

Introduction to Harberger's *Monopoly and Resource Allocation*—The Pioneering Article on Deadweight Loss and Empirical Measurement of the Social Costs of Monopoly

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I. Introduction

Arnold Harberger's 1954 article, *Monopoly and Resource Allocation*,¹ brought empirical analysis of the social costs of monopoly into the mainstream of antitrust work. In the mid-twentieth century, the dominant mode of monopoly analysis in the United States (and therefore worldwide) was structural rather than empirical, and that structural approach supported a highly interventionist antitrust regime. Harberger's 1954 article broke with the then-current economic orthodoxy and set monopoly research on a path that would lead to a strong shift toward empiricism and the development of a more cautious approach for antitrust enforcement. The article is famous for bringing monopoly deadweight loss analysis into the mainstream, graphically represented (see page 283 of the reprint that follows) as the "deadweight loss triangle" familiar to all modern students of antitrust; so much so, in fact, that deadweight loss triangles are now

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known as “Harberger triangles.”² But it was Harberger’s final estimate of the social costs of monopoly that was the bombshell in this work.

Harberger concluded that the aggregate social costs of monopoly in the U.S. were tiny: only about 0.1 percent of economic output, costing the average American about \$48 in today’s dollars. Although Harberger did not say so explicitly—the word “antitrust” does not appear in his paper—this conclusion suggested that antitrust enforcement should be ratcheted back, and even called into question whether antitrust enforcement should be attempted at all.

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As a professor of economics at the University of Chicago from 1953 to 1982, Harberger focused his career on the economics of public finance and taxation, and he mostly left the specifics of the antitrust debate that blossomed in the 1960s and 70s to other scholars who focused on antitrust. As a result, it is possible to meet antitrust lawyers today who do not know Harberger’s name; however, every modern antitrust lawyer uses tools and, if policy oriented, participates in debates that can be traced directly to Harberger, and particularly to his 1954 article. What follows below is a reminder of why Harberger deserves a re-reading. This introduction is organized into three short sections: a summary of the state of monopoly economics at the time Harberger published *Monopoly and Resource Allocation*; the paper’s key points; and the paper’s role in shaping monopoly economics and antitrust practice as we know them today.

II. Structural Analysis and the Economic Orthodoxy before Harberger

To understand why *Monopoly and Resource Allocation* was so revolutionary, one must recall the state of monopoly economics and antitrust thinking of the mid-Twentieth century United States. To a modern student of antitrust, for whom the Chicago School is familiar and *Von’s Grocery*³ is a kind of epithet, it may be difficult to imagine a time when structural analysis was dominant. But dominant it was. Herbert Hovenkamp explained the mid-century mindset at length in his *Introduction to the Neal Report* (in the Spring issue of this magazine).⁴ As Hovenkamp observed, economists and law professors had spent the first fifty years of the Twentieth Century creating an elaborate theoretical body of work eventually known as the “structure-conduct-performance” (S-C-P) paradigm. The most elegant and most tested model of industrial economics of its time,⁵ the S-C-P paradigm represented the high point of structuralism. According to the paradigm, concentration (structure) powerfully influenced conduct, with increases in concentration almost inevitably causing decreases in competition (conduct); less competition almost inevitably led to decreased efficiency and social welfare (per-

formance); and therefore one could effectively delete the middle step and state that structure equals performance. Since the middle step regarding conduct could be ignored (this was the “disappearing middle” in the language of the day), economists, it was assumed, need not evaluate competitive behavior directly. Economists using these structural methods had concluded by the 1950s “that some 20 to 30 to 40 per cent” of the U.S. economy was “effectively monopolized,”⁶ and that social welfare losses were correspondingly large.

Ultimately, structuralism and the S-C-P paradigm found their way into the Neal Report,⁷ a report on competition in the U.S. economy commissioned by President Lyndon Johnson in 1967 and published in 1969, that suggested reforms to the antitrust laws. The Neal Report is an excellent single source for anyone curious about the economic orthodoxy against which Harberger was working. The Report observed with alarm that “industries in which four or fewer firms account for more than 50 percent of output produce nearly 24 percent” of the total value of manufactured products in the U.S., and stated that “[a]n impressive body of economic opinion and analysis supports the judgment that this degree of concentration precludes”—not reduces, but *precludes*—“effective market competition [.]”⁸ The Report proposed a Concentrated Industries Act under which the Department of Justice would “search out” concentrated industries—defined as those in which the four largest firms’ combined market share exceeded 70 percent—and order divestitures so that no firm would have a market share above 12 percent. Even a firm with a 15 percent market share would see “steps to reduce” its share under this law.⁹ And the Report even took aim at the patent system, stating that “patents are one of the principal sources of monopoly power” and calling for legislation “to establish the principle that a patent which has been licensed to one person shall be made available to all other qualified applicants on equivalent terms.”¹⁰ Truly, this was a different model of antitrust than today’s: the markets seen as “precluding” competition in the Neal Report could have Herfindahl-Hirschman Index (HHI) scores as low as 650, well under the 1000 HHI value that the U.S. government’s Horizontal Merger Guidelines regard as “unconcentrated,”¹¹ and in which mergers now have a virtual safe harbor.¹²

