

Assessing Quality-Adjusted Changes in the Real
Price of Basic Cable Service

Steven S. Wildman
Michigan State University

September 10, 2003

I. Introduction and Summary

Historically, the nominal price for basic cable television service has increased more rapidly than the consumer price index (CPI).¹ This trend, which continues today, has been cited as evidence that cable system operators enjoy market power and that cable subscribers have been hurt by rising subscription fees. While superficially appealing, both claims are analytically incomplete at best. The first ignores the role of costs in the determination of prices and the second ignores the need to consider changes in quality as well as price in determining whether an industry's customers are helped or hurt by changes in its products and prices over time. In addition, the claim that rising prices are evidence of market power embeds a logical fallacy based on a confusion of levels of prices with trends in prices over time.

Recognizing that both prices and changes in service quality must be considered in assessing an industry's performance, the Federal Communications Commission asked in its July 30, 2003 Notice of Inquiry for comments and evidence that would help it better assess the relationship between price and quality for MVPD services. This report responds to that request, focusing on changes in prices and quality for basic cable services from 1997 through 2003. It provides evidence that the quality of services offered cable subscribers has been persistently increasing over time, and suggests price per viewing hour as a measure of quality-adjusted basic cable prices that has significant advantages over unadjusted prices and the price per channel approach to adjusting for changes in quality that some have advocated in the past. For a

¹ As used in this report, the term basic cable service, or basic service, refers to two sets of services commonly included under the label of basic. One is the combination of local broadcast stations and public, educational, and government channels that cable operators are required by law to offer as a stand-alone package. The other is the set of commercial networks, most of which sell advertising, that is sold by cable operators in what is called the

representative basic cable subscriber, the real (inflation-adjusted) price paid per hour spent viewing ad-supported basic cable networks in 2003 was just over 15 percent lower than it was in 1997. By this measure, cable viewers appear to be substantially better off now than they were six years ago. Moreover, observed increases in time spent watching basic cable services during this period and evidence that cable subscribers value cable programming more now than in the past suggest that the estimated 15 percent reduction in the real price per hour of cable viewing may substantially understate the true reduction in the quality-adjusted price of basic service that occurred during this period.

Given the persistence of claims that rising nominal prices are evidence of market power, this report also touches briefly on the logical fallacy underlying this claim and the need to consider movements in input costs as factors influencing price trends in consumer goods and services.

II. The Logical Fallacy

The logical fallacy at the heart of the claim that rising prices are evidence of market power is based on a confusion of levels of prices with trends in prices. The nature of this fallacy was fully explained in a paper by Debra Aron that was attached to comments filed with the FCC by NCTA in MB Docket 02-145.² Here I simply restate the fairly straightforward intuition underlying her analysis.

At the heart of the fallacy is a confusion of levels of prices with trends in prices. At any point in time, prices will be higher if the firms serving a market have market power than if they don't. In fact, the ability to set and maintain prices at supra-competitive levels is what we mean

expanded basic programming tier. Because most cable subscribers take both tiers of basic service, the term basic is commonly used to refer the combination of the two sets of services.

² Statement of Professor Debra J. Aron, attached to NCTA Comments in MB Docket 02-145.

by market power. We expect profit-maximizing firms to fully exploit such market power as they have. If they didn't, they wouldn't be maximizing profits. A direct implication of profit-maximization, however, is that by themselves trends in prices over time can tell us nothing about whether the firms serving a market have market power. While prices are influenced by the competitiveness of the markets in which firms sell their products, the effect of a market's competitiveness should always be reflected in its prices. That is, if a firm's market power remains constant over time, the effect of that market power on price should also be constant over time. Market power is simply not predictive of movements in prices.

If the intensity of competition was the only factor influencing prices, changes in a market's prices over time might be interpreted as a reflection of changes in the intensity of competition in that market over time, but this is simply not the case. Price levels are influenced by a number of other factors, including input costs, the level of demand for the market's products, and the quality of its products. Changes in one or more of these factors, all of which may vary independently of the intensity of competition, will influence price levels and changes in price levels over time. The simple observation that prices have changed by itself cannot tell us which of the many factors influencing firms' prices may have changed as well. If firms set prices to maximize their profits on an ongoing basis and prices change from one period to the next, it can only mean that one or more of the many elements in their profit calculus changed between the two periods, nothing more. Additional information would be required to narrow the list of candidates. To infer more from the simple fact that prices change over time, one would have to assume that firms' pricing strategies were driven by objectives other than maximizing profits.

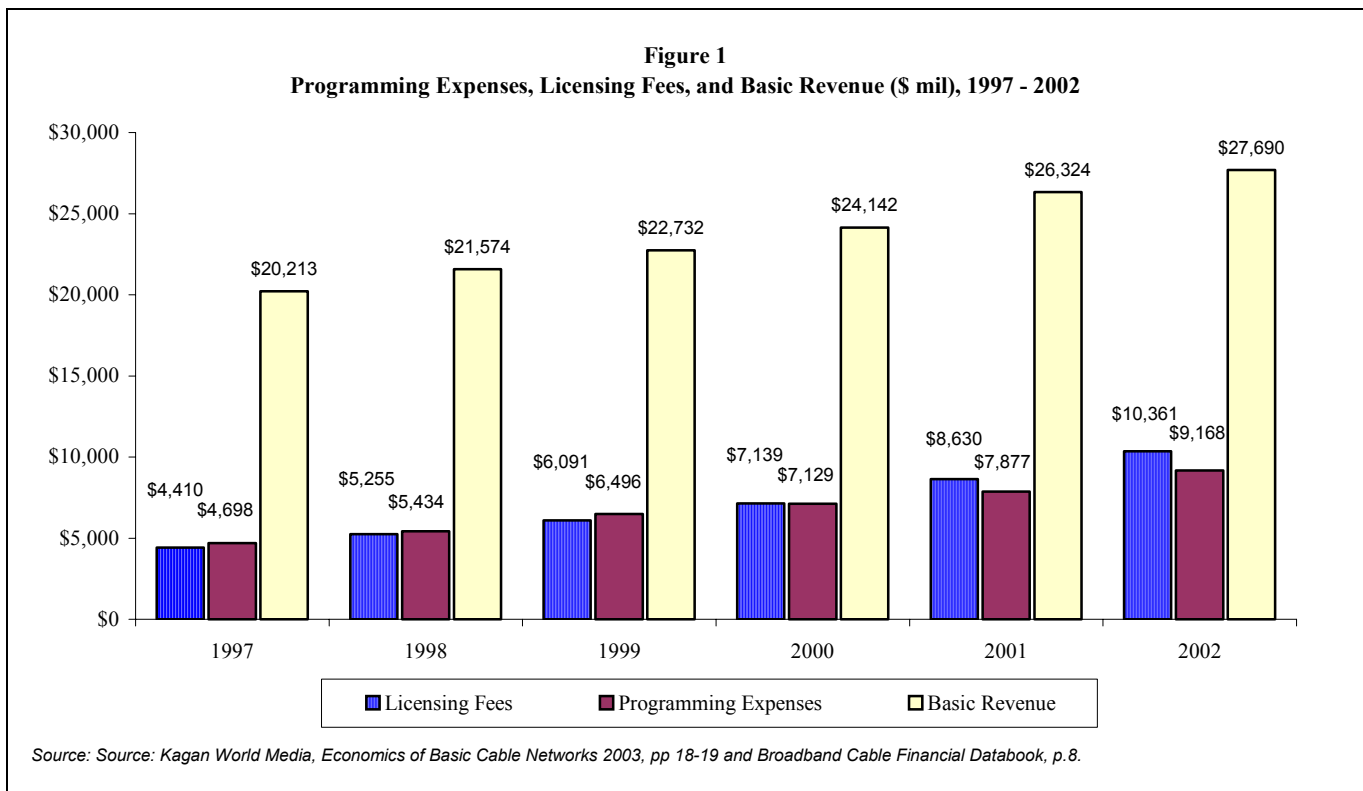
III. How well an industry performs in delivering value to its customers cannot be judged by comparing changes in its prices to the CPI.

