Historical Distortion:
How Misuse of "Public Utility and "Natural Monopoly" Misdirects U.S. Telecommunications Policy Development

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Introduction

This paper is another component in my body of research that examines how "public utility" and "natural monopoly" have been misused in U.S. telecommunications policy debates as to both network neutrality and technology transitions. In 2014 as the FCC considered potential Internet openness rules upon remand in *Verizon v. FCC,* opponents mischaracterized reclassification of broadband Internet access services under Title II as "public utility" regulation and unnecessary given the absence of monopoly power. Large telecommunications providers have also used "natural monopoly" to influence the FCC's consideration of technology transitions and states' consideration of deregulatory policies. Misuse of public utility and natural monopoly concepts misdirects policy inquiry and, if insufficiently rebutted, may lead to adoption of policies adverse to societal and customer interests.

In the FCC's open Internet proceeding, I filed a research paper coauthored with Jon Peha (Cherry & Peha, 2014), which was written to redirect inquiry to the proper legal basis for classifying a service – simply the coexistence of certain technical and commercial functionalities of the service – as a common carriage ("telecommunications service") under Title II of the federal Communications Act. This redirection was necessary to refute the mischaracterization, whether intentional or unintentional, that such classification is based on assessment of market structure, market power or monopoly. This research paper (Cherry & Peha, 2014) relied in significant part on my prior research that explains how conflation between the two legal statuses of common carrier and public utility has contributed to such mischaracterization (Cherry, 1999, 2006, 2008b).

In its *Open Internet Order* (2015), the FCC relied on the analysis in Cherry and Peha (2014) in its declaratory ruling that classified commercial broadband Internet access service as a Title II service. The FCC 2015 order is currently under appeal before the D.C. Circuit Court of Appeals. Even if upheld, Congressional legislation to override the order remains ever a possibility. Moreover, there will be continuing regulatory and legislative developments, both state and federal, related to technology

transitions. For these reasons, ongoing and future policy debates need to be informed as to how public utility and natural monopoly concepts have, and may continue to be, misused to influence adoption of policies adverse to societal and consumer interests.

Another component of my research relating to misuse of public utility and natural monopoly concepts examines why recent telecommunications policy outcomes are diverging between the U.S. and Canada, notwithstanding the similarities in their common law and statutory law histories. My comparative analysis (Cherry, 2015) finds that a *false monopoly theory* argument – that the historical duties of telecommunications carriers have been based on the existence of monopoly, and thus are not applicable in a competitive environment – has been raised in both nations to support deregulatory policies. In this regard, in both the U.S. and Canada, telecommunications carriers' dual legal status as common carriers and public utilities under the common law has created confusion, creating a tendency to misattribute their duty to serve to the existence of monopoly. The efficacy of this false monopoly theory, however, has been greater and continues to distort telecommunications policy development in the U.S. In Canada, the confusion underlying the false monopoly theory argument has been more easily corrected in light of some important historical differences in the evolution of early telephony policy choices[1] as well as differences in administrative procedures and policymaking forums.[2] A manifestation of the difference in policy outcomes is that the CRTC expressly rejected the monopoly theory argument in a proceeding on broadband providers' obligation to serve, whereas the FCC has not directly litigated the issue. In addition, Canada has always maintained a common carriage classification for broadband services; on the other hand, in the U.S. the FCC classified cable modem

[1] One of the critical historical differences was the invalidation of Bell telephony patents in Canada a full decade before their expiration in the U.S. This led to an earlier period of legal telephony competition and policy experimentation in Canada. This experimentation resulted in provincial ownership of telephony in some Canadian provinces. Having learned from this experience, AT&T created its now famous public relations campaign of regulated monopoly as a *political strategy* to avoid public ownership of telephony by States in the U.S. This public relations campaign has induced a false memory in the U.S. – not found in Canada – as to the origins of regulated monopoly for telephony. This false memory is now being leveraged (in combination with the confusion between common carriage and public utility) in the U.S. for purposes of a *deregulatory policy strategy* based on the argument that if a broadband service provider is not a monopoly then no common carriage or public utility regulation is needed. Yet telephony companies were both common carriers and public utilities even during the early period of competition in the early 20th century.

[2] The Canadian national regulatory agency, CRTC, continues to hold hearings and examine witnesses, and assesses fees on proceeding participants to fund research and expert witnesses representing consumer interests. Overall, the CRTC's procedures better enable direct confrontation of parties' arguments relative to those used by the FCC.

service and DSL services as information services in 2002 and 2005, respectively, and did not reinstate the common carriage classification until its *Open Internet Order* in 2015.

This paper expands on this prior research by explaining how misuse of the public utility and natural monopoly concepts is also driven by *gaps in knowledge within and among professions*, undermining the validity of ostensibly academic analyses and misinforming development of policy recommendations. In particular, this paper focuses on the economists' misuse of the public utility and natural monopoly concepts to explain economic regulation and to make policy recommendations, as "there is often a gap between the economic criteria justifying regulation on the one hand, and the legislative and legal concepts on the other" (Phillips, 1988, p. 43). Such misuse contributes to and reinforces the false monopoly theory argument. Yet it remains uncorrected, in part, because many members of the legal profession lack sufficient understanding of developments in theoretical economic theory and their influence on the change in regulation (Kearney and Merrill, 1998).

The collective effect of these various misuses of public utility and natural monopoly is to distort historical, and misdirect future, policy development. The adverse consequences are revealed by *the policy questions that are not asked*. For example, the policymakers' focus is diverted from the original policy goals underlying the duties of common carriers that arise from social, legal, political – not just economic – considerations. Policymakers are encouraged to believe that competition will be sufficient to protect consumers' interests. Yet, Congress expressly rejected this conclusion when it enacted a statutory framework for common carriage in the Interstate Commerce Act of 1887 – creating a new enforcement mechanism of regulatory commission oversight given the inadequacy of competition and common law remedies to protect customers' interests *due to the rise of corporate, not monopoly, power* – and later applied in the Communications Act of 1934 (Cherry, 2012). As a result, awareness is directed away from the reemergence of policy problems incited by deregulatory policies.

The analysis in this paper is structured as follows. Economists' misuse of the public utility and natural monopoly concepts reflects an accumulation of historical inaccuracies. The first three sections of this paper explain the nature of these historical inaccuracies. Section 1 explains that public utility regulation is *not* based on natural monopoly, contrary to economists' assertion. Section 2 examines the historical development of public utility as a special legal status that derives from the government grant of certain types of franchises. It explains how focus solely on economic characteristics of an industry to explain public service regulation ignores important social characteristics of the industry that shape policy toward regulation. As a result, the legal basis for public utility status is unacknowledged, and a

requirement of monopoly is erroneously imputed as the defining characteristic for public service regulation. Section 3 describes how the concepts of public utility and monopoly have become conflated with the legal issue as to the constitutionally permissible scope of government to regulate under its police power. Such misinterpretation of important U.S. Supreme Court jurisprudence of constitutional law is a further source of confusion regarding the legal status of a business as a public utility and the historically false theory that regulation is based on the existence of monopoly. Section 4 then examines how economists' natural monopoly theory of public utility regulation reflects all of the historical inaccuracies discussed in sections 1-3, based on review of Alfred Kahn's analysis in *The Economics of Regulation: Principles and Institutions* (1988). Kahn was chosen for this purpose, as he is the preeminent regulatory economist whose research is foundational to that of many economists related to regulated industries in the U.S, and largely through this frequently cited text. Section 5 reviews Kearney and Merrill's analysis (1998) of the transformation in the regulatory paradigm of regulated industries law in the U.S. Their analysis describes how ideological consensus within the economics profession, supported in significant part by the natural monopoly theory, has been a powerful force in this transformation. This section explains how my analysis in this paper is complementary to their analysis. My own analysis probes more deeply the nature of the historical inaccuracies underlying the ideological consensus among economists, whereas Kearney and Merrill provide a broader context for understanding how this consensus has transformed the regulatory paradigm. The paper concludes with section 6. It discusses Kearney and Merrill's view of some possible "ideal-type" future trajectories for regulated industries law and their prediction as what future trajectory is more likely. My own observation is that the FCC's recent *Open Internet Order* may be an inflection point that will enable a different trajectory from that seen more likely by Kearney and Merrill almost two decades ago.

1. Conflating Natural Monopoly with the Basis for Public Utility Regulation

In U.S. telecommunications policy debates related to network neutrality and technology transitions, there has been conflation among the concepts of public utility, natural monopoly, and federal constitutional law as to the permissible scope of economic regulation under government's police power. The meaning of each has not been properly understood, much less their interrelationship.

To disentangle the confused threads of rhetoric, we need to understand the origins of the various concepts. First, in this section, it is helpful to start with the concept of regulation.

> *Regulation is an economic, legislative, and legal concept.* The legislature usually decides what industries should be regulated. Such decisions may be based upon the economic characteristics of certain industries, prevailing social philosophies, or political considerations. The policies adopted, however, must conform to existing legal concepts and procedures (Phillips, 1988, p. 43, emphasis added).

However, "there is often a gap between the economic criteria justifying regulation on the one hand, and the legislative and legal concepts on the other" (Phillips, 1988, p. 43). This gap between economic criteria and the legislative/legal concepts is an important source of the confusion that has permeated telecommunications policy debates in the U.S.

The economic concept that has proved problematic is that of "natural monopoly." Importantly, it is an economic construct, which, in turn, is composed of different elements.

