



**United States of America
Federal Trade Commission**

***Sleepy Hollow* and the Arrovian Legend:
Is There a Generalizable Relationship Between
Concentration and Innovation?**

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“Big Techs and Start-Ups: Where is the Innovation?”*

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Second, some believe that more concentrated industries are as a rule less innovative than un-concentrated ones, and therefore any acquisition that increases concentration necessarily reduces competition.⁴

Some trace these arguments to work by Kenneth Arrow, a Nobel Prize-winning economist. In what is commonly called the “Arrow vs. Schumpeter” debate, Schumpeter supposedly championed the opposing view that monopolists are more innovative.

Some commentators today claim that subsequent empirical research has unambiguously proven Arrow’s hypothesis that small firms are more likely to innovate, and disproven Schumpeter’s hypothesis to the contrary. Whether this claim is true could have significant implications for the hot button issue of killer acquisitions, and for that reess inny ue04y0is cr0]f(e oh)]Tc -0.019

Of course, legends are part of the landscape here in the United States. For example, Silicon Valley is home to real-life unicorns with names like Uber, Pinterest, and Peloton.⁸ The conquistador Ponce de Leon supposedly was convinced that the mythical Fountain of Youth could be found somewhere in my native Florida.⁹ And, about twenty miles north of where we sit tonight, the famous Headless Horseman of Sleepy Hollow haunts the hamlet of Tarrytown, New

message is that when we're assessing innovation, we should conduct a holistic evaluation more closely tethered to the facts at hand.

II. TODAY'S ARROVIAN LEGEND

Despite this nuance, many in Washington believe the answer to tonight's question is

empirical evidence into a simple, administrable rule. But, whatever the origin, the result is that we have created a legend, and one that grows with each retelling.¹⁵

Generally speaking, I am not in favor of sweeping policy proposals – but if we are going to deploy them, we should base them on sound theory and evidence. Therefore, in this context, if we seek to block acquisitions of nascent competitors as a means of promoting innovation, then we should be able to show two things – first, that these acquisitions slow innovation and second, that issuing a blanket prohibition on these types of acquisitions would necessarily hasten innovation. Similar theoretical and evidentiary burdens would apply to proposals to promote innovation by breaking up Big Tech.

III. DECONSTRUCTING THE LEGEND

In deconstructing this legend, we should first ask what the economic literature actually says. The theoretical literature, and particularly the foundational work by Schumpeter and Arrow, includes far more assumptions, qualifications, and limitations than the idealized version

¹⁵ For example, Khan argues that “a host of empirical evidence” favors the Arrovian view. For support, she cites two policy papers, one by Carl Shapiro and the other by Jon Baker. *See id.* at 969 n.41 (citing Shapiro and Baker generally, without pincites, as support). Yet Shapiro and Baker are themselves far more nuanced and modest in their claims. *See* Carl Shapiro, *Competition and Innovation: Did Arrow Hit the Bull’s Eye?*, in *THE RATE AND DIRECTION OF INVENTIVE ACTIVITY REVISITED* 361, 362-63 (Josh Lerner & Scott Stern eds., 2012) (describing his paper as “an audacious attempt to distill lessons from the huge and complex literature on competition and innovation that are simple and robust enough to inform competition policy,” noting that Schumpeter “emphasized that a great deal of innovation is attributable to large firms operating in oligopolistic markets,” “consciously oversimplifying” the Schumpeterian position as “[t]he prospect of market power and large scale spurs innovation,” and arguing “that the Arrow and Schumpeter perspectives are fully compatible and mutually reinforcing”); Jonathan B. Baker, *Beyond Schumpeter vs. Arrow: How Antitrust Fosters Innovation*, 74 *ANTITRUST L.J.* 575, 583-587 (2007) (conducting an abbreviated literature review, arguing that almost all of the reviewed studies are flawed or limited, and offering an alternative explanation for some empirical findings, but nonetheless concluding that “[t]aken as a whole, this empirical evidence highlights the importance of the second principle” that competition “encourages [firms] to innovate”).

