

the same increment in net revenues so that disadvantaging one or a few of these services would have little effect on the amount the cable system would pay for the service owned by the MSO. Only by eliminating a large number of these rival services could this strategy raise the profits of the MSO's program service, but this would also increase the cost of the strategy.

To determine if foreclosure of a rival service would be profitable, a vertically integrated MSO would weigh its losses as a cable operator against any gains of its affiliated program service in other markets. If the losses exceeded the gains, the foreclosure strategy would be unprofitable.

It is difficult to state general conditions that identify all circumstances in which foreclosure would not be profitable. The magnitude of the costs and benefits of a foreclosure strategy depends on too many unobservable variables, such as the value to cable systems of carrying various services and the bargaining dynamics between cable systems and program services.

However, our earlier analysis indicated that a cable MSO may be too large, as well as too small, for a strategy of disadvantaging rival program services to be attractive. Increasing the share of all subscribers served by the foreclosing MSO also increases the losses it must bear. Moreover, as the analysis in the CRA report submitted in the companion proceeding on attribution suggests, as MSOs grow larger, even large price increases for the affiliated service may not substantially increase the incentive to foreclose because of the increased subscriber losses experienced by the operator's cable systems.⁴

⁴ S.M. Besen, D.P. O'Brien, J.R. Woodbury, and S.X. Moresi, "An Economic Analysis of the Effects of Partial Ownership Interests in Cable Systems," August 14, 1998.

In addition, if larger MSOs are able to bargain for lower license fees, the costs to them of foreclosure will be higher relative to smaller MSOs. Bargaining for better license terms would mean the large MSO would keep a larger share of the amount by which the incremental net revenues generated by the program service exceeded the costs of supplying that service.

However, increasing the number of subscribers served by the integrated MSO also reduces the benefits realized through the program service it owns. The program service earns increased revenue because elimination of the rival allows it to capture more of the revenues that cable systems earn by carrying it. But this is a gain only when those cable systems are not owned by the MSO.⁵ Increasing the number of subscribers served by the integrated MSO may reduce the likelihood that the gains from foreclosure will outweigh the costs.

E. Counterstrategies to Prevent Foreclosure

Although effecting a profitable foreclosure strategy is by no means easy, there is an additional hurdle that must be surmounted. Cable systems that would be disadvantaged if a rival program service were foreclosed have an incentive to attempt to keep the rival in business by adopting counterstrategies to the attempt to foreclose.⁶ This may make the foreclosure strategy unprofitable, so it may not be pursued in the first place.

A foreclosure strategy that appears profitable rests on the ability of the MSO to disadvantage a rival program service, perhaps to the point that it goes out of business.

⁵With elimination of the rival service, the license fees paid by a MSO to a program service it owns might increase, but this is an intrafirm transfer that adds nothing to the profitability of foreclosure.

⁶See F.H. Easterbrook, "Predatory Strategies and Counterstrategies," University of Chicago Law Review, 48, 1981.

If it goes out of business, the profits earned by cable systems in other markets may be reduced.⁷ This loss in profits, however, may be greater than the additional amount necessary for the rival program service to stay in business. In such cases, there is the potential for payments to be made from the disadvantaged cable operators to the disadvantaged program service that will prevent it from going out of business.⁸

Although the coordination problems of effecting this counterstrategy should not be minimized, we observed in our earlier analysis that a successful counterstrategy might not require the cooperation of all disadvantaged MSOs. Moreover, there may be instances in which many cable operators realize that the success of the program service depends on each making an appropriate contribution. Still another possibility is that a number of cable MSOs may vertically integrate with an otherwise disadvantaged program service. Finally, the program service may solicit increased payments from cable operators that are contingent on receiving similar payments from other operators.⁹

Faced with the likelihood of an effective counterstrategy, a MSO may decline to pursue the foreclosure strategy. In these instances, there are no benefits from pursuing the strategy, and costs must be incurred in the MSO's own markets when it does not carry the rival program service.¹⁰

F. Foreclosure vs. Efficiency

We concluded in our earlier analysis that the likelihood of vertical foreclosure

⁷As noted in the previous section, this will depend on the substitutability among program services.

⁸Note that the necessary payments may be smaller than the loss in revenues experienced in the market of the vertically integrated MSO.

