

SAMOA



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The Changing International Telecommunications Environment

SAMOA CASE STUDY

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prepared by

William J. Withers¹

ITU Asia-Pacific Office

¹ The views expressed in this report are those of the author and do not necessarily reflect the opinions of the ITU or its membership. This version of the report has been edited for the purposes of the case study programme. A full version of the report can be obtained from the authors at .William@itu.or.th.

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AUTHOR'S NOTE

This report presents a case study of Samoa which was undertaken to examine telecommunication policy, regulation, and operating environment in the context of changes in the international telecommunication environment including changes in the division of revenue derived from jointly-provided international services. In assembling the input data for this report, discussions on the matter of confidentiality were held with Mr. Asamu Ah Sam, Assistant Director Operations and Mr Nerony Lam Sam, Assistant Director Finance for the Posts and Telecommunications Department of the Government of Samoa (the Department). As a result, the data in the report with respect to specific accounting rates and demand on particular routes, is presented in a summary format as certain data is considered of a sensitive and confidential nature by the Department.

The absence of current and historic accounting and financial records for the Department presented certain limitations to conducting a more complete revenue and cost analysis. As a result, the analysis of the revenue mix and the related trends was 'constructed' from a limited set of known variables. Similarly with the cost functions (Chapter 4 - Cost Evaluation), the historic data is also limited and insufficient in terms of quantity and disaggregation and this has therefore encumbered the process of reaching sound conclusions in terms of the unit cost for terminating international traffic.

Such limitations in accounting and financial records are not unique to Samoa. The absence of adequate financial recording and reporting appears to be a prominent characteristic of many state-owned and non-corporatised telecommunication operators, particularly in developing and less developed economies. The Government of Samoa is in the process of corporatising the Department and one of the matters being addressed is that of accounting and financial reporting. Notwithstanding such limitations, the construction and application of the scenarios (Chapter 5 - Scenarios for Changes in the International Accounting System) permits certain conclusions to be drawn with respect to the relative impact of the various approaches.

One of the notable findings in the Samoa case study is that, without any changes in the international settlement method and given the historical downward trend in the weighted accounting rate from 1992 to 1997, the weighted rate by 2002 would be in the range of 22 cents compared to the FCC benchmark rate for Lower Middle income economies of 19 cents (see Table 3.2). Such a finding supports the suggestion in the conclusion of a strategic short term focus on international price re-structuring as opposed to settlement methodology reform.

While the findings associated with each of the scenarios relate to the Samoan environment, the issues which are raised and the implications of applying certain settlement methodologies may also apply to other small, less developed economies which exhibit a unusually heavy reliance on international settlement in-payments to provide financial strength and sustainability for their infrastructure development plans.

The summary of findings and strategic plan proposals for settlement reform put forward in Section 6.2 are submitted for discussion and debate. The suggested strategies focus on marketplace results and the consumer in the context of price re-structuring and settlement reform.

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1. THE SOCIO-ECONOMIC ENVIRONMENT IN SAMOA

1.1 Macro-Economic, Social, Geographical And Demographic Status

The country of Samoa, formerly known as Western Samoa, is located in the central part of the South Pacific and has a land mass of some 3000 square kilometres. The population (1996 - 165,000 - see Annex One) is distributed between Apia, the capital and some 362 villages along the coastal regions of the four inhabited islands. The two main islands are Upolu, on which Apia is located, and Savai'i.

The Samoan economy is largely based on the agriculture sector and other primary sector activities. There is also a small manufacturing sector and since the later 1980's, selected service industries such as distribution, tourism and transport have increased and partially replaced the earlier reliance on the agriculture sector as the main economic activity.

During the early 1990s two major cyclones, 'Ofa' in 1990 and 'Val' in 1991, caused major damage to basic infrastructures and a major re-building of the telecommunications infrastructure took place from 1992 onwards.

Total output in terms of gross domestic product remained fairly flat during from 1991 to 1995 partially due to the impact of the cyclones in 1990 and 1991. In terms of per capita income, GDP per capita also remained flat during this period as population growth was less than one percent between 1993 and 1996.

During the early 1990's foreign aid accounted for about one-third of the gross national product with the majority of it being provided by Australia and Japan. With a substantial number of Samoans residing in New Zealand, Australia and the United States, there has been a significant dependence on offshore remittances as a source of national savings in the past, however the overall value of this source has declined in recent years. However, in terms of the direction of telephone traffic, the estimated 100,000² Samoans who reside in New Zealand, Australia and the United States are the source of a substantial portion of the growing number of incoming minutes from these developed economies.

The Samoan economy is one of five in the South Pacific region to be classified as 'least developed'.³ The fragile nature of LDC economies is such that any material variation in foreign exchange in-payments is likely to have an equally significant impact on the overall national accounts.

1.2 Plans For Future Development

The Government of Samoa's National Strategic Plan for 1996 and 1997 is entitled 'A New Partnership - A Statement of Economic Strategy 1996 - 1997'. The following statements contained in the plan provides a description of the general focus for economic and information infrastructure development:

"During the past five years the Government has declared its commitment to promoting the private sector as the engine of economic growth. To this end Government has withdrawn from some activities altogether; important public services have been contracted out to private businesses; state-owned enterprises have been wholly or partially privatised; deep cuts have been made to public expenditure; and a forceful start has been made to reforming the fiscal system.

But there is still much to be done. Over the next 3-5 years there will be a series of mutually reinforcing policies to create a more vigorous, competitive, efficient economy. In this the Government seeks a partnership with the private sector. To this end the Government will work towards the creation of a 'level playing field' on which businesses can compete on equal terms with

² 'The Pacific Link - Western Samoa Country Report', Cutler Consulting, September, 1993, page 1.

³ 'Telecommunications Indicators for Least Developed Countries', First Edition, ITU Geneva, June 1995. The four criteria for ranking economies as 'least developed' are as follows- a) population less than 75M; b) per capita GDP less than US\$ 700. (average 1990-92); c) augmented physical quality of life index (APQLI) less than 47 (comprised of four indicators - life expectancy at birth, per capita calorie supply, school enrolment ratio, and adult literacy rate); and d) economic diversification index (EDI) less than 26 (share of manufacturing in GDP, the share of employment in industry, per capita electricity consumption, and the export concentration ratio). The last 'LDC' categorisation took place in December 1994 and employed average per capita income for the period 1990-92. The list of LDC countries is due to be reviewed and revised in December 1997.

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one another, with foreign competitors and with the public sector in its role as a supplier of goods and services. ...

(from the National Plan - Sectoral Strategy for Communications)

.... The Post and Telecommunication Department will be corporatised during the 1996/97 fiscal year, with a view to eventual privatisation. The new corporation will continue to provide both postal and telecommunications services, and will explore new product possibilities arising from fast developing technology. As a start, a private investor is to be given the cellular phone franchise in a joint venture partnership with Post and Telecommunication Department.⁴

The Government's emphasis on attracting private capital and seeking partnerships with the private sector has been made operational with the licensing of a cellular operator which is a joint venture enterprise between the private sector and the Government.

In terms of capital requirements for infrastructure development, the estimated capital expenditures for the period 1990 to 1995, based on a 'standard cost' of US\$ 1'500 per line, was some US\$ 5.5M or about US\$ 1.1M per year.⁵ Future requirements are estimated to be some US\$ 14M over the period 1996 to 2000 or about US\$ 2.8M per year based on the historic growth rate. Based on this level of expenditure and the trend in population growth, the overall penetration rate is estimated to reach about 10 per hundred by the year 2000.⁶ However, revised estimates of future capital requirements need to reflect the general downward trends in the 'average cost per line' and also that some of the demand will be satisfied by the new cellular and wireless local loop operator.

For example, a portion of the future demand and the related capital expenditures will be met by the new service provider with the introduction of cellular mobile service. However, even with this new source of capital, the need for additional capital to expand the basic wired infrastructure will continue in order to satisfy demand in the existing exchange areas, and also for modernisation as well as to provide the added capacity required by the cellular mobile operator for the processing of calls between the cellular mobile and wired networks.

