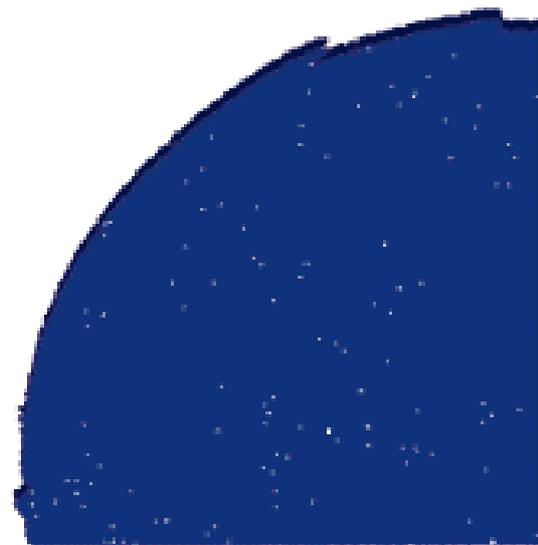


Developments in International Telecommunications

*Executive summary of a report by Ovum
for the ART*



WARNING

The ART ordered the present study to Ovum in order to shed light on the perspectives of development in international telecommunications.

In its concern about transparency and open information, ART has decided to publish the executive summary of this study.

The methodology applied and the results reached are the liability for Ovum and do not involve the ART.

Interested parties are invited, if need be, to send their comments to the ART.

Executive Summary

S1 Introduction

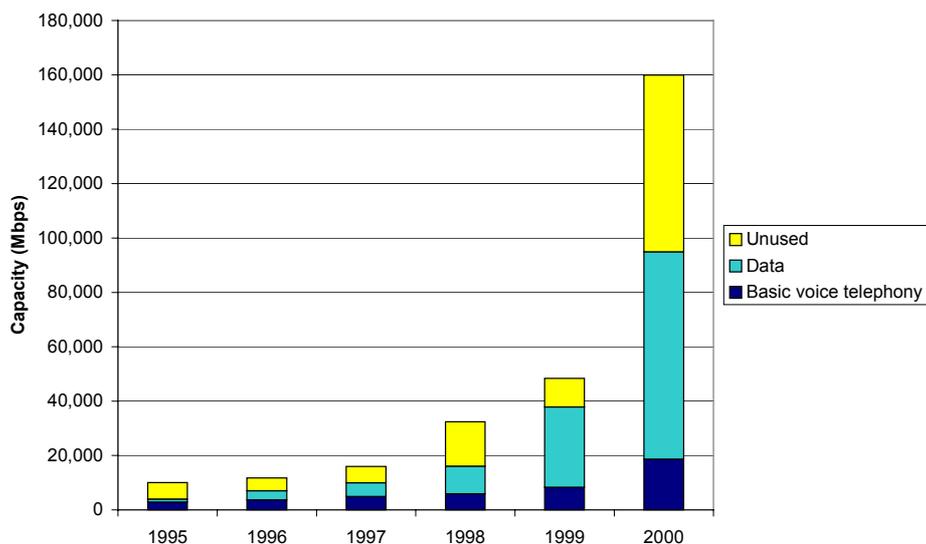
This report presents the findings of a review of developments in international telecommunications. As well as describing and quantifying major developments and looking at any specific issues for developing countries, we consider how future changes in the international telecommunications industry might lead to market failure and what possible regulatory measures might prevent such failure.

S2 Demand for international services

We must make a clear distinction between voice and data when looking at demand for international telecommunication services:

- demand for international **voice** services has grown steadily at 12 to 16% over the last ten years. We expect this trend to continue
- in contrast demand for international **data** services has grown explosively over the last five years with the development of the Internet. Figure S1 illustrates. We expect growth rates to slow over the next few years but to remain above 100% per annum

Figure S1 Use of international circuits from the USA



Source: FCC

- a low proportion of **voice** traffic is international: 3 to 5% is typical. In comparison a high proportion of **data** traffic, and especially Internet traffic, travels across national borders
- the flow of international **voice** traffic between developed and developing countries is asymmetric. This rule applies not only to North America but also to Western Europe. So for example 0.2% of the world's international traffic flows from Africa to Western Europe but 0.8% flows in the opposite direction
- flows of international **data** traffic are even more asymmetric with a high proportion of traffic transiting or terminating in the USA. This proportion has however dropped significantly in many parts of the developed world, as countries have opened local Internet exchanges and a growing proportion of Internet content has been produced locally
- prices for international **voice** services are dropping at around 10% per annum in most countries of the world. But, given the faster growth in traffic, this means that end user revenues from international voice services continue to rise.
- in contrast it is difficult to measure international end user revenues from **data** services. For example, when a user buys access to the Internet the charge does not vary with the proportion of international traffic which is generated
- the revenue generated for each megabit of information carried is much higher for **voice** than for **data**. For example, BT estimates that 80% of its international revenue comes from voice but that this traffic uses up less than 10% of its international networking capacity.

