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ARTICLE

Up and to the Right: The Development, Diffusion, and Impact of the Casey Life Cycle Model on Venture Capital Policy and Practice

M.R. Sauter

This article contributes an account of a key moment in the development of venture capital. I argue the US Small Business Administration's Task Force on Venture and Equity Capital for Small Business, established in 1976 and headed by William J. Casey, had an outsized impact on the development of modern venture capital and its close associations with the high technology sector. The Task Force's 1977 report was influential in establishing both the figure of the venture capitalist and the business model of institutionally supported, limited partnership venture capital in the minds of policymakers, businesspeople, and the general public. This article traces the influence of one part of the Report: a prominently featured schematic model, entitled "Life Cycle of a New Enterprise: Model of a Growing and Successful Company, 1975-1976 Financial Market Conditions." I trace the influence of the LCM as it spread through the developing high technology sector, as shown by its appearances in business publications, governmental reports, and congressional testimonies offered by industry leaders. The LCM was genericized away from its original authors and intentions, becoming part of the economic imaginary of the technology and innovation sector.

Keywords: venture capital; finance; public policy; Small Business Administration

In 1976, the US Small Business Administration (SBA) convened a blue-ribbon task force under the direction of William J. Casey with the goal of delivering a set of policy solutions to a perceived crisis in small business funding. This "crisis," as identified by the SBA, manifested as a decline in equity investment in American small businesses and initial public offerings (IPOs) following the 1973–1976 recession. The Task Force on Venture and Equity Capital for Small Business, also known as the Casey Task Force, delivered their recommendations in a 1977 report.[1] The Casey

1. Published Casey Report.

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Report was well publicized, with Task Force members, their business partners, and Congressional allies distributing copies, giving interviews, and promoting the Report's conclusions in print and in the halls of government. Within five years of its release, the Report's policy agenda, including changes to labor regulation, tax law, and several Security and Exchange Commission (SEC) rules, had been enacted.

The Casey Report and the promotional efforts of Casey and other Task Force members were influential not only in instituting its policy agenda but also in establishing a public image of the venture capitalist and the business narratives of the limited partnership, equity investment model in high technology. This public image and narrative was in part based on the specific way some Task Force members were already doing business; the Casey Task Force's seventeen, primarily East Coast, members included prominent New York financier Charles Lea, a general partner at New Court Private Equity, which had adopted an institutionally funded limited partnership firm model in 1972.[2] The policy agenda advocated for by Casey included large reductions in capital gains tax; revisions to SEC rules 144 and 146 to ease the secondary sale of unregistered securities; and the relaxing of ERISA investment guidelines to mark high-risk venture capital investments as permissible for pension funds.[3] These changes were implemented over the five years following the Report's 1977 publication and cleared the way for institutional capital, handled primarily by limited partnership firms making early equity investments in high-growth potential companies, to become a dominant model of venture investment in the US by the 1980s. As noted by Kenney and others,[4] the limited partnership, institutionally funded firm model had been adopted by a small handful of investment firms prior to the mid-1970s but did not become common practice amongst private equity and venture capital investors until after the loosening of ERISA restrictions at the end of the decade.

Passing this policy agenda was, in some ways, regulatory whiplash. SEC rules 144 and 146 had both been enacted during Casey's time at the head of the SEC (1971–1973) and he had made public statements endorsing them. ERISA, following a long legislative gestation, had passed in 1974. The agenda outlined in the Casey Report entailed significant rollbacks to what had been substantial progress in investor protection and labor rights. Significantly, the Casey Task Force did not simply offer a regulatory agenda in their Report. Rather, they folded their agenda into a business narrative which included at its center the figure of the American venture capitalist. This narrative valorized the role of the venture capitalist as a uniquely American and uniquely successful risk laborer, who put his special capacities for risk to work building the American project and growing the assets of others. As presented by the Task Force, this figure and his attendant narratives were ahistorical but charismatic and used to justify rolling back regulations the Task Force targeted, which they argued unnecessarily and dangerously hampered a fundamental part of American economic life.