> While examining the origins of the theory of natural monopoly, we want to eliminate a source of confusion, which derives from the fact that *the concept of natural monopoly is composed of different elements*…: the expression itself; the singling out of the concrete situations to which it is applied; the inquiry into economies of scale; the consideration of their incompatibility with perfect competition; the drawing of the diagram; *and the need for government intervention. …[E]very feature has its own history, and requires a separate analysis.* In other words, we think that an accurate historical reconstruction of the notion of natural monopoly, because of its complexity, cannot be written without breaking it down into all its component parts and analyzing the particular paths followed by them separately. If each of these elements is not considered individually, it is hard to correctly to identify original contributions, and to properly reconstruct the influence of ideas" (Mosca, 2008, p. 321, emphasis added).

Of relevance here is the element of natural monopoly that developed to explain or justify the need for government intervention. It is this element that has a misleading association with the legal concept of public utility.

> The classic *economic* case for extensive regulation of price, investment, service, and other managerial decisions of an industry is the inherently noncompetitive situation. **Public utilities are frequently referred to as "natural monopolies." The phrase is misleading**" (Phillips, 1988 45, emphasis in italics in original, emphasis in bold added, footnotes omitted).

Referring to public utilities as natural monopolies is misleading *for asserting the basis for regulation of public utilities* because not all public utilities possess the same economic and noneconomic characteristics. As for economic characteristics:

> Economies of scale may allow one firm to serve a market at a lower average cost than can several competing firms. *But in some cases, primarily in transportation utilities,*

> *competition was limited for many years by legislative policy rather than by technological conditions.* In such cases, there was nothing natural or inherent about the resulting market structure. Similarly, interindustry or intermodal competition may be present. While this type of competition may lead to different results than does intraindustry or intramodal competition, it can still serve to limit discretionary control over price. *Many utility industries, therefore, exhibit both monopolistic and competitive elements*
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> It should be emphasized also that economic conditions are constantly changing. … What is "natural" at one period of time, then, may become quite unnatural at another. One must distinguish, therefore, between a permanent and a temporary natural monopoly (Phillips, 1988, p. 45, footnotes omitted, emphasis added).

Moreover, notwithstanding economic considerations, "non-economic factors have played an important role in shaping public policy decisions" (Phillips, 1988, p. 53).

> The point being stressed is that public policy is determined on economic and on political and/or social grounds and, *since not all public utilities possess the same economic and noneconomic characteristics, the basis for their regulation also differs* (Phillips, 1988, p. 53, emphasis added).

Similar to Phillips, emphasizing that regulation is the product of public policy, the economist Nelson (1966) also laments use of the phrase "natural monopoly".

> *One of the most unfortunate phrases ever introduced into law or economics was the phrase 'natural monopoly'. Every monopoly is a product of public policy.* No present monopoly, public or private, can be traced back through history in a pure form…
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> "[N]atural monopolies" in fact originated in response to a belief that some goal, or goals, of public policy would be advanced by encouraging or permitting a monopoly to be formed, and discouraging or forbidding future competition with this monopoly (p. 3, emphasis added).

The misleading association of natural monopoly with public utility is furthered deepened by economists' attempts to explain why government may have chosen in some cases to grant exclusive monopoly franchises to public utilities.

> Perhaps, as others have observed, the notion of a natural monopoly was invented to justify exclusive markets for utility companies after their ineffectual and sometimes wasteful rivalry proved unsatisfactory to both the investor and the consumer interests (Phillips, 1988, p. 45, footnote omitted, quoting Troxel, 1947, p. 27).
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> It was out of this experience that the concept of "natural monopoly" gradually emerged, as an attempt on the one hand to explain the persistent tendency of competition to produce inferior results and to disappear and, on the other, to justify its abandonment (Phillips, 1988, p. 45, fn. 10, quoting Kahn, 1971, Vol. II, p. 118).

As further explained in the next section, the concept of natural monopoly is also misleading given that "public utility" is a special legal status and that legal status is *not* based on the existence of monopoly.

2. Failure to Understand Public Utility as a Special Legal Status

Public utility is a special legal status - under which the entity bears special legal obligations - that developed under the common law during the nineteenth century in both the U.S. and Canada. This section explains how the legal origins of this status can be traced to the English common law of "public callings", and the subsequent growth of the law of public service companies through government grant of franchises. Moreover, these franchises may, but need not, grant exclusive monopolies. This historical evolution of public service companies is critical for understanding some early misattributions of monopoly as well as the later conflation with judicial litigation of constitutionally permissible regulation discussed in section 3.

2.1. Origins during feudalism: Public callings

From medieval times under English common law, "public callings" (or "common callings") bore unique obligations under *tort law* merely by virtue of their *status* as public employments. Public callings were simply undertakings to serve the public,[3] unlike the performance of services within the feudal relation of lord to man that was considered private employment. During the medieval period, the state of society was so primitive that most economic activities were conducted in the context of private rather than public employments (Burdick, 1911, p. 522). Moreover, public employments bore obligations as a matter of law under tort law, as the common law of contract did not yet exist.[4]

Public callings included not only common carriers and innkeepers, but also other occupations such as blacksmiths, surgeons, tailors, barbers, bakers and ferrymen. The tort obligations of public callings are a duty to serve all upon reasonable request without unreasonable discrimination at a just and reasonable price and with adequate care.[5] The tort obligations borne by public callings were based solely on their status as public employments and not on the existence of monopoly.[6] Unfortunately, some modern commentators have inappropriately attributed the public callings' duty to serve to the

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[3] "The term *common calling* meant that the practitioner of an occupation (1) performed the occupation as a means of livelihood and (2) held himself out to serve the public at large, as distinct from performing the services exclusively under private arrangements" (Payton, 1981, p. 147 n. 1).

[4] For a discussion that the common law obligations of public callings arose under the English common law of tort, *see* Cherry (1999), pp. 8-10. *See also* Burdick (1911), at pp. 516-517.

[5] *See* Adler (1914) at pp. 159-161; Stone (1991), at pp. 29-30; Payton (1981), pp. 122-136, 144.

[6] For a discussion that classification of a public calling is not based on the existence of monopoly, *see* Adler (1914), at pp. 146-152, 156; Stone (1991), at p. 29; Payton (1981), at pp. 130-131.

existence of a virtual monopoly.

> Some modern commentators have attributed the duty to serve to the fact that the innkeeper, the smith, and the common carrier have a virtual monopoly vis-à-vis their individual customers. Although the concept of virtual monopoly may appeal to the modern mind because it makes imposition of the duty to serve economically rational, we should recognize that contemporaries would have been baffled by such an explanation. … The monopoly theory does not account, however, for the other bases of the duty in cultural expectations and public policy that can plainly be seen underlying the law (Payton, 1981, pp. 130-131, footnote omitted).

The duty to serve was imposed under local custom, or custom of the realm (Payton, 1981, pp. 123-131). In addition, one of the grounds underlying the common law obligations of innkeepers, blacksmiths and common carriers is that they "were essential to travelers, a uniquely vulnerable class of people whose safety and well-being were important for the good of the realm" (Payton, 1981, p. 130).

2.2. Transition to capitalism: Survival of common law duties for some public callings

During the latter part of the seventeenth century, most trades began to do business as public employments, so the concept of a public calling began to lose its significance (Stone, 1991, pp. 29-30; Burdick, 1911, p. 522). By the end of the eighteenth century "[i]n ordinary trades there ceased to be any need for a distinction between the *common* and the private exercise of trade" (Adler, 1914, p. 157, emphasis in original). "Although the original economic reasons for the idea of 'common' calling disappeared, the concept underwent an important transformation (Stone, 1991, p. 29).[7]

"Certain kinds of businesses, … most notably common carriers by land and water and innkeepers, were treated differently, … mark[ing] the beginning of the idea of the public service company" (Stone, 1991, p. 30).[8] The common law tort obligations of public callings remained for these kinds of businesses. The duty to serve had come to be "justified on the grounds of public necessity", or public policy, which in turn justified the corollary duty to serve for a reasonable price that was no longer imposed upon those engaged in private businesses (Burdick, 1911, p. 528). "Thus, certain occupations, because they did things that were public in nature (as yet undefined), were under a special set of obligations *that included the duty to serve all impartially and adequately*" (Stone, p. 30,

[7] "[M]any commentators have noted the remarkable capacity of common law judges to transform concepts and ideas that originated in feudal and agrarian England into ones that are functional in a capitalist industrial society" (Stone, 1991, p. 29).

[8] *See also* Burdick (1911, p. 515) (Public or common callings were the original public service companies); Stone (1991, p. 29) ("The public service company concept can be traced back to the fourteenth-century idea of a 'common calling.'").

emphasis added).[9] Stone (1991) further explains why the concept of the public service company was not, at the time, further defined.

> When the public service company conception was devised in the late seventeenth century, there was little need to define the idea sharply. Few businesses were covered, and most important, the number of new businesses that might conceivably be included — namely, those in communications and transportation — did not expand significantly until the major technological breakthroughs of the nineteenth century. Moreover, the sharp intellectual division between what the appropriate roles are for state and free market that began during the time of Adam Smith had not yet taken root. Consequently, there was no great need for the courts or other policymakers to sharpen the conception of the public service company. The short list of industries covered, reasoning by analogy and the common law's mechanism of rule by precedent, provided sufficient guidance (p. 30).