Likewise, the theoretical literature may be oversimplified. For example, a scholar who argues “Schumpeter was right” claims he “advanced the now familiar hypothesis that large firms with market power accelerate the rate of innovation.” Tom Nicholas, *Why Schumpeter Was Right: Innovation, Market Power, and Creative Destruction in 1920s America*, 63 *J. ECON. HISTORY* 1023, 1023 (2003). Again, this approach may simply reflect an impulse to simplify a complex argument for exposition. But others take a more nuanced approach when characterizing Schumpeter’s thesis. *See, e.g.,* Shapiro, *supra*, at 363.

we commonly hear. And, contrary to what we often hear, the empirical literature finds no clear and robust relationship between innovation and market structure. Instead, it identifies a large number of factors that affect the pace and direction of innovation. In short, the evidence is far less clear-cut than many observers claim.

A. Theoretical Literature

Let's start at the beginning, with Arrow and Schumpeter's theoretical articles. Today, Arrow apparently stands for the proposition that atomistic markets are always more innovative than concentrated ones.¹⁶ If you read Arrow's seminal 1962 article,¹⁷ you will indeed find a passage in which he said that "the incentive to innovate is less under monopolistic than under competitive conditions."¹⁸ Yet immediately before this statement you will find two qualifications that the modern Arrowian legend ignores. First, Arrow explained that the "monopolistic" conditions he has in mind are those in which a firm enjoys significant barriers to entry and in which "only the monopoly itself can invent."¹⁹ I have practiced antitrust law for more than two decades, and I have yet to find a market in which only one firm can innovate. Second, in the same paragraph Arrow also said that "a situation of temporary monopoly, due perhaps to a previous innovation, which does not prevent the entrance of new firms with innovations of their own, is to be regarded as more nearly competitive than monopolistic for the purpose of this analysis."²⁰

In other words, Arrow would characterize most – if not all – of the industries that exist today as "more nearly competitive than monopolistic," and therefore presumably mo16

innovative than his hypothetical pure monopolist. But observers now routinely argue that today's tech firms are precisely the kind of monopolists Arrow had in mind.²¹

Sometimes good legends come in pairs, like Merlin and Excalibur. And so some have paired the Arrovian legend with a Schumpeterian one. Going back to the original work, Joseph Schumpeter's 1942 book,²² I can confirm that Schumpeter did say "the trail [of innovation] leads not to the doors of those firms that work under conditions of comparatively free competition but precisely to the doors of the large concerns" and that "a shocking suspicion dawns upon us that big business may have had more to do with creating the standard of life than with keeping it down."²³ Yet he also said that the "perennial gale" of "creative destruction" affects all firms, from "new concerns, methods and industries" to "old concerns and established industries."²⁴ And, perhaps even more to the point, he also said his theory "does not amount to a case against state regulation," but instead shows "that there is no general case for indiscriminate 'trust-busting' or for the prosecution of everything that qualifies as a restraint of trade."²⁵ So what Schumpeter actually said bears little resemblance to the caricature we sometimes hear today.²⁶

²¹ See, e.g., Tim Wu, *Taking Innovation Seriously: Antitrust Enforcement If Innovation Mattered Most*, 78 ANTITRUST L.J. 313, 318 (2012) ("In more recent times, we might ask if Google would have continued to improve its search engine or developed Google+ if not facing serious challenges from Microsoft or Facebook, respectively. As Kenneth Arrow pointed out long ago, absent an external threat, a monopolist often has less to gain from innovation, because it already controls the market.") (citing Arrow, *supra* note 17, at 619).

²² JOSEPH A. SCHUMPETER, *CAPITALISM, SOCIALISM AND DEMOCRACY* (3d. ed., 1962) (1942).

²³ *Id.* at 82.

²⁴ Schumpeter at 90 ("Our argument however extends beyond the cases of new concerns, methods and industries. Old concerns and established industries, whether or not directly attacked, still live in the perennial gale. Situations

effort dedicated to more incremental and process innovations tends to increase with firm size,”³¹ but that larger firms also “appear to be better positioned to profit from the innovations they have in hand.”³² In other words, firm size does not appear to matter much in isolation, but may matter when combined with other variables.

