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Regulatory Failure: Time for a New Policy Paradigm (*)

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Abstract: Regulation is presumed to be designed to avoid (potential) market failures, usually because of firms' market power, the consequence of which leads to a decrease in economic welfare. However, the cost of regulation may outweigh any effects policy makers have on the firm due to administrative costs, regulatory capture and other effects that have been addressed by others. More importantly, policy makers have been using the wrong models to guide their decisions, with a major impact on the investment incentives of firms, a misallocation of resources and a lowering of social welfare. As policy makers misread economic theory, they produce results worse than those they are attempting to correct. Thus, these distorting effects are equally as bad, or worse than, the market failure regulators hoped to ameliorate. However, this need not be the case. By concentration on dynamic models, rather than the simple static models on which policy makers have focused, it is possible to improve economic welfare and obtain results that at least are better than the costs associated with current regulatory practices. Ofcom appears to be moving in this direction. Will other policy makers learn from Ofcom? This paper shows some of the failures of the current model and sets forth some of the necessary steps to make improvements. However, it is unclear whether the institutional structures will allow for such a departure from the current paradigm.

Key words: competition, economic dynamics, neoclassical economics, pricing policy, regulation.

The rationale for government intervention in markets has been a market failure – usually due to monopoly/oligopoly power. Without government intervention, so the argument goes, prices will be too high, restricting demand and creating excess profits – all of which creates inefficiencies and leads to high social costs and loss of welfare. In the

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telecommunication industry network externalities are also suggested as a rationale for intervention. Turning the issue on its head, this paper questions whether the appropriate regulatory models, and hence the suitable policies have been applied. This paper asks if the cost of regulation is not worse than the problems it is allegedly correcting? Is government failure greater than any possible market failure in the current environment? The paper ends with a discussion of dynamic models that correct many of the problems with the static models identified. This paper only highlights some of these issues, but in light of the New European Regulatory Directives and the legislation under consideration by the United States Congress, we are of the opinion that this side of the equation should be addressed ¹.

This paper focuses on whether the tools been applied correctly and finds that they have not. Secondly, it suggests changing the policy paradigm to a model that considers the dynamic nature of markets and the firms' incentives and behavior in this context. Although dynamic models are more difficult to specify and analyse, and generally offer no simple solutions, this shift in focus, if it were to be maintained, would correct many of the distortions created by the current paradigm and make regulation meaningful.

Although the United States is used in our examples, it is not unique in this respect. Policy communities throughout the world have used a simplistic approach to policy formulation, and in particular to competitive and pricing issues, while ignoring investment issues. Policy makers have incorrectly assumed that the outcome of "competition" will promote optimal and desirable investment. We take issue with this conjecture: "competition" is not the competition of the economist; the inference does not address the appropriateness of the investments. Indeed, this paper shows that current regulatory policy promoting "competition" has been deleterious to sound investment policy.

Firstly, we address the range of problems introduced by the misapplication of the perfectly competitive model: the introduction of competition without regard to its efficiency and the distortion in pricing created by relying on the perfectly competitive model. The second section addresses how the inappropriate foundation of public policy distorts "competition," pricing guidelines and leads to inappropriate investments decisions. The third section briefly discusses how dynamic models address and alleviate many of

¹ Some may protest that we are in a "deregulated" environment, but this is belied by the extensive size of the regulatory budgets in the United States and Europe.

these issues. The fourth section discusses what lessons we can learn from this analysis and the final section offers some conclusions and suggestions for future research.

■ Incorrect foundations

With respect to competitive policy, many regulators have made the leap from the results derived from perfect competitive markets and determined that a duopoly – a market structure with only two players in the market – is "competitive." This line of reasoning explains why when British Telecom was privatized in the United Kingdom during the mid-1980s, the regulatory authority allowed only one additional carrier into the market. It also explains why cellular mobile licenses were granted to the incumbent carriers and one other provider in the United States ².

We do not disagree with the construct of the competitive model, but rather question its applicability in a world in which the assumptions underlying perfect competition are far removed from market reality. Furthermore, the competitive model is, at best, a comparative static model that does not entirely correspond to market place realities. Perfect information is not available, capital markets are not efficient, input prices are not set competitively, etc. Our focus in this essay is on the applicability of the textbook model of competition and how misapplying this model distorts policy choices. A corollary to these issues is whether the policy targets are the appropriate ones. Should the focus be on investment policy and not on the promotion of competition for its own sake? Our answer is affirmative.