2.3. Conflating monopoly with the 19th century growth of public service companies under public utility franchises

Due to the rise of new technologies (including transportation and communication) during the industrial revolution, the nineteenth century was a period when the concept of the public service company needed to be refined and clarified (Stone, 1991, p. 31). During this period, a new body of common law, public utility law, emerged. "Before the arrival of regulatory agencies, policies for public utilities were made by judges employing an evolving common law and legislators promulgating rules in new situations" (Stone, 1991, p. 26).[10]

In the United States (as well as Canada), public utilities constitute a specific, legal category of entities that evolved under the common law. In essence, public utility law developed from the confluence of other developments in the law related to: governments' power to regulate commercial activities under the police power; governments' authority to delegate its powers to private parties through franchises; and businesses' ability to organize their activities into a corporate form (Cherry, 1999, pp. 50-57).

Under the police power to regulate*,* the inherent power of a sovereign that the U.S. and Canada have in common, state policies were designed to promote the development and expansion of industry while assuring that business activities operated to promote the common good (Stone, 1991, p.18). "On

[9] The phrase "as yet undefined" refers to language quoted from the case *Lane v. Cotton,* 12 Mod. 472 (1701).

[10] Judicial development of the concept of public utilities in the U.S. during the nineteenth century is discussed at length in Levy (1957).

the one hand, states would promote enterprises thought regulatory, licensing, subsidy, or other policy instruments. On the other, the activities of these enterprises could be curbed or compelled to operate for the public good through the police power" (Stone, 1991, p. 18).

During the nineteenth century, social and economic development in the U.S. gave rise to conditions "which have been held increasingly to necessitate and to justify the grant to private individuals and enterprises of the exercise of powers or privileges not otherwise inhering in such individuals and enterprises" (Burdick, 1911, p. 616). The grant of such powers or privileges created a new legal entity, referred to as a franchise. "[A] franchise is a right, privilege or power of public concern" (Burdick, 1911, p. 616, quoting *California v. Pacific Railroad,* 127 U.S. 1, 40 (1888)).

Franchises are of two types, the "right to be" and the "power to do" (Burdick, 1911, p. 616). Every corporation is a legal entity that exists by virtue of the government grant of a corporate charter - that is, the "right to be". But, it is the government's delegation of some of its own power – "the power to do" - to private parties through a franchise that creates the unique legal status of a public utility. Governmental powers most frequently sought for furtherance of private enterprises are the general power of eminent domain, the power to use public streets and highways, the privilege of exclusive performance of some undertaking, or use of state funds or credit (Burdick, 1911, p. 617).

It is the franchise with the "power to do" granted to a public utility that is of critical importance to the analysis in this paper. Such a franchise is an *agreement* between government and the public utility, whereby in exchange for the grant of government power or privilege to the public utility the government also imposes certain legal obligations. These obligations are a form of regulation deriving from the government's police power. Moreover, some of the regulatory obligations need not be expressly stated in a franchise agreement but may impliedly arise merely by virtue of acceptance of the franchise.

For example, it is the acceptance of a franchise (with the power to do) that carries with it the duty to serve, one of the fundamental obligations of a public utility.[11] Even if not expressly stated, the duty to serve is presumed to have been intended by the legislature in creating a public franchise (Burdick, 1911, p. 630). "The courts supplied the duty to serve all members of the public as an *implied* term of the charters" (Payton, 1981, p. 138, emphasis added). "[I]n the English and American common law … the duty to serve [was] justified variously because the company exercises delegated

[11] *See, e.g.,* Burdick (1911, p. 627) ("The authority to the effect that the grant of the power [eminent domain and use of streets and highways] carries with it this correlative obligation [duty to serve] is overwhelming").

governmental power, offers an essential public service, controls an artery of commerce, or has a monopoly" (Payton, 1981 p. 138).

It bears emphasizing here that virtual monopoly is *not* required for the imposition of the duty to serve under the common law. Some commentators, including Bruce Wyman,[12] argue that the original reason for classing certain callings as public callings is because they were virtual monopolies. Burdick[13], Adler[14] (1914, p. 149,) and Stone (1991)[15] disagree with this conclusion because it is simply factually wrong. Adler states "Monopoly … cannot be accepted as an explanation of the distinction between public and private callings, either at present or in the distant past. … *The reason for this failure is neglect of the facts.* … From the earliest times one who was engaged in a given occupation as a business was described as being in a common employment, otherwise the employment was private" (1914, p. 149, emphasis added). Similarly, as for common carriers in particular, Payton states "[I]t is apparent from the historical and legal record … that a common carrier has never been allowed to refuse customers arbitrarily because other conveyances are readily available" (1981, p. 150 n. 44).

Stone (1991) also offers an explanation for modern commentators' tendency to impute a monopoly requirement. He first emphasizes the primary importance of the *social* characteristics of an industry in determining whether a firm is a public service company.

> The starting point, then, in distinguishing public service companies from others is that the most important consideration is the kind of service involved and not the number of firms or potential firms in an industry. … [A]lthough the economic characteristics of an industry play important roles in shaping policy (or no policy) toward it, *the social characteristics of an industry are primary in determining whether or not a firm is a public service company* (pp. 26-27, emphasis added)

But, he observes that contemporary policymakers and commentators tend to employ only economic criteria.

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[12] Both Adler (1914) and Burdick (1911) specifically identify Bruce Wyman as one of the commentators that makes this erroneous claim.

[13] Burdick (1911, p. 515) ("A careful study of the subject has led me to a somewhat different conclusion"). Wyman also asserts that virtual monopoly makes a business a public calling, which in turn entitles a grant of powers of eminent domain and use of streets and highways. Burdick states that being a public calling is not a condition precedent to receive grant of a franchise, rather the cases show that "*as a result* of the grant of powers above mentioned the grantee is bound to exercise these powers to the public" (1911, p. 620, emphasis in original).

[14] Reference is in the next sentence. *See also* Adler (1914) at pp. 151-152.

[15] Stone (1991, p. 29, footnote omitted) ("Neither monopoly nor the kind of occupation determined whether one was classified as 'common'").

> The point is an extremely important one because many contemporary policymakers and commentators employ *only* economic criteria in making their policy recommendations. Under their view, if an industry can be shown not to be a natural monopoly — an industry in which production is done most efficiently by a single firm — it should no longer be subject to economic regulation. … But under public service liberalism the framework for policymaking involves far more than economic criteria.
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> *Monopoly ... plays an important role in the policy toward public service companies, but it is not the defining characteristic. … Most important ... telephone systems were considered public service companies even when they were engaged in vigorous competition.* (Stone, p. 27, emphasis added)

Thus, Stone's explanation is an expression of the problem identified by Phillips (1988) and Nelson (1966) discussed in section 1. By ignoring the social criteria, the focus solely on economic criteria not only erroneously elevates its importance but also obscures the primary public policy purpose for imposing public service obligations – and that reason is *not* monopoly.

2.4. Statutory codification of obligations for public service companies

Legislatures may codify legal obligations — whether preexisting common law obligations or new obligations — in statutes for businesses that are already public service companies. For example, in the Interstate Commerce Act of 1887 (ICA), Congress codified common law obligations of railroad common carriers and provided a new legal framework — based on regulatory oversight of a federal expert agency, the Interstate Commerce Commission (ICC) — for enforcement of such obligations.[16] The ICA was later amended in 1910 to extend jurisdiction of the ICC to telegraphy and telephony.[17] Similarly, states' legislatures have enacted public utility statutes that codify the common law status of public utilities, creating a legal framework based on regulatory oversight of state expert agencies for enforcement of statutory obligations.

[16] The Cullom Report, named after Senator Cullom, is the report of the U.S. Senate Select Committee on Interstate Commerce, which provides a comprehensive record of the Committee's investigation and recommendation for federal legislation. The Cullom Report cogently explains the reasons for such codification under federal law: (1) inadequacy of the common law remedies, even under state statutes that established regulatory agencies; (2) the states lacked jurisdiction over interstate commerce; and (3) the insufficiency of competition to protect customers from oppressive practices and unreasonable discrimination. *Report of the Senate Select Committee on Interstate Commerce,* 49th Congress, 1st Session (1886). *See also* Stone (1991, p. 32) ("The influential 1886 Cullom Report, which led to enactment of the Interstate Commerce Act, provides a contemporary view of the centrality of the railroad and why it is a model of a public service industry").

[17] "Now the telegraph line and the telephone line are becoming rapidly as much a part of the instruments of commerce and as much a necessity in commercial life as the railroads." 45 *Congressional Record* 5534 (1910) (Congressional statement).

2.5. Statutory imposition of obligations for businesses that are not public service companies under the common law

A business that is not a public service company under the common law — whether as a common carrier or through grant of a public utility franchise — may nonetheless bear similar obligations by virtue of statutory law. Under the state's police power, "such duties [as those peculiar duties imposed under the common law] may be imposed upon businesses by statute when such businesses would not be subject to those duties under any of the principles previously discussed [under the common law]" (Burdick, 1911, p. 742). Whether, under the U.S. Constitution, government's police power had sufficient breadth to so regulate those businesses that are not public service companies under the common law was the subject of litigation in the nineteenth and early twentieth centuries. As explained in the next section, a failure to properly interpret the ensuing judicial litigation of constitutional law is a further source of confusion regarding the legal status of a business as a public utility.