For similar reasons, an industry's performance cannot be judged by comparing changes in its prices to changes in the consumer price index (CPI) over time. Roughly speaking, the CPI is an average of the prices for a large number of goods and services included in a hypothetical market basket constructed by the U.S. Bureau of Labor Statistics to reflect representative consumer purchasing habits. The weights of the individual prices in the basket reflect the relative importance of the associated goods and services in household budgets. Because the many factors that influence prices may and do vary among industries, price trends for the various components of the CPI will naturally diverge from the CPI over time. It would be wrong to conclude, however, that industries whose prices rise less rapidly than the CPI are, in some way meaningful for policymaking, performing better than industries whose prices rise more rapidly than the CPI. The following example illustrates this point.

Consider two industries for which input prices are the only price-influencing factors that changes over time. The firms in the first industry are economically efficient in the sense that they deliver the maximum possible value to their customers given the costs of the inputs they utilize to produce their products. Firms in the second industry are not nearly so efficient and they deliver only half the value to their customers that would be possible if they operated as efficiently as firms in the first industry. The prices of the inputs used to produce the first industry's products are increasing considerably more rapidly than the CPI. As a consequence, its prices must also increase more rapidly than the CPI for revenues to keep up with rising costs of production. For reasons totally exogenous to the industry, prices for the second industry's inputs are falling and as a result the prices charged by firms in this industry are observed to fall relative

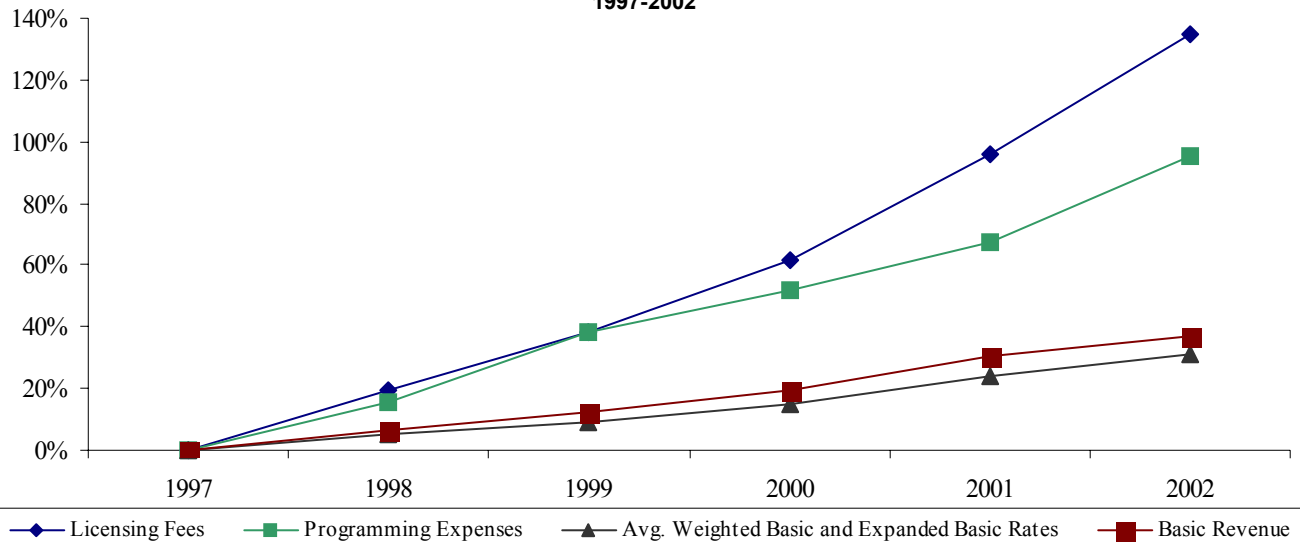
to the CPI. For policy purposes, how well an industry performs should be judged by how effectively it converts the inputs it employs into value for its customers. By this standard, it is clear that the industry whose prices are increasing relative to the CPI is performing better than the one whose prices are falling because performance in the second industry could be improved. Yet, if judged by changes in their prices relative to the CPI, a naïve policy analysis would come to just the opposite conclusion.

As noted earlier, the price of basic cable service has been rising relative to the CPI. Basic cable prices have not risen more rapidly than have cable systems' payments for the networks that typically account for over one-third of their costs,³ however, as is evident from Figures 1 and 2.



³ Morgan Stanley, *Pricing Power II: Subscriber Mix is Key to Valuation*, December 9, 2003, p. 16.

Figure 2
Growth Trends For Licensing Fees, Programming Expenses, Basic Revenues and Basic Rates, 1997-2002



Source: Source: Kagan World Media, *Economics of Basic Cable Networks 2003*, pp 18-19 and *Broadband Cable Financial Databook*, p.8.

Figure 1 reports estimates of cable operators' annual license fee payments to network suppliers from 1997 through 2002, the networks' content production and acquisition costs, and the basic service subscription fees received by cable systems for the same years. Year-to-year increases in all three series appear substantial in absolute terms. The annual percentage increases for the three series are shown in Figure 2, which also reports for purposes of comparison the corresponding year-to-year percentage increases in the U.S. average price of basic service. Operators' subscription revenues rose much less rapidly than did their total license fee payments to networks. The networks' programming expenses also increased considerably faster than subscription revenues, although not as fast as network license fees. The average price of basic service rose at a slightly slower rate than did aggregate basic subscription fees, with the difference reflecting the fact that the growth in subscription fees reflects growth in the number of basic subscribers during this period, as well as growth in per subscriber payments.

The critical point illustrated by Figure 2 is that while the price of basic service may have been growing at a substantially more rapid rate than the CPI, a critical component of the cost of basic service was growing much more rapidly than were the revenues from the sale of basic service. Given the unavoidable influence of costs on prices, it should not be surprising that the prices for cable services have been rising more rapidly than the CPI, regardless of the competitive situation of cable system operators. But whether cable operators have been doing a good job of creating value for their subscribers from the programming inputs they purchase simply cannot be determined from CPI comparisons.