Important to the establishment of this narrative was the "Life Cycle of a New Enterprise" model, which featured prominently in the Report. This schematic, entitled the "Life Cycle of a

2. Kenney, 1702; SBA Task Force on Venture and Equity Capital member list.
3. Published Casey Report.
4. Nicholas (2019); Gompers (1994).

New Enterprise: Model of a Growing and Successful Company, 1975-1976 Financial Market Conditions," would prove to be influential in several areas, including regulatory policy, the popular perception of venture capitalists, and the professionalization of the developing venture capital community, just as the concrete policy recommendations in the Report were. Where the Task Force's regulatory agenda opened the door to institutional capital and the quick secondary sale of unregistered securities, the Life Cycle Model (LCM) provided a compelling, communicable narrative for why such things were desirable and justifiable in the American economic project.

In the years following the publication of the Casey Report, the Model, referred to both as the Casey Model and the Life Cycle Model, detached from the original context of the report and became a touchstone in areas not directly related to the Task Force's original policy goals. Its connection to its original authors was severed, and multiple federal agencies, including the SBA and the Office of Technology Assessment (OTA), would either claim the model as their own work product or be credited for it by others. These misattributions often occurred as the Model was cited as factual background material. As its original context faded, so did awareness of the motivation for its creation: the advocacy of a concrete regulatory agenda. Its values, logic, and conclusions regarding the role of limited partnership equity venture capital in the high-technology sector became part of the "common sense of capital,"[5] and the model transformed from an ideological object into an assumed part of standard economic thinking. Over the course of several decades, the LCM became understood not as a specific type of persuasive rhetorical object seen in context with political goals but as part of expected, unquestioned vernacular knowledge. The transformation from a persuasive argument into a basic, commonly invoked illustration of how high-technology businesses functioned occurred despite significant evidence the LCM was not based in a rigorous study of prevailing business conditions and did not reflect common norms or practices at the time it was developed.

This article examines the LCM, its conditions of creation, and how it was referenced and cited following its original publication. As such, it contributes a historical case to the understanding of how models function regarding policy, professionalization, and the construction of epistemic infrastructures and cultures of capital. I trace references to the LCM in governmental archives, law review articles, policy papers, and popular press items. Through this analysis, I argue the LCM had a material impact on the functioning of the high-technology sector, as its diffusion, use as an argument for policy changes, and incorporation into the epistemic infrastructure[6] of US business and high technology helped naturalize business practices and policy that fell in line with the dictates of the model itself.

This work is based in an extensive review of the personal papers of William J. Casey, Patrick Liles, and other Task Force members, along with an examination of Congressional testimony, and other government and media sources pertaining to venture capital and the US high-technology sector from 1970 through 2010.

5. Fourcade and Khurana, 349–382.
6. Murphy (2017).

The Casey Life Cycle Model and the Venture Capital Pipeline

The LCM, shown as Figure 1, appears early in the published report, printed sideways on page five under the title, "Life Cycle of a New Enterprise: Model of a Growing and Successful Company: 1975-1976 Financial Market Conditions."[7] The model is drawn as a multipart linear schematic, illustrating the growth process of an unidentified company through six defined phases, from Phase 0 or research and development (R&D) through to Phase 5 or maturity. The schematic tracks the company's growth through a period between nine and twenty years, mapping an extensive set of "Company Characteristics," "Applicable Government Regulations," and "Principal Financing Sources" onto the company's age, revenues, and debt load. The LCM here is an economic microworld, tailored to the concerns and considerations of the Casey Report, with all "applicable government regulations" and "principal funding sources" discussed in the Report itself.