3. Conflating Public Utility and Monopoly with the Constitutionally Permissible Scope of Economic Regulation

The inherent power of government to regulate is referred to as the *police power*. An important function of the courts is to determine when government regulation falls within the scope of the police power without violating provisions of the U.S. Constitution. During the period 1877-1934, the U.S. Supreme Court applied the concept of "businesses affected with a public interest" as a constitutional test to determine the permissible scope of government regulation under the Due Process Clauses of the Fifth and Fourteenth Amendments applicable to the federal and state governments, respectively (Barnes, 1942, pp. 1-13). The significance of identifying certain businesses as being "affected with a public interest" is that the scope of permissible regulation under the police power for such businesses was deemed to be greater than that for other businesses. For a business deemed *not* affected with a public interest, the permissible scope of regulation was quite narrow. Therefore, the validity of government regulation often hinged on government's ability to convince the courts that the business in question did fall into one of the classes of businesses affected with a public interest.

The important line of U.S. Supreme Court cases applying the concept of "businesses affected with a public interest" starts with *Munn v. Illinois,* 94 U.S. 113 (1877). Businesses affected with a public interest were those for which it was deemed that dependent customers required protection. As the Court later summarized in a subsequent case, such businesses fell into three categories:

(1) Those which are carried on under the authority of a public grant of privileges which either expressly or impliedly imposes the affirmative duty of rendering a public service demanded by any member of the public. Such are the railroads, other common carriers and public utilities.
(2) Certain occupations, regarded as exceptional, the public interest attaching to which, recognized from earliest times, has survived the period of arbitrary laws by Parliament of Colonial legislatures for regulating all trades and callings. Such as those of the keepers of inns, cabs, and grist mills…
(3) Businesses which though not public at their inception may be fairly said to have risen to be such and have become subject in consequence to some government regulation. They have come to hold such a peculiar relation to the public that this is superimposed upon them.
(*Charles Wolff Packing Co. v. Court of Indus. Relations,* 262 U.S. 522, 535 (1923)).

In *Munn v. Illinois,* the U.S. Supreme Court considered the constitutionality of an Illinois statute that established regulation for grain elevators and warehouses in the city of Chicago. The Illinois Constitution of 1870 contained a provision that granted state legislative power to prescribe rates and service for several businesses. Pursuant to this provision, the Illinois legislature enacted a statute that required licensing, the filing of a schedule of rates for the storage of grain, and a charge that did not exceed a maximum rate specified in the law. Upon being sued for failure to comply with the statute, Munn and his partner Scott contested the law on the ground that it constituted state regulation of interstate commerce and that they were being deprived of their property without due process of law.

The Court upheld the constitutionality of the Illinois statute. In so doing, it effectively found that the grain elevator business fell into the third category of businesses affected with a public interest described above.

> [It is not] a matter of any moment that no precedent can be found for a statute precisely like this. It is conceded that the business is one of recent origin, that its growth has been rapid, and that it is already of great importance. And it must also be conceded that it is a business in which the whole public has a direct and positive interest…[T]his statute extends the law so as to meet the new development of commercial progress. There is no attempt to compel these owners to grant the public an interest in their property, but to declare their obligations, if they use it in this particular manner. *Munn v. Illinois,* 94 U.S. at 133.

In justifying this extension of a "business affected with a public interest" to the grain elevator service in this case the Court stated that business "may be a 'virtual' monopoly" and under the circumstances similar to historical public callings (94 at 131).

> Thus it is apparent that all the elevating facilities through which these vast productions "of seven or eight great States of the West" must pass on the way "to four or five of the States on the seashore" may be a "virtual" monopoly.
>
> Under such circumstances it is difficult to see why, if the common carrier, or the miller, of the ferryman, or the innkeeper, or the wharfinger, or the baker, or the cartman, or the hackney-coachman, pursues a public employment and exercises "a sort of public office," these plaintiffs in error do not. They stand, to use again the language of their counsel, in the very "gateway of commerce," and take toll from all who pass. Their business most certainly "tends to a common charge, and is become a thing of public interest and use." Every bushel of grain for its passage "pays a toll, which is a common charge," and, therefore, according to Lord Hale, every such warehouseman "ought to be under public regulation, viz., that he … take but reasonable toll." Certainly, if any business can be clothed "with a public interest, and cease to be *juris privati* only," this has been. It may not be made so by the operation of the Constitution of Illinois or this statute, but it is by the facts.
>
> We are also not permitted to overlook the fact that …[the revision to the Illinois Constitution in 1870] indicates very clearly that during the twenty years in which this peculiar business had been assuming its present "immense proportions," something had occurred which led the whole body of the people to suppose that remedies such as are usually employed to prevent abuses by virtual monopolies might not be inappropriate here. (94 at 131-132)

In retrospect, the Court's use of the term " 'virtual' monopoly" was problematic. In subsequent cases, parties asserted that *Munn v. Illinois* required that "businesses affected with a public interest" be a public utility or a business that is a monopoly. In *Nebbia v. New York,* 291 U.S. 502 (1934), the U.S. Supreme Court rejected these assertions, explaining how to correctly interpret *Munn v. Illinois.*

In *Nebbia v. New York,* the Court considered the constitutionality of a New York statute that empowered a Milk Control Board to fix minimum and maximum retail prices to be charged by stores for milk sold to consumers for consumption off premises. The appellant (against whom the statute had been enforced) argued that the statute would be *per se* unreasonable and unconstitutional unless:

> …applied to businesses affected with a public interest; [and] that a business so affected is one in which property is devoted to an enterprise of a sort which the public itself might appropriately undertake, or one whose owner relies on a public grant or franchise for the right to conduct the business, or in which he is bound to serve all who apply; in short, such as commonly called a public utility; or a business in its nature a monopoly (291 U.S. at 531).

In this regard, the appellant acknowledged various ways in which a business could be a public utility under the common law.

The Court stated that the dairy industry was not a public utility in the accepted sense of the phrase, that this was not a case involving monopoly or monopolistic practice, and that those engaged in business were not dependent upon public grants or privileges (291 U.S. at 531). The Court then observed the appellant's claim that *Munn v. Illinois* "limited permissible legislation [prescribing charges] to businesses affected with a public interest, and … no business is so affected except it have one or more of the characteristics he enumerates" (291 U.S. at 532). The Court then explained how to correctly interpret *Munn v. Illinois*:

> *But this is a misconception. Munn and Scott held no franchise from the state.* They owned the property upon which their elevator was situated and conducted their business as private citizens. No doubt they felt at liberty to deal with whom they pleased and on such terms as they might deem just to themselves. *Their enterprise could not fairly be called a monopoly, although it was referred to in the decision as a "virtual monopoly". This meant only that their elevator was strategically situated and that a large portion of the public found it highly inconvenient to deal with others. This court concluded the circumstances justified the legislation as an exercise of the governmental right to control the business in the public interest; that is, as an exercise of the police power.* It is true that the court cited a statement from Lord Hale's *De Portibus Maris*, to the effect that when private property is "affected with a public interest, it ceases to be *juris privati* only"; but the court proceeded at once to define what it understood by the expression, saying: "Property does become clothed with a public interest when used in a manner to make it of public consequence, and affect the community at large" (p. 126). *Thus understood, "affected with a public interest" is the equivalent of "subject to the exercise of the police power"; and it is plain that nothing more was intended by the expression.* (291 U.S. 532-533, emphasis added)

The Court further explained that under *Munn v. Illinois,* the statement that one has dedicated his property to public use does not require the *intention* to conduct one's business to a public use, but is "merely another way of saying that if one embarks in a business which public interest demands shall be regulated, he must know regulation will ensue" (291 U.S. at 534). Moreover, the Court stated that "[t]he touchstone of public interest in any business, in its practices and charges, clearly is not the enjoyment of any franchise from the state, *Munn v. Illinois, supra.* Nor is it the enjoyment of a monopoly … *Brass v. North Dakota"* (291 U.S. at 534-535). Finally, in perhaps the now most well known passage, the Court held:

> It is clear that there is no closed class or category of businesses affected with a public interest, and the function of courts in the application of the Fifth and Fourteenth Amendments [of the U.S. Constitution] is to determine in each case whether circumstances vindicate the challenged regulation as a reasonable exertion of governmental authority or condemn it as arbitrary or discriminatory. The phrase

> "affected with a public interest" can, in the nature of things, mean no more than that an industry, for adequate reason, is subject to control for the public good. (291 U.S. 536, citation omitted)

Thus, having clarified the scope of the government's police power to regulate *any business* in *Nebbia v. New York,* for constitutional purposes the need to prove that a business did or did not fall into one of the historical classes of businesses affected with a public interest fell into disuse. Yet, the Court maintained that permissible regulation as to a *given business* depends on the specific circumstances in each case. For this purpose, the Court enounced a legal standard now known as the rational relationship test.

> [A] state is free to adopt whatever economic policy may reasonably be deemed to promote public welfare, and to enforce that policy by legislation adapted to its purpose. The courts are without authority either to declare such policy, or, when it is declared by the legislature, to override it. If the laws passed are seen to have a reasonable relation to a proper legislative purpose, and are neither arbitrary nor discriminatory, the requirements of due process [under the U.S. Constitution] are satisfied, and judicial determination to that effect renders a court *functus officio.* 291 U.S. 537.

The Court proceeded to examine the specific circumstances of the case, concerning the constitutionality of price regulation of retail milk sales in New York. The Court found that the dairy industry, not having received any public grant or franchise, was clearly not a public utility, nor was it a monopoly (291 at 530-31). However, state legislative investigation in 1932 "was persuasive of the fact that … unrestricted competition aggravated existing evils, and the normal law of supply and demand was insufficient to correct maladjustments to the community," and "in these circumstances the legislature might reasonably consider further regulation and control desirable for protection of the industry and the consuming public" (291 U.S at 530).