Competition

The conventional economic model of perfect competition produces many desirable results. Only the most efficient producers survive, and are producing at the lowest minimum unit cost. Consumers cannot be made better off without making others worse off. Prices are optimal. Utopia has

² Clearly, a cellular service can be seen as a viable alternative to fixed-line telephone service, but initially granting a cellular license to the incumbent largely foreclosed this alternative. After the completion of the recent mergers and acquisitions in the United States, fixed-line incumbents will control 75 percent of the cellular market (BAUER, 2005).

been achieved with perfect competition. Is it any wonder that the policy makers point to competition as a panacea with which to solve all economic ills? Consider the late-1970s and early-1980s where the telecommunications industry was undergoing unprecedented change. Competition was expanded to ever widening areas due to court and Federal Communications Commission (FCC) decisions – private lines (1959), private microwave systems (1969), customer premise equipment (CPE) (1968), domestic satellites (1972) and public switched networks (1976 and 1978)³.

In the early 1970s in the United States some policy makers argued for competition as the preferred policy when reviewing the domestic satellite policy. The competitive focus led to the opening of the customer premise equipment (CPE) market and the entrance of MCI into the long distance market. These events seemed to underscore the benefits of competition. The history of this move to competition is well documented (KAHN, 1988) and we do not intend to repeat it here, except to point out that the notion of competition began to permeate the thinking of policy makers (after they fought its adoption in the preceding years). Indeed, the results were encouraging. Innovations in customer premise equipment occurred and prices fell (including long distance charges). Other players entered the market. Technology innovation proceeded apace, with cellular mobile service implemented after many years of regulatory debate, and the nascent internet was being developed⁴. Market structures were also undergoing changes. New interexchange carriers were gaining market share. Clearly, the traditional monopoly structure dominated by the Bell System and independent telephone companies was changing dramatically. Thus, the late-1970s and early-1980s marked a watershed for the telecommunications industry. This period culminated in the 1984 divestiture of AT&T into a long-distance company and seven regional operators⁵. This radical change was to settle the government's antitrust lawsuit against AT&T (ALLEMAN & COLE, 2003).

Concurrently, in the United Kingdom the move towards privatization began with British Telecom (BT), which was privatized around the same time as the AT&T divestiture. The UK Government also had a competitive model in mind when BT was privatized. The government allowed Mercury (a

³ See ALLEMAN & COLE (2003) for a brief history of these events.

⁴ See HAUSMAN (2002) for an estimate of the cost of regulatory delay in the cellular market.

⁵ AT&T's manufacturing arm (Western Electric) remained, but Bell Laboratories was divided between AT&T and the regional operators.

subsidiary of Cable and Wireless, the traditional international carrier in the UK) to enter the market, but no other players. Soon a series of privatizations around the world were proposed and in many cases, took place with the encouragement of the U.S. and the UK Governments. The "competitive" model was the model in vogue! ⁶

Faux success

In the case of CPE, the conditions were close enough to the conventional model to allow competitive entry. The telephone was similar to many other electronic appliances made by other manufacturers. Economies of scale and scope were not significant, if they existed at all as many firms entered the market. Moreover, this market had high profit margins since this segment of the market was probably where incumbent telephone companies had previously "hidden" monopoly rents from their other businesses that were under regulatory control. A variety of new and innovative CPE equipment was introduced and prices fell. A true success story for competition!

However, the same cannot be said of the long distance segment. Here the conditions, which prompted the entry of MCI and others, were due to an arcane mechanism used to determine telephone industry "costs". The system was based on the Smith vs. Illinois Supreme Court decision in 1930 where the Court ruled that some local exchange equipment (or plant) had to be allocated to intrastate and interstate long-distance service by jurisdictional separation. This jurisdictional separation of cost began as a small percentage of local costs, but grew as different plans were implemented and through the growth in long-distance minutes, on which the allocations were based (ALLEMAN & COLE, 2003). Thus the industry had allocated its costs between "local" and long distance businesses by an arbitrary cost allocation mechanism, which for political reasons steadily increased the allocation to long distance over time. It was under this costing/pricing umbrella that MCI and other long distance carriers were able to shelter themselves from the rigors of the market place. That is, the prices they were "competing" against were artificial and did not represent the true cost of the service, but a composite of the local access and long distance

⁶ This policy was coupled with "price cap" or incentive regulation, which limited the weighted average of the incumbent carrier's price changes to less than the change in the consumer price index less a factor for productivity improvements. This was introduced by the UK Government, but was soon adopted in the United States and other countries that privatized their telecommunication and other infrastructure sectors.

costs. Thus, while prices fell in this segment, this was not due to more efficient providers ⁷.