We also cannot tell by comparing movements in cable prices to the CPI whether cable subscribers were better or worse off when prices were lower because, as was mentioned earlier, price changes may reflect changes in the quality of the service delivered consumers, as well as changes in costs. Further complicating an assessment of industry performance is the possibility that costs may have risen because service providers and/or input suppliers increased their spending for inputs that could add value to the products and services offered consumers. If, over a period of time, an industry's price increases exceed what its customers would have been willing to pay for any improvements in the quality of its products realized during that period, the industry's customers were better off when its prices were lower. On the other hand, if an industry's prices increase, but by less than the value of improvements in its products to consumers, its customers are better off after the price increase than before. Attempts to restrict price increases could work counter to the interests of consumers in this second situation if the industry's investments in quality enhancement were undertaken in expectation that prices could be raised as the value delivered increased.

In principle, comparisons of changes in an industry's prices with the CPI could reveal whether the value net of price delivered to consumers by the industry's products was increasing or decreasing relative to other products and services in the BLS market basket if the industry's prices were appropriately adjusted to reflect changes in the quality of its products and if the prices for the other goods in the basket were also adjusted to reflect changes in their qualities. Unfortunately, this is often not possible in practice. Changes in quality are difficult to measure and the BLS makes no adjustments for changes in quality for the prices of many of the goods and services in the CPI. For other products such adjustments as are made are partial at best. This is the case for the BLS cable index, where unspecified adjustments are made to reflect the addition of new networks to cable system lineups, but no attempt is apparently made to reflect changes in the quality of the established networks already available, which account for the bulk of cable viewing. As can be seen in Figure 4 in Section IV, the BLS cable index closely tracks a basic cable index constructed from unadjusted basic rates.

While a portion of the increase in programming expenditures by cable networks discussed above may reflect spending by new networks, network-specific data make clear that established networks increased their spending on programming substantially during this period, even as new networks were trying to find places in cable systems' network lineups. This is evident in Table 1, which reports the average for estimated programming expenditures for the top 10 cable networks (ranked by the average number of TV households in their audiences during the second quarter of 2003) for 1997 and 2002. Nine of the top ten networks increased their programming budgets during this period, most substantially and three by over 100 percent. For the top 10 networks as a whole, expenditures on programming increased by 54.9 percent. The total number of cable networks also increased considerably during this period. Due to the

added expenditures of new networks, the total of cable networks' spending on programming increased even more rapidly than did expenditures by the top 10 networks.

If the value of established cable networks to cable subscribers increased as a result of their increased expenditures on programming, such adjustments as are made in the BLS cable index to reflect new services may dramatically underestimate true changes in service quality. As the Commission recognized in its Notice of Inquiry, we need better information on changes in the quality of cable services to determine whether the situation for cable subscribers has improved or worsened over time.

Table 1
Growth In Programming Expenses

Networks	Programming Expenses (\$ mil.)	
	1997	2002
1 Nick	224.0	300.3
2 Fox News	54.0	127.0
3 TNT	396.4	690.1
4 TOON	31.1	81.1
5 Lifetime	147.4	304.5
6 Disney	102.2	140.5
7 TBS	207.1	383.0
8 USA	348.0	339.4
9 CNN	140.8	222.1
10 TLC	74.3	83.7
Top 10 Total	1725.3	2671.7
% Change	0.0%	54.9%
Total Expenses All Networks*	4698.4	9168.0
% Change	0.0%	95.1%
Top 10 As % Of All Networks	36.7%	29.1%

Sources: Cable Network Economics, Kagan World Media p6-7 and Cable Program Investor, August 21,2003, Kagan World Media, p13

**Source: Kagan World Media, "Economics of Basic Cable Networks 2003"*

IV. Assessing changes in the benefit-price relationship for cable television

Because the number of networks included in basic service packages has been increasing over time and one would expect the new channels to have some value to viewers, dividing the number of channels offered by the price of service has been suggested as one way of adjusting nominal prices for cable services for changes in service quality over time. However, as the FCC observed in paragraph seven of the Notice of Inquiry, “not all consumers watch all channels.” As this observation applies to new channels as well as to existing channels, it is possible that the ratio of all new channels to all previously existing channels may be either larger or smaller than the ratio of new channels watched to previously existing channels watched. Viewers also may not value new channels the same as those they were already receiving, which is a second potential problem with a per channel price. A third potential source of bias in this measure is that it cannot reflect changes in the value of previously existing networks to cable subscribers, the same problem identified above with the BLS cable index. If the increased programming expenditures by established networks made them more valuable to viewers, then price adjustments that only reflect increases in the number of channels over time would fail to capture all of the increased value delivered to cable customers.

Subsection A below looks at behavioral evidence which suggests that the consumption value subscribers realize from basic cable services has been increasing over time. Subsection B suggests that price per viewing hour (PPVH), which is the price cable subscribers pay for service divided by the number of hours spent watching programs on basic cable networks, may be a superior, though still imperfect, alternative to other quality-adjusted measures of the price of basic cable service. PPVH has the advantage of reflecting in a single measure changes in the

nominal price of basic cable service and cable viewers' responses to changes in the quality of cable services over time.

By this measure, it appears that the value proposition offered cable subscribers has been improving steadily over time. If calculated using nominal prices (prices that are not adjusted for inflation), the nominal PPVH (NPPVH) was about three percent lower in 2003 than it was in 1997. Of course, a better measure of the true cost of cable service to cable subscribers would adjust the nominal price of cable service to reflect the effect of inflation on the purchasing power of the dollar. Using the more appropriate inflation-adjusted real price of cable service to calculate a real price per viewing hour (RPPVH), I estimate that the RPPVH has declined by slightly over 15 percent over the last six years. Furthermore, when combined with evidence that the value of cable networks to cable subscribers has been increasing over time, a comparison of the increased time cable subscribers spend watching basic networks reported in Subsection A with the change in the inflation-adjusted average price of basic service during the same period suggests that the 15 percent reduction in RPPVH probably understates the reduction in the true quality-adjusted price of basic cable service during this period, possibly by a very substantial amount. This analysis is presented in Subsection C.

