

WHITE PAPER ON INTERCONNECTION

STATEMENT OF OBJECTIVES:

This paper identifies the principal economic issues associated with interconnection costing and pricing from the public policy perspective. It is offered as a straight-forward, non-partisan contribution to the trade dispute between the United States and Japan over the interconnection fees charged by Japan's NTT pursuant to government price regulation.

Policymaking, and the public interest, should benefit by application of sound economic theory and practice. Understanding economics is particularly critical where, as here, the disputed claims are based upon interpretations of economic models. Consequently, it is the hope of the authors that this white paper can place helpful boundaries around this particular dispute and, perhaps, offer a sound economic-based framework to serve as the basis for further negotiation and eventual compromise.

In keeping with the purely economics focus, this paper takes no position on any legal claims or treaty interpretations; these matters are beyond the scope of this document.

ABSTRACT:

Application of economics to interconnection costing and pricing offers the following guidance to public policy implementation:

- Policy choices should be made with an eye to achieving welfare maximization.*
- Social equity objectives, such as universal service should be implemented only if they increase welfare. Welfare may increase due to network externalities or for equity reasons. Implementation should be in the least distortionary way.*
- Although LRIC is conceptually an important forward-looking cost methodology, economics has not dictated a single implementation approach.*
- Economics has made recent strides in accommodating dynamic market situations, especially including the real options approach to resource allocation and capital investment analysis, which may help improve LRIC methodology.*

DESCRIPTION OF THE PROBLEM ADDRESSED

A major trade dispute has erupted between the United States and Japan over the methodology deployed by Japan to set interconnection charges. The United States Trade Representative (USTR), a representative of the Office of the President, has taken the position that Japan has broken its commitment to implement long-run incremental cost methodology (LRIC) and has, instead,

implemented a flawed methodology resulting in a rate level that is unreasonably high. The USTR has focused on two methodological faults:

- Japan has underestimated the amount of non-traffic sensitive costs in NTT's network and has improperly attributed these costs to usage-based interconnection charges
- Japan allows for depreciation rates that are too short.

The USTR has also asserted that the absolute level of the interconnection charge is too high in comparison with the rate levels of the U.S. and other countries, especially in European countries.

The interconnection problem is a product of the transition of the telecommunications sector from monopoly to competition and the translation of social policy concerns to the new environment.

Throughout most of the twentieth century, the old-style monopoly provisioning of telecommunications services through a government agency or franchised carrier was imbued with strong social equity considerations that resulted in economic distortions. Most notably, pricing was structured to keep basic telephone service rates low. The worldwide move toward privatization and the introduction of competition has inevitably placed economic pressures on the old pricing structures. The new competitive regimes have also introduced the need for interconnection fees, the charges levied by carriers on other carriers to complete calls between their networks. Interconnection fees levied by incumbents have generally incorporated an above-cost charge that is justified as necessary to provide below-cost local service. Virtually all major countries, including the United States and Japan, have continued this practice, which is usually also associated with an obligation on the part of the incumbent carrier to serve all demand for access. It is noteworthy, that with the recent passage of the "CALL plan" the United States has greatly reduced the amount of the subsidy collected through interconnection.¹

Interconnection and antitrust

In addition to social equity issues, interconnection also presents antitrust issues. Markets do not set interconnection charges in most situations involving incumbent landline carriers. The market power of the incumbent is considered too great to be given free rein and thus government regulation steps in to oversee or control the pricing process.

¹Federal Communications Commission Sixth Report and Order in CC Docket Nos. 96-262 and 94-1 Report And Order in CC Docket No. 99-249 Eleventh Report and Order in CC Docket No. 96-45, May 31, 2000

Interconnection pricing issues represent the conjunction of two overarching economic principles: (1) the maximization of welfare, and (2) achieving economic efficiency.

The maximizing welfare goal

Economics teaches that the proper goal for public policy is the maximization of welfare. In a competitive market, government intervention in price setting will most likely skew efficient market operations and thereby harm welfare. But, in a situation of market failure, government intervention can enhance welfare by overcoming the market distortion. To accomplish that favorable result, the intervention must be limited in design and effect to address the specific market failure.

Approximating competitive prices

The mechanism that has long been recommended by economics in the case of market failure is that government set prices at levels that approximate the prices that would obtain in a competitive market.

Stranded costs

An incumbent national carrier may experience stranded costs as a consequence of being forced to set its prices at levels that approximate the prices that would obtain in a competitive market.² The reasons for the possibility of stranded costs have to do with the long legacy of public-welfare driven pricing mechanisms that kept basic local telephone service costs low. The resulting elaborate, non-market-based pricing schemes used in most countries gave rise to inefficiencies. The following questions are important when thinking about stranded costs: 1) what is the magnitude (if any) of stranded costs; and 2) if there are stranded costs, what is the most efficient way to recover those costs.

