 300 418, ETS 300 247 and ETS 300 247/A1 are deemed to comply with the requirements for this type of leased line.

(e) Leased lines meeting the requirements of ETS 300 418 and ETS 300 419 are deemed to comply with the requirements for this type of leased line.