⁹There would appear to be no legal impediments to solicitations of this form.

¹⁰The effect on competition will depend on the form of the additional payments that are made by cable operators to the rival service. If these payments affect only infra-marginal subscribers, there is no effect.

may be quite remote. In addition, there are a number of well-known efficiency benefits from vertical integration, the attainment of which may be limited by restrictions on the size of cable operators. As we observed previously, these efficiencies must be accounted for by the Commission in determining the appropriate limit. The Commission should not adopt excessively stringent limits on the size of MSOs because doing so might sacrifice substantial efficiency benefits from vertical integration.

Vertical integration can eliminate the distortion created by double marginalization, the successive mark-ups over marginal cost that occur when a programmer and cable operator make pricing decisions without accounting for the effects of their decisions on the profits of the other. For example, when a cable operator with programming interests raises a program service price, it is concerned with how the price increase affects its own profits, not the profits of the cable operators that buy its service. This causes the operator to charge a higher program service price than it would if it owned the other cable operators. Similarly, when setting the price of cable service, an unintegrated cable operator will ignore the fact that a higher subscriber price reduces the demand for the program service and therefore reduces the program service's profits. All else equal, this causes the cable operator to charge a higher price than it would if it owned one or more programming services.¹¹

Once the vertically integrated cable operator acquires an unintegrated operator, the pricing incentives change. The vertically integrated owner will take into

¹¹ In principle, double marginalization could be eliminated contractually if the programmer sold the service for a fixed dollar amount plus a per-subscriber charge equal to the marginal cost of serving an additional subscriber. We understand that these kinds of contracts are rarely executed in practice, suggesting that the costs of reaching an agreement with each cable operator on the appropriate fixed

account the combined profits of the program service and the newly acquired systems in setting the price of the program service. In particular, the operator will "charge" the newly acquired system the marginal cost of program distribution, thereby eliminating one of the two margins.¹² The acquired cable system will then lower the price it charges to cable subscribers, reflecting the lower programming cost. The more systems that are owned by the vertically integrated cable operator, the greater the benefits from the elimination of double marginalization.

In addition to eliminating the distortions created as a result of double marginalization, the acquisition of one cable system by another can increase expenditure on demand or quality-enhancing activities. For example, suppose that the most efficient promoter of a program service in a local area is the local cable operator. If the cable operator incurs the costs of promotion, it will increase the demand for the program service, generating more subscribers and/or permitting the operator to raise the price of the service. However, the cable operator may underinvest in promotion because it bears all of the cost but captures only part of the benefits (some of which will accrue to the program service). Similarly, the promotion may also enhance the value of the service on distribution outlets other than cable, or the promotional effects may extend beyond the local area. Because the cable operator will not share in these benefits, it will engage in less promotion than would be desired by the programmer. More generally, as long as the program price exceeds its marginal cost, the operator will underinvest in activities that enhance the

dollar amount may be substantial.

¹² We put "charge" in quotation marks because the accounting charge may differ from the amount that the operator uses in setting cable service prices.

value of the programming because the operator does not reap all of the benefits of its actions.

In this case, the programmer could, in principle, contractually agree to reimburse the cable operator for its promotional expenses. Two problems arise in doing so, however. First, the cable operator may incur excessive promotional expenditures because it is no longer bearing the costs of promotion. Second, the cable operator may attempt to reclassify some of its costs so that they qualify for reimbursement. As a result, the programmer may have to monitor closely the behavior of the operator by (for example) playing a significant role in designing and implementing the promotional strategy. The need to incur what could be substantial monitoring costs could make programmer participation unprofitable and result in a failure to undertake the promotional effort at efficient levels.

By contrast, if the cable operator were to acquire the program service, the operator would capture all of the profits that the service earned as a result of its efforts. Thus, it would have a stronger incentive to engage in the promotion. These promotional benefits increase as the number of systems owned by the vertically integrated cable operator increases.

There are other examples that illustrate the same point. Some promotional expenditures may most efficiently be borne by the programmer. Similarly, the programmer may be able to invest in improving the quality of its service. However, such investments may also increase the value of the cable systems on which the program services are offered. Because the programmer is unlikely to be able to

capture all of those additional profits, the programmer will invest less in promotion or quality than it would if it could capture all of those gains.