S3 The supply of international services

Factors driving change

The industry which supplies international telecommunications services has changed dramatically over the past decade and continues to evolve rapidly. Three main factors have driven these changes:

- **liberalisation** of telecommunications markets. Twelve years ago three countries had partially liberalised their telecommunications markets. Today over 40 have fully liberalised these markets. This liberalisation allows new entrants to offer international services in competition with the incumbent. But it also leads to the creation of a large number of new national operators – both fixed and mobile – with international traffic to deliver. This is one of the main factors which has led to the development of the global wholesale carrier
- growth in the **use of the Internet**. 12 years ago the Internet was a specialist network used largely by academics. Now nearly one in two people in the developed world use it on a regular basis. This explosion in Internet demand has created a massive increase in demand for international bandwidth - another reason for the emergence of the global wholesale carrier
- major advances in **technology**.

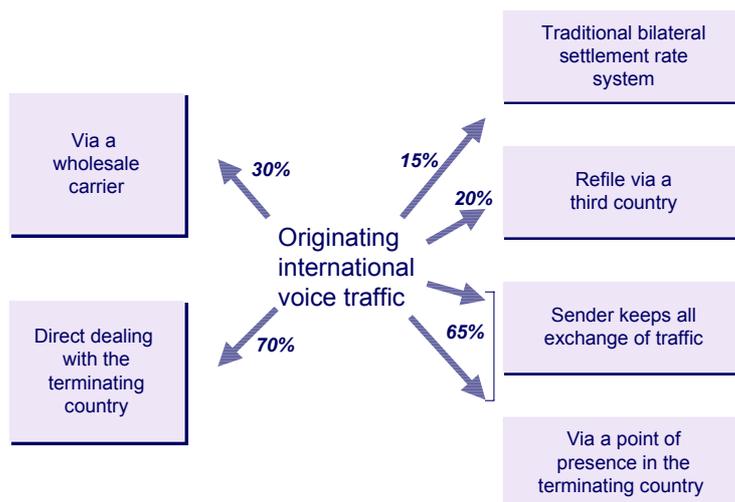
- the move from *analogue to digital* switching has substantially lowered the unit cost of an international voice call and made least cost routing of international calls a possibility
- the introduction of *fibre optic cables* has sent the price of international circuits on high traffic routes tumbling
- we now expect to see international voice traffic move from circuit switched to *IP transmission* over the next few years.

The breakdown of the traditional settlement system

In combination these three factors have transformed the way in which international voice traffic is delivered. Traditionally carriers agreed bilaterally negotiated settlement rates and paid each other at these rates for each minute terminated in the other's country, even though this settlement rate is often well above the cost of terminating the call. This system has now almost totally broken down. Figure S2 illustrates. It shows that:

- less than 15% of international voice traffic continues to use the traditional bilateral settlement regime
- the bulk of traffic is now terminated on either a sender keeps all basis (like Internet peering) or through a point of presence in the terminating country
- a growing proportion, currently around 30% of international voice traffic, is carried by *global wholesalers*.

Figure S2 Delivering international voice traffic in 2002



The rise and fall of the global wholesaler

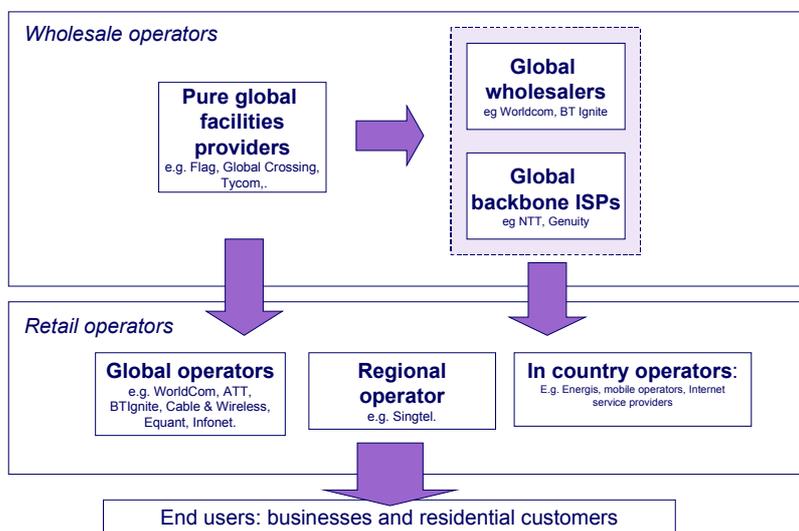
The global wholesaler is a new phenomenon. 10 years ago 100% of the capacity on the trans-Atlantic route was owned by consortia made up of the traditional in-country incumbent operators. Today 93% of built capacity across the Atlantic is held by just five companies – Flag, Global Crossing, Level 3, 360Networks and Tycom. None of these companies existed 10 years ago.