The other "success" story was the Competitive Access Providers (CAPs) who were also able to take advantage of the price disparity caused by the cost allocations mechanisms. Initially, these carriers provided services to business customers in large metropolitan areas. Among the reasons for their comparative advantage was the over-pricing of the business services to support cost allocations. The CAPs could not only offer lower cost services because they did not provide a subsidy between the residential and business customer as incumbents did, they could also offer a direct connection to long distance carriers, avoiding the "local" costs allocated to this service by incumbents. Moreover, the CAPs operated in the large urban areas which traditionally had higher prices (not costs) than rural areas. Thus, the three services – long distance, business and urban areas – subsidized residential access and rural areas, which then allowed firms to enter the markets providing the subsidy. Business access costs dropped and so did long-distance prices for these business customers. The two major CAPs, Teleport and MFS, proved such a success that they were sold to AT&T and MCI, respectively for billions of dollars. Thus, from an uninitiated perspective, these cases "proved" the success of competition. After fighting the introduction of competition, and losing several court battles in the process, the FCC and the legislature embraced the concept. The result became reflected in the Telecommunication Act of 1996.

The apparent success of MCI, and the huge gains in the sale of Teleport and MFS were an example others wished to emulate. In addition, the public was becoming aware of the internet with all its promise. Thus, the stage was set for a spectacular expansion of the information, communications and technology (ITC) sector and the related stock market bubble, which collapsed in the spring of 2001.

Others have covered the rise and fall of the sector (CRANDALL, 2005; NOAM, 2003) and the (ir)rationality of the stock market crash (SCHILLER, 2000). What we wish to point out is that, it was largely the failure of government policy due to a lack of understanding of the underlying

⁷ The market test of the new entrants' efficiency *vis-à-vis* the incumbents could not be proved definitively one way or another because of the cost allocations, although many well-compensated consultants tried.

economics that led to this market failure⁸. Two firms do not create competition in the economist's sense, nor is competition sustainable when false price signals are sent to the market because of artificial cost allocations. What policy makers failed to note were the special requirements of perfect competition and the particular circumstances of the industries to which they were applying it.

Optimal pricing

Let us now examine how these inappropriate models have impacted pricing or ratemaking issues. Since the 1996 Telecommunication Act, the FCC has formalized its pricing policy by relying on notions derived from competition theory. As noted, perfect competition implies that when there are many firms – virtually an infinite number – in the industry, no single firm can affect prices in the market. From the firm's point, according to the theory, demand is perfectly elastic and the firm produces where price equals marginal cost. It is then shown that this is the most efficient allocation of resources. Ergo, first-best pricing is price equals marginal cost. However, infinity is a great deal more than two or three or four firms in the industry⁹.

With respect to pricing rules, simplistic results have been utilized, as noted. The prime example is the rule "price equals marginal cost" derived from the efficient price rule of conventional economics in a static context. It has been used to justify "long-run incremental cost" methodology to determine prices. In the United States this has been contextualized as Total Service Long Run Incremental Cost (TSLRIC)¹⁰. The fundamental idea is that under the neoclassical economics assumption of perfect competition this is the best, most efficient pricing method.

⁸ DARBY (2002) estimates that the loss in market capitalization was over five trillion (United States) dollars, 98 percent of which was lost in the information, communication, and technology (ICT) sector (approximately four and a half trillion dollars).

⁹ Recognizing that this perfect world does not exist, some commentators have developed the theory of contestable markets, claiming that this emulates the competitive solutions (BAUMOL & SIDAK, 1995; BAUMOL, PANZER & WILLIG, 1982). We, and others, take issue with this (NUTTAL & VICKERY, 1996). This theory is flawed in that it assumes that the entry into and exit from markets is costless. This might not be a problem if the theory decayed as this assumption is relaxed, but it does not. The theory totally collapses if even the smallest cost of entry or exit exists (See ALLEMAN, 1999)

¹⁰ For a review of the history and rationale of this practice in the United States, see NUECHTERLEIN & WEISER (2005).