As another example, by virtue of its daily contact with cable subscribers, a cable operator may be able to acquire information less expensively than can a programmer about subscriber preferences that would increase the attractiveness of a particular program service. The cable operator cannot capture all of the gains from this information through increased subscribership, or higher prices, on its systems because the service is now more valuable when sold to other cable systems as well. Consequently, a cable operator may not be willing to invest in acquiring the information and, as a result, some program services may never be developed.

In each of these cases, the ownership of the input suppliers by the cable operator would encourage investments and promotions that benefit cable subscribers. In making its investment and promotional decisions, the owner of the combined entity will fully account for the profit-increasing effects that the cable system action has on input supplier profits and that the input supplier action has on cable system profits. Significantly, the magnitude of these benefits increases with the size of the cable operator. Thus, by limiting the size of cable systems, the horizontal limits likely sacrifice the attainment of these efficiencies.

G. Efficiency in the Supply of New Services

As we noted above, large cable operators have been instrumental in the introduction and development of new cable program services either through their ownership of program services or by assuring carriage of new or struggling services. Large operators are willing and able to take the risk of promoting new services

because they will obtain a large share of the resulting benefits if these services are successful. Because many of the costs of development are independent of the number of subscribers served, smaller operators will often be unable to economically incur the costs of such developments. They are more likely to attempt to "free ride" on the development efforts of larger operators in the expectation that they will be able to carry services that succeed without incurring the development costs of those services that fail.

These considerations apply not only to program service development but to the development of other types of services as well. For example, significant costs must be incurred to carry out the research and development activities that are necessary to permit Internet Protocol telephone over cable. However, small cable operators will not undertake these activities because they will capture only a small portion of the benefits that result from the development effort. Because the development activities are most likely to be undertaken by large cable operators, placing limits on the size of cable MSOs makes it less likely that these promising research and development activities, among others, will be undertaken.

Moreover, size creates an additional advantage in bringing new technologies forward that is not present in the development of program services. Many new telecommunications services that can be offered over cable require a significant degree of interoperability among different cable systems. For example, IP telephony will require uniform addressing systems and directory services to permit subscribers to one cable system to communicate with subscribers to another. Large cable operators are in a unique position to promote the development of industry-wide

standards that will be needed to promote the development of these new services because they can be confident that other, smaller operators will follow their choices.¹³ The introduction of new services that require standardization is thus likely to be more difficult if cable system ownership is fragmented. Limiting the size of cable MSOs, by reducing the ability of any one cable operator to promote interoperability among cable systems, may threaten, or delay, the introduction of new services by the cable industry.

III. Empirical Evidence on Vertical Foreclosure

The principal concern expressed by Congress in instructing the Commission to adopt rules limiting the size of cable MSOs is that large MSOs would favor program services in which they had ownership interests and disfavor independently owned services. Although there was some largely anecdotal evidence available at the time the rule was adopted, systematic evidence was quite limited. However, there is now a substantial body of clear evidence that the concerns of Congress, which provided the basis for the Commission's rule, were vastly overstated.

This section briefly describes the empirical evidence about whether vertically integrated systems "favor" program services in which they have ownership interests and "foreclose" program services that compete with the services they own.¹⁴ The

¹³ Another area where large MSOs can promote interoperability is in the standardization of the billing systems used by cable operators.

¹⁴ We reviewed the following: (1) U.S. Department of Commerce, *Video Program Distribution and Cable Television: Current Policy Issues and Recommendations*, NTIA Report 88-233, June 1988 (comparison of carriage rates of vertically integrated and non-integrated MSOs for various program services); (2) Klein, B., *The Competitive Consequences of Vertical Integration in the Cable Industry*, mimeo, June 1989 (comparison of carriage rates of vertically integrated and non-integrated MSOs for various program services); (3) Salinger, M., "A Test of Successive Monopoly and Foreclosure Effects: Vertical Integration Between Cable Systems and Pay Services," mimeo, 1988 (probit analysis of carriage rates of pay services by cable systems integrated with the services, systems integrated with

description is based on evidence from the public literature, including published papers, articles, and studies performed for regulatory proceedings, as well as the results of our own analyses of differences in carriage rates between TCI-owned systems and unaffiliated systems.¹⁵

The bulk of the empirical evidence indicates that vertically integrated cable operators do not disfavor non-pay program services in which they do not have ownership interests. In particular, carriage rates for these services by vertically integrated systems are generally not lower than those of systems that are not vertically integrated. Moreover, even where carriage rates by vertically integrated operators are found to be lower, the differences are generally small when compared either to the universe of cable subscribers or to the total number of subscribers with access to the service.