Given the holding and analysis in *Nebbia v. New York,* a wide range of businesses can be subject to some government regulation. The constitutionally permissible scope of the government's police power to regulate a business (1) is not limited to characteristics enumerated in *Munn v. Illinois;* (2) does not require that the business be intended to be conducted for public use; (3) does not require the business to be a public utility; and (4) does not require a monopoly. However, what would be deemed a reasonable exertion of governmental authority is still likely to be greater for a business in which *the circumstances are similar* to those of the traditional justification for regulating "businesses affected with a public interest". Moreover, the common law was left undisturbed as to when a

business is a public service company, whether a common carrier or public utility, and thereby bound by the implied duties of that legal status.

Notwithstanding the clarity of the Court's statements in *Nebbia v. New York,* Stone (1991) observes that what constitutes a public service company has been confused with the constitutional question of the permissible scope of economic regulation.

> The public service idea has also become enmeshed in important constitutional questions that are apart from its theoretical basis. Behind the passions of the constitutional questions lay important policy issues, analytically separate from the former but, unfortunately, intertwined in practice. In brief, the question of whether a particular business is "clothed with a public interest" and therefore should be heavily regulated because that would be sound public policy is very different from whether the price regulation of a particular business is permissible under the Fourteenth Amendment of the Constitution or whether it constitutes an unconstitutional taking of property without due process of law. Virtually every student of constitutional law is familiar with the leading cases culminating in *Nebbia v. New York,* finally rejecting the distinction on constitutional grounds when the Court held five to four that New York could constitutionally fix minimum and maximum retail milk prices. But few are aware of the numerous English and state common law decisions that developed and applied the public service company concept on public policy grounds. We are concerned with the public policy aspect of the distinction between public service companies and other firms, not the now settled constitutional issues that in many ways obscured the fundamental distinction that we are exploring. (Stone, 1991, pp. 27-28, footnote omitted)

This confusion is in addition to that described in section 1 whereby the focus solely on economic criteria obscures the social characteristics of an industry in determining whether a firm is a public service company. Thus the exclusive focus on economic criteria to explain public utility regulation contributes to multiple historical errors, as illustrated in the following section 4.

4. The Cumulative Historical Distortions of the Economists' Natural Monopoly Theory of Public Utility Regulation

At this juncture we can now understand the cumulative historical distortions underlying the economists' natural monopoly theory of public utility regulation. This is perhaps best exemplified by examining the assertions of the regulatory economist, Alfred Kahn, who is commonly known as the "Father of Airline Deregulation" in the U.S. and whose research is foundational to that of many economists related to regulated industries. As this section explains, Kahn's analysis of public utility regulation in *The Economics of Regulation: Principles and Institutions, Vols. I & II* (1988), the text that economists frequently cite, embodies each of the conflations and misunderstandings described in sections 1-3.

4.1 Kahn fails to recognize the special legal status of public utilities

In Volume I of *The Economics of Regulation: Principles and Institutions,* Kahn discusses economic principles. It commences with "Part I: The Institution of Regulated Monopoly", and opens with the following statements.

> Economics emerged in the eighteenth and nineteenth centuries as an attempt to *explain* and to *justify* a market system. This is an oversimplification, but it is a broadly accurate characterization of the mainstream of Western economic thought. The purpose had been to describe how an essentially uncontrolled economy, in which the critical economic decisions are made by individuals, each separately pursuing his own interest, can nonetheless orderly and efficiently do society's work (Kahn, 1988, Vol. I, p. 1, emphasis in original).

At the outset, it is important to note that Kahn describes the purpose of economics as explaining and justifying a market system where economic decisions are made by *individuals.* His analysis, however, does not purport to address an important question: what happens when economic decisions are made by organizations – such as corporations and public utilities – that are separate legal entities which act on behalf of collectivities of individuals?

Kahn then explains that there are two large chunks of the economy that the competitive market model does not, or even purport to, describe: the public sector and "public utilities, in which the organization and management is for the most part (in the United States—not in most other countries) private but the central decisions are subject to direct governmental regulation" (1988, Vol. I, p. 2, footnote omitted). Here Kahn separates the public sector from public utilities, based on his observation that most public utilities in the U.S. are privately owned companies and subject to direct governmental regulation. What he does not state – and the significance of this omission will shortly become apparent – is that a public utility in the U.S. may be publicly or privately owned but in either case it operates pursuant to a government franchise.

Kahn proceeds to discuss regulation, generally, of the competitive market sector.

> To be sure, the government influences the functioning of the private, competitive sectors of the economy as well in many ways—for example, by regulating the supply and availability of money, enforcing contracts, protecting property, providing subsidies or tariff protection, prohibiting unfair competition, providing market information, imposing standards for packaging and product content, and insisting on the right of employees to join unions and bargain collectively. In principle, these influences['] … role is generally conceived as one of maintaining the institutions *within* whose framework the free market can continue to function, of enforcing, supplementing, and

> removing the imperfections of competition—not supplanting it" (1988, Vol. I, p. 2, emphasis in original, footnote omitted).

The last sentence of the above quote bears emphasis. Kahn asserts that the role of government influences "is generally conceived as one of maintaining the institutions *within* whose framework the free market can continue to function…." What he does not acknowledge is that government influences also include the creation of *new* types of legal institutions, such as a public utility through the government grant of a franchise.

Kahn then provides his description of the regulation of public utilities.

> There are four principal components of this regulation that in combination distinguish the public utility from other sectors of the economy: control of entry, price fixing, prescription of quality and conditions of service, and the imposition of an obligation to serve all applicants under reasonable conditions. *This book is an analysis of the economics of that regulation—its characteristics and consequences, the principles that govern it, and the principles that ought to govern it*" (1988, Vol. I, p. 3, emphasis added).

Kahn does not clearly define what a public utility is. *He seems to equate public utility with a certain type of regulation.* Does this mean that an entity is no longer a public utility if components of its regulation change? But such an understanding is inconsistent with the legal status of a public utility. As discussed in section 2.3, public utility is a legal status conferred by virtue of grant of some government privilege or power in a franchise. The components of regulation applied to the public utility could change over time – e.g. under municipal or state regulation – but change in the public utility's obligations do not change its legal status as a public utility.

4.2 Kahn conflates public utility with the constitutionally permissible scope of regulation

Kahn's misunderstanding of the concept of public utility becomes clearer in his assessment of U.S. Supreme Court cases related to "businesses affected with a public interest". Kahn discusses the period 1877-1934, during which the U.S. Supreme Court applied the concept of "businesses affected with a public interest" as a constitutional basis for regulation consistent with the 14th Amendment of the U.S. Constitution. The legal cases include *Munn v. Illinois* and *Charles Wolff Packing* discussed in section 3.1. Kahn then discusses *Nebbia v. New York* (1934), stating that the Court "held, in effect, that there was no longer any constitutional barrier to legislatures imposing any type of economic regulation on any industries within their jurisdictions, where in their judgment it would serve the public interest, provided only that they did not do so in an utterly capricious or discriminatory manner"

(1988, Vol. I, p. 7). After quoting a portion of the Court's opinion, Kahn then concludes: "*As far as the United States Constitution is concerned, there is no longer any distinction between the public utilities and other industries*" (1988, Vol. I, p. 8, emphasis added).

Kahn's conclusion is both a fundamental misunderstanding of public utility law and a misinterpretation of the Court's holding in *Nebbia v. New York.* First, after *Nebbia,* public utility still remains a separate legal status – deriving from the grant of a franchise with "power to do", as explained in section 2.3. Second, as discussed in section 3.2, under *Nebbia* the status of a business *as a public utility* can be a legal basis for why *a given form of regulation* is not capricious or discriminatory *for that business* – but still may be capricious or discriminatory for other businesses operating under different circumstances – pursuant to the rational relationship test. Kahn is thus confusing what constitutes a public service company with the constitutional question of the permissible scope of economic regulation, as identified by Stone (1991) and discussed in section 3.3.

4.3 Kahn equates public utility with monopoly elements and direct regulation

Kahn then claims there has been a blurring of the boundaries between public utilities and other industries, and such blurring arises from his equation of public utilities with certain components of regulation.

> The period of the 1920s and 1930s, the very time when the constitutional issue was most strenuously contested and ultimately resolved, were especially propitious for this extension and *blurring of the edges of the public utility concept, that is, of the boundaries between the industries appropriately regulated and those left to the regime of competition*. Economists and lawmakers were pointing with increasing emphasis to the *pervasiveness of monopoly elements* through the economy, and this suggested at least to some that direct regulation of performance might be required to protect the consumer over a far wider range of industry than the public utilities proper" (1988, Vol. I, p. 9, emphasis added, footnotes omitted).

Kahn describes the distinction between public utility and other industries as "the boundaries between the industries appropriately regulated and those left to the regime of competition". *It is at this point that Kahn incorporates the economists' focus on monopoly elements as a basis for justifying such a distinction.*

After discussing the above monopoly elements, Kahn then incorporates economists' focus on economies of scale and destructive competition as a basis for claiming there is a blurring of the boundaries between public utilities and other industries.

> In other contexts, these and other observers were pointing out that some of the same factors that made competition infeasible and potentially destructive among public utility companies—notably economies of scale and heavy overhead costs—were widespread in unregulated industry as well. This led some of them to call for the introduction of comprehensive regulation as a means of eliminating the wastes, instabilities, and social costs imposed by competition, an argument that reinforced the movement, increasingly popular among businessmen, for 'rationalization' of industry by industry-wide cooperation and cartelization. Not surprisingly, it was in the middle of the Great Depression that these views prevailed—in the *Nebbia* decision, which involved *minimum* price fixing for milk … (1988, pp. 9-10, emphasis in original, footnotes omitted).