A. Increased viewing of basic networks reflects increased value of basic cable programming to subscribers

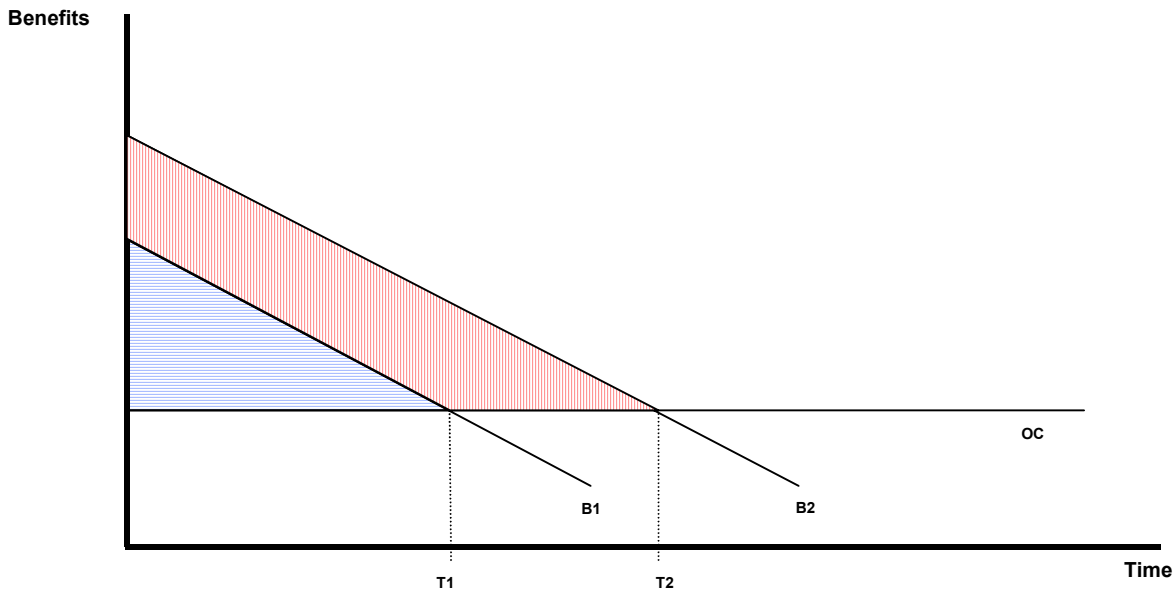
Slowly, but seemingly inexorably, cable services have been increasing their audience shares at the expense of their broadcast competitors. This trend, which has been evident since the ratings services first started reporting measures of cable audiences, has been interpreted by many as evidence that the appeal of cable programming has been increasing relative to the programs offered by the major broadcast networks and individual television stations in local markets. While increasing cable audience shares reflect viewers' decisions to spend more time

watching cable networks, the actual shift in time involved is less frequently reported and is almost certainly larger than is generally realized. From the 1996-1997 television viewing season to the present, which is the period of time covered by the data examined below, the amount of time the average cable household spent watching the ad-supported cable networks that predominate in cable systems' expanded basic packages increased by 43 percent—from 24 hours and 22 minutes per week to 34 hours and 44 minutes per week.⁴ Even more so than the increases in cable viewing shares that are more commonly cited, this increase in time spent watching basic cable programming is direct evidence of an increase in the value of basic cable programming to cable subscribers.

The economics behind this observation is straightforward. Subscribers pay a fixed monthly fee for basic service that does not vary with the amount of time they spend watching basic cable programs. Because cable subscription fees are fixed independently of the amount of cable programming watched, a subscriber's decision to spend more or less time watching cable television must reflect a change in the relative benefits anticipated from spending that time watching cable programs or engaged in other time-consuming activities. This relationship is illustrated diagrammatically in Figure 3.

⁴ 1996/97-2001/02: CAB, CableTV Facts 2003, p. 7; 2002/03 estimate: CAB.

Figure 3
Benefits of Improved Programming to a Representative Subscriber



B1 and *B2* in Figure 3 are marginal benefit of viewing schedules for a representative cable subscriber. The schedules give the marginal value to the viewer of different amounts of time spent watching ad-supported, basic cable channels, starting with the program valued most highly and proceeding through the remaining programs in order of descending value. *B1* is the benefit schedule before an increase in programming quality. *B2* is the benefit schedule after quality has increased. Benefits are measured vertically and time spent viewing or doing other things is measured on the horizontal axis. The horizontal line, *OC*, is the opportunity cost of time spent doing something other than watching cable TV, which would include watching local over-the-air TV channels carried by the cable system along with other things the subscriber might do with her time.⁵

⁵ If cable programs were homogeneous goods, a benefit schedule could be converted to a representative viewer demand curve by subtracting *OC* from the height of the benefit schedule, because the maximum a consumer will pay for a unit of a product is the difference between the consumption value anticipated and the opportunity cost of the next best option.

The increase from $T1$ to $T2$ in time spent watching programs on basic channels is the representative subscriber's response to the increase in the quality of programs available on basic channels. As such it is a direct reflection of the fact that programming quality has increased. (It could also reflect an increase in the quality of the viewing experience due to technical improvements in the distribution system.) While the increase in time spent watching cable programs is evidence that the quality of cable service has increased, by itself, it cannot tell us how much overall benefits have increased because it only reflects the shift in that portion of the benefit schedule near its intersection with OC .

The total increase in the value of basic service to the representative cable subscriber can also be represented with Figure 3. In what follows I will use the term "added value" to refer to the benefits a cable subscriber realizes from watching basic cable programs over and above the benefits she would have been realized from the next best use of the viewing time. The added value of programming watched before the increase in quality is the horizontally shaded triangle under $B1$ and above OC . The overall increase in value due to the increase in quality is the additional vertically shaded region between $B1$ and $B2$ and above OC . As drawn, $B2$ is parallel to $B1$ and it is apparent on inspection that the percentage increase in value delivered to the representative subscriber is considerably greater than the percentage increase in viewing time. (The horizontal distance between $B2$ and $B1$ is constant, while the distance from $B1$ to the vertical axis diminishes as we move up $B1$ from its intersection with OC .)

For the 1997 and 2003 benefits schedules for basic cable programs, we know only the magnitude of the distance between them where they intersect OC , which is the 10 hours and 22 minutes of extra time spent watching basic cable networks. However, a general and broadly distributed increase in cable networks' ratings during the period examined here strongly suggests

that the substantial increase in cable networks' programming budgets during this period combined with the introduction of new networks has shifted the entire benefits schedule outward—not just the lower portion near the opportunity cost line, as might be the case if the audiences attracted by new networks accounted for most of the increase in time spent watching cable programs.

Because it takes time for new networks to build coverage and, more significantly, to develop a following among the subscribers they do reach, the most popular cable networks tend to be the ones that have been around for a while. Thus, among the 10 most popular cable networks in the Second Quarter of 2003, the youngest (Fox News) was launched in 1996 and the second youngest (Cartoon Network) launched in 1992. All the rest commenced operations in the 1970s (2) or the 1980s (6), and all but one of these started up prior to 1985. Among the second 10 most popular networks, only four were launched in 1994 or later, and just one, Lifetime Movie Network, which started up in 1998, was launched after 1996. 24 hour ratings for the five least watched of the top 20 network varied from a third to just under half of the 24 hour ratings for the most popular networks. Many of the newer networks are not listed in this table because their audiences are not large enough to be reported by Nielsen.⁶

The Nielsen estimates of cable network audiences over the last six years reported in Table 2 show that within-coverage area 24-hour ratings have grown for the more popular established networks even as an increasing number of new networks have also managed to attract viewers. With the exception of the top five networks, for which there was a slight decline in the average rating from 1997 to 2003 due to a substantial drop in prime time ratings for one of the

⁶ Nielsen does not report audience estimates for programs with very small audiences because the numbers of viewers watching these programs in their measured sample audience is too small to report estimates with acceptable degrees of statistical significance.

networks, the same pattern is evident in the networks' prime-time ratings during this period reported in Table 3. The largely across the board increase in cable networks' ratings suggests that the quality of cable networks' programming has also increased across the board. Just as the viewers attracted by new networks are evidence of added value for viewers, so are the audience gains of established networks.