Similarly, there is little or no evidence of the foreclosure of pay services. While most studies find that cable systems that are integrated with pay services tend to carry rival pay services less frequently than do unintegrated systems, (which is an unremarkable finding because of the efficiencies of vertical integration), the magnitude of the extent to which disadvantaged rivals are denied access to the subscriber universe is quite small.

rival services, and non-integrated systems); (4) Crandall, R., *Vertical Integration and q-Ratios in the Cable Industry*, mimeo, 1990 (probit analysis of carriage rates of basic services); (5) D. Waterman and A.A. Weiss, "The effects of vertical integration between cable television systems and pay cable networks," *Journal of Econometrics* 72 (1996) 357-395 (reduced-form equations comparing the carriage, price, and subscribership of each of four pay movie networks for systems that are integrated with the services and those that are not); (6) D.H. Waterman and A.A. Weiss, *Vertical Integration in Cable Television*, (Cambridge, MA: MIT Press, 1997) (similar analysis for carriage of pay and basic services); and (7) Chipty, T., "Vertical Integration, Market Foreclosure, and Consumer Welfare: An Empirical Investigation" mimeo, various versions (statistical analysis of the number and types of pay and basic program services carried by vertically integrated and non-integrated cable systems).

¹⁵ Appendix A provides a detailed description of our analysis of TCI's carriage behavior.

More generally, even where there are statistically significant differences in carriage rates, these differences are unimportant economically. That is, even in those studies that find a statistical relationship between vertical integration and cable carriage, the implied magnitude of any “foreclosure” effect is too small to be ascribed to an effort to disadvantage rival program services.

A number of studies have specifically examined TCI’s carriage behavior. Crandall found that TCI systems were significantly more likely to carry both affiliated and unaffiliated program services than were systems that were not affiliated with any service, indicating no evidence of discrimination against unaffiliated services. Using more recent data, we found that TCI had higher carriage rates than cable systems without programming interests for 13 of 19 affiliated program services, but that it also had higher carriage rates for 25 of 46 unaffiliated services.¹⁶ Importantly, the differences in carriage rates between TCI and other operators were generally quite small. Overall, we found that the net “foreclosure” rate for unaffiliated services was less than one-half of one percent of all subscriber transactions, an amount that is clearly too small to attribute to a systematic foreclosure strategy.

In addition to evidence on the carriage of individual services, some studies consider the effect of vertical integration on the number of services offered, price, and subscribership. The limited evidence suggests that operators that are integrated with pay services carry somewhat fewer pay services (between .5 services and 1 service) than do other operators. The evidence of the effect of vertical integration on pay

¹⁶ When we compared TCI carriage rates with those of non-TCI systems without controlling for other differences among systems, we found that, relative to its owned program services, TCI favors unaffiliated services. Moreover, we found no significant relationship between TCI’s carriage behavior and the magnitude of its ownership interest in a program service.

prices and subscribership appears less conclusive but suggests that prices are lower and subscribership is higher in systems that are vertically integrated with pay services.

For non-pay services, the evidence is generally consistent with the conclusion that vertical integration increases the number of services offered. In addition, the results suggest that vertical integration between systems and non-basic cable services is associated with lower non-pay service prices and higher non-pay penetration.

Finally, evidence on the survivability of program services that are not integrated with cable operators provides many instances of services that, while not vertically integrated, have existed for a very long period of time. Indeed, some of these are among the most successful program services.