In so doing, Kahn again misunderstands the *Nebbia* case. The U.S. Supreme Court ruled as to the permissible scope of the government's police power under the Due Process Clause of the U.S. Constitution, and found that this power was not confined to a class of "businesses affected with a public interest". Having been granted a public utility franchise was one type of a business affected with a public interest. But *Nebbia* held that it was no longer necessary for government to find that a business was "affected with a public interest", such as a public utility, in order to exercise its police power. Thus, *Nebbia* did effectively expand the scope of industries that can be regulated under government's police power. And thus, additional reasons for such expansion have been argued – including by analogy to characteristics of industries that did bear the legal status of public utility. But the *Nebbia* Court was very clear that the milk industry was not a public utility, and that regulatory intervention related to minimum price fixing for milk was based on a different public purpose.

Kahn then clarifies his view that the line between a public utility industry and other industries is that the former is subject to direct government controls.

> And yet there *is* such a thing as a public utility. The line between these and other types of industries is a shadowy area; and it shifts over time. But there remains a core of industries, privately owned and operated in this country, in which, at least in principle, the primary guarantor of acceptable performance is *conceived* to be (whatever it is in truth) not competition or self-restraint but direct government controls—over entry (and in many instances exit), *and* price, *and* conditions of service—exercised by administrative commissions constituted for this specific purpose" (1988, Vol. I, p. 10, emphasis in original, footnote omitted).

Kahn is thus equating public utility with a specific form of government regulation—direct government control over entry, price and conditions of service—as opposed to reliance on competition. He is *not* recognizing the legal status of public utility as being conferred by a government franchise.

Moreover, Kahn's description of new entrants into the category of public utility is revealing.

> There have been some new entrants that would have been recognized barely or not at all in, for example, 1900—the production and field sale of natural gas, common carrier pipeline transmission of hydrocarbons, commercial aviation and trucking. But *the principles underlying the extension of direction regulation to most of them were the traditional ones*: they were new common carriers, or required franchises or certifications carrying with them the right of eminent domain, or were conceived of as so intimately affecting the prices or service of the traditional utilities as to require regulation themselves (as in the case of trucking and the field sales of natural gas) (1988, Vol. I, p. 11, emphasis added).

If there was any doubt, it is now clear that Kahn is equating public utility status with the imposition of direct government regulation. He includes, *but does not require*, the granting of a government franchise as the source of the legal status of a business as a public utility. In addition, he conflates the legal statuses of common carrier and public utility. As discussed at length in previous research (Cherry, 2006 & 2015), conflation of the legal statuses of common carriers and public utilities is yet another source of confusion that permeates telecommunications policy debates in the U.S.

4.4 Kahn asserts natural monopoly as an economic justification for regulated monopoly

Having defined public utility as a form of direct government regulation, Kahn then jumps to a list of economic justifications for regulated monopoly: as essential input; economies of scale; natural monopoly; and when competition doesn't work well.

> It would be tidy to include in this introduction an exposition of the economic logic of the institution of regulated monopoly. The list of economic justifications would have to involve the following:
>
> 1. The importance of these industries, as measured not merely by their own sizeable share in total national output, but also by their very great influence, as suppliers of essential inputs to other industries, on the size and growth of the entire economy. These industries constitute a large part of the 'infrastructure' uniquely prerequisite to economic development. On the one hand, they condition the possibilities of growth (as Adam Smith recognized, the division of labor is limited by the extent of the market, and the latter depends in turn on the availability and price of transportation). On the other hand, because many of these industries are characterized by great economies of scale, their own costs and prices depend in turn on the rate at which the economy and its demand for their services grows. As general economic growth proceeds, the contribution of these industries to further expansion is thus enhanced by their own progressive realization of those economies of scale, in a cumulative and self-reinforcing process.

> 2. That many of them are 'natural monopolies': their costs will be lower if they consist in a single supplier. This creates the efficiency case for monopolistic organization and, along with the importance of the service and consequent inelasticity of demand, the need for regulation to protect the consuming public.
> 3. That for one or another of many possible reasons, competition simply does not work well.
>
> But this would be a terribly superficial statement. And it will take many chapters to make it less so. The reason is that every part of the rationalization involves an issue or series of issues instead of a settled conclusion. For instance, the public utilities are important; but do they make a greater contribution to national product or economic growth than the provision of food, medical care, housing or education, none of which is regulated in the same fashion? Their importance, clearly, is not a sufficient explanation or economic justification for their subjection to regulation. Nor is it a *necessary* condition—one could find economic justification for regulating 'unimportant' industries such as ticket brokers, except that since it uses resources to regulate, there would be no economic point in doing so for industries so unimportant that the benefits of regulation could not possibly outweigh the costs of administration (1988, Vol. I, pp. 11-12, emphasis in original, footnote omitted).

It is the second justification, natural monopoly, on which Kahn bases the rationale for regulated monopoly". Kahn then further expounds on the concept of "natural monopoly".

> There is no room for doubt that at least *some* of the public utility industries are in *some* respects 'natural monopolies'. But the interesting economic questions are: What makes them so? Is natural monopoly synonymous with long-run decreasing cost tendencies? If so, what about the public utilities, such as the supply of water, that *seem* to be characterized by long-run tendencies to increasing costs. Does a tendency for costs to decline over time constitute an evidence of natural monopoly? What parts of these industries are natural monopolies, what parts not? Might they be natural monopolies in some static, efficiency sense but 'unnatural' ones in terms of the prerequisites for innovation and growth? And how then do we handle, in theory and in practice, the growing competition between 'natural monopolists,' such as electric, and gas distribution companies for the home heating and cooking market, or between international cable and satellite communications? And how do we cope with the historical fact that the prime historic exemplars of the extension of public utility regulation in the United States in the last quarter of the nineteenth century—railroads and grain elevators—were not really natural monopolists?
>
> As we have already suggested, part of the case for regulation and the inappropriateness of competition inheres in the heavy fixed costs that characterize most of these industries. But do heavy fixed costs make monopoly 'natural'? Or competition unreliable? …
>
> In short, we have here not a description but a series of complicated analytical questions concerning the proper roles of competition and monopoly in these industries—questions

> that will concern us throughout this entire book, and especially in its second volume" (1988, Vol. I, pp. 11-12, emphasis in original, footnotes omitted).

Kahn's entire exposition reflects his mischaracterization of public utility status of an industry as based on a certain type of regulation (rather than reliance on competition). He introduces the concept of "natural monopoly" as one of the potential justifications for such regulation – but finds reliance on natural monopoly as problematic for this purpose. *Kahn fails to recognize that he is misapplying the concept of public utility. Because public utility is a legal status conferred by grant of a franchise, he should be asking why franchises are granted and regulatory obligations are imposed as a condition of acceptance of the franchise. Asked this way, he would find that existence of a monopoly, much less a natural monopoly, is not the defining characteristic for granting a franchise.*

Notwithstanding Kahn's exposition about public utilities, Kahn claims "the subject of this study is not the 'economics of public utilities,' but the 'economics of regulation'"(1988, p. 12). He bases this assertion on a continuing misunderstanding of the *Nebbia* decision.

> Reflecting and encouraged by the *Nebbia* decision, as we have already seen, the government regulated many industries that are not really public utilities. Conversely, even among the "public utility" industries or at least at their periphery the regulation is often incomplete—control over price but not entry (for example, in insurance), over entry but not price (for example, in radio and television) or quality of service (for example, banking), and so on. *And even over those industries most thoroughly regulated and most clearly identifiable as public utilities, issues abound concerning the appropriate definition and role of regulated monopoly as the principal institution of social control…*
>
> This is not to deny that, even after *Nebbia*, there is a more or less distinctive core of public utility industries. It is to emphasize instead that it is the phenomenon of economic regulation itself, wherever practiced, whose economics we study here—not the public utility industries as such" (1988, Vol. I, pp. 12-13, emphasis added).

Again, Kahn is equating public utility status with a form of heavy-handed regulation, now including "regulated monopoly as the principle institution of social control". *Kahn's mischaracterization of public utility status now extends to regulated monopoly as the principle institution of social control. Thus, even though Kahn claims his book is focused on the economics of regulation (generally), analytically this is impossible, as he is utilizing a legally incorrect definition of public utility as a key frame of reference for his analysis.* Illustratively, Kahn asserts:

> "Our central question is: What guidance can economics provide legislators, administrators, and judges in *framing*, applying, and enforcing *policies* involving the direct regulation of private industry?
>
> The answer to this question combines the two quite distinct purposes of economics—science and prescription" (1988, Vol. I, p. 14, emphasis added, footnote omitted).

Thus, conflation of public utility with regulated monopoly becomes a distorted frame of reference for Kahn's economic analysis of regulation to inform public policymaking. This misframing is exacerbated by the failure to recognize that public utility (as well as common carriage) status arises from *social concerns*, not necessarily economic ones, as explained in section 1. For public utilities those concerns underlie the granting of franchises, and those franchises need not be monopolies, as explained in section 2.3.[18]

Unaware of the cumulative historical distortions embedded in his analysis, Kahn emphasizes the need for economists' direct role in the regulatory process, given their technical skills.