By the time of the Neal Report’s publication in 1969—although one would not realize this from the Report itself—the consensus surrounding structural economics was breaking up. The Report served simultaneously as structuralism’s culmination and its last gasp. Hovenkamp’s observation on this point cannot be improved, so I will simply quote it:

“The tragedy of the Neal Report is that the model it represented was just on the verge of complete, catastrophic replacement. . . . Indeed, the publication of the Neal Report played no small part in instigating a massive reaction among younger academics that eventually cast the S-C-P paradigm onto the dung heap of defunct economic doctrines.”¹³

That massive reaction was led by a small number of scholars dedicated to antitrust, including one who served on the Neal commission itself: Robert Bork, who had written the seminal article *The Crisis in Antitrust* (1963),¹⁴ wrote a strong dissent to the Neal Report, and later published *The Antitrust Paradox* (1978). But although the reaction came to prominence in the 1960s and 70s, it would be a mistake to imagine it bursting onto the scene without precedent, as if a new Athena had sprung forth fully formed from the side of Bork's head. The reaction was built on a foundation laid by Harberger.

III. The Key Points of *Monopoly and Resource Allocation*

So what exactly is so different about *Monopoly and Resource Allocation*—what did Harberger do that was against the structuralist orthodoxy of his time? Four things: he directly asked whether it was possible to, in his words, “try to get some quantitative notion of the allocative and welfare effects of monopoly,”¹⁵ in particular in U.S. manufacturing; he made a graphical representation of the deadweight loss triangle; he used an empirical estimate of that deadweight loss to answer his question; and, when the loss appeared to be very small, he stated this conclusion:

“[I]t seems to me that the monopoly problem does take on a rather different perspective in light of the present study. Our economy emphatically does not seem to be monopoly capitalism in big red letters.”¹⁶

The last point was certainly revolutionary; it surprised even Harberger, who said, “I must confess I am amazed at this result.”¹⁷ But the first three points were no less groundbreaking, at least as a matter of academic inquiry.

Taking these points in order, one begins with the surprising observation (to a modern student of antitrust) that before Harberger, academics did not even try to estimate the magnitude of monopoly welfare loss economy-wide. Harberger's estimate was the first.¹⁸ Why was there so fundamental a hole in the literature? The answer seems to be both that it was assumed to be extremely difficult to do so, and that it was assumed to be unnecessary—few doubted that monopoly losses were quite severe. Harberger himself observes

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that "I never really tried to quantify my notions of what monopoly misallocations amounted to, and I doubt that many other people have."¹⁹

A subtler answer may be that a sort of feedback loop was at work. Prominent academics said that only structural analyses, not empirical estimates, were feasible and necessary; so judges entertained only structural arguments; so lawyers employed only structural expert witnesses, not empiricists, in important cases; and so empiricists never became prominent in antitrust academia. This may help explain why it fell to Harberger, an obscure (to antitrust experts) economist at Chicago focusing on tax matters, to create a revolution under the very noses of

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his antitrust colleagues. The Neal Report is, after all, named for commission chairman Phil C. Neal, then Dean of the University of Chicago Law School. Harberger became a grandfather of what came to be known as the empiricist Chicago School but it is worth noting that the actual school in Chicago in 1954 was quite friendly to structuralism.