These findings, which are consistent with the theoretical analysis presented above, are similar to those offered in another recent review of antitrust policy towards vertical integration in the cable industry:

...there is no empirical basis for concluding that vertical integration or mergers [in the cable industry] are, on balance, anticompetitive. Thus, in this case, there does not appear to be an empirical basis for challenging vertical mergers or seeking or accepting sweeping consents.¹⁷

IV. Modifying the Current Cable Ownership Rule

The previous discussion reveals that the concerns of the Congress were not well founded when it instructed the Commission to adopt national cable ownership

¹⁷ Michael W. Klass and Michael A. Salinger, "Do New Theories of Vertical Foreclosure Provide Sound Guidance for Consent Agreements in Vertical Merger Cases?," *The Antitrust Bulletin* (Fall 1995), p. 692.

limits. Integrated operators do not carry rival program services less often than do operators that are unintegrated. Moreover, only a small difference is found in those few studies where a statistically significant difference is observed. This evidence indicates that the Commission can raise the ownership limit without fear that vertical foreclosure will occur or monopsony power will be exercised.

This conclusion is buttressed by the substantial growth in DBS subscribership that has occurred since the rule was initially adopted. When the ownership cap was adopted, DBS had not yet become operational. By contrast, today there are 7.2 million DBS subscribers served by three major DBS operators — PrimeStar, EchoStar, and DirecTV — which “pass” almost all television households, and Kagan forecasts that there will be 12 million DBS subscribers by the year 2000.¹⁸ In addition, there are now about 4.5 million subscribers to C-band, MMDS, and SMATV.¹⁹

The competitive significance of this growth is completely ignored by the current cable ownership rule. Although non-cable MVPD subscribership has grown substantially, and program services can now reach virtually all television households through outlets other than local cable systems, that is not taken into account in the ownership cap placed on cable MSOs. Under the current rule, the number of subscribers served by competing MVPDs could increase substantially without affecting the number of subscribers that could be served by a cable MSO. Clearly, it

¹⁸ These data are from Paul Kagan Associates, *Kagan Media Index*, July 17, 1998, pp. 8, 14. During the period from 1994-1998, the number of DBS subscribers grew by 88.1% per annum, while the number of basic cable subscribers grew by 2.3% per annum.

¹⁹ The number of C-band subscribers declined slightly between 1994 and 1998 but the number of MMDS subscribers doubled and the number of SMATV subscribers increased by about 40%.

is important that the cap be modified to reflect the growing competitive significance of DBS and other MVPDs.

The rationale for the ownership rule is that if a sufficient number of outlets were not affiliated with a particular MVPD, the failure of that MVPD to carry rival program services would not foreclose them or weaken them substantially. The Commission's rule was adopted when the only significant MVPD outlets were cable systems, so that there was only a single outlet for a program service in each geographic area. As a result, a program service that was not carried by a cable system could not turn to another MVPD to reach viewers in that area. However, the growth in DBS subscribership, as well as the growth in subscribership of other non-cable MVPDs, has reduced whatever ability large cable MSOs may have had to engage in the kinds of practices that gave rise to Congress' concern about concentration in cable ownership. In particular, by creating additional outlets through which program services can reach potential subscribers, the growth of DBS has reduced any ability that a large cable MSO might have either to foreclose rival program services or to exercise monopsony power.

Because the growth of DBS and other MVPDs has substantially reduced the percentage of potential viewers that might be foreclosed by a large cable MSO, it is important to take that growth into account in establishing a cable ownership cap. Were the Commission to do so, the limit on the size of a cable MSO would be increased because DBS, along with other MVPDs, provides an alternative route through which a foreclosed programmer could reach virtually all television households.

One approach to modifying the cap is to take into account the number of homes passed by DBS. However, determining the effective number of homes passed by DBS is difficult because DBS “passes” virtually every household; indeed, because there are three DBS operators, these households are all passed numerous times. A *subscriber-based approach* can be thought of as a response to this practical difficulty because it raises no ambiguity about how to account for the growth of DBS and other non-cable MVPDs.²⁰ More importantly, a subscriber-based approach takes into account the fact that, as the number of subscribers served by other MVPDs increases, the ability of a large cable MSO to exercise monopsony power, or to engage in vertical foreclosure, is reduced. A subscriber-based approach automatically takes the growing competitive significance of other MVPDs into account by increasing the number of subscribers that can be served by any cable MSO as the number of subscribers to other MVPDs increases.