Table 2
Average Full Day Rating By Coverage Area

Average Full Day Rating	1997*	2003
Top 5 Networks	1.06	1.24
Top 6-10 Networks	0.49	0.84
Top 11-15 Networks	0.26	0.56
Top 16-20 Networks	0.20	0.50
Top 21-25 Networks		0.40
Top 26-30 Networks		0.40
Top 31-35 Networks		0.30
Top 36-40 Networks		0.22
Top 41-45 Networks		0.20
Top 46-50 Networks		0.12
Top 51-52 Networks		0.05

**) For 1997, there are only 17 stations listed*

*Sources: Cable TV Programming, Aug 31, 1997, Kagan World Media, pp 6-7
and Cable Program Investor, Aug 21, 2003, Kagan World Media, p 13*

Table 3
Average Prime Time Rating By Coverage Area

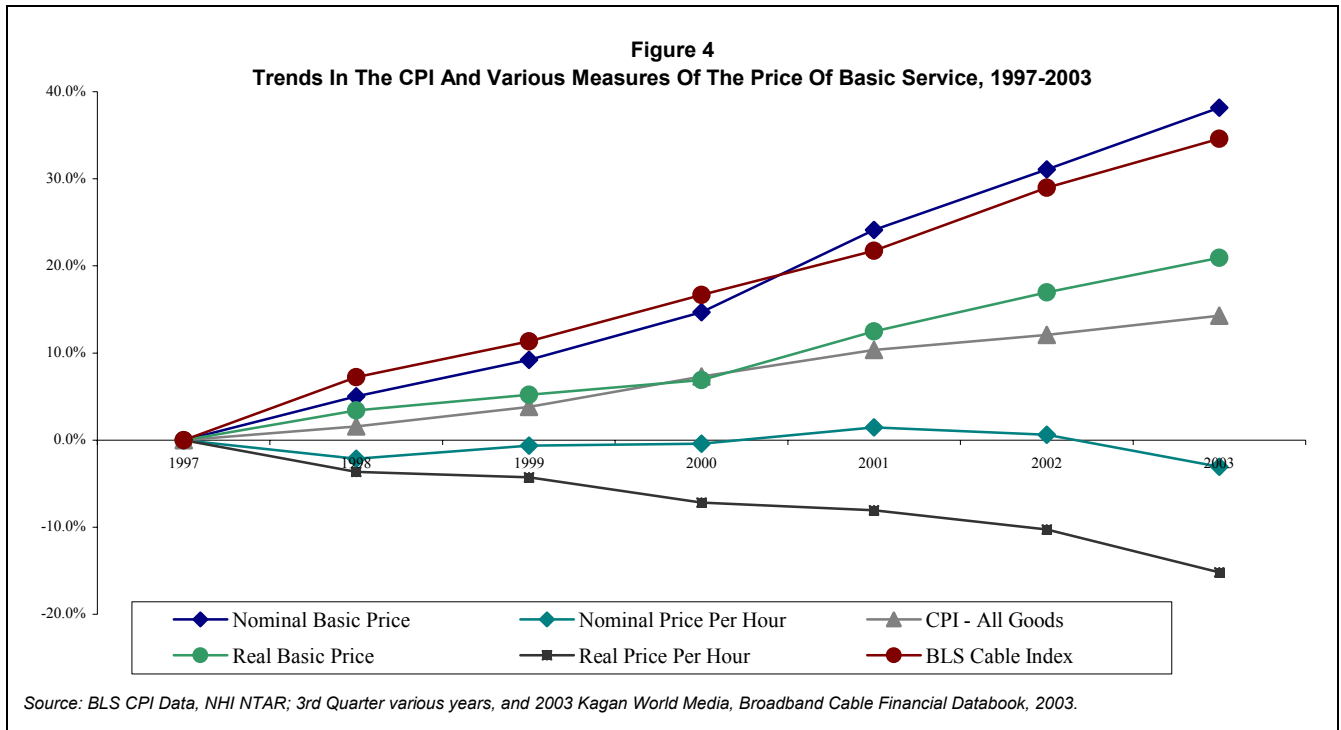
Prime Time Day Rating	1997*	2003
Top 5 Networks	1.89	1.78
Top 6-10 Networks	1.23	1.36
Top 11-15 Networks	0.81	0.98
Top 16-20 Networks	0.49	0.86
Top 21-25 Networks	0.34	0.68
Top 26-30 Networks	0.30	0.60
Top 31-35 Networks		0.46
Top 36-40 Networks		0.40
Top 41-45 Networks		0.24
Top 46-50 Networks		0.20
Top 51-52 Networks		0.05

**) For 1997, there are only 27 stations listed*

Sources: Cable TV Programming, Aug 31, 1997, pp 6-7 and Cable Program Investor, Aug 21, 2003, p 13

- B. Measured per unit of viewing time, the price of cable basic cable service has been falling

The data on viewing hours and basic cable prices presented above showed that both have increased substantially over the past six years. Calculated in percentage terms, the two increases were nearly identical, with a slightly larger percentage increase in time spent viewing producing about a three percent decline in subscriber payments per viewing hour. This, of course, ignores changes in the value of the dollar over this time. Due to low but persistent inflation, approximately \$1.14 was required in June of 2003 to purchase what a dollar would have bought in 1997. Seven-year trends in the nominal and real prices per hour of cable viewing (NPPVH and RPPVH) are shown in Figure 4. When the price of basic cable service is adjusted for the reduction in the purchasing power of the dollar over time, the real price paid for an hour of cable viewing is shown to have fallen by about 15.2%, which is a fairly substantial reduction.



(1)

Price per viewing hour is an intuitively appealing index of value delivered because it is a ratio of payments made to a measure of services actually consumed. It also has the advantage of reflecting in a single measure changes in nominal prices and viewer responses to changes in the quality of services provided, as was mentioned earlier. Its principle shortcoming is that it assumes that the added value delivered to viewers is not concentrated in the new programs and networks watched, but is also comprised in substantial part from increased value delivered by the networks and programs that viewers were already watching, when this might not be the case. While the general increase in cable networks' viewing shares documented above is evidence that both old and new networks have contributed to an increase in the value of basic cable service to subscribers, the question of the size of their relative contributions still remains. However, utilizing the data reported above on changes in the inflation-adjusted average price for basic service and household average changes in time spent watching basic cable networks and

plausible assumptions regarding changes in the benefits cable viewers derive from watching basic cable programs, it is possible to estimate changes in the benefits of subscribing to a basic cable service for a representative cable household for a number of plausible scenarios. The calculations reported below suggest that changes in RPPVH may substantially understate the extent to which the real quality-adjusted price of basic cable service has declined.

C. Representative household estimates of changes in quality-adjusted prices

To construct estimates of changes in quality-adjusted prices, it is convenient to represent the added value of basic service in terms of the mean added value of the individual programs watched. Total added value is the mean added value times the total number of programs watched. Similarly, the price paid for basic service can be expressed as the price per viewing hour times the number of hours watched. The net benefit of basic cable service to a subscribing household's welfare is the difference between the total added value of basic service and the price of the service. Estimates of average viewing hours and the real price per viewing hour were presented in Subsections A and B above. If we had comparable estimates of mean added values, we could calculate directly the effects of changes in programming quality for a representative basic cable household.