After asking the hitherto unexamined question, Harberger set about using the deadweight loss triangle to answer it. Harberger in 1954 was not the first to draw such a figure. Deadweight loss triangles (under various names) had been known at least since the 1840's work of a French engineer named Jules Dupuit, who used them to measure the consumer benefits of public works.²⁰ Others used them over the intervening century to evaluate the loss due to many distortions, including taxes, which is almost certainly how they came to be on Harberger's mind.²¹

Harberger did not appear to believe that his use of deadweight loss triangles was revolutionary; he introduced a triangle without fanfare in his Figure 1, and never called it a deadweight loss triangle or gave it a name of any kind in the 1954 article.²² But it would be a mistake to minimize Harberger's innovation just because the basic idea of the triangle was already known; almost no economists were measuring deadweight loss triangles empirically in Harberger's time, and none were using them to estimate monopoly effects.²³ This was an important omission: without such estimates, it was impossible to offer reliable answers to important questions about monopoly distortions, and antitrust economics lacked the empirical grounding that later facilitated rapid progress.²⁴

Harberger's empirical findings in *Monopoly and Resource Allocation* are best taken directly by reading the article, of course, but they can be summarized briefly. First, Harberger looked for a time when economic data was relatively well kept and economic shocks were relatively few. This was no easy task to an academic working in the early 1950s—the United States had seen three major wars

and a Great Depression in just the past fifty years—but Harberger was able to find a suitable period in the late 1920s.

He averaged rates of economic return over a five-year period (to further smooth out temporary distortions) for 73 manufacturing industries, assumed that the average rate of profit was the competitive profit, measured how each of the industries deviated from that competitive profit, and then took that deviation as the amount that “prices in each industry were ‘too high’ or ‘too low’ when compared with those that would generate an optimal resource allocation.”²⁵ He then applied a formula to determine the amount that consumer welfare would increase or decrease if each industry either acquired or divested itself of the appropriate amount of resources to remove the distortions he found; he expanded that figure to cover the whole economy (not just the sectors that he directly measured); and he got “what we really want: an estimate of by how much consumer welfare would have improved if resources had been optimally allocated throughout American manufacturing in the late twenties.”²⁶ He then applied several reductive factors, since this number was a measure of all distortion, not merely monopoly distortion; however, he applied the reduction conservatively, meaning that “in short, [he] labored at each stage to get a big estimate of the welfare loss [.]”²⁷ Even so, he said, “we come out at the end with less than a tenth of a per cent of the national income.”²⁸

Harberger was cautious about his results. He acknowledged that some factors may have caused him to underestimate the harm (although others, he noted, may have caused him to overestimate it). He declared that he did not mean to minimize the effects of monopoly: “a tenth of a per cent of the national income is still over 300 million [in 1954] dollars,”²⁹ or about \$14.29 billion today. And he was at pains to admit that he did not examine certain ancillary effects; for example, he decided not to take on the task of analyzing the redistributions of income that arise when monopoly is present.³⁰ “All I want to say here,” he wrote, “is that monopoly does not seem to affect aggregate welfare very seriously through its effect on resource allocation.”³¹ Harberger did not call for changes to antitrust practice—as previously mentioned, the word “antitrust” never appears in *Monopoly and Resource Allocation*—and in fact, in the 1954 article, he did not call for policy changes of any kind. Then again, with these results, he did not need to.

One final note about the article itself. Unlike the Neal Report, which Hovenkamp described as “a trip to another world,” Harberger’s article seems to today’s reader to be surprisingly modern: it presents empiricism as a given, not as some type of new and untried device. True, the writing may appear old-fashioned: the article proceeds in a conversational, almost folksy style more suited to the first half of the Twentieth Century than the second, making the reader feel as if he or she were seated in a

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winged chair before a fireplace during one of Chicago's brutal winters, casually bantering with a colleague over some minor academic point.

There is no hint from Harberger's tone that he was shaking the entire foundation upon which early- and mid-century antitrust practice was based. To the modern reader who knows what became of this article, the disconnect between tone and substance is a bit shocking; it is as if the professor has offered a tumbler of aged scotch and, after accepting, one discovers the glass to contain a hand grenade. In the final analysis, Harberger is revealed as a master of modesty and understatement. Modern academics, seeking as they would even the smallest measure of Harberger's renown, might want to take note.

IV. Deadweight Loss and Harberger's Thesis in Modern Antitrust Practice

Harberger may not have made policy prescriptions in his 1954 article but he was indeed motivated by policy. And he appears to have been a bit frustrated that policy changes take time, as they did in the area of antitrust. As proof, look no further than the facts that *Von's Grocery* was a 1966 decision (12 years after *Monopoly and Resource Allocation*) and the Neal Report was published in 1969 (15 years after). By 1964, Harberger was calling explicitly for policy to catch up to the new empiricism in monopoly economics:

“The measurement of deadweight losses is not new to economics by any means. It goes back at least as far as Dupuit. . . . Nonetheless I feel that the profession as a whole has not given to the area the attention that I think it deserves. We do not live on the Pareto frontier, and we are not going to do so in the future. Yet policy decisions are constantly being made which can move us either toward or away from that frontier. What could be more relevant to a choice between policy A and policy B than a statement that policy A will move us toward the Pareto frontier in such a way as to gain for the economy [a wealth effect greater than] policy B . . . ?”³²