However, this perfect world does not exist as we have already noted and, as many commentators have pointed out, externalities – call and network – distort the simple model; economies of scale and scope eliminate the possibility of an infinite number of providers; indeed in capital intensive network industries such as telecommunications, only a few providers can survive ¹¹. Nevertheless, policy makers have assumed that this perfect world exists; and have attempted to require incumbents to interconnect with entrants at prices that approximate static marginal costs. They have attempted this by producing a variety of engineering cost models to mimic the "marginal cost" methodology. These models have serious flaws because they lack a fundamental understanding of economics and finance. We do not wish to critique these models – this has been done adequately elsewhere – except to note that none of them has a dynamic component that accounts for uncertainty of costs and revenues (See ALLEMAN, 1999).

Nevertheless, regulatory communities have accepted the traditional first-best pricing results, and the models on which they are based, to apply to charges for intermediate services such as interconnection or access to the network ¹². We disagree with this approach on numerous grounds, but this paper's primary concern is with the lack of dynamic efficiency of these naive pricing instruments (and cost models), which we discuss below.

■ Lack of dynamic efficiency

Virtually all policy makers have ignored dynamic considerations in their deliberations. While current policy practices do not account for dynamic efficiency, we feel it is more significant than static efficiency. Static efficiency is concerned with the allocation of resources at a moment in time when, *inter alia*, the productions technologies are the same, knowledge is the same and the products/services are identical, etc.

A moment's reflection will determine this is an extremely narrow view of the economy, particularly in the ICT sector which has seen dramatic

¹¹ As BOURDEAU *et al.* in this volume show, the problem may be more insidious. Incumbents may be able to exclude competition by virtue of their choice of technology, patents, and other means to foreclose entry into their markets.

¹² For a general exposition of the intermediate pricing issues, see LAFONT & TIROLE (2000). For a review of the economics literature on the derivation of a variety of pricing rules from these models, see VOGELSANG (2004).

changes. Alternative, but not exactly similar services are in use: fixed-line voice, cellular mobile service, and voice over internet protocol (VoIP) are certainly not identical as assumed of the neoclassical models. Or on the video side: cable services, direct satellite services, and streaming video over a broadband connection are similar but have their own unique characteristics. Likewise, this sector has witnessed a series of product innovations and technological progress such as digital service over cable and digital subscriber line (DSL) service over the traditional telephone lines. Or consider the internet or many of its derivative innovations and services such as streaming audio and video, VoIP, etc. None of these fit the static model of competition.

However, dynamic models assume all of these conditions to varying degrees: resources are not stagnant; innovations will occur, technical progress will continue, substitute services will arise, and consumers' desires and needs will change. In these situations the policy maker does not have a "formula" to apply in developing policy. They are forced to make a much more reasoned approach to what will happen in the market – with technology, innovation, and market power. Consumers' desires may go well beyond simply the price of a service – but include its attributes, performance, qualities, etc. And, since the ultimate goal of public policy may not be lower (short-term) prices, policy makers must be concerned with a larger view of the benefits derived from various market structures. Innovation, economic growth, and the magnitude and quality of investment over the long run should be their concern (ELLIG, 2001) ¹³.

In this short essay, we address one aspect of these dynamic issues – investment and, in particular, sunk investments ¹⁴. While it goes without saying, ICT Investment decisions are crucial to the future infrastructure of an economy, and regulatory policy has significant impact on these decisions. But much of the economic literature ignores this consideration of the dynamic impact ¹⁵ and how it affects the timing, magnitude and pattern of

¹³ Dynamic models have been in the economist tool kit for sometime, for example Schumpeter's work; unfortunately, they seem to be rarely utilized. The Schumpeterian model is one of those models most often cited, but the policy makers do not seem to relay on this or other dynamic models in their deliberations.

¹⁴ ELLIG (2001) develops taxonomy of dynamic economic analysis and his book of readings provides examples of the various methods.

¹⁵ There are exceptions, of course; for example in the ICT sector, CRANDALL *et al.* (2004), EVANS & SCHMALENSEE (2001), HAUSMAN (1998, 1999), PINDYCK (2004, 2005a), and QUIGLEY (2004).

investments and how these concerns interact with financial markets ¹⁶. Indeed, the prospective of regulatory behavior by financial markets can have a significant impact on the equity and bonds markets that, in turn, determines the cost and level of funding of the enterprise. Among the goals that the regulators should consider are how their decisions will impact innovation, the cost of capital, the magnitude of investment, as well as its timing because all of these will ultimately impact costs and prices in the long run. However, the nature of investment in this sector have unique characteristics: they are significant and to a large extent sunk or irreversible.