Let $M1$ be the mean of the added value of basic cable programs watched by a representative household in 1997 and let $M2$ be the mean added value for cable programs watched in 2003. In terms of Figure 3, $M1$ would be the area of the horizontally shaded triangle divided by $T1$ and $M2$ would be the sum of the areas of the horizontally shaded triangle and the

vertically shaded region divided by $T2$. For the representative cable subscriber, the change in the net benefits (CNB) of cable viewing from 1997 to 2003 is given by equation (1).

$$CNB \equiv (M2 - P2)T2 - (M1 - P1)T1, \quad (1)$$

where $P1$ and $P2$ are the real prices per viewing hour for 1997 and 2003 respectively.

For the average cable household, $P2=0.85P1$, as reported in the previous subsection, and from the 43 percent increase in time spent watching basic cable networks from 1997 to 2003 we know that $T2=1.43T1$. If we express $M2$ as a multiple m of $M1$, so that $M2=mM1$, we can use the following simplified expression for CNB .

$$CNB = [(1.43m - 1)M1 - 0.2155P1]T1. \quad (2)$$

We can use equation (2) to solve for \hat{m} , the value of m for which CNB equals zero. The importance of \hat{m} is that if m is less than \hat{m} , the representative subscriber derives less value from basic cable in 2003 than she did in 1997. If m is greater than \hat{m} , she is better off in 2003.

Letting r stand for the ratio of $P1$ to $M1$, we have

$$\hat{m} = \frac{(1 - 0.2155r)}{1.43}. \quad (3)$$

$P1$ can be no greater than $M1$. If it were, the cost of service would exceed its benefits and the household would not subscribe. For $P1=M1$, $r=1$ and $\hat{m}=0.549$. This is the smallest possible value for m . \hat{m} achieves its maximum value of just under 0.7 if r is equal to zero, in which case

the ratio of benefits delivered to the price paid is so great that price is trivial in comparison, as would be the case if the price was zero. More plausible ratios of PI to MI produce values of \hat{m} between these extremes. For example, \hat{m} would be approximately 0.624 if PI were half of MI . These calculations are of particular relevance to an attempt to determine whether cable subscribers are better or worse off following the increases in subscription prices and viewing time noted above because they tell us that for the representative subscriber to be worse off after the price and quality changes than before, the average net benefits realized from an hour spent watching basic cable programs would have to fall to less than seventy percent of its initial value. This flies in the face of the evidence presented earlier that viewers value cable programming more highly today than they did in 1997.

Dividing CNB by $(MI-PI)TI$ allows us to calculate percentage changes in the total net benefits realized by the representative viewer for different values of m and r . Thus for $m=1$, in which case the average hour of cable viewing would deliver the same net benefits to a cable subscriber in 2003 as in 1997, and $r=0.9$, benefits net of price for the representative cable subscriber would have increased by 236 percent. But even for r at its lowest possible value of zero, the representative subscriber's net benefits would still increase by a minimum of 43 percent, nearly three times the 15 percent reduction in RPPVH, as long the average value of an hour of cable viewing did not decline from 1997 to 2003. If it rose, the increase is potentially much larger.

Of course we don't know the actual values of m and r . But these calculations based on hypothetical values for these ratios illustrate an important point. Given the large increase in time spent watching cable networks over the last six years and the decline in the real price per hour of cable viewing, it seems highly likely that cable subscribers have benefited substantially from

changes in the services provided, even though they are paying more for cable service now than they did in 1997.

V. Conclusions

While the nominal price of basic cable service has been increasing over time, the dramatic increase in the amount of time cable subscribers spend watching basic cable networks is compelling evidence that the quality of basic services has been increasing as prices have been going up. A dramatic increase in spending on programming by the basic networks has undoubtedly contributed substantially to the increase in quality. The real (inflation-adjusted) price of cable service divided by the number of hours spent watching basic cable programming is an appealing measure of changes in the quality-adjusted real price of basic service because it reflects both changes in the price of service and viewer responses to changes in service quality over time. Calculations based on a hypothetical representative basic subscriber suggest, however, that for the 1997-2003 period, the estimated 15 percent reduction in the real price per viewing hour for basic service may substantially understate the reduction in the true (but unobserved) quality-adjusted price of basic service.

STEVEN S. WILDMAN
Curriculum Vitae

Michigan State University
Department of Telecommunication
409 Communication Arts & Sciences
East Lansing, MI
Tel. (517) 432-8004
Fax (517) 432-8065
swildman@msu.edu

LECG, Inc.
1603 Orrington Avenue
Suite 1500
Evanston, IL 60201
Tel. (847) 475-1566
Fax (847) 475-1031

EDUCATION

Ph.D., STANFORD UNIVERSITY, Economics, 1980.

M.A., STANFORD UNIVERSITY, Economics, 1977.

B.A., WABASH COLLEGE, Economics, 1971.

PRESENT POSITIONS

MICHIGAN STATE UNIVERSITY, Department of Telecommunication.
James H. Quello Professor of Telecommunication Studies

MICHIGAN STATE UNIVERSITY, Quello Center for Telecommunication Management & Law.
Director

ACADEMIC AND PROFESSIONAL EXPERIENCE

Northwestern University, Department of Communication Studies, 1988-1999.
Associate Professor

Northwestern University, Program in Telecommunications Science, Management & Policy, 1990-1999. Director

ECONOMISTS INCORPORATED, 1983 - 1988.
Senior Economist

UNIVERSITY OF CALIFORNIA, Los Angeles, Department of Economics, 1979 - 1983.
Assistant Professor

RAND CORPORATION, 1981 - 1983.
Consultant

FELLOWSHIPS AND AWARDS

Van Zelst Research Professor of Communication, Northwestern University, 1996-1997

McGannon Award for Social and Ethical Relevance in Communication Policy Research for 1992.

Ameritech Research Fellow, Northwestern University, 1990 - 1991.

Ameritech Research Professorship, Northwestern University, 1989 - 1990.

National Science Foundation Fellowship, 1974 - 1977

PUBLICATIONS

Books

International Trade in Films and Television Programs, with Stephen E. Siwek, Ballinger, 1988.⁷

Video Economics, with Bruce M. Owen, Harvard University Press, 1992.⁸

Electronic Services Networks: A Business and Public Policy Challenge, co-edited with Margaret E. Guerin-Calvert, Praeger Publishers, 1991.²

Making Universal Service Policy: Enhancing the Process Through Multidisciplinary Evaluation, co-edited with Barbara A. Cherry and Alan H. Hammond, IV, Lawrence Erlbaum, Publishers, 1999.²

Broadband: Bringing Home the Bits, member of NRC committee authoring report, National Research Council, 2002.

I. EDITED JOURNAL SPECIAL ISSUES

SPECIAL ISSUE ON TELECOMMUNICATIONS POLICY, *Industrial and Corporate Change*, vol. 4, 1995. Co-edited with David J. Teece.¹

SPECIAL ISSUE ON MEDIA AND MULTIMEDIA, *Information Economics and Policy*, vol. 10, no. 2. 1998.