1.3 Dependence on Settlement Payments in The National Economy

The significance of the telecommunication sector in terms of Samoa's gross domestic product is substantial when compared to the average for other countries within the Lower Middle Income Group. Based on 1995 telecommunication revenues and 1994 GDP, the average for total telecommunication revenues as a percentage of GDP in Low Income and Lower Middle Income countries was 1.3% and for High Income countries with fully developed networks it was 2.1%,⁷ whereas in Samoa, 1995 telecommunication revenues represented some 5.7% of 1994 GDP. This higher dependence on the telecommunication sector in terms of total economic output in Samoa is similar to that of the Solomon Islands (another South Pacific LDC) with a figure of 4.7% and another island nation, Jamaica at 5.5%.⁸

The significance of the Samoan telecommunication sector from another perspective is that of net settlement in-payments in relation to the country's current account. With net settlement in-payments of some US\$ 3.2M in 1996, compared to the 1996 change in the country's net current account of some \$ 25 million tala (US\$ 10.2m), the reliance on foreign exchange inpayments from international settlements is material.⁹

⁴ 'A New Partnership - Statement of Economic Strategy 1996 - 1997', Government of Western Samoa, January 1, 1996 pages 3 and 13.

⁵ Ibid., page A-9.

⁶ Ibid., page A-81.

⁷ World Telecommunication Development Report 1996/97, ITU Geneva, March 1997, page A-56, 57 and 59.

⁸ Ibid., page A-57.

⁹ Central Bank of Samoa Bulletin, December, 1997, Table B-1, page 45.

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Another aspect of the dependency on international settlements is evident in the proportion of total telecommunication revenues derived from the international segment. In 1996, some 65 to 70% of total telecommunication revenue was derived from the international segment of the business. This high dependency on international revenue is due to a number of factors. First, the concentrated nature of the population and in-service lines in the capital, Apia, results in a limited amount of revenue being derived from domestic long distance service. Second, the low level of economic development results in a smaller portion of business customers and thereby lower fixed and usage revenue from the business segment. Third, the nature of the overall demographics, with some 100'000 Samoans residing outside the country, and retaining strong family ties with those residing in Samoa, coupled with both the relative difference in income levels and in outbound/inbound price differentials, produces substantial international calling on the inbound routes.

The significance of the overall telecommunication sector to the total economy and, in particular, that of telecommunication foreign exchange 'in-payments' from international settlements as well as the high proportion of total revenue derived from the international segment, requires that any specific changes in settlement arrangements be phased in over an appropriate time period. In addition, a full and precise evaluation should be undertaken to determine the specific effects and the corresponding required actions needed to minimise the impact of such changes on the viability of the operator and the ability of it to continue with the required expansion programme for the basic information infrastructure in Samoa.

2. TELECOMMUNICATION POLICY AND NETWORK DEVELOPMENT

2.1 Regulatory And Policy Structure

Regulatory functions such as licensing and frequency management are both located within the Sector Ministry, whereas price-setting and broad policy objectives such as corporatisation and privatisation initiatives are located at the Cabinet level.

As noted in Section 1.2, a number of broad objectives for the information infrastructure sector are stated in the Government's National Strategic Plan which reads, in part, as follows:

(from the National Plan - Sectoral Strategy for Communications)

*"... The Post and Telecommunication Department will be corporatised during the 1996/97 fiscal year, with a view to eventual privatisation. The new corporation will continue to provide both postal and telecommunications services, and will explore new product possibilities arising from fast developing technology. As a start, a private investor is to be given the cellular phone franchise in a joint venture partnership with Post and Telecommunication Department."*¹⁰

The corporatisation initiative was not completed by the end of the 1996/97 fiscal year, however, an implementation plan was scheduled to be presented in Cabinet during December of 1997 with a target date for full corporatisation of July 1998. As in many developing economies, the reform process in Samoa, while addressing such initiatives as privatisation, corporatisation and liberalisation, does not adequately address the broader requirement for effective governance in terms of institutional reform for policy development and regulation.

In addition, the absence of a more detailed set of infrastructure development objectives both in terms of the number of lines to be added in rural and urban areas and the related capital expenditure requirements undermines any objective review and comparison of policy objectives, results and operator performance. This absence of quantified policy objectives by which to judge infrastructure development results and reform initiatives is a common weakness in many developing and developed economies.

In terms of regulation, there is a need for a formal regulatory framework suitable for the present industry structure and related legislation having regard to the introduction of the partially privatised operator with an exclusive license and the plan to corporatise the state-owned basic service provider. The absence of these institutional reform initiatives—policy and regulatory reforms—may eventually undermine the overall effectiveness of the privatisation and liberalisation reform initiatives which have already been undertaken as well as the planned corporatisation initiative.

Issues such as licensing, price-setting, spectrum management and interconnection arrangements in either a duopoly or fully competitive environment are likely to arise in the future and without an appropriate regulatory mandate and a functional regulator, one or all of these issues may unduly constrain the effective and efficient development of the information infrastructure (see further comments on governance in Chapter 5).

2.2 The Network: Development Plans, Indicators and Price Structure

There are two public telecommunication operators serving Samoa. The incumbent fixed-wire basic service provider is the Posts and Telecommunications Department of the Government of Samoa which is currently a non-corporatised business entity.

The second public service provider, Telecom Samoa Cellular, is a recently created joint venture company which has been licensed to provide both cellular mobile service and wireless local loop services in the rural areas.

The basic fixed-wire network consists of a main digital switching centre in Apia which performs the local, domestic trunk and international switching functions. There are six remote switching units which provide

¹⁰ 'A New Partnership - Statement of Economic Strategy 1996 - 1997', Government of Western Samoa, January 1, 1996 page 13.

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service to towns and villages in the outlying areas. A digital microwave system provides the main backbone facilities across both of the main islands and also the international route for American Samoa.

The cellular network consists of a single switching centre located in Apia and three cell sites. The development plan includes expansion of the network to outlying areas.

The development of the wired network has progressed from a base of 6,500 lines in 1992 to 8,251 by year-end 1996 (see Annex One). The overall penetration level increased from 4.01 to 5.00 over the same period. While Samoa is included in the 'lower middle income' group of economies based on per capita income, it is designated as a 'less developed country' (LDC). With a penetration rate of 4.36 in 1993, it had the highest penetration rate of all 48 LDCs which collectively had an average rate of penetration of 0.29 as of 1993.¹¹

In terms of growth rates, Samoa achieved a 17.4% average annual growth in main lines from 1990 to 1995 which was substantially above the average of 8.2% of all lower middle income economies during that period. With respect to development in the main urban area, Apia, the penetration rate was 19.29% in 1995 and was comparable to the average for all lower middle income economies of 21.98%.¹²

As with many developing economies, infrastructure development outside the main urban area has been limited with the overall penetration rate being 0.78% in 1995 compared to an average of 8.40% for other countries in the same income group. The level of development outside Apia has increased with the introduction of the cellular mobile service. However, the introduction of the wireless local loop service has been delayed due to a dispute with respect to the provision of customer equipment by the fixed wire operator.

Based on the rapid roll-out of the cellular mobile service, with some 1'545 connections as of February, 1998, or approximately 15% of total connections after seven months of introducing the service suggests that a considerable amount of repressed demand existed. In addition, with the current growth rate, the cellular mobile service could be providing in the order of 30% of total connections after the first year of operation.

The current price structure for fixed line services has remained essentially unchanged since about 1989. Given the changes in the consumer price index (see Annex One) over the period 1992 to 1996, real price levels have been declining, particularly during the period from 1994 to 1996. Notwithstanding these overall real price decreases, the matter of price structure changes has not been adequately addressed.

Given the level of international prices for outgoing calls, the comparable price on each route for incoming calls, the general trend in the weighted accounting and settlement rate, and the trend in the overall international price structure, there is a pressing need to review and re-structure both international and domestic prices. (see further comments on pricing in Section 5.7.1 - Commercial Options)

In terms of domestic price levels, consideration will need to be given to the price levels for cellular-mobile services relative to those for fixed-wire services in the interest of optimising the overall price structure and thereby fostering the effective and efficient development of the overall information infrastructure. For example, the current level of cellular mobile prices for access and usage have established a 'price-ceiling' for basic network access and usage and therefore limit the extent to which fixed-wire local access and domestic usage prices may be increased. As a result, any price re-structuring of domestic fixed-wire services undertaken in conjunction with decreases in the price for international services are limited in terms of shifting the revenue requirement from international service to domestic ones.

Given the current interconnection arrangements, sender-keeps-all, the longer term result of such a shift in demand could be the undermining of the financial resources available to the fixed operator for further development of the wired infrastructure. Given the need to make available such services such as internet access and other higher speed access capabilities for health and education services as well as dedicated high

¹¹ 'Telecommunication Indicators for the Least Developed Countries (1995), ITU, Geneva, May 1995, page 99.

¹² Op. Cit., 'World Indicators 1996/97', page A-25.