Financed by the banks the new global wholesalers have built high bandwidth fibre optic transmission networks around the world and tried to capture a significant proportion of ISPs and new national carriers as customers. But many of them are now in severe financial difficulties. The downturn in telecommunications and Internet demand since March 2000, coupled with substantial over-supply of bandwidth in the past three years, has meant that the new global wholesalers have found it difficult to generate sufficient revenue to finance their debts.

The current structure of the industry

Figure S3 shows the current structure of the international telecommunications service industry.

Figure S3 The value chain of the international telecommunications industry



There are six main categories of player:

- **pure global facilities providers** such as Flag and Global Crossing
- **global wholesalers** who operate a mixed strategy eg. Worldcom and BT Ignite. Sometimes they lease facilities from the pure global facilities providers and sometimes they build their own

- **global backbone ISPs** like NTT and Genuity. This is a new and emerging category of operator which primarily sells global Internet connectivity to local ISPs at local points of presence
- **global retail operators** who sell service to multi national companies eg Teleglobe and Infonet
- **regional retailers** like PCCW and Singtel in the Asia Pac region
- **in-country operators and service providers** who serve business and residential customers in national markets using fixed networks, mobile networks and/or the Internet.

Expected changes over the next five years

Over the few years we expect to see the industry structure of Figure S3 to develop in a number of ways:

- the industry will **consolidate**. By 2006 we expect to see an international services industry which consists of three to four global players, three to four regional players in each region and perhaps three major fixed operators and three to four mobile operators in each country. The massive economies of scale in the international market will mean that only the biggest operators will survive as global players
- the industry will **polarise** between the national carriers and the global/regional players. National carriers will focus on serving their in-country customers and outsource the carriage of their international telecommunications traffic to the global and regional carriers
- the industry will see **little investment** in further facilities until wholesale prices have stabilised and excess capacity has been cleared from the market in 2005
- the balance of **bargaining power** will shift. Right now the *national retailer* is in a very strong position in terms of purchasing international service. There is a large number of suppliers eager to take its business on all except a few difficult, low volume, routes. But once consolidation is complete and excess capacity disappears the position of the *global wholesalers* who survive will strengthen considerably.

S4 Issues for developing countries

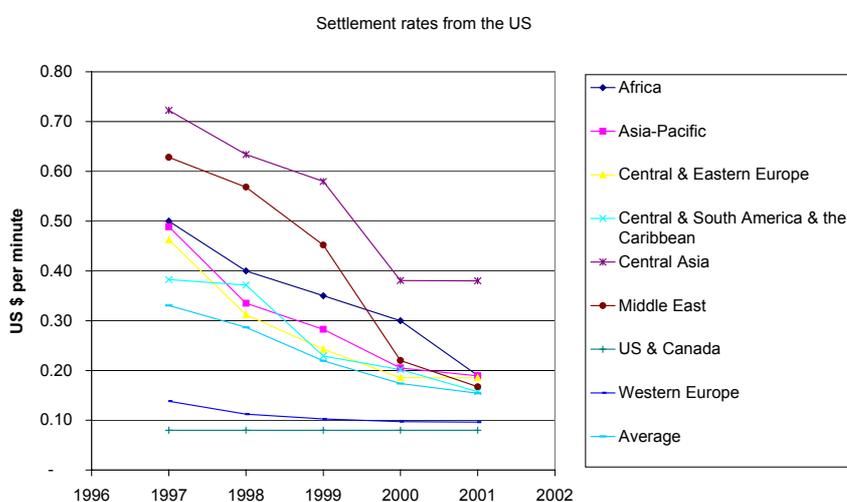
The dependence on net settlement rate revenues

Traditionally the monopoly operator in a developing country has generated substantial net settlement rate revenues from international telecommunications. It has received substantially more inbound minutes than it has generated outbound minutes whilst settlement rates for this net inflow of traffic have been significantly above cost. This net settlement rate revenue, which has accounted for up to 50% of the operator's revenues, has provided funds for fixed network build out and for maintaining local services at affordable levels.