At the same time, however, it must be recognized that current DBS subscribership is likely to *understate* its competitive significance because DBS subscribership has been growing quite rapidly. In making their pricing, programming, and investment decisions, cable operators will take into account the fact that DBS is viewed as a good substitute by current and potential cable subscribers rather than focusing only on DBS’ current market share. Because of the long-lived nature of

²⁰ We originally supported the “homes-passed approach” because of a concern that a subscriber-based formula might create disincentives for subscriber growth for a MSO that was nearing the ownership cap. Thus, some households, which would have subscribed to cable in the absence of a subscriber cap, might have been without any MVPD service because of the subscriber cap. This concern is attenuated today, since cable systems face competitive alternatives in every area of the country, and households that are discouraged from subscribing to cable have other alternatives.

many of these decisions, cable operators must respond to DBS' competitive significance, not its current share.

V. Conclusion

Writing in 1993, we concluded that neither the then-current level of horizontal concentration in cable ownership, nor an increase in that concentration, posed a substantial threat of increased market power and reduced program diversity. This conclusion has been further buttressed by new evidence and market developments that have emerged since the 1992 Cable Act was adopted, and since the Commission adopted its rule limiting MSOs to passing no more than 30 percent of all cable households. The economic evidence indicates that Congress' concern about the foreclosure of rival program services was substantially overstated, if it had any basis at all. The most important market development has been the rapid growth of DBS, which in 1992 had no subscribers. By contrast, DBS operators currently have more than 7 million subscribers, or over 9 percent of subscribers to all MVPDs. As a result of this growth, cable subscribers and program services now have an important alternative that was not available to them in 1992. This, in turn, means that the Commission should be less concerned now than it was then about the potential for anticompetitive behavior by large MSOs and should, for this reason alone, raise its limit on the size of MSOs.

Appendix A

STATISTICAL ANALYSIS OF TCI'S CARRIAGE BEHAVIOR

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A.1 Introduction

We have undertaken two studies of TCI's carriage behavior. In the first study, we compare, for a large number of cable program services, TCI's overall carriage rate with that of other cable operators. In the second study, we carry out a statistical analysis of the carriage behavior of individual cable systems to determine whether, and to what extent, TCI systems behave differently from otherwise identical but unintegrated systems.

We find that TCI does not favor affiliated programming services in any way that significantly forecloses non-affiliated programming. Moreover, if TCI had undertaken a large-scale foreclosure strategy in the past, it would have carried competing services substantially less frequently than did unintegrated but otherwise identical cable operators. In fact, the evidence is inconsistent with this proposition. In those few cases in which there is a *statistical* relationship between vertical integration and carriage, the *economic* effect is invariably small. This evidence is inconsistent with the view that TCI has historically attempted to disadvantage rival programming services, and provides no support for the proposition that such conduct would likely take place in the future.

A.2 Comparison of TCI's Carriage Behavior to That of Other Cable Operators

We have performed a carriage analysis that compares TCI's current carriage of individual program services with carriage by all other cable system operators. The results of the analysis are reported in Table A-1.

The second and third columns of this table compare the carriage rate of various program services on TCI's owned-and-operated systems with the carriage rate for all other systems; the fifth column reports the difference in carriage rates. On average, the extent of carriage on TCI systems is *less* for all services, *owned or otherwise*. For services in which TCI has an ownership interest, the average carriage rate on TCI systems is about 6 percentage points less than that on other systems. For services in which TCI has no ownership interest, the average carriage rate on TCI systems is about 3 percentage points less than that for non-TCI systems. Thus, these data indicate that, relative to its owned services, *TCI actually favors non-affiliated services*.

Moreover, TCI's lower carriage rates of non-affiliated services typically affect only a small percentage (0.49 percent) of all cable subscribers. In addition, the number of TCI's affected subscribers typically represents a very small proportion (1.1 percent) of the total subscribers to the non-affiliated services. Of course, some services are affected to a greater extent, particularly the Sci Fi Channel, Home and Garden TV, The Inspirational Network, and the History Channel. However, two of these services, Home and Garden TV and the History Channel, were only in existence for a year or less during the time period

covered by our analysis. Thus, the lower penetration on TCI systems may simply have reflected the newness of these services.

Table A-1 also reports the results of a test to determine whether a higher ownership interest leads to a larger difference between TCI's carriage rate and that of other systems. If the degree of "favoritism" within the set of TCI's affiliated services increased with TCI's ownership percentage, one would expect a significant correlation between TCI's ownership interest and the carriage rate difference. In fact, the correlation is statistically insignificant.