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speed services for both business and government, it is essential that the appropriate balance be struck between the development of cellular-mobile network and the underlying fixed-wire infrastructure. In order to achieve such an objective, fair and equitable interconnection arrangements are essential for if the end-user prices of providing the respective services fail to reflect the real underlying costs, network development will be inefficient and in neither the public nor the private interest.

In addition to the need for pricing interconnection facilities to reflect adequately the underlying costs, is the need to reduce prices for international services progressively. It is not feasible to determine the extent to which prices on each route should be reduced in order to maximise revenues. Nevertheless, phased reductions over a number of financial periods, accompanied with the introduction of 'off-peak' pricing and effective monitoring and analysis of the impact on net revenues will ensure that major disruptions in the revenue stream are avoided. One approach would be to commence the price adjustments on one or two of the lighter routes in order to gain experience and develop empirical evidence on the price-revenue relationship and the application of 'off-peak' pricing. Such an approach would also allow for the development and refinement of any new billing software which may be required in order to more effectively implement and monitor changes in pricing packages.

The current prices for basic services are presented below in Table 2.1.

Table 2.1: Current Prices for Basic Services

<i>Service</i>	<i>Price (Samoa \$)</i> <i>100 Sene=\$1.00</i>	<i>Rate in US\$</i> <i>@ 2.46S/US\$</i>
1. Residential Line (monthly)	10.00	4.06
2. Business Line (monthly)	15.00	6.10
3. Installation (residential. & business)	50.00	20.33
4. Local calls (per call)	0.12	0.049
Cellular to cellular or to PSTN	0.33	0.134
5. National calls (between exchanges - no 'off-peak' rates) per minute	0.20	0.081
6. International calls - four groups/bands (no 'off-peak' rates)		
-- Group 1 Countries - only American Samoa	1.50	0.61
-- Group 2 Countries - South Pacific countries i.e. Fiji, Solomon Islands, Australia and New Zealand	3.00	1.22
-- Group 3 Countries - i.e. United States, Europe, Japan, India, Pakistan	4.50	1.90
-- Group 4 Countries - i.e. south-east Asia, South America, Africa	6.00	2.44

Source: Posts and Telecommunications Department

2.3 International Gateways - Technology And Service Providers

International connections are provided via a Standard A earth station in Apia and is equipped to provide direct links to New Zealand, Australia, the United States, Japan and Fiji. The current facilities provide a total capacity of about 160 equivalent voice channels which are allocated as follows:

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Table 2.2: International Links

<i>Destination</i>	<i>Capacity</i>
1. New Zealand	60 channels (voice)
	2 megabits (data)
2. America Samoa	30 channels (voice)
3. Australia	30 channels (voice/data)
4. United States (mainland)	14 voice channels
5. United States (Hawaii)	8 voice channels
6. Japan	4 voice channels
7. Fiji	6 voice channels

Source: Posts and Telecommunications Department

3. EVOLUTION OF THE INTERNATIONAL TELECOMMUNICATION ENVIRONMENT

The regulatory status of services such as call-back, international simple resale, internet telephony and other alternative calling procedures such as 'country-direct' services is unclear given the absence of any active regulatory function. However, given the overall trends in incoming and outgoing traffic it is reasonable to assume that some of these alternative calling procedures are being employed.

In terms of accounting rates, they have been on a downward trend with a reduction of some 28.5% in the weighted accounting rate from 1992 to 1997 (see Table 3.2)

The international links for traffic which have direct routes are New Zealand, Australia, United States-mainland and Hawaii, American Samoa, Japan and Fiji. The remaining international traffic is handled by transit arrangements via New Zealand, Australia and the United States. The transit traffic as a portion of total traffic averages about twelve percent which given the decline in total outgoing traffic suggest that the 'erosion' is also impacting on both the directly routed and the transit traffic.

The trends in international traffic, incoming and outgoing, are both pronounced and inverse. The inverse relationship between the growth in the 1990's between incoming minutes and outgoing results in an increasingly larger dependence on 'in-payment' funds in terms of total revenue and income.

Table 3.1: International Traffic - 1990 to 1996

In millions of minutes for Five major routes: To/From - New Zealand, Australia, United States, American Samoa and Fiji

<i>Year</i>	<i>Outgoing</i>	<i>Incoming</i>	<i>Ratio - In/Out</i>
1990	2.1		
1991	2.9	4.2	1.4
1992	3.2	4.3	1.3
1993	3.8	5.9	1.6
1994	4.1	7.5	1.8
1995	3.7	8.5	2.3
1996	3.7	9.8	2.6

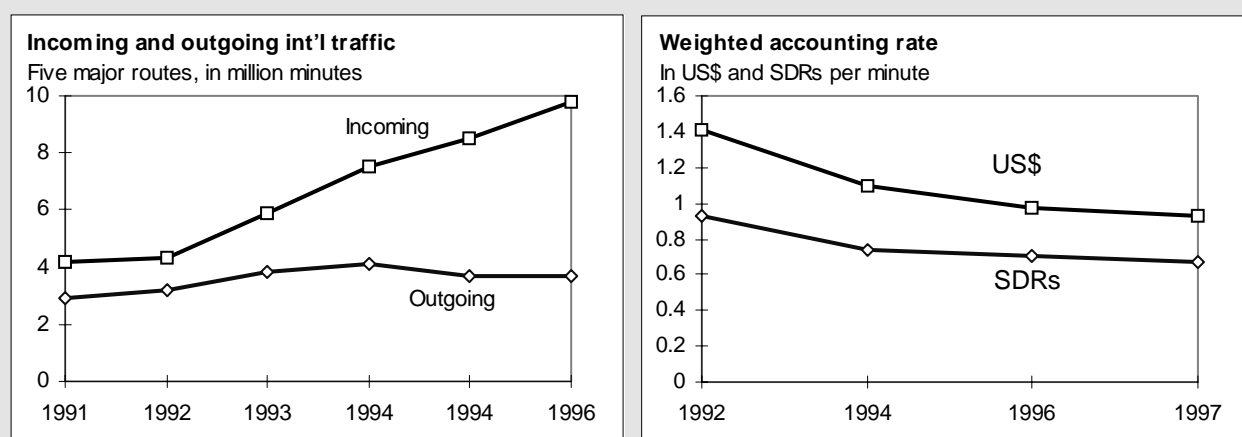
Source: Posts and Telecommunications Department

The basic network development pattern reflects a substantial investment in exchange capacity and distribution plant taking place after the two major cyclones of 1991 and 1992. As a result a substantial growth in lines and customers occurred during late 1992 and throughout 1993.

The historical trend in outgoing and incoming traffic is presented in Table 4.1. The historical trends for each direction have a number of distinct features. The outgoing traffic displays a somewhat uniform growth rate from 1990 until 1994 and then declines to a pre-1993 level of some 3.7 million minutes for 1995 and 1996. With respect to incoming traffic, the historic pattern displays a substantial growth rate commencing in 1993 and continuing into 1997.

The magnitude of the change in the relationship between incoming and outgoing traffic is reflected in the changes in the ratio of incoming to outgoing minutes reflected in Table 3.1. While no attempt was made to determine and quantify the causes of the changes in the ratio, a number of factors likely contributed. As previously noted, the demographics for Samoa are such that while a population of some 165'000 reside in Samoa, an additional 100'000 are living in either New Zealand, Australia or the United States.

This demographic feature coupled with the difference in relative per capita incomes within Samoa compared to those in these other developed economies will no doubt influence the demand function in each direction. A third factor is the relative level of prices in each direction. On the heaviest route, Samoa to New Zealand, the outgoing price per minute from Samoa is in the order of two times higher than that of the 'off-peak', savings-plan price offered in the other direction. All three of these factors as well as the rapid expansion of Samoa's network from 1992 to 1996 have contributed to some extent to the changing ratio between incoming and outgoing traffic.

Figure 3.1: Trends in Samoa's international traffic and accounting rates, 1991/92-1996/97

Source: Posts and Telecommunications Dept.

Table 3.2: Trend in Weighted Accounting Rate - 1992 to 1997

Year	Weighted Accounting Rate (SDR)	Weighted Accounting ¹³ Rate (\$US)	Weighted Settlement Rate (\$US)
1992	0.934	1.41	0.705
1994	0.734	1.10	0.550
1996	0.702	0.97	0.485
1997	0.668	0.93	0.465

Source: Posts and Telecommunications Dept.