Journal Articles

“Rethinking Access: Introduction to the Symposium Theme and Framework,” with Johannes M. Bauer, *Law Review of the Michigan State University Detroit College of Law*, vol. 2002, No. 3 (Fall 2002).²

“The Market for Television Advertising: Model and Evidence,” with B. D. McCullough and R. Kieschnick, *Review of Marketing Science*, Vol. 1, Issue 2 (Nov. 2001).²

“Preventing Flawed Communication Policies by Addressing Constitutional Principles,” with Barbara A. Cherry, *Law Review of the Michigan State University Detroit College of Law*, vol. 2000, No. 1 (Spring 2000).²

“An Institutional Perspective on Regulatory Regimes and Investment Decisions by Telecommunications Providers,” with Barbara A. Cherry, *Telecommunications and Broadcasting Networks under EC Law: The Protection Afforded to Consumers and Undertakings in the*

⁷ Senior author.

⁸ Equal joint author.

Information Society, Series of Publications by the Academy of European Law Trier, Vol. 27 (2000).²

“Institutional Endowment as Foundation for Regulatory Performance and Regime Transitions: The Role of the US Constitution in Telecommunications Regulation in the United States,” with Barbara A. Cherry, *Telecommunications Policy*, vol. 23, no. 9 (1999).²

“Economic Theories of Tying and Foreclosure Applied—and Not Applied—in *Microsoft*,” with Debra J. Aron, *Antitrust*, vol. 14, no. 1 (1999), pp. 48-52.²

“Media and Multimedia: The Challenge for Policy and Economic Analysis,” in *Information Economics and Policy*, Vol. No. 1 (1998).

“Interconnection Pricing, Stranded Costs, and the Optimal Regulatory Contract”, in *Industrial and Corporate Change*, vol. 6, no 4 (1997).

“Introduction: Policy and Strategy for Rapidly Changing Telecommunications Markets,” with David Teece, *Industrial and Corporate Change*, vol. 5, no. 4 (1996).¹

“The Pricing of Customer Access in Telecommunications,” with Debra J. Aron, *Industrial and Corporate Change*, vol. 5, no. 4 (1996).²

"Network Programming and Off-Network Syndication Profits: Strategic Links and Implications for Television Policy," with Karla Robinson, *Journal of Media Economics*, Vol. 8, No. 2 (1995).¹

"Trade Liberalization and Policy for Media Industries," *Canadian Journal of Communication*, Vol. 20 (1995).

"Network Competition and the Provision of Universal Service," with John C. Panzar, *Industrial and Corporate Change*, Vol. 4, No. 4 (1995).²

"Funding the Public Telecommunications Infrastructure," with Bruce Egan, *Telematics and Informatics*, Fall 1994.²

"Toward a New Analytical Framework for Media Policy: Reconciling Economic and Non-Economic Perspectives," with R. Entman, *Journal of Communication*, Winter 1992.² Reprinted in part in *Taking Sides: Clashing Views on Controversial Issues in Mass Media and Society*, A. Alexander and J. Hanson (eds.), The Duskin Publishing Group, Inc., 1993.

"Selecting Advanced Television Standards for the United States: Implications for Trade in Programs and Motion Pictures," *Journal of Broadcasting and Electronic Media*, Spring 1991.

"The Privatization of European Television: Effects on International Markets for Programs," *Columbia Journal of World Business*, December 1987.¹

"A Note on Measuring Surplus Attributable to Differentiated Products," *Journal of Industrial Economics*, September 1984.

"Economic Consequences of the Informational Characteristics of Mass Media," *The American Economist*, Spring 1981.

Book Chapters

“Broadband Deployment: Toward a More Fully Integrated Policy Perspective”, with Johannes M. Bauer and Junghyun Kim, in A. Shampine (ed.), *Down to the Wire: Studies in the Diffusion and Regulation of Telecommunications Technologies*, Nova Science Press, forthcoming.²

“Conditional Expectations Communication and the Impact of Biotechnology,” in S. Braman (ed.), *Biotechnology and Communication: The Meta-Technologies of Information*, Lawrence Earlbaum Associates, Publishers, forthcoming.

“Effecting a Price Squeeze Through Bundled Pricing,” with Debra J. Aron , in S. Gillett and I. Vogelsang (eds.), *Competition, Regulation and Convergence: Current Trends in Telecommunications Policy Research*, Lawrence Erlbaum Associates, Publishers, 1999.²

“Conceptualizing Universal Service Policy: Definitions, Context, Social Process, and Politics,” with Barbara A. Cherry. In B. Cherry, S. Wildman and A. Hammond IV (eds.), *Making Universal Service Policy: Enhancing the Process Through Multidisciplinary Evaluation*, Lawrence Erlbaum Associates, Publishers, 1999.²

“Unilateral and Bilateral Rules: A Framework for Increasing Competition While Meeting Universal Service goals in Telecommunications,” with Barbara A. Cherry. In B. Cherry, S. Wildman and A. Hammond IV (eds.), *Making Universal Service Policy: Enhancing the Process Through Multidisciplinary Evaluation*, Lawrence Erlbaum Associates, Publishers, 1999.²

“Review of Federal Universal Service Policy in the United States,” with Barbara A. Cherry, in B. Cherry, S. Wildman and A. Hammond IV (eds.), *Making Universal Service Policy: Enhancing the Process Through Multidisciplinary Evaluation*, Lawrence Erlbaum Associates, Publishers, 1999.²

“Towards a Better Integration of Media Economics and Media Competition Policy,” in *A Communications Cornucopia: Markle Foundation Essays on Information Policy*, R. Noll and M. Price (eds.), Brookings Institution, 1998.

“Regulatory Standards: The Effect of Broadcast Signals on Cable Television,” with James N. Dertouzos, in *A Communications Cornucopia: Markle Foundation Essays on Information Policy*, R. Noll and M. Price (eds.), Brookings Institution, 1998.²

“The Economics of Minority Programming,” with Theomary Karamanis, in A. Garmer, ed., *Investing in Diversity: Advancing Opportunities for Minorities and the Media*, The Aspen Institute, 1998.¹

“A Structure and Efficiency Approach to Reforming Access and Content Policy,” with Karen D. Frazer, in C. Firestone and A. Garmer, eds., *Digital Broadcasting and the Public Interest: Reports and Papers of the Aspen Institute Communications and Society Program*, Aspen Institute, 1998.¹

“Interconnection Pricing and Network Competition,” in *Progress in Communication Science, Volume 15: Advances in Telecommunications Theory and Research*, H. Sawhney and G. A. Barnett (eds.), Ablex, 1998.

"Funding the Public Telecommunications Infrastructure," with Bruce Egan, in *Globalism and Localism in Telecommunications*, E. Noam and A. Wolfson (eds.), Elsevier, 1997.²

"Information Technology, Private Networks, and Productivity," in *Private Networks and Public Objectives*, E. Noam (ed.), Elsevier, 1996.