> Economists have a particular advantage when it comes to taking a direct role in the regulatory process. The job is an extremely technical one and becomes more so each year. It used to be done almost exclusively by lawyers and politicians, with accountants and engineers as assistants. But for decades there has been great and increasing dissatisfaction with their performance. One important criticism has been that they were behaving too much like lawyers and bookkeepers—excessively concerned with proper administrative procedures, the balancing of equities, and the measurement and covering of accounting costs—and too little like economists—paying practically no attention to things such as marginal cost, elasticities of demand, or to the dynamic conditions of innovation and growth. For these and other reasons that will appear later, economists have been drawn more and more into the process, bringing with them their own esoteric terminology and tools; the lawyers that have failed to seek their direct cooperation find they cannot understand what their opponents' witnesses are saying (1988, Vol. I, p. 15).

Economists do offer tools and analysis that can more fully inform policy debates, such as likely economic impacts (both short and long term). However, in justifying his economic approach to regulatory policy, Kahn evokes criticisms of other approaches, such as that of lawyers. Yet, Kahn fails to recognize that his economic analysis of regulation is flawed as it is not based on an accurate understanding of the legal context and evolution of bodies of law related to regulation.

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[18] Furthermore, as explained Cherry (2015), regulated monopoly status of U.S. telephony arose from AT&T's *political strategy*, facilitated by AT&T's campaign of universal service in response to the evolution of publicly-owned telephony in Canada.

5. Natural Monopoly Theory Has Transformed the Paradigm for Regulated Industries

Since the 1970's there has been a transformation in the regulatory paradigm of regulated industries law in the U.S. Kearney and Merrill (1998) explain how ideological consensus within the economics profession, supported in significant part by the natural monopoly theory, has been a powerful force in this transformation. Moreover, they stress how this ideological consensus is based on an *ahistorical view* of regulation. Although my own analysis here probes more deeply into the nature of some of the historical distortions in the economists' view of public utility regulation and monopoly, as to the historical inaccuracies that Kearney and Merrill identify, our analyses are consistent. In this respect, my analysis can be viewed as an extension of theirs.

Kearney and Merrill's analysis (1998) also cogently describe the impact that this ideological consensus has had on the transformation of the law of regulated industries. In this respect, their analysis provides the broader context for understanding the significance of economists' ahistorical view, the nature of which I further examine. Indeed, my own analysis here is a response to the lack in legal scholarship "comment[ing] on apparent subtractions from the corpus of regulation" and how "[m]ost legal scholars and lawyers are only dimly aware of the monumental changes that have been taking place in common carrier and public utility law in recent years" (Kearney & Merrill, 1998, p. 1408). Therefore, the analysis in Kearney and Merrill is provided here at some length in order to demonstrate its complementarity with my analysis and body of research, and to better facilitate closing the gap in scholarship that they identify.

Kearney and Merrill's analysis describes the transformation in the regulatory paradigm of regulated industries law in the U.S. "The original paradigm was based on the assumption that regulatory agencies had to exercise pervasive control over regulated industries in order to protect the end-user—the consumer" (Kearney & Merrill, 1998, p. 1359), and "[t]he progenitor of the historically dominant model was the Interstate Commerce Act" (Kearney & Merrill, 1998,p. 1331).

The new paradigm started emerging in the 1970's, beginning with the airline industry in which Alfred Kahn's influence is unequaled. Under the new paradigm, the existence of natural monopoly characteristics is the basis for regulatory intervention – dramatically changing the role of the regulator.

> Under the new paradigm, the regulator plays a far more limited role. Instead of comprehensively overseeing an industry in order to protect the end-user, its principal function is to maximize competition among rival providers, in the expectation that competition will provide all the protection necessary for end-users. Specifically, *the regulator is expected to intervene only* when there is some reason to conclude that a regime of market-based transactions will not suffice to advance competition, as *where*

> *one firm in the industry owns a bottleneck facility that has natural monopoly characteristics* (Kearney & Merrill, 1998, p. 1361, emphasis added).

Kearney and Merrill assert that “[t]elecommunications provides an illustration of this transformation in the regulator’s role” (1998, p. 1362); and “[a]lthough the details vary, the story is largely the same throughout regulated industries” (1998, p. 1363).

Kearney and Merrill explain how this new paradigm is based on an *ahistorical* view of regulation, which fundamentally changes the view of relations between providers and end-users as demonstrated by review of the role of tariffing. “Although it has now become a commonplace to associate the tariff-filing system with regulation of monopolies, this is an ahistorical view of the matter” (Kearney & Merrill, 1998, pp. 1332-1333, footnote omitted). Referring to the historical developments underlying the Cullom Report[19] and enactment of the Interstate Commerce Act of 1887, they assert: “Thus, it was vigorous competition, as much as anything else, that gave rise to the wide variety of kickbacks, gratuities, and other devices that agitated much of the public. By 1887, the populist movement that had arisen in opposition to these ‘preferences,’ which were associated with large, monied, better-situated, and particularly corporate interests, could no longer be resisted, and the first major federal regulatory statute was enacted” (Kearney & Merrill, 1998, p. 1333, footnote omitted).

Kearney and Merrill then explain how history is central to understanding the historical inaccuracy of natural monopoly as the original basis for regulation.

> This history is central to understanding the original paradigm of regulated industries law. The Interstate Commerce Act … was essentially copied by Congress and the states into numerous subsequent regulatory acts. … *The reason for this replication had nothing to do with the structure of these industries. Some were natural monopolies; others were highly competitive.* Rather, it simply was generally accepted that an administrative system based on filed tariffs was the appropriate approach to regulating public utility and common carrier services, and that government oversight of the market was required to ensure the accepted goals of reasonableness, non-discrimination, and reliable service (1998, pp. 1333-1334, footnotes omitted, emphasis added).

Moreover, the historical and ahistorical views provide differing definitions of discrimination and the relationship to tariffing.

> [Under the original paradigm,] [t]ariffs were required whether the industry was competitive or monopolistic, primarily as a prophylaxis against discrimination. Implicit in this policy was the understanding that ‘discrimination’ is any differential pricing of

[19] See note 16, *supra.*

> services provided to similarly situated end-users. *This is a definition grounded in a social policy of equal treatment*" (Kearney & Merrill, 1998, p. 1340, emphasis added).

> "Under the new paradigm, *tariffing* is being eliminated for all regulated services that can be provided on a competitive basis, and *is retained only for those service segments regarded as natural monopolies*. Implicit in this new policy is the understanding that 'discrimination' cannot exist in a competitive market, and hence is a concern only when a single dominant firm has monopoly power. This is a definition grounded in economic theory. Thus, we see that regulatory changes designed to promote competition entail, as a closely associated concomitant measure, proposals that regulated services be detariffed (Kearney & Merrill, 1998, p. 1340, emphasis added).

As a result, the ahistorical view derived from economists' concept of natural monopoly shifts the role of the regulator and thereby creates the central tenets of the new paradigm. First, replace tariffs with contracts for services provided by competing providers.

> The new paradigm seeks to subject to ordinary contractual relations all common carrier and public utility services that can be provided by multiple competing providers. In industries and industry segments with few natural monopoly features, this means complete detariffing, elimination of all entry restrictions, and outright abolition of the control of an administrative agency (airlines, trucking, customer premises equipment). In industries and segments where services have been bundled together through vertical and horizontal integration, this means that segments that can be provide competitively must be unbundled and opened to competition (long-distance telephony, natural gas production, electricity generation). Once competition is introduced, cross-subsidies will disappear and universal service obligations either will be promoted through the imposition of competitively neutral taxes (telephony, perhaps electricity) or will be ignored (railroads, airlines) (Kearney & Merrill, 1998, pp. 1363-1364).

Second, focus on market segments with or without monopoly characteristics for purposes of regulation, and, in particular, focus on wholesale rather than retail markets.

> Given the near-complete reliance on market transactions in industries and industry segments that can be made competitive, *the focus of the agencies necessarily turns to those market segments that have natural monopoly characteristics*. Here, the great concern is that incumbent providers that control bottleneck facilities will use their monopoly power to discriminate against competitors in the service segments that have been opened to competition. To prevent this from happening, a new set of regulatory obligations—including the duty to interconnect, to lease unbundled network elements, and to sell services for resale—is imposed on the owners of such bottleneck facilities and becomes the focal point of regulatory attention. *In effect, the owners of natural monopoly facilities assume new common carrier duties toward their competitors, and these duties are regarded as more important than those they owe to their traditional customers.* The role of the agency correspondingly shifts from protecting the end-user

> to implementing a version of the essential facilities doctrine originally developed under the antitrust laws (Kearney & Merrill, 1998, p. 1364, emphasis added).

Economists' resistance to the FCC's classification of broadband Internet access services as a common carriage service ("telecommunications service") between the provider and end-user customer (retail market) is a manifestation of this ahistorical, natural monopoly view of regulation.

Kearney and Merrill believe technological changes and chain reactions brought about by competition among industries are not the prominent reasons for this transformation in regulated industries law. Rather, they believe the following explanations have great force: (1) interest group politics; and (2) "ideological consensus among policy elites that the risks of regulatory failure associated with the original paradigm are greater than the risks of market failure associated with competition" (Kearney & Merrill, 1998, p. 1383). These "two explanations … focus … on the *distributional* consequences of regulatory change and the *perceptions* of efficiency gains shared by policy elites" (Kearney & Merrill, 1998, p. 1383, emphasis in original). However, "we think that the phenomenon of chain reaction helps explain why regulatory change has occurred simultaneously or nearly simultaneously in so many industries" (Kearney & Merrill, 1998, p. 1393).