Long-run incremental cost modeling (LRIC) has long been the currency of economic discussion about the kind of costs/price analysis that can successfully approximate a competitive model.

The amount of non-traffic sensitive costs is important.

USTR argues that a number of specific items should be counted as non-traffic sensitive and excluded from the interconnection charge cost calculations. Determining what physical components are traffic sensitive is an important feature of this debate. In general, traffic sensitivity starts at the point where traffic aggregation begins.

To the extent fixed (non-traffic sensitive) costs can be identified, it is welfare enhancing to recover them based on a mechanism that incorporates both demand and supply conditions. In particular, prices should be Ramsey prices

² Access regulation is necessary when the market is not sufficiently competitive. Even with additional competition, some regulation of interconnection may be necessary to prevent anticompetitive behavior by a dominant network.

where the price-cost margin is inversely proportional to the demand elasticity of a service. In general, this will amount to higher price cost margins for access to the network since the elasticity of demand for this service is relatively low.

Depreciation

Accurate economic depreciation is important for estimating cost models. If depreciation is too low, rates will also be too low and the firm will be less able to cover its costs. Cross country differences in accounting depreciation rates have little to do with economic depreciation rates and should not impact the economic costs.

There are many potential LRIC models supported by sound economic analysis and important enhancements to LRIC have been developed.

No particular version of LRIC can claim definitive status.

The FCC has recognized that there is a wide degree of legitimate difference among economists on how to apply LRIC.³ In the United States, the state regulatory authorities rather than the FCC have been given the power to apply TELRIC.

A significant amount of economic criticism has been leveled at some LRIC applications as not properly recognizing common costs. However, the FCC clearly indicated in its interconnection order that reasonable allocations of common costs needed to be added to TELRIC prices so that the incumbent firm could cover all of its costs including a reasonable profit. Using "elements" in TELRIC rather than "services" in TSLRIC should tend to lower, but not eliminate the degree of common costs. But under either mechanism, the incumbent firm should be allowed a chance for full recovery of its costs including a reasonable return.

Real options

A newer cost methodology has recently been discussed in economics as a supplement to the discounted cash flow analysis from which LRIC has been derived in many circumstances, including those pertinent to today's telecommunications markets. Called "Real Options," the concept's current popularity reflects Wall Street's efforts to better evaluate investment risk in dynamic market situations involving potential demand shifts, rapid changes in capital costs or a high level of innovation. Real options methodology is generally recognized in the economics community as valid and a significant supplement to the LRIC methodology.

² The Federal Communications Commission acknowledged that in response to its request for expert opinion in its unbundling proceeding, "there was a lack of general agreement on the specifics of methodology for deriving prices based on LRIC or total service long-run incremental cost (TSLRIC)." Federal Communications Commission First Report and Order in CC Dkt. 96-98, August 8, 1996.

The principles of real options have been articulated in several serious recent works, including *Investment under Uncertainty* by Avinash K. Dixit and Robert S. Pindyck⁴ and *Real Options: Managerial Flexibility and Strategy in Resource Allocation* by Lenos Trigeorgis.⁵ Economists have recently begun to apply this new teaching to telecommunications and the results have direct impact on the application of LRIC to costing and pricing methodologies.⁶

It is not the purpose of this paper to apply or predict the outcome of applying real options, or a version of LRIC methodology enhanced by adding real options components. However, we do take note that telecommunications investments in this time period, once made, may involve a significant degree of "sunk" costs if they cannot be re-deployed easily, or at all. For example, some fiber transmission lines can be enhanced with Dense Wavelength Division Multiplexing (DWDM), but some cannot. In other cases, a local loop may be replaced by a wireless "loop."⁷ In these circumstances, the option of waiting to invest after further innovation has value. This value should be reflected in the cost basis of current assets. This value would possibly be understated by LRIC, which could result in undervaluation of assets and an uneconomically low price. On the other hand, it is this type of issue that seeks to be captured by the real option approach.

CONCLUSION

Japan should seek the welfare enhancing solution to pricing interconnection, factoring all of the relevant issues necessarily involved in this very complicated and important subject. The United States should recognize that Japan will take costs and demand into account when setting prices for interconnection. The undersigned encourage the two governments to find an economically rational solution to this dispute and offer their services, if desired, to provide further analysis and support toward that end.

James Alleman, University of Colorado, USA
Gary Biglaiser, University of North Carolina, USA
Hudson Janisch, University of Toronto, Canada
Tsuruhiko Nambu, Gakushuin University, Tokyo, Japan
Greg Rosston, Stanford University, USA
Brian Savin, de Fontenay, Savin, and Kiss, USA

⁴ Princeton University Press 1994.

⁵ MIT Press 1998.

⁶ See *The New Investment Theory of Real Options and Its Implications for Telecommunications for Telecommunications Economics*, edited by James Alleman and Eli Noam. Kluwer Academic Publishers 1999.

⁷ We do note that the value of the sunk asset does not go to zero, but merely to a lower value where it might be used.