The trend in the settlement rate over the most recent five year period, 1992 to 1997, has been a reduction of some US\$ 0.240 (0.705-0.465). Assuming a similar trend over the next five year period, the resulting weighted settlement rate would be in the order of US\$ 0.225 (0.465-0.240). Such a result would be comparable to the FCC benchmark settlement rate for Lower Middle Income countries for the year 2001 of US\$ 0.19.

The trend in the weighted accounting rate is such that, given some price re-structuring over the next few years and also when applying the FCC's TCP method that some allowance is made for exhibiting higher costs in the allowance for international switching due to an absence of more pronounced economies of scale, the 'trended' settlement rate would likely be somewhat lower than that resulting from the FCC's Tariffed Components Price (TCP) methodology for Lower Middle Income Countries if applied to price structures in place during 2001. The major difference between the current TCP level and that of 2001 would be the higher 'national extension component' due to the impact of price re-structuring and a higher allowance for international switching. As local access and usage prices increase, given the current distribution of incoming international traffic, the overall TCP level will also increase.

Therefore, without any changes in the international settlement method, if the downward trend in the weighted accounting rate was to continue, the resulting rate in 2002 would be in the order of 22.5 US cents which would not only be within range of the FCC Benchmark (19 US cents), but also within one cent of the country-specific TCP for Samoa of 21.5 US cents which may be understated for the above-mentioned reasons.

¹³ Conversion @ 1SDR= US\$ 1.50 for 1992 and 1994 and @ 1SDR= US\$ 1.385 for 1996 and 1997.

4. COST EVALUATION OF INTERNATIONAL SERVICES

The absence of accounting and financial reporting data prevents any meaningful analysis and evaluation of telecommunication service costs in Samoa. Such a situation is not unique to Samoa and therefore should be taken into account when developing any international settlements reform plans. The general absence of suitable costing data prompted the FCC to develop the 'tariffed components price' (TCP) method in establishing the settlement benchmarks in Decision 97280 on reforming the international settlements process.

While there are a number of application shortcomings of the TCP method, it does overcome the numerous shortcomings of attempting to employ costs as the basis for establishing settlement rates. In fully liberalised and effectively competitive markets, prices should generally reflect the overall cost functions of the respective segments. As well as the degree of rivalry, underlying factors such as scale, geography, demographics and customer base will also influence both costs and pricing in these markets.

One of the application shortcomings of the TCP method is associated with the status of price re-structuring in liberalised economies compared to the absence of price re-structuring in non-liberalised ones. For example, the TCP for New Zealand is 23.8 US cents and for Australia 18.7 US cents, whereas the benchmark average settlement rate for high income countries is 15 US cents. The variance between the 'average' and the extremes is substantial in terms of the compensation per minute. This difference in developed and liberalised markets may be due to either differences in underlying costs due to demographic and geographic concentration and size or possibly the difference in the degree of rivalry in the respective markets.

A further example of these variances is with developed and liberalised economies such as the UK (13.0 US cents) with more concentrated geographic and demographic features which exhibit country-specific TCPs which are somewhat below the High Income group average of 15 US cents. A further example of the impact on the TCP of geographic and demographic concentration as well as possible differences in the degree of rivalry are the economies of Singapore and Hong Kong with TCPs of 7.6 and 7.0 US cents respectively. Given these significant variances in country-specific TCPs within the High Income group - New Zealand (23.8 US cents), Singapore (7.6 US cents) - the application of the TCP methodology in the settlement process for High Income economies should employ country-specific TCPs. Otherwise a subsidy would flow not only between High Income countries but also the potential for subsidies to flow from developing and less developed economies to High Income economies due to the significant variance between the average TCP and those at the lower and higher ends of the range.

Since the TCPs reflect, in part, a country's price structure, from international private line prices for the transmission segment to local and domestic long distance prices for the national extension portion, they also reflect any variances between price and cost inherent within the pricing structure. Therefore, for countries with fully liberalised markets and re-structured prices, the country-specific TCPs will tend to be closer to costs than for those with some or all of their relevant market structures being ones of monopoly supply. As a result, the application of the TCP methodology for economies with liberalised markets and re-structured prices should result in termination fees for settlement purposes being a reflection of the overall industry's cost function assuming the use of appropriately 'weighted' prices for each of the components. In addition, the present methodology requires the development of a price-based or cost-related element for international switching as the current component is a hypothetical factor related to degrees of digitisation

For countries with some or all of the relevant market segments having monopoly structures or with limited rivalry and without re-structured prices, the country-specific TCP will reflect the related price structure but not necessarily the underlying cost functions. In the case of Samoa, the country specific TCP of 21.5 US cents is within 2.5 cents of the Benchmark rate (19.0 US cents) for Middle Income countries.

As previously noted, the historic trend in Samoa's weighted settlement rate (see Table 3.2) is such that given the continuation of the trend, the resulting weighted settlement rate would be in the order of 22.5 US cents by the year 2002. In addition, with possible upward adjustments to the switching component and the impact of some re-pricing, a settlement rate based on a modified-TCP method and employing current prices is likely to be in excess of the current benchmark rate as well as the current country-specific rate.

In evaluating the applicability of the TCP methodology in the case of Samoa, certain issues arise in terms of the matter of cost-based termination fees and the relative levels of certain TCP components which suggest

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that further analysis and consideration of Samoa's country-specific cost characteristics need to be taken into account. Table 5.1 presents the individual component 'prices' resulting from the application of the TCP methodology for Samoa, New Zealand and Australia.

One such issue relates to the 'international switching component' which due to the absence of both adequate cost and pricing data, the TCP methodology employees the ITU-T information for TEURM member countries to determine and assign a unit 'cost' for switching. The factor is then assigned based on the expected degree of digitalisation of the switching function based on the assumption that less developed economies have lower levels of digital equipment.

Table 4.1: TCPs for Samoa, New Zealand & Australia

In US cents per minute

<i>Component</i>	<i>Samoa</i>	<i>New Zealand</i>	<i>Australia</i>
1. International Transmission	16.5	5.7	4.8
2. International Switching	1.9	1.9	1.9
3. National Extension	3.1	16.2	12.0
Total	21.5	23.8	18.7

Source: Case Study, FCC.

In the process of applying the TCP methodology to Samoa, the lowest 'cost' rate (1.9 US cents) was selected as Samoa employs a digital switch for international services. However, several variables other than technology are not reflected in the rate. First, any variation due to economies of scale are not necessarily reflected, particularly those which may be absent in very small scale international switching units. Second, the vintage of the switch having regard to the general downward slope in switching costs even between different vintages of digital switches may exhibit significant variation from the overall average.

The absence of adequate, reliable and relevant accounting, financial reporting and costing data in both liberalised and non-liberalised economies as well as the cost and time required to develop adequate information systems to provide the essential inputs are sufficient reasons for considering methodologies other than fully cost-based ones to support settlement reform. One such approach is a modified price-based methodology such as TCP suitably adjusted and applied to overcome the above-mentioned shortcomings and combined with a set of benchmarks for price re-structuring.

5. SCENARIOS FOR CHANGES IN SETTLEMENT METHODS

5.1 Alternative Scenarios

Four scenarios for the evolution of the international accounting and settlements system—Benchmarks, Staged Reduction, Call Termination and Sender Keeps All—are presented in the following sections. The following describes the general framework and assumptions related to the various scenarios:

1. Time periods - All scenarios cover a five-year period 1997 to 2001. The ‘phase-in’ dates and periods for the various settlement rates employed in Scenario 1 A and B (Benchmarks) and also in Scenario 3 A and B (Termination fees) are those described in FCC Decision 97-280, paragraphs 6 and 22. Therefore, January, 1999 is the phase-in date for new rates to High Income countries (New Zealand, Australia and the United States) and January 1, 2001 is the phase-in date for traffic terminating in Samoa, a Lower Middle Income country. The phase-in period for Scenario 2 is the full five year period 1997-2001. For Scenario 4 (Sender Keeps-all), the implementation date is 1 January, 1997.

2. Amortisation periods - The difference between the actual settlement rate in 1996 and the target settlement rate i.e. US\$ 0.15 per minute for out-payments to High Income countries in 1999 is amortised uniformly over the three year period 1997 to 1999 in the Benchmark scenario and the phase-in period for in-payments to Samoa at 0.19 per minute is 2001 and is uniformly amortised over the period 1997 to 2001.