"One-Way Flows and the Economics of Audiences," *Audiences: How the Media Create the Audience*, J. S. Ettema and D. C. Whitney (eds.), Sage, 1994.¹

"The Economics of Trade in Recorded Media Products in a Multilingual World: Implications for National Media Policies," with Stephen E. Siwek, in *The International Market in Film and Television Programs*, Eli M. Noam (ed.), Ablex, 1993.¹

"Investing in the Telecommunications Infrastructure: Economics and Policy Considerations," with Bruce L. Egan, in the *1992 Annual Review of the Institute for Information Studies*.²

"Electronic Services Networks: Functions, Structures, and Public Policy," with Margaret E. Guerin-Calvert, in *Electronic Services Networks: A Business and Public Policy Challenge*, Margaret E. Guerin-Calvert and Steven S. Wildman (eds.), Praeger Publishers, 1991.¹

"The Economics of Industry-Sponsored Search Facilitation," in *Electronic Services Networks: A Business and Public Policy Challenge*, Margaret E. Guerin-Calvert and Steven S. Wildman (eds.), Praeger Publishers, 1991.¹

"Program Competition and Diversity in the New Video Industry," with Bruce M. Owen, in *Video Media Competition: Regulation, Economics, and Technology*, Eli M. Noam (ed.), Columbia University Press, 1985.¹

Papers in Published Conference Proceedings

“Program Competition and Advertising Strategies in the Age of Digital Television,” in *The Future of Digital Television: Market, Audience, and Policy*, proceedings of the KISDI-KSJCS International Conference of same title, held Nov. 29, 2001 in Seoul, Korea, pp. 29-45.

"Communication Technology and Productivity: The Role of Education," *Annual Review of Communication*, National Engineering Consortium, Vol. XXXVII (1993-94).

"Controlling Occupational Radiation: Alternatives to Regulation," with L.A. Sagan and R. Squitieri, presented at the International Symposium on Occupational Radiation Exposure in Nuclear Fuel Cycle Facilities, Los Angeles, CA, June 18-22. Published in proceedings of same conference.²

"Economic Issues in Mass Communication Industries," with J. N. Rosse, J. N. Dertouzos and M. Robinson, presented at the FTC Symposium on Media Concentration, Washington, D.C., December 14-15, 1978. Published in the proceedings of same conference.⁹

"Vertical Integration in Broadcasting: A Study of Network Owned-and-Operated TV Stations," S.I.E. No. 97, Department of Economics, Stanford University, also published in the Proceedings of the FTC Symposium on Media Concentration, Washington, D.C., December 14-15, 1978.

Other Publications and Working Papers

Review of *The Telecommunications Act of 1996: The "Costs" of Manged Competition*, by Dale E. Lehman and Dennis Weisman, *Journal of Economic Literature* (December 2002), vol. 40(4), pp. 1272-1273.

Review of *Much Ado About Culture: North American Trade Disputes*, by K. Acheson and C. Maule, *Journal of Economic Literature* (September 2001), vol. 39(3), pp. 938-940.

"AOL-Time Warner Merger Will Redefine Business: Deal Gives AOL Access to Homes," Lansing State Journal, Feb. 6, 2000, p. 11A.

"A Framework for Managing Telecommunications Deregulation while Meeting Universal Service Goals," with Barbara A. Cherry. Presented at the Twenty-Third Annual Telecommunications Policy Research Conference, Solomons, Maryland, October 2, 1995.

"Monopolistic Competition with Two-Part Tariffs," with Nicholas Economedes, August 1995.²

Review of *Television in Europe*, by Eli Noam, *Journal of Economic Literature*, December 1993.

"Competition in the Local Exchange: Appropriate Policies to Maintain Universal Service in Rural Areas," with John C. Panzar, September 1993.

Review of *The World Television Industry: An Economic Analysis*, by Peter Dunnett, *Journal of Communication*, Winter 1992.

"An Empirical Study of Broadcast Competition to Cable," with James N. Dertouzos, July 1990.²

"A Model of Supply and Demand for Information in a Competitive Market," October 1989.

"ATV Standards and Trade in Recorded Video Entertainment," paper presented at the Sixteenth Annual Telecommunications Policy Research Conference, October 30-November 1, 1988, Airlie, VA, revised April 1989.

"Competition, Regulation and Sources of Market Power in the Radio Industry," with Duncan J. Cameron, May 1982, revised October 1989.¹

"Program Choice in a Broadband Environment," with Nancy Y. Lee, Working Paper, Center for Telecommunications and Information Studies, Columbia University, May 1989.¹

"Trade in Films and Television Programming," with Stephen E. Siwek, presented at Trade in Services and Uruguay Round Negotiations, London, England, July 8, 1987, and Geneva, Switzerland, July 18, 1987.¹

⁹ Joint author credited as a "with."

Review of *Oligopoly Theory*, by James Friedman, *Journal of Economic Literature*, March 1985.

"Recruiter Incentives: Effects on Performance," Rand Cooperation Working Draft, April 1983.

"Anticipated Preemption and the Determination of Initial Structure in a Growing Market," UCLA Working Paper No. 267, September 1982.

"A Spatial Model of Entry Deterrence," S.I.E. No. 103, Department of Economics, Stanford University, November 1978, revised December 1980.

"Advertising, Consumer Learning and Competitive Strategies," Dissertation filed January 1980. Also published as S.I.E. paper No. 110 by Department of Economics, Stanford University, December 1979.

"A Study of Economic Issues in the Recording Industry," with James N. Dertouzos.² Study commissioned by the National Association of Broadcasters.

OTHER PROFESSIONAL ACTIVITIES

Co-convenor, conference on telecommunications free trade zones, Northwestern University, March 30, 1992. Sponsored by the Annenberg Washington Program of Northwestern University and the Illinois Commerce Commission.

Convener, half-day conference on electronic services networks at Northwestern University, April 9, 1990.

Co-convenor, day-long Washington, D.C. conference on electronic services networks sponsored by the Annenberg Washington Program, February 23, 1990.

Member, Editorial Board, *Journal of Media Economics*.

Member of Organizing Committee for the Nineteenth and Twentieth Annual Telecommunications Policy Research Conference, Solomon Island, MD.

Member, Executive Committee, Consortium for Research in Telecommunications.

Organizer, 1996 Conference on Telecommunications Policy and Strategy of the Consortium for Research in Telecommunications Policy, Evanston, IL, May 10,11, 1996

Co-organizer, Telecommunication Policy and Law Symposium: "Preventing Flawed Communication Policies by addressing Constitutional Principles", Washington, D.C., April 18, 2000.

Member, National Research Council Broadband Last Mile Committee, Fall 1999-present.

REFEREEING AND REVIEWING

American Economic Review, referee

Communication Law and Policy, referee

Communication Research, referee

Communication Theory, referee

Journal of Economics and Business, referee

Information, Economics and Policy, referee

Information Systems Research, referee

International Journal of the Economics of Business, referee

International Journal of Industrial Organization, referee
International Journal on Media Management, Associated Reviewer and referee,
Journal of Broadcasting and Electronic Media, referee
Journal of Communication, book reviewer
Journal of Information, Economics and Policy, referee
Journal of International Economics, referee
Journal of Economic Literature, book reviewer
Journal of Industrial Economics, referee
Journal of Media Economics, editorial board, referee
National Science Foundation, proposal reviewer
The Rand Journal of Economics, referee