Second, neither study found robust evidence that more competitive markets are necessarily more innovative. According to Gilbert, “neither theory nor empirical evidence supports a strong conclusion that competition is uniformly a stimulus to innovation” and “[t]here is little evidence that there is an optimal degree of competition to promote R&D.”³³ In a similar vein, Cohen concludes that “[p]erhaps one of the most basic lessons to emerge from the empirical literature is that, although testing loosely motivated hypotheses may yield empirical results, even robust ones, their interpretation can be challenging, and the insight that can be gleaned from such findings is often limited in the absence of underlying theory.”³⁴

So, to put it in more concrete policy terms, we cannot say that small firms always and everywhere are more innovative than large ones. Nor can we say that deconcentrating a market now dominated by a few large firms will necessarily result in more innovation.

IV. TOWARDS A MORE NUANCED APPROACH

So what can we say? Again, the empirical literature points the way. Cohen says “perhaps the most persistent finding concerning the effect of concentration on R&D intensity is that it depends upon other industry-level variables.”³⁵ “It depends” – how you hear those words depends on where you sit. To an outside lawyer who bills by the hour, it’s a dream come true.

³¹ Cohen, *supra* note 27, at 137.

³² *Id.* at 140.

³³ Gilbert, *supra* note 28, at 205-06.

³⁴ Cohen, *supra* note 27, at 198.

³⁵ *Id.* at 146.

“appropriability,”⁴² the relative “maturity” of the industry,⁴³ and the inherent level of technological opportunities.⁴⁴ For example, Cohen suggests that innovation is greater in the pharmaceutical industry because the nature of small-molecule drugs makes it very difficult to “invent around” a patent, providing a patentee with a near-complete ability to exclude rivals.⁴⁵ In contrast, he believes that it is significantly easier to design around electrical or mechanical patents, which may cover only one of three or four different ways to accomplish a task.⁴⁶ Industry clustering may also explain why some industries are more innovative than others. The American semiconductor industry clustered in Silicon Valley; the global finance industry clustered in New York, London, Singapore, Frankfurt, and Zurich. Clusters may promote the development of specialized labor forces and the diffusion of new ideas among firms,⁴⁷ thereby increasing the pace of innovation and making more intensive use of the unpatented innovations that have already occurred.⁴⁸

The third category contains *variables specific to the firm*, like the firm’s culture, leadership, and inherent capacity to absorb and apply new innovations.⁴⁹ For example, Cohen hypothesizes that firms may have differential capacities to assimilate and use new technologies.⁵⁰

⁴² See Cohen, *supra* note 27, at 182-193; see also Shapiro, *supra* note 15, at 364.

⁴³ Cohen, *supra* note 27, at 139 n.9 & 140 (discussing Zoltan J. Acs & David B. Audretsch, *Innovation, Market Structure, and Firm Size*, 71 REV. ECON. & STAT. 567 (1987); NANCY S. DORFMAN, *INNOVATION AND MARKET STRUCTURE: LESSONS FROM THE COMPUTER AND SEMICONDUCTOR INDUSTRIES* (1987)).

⁴⁴ Gilbert, *supra* note 28, at 194-95.

⁴⁵ Cohen, *supra* note 27, at 183 n.71 (discussing Richard C. Levin et al., *Appropriating the Returns from Industrial Research and Development*, 1987 BROOKINGS PAPERS ON ECONOMIC ACTIVITY 783 (1987)).

⁴⁶ *Id.*

⁴⁷ See, e.g., EUROPEAN COMMISSION, DIRECTORATE-GENERAL FOR ENTERPRISE AND INDUSTRY, *EU CLUSTER MAPPING AND STRENGTHENING CLUSTERS IN E*

V. CONCLUSION

In recent years, we have seen the growth of a new legend. Using a highly stylized version of Arrow's work and aggressive claims