Eventually, other economists did catch up and, with them, policymakers. The Neal Report quickly became a dead letter, due in part to the influence of Harberger's work. As various scholars examined both Harberger's specific results and his approach, a debate ensued, and in general his results regarding deadweight loss effects proved robust. The debate ranged across several disciplines—from antitrust to corporate income tax—but Harberger's work survived, in part because Harberger made conservative estimates and in part because many aspects

of alternative calculations and methodological specifications tended to cancel each other.³³ For work that supported the thesis of *Monopoly and Resource Allocation*, see F.M. Scherer's *Industrial Market Structure and Economics* (2d ed. 1980) and studies by Schwartzman, Siegfried, Tiemann, & Worcester.³⁴ Other studies found greater or lesser welfare effects in different time periods, but this author is not aware of any well-respected study of the U.S. economy that finds a different and larger effect sufficient to support the highly interventionist antitrust approach that prevailed in 1954. (Note that this may not be as true for other nations' economies; for example, Jenny & Weber in 1983 found that the deadweight loss in France might be as high as 7.3 percent.³⁵)

The larger effect of Harberger's article has been to reframe the terms of antitrust work, both as a matter of case practice and policy debate. On the case practice side, any practitioner knows that in most mergers, single firm conduct, and rule of reason cases, empirical analysis of welfare effects is mandatory. *Per se* rules still exist in antitrust law, and structural analysis still has its place in the initial screens applied by the U.S. Horizontal Merger Guidelines, but in other situations, empirical analysis of welfare effects is often dispositive. As this author has previously explained in greater detail, empirical welfare economics has become almost synonymous with antitrust economics, and antitrust economics has transformed U.S. antitrust law into an "effects based" (outcome based) system via its adoption in landmark Supreme Court decisions. So much so, in fact, that the Supreme Court—having become comfortable with such economics through its antitrust jurisprudence—now appears to be using welfare economics to transform other areas of the law as well.³⁶

On the policy side, Harberger's work and subsequent similar studies forced defenders of antitrust to react, and now form the background against which academics measure arguments over the proper level of antitrust enforcement. That debate has not been wholly negative for the antitrust side. True, some have concluded that the antitrust flame is not worth the candle, and that the Sherman Act should be repealed. Most, however, have concluded that while antitrust should be less interventionist than its 1950s model, antitrust law is still meaningful.

IF ANYTHING, THE ADVERSITY REPRESENTED BY HARBERGER'S THESIS HAS MADE ANTITRUST'S DEFENDERS SMARTER AND STRONGER.

If anything, the adversity represented by Harberger's thesis has made antitrust's defenders smarter and stronger. Instead of resisting welfare economics, they have embraced and co-opted it. They have focused the most enforcement effort where the chance of false positives (unmerited enforcement) is least, using policies such as the "antitrust hierarchy," which devotes enforcement resources in descending order to cartels, merger enforcement, and non-merger civil conduct. And they have developed subtler arguments, such as taking the position that deadweight loss should not be the only concern of antitrust law: wealth distribution distortions, rent seeking distortions, and reductions to dynamism and technological

innovation, they have claimed, are difficult to measure via Harberger's method but nonetheless crucial.³⁷ Such debate is beyond the scope of this introduction. For now, it is enough to observe that the tools and debate of modern antitrust practice can be traced in important ways back to *Monopoly and Resource Allocation*, and that the article is well worth a read by the many antitrust lawyers who came of age after its revolutionary ideas had become the mainstream. ▼