3. Demand Forecast - The forecast for Scenario A of each settlement alternative—Benchmarks, Staged Reduction, Terminating fee, and Sender Keeps-all—for outgoing and incoming minutes is based on an analysis of the traffic pattern on each of the three major routes included in the scenarios—New Zealand, Australia and the United States—during the period 1994-96. Prices are assumed to retain their historic relationship; declining in real terms at the rate of change in the consumer price index for outgoing calls and declining for incoming calls at the historic rate. The analysis excludes transit traffic which historically accounts for about 12% of the total traffic in order to simplify the impact calculations.

Traffic in terms of total outgoing minutes is estimated to increase at an annual rate of 2% on each of the three routes for the full period, 1997 to 2001, for each of the Scenario A settlement options. Incoming traffic growth rates for the Scenario A options are forecast to continue their historic growth trends over the five year period with the New Zealand and US routes averaging about 14% growth and the Australian route averaging about 3% growth.

The Scenario B for each settlement alternative reflects a change in the assumption for both incoming and outgoing demand due to the relative changes in prices. Outgoing prices are assumed to decline at a rate of 10% per year for the five year period. This price change is reflected in the higher growth rate for outgoing demand on each route. The estimated increase in demand is assumed to accelerate during the period commencing with no increase in 1997 and increasing at a rate of 2% per year with an estimated growth of 8% in 2001.

The incoming demand is also modified in Scenario B with the growth rates being reduced on average as follows - New Zealand 7%, Australia 2.5% and the United States 7%.

5.2 The (FCC) ‘Benchmark’ system or ‘price caps’ for Accounting Rates

The result of applying the Benchmark method in Scenario 1A is that total international revenue peaks in 1999 at \$7.2m and then declines to \$6.4m in 2001 to about the same level as it was in the base-year 1996. Since the outgoing traffic is estimated to grow on average at a rate of only 2%, the major factors for the changes in revenue are the reduction in the settlement rates to a level of 15 cents per minute in 1999 and the steady decline in the settlement rate for incoming traffic over the five year period which is partially modified by the growth in traffic.

Table 5.1: Benchmark Scenario 1A, 1997 - 2001

Revenues from major routes (Australia, New Zealand and the United States), in US\$m

<i>Year</i>	<i>Billed Revenue</i>	<i>In-payment</i>	<i>Out-payment</i>	<i>Net International Revenue</i>
1996 Base-year	3.3	4.4	-1.2	6.5
1997	3.4	4.5	-1.0	6.9
1998	3.4	4.4	-0.7	7.1
1999	3.5	4.1	-0.4	7.2
2000	3.6	3.8	-0.4	7.0
2001	3.6	3.2	-0.4	6.4

Source: Case study.

In Scenario 1B, the impact of the decrease in prices for outgoing calls is reflected in the decline in billed revenue which is partially off-set by the increase in demand. In-payments also decline due to the decrease in the growth of incoming minutes. The overall result is a decline in international revenue in the order of 28% over the five year period.

Table 5.2: Benchmark Scenario 1B, 1997 - 2001

Revenues from major routes (Australia, New Zealand and the United States), in US\$m

<i>Year</i>	<i>Billed Revenue</i>	<i>In-payment</i>	<i>Out-payment</i>	<i>Net International Revenue</i>
1996 Base-year	3.3	4.4	-1.2	6.5
1997	3.0	4.2	-1.0	6.2
1998	2.9	3.9	-0.7	6.1
1999	2.9	3.5	-0.4	6.0
2000	2.8	3.0	-0.4	5.4
2001	2.8	2.4	-0.5	4.7

Source: Case study.

5.3 The Staged Reduction Method

This scenario is based on an annual reduction in the settlement rate of 10% over the five year period 1997-2001. Given the current level of settlement rates, the overall reduction for the period is less than that which would be experienced using the Benchmark scenario. Based on the price levels and demand assumed for Scenario A the net international revenue in the year 2001 is some \$7.5M compared to the Benchmark revenue of some \$6.4M. The major factor is the increased level of in-payments due to traffic growth which peak in 1999 and then decline due to the reduction in the incoming settlement rate.

Table 5.3: Staged reduction scenario 2A, 1997 - 2001

Revenues from major routes (Australia, New Zealand and the United States), in US\$m

<i>Year</i>	<i>Billed Revenue</i>	<i>In-payment</i>	<i>Out-payment</i>	<i>Net International Revenue</i>
1996 Base-year	3.3	4.4	-1.2	6.5
1997	3.4	4.6	-1.1	6.9
1998	3.4	4.8	-1.1	7.1
1999	3.5	5.7	-1.0	8.2
2000	3.6	4.7	-0.9	7.4
2001	3.6	4.7	-0.8	7.5

Source: Case Study.

The decline in net international revenue in Scenario 2B is primarily due to the decrease in prices for outgoing traffic and also the reduction in in-payments due to both the lower level of demand and the declining settlement rate. However, the revenue in 2001 remains somewhat higher than that in Benchmark Scenario-1B due to the higher level of the settlement rate in the Staged Reduction method.

Table 5.4: Staged reduction scenario 2B, 1997 - 2001

Revenues from major routes (Australia, New Zealand and the United States), in US\$m

<i>Year</i>	<i>Billed Revenue</i>	<i>In-payment</i>	<i>Out-payment</i>	<i>Net International Revenue</i>
1996 Base-year	3.3	4.4	-1.2	6.5
1997	3.0	4.3	-1.1	6.2
1998	2.9	4.2	-1.1	6.0
1999	2.9	3.9	-1.0	5.7
2000	2.8	3.7	-0.9	5.6
2001	2.8	3.5	-0.9	5.4

Source: Case Study.

5.4 The ‘Call-termination’ method

The settlement rates for New Zealand, Australia and Samoa in this scenario are those developed employing the methodology in FCC Decision 97280, Appendix E. This methodology is described as the ‘tariffed components price’ (TCP) and was employed to determine the FCC Benchmark settlement rates in the above-mentioned decision. The resulting settlement rates are as follows: New Zealand is 23.8; Australia 18.7 and Samoa 21.5 cents per minute (see Table 5.1).

The settlement rate for the United States is the FCC benchmark rate for High Income countries which is 15 cents per minute effective in 1999. It should be noted that the rate for the US is the average for High Income countries based on the TCP method whereas the actual rate is more likely to be somewhat less if a specific calculation was performed. Since the required details to calculate the TCP for the US were not readily available, the benchmark rate was employed.

The settlement rate for incoming traffic to Samoa is based on the application of the TCP methodology for the three TCP components: national extension - 3.1 cents (based on current domestic prices for local and domestic long distance calls and a 70/30% distribution of incoming international traffic between Apia and the rest of the country); international switching - 1.9 cents (for digital switching); and international transmission 16.5 cents (based on the private line price on the international routes being studied).

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The 'cost' for international switching of 1.9 cents for Samoa using the TCP method may be understated having regard to the small exchange size in Samoa compared to those existing in most larger economies as well as other factors such as the cost of capital, transportation, installation and exchange rate costs.

The international transmission component for New Zealand is 5.7 cents and for Australia 4.8 cents compared to 16.5 cents for Samoa based on the TCP method. The variance between the rates for New Zealand and Australia compared to Samoa are due to differences in the private line prices on the major routes from the respective countries to the United States. The presence of economies of scale and the use of submarine cable compared to satellite facilities by Samoa appear to account some of the differences in the underlying private line price structure as well as the liberalised market structure in New Zealand and Australia.

Differences in the national extension component reflect the mix of traffic between major centres with international gateways and the rest of the country, country size, and differences in both local and domestic calling prices. In terms of the latter, the impact of price re-structuring (rebalancing) in liberalised markets will tend to increase the local price component and thereby increase the level of the national extension component and decrease the international transmission component. As a result, the implementation of price re-structuring will tend to increase the overall settlement rate depending on the relative changes in international private line prices and those for local and domestic calling.

The resulting call-termination settlement rate for Samoa at the end of the five year transition period is 21.5 US cents per minute compared to the benchmark rate employed in Benchmark Scenario of 19 US cents per minute. In view of the dynamic relationship between a TCP-based settlement rate and underlying prices, the phase-in period in applying such a methodology on a country-specific basis should take into account any resulting price re-structuring which occurs during the phase-in period.

The phase-in period for the new settlement rates is consistent with that employed in the other scenarios with the new rates effective in 1999 for the high income countries and in 2001 for Samoa.

Table 5.5: Call termination scenario 3A, 1997 - 2001

Revenues from major routes (Australia, New Zealand and the United States), in US\$m

<i>Year</i>	<i>Billed Revenue</i>	<i>In-payment</i>	<i>Out-payment</i>	<i>Net International Revenue</i>
1996 Base-year	3.3	4.4	-1.2	6.5
1997	3.4	4.5	-0.9	7.0
1998	3.4	4.5	-0.8	7.1
1999	3.5	4.3	-0.6	7.2
2000	3.6	4.1	-0.6	7.1
2001	3.6	3.6	-0.6	6.6

Source: Case Study.