A.3 Statistical Analysis of Carriage Behavior

We also undertook a statistical analysis of individual cable system behavior to address directly the concern that vertical integration between TCI and cable program services would lead TCI to disadvantage rival services. In particular, we analyzed, for each of a large number of cable program services, the determinants of the carriage behavior of TCI systems and of cable operators that are not affiliated with any cable program service. For all cable program services, we then estimated the number of TCI subscribers that are unavailable to "disadvantaged" services as a percentage of all subscriber transactions. We measured both the gross and net foreclosure rates, where the gross foreclosure rate is the percentage of subscribers (or subscriber transactions) without access to services that are carried less frequently on TCI's systems than on unintegrated systems. The net foreclosure rate is the gross foreclosure rate less the rate at which rival services *gain* because TCI carries them *more frequently* than do unintegrated systems. While the gross foreclosure rate may be used to

evaluate the carriage of any *particular* rival (or owned) service, drawing inferences about the presence and extent of foreclosure for any *group* of services must also account for services that are favored by TCI.

A.3.1 Methodology

Our approach is to estimate the difference between the carriage of a service by a TCI system and its carriage by an otherwise identical system that is unintegrated with a cable service. Ultimately, we are seeking answers to the following questions: First, given two otherwise identical cable systems, will the systems' propensity to carry any particular service differ if one is owned by TCI and the other is not? Second, if there is a difference, how large is it? Below we discuss the methodology we employed in conducting our statistical foreclosure analysis.

For each of 65 nationally distributed pay and basic services, using data from the 1993 Cable and Television Factbook, we estimated the likelihood that a sample of majority-owned TCI systems would carry the service, after accounting for differences in system and franchise characteristics.¹ Similarly, we estimated the likelihood that a cable system not affiliated with any program service would

¹ We focused only on nationally distributed services. While judgment was used in this determination, typically the service had to reach at least a dozen states and not be confined to any specific geographic region. We excluded audio-only and text-only services from the analysis. In addition, we became aware that at the time of submitting their Factbook entries, TCI was instructing systems to report the combined Nickelodeon and Nick-at-Nite services as Nickelodeon only. We understand that virtually every TCI system carrying Nickelodeon also carried Nick-at-Nite. To avoid any confusion, we excluded Nick-at-Nite from our calculations.

carry each of these services.² For each service, we then calculated the number of TCI subscribers that did not have access to each service, or the extent to which the service was offered to additional subscribers, because of its greater carriage on TCI systems. In both cases, this difference was calculated as the number of subscribers that would have had access to the service on TCI systems, minus those who would have had access to the service on otherwise identical but unintegrated cable systems.³

² Technically, we estimated probit equations for each of these services. These probits were designed to adhere as closely as possible to Crandall's specification. The dependent variable in the probit took a value of 1 if the service was carried by the system and zero otherwise. In addition to including a variable that took a value of 1 if the system in question was a TCI-owned system, the other variables controlling for system and franchise characteristics included: system age, homes passed, the number of off-air stations, miles of cable per subscriber, the basic subscription fee, the number of basic subscribers, the channel capacity of the system, the number of subscribers per home passed by the cable system, percentage of the population over 65, percentage of the population under 14, percentage of the population between 15 and 24, income per household, and number of persons per household. The data for the system characteristics were drawn from the Factbook. Because the data contained in the Factbook can be years old, we limited the analysis to those systems reporting data from January 1, 1992.

The demographic data were drawn from the City and County Databook and were matched to the Factbook data by the reported counties served. In order to determine which systems were TCI systems and which of those were majority-owned, we relied on the Factbook information. To determine which systems were non-affiliated with any program service, we compared the system owner with a list of owners of program services from the Factbook, various newsletters published by Paul Kagan, Inc., and internal TCI documents. After excluding observations with missing values, the TCI sample consisted of 754 systems and the unintegrated sample consisted of 1,480 systems.

For each service, the raw TCI carriage statistics, those for the unintegrated systems, the estimated coefficient of the TCI variable, and its associated P-value (level of statistical significance) are reported in Table A-4.