The Life Cycle shows a company pouring capital and effort into R&D, sticking with the project through difficult early years, and ending on track to strong financial growth. The

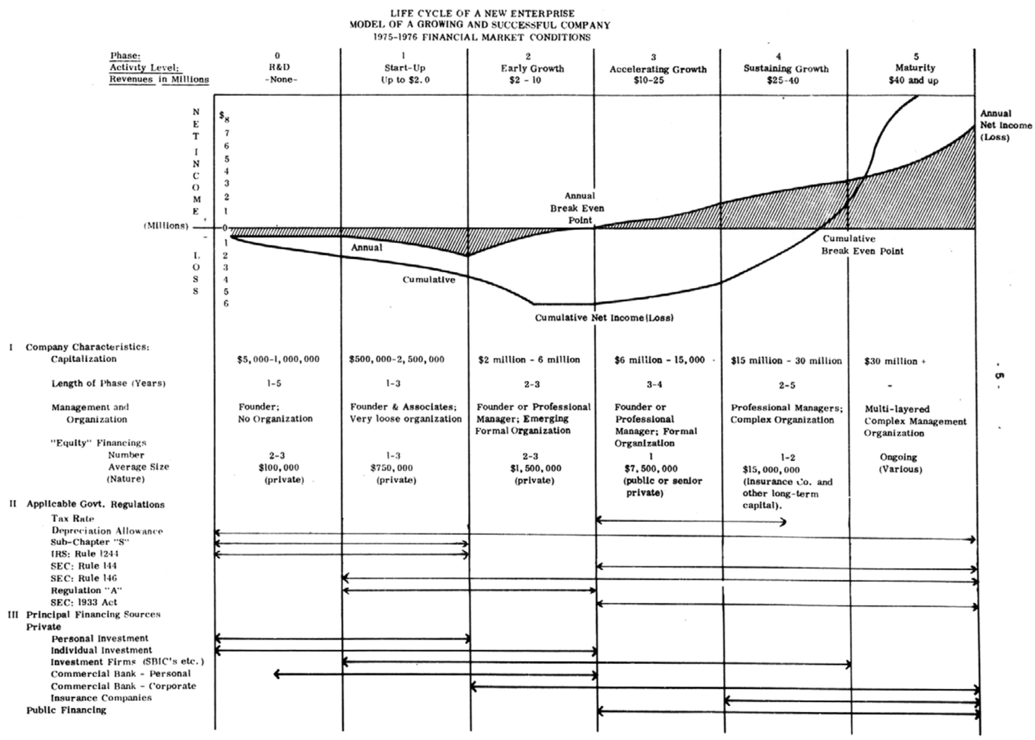


Figure 1. Life Cycle of a New Enterprise as it appears in the published Casey Report, January 1977.

7. Published Casey Report, 5.

schematic shows "Annual Net Income" and "Cumulative Net Income," noting the "Annual Break Even Point" at the end Phase 2, "Early Growth," attractively positioned at the schematic's middle point, and the "Cumulative Break Even Point," at the end of Phase 4 or "Sustaining Growth." Both income lines dip into the negative numbers in the company's younger days but exit the schematic on a cheerful up and to the right trajectory, powered by a lucrative entry into the public financial markets.

The LCM depicts successful entry into the public financial markets as a vital step to reaching maturity. The policy recommendations made in the Casey Report are helpfully indexed on the Model itself according to the life cycle stages they would impact. Covering the loosening of the prudence standard in ERISA, lowering the capital gains tax, and revisions to SEC rules 144 and 146, these are framed in the schematic as facilitating that market entry. Significantly, these changes serve to remove constraints on the movement of capital and the activities of investors, and do not directly impact the "new enterprise," ostensibly the focus of the Model. Companies "without access to public securities markets" are depicted as having a grim future, stuck in a debt cycle of short-term notes "renewed and rewritten at regular intervals"[8] by the local bank. Not even that debt-bound future was secure, however, "as more and more local banks are absorbed by large banks, the entrepreneur may find himself faced with a more impersonal and cautious branch manager, who may not want these small business risks."[9] The LCM, and the Casey Report's accompanying narrative, depicted early and frequent infusions of private equity investment followed by a debut on the public financial markets as the only way for companies to grow.