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- 1 Arnold C. Harberger, *Monopoly and Resource Allocation*, 44 AM. ECON. REV. 77 (1954), reprinted at 283 in this issue of COMPETITION POLICY INTERNATIONAL (page citations hereinafter are to the CPI reprint).
 - 2 See generally James R. Hines, Jr., *Three Sides of Harberger Triangles*, NBER Working Paper Series, Working Paper 6852 (1998) (available via SSRN). "Harberger triangles" are so called due to the author's entire body of work but the 1954 article and another in 1971 (Arnold C. Harberger, *Three Basic Postulates for Applied Welfare Economics*, 9 J. ECON. LIT. 785 (1971)) are most responsible for this appellation.
 - 3 *United States v. Von's Grocery Co.*, 384 U.S. 270 (1966). In this now-infamous case, the merger of the two largest grocery companies in a market was found to violate Clayton Act section 7, despite the fact that their combined market share was only 7.5 percent. Equally famously, Justice Stewart, in dissent, observed that in such cases brought under section 7, "the sole consistency that I find is that in litigation under §7, the government always wins." *Id.* at 301.
 - 4 Herbert Hovenkamp, *Introduction to the Neal Report and The Crisis in Antitrust*, 5 COMPETITION POLICY INTERNATIONAL 217 (2009).
 - 5 *Id.* at 219.
 - 6 Harberger, *Monopoly and Resource Allocation* at 283.
 - 7 Report of the White House Task Force on Antitrust Policy (May 27, 1969), originally published at 115 CONG. REC. 11, 13890, reprinted at 5 COMPETITION POLICY INTERNATIONAL 227 (2009) (page citations hereinafter are to the CPI reprint). The report is called the Neal Report after its chairman, Phil C. Neal, then Dean of the University of Chicago Law School.
 - 8 *Id.* at 228.
 - 9 *Id.* at 237.
 - 10 *Id.* at 230.
 - 11 U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, HORIZONTAL MERGER GUIDELINES 15 (1992 & Rev. 1997), available at <http://www.usdoj.gov/atr/public/guidelines/hmg.htm>.
 - 12 Hovenkamp, *Introduction to the Neal Report* (supra note 4) at 218.
 - 13 *Id.*
 - 14 Robert Bork & Ward Bowman, *The Crisis in Antitrust*, FORTUNE (Dec. 1963); and 65 COL. L. REV. 363 (1965).
 - 15 Harberger, *Monopoly and Resource Allocation* at 283.

- 16 *Id.* at 290.
- 17 *Id.*
- 18 Robert H. Lande, *Wealth Transfers as the Original and Primary Concern of Antitrust: the Efficiency Interpretation Challenged*, 50 HASTINGS L. J. 871, 879 n. 32 (1999).
- 19 Harberger, *Monopoly and Resource Allocation* at 290.
- 20 Hines, *Three Sides of Harberger Triangles* (*supra* note 2) at 3-4, discussing A. Jules E.J. Dupuit, *De la Mesure de l'Utilité des Travaux Publics*, ANNALES DES PONTS ET CHAUSSÉES, 2d ser., 8 (1844); translated by R.H. Barback as *On the Measurement of the Utility of Public Works*, INTERN. ECON. PAPERS 2 (1952); reprinted in KENNETH J. ARROW & TIBOR SCITOVSKY EDS., *READINGS IN WELFARE ECONOMICS* 255 (1969).
- 21 See *id.* at 4-22 (discussing the history of deadweight loss analysis, primarily in tax economics).
- 22 See Harberger, *Monopoly and Resource Allocation* at 284.
- 23 See Hines, *Three Sides of Harberger Triangles*, *supra* n. 20, at 24.
- 24 See *id.*
- 25 Harberger, *Monopoly and Resource Allocation* at 285.
- 26 *Id.* at 287.
- 27 *Id.* at 290.
- 28 *Id.*
- 29 *Id.* at 287.
- 30 *Id.*
- 31 *Id.* (emphasis added).
- 32 Arnold C. Harberger, *The Measurement of Waste*, 54 AM. ECON. REV. 58, 58-59 (1964).
- 33 Hines, *Three Sides of Harberger Triangles*, *supra* n. 20, at 12.
- 34 David Schwartzman, *The Burden of Monopoly*, 68 J. POL. ECON. 627 (1960); John J. Siegfried & Thomas K. Tiemann, *The Welfare Costs of Monopoly: An Inter-Industry Analysis*, 12 ECON. INQUIRY 190 (1974); Dean A. Worcester, Jr., *New Estimates of the Welfare Loss to Monopoly, United States: 1956-1969*, 40 S. ECON. J. 234 (1973).
- 35 Frédéric Jenny & André-Paul Weber, *Aggregate Welfare Loss Due to Monopoly Power in the French Economy: Some Tentative Estimates*, 32 J. INDUSTRIAL ECON. 113 (1983).
- 36 See Hill B. Wellford, *Is the Supreme Court Importing Antitrust Economics into Patent Law? A Different Look at eBay, MedImmune, KSR, and Quanta Computer*, GLOBAL COMPETITION POLICY (Mar. 2009 rel. 2).
- 37 See, generally, H. Hovenkamp, *Antitrust Policy and the Social Cost of Monopoly*, 78 IOWA L. REV. 371 (1993) and F.M. Scherer, *Antitrust, Efficiency, and Progress*, 62 N.Y.U. L. REV. 998 (1987).