If a policy maker is concerned with social welfare, then this requires knowledge of economic cost and benefits, but not simply in the static sense. This paper argues that not recognizing the dynamic benefits and costs leads to a distortion of social welfare. More specifically, significant costs will be unrecognized if the dynamics of the firm are not considered. The interaction of regulation with valuation influences welfare in several dimensions. Firstly, unrecognized costs on the part of the regulatory community mean that the prices set by it will not be correct. Secondly, if the financial community recognises that the regulator is not accounting for all the enterprise's costs, then it will be more expensive for the firm to raise debt and equity capital, which, in turn, will increase cost in a vicious cycle, raising costs for consumers.

Unrecognized opportunity costs

For example, one of the major costs that has not been adequately identified or quantified is the obligation to serve. Under the current practice in most countries, whenever a customer demands service, incumbent carriers are obligated to provide the service as part of the common carrier obligation. With respect to investments in new services such as broadband, this unrecognized cost may be even more critical. The United States Congress has had legislation before it that would require telephone companies to provide mandatory broadband service. This would not allow firms to assess the market, determine the best time to enter and where best to enter. Firms would be on a specific time and geographic schedule and would lose the option to delay. Moreover, if the customer proves

¹⁶ Economists, at least since the time of AVERCH & JOHNSON (1962), have noted that regulation can impact investment decisions, but make no assumptions about the impact of regulations on financial markets.

unprofitable, the carrier still must retain this customer. Thus, carriers also lose their right or option to abandon the service (ALLEMAN & RAPPOPORT, 2002). But these options are opportunity costs, which must be recognized in proper cost determination (ALLEMAN & RAPPOPORT, forthcoming). Under the regulatory franchise, incumbent carriers are precluded from exercising the option to delay or shutdown and restart operations.

The options have not been considered in the various cost models that have been utilized by the regulatory community for a variety of policy purposes. The lack of consideration of these options imposes a cost to companies and society. As mentioned, the loss of these options can be thought of as an opportunity cost to firms. In a previous paper the authors (2002) used the deployment of DSL to illustrate the delay option and the learning option. We indicated how both may be quantified and suggested the parameters that are relevant for these options (See ALLEMAN & RAPPOPORT, forthcoming) for an elaboration of these issues. Many of these options arise because of irreversible investments or sunk costs. Indeed, the most valuable options may be those associated with sunk costs, since, once exercised, the investments are irreversible. Moreover, if the investment proves unprofitable, the firm cannot recover even some of its investment costs. These costs are not only applicable to the incumbents, but to potential entrants. Thus, when policymakers consider what would be required for new firms to enter a market, they must consider the entrant's option or opportunity costs.

Irreversible investments also play a critical role in the determination of market structure (PINDYCK, 2005b). Indeed, this is implicitly recognized to varying degrees by regulatory commissions by the requirement to interconnect entrants to incumbents' networks. What policy makers have failed to recognize is the irreversibility of these costs and their implications.

One of the greatest sources of potential in terms of the application of dynamic analysis is dealing with irreversible investments, since such an investment means that a wrong decision cannot be changed, in contrast to an investment which, if the investment proves to be unprofitable, can be sold¹⁷. But who will buy fiber in the ground, if it has proved unprofitable? It cannot be easily moved or put to another use. Thus, intuitively, the "hurtle-rate" will have to be higher than an investment which is fungible.

¹⁷ We only focus on one tool of dynamic analysis in this essay, but others are available (ELLIG, 2001).

Alternatively, if the firm "waits-and-watches"; the market to see if a profitable environment is forthcoming, it can make the correct decision before committing the investment with a positive probability of failure.

Sunk costs

What are sunk costs and how do they impact pricing issues, entry conditions and market structure? Sunk costs are generally industry and firm specific, which implies that they are not fungible¹⁸. In particular, when the economy is in a down cycle, the firm's plant and equipment cannot be sold to others in the industry, because they have no value (ALLEMAN & RAPPOPORT, forthcoming; PINDYCK, 2005b). When considered dynamically, it is clear the incumbent firm has already exercised its option to delay; whereas in the static context, this fact would not be considered, but only the direct cost of the investment. Thus, one can think of this as an opportunity cost. Yet it is worth noting that even in this simple example, the difference is profound. None of the cost models or the incremental cost-pricing models even considered this opportunity cost. Moreover, this is just one of the many considerations policy makers, business people and financial analysts would bear in mind when making the investment. Potential competitors also have to value not only the direct cost of investing, but also its delay option. The consideration of sunk costs, as opposed to fungible investment alternatives, raises entry barriers. Neglect of these dynamic issues can cause serious and distorted policy making¹⁹.