The disappearance of this revenue stream

Over the past four years however settlement rates have fallen rapidly. Figure S4 illustrates. Liberalisation of the industry, together with FCC and ITU initiatives, has had a substantial effect. For example it has driven the average settlement rate between Africa and the US from over 60 cents per minute to under 20 cents per minute¹ over the last five years.

Figure S4 The decline in settlement rates in the late 1990s



With this fall in net settlement rate revenue in most developing countries we expect to see:

- investment in new fixed network build reducing
- the price of local services increasing significantly.

The importance of transit rates

Transit rates are also important to developing countries where it often makes commercial sense to establish direct connections to only a limited number of countries. Operators must then use transit operators to carry traffic to other countries where they do not have direct connections. The volume of such transit traffic is very substantial.

¹ Even this settlement rate may be well above cost in most developing countries. Ovum estimates that the cost of terminating international calls is around 6 to 8 cents per minute in a reasonably sized country with a teledensity of 1 to 2%

Analysis of transit rate data from Africa suggests that operators in developing countries have benefited from competition in the transit service industry but that market mechanisms are still far from fully effective.

The digital divide

These developments in international telecommunications are important when considering how best to bridge the digital divide between the developed and developing world in terms of access to the Internet. We have identified five main challenges for the initiatives which Governments from the developed world are funding to try to bridge this digital divide:

- the current lack of basic infrastructure in terms of low PC ownership, low telephone penetration, poor quality fixed network access and even lack of electricity at home
- the likely low levels of build-out of fixed networks over the next few years
- the high cost of global Internet connectivity.
- the poor record of network build-out by existing monopoly operators
- the need to develop substantial local content which serves the real needs of the population of the developing country concerned.

A key issue in tackling these problems is the speed with which developing countries should liberalise supply of their telecommunications services and facilities. This in turn raises the issue of how to fund progress towards universal service as monopoly operators in developing countries rebalance prices towards cost in preparation for competition. Some argue for a free market approach; others propose a universal service tax on the telecommunications of competing operators which is then used to fund fixed network build out.

S5 Conclusions

Our work leads us to draw nine main conclusion on the way the international telecommunications facilities and service markets function and the need for regulatory control of them:

- the international telecommunications service market has undergone a fundamental transformation over the last decade – from one based on monopoly supply to one which is fiercely competitive on all major routes
- the market is functioning well and supra normal profits are disappearing fast. Regulators should monitor market mechanisms but not intervene
- the market is far from transparent. Outside the USA statistics on its development are scarce and operators are often bound by non-disclosure agreements on interconnect arrangements. We believe that regulators in the US and Europe should be able to agree on measures which would require greater disclosure without substantially damaging the commercial position of the international carriers who are affected by such disclosures

- there is a growing gap between the global reach of the international carriers and the national and regional jurisdictions of the bodies which might in future be required to regulate them. But this is not, in our view, a cause of any great alarm
- there is currently a market failure in the financing of international telecommunications ventures. Financial institutions have swung rapidly from a position of uncritical supply of capital to ventures with highly risky business plans, to one in which capital for international telecommunications projects is tightly rationed
- international carriers are concerned that different market conditions in individual country markets - in terms of levels of liberalisation, licensing arrangements, interconnect and even the need for bribes - raises substantially the cost of providing international service. They call for greater harmonisation of national market conditions
- the liberalisation of international telecommunications has created additional problems for developing countries. Liberalisation, coupled with initiatives from the FCC and the ITU, has led to a rapid reduction in the net settlement rate revenues enjoyed by many developing countries. And this reduction has made it more difficult for operators in these countries to fund fixed network build out and/or hold down the price of local telephone service to affordable levels
- developing countries can only deal with these changes in a satisfactory way if they do so within the broader context of developing their national telecommunications infrastructure. Our analysis suggests that this requires clear and consistent answers to four inter-linked questions:
 - how can a developing country improve the poor track record of fixed network build out by its main operator(s)?
 - how can the main operator(s) rebalance its prices towards costs while, at the same time, preserving the affordability of basic services?
 - how quickly should a developing country liberalise the supply of its telecommunications services and facilities, both at the national and international level?
 - what priority, if any, should a developing country give to the use of its hard currency reserves for fixed rather than mobile network build out²?

² On the grounds that fixed networks offer lower unit cost solutions overall and are better suited to Internet use