The impact on international revenue in Scenario 3A is a slight increase of approximately \$0.1m from the base year of 1996 to the end of the five year transition period, 2001. The main variables are the increase in incoming traffic which are off-set by the declining settlement rate level and higher out-payments due to higher settlement rates to New Zealand and Australia compared to the Benchmark scenario.

Table 5.6: Call termination scenario 3B, 1997 - 2001

Revenues from major routes (Australia, New Zealand and the United States), in US\$m

<i>Year</i>	<i>Billed Revenue</i>	<i>In-payment</i>	<i>Out-payment</i>	<i>Net International Revenue</i>
1996 Base-year	3.3	4.4	-1.2	6.5
1997	3.0	3.8	-1.0	5.8
1998	2.9	4.0	-0.8	6.1
1999	2.9	3.6	-0.6	5.9
2000	2.8	3.2	-0.6	5.4
2001	2.8	2.7	-0.7	4.8

Source: Case Study.

In Scenario 3B, international revenue declines by some 26% from the base-year, 1996, to the end of the five year transition period. The primary causes of the decline are a combination of the reduction in billed revenue due to the price decreases and the lower level of in-payments due to the declining settlement rate for incoming traffic. It should be noted that one aspect of the TCP methodology which may need further review and analysis is the impact of price re-structuring on both the national extension component and the international transmission component. In addition, as previously noted, the international switching component may require some upward adjustment to reflect the higher unit costs for the smaller scale switch and other higher cost factors.

5.5 Collapse of System - Sender Keeps All

This scenario assumes that each operator retains their total originated international revenue and consequently no compensation is paid for terminating minutes of traffic. The scenario is presented employing the same assumptions for demand and price levels as those in the previous scenarios. However, in this scenario the only 'revenue' earning minutes are those originating in Samoa and the total revenue is the product of outgoing minutes and the current (1996) price per minute for Scenario 4A and the revised prices for outgoing traffic employed in the B Scenarios.

Table 5.7: Sender-Keeps-All, Scenario 4A, 1997 - 2001

Revenues from major routes (Australia, New Zealand and the United States), in US\$m

<i>Year</i>	<i>Billed Revenue</i>	<i>In-payment</i>	<i>Out-payment</i>	<i>Net International Revenue</i>
1996 Base-year	3.3	4.4	-1.2	6.5
1997	3.4	nil	nil	3.4
1998	3.4	nil	nil	3.4
1999	3.5	nil	nil	3.5
2000	3.6	nil	nil	3.6
2001	3.6	nil	nil	3.6

Source: Case Study.

The loss of compensation for incoming minutes results in a decline of approximately 45% in international revenue by year five in Scenario 4A. In Scenario 4B the impact of the price declines results in a more pronounced decrease in the net international revenue from US\$ 6.5M in 1996 to US 2.8M in 2001, a decline of about 60%.

Table 5.8: Sender-Keeps-All, Scenario 4B, 1997 - 2001

Revenues from major routes (Australia, New Zealand and the United States), in US\$m

<i>Year</i>	<i>Billed Revenue</i>	<i>In-payment</i>	<i>Out-payment</i>	<i>Net International Revenue</i>
1996 Base-year	3.3	4.4	-1.2	6.5
1997	3.0	nil	nil	3.0
1998	2.9	nil	nil	2.9
1999	2.9	nil	nil	2.9
2000	2.8	nil	nil	2.8
2001	2.8	nil	nil	2.8

Source: Case Study.

5.6 Summary

The main result of the application of the eight different scenarios, in terms of the impact of net international revenues, is that in six of the scenarios there is a decrease in net international revenue at the end of the five-year transition period compared to the revenue in the base year. Scenario 2A, the Staged reduction method, and 3A, Termination charges, are the only two scenarios which produce an increase in net international revenue.

It should also be noted that a fairly robust forecast of growth in terms of incoming minutes is employed in all 'Scenario A's and although these are based on historical trends, they may not materialise over the full five-year transition period.

The most significant declines are reflected in the 'Sender Keeps-all' methodology with revenue declining in Scenario 4A and 4B at rates of approximately 45% and 57% respectively. The least amount of revenue erosion is reflected in the 'Staged Reduction' methodology which produces a revenue increase in Scenario 2A of some \$1.0m and in the 'Termination charges', Scenario 3A, which employs the TCP methodology an increase of \$0.1m.

Table 5.9: Summary of 'Scenario A's: Impact on net international revenues

Revenues from major routes (Australia, New Zealand and the United States), in US\$m

<i>Year</i>	<i>1. Benchmarks</i>	<i>2. Staged Reduction</i>	<i>3. Termination Charges</i>	<i>4. Sender Keeps All</i>
1996 Base-year	6.5	6.5	6.5	6.5
1997	6.9	6.9	7.0	3.4
1998	7.1	7.1	7.1	3.4
1999	7.2	8.2	7.2	3.5
2000	7.0	7.4	7.1	3.6
2001	6.4	7.5	6.6	3.6
% Change-1996-2001	(1.5%)	15.4%	1.5%	(44.6%)

Source: Case Study.

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A summary of the overall results for each scenario is presented in Tables 5.9 and 5.10. Given the degree of dependence that economies such as Samoa have on the international settlement in-payments, the implications of declining net international revenues on the long term sustainability of the operator and the prospects for a successful privatisation in terms of a reasonable financial return to the Government need to be more carefully evaluated before proceeding with the implementation of settlement reform in such economies. Matters such as the degree of price re-structuring which can be effectively implemented without pricing basic access at a level which results in services being discontinued and/or significant collection problems also need to be considered.

Table 5.10: Summary of ‘Scenario B’s: Impact on net international revenues

Revenues from major routes (Australia, New Zealand and the United States), in US\$m

<i>Year</i>	<i>1. Benchmarks</i>	<i>2. Staged Reduction</i>	<i>3. Termination Charges</i>	<i>4. Sender Keeps All</i>
1996 Base-year	6.5	6.5	6.5	6.5
1997	6.2	6.2	5.8	3.0
1998	6.1	6.0	6.1	2.9
1999	6.0	5.7	5.9	2.9
2000	5.4	5.6	5.4	2.8
2001	4.7	5.4	4.8	2.8
% Change-1996-2001	(27.7%)	(16.9%)	(26.2%)	(56.9)

Source: Case Study.

5.7 Possible responses to changes in settlement methods

5.7.1 Commercial Response

The scope for commercial responses in a small market such as Samoa are limited, particularly with respect to new services and the diversification of revenues. In addition, with the recent introduction of a new operator in the cellular mobile and wireless local loop market segments, the option of diversifying the revenue base in these areas is also restricted.

While the option of introducing new services such as paging and internet access provide potential opportunities, the extent of revenues from such services are also limited by the total market size and the limited business-market segment. With respect to internet access, a firm located in Apia had been providing such a service, however, it recently ceased operations. As a result, the Government licensed two new operators. One of the new internet access service providers is a computer service company which is a joint venture between the government and a private firm. The second company is a private firm which operates as a provider of telecommunication customer-equipment.

The opportunity to undertake some degree of price re-structuring (re-balancing) is the most readily available option. However, as with other commercial options, this alternative is also limited in view of the current revenue mix with from 65 to 70% of total annual revenue being derived from the international service segment.

In terms of domestic price levels and the relative prices of fixed-wire and cellular services, consideration needs to be given to the current price levels for cellular-mobile services in the interest of optimising the overall price structure and thereby fostering the effective and efficient development of the information infrastructure. For example, should the resulting price re-structuring result in local access and usage prices for fixed-wire access being comparable to those for cellular-mobile access, a substantial portion of demand for new network connections may shift to the cellular network and away from the wired network.

Given the current interconnection arrangements between the fixed and mobile networks, sender-keeps-all, the longer term result of such a shift in demand could be the undermining of the financial resources available to the fixed operator for further development of the wired infrastructure. Given the need to make

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available such services such as internet access and other higher speed access capabilities for health and education services as well as dedicated high speed services for both business and government, it is essential that the appropriate balance be struck between the development of cellular-mobile network and the underlying fixed-wire infrastructure. In order to achieve such an objective, fair and equitable interconnection arrangements are essential, since if end-user prices for providing the respective services fail to reflect the real underlying costs, network development will be inefficient and in neither the public nor the private interest.