Kearney and Merrill first describe the role of interest group politics as occurring in waves of deregulation. Of particular relevance here, however, is their discussion of the second great force for transformation in regulated industries law – the role of ideological consensus among policy elites. They first note the apparent global diffusion of ideological consensus. The transformation in regulated industries not only in the U.S. but also internationally "strongly suggests that a significant degree of ideological consensus has emerged about the virtues of markets as the dominant mode of industrial organization for delivering public utility services" (Kearney & Merrill, 1998, p. 1398, footnote omitted).

More importantly, they emphasize *the ideological consensus within the economics profession*: "[I]f we confine ourselves to considering elite opinion about economic regulation of common carriers and public utilities, there can be no doubt that the perceptions of regulatory failure are in the ascendancy, while perceptions of market failure are in decline. Nowhere is this clearer than within the economics profession" (Kearney & Merrill, 1998, p. 1399). This ideological consensus among economists, where concerns of regulatory failure dominate those of market failure, has a strong relationship to natural monopoly.

> Beliefs within the economics profession about the proper treatment of regulated industries have changed in three important respects in recent decades. First, economists today tend to be less apprehensive about the phenomenon of natural monopoly as a type of market failure than they were in the past. Second, economists tend to regard public regulation more skeptically than was true in earlier generations. Third, a new theory—generally known as the theory of contestable markets—has emerged which is widely viewed as justifying a much more minimalist form of regulation of natural monopolies than the pervasive oversight associated with the original paradigm (Kearney & Merrill, 1998, pp. 1399-1400).

The first two changes in economists' beliefs "can be seen in their starkest form in the writings of economists closely associated with the Chicago School" (Kearney & Merrill, 1998, p. 1400). Milton Friedman argued for leaving natural monopolies unregulated: "that regulated monopolies would exercise *de jure* rather than merely *de facto* monopoly power" (p. 1400), and that de jure is what would lead to regulatory capture (pp. 1400-1401). Friedman's theory was bolstered by the work of other economists' empirical studies tied specifically to natural monopoly theory arguments. Here, Alfred Kahn's influence is again noted.

> Various studies have identified other or derivative reasons why regulation fails, even if the underlying industry structure is characterized by natural monopoly. The best know is the Averch-Johnson hypothesis, which posits that cost-of-service regulated creates an incentive for utilities to make excessive capital investments in order to boost their rate of return (Kearney & Merrill, 1998, p. 1401, footnote omitted).
>
> Alfred Kahn and others have also argued that the extensive cross-subsidies that characterize regulation of natural monopolies are inherently inefficient (whatever one thinks of their distributional consequences) (Kearney & Merrill, 1998, p. 1401, footnote omitted).

The theory of contestable markets also played a significant role. Under Baumol's theory of contestable markets "lowering entry and exit barriers could produce efficiency gains, even if only one firm service an industry at any given time. This theory suggested that *even natural monopoly industries should be opened to competition*, as long as regulators establish and enforce competitively neutral prices for access to bottleneck facilities" (Kearney & Merrill, 1998, p. 1402, footnotes omitted, emphasis added). Overall, the "[c]hanging ideas about market failure and regulatory failure within the economics profession thus have almost certainly played a critical role in the great transformation" (Kearney & Merrill, 1998, p. 1402).

6. Possible Future Trajectories for Regulated Industries Law

Given this transformation, Kearney and Merrill foresee three possible future, "ideal-type" trajectories for regulated industries law. First is the "rever[sion] toward a system that more closely approximates the original paradigm (or perhaps even sees state ownership of public utilities)" (Kearney & Merrill, 1998,pp. 1403-1404). They consider this trajectory the least plausible, and they "also think it unlikely that concerns about discrimination will again mount to the heights that existed at the beginning of the original paradigm" (Kearney & Merrill, 1998, p. 1404).

Second is that "the legal system could *continue to follow the current path that places critical reliance on the concept of natural monopoly*. The task of regulatory agencies under this trajectory would generally be to control access to and pricing of these natural monopoly service elements, but otherwise to foster open competition in all common carrier and public utility markets" (Kearney & Merrill, 1998, p. 1404, emphasis added).

Third is that "the legal system could gravitate toward the position that Milton Friedman outlined in 1962 *in which natural monopoly plays no role*; this would mean dismantling the system of active regulation of public utilities altogether, *leaving technological innovation, market forces, and antitrust and common–law actions as the only forms of discipline*" (Kearney & Merrill, 1998, p. 1404, emphasis added).

Kearney and Merrill then offer their own prediction as to the likely future trajectory of regulated industries law in the U.S.

> "In sum, we cautiously predict that the most likely path of the great transformation is the current one: a mixed system of competition through regulation. In all industries and industry segments where more than one firm can effectively operate, positive regulation will continue to give way to competition. But in industries or, rather, industry segments where one firm can operate more efficiently than two, *positive regulation will continue to exist under the guise of regulatory superintendence of natural monopoly bottlenecks*" (1998, p. 1407, emphasis added).

My own analysis seeks to close the gap in understanding between economists and lawyers so that the future trajectory of regulated industries law will *not* continue to be dictated by the "guise of regulatory superintendence of natural monopoly bottlenecks" (Kearney & Merrill, 1998, p. 1407), but rather will reflect a recovered awareness of the social concerns underlying the original regulatory paradigm. Interdisciplinary research can indeed enable recapturing such awareness to alter future

policy development, as illustrated by the influence of Cherry and Peha (2014) – an interdisciplinary legal-engineering analysis - on the FCC's declaratory ruling in its *Open Internet Order* (2015). The FCC's *Open Internet Order* (2015) - by restoring common carriage classification for broadband Internet access services between the provider and retail customer and providing a modified framework of regulatory oversight under the FCC's forbearance power - appears to be an inflection point that will redirect regulation, at least part, back towards the original regulatory paradigm. But for this new trajectory to be sustainable, it must withstand not only judicial review but also future attempts of Congressional legislation to override the FCC's decision. Hopefully, the research presented here will contribute to the sustainability of this recent shift in the policy trajectory.

References

Adler, Edward A. (1914). "Business Jurisprudence," 28 *Harv. L. Rev*. 135.

Barnes, Irston R. (1942). *The Economics of Public Utility Regulation.* New York, NY: F. S. Crofts & Co.

Burdick, Charles K. (1911). "The Origin of the Peculiar Duties of Public Service Companies, Parts I-III," 11 *Columbia L. Rev.* 514-531, 616-638, 743-764.

Cherry, Barbara A. (2015). "Technology transitions within telecommunications networks: Lessons from U.S. v. Canadian policy experimentation," 39 *Telecommunications Policy* 463-485.

Cherry, Barbara A. (2012). "Challenges of Institutional Governance for Network Infrastructures: Reinstitution and Expansion of Legal Innovations," in *Regulation and the Economic Performance of Communication and Information Networks* (G. Faulhaber, G. Madden, & J. Petchy, Eds.) (Edward Elgar Publishing), pp. 1-38.

Cherry, Barbara A. (2008a). "Institutional Governance for Essential Industries Under Complexity: Providing Resilience Within the Rule of Law," 17 *CommLaw Conspectus* 1-31.

Cherry, B. A. (2008b). "Maintaining Critical Legal Rules to Enable Sustainable Communications Infrastructures," 24 *Georgia St. U. L. Rev.* 945.

Cherry, Barbara A. (2007). "The Telecommunications Economy and Regulation as Coevolving Complex Adaptive Systems: Implications for Federalism," 59 *Fed. Comm. L. J.* 369-402.

Cherry, Barbara A. (2006). "Misusing Network Neutrality to Eliminate Common Carriage Threatens Free Speech and The Postal System," 33 *N. KY. L. Rev.* 483-511.

Cherry, Barbara A. (1999). *The Crisis in Telecommunications Carrier Liability: Historical Regulatory Flaws and Recommended Reform.* Norwell, MA: Kluwer Academic Publishers.

Cherry, Barbara A., and Peha, Jon (2014). "The Telecom Act of 1996 *Requires* the FCC to Classify Commercial Internet Access as a Telecommunications Service," *In the Matter of Protecting and Promoting the Open Internet,* GN Docket No. 14-28, Federal Communications Commission.

Federal Communications Commission, *Report and Order on Remand, Declaratory Ruling, and Order,* In the Matter of Protecting and Promoting the Open Internet, GN Docket No. 14-28, FCC15-24 (released March 12, 2015).

Kahn, Alfred E. (1988). *The Economics of Regulation: Principles and Institutions. Vols. I & II.* Cambridge, MA: The MIT Press.

Kearney, Joseph D., & Merrill, Thomas W. (1998). "The great transformation of regulated industries law," 98 *Columbia Law Review* 1323-1409.

Levy, Leonard W. (1957). *Law of the Commonwealth and Chief Justice Shaw*. New York, NY: Oxford University Press.

Mosca, Manuela (2008). "On the origins of the concept of natural monopoly: Economies of scale and competition," 15(2) *European J. History of Economic Thought* 217-353.

Sallyanne Payton, *The Duty of a Public Utility to Serve in the Presence of New Competition,* in *Applications of Economic Principles in Public Utility Industries* (Werner Sichel & Thomas G. Gies, eds.) (University of Michigan) (1981), pp. 121-152.

Phillips, Charles F. (1988). *The Regulation of Public Utilities: Theory and Practice.* Arlington, VA: Public Utilities Reports, Inc.

Alan Stone, *Public Service Liberalism: Telecommunications and Transitions in Public Policy* (Princeton, NJ: Princeton University Press) (1991).

Troxel, Emery (1947). *Economics of Public Utilities*. New York, NY: Holt, Rinehart & Winston, Inc.