³ For each TCI system in the sample, we estimated the probability of carrying the particular service on a TCI system and the probability of carrying the same service on an unintegrated but otherwise identical system. The difference in probabilities was then multiplied by the number of subscribers to the system to determine the extent to which a service was advantaged or disadvantaged. For each service, this number was then summed over all TCI systems in the sample and computed as a percentage of all TCI subscribers in the sample. Finally, this percentage was applied to all TCI's subscribers (as opposed to only those in the sample) to estimate the subscribers in all of TCI's systems having access to the service.

There were some services for which we were unable to estimate the extent of advantage or disadvantage from the probit coefficients because the service was either carried or not carried by

A.3.2 Results

Table A-2 reports the estimated differences in carriage rates between TCI and its unintegrated counterparts. As shown in this table, TCI's carriage behavior disadvantaged 21 non-affiliated services, affecting 18.5 million subscriber transactions, and advantaged 25 non-affiliated services, affecting 14.7 million subscriber transactions. The estimated gross foreclosure rate for all services combined is about 1.8 percent,⁴ and the net foreclosure rate *is less than one-half of one percent*.

None of these foreclosure rates appears quantitatively significant. TCI's carriage behavior towards non-affiliated services becomes even less competitively significant when viewed in light of the results contained in Table A-3, which reveals that TCI "forecloses" about one-third of the 19 TCI-affiliated services considered in this analysis. Indeed, the typical percentage of TCI subscribers without access to these affiliated services (the typical gross foreclosure rate) is about 8.5 percent, an average that is *higher* than that for the disadvantaged non-affiliated services.

virtually all systems. For these services, we multiplied the difference in the raw carriage frequencies by the number of TCI subscribers. Finally, TCI's carriage rate for a number of services was not statistically different from that of unintegrated systems. Thus, statistically, these services were neither disadvantaged nor advantaged by TCI carriage choices. For these services, we used the point estimate to estimate the extent of advantage or disadvantage.

We used the predicted probability that a particular TCI system would carry a service, rather than using the actual access to the service on TCI systems. This is because some variables have likely been omitted from our analysis, and their omission would be reflected in the actual but not the predicted subscriber access.

In sum, while some non-affiliated services are available to fewer TCI subscribers than to subscribers to comparable unintegrated systems, the extent of the affected market is too small to be seen as the outcome of a foreclosure strategy or to have a significant effect on competition. Indeed, by this standard, nearly one-third of the TCI-affiliated programming services studied here are also disadvantaged -- *and importantly, more non-affiliated services are advantaged than disadvantaged by TCI*. These results comport with the view that TCI's carriage decisions are largely, if not solely, determined by which services are profitable to offer cable subscribers, without regard to the effect of those carriage decisions on TCI's competitive position in the supply of program services.

A.4 Evidence Regarding Favoritism

A.4.1 Favoritism and Efficiency

Because vertical integration between cable systems and program services reduces or eliminates a number of costs associated with arm's-length transactions, including double marginalization, bargaining costs, and opportunism, the costs of carrying an affiliated service are lower than those for a non-affiliated service. Thus, a finding that vertically integrated cable operators tend to carry their affiliated services more often than do unintegrated operators is unremarkable. Of the 19 TCI-affiliated services we examined (see Table A-3),

⁴ This is calculated as the number of subscriber transactions foreclosed for all non-affiliated services as a percentage of the total number of subscriber transactions for all non-affiliated services (see Table A-2).

13 are advantaged by TCI. However, Encore is the only service for which the extent of the advantage is substantially greater than that for non-affiliated services and the evidence does not suggest this resulted from an exclusionary strategy.

Moreover, as observed earlier⁵, TCI carries nearly one-third of its *affiliated services less* often than unintegrated systems. Indeed, for affiliated services, the typical percentage of TCI subscribers that are disadvantaged by TCI's carriage is about 8.5 percent, an average that is *higher* than that for the *non-affiliated* services that are disadvantaged by TCI's carriage behavior.

A.4.2 Efficiencies

Because the evidence regarding exclusionary behavior appears weak, this might suggest that any favoritism by TCI towards affiliated services is more likely due to efficiency rather than anticompetitive reasons. We also conducted a somewhat more direct test of this hypothesis. If vertical integration results in cost savings, one way in which those savings may become apparent is through increases in the number of services offered by TCI. We performed regressions of the number of services offered both by TCI and by unintegrated systems on a variety of independent variables. The results suggest that, holding other factors

⁵ See Tables A-2 and A-3.