In addition to the need for pricing interconnection facilities to adequately reflect the underlying costs, is the need to progressively reduce prices for international services. While it is not feasible to determine the extent prices on each route should be reduced in order to maximise revenues, phased reductions over a number of financial periods, accompanied with the introduction of 'off-peak' pricing and effective monitoring and analysis of the impact on net revenues will ensure that major disruptions in the revenue stream are avoided. One approach would be to commence the price adjustments on one of the international routes in order gain experience and develop empirical evidence on the price-revenue relationship.

While the current level of local access prices and usage (see Table 2.1) are such that some upward price adjustments over a period of several years should be considered, any upward adjustments need to take into account the price levels of the cellular-mobile service. For example, cellular to cellular and cellular to fixed-wire calls are currently priced at 33 sene per minute (US 13.4 cents) while fixed-wire calls are priced at 20 sene per minute (US 8 cents) for national calls. In terms of local exchange calls, fixed-wire calls are priced at 12 sene per call. Based on an average call length of three minutes, a local call within the wired network is currently priced at about 1.6 US cents per minute. Therefore, while there may be some scope for increasing the local usage price, there is an upper limit or 'ceiling' on increases due to the price level of calls via the cellular mobile network.

In terms of network access, with the lower priced cellular units selling for about US\$ 90, and the business installation price for fixed service at US\$ 50, there are also limits to any increase in this area by the fixed-wire operator. Similarly, with the fixed month charge, with cellular prices in the range US\$ 13-14 range and the current business price for the fixed-wire service at US\$6.10, any price adjustments in terms of 're-balancing' are also likely to be limited.

Another commercial and/or policy option which could be pursued is to review the interconnection arrangements between the fixed and mobile operator. Based on inputs from the fixed operator, the current settlement method appears to be a 'sender-keeps-all' arrangement. As a result, the fixed-wire operator does not currently receive compensation for the use of the fixed network by mobile customers. While a 'sender-keeps-all' arrangement may be suitable where the traffic exchanged between the respective operators is balanced in terms of incoming and outgoing traffic and the respective costs are comparable, such conditions are not likely to exist where one network is in the start-up mode and employs new technology and the other is a substantially larger, established network which uses older technologies which may exhibit higher unit costs. In addition, a further implication of the present connecting arrangements relate to international minutes and the settlement arrangements between the fixed operator which handles international traffic and thereby is required to compensate foreign operators for outgoing minutes.

In summary, the most readily available commercial option not only in response to a reduction in settlement rates but also in the interest of increasing network efficiency as well as embarking on price re-structuring, is the introduction of 'off-peak' pricing on both the domestic and international routes. Given some recent price-discounting by the cellular operator in both usage and fixed-monthly prices, current developments in internet telephony, the level of international outbound-calling prices and the absence of off-peak calling incentives, there is some urgency in terms of planning and implementing a price re-structuring plan.

5.7.2 Policy Options

The current policy of liberalisation and privatisation in terms of the introduction of cellular-mobile and wireless local loop services, as noted in Chapter 2 (Telecommunication Policy and Network Development), has been initiated in the absence of a formal regulatory structure and the implementation of the corporatisation of the incumbent operator. As a result, the current duopoly market structure is evolving without an adequate regulatory framework to address such matters as interconnection arrangements and the pricing of end-user services.

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Given the probability of a continuing decline in settlement rates and the need to examine the matter of price restructuring, the Government, as a policymaker, will need to examine the issue of universal service. In the light of price re-structuring, the matter of whether a universal service fund is required to ensure that rural and remote areas are adequately served needs to be addressed from both a policy and funding standpoint.

In an era of monopoly supply and state-ownership, matters such as universal service and cross-subsidies are generally either not raised, or are addressed in the context of a broad policy in terms of the monopoly operator being obligated to provide universal service. However, with the introduction of liberalisation, even in a duopoly environment, and privatisation, such matters need to be explicitly addressed both in terms of policy and within the regulatory framework. The failure to address such matters is neither in the interests of the private investor and the incumbent state-owned operator, nor in the broader public interest.

The absence of an adequate information industry policy framework, particularly for the expansion of the basic infrastructure, given current levels of penetration in the rural areas, may result in random and at times inconsistent initiatives in terms of licensing, price-setting and interconnect arrangements which unduly hamper the effective and efficient development of the infrastructure in the long term. In addition, the objectives associated with specific reform initiatives such as corporatisation, privatisation, and liberalisation may also be undermined due to an absence of explicit linkages between such initiatives and the government's broad information industry objectives.

Samoa is not unique in terms of the absence of a suitable information industry policy and an adequate framework for governance. The absence of clear and quantified policy objectives for infrastructure development is a shortcoming in many developing economies where licensing, liberalisation and privatisation initiatives are frequently undertaken as independent initiatives and sound policy objectives and good governance are either 'after-thoughts' or not thought of at all. Specifically, in terms of price-setting, the practice of filing new pricing proposals and having them not addressed by Cabinet for extended periods of time may explain the absence of any major price adjustments over the past nine years. Given international trends in pricing and settlement rates and also in internet telephony, a sound governance framework and timely decision-making are required. Without this institutional foundation, the benefits of liberalisation and privatisation will, at best, not be maximised or, at worst, be completely undermined.

In terms of strategic responses from both a commercial and policy standpoint, the Government has fostered a degree of rivalry and liberalisation as well as privatisation with the licensing of the new cellular operator. In order to ensure that the benefits of liberalisation are retained and even enhanced, the corporatisation of the fixed-wire operator must be expedited in order to permit the entity to more effectively compete with the new rival. To do otherwise, will undermine many of the potential benefits of liberalisation. In addition, should the Government proceed with the privatisation of the fixed-operator, effective corporatisation is an essential stage in the process of maximising the value of the firm before a partial or full privatisation.

Two other requirements of privatisation initiatives are the need for clear and concise policy objectives and a transparent and effective governance process for the industry to ensure potential investors of fair and equitable treatment. In addition, in order to foster effective rivalry and the benefits of liberalisation, the ownership of the respective business entities, the fixed-wire and the cellular operator, should be independent and non-affiliated firms. Without such an arrangement, the benefits of liberalisation and privatisation will not be fully realised.

A functional duopoly market with an effective degree of rivalry requires a sound policy framework, transparent and effective governance, and unrelated rivals.

6. CONCLUSION

6.1 The Samoan Case

The main findings from the case study which relate specifically to Samoa are as follows:

1. Without changes in the current settlement method, the historic downward trend in the Samoan weighted settlement rate (see Table 3.2) is such that given a similar trend to the year 2002, the resulting weighted settlement rate would be in the order of 22.5 cents per minute which is comparable to both the benchmark rate of 19.0 cents and the TCP country-specific rate of 21.5 cents;
2. The historic downward trend in accounting rates (see Table 3.2) has not lead to corresponding decreases in outbound calling prices which have been unchanged since 1989 (see Table 2.1);
3. Any decline in international settlement in-payments (in 1996 approximately 50% of international revenue) would have a material impact on - (a) Samoa's telecommunication revenues (65 to 70% of total revenues are derived from the international segment); (b) Samoa's current account balance; and (c) Samoa's total economic output (1996 Samoa telecommunication revenues were some 5.3% of 1996 GDP); and
4. Price structure review and reforms are needed in Samoa due to: (a) changes in market structure with the entry of a cellular operator into the local access and domestic toll market segments; (b) the absence of any major price adjustments since 1989; (c) the need to substantially reduce international outbound calling prices; and (d) the need to introduce off-peak pricing to improve network and operator efficiency and also to increase revenues from domestic and international network utilisation.