However, this is not the only concern in a dynamic world. Demand, technology, factor prices, and many other parameters are subject to uncertainty. One of the principal uncertainties for new services is demand, which, in turn, impacts cash flow, investment valuations, profits, and economic depreciation among other economic variables. Regulation can also present the market and the firm with uncertainty, since regulation can

¹⁸ Sunk costs should be distinguished from fixed costs. Sunk costs are costs that cannot be recovered once they are incurred, whereas fixed costs end once the firm ceases production. An important distinction between fixed and sunk cost is that the sunk cost that has to be incurred at the initiation of the project, before the profitability of the project is known. See PINDYCK (2005a) and ALLEMAN & RAPPOPORT (forthcoming) and the reference cited therein.

¹⁹ This is distinct from the HAUSMAN's analysis (1998 and 1999) of the "free option" which is available to the CLEC under the unbundled network elements (UNE) policy. In the case we discuss, the opportunity cost is incurred because the incumbent has exercised its options, and, thus it is no longer available – the money has been spent.

restrict the flexibility of the firm through the imposition of price constraints and by imposing costs associated with either delay, abandonment, or foreclosing other options available to the firm. If these regulatory impacts are left unaccounted, there are significant costs to the firm and to society. (ALLEMAN & RAPPOPORT, 2002, forthcoming)

Fortunately, this is not true everywhere. Ofcom (2005), the regulatory authority in the United Kingdom, has explicitly recognized that dynamic issues are important. It has requested comment on one of the techniques for examining pricing issues using some of the dynamic tools that are available. We applaud Ofcom's approach of examining the real options method to determine the correct pricing of wholesale rates for alternative carriers. Let us anticipate that other regulators will follow. We hope that this essay will spur more discussion and research into the dynamic nature of the ITC market place and its regulation.

■ Lessons

What are the lessons to be learned? Firstly, in the current debate over convergence, policy makers point to telephony and cable companies moving into each other's markets²⁰. Telephone companies are announcing video services to their customers and cable firms are providing voice telephone services. In the video sector, policy makers also point out that satellites provide video services. In voice services, wireless is also available. "Aha!" policy makers exclaim, competition has arrived. We can now leave these areas to market forces. All that needs to be done is to provide a "level-playing field" (MARTIN, 2005)²¹. A plethora of providers! No appeal to duopoly or oligopoly theory, the market is at work, nothing more needs to be done.; and certainly not any dynamic analysis. Obviously, recent history belies this conjecture. The lesson is that these are not perfectly competitive markets and, therefore, cannot be relied on to produce the results of perfect competition. Moreover, the world is not static; dynamic considerations must be accounted for. A more nuanced approach needs to be taken which accounts for market power, the substitution of alternatives (and who controls

²⁰ See BAUER in this volume for an in-depth discussion of the convergence concept and its pitfalls.

²¹ This is not to discount the concept of a level playing field, but this does not solve all problems.

them), how will the dynamics play out etc. and how will this impact investment decisions. A hands-off approach will not suffice to obtain the desired societal outcome.

■ Conclusion and further research

The legislative and regulatory communities, as well as significant segments of the academic community, have relied on simple static or comparative static analysis to determine proper regulatory policy, particularly competition and pricing policy. Allegedly, these policies are to correct market failures, but the question is whether these policies are more detrimental than the market failures they are designed to remedy. The large public costs of regulation, as well as costs to the firms who must deal with the regulators and legislators, gaming of the regulatory process, etc. may well have swamped the distortions caused by market failures. Even more so if the models used by policy makers do not reflect market place realities, especially given that intermodal competition is emerging in the sector.

A variety of dynamic models are now available offering better and more profound insights into the workings of the market. If policy makers are going to evoke the "market" then they need a better understanding of what this means.

In this essay, we have focused on two regulatory problems related to the inappropriateness of the models used by policy makers. The first is to apply a simple, but easily understood, competitive model that is inappropriate to market conditions. The second focus in this essay is on the lack of dynamic considerations and how this impacts policy choices. This dynamic aspect of the market has been virtually totally ignored in the policy community. Both factors cause inappropriate policy conclusion with as yet unquantified costs to society.

On a brighter note, Ofcom (2005) has begun to recognize some of the new techniques for examining policy issues with the dynamic tools that are available. We trust that this paper will spur more discussion and research into the dynamic nature of the ITC market place and can only hope that institutional structure will allow for such a departure from today's paradigm.

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