6.2 The General Case

The following are a number of general findings in the matter of international settlement reform which arise from the Samoa case study:

1. The main focus of international settlement reform should be on the marketplace and specifically end-user prices as historically reductions in settlement rates have not generally produced corresponding decreases in end-user prices, particularly in non-liberalised markets. Consequently, the early stages of settlement reforms should focus on pricing reforms in non-liberalised markets by employing pricing benchmarks and incentives for compliance to encourage such reforms;
2. Should further reductions in settlement rates be mandated in the absence of any related price re-structuring initiatives, the current traffic and settlement imbalances are likely to be amplified;
3. Having regard to the need for price re-structuring in non-liberalised economies, there is a need to develop a suitable set of price benchmarks to ensure some form of universal access is available and maintained in all countries. In setting price-level benchmarks for universal access, consideration needs to be given to such factors as differences in average per capita income levels, the need to rapidly develop the infrastructure in developing economies, particularly in rural and remote areas, and the potential, with more flexible billing systems, to package access service and thereby respond to different market segments by matching needs to affordability;
4. In order to develop effective policies and plans for price re-structuring and international settlement reform, developing and less developed economies (lower middle income and low income economies and, in particular, economies classified as 'less developed countries') should be further segmented into settlement reform categories, in addition to per capita income level categories, to categories such as: (a) market structure - degree of liberalisation in each market segment - access, domestic and international; (b) international market segment size relative to the total operating revenue and the total economy; and (c) the significance of international in-payments to total operating revenue and the total economy; and thereby permit the development of a more focused and appropriate set of reform strategies in terms of both content and timing for each of the respective categories;

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5. The absence of adequate, reliable and relevant accounting, financial, and costing data and the cost and time required to develop these inputs and outputs of a costing model suggest that a modified-TCP approach combined with a set of price re-structuring benchmarks may be a more effective and efficient approach to international settlement reform;
6. Having regard to points (4) and (5), economies in the high and upper middle income categories should be given the option of either adopting their country-specific TCP settlement rate for incoming traffic or developing an acceptable, cost-based rate should they consider the TCP settlement level to be below cost;
7. In setting settlement rates for developing economies, an allowance should be made (in the national extension component) for contribution payments to a universal service fund similar to such contribution allowances in developed economies;
8. Any changes in the international settlement process which results in either increases or decreases in settlement payments also needs to identify the resulting impact on both end-user prices and financial returns to operators to ensure a fair and equitable distribution of both incremental gains and losses; and
9. The reference data for establishing both price and settlement benchmarks should take into account the following reference data; (a) any readily available and relevant cost data; (b) the pricing data available in the TCP database; (c) variables due to geographic, demographic and market size and concentration; and (d) results available in a number of the developed economies on the matter of quantifying contribution payments to universal service funds and the means of identifying recipient exchanges in high cost and remote areas (for example, see FCC decision, FCC 97-157 - Report and Order In the matter of Federal-State Joint Board on Universal Service, Section VI - Carriers Eligible for Universal Service Support and Section VII - Rural, Insular, and High Cost, adopted 7 May, 1997 - and the Canadian Radio-television and Telecommunications Commission (CRTC) decision, CRTC 97-8, 1 May 1997, Section VIII - Contribution - paragraphs 151 to 185).

6.3 Matters to Consider

The pressing need for price re-structuring in many developing economies and the related inefficiencies suggest that a plan to commence the process of price re-structuring, particularly in non-liberalised markets, may return sufficient early benefits so as to off-set subsequent downward adjustments in settlement rates.

In terms of international settlements, two related issues which need to be addressed in the process of reform are the movement to cost-based transit fees, particularly in non-liberalised markets and, given that cost structures are asymmetric, a departure from the current process of excessive out-payments to low-cost countries and the inherent subsidy flows which result from the 50:50 division of settlement revenue which is currently employed.

Therefore, the international settlement reform process, particularly in the developing and less developed economies with low levels of infrastructure development and limited market size, should be focused on initiating price reform as a short term priority and the mechanics of settlement reform as a longer term objective. Such a reform plan would contain both a set of short term objectives and strategies in terms of price re-structuring and a set of longer term plans for reforming the settlement process. With respect to a short term plan for price re-structuring, one of the activities for effectively implementing the plan could be the development of a set of pricing benchmarks both in terms of local access and international calling prices. An extensive tariff database has already been developed in the form of the FCC's 'Tariff Components Price' method (FCC Decision 97-280, Appendix E). Such a database could be employed for reference and analytical purposes in developing a set of benchmark prices for low income and developing economies. Given the absence of suitable cost data, the short term approach should focus on a price benchmarking methodology in order to move forward with price re-structuring and not become unduly embedded in a costing exercise.

A short term strategy could also establish a relationship between price re-structuring and adjustments in the settlement rate. For example, out-payment rates to high income countries could be adjusted over a five-year phase-in period from their current levels to the respective countries TCP rate. The total amount of the

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reduced pay-out from the developing economy would be required to be applied to an outgoing price reduction on that particular route.

The application of such an adjustment process is both cost-based from the standpoint of moving settlement rates towards cost and also price-based in terms of initiating the price re-structuring process in developing economies.

Just as many developed economies have incorporated 'universal' service funds into their domestic settlement process, policymakers and regulators in developing economies require the means and methods to put forward similar programs in their domestic economies in order to foster universal access to the global information infrastructure in a non-discriminatory and economically efficient manner.

What should not be overlooked is that there is a matter of urgency associated with the need to reform inefficient price structures. As noted by Frances Cairncross in her article, '*The Death of Distance*':

*"The death of distance as a determinant of the cost of communications will probably be the single most important economic force shaping society in the first half of the next century"*¹⁴

With some trans-Atlantic prices in the order of ten cents per minute, a number of effectively-liberalised economies are already employing this new 'economic' force described by Ms. Cairncross. What pricing and international settlement reform programs must address is the means to ensure that non-liberalised economies also seize the benefits of this new economic force. Otherwise, broader developments will not be forthcoming in those economies which are in the greatest need for the rapid development of their information infrastructure as well as in need of increasing their country's capacity to undertake broader social and economic reforms.

In addition, the emergence of this new economic force in terms of pricing and the global information infrastructure is already evident in certain liberalised economies as an increasing number of Internet-based telephony services are being introduced such as those described in a recent article in New Zealand's 'Business Herald' which reads, in part, as follows:

"Dramatic cost-savings made possible through local and United States-based Internet telephony services are gaining the attention of business and residential phone users. ...

... The unique New Zealand offering provides phone to phone voice calls via the Net and savings of about 38 per cent for peak-time calls to the United States and Britain, 30 per cent to Australia and up to 60 per cent on local toll calls. ...

... American telcos are also beginning to realise how such companies might steal some of their market. AT&T has announced an IP (Internet Protocol) telephony trial and Qwest Communications and a few other carriers already allow people to make calls over the Net for 5USc to 7.5USc a minute. USA Global Link has also announced plans to build an IP-based network just for international calls.

*International Data predicts that by 2002 the Internet could account for 11 per cent of United States and international long-distance voice traffic, up from just 0.2 per cent last year."*¹⁵

The need for telecommunication pricing reform is particularly urgent in developing and non-liberalised economies and should be undertaken in the context of a sound set of principles and benchmarks. The results of initiating price reform will enhance the settlement reform process as it will focus on quantifiable objectives and an effective means with which to measure the progress of both price structure and settlement reforms.

¹⁴ 'The death of distance', by Frances Cairncross, The Economist, 30 September, 1995,

¹⁵ 'Telephony cost cuts draw custom - US-based Internet services provide cheaper calls', Business Herald, Wellington New Zealand, 17 February, 1998, page D8.

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**ANNEX ONE - SOCIO-ECONOMIC AND TELECOMMUNICATION INDICATORS FOR
SAMOA, 1992-1996**

	1992	1993	1994	1995	1996
1. Demographic/Economic					
Population (10x3)	162	163	164	164	165
Density per sq. km.				58	
GNP per capita (PPP-US\$)	1'870	2'000	1'860	2'030	
Average Annual Exchange Rate per US\$	2.47	2.57	2.53	2.47	2.46
Consumer Price Index (1990=100)	107	109	129	130	140
2. Telephone Network					
Total Main Lines ¹⁶ in operation	6'500	7'100	7'400 est.	7'800	8'251 est.
Per 100 -population	4.01	4.36	4.51	4.76	5.00
Largest City				19.29	
Connected to digital Exchanges	100	100	100	100	100
3. Mobile Services					
Cellular Mobile					1,545 ¹⁷
4. International Traffic					
Outgoing minutes (millions)	3.2	3.8	4.1	3.7	3.7
Incoming minutes (millions)	4.3	5.9	7.5	8.5	9.8
5. Human Resources					
Full-time telecom staff		195	174		
Main lines per employee		36	45		

¹⁶ Lines in Service - Based on data from ITU Telecommunication Indicator publications - estimate for 1994 based on previous year's growth rate and for 1996 based on difference between data provided by company for November 1997 of 8,702 and the 1995 year-end actual of 7,800.

¹⁷ Cellular mobile service introduced in July 1997 - as of 10 February, 1998 total service units was 1,545. Based on the 8,702 fixed connections as of November, 1997, and the 1,545 mobile connections, the percentage of total connections provided by the mobile service is approximately 15%.