For our purposes, it is important to understand the original contexts of the LCM's construction and circulation. It is unclear which member of the Task Force was responsible for the design of the schematic or the choice to include it so prominently in the Report.[10] The Task Force's seventeen members included New York and East Coast–based financiers, successful entrepreneurs, business school professors, and heads of various manufacturing and small business trade groups.[11] Their contributions varied, with some appearing in the only in meeting transcripts and others contributing more substantial research and written material. Drafts present in the Casey papers indicate Casey himself took a primary role in drafting the text of the Report. Complicating this history, however, is a 1983 document entitled, "The Issue of 20 Year Firm Development," prepared by the SBA in response to Congressional queries. This document quotes a 1981 letter by Harvard Business School professor and Casey Task Force member Patrick Liles, stating the Life Cycle chart was "only intended to give a very generalized notion of a new enterprise life cycle" and "was in no way intended to represent the results of a study by the Task Force or a summary of studies done by others."[12] An SBA description of the LCM as a

8. Published Casey Report, 8.

9. Published Casey Report, 8.

10. Though the Casey papers contain a great deal of material regarding the development and authorship of the Report, they contain no materials regarding the development of the Model itself.

11. SBA Task Force on Venture and Equity Capital member list.

12. Patrick Liles, correspondence. Included as p 402. Prepared Testimony of James C. Sanders, Administrator, Small Business Administration. "Appendix: The Issue of 20 Year Firm Development."

"hypothetical"[13] intended to serve as a scaffold for the "collective experience and wisdom"[14] of the Task Force members appears in multiple documents and hearings. In contrast to Liles's subsequent statement and the SBA's characterizations, however, the Casey Report does not describe the LCM as a "theory" or "intuition" or even as a reflection of the "collective wisdom and experience" of the Task Force members. The Model as originally presented is not hedged at all. Rather, it is introduced as "[t]he chart on the next page illustrates the stages a company must go through to achieve maturity as a corporate entity."[15] This unmarked presentation potentially contributed to the LMC escaping the contexts of its original publication and becoming an assumed source of factual background material.

The life cycle metaphor at the core of the model is not unique to the Casey Model or unexpected given the intellectual context of managerial and innovation thought at the time. Michelle Murphy has noted the heavy influence studies of ecology had on the development of business management thought in the 1970s,[16] noting how "cybernetically inflected…systems ecology" that emphasized the management of systems of organic and inorganic components, "its flows, relationships, and second-order consequences, made systems ecology enormously attractive as a management ideology for business."[17] Benoit Godin similarly notes the prevalence and influence of evolutionary metaphors in contemporaneous studies of innovation and economics.[18] The Casey Report's reliance on the *life cycle* as a central metaphor fits the Model into an existing trend in managerial literature.[19] The life cycle metaphor in the Casey Report creates relationships and interdependencies between the firm, the law, and financial actors, contextualizing it within ecosystems of regulatory and financial resources. The Report then argues the environment could be improved by select, directed interventions in the legal and financial ecosystems the business grows within. This metaphor would be extended by several actors in their citations of the LCM.

The idea that equity investment was both necessary and desired by small business had been repeated by Federal and Congressional advocates for some time by 1976, despite substantial evidence that American small businessmen were generally not interested in

13. SBA, Minority Small Business, 95. This description first appears in the SBA rule making document cited above that establishes 8(a) participation limits. This rule making is reproduced in full, in part, or in revision as an attachment to testimony in several hearings, including U.S. Senate. Committee on Small Business. Federal Minority Business Development Program. Hearing, March 24, 1983; U.S. Senate. Committee on Small Business. S. 1022 A Bill to Make Small Businesses Owned by American Indian Tribes Eligible For the SBA 8(a) Program. May 11, 1983; U.S. House. Committee on Small Business. Subcommittee on SBA and SBIC Authority, Minority Enterprise and General Small Business Problems. H.R. 863, to Amend the Small Business Act. Hearing, April 20, 1983.

14. SBA, Minority Small Business, 95.

15. Published Casey Report, 4.

16. Murphy (2006).

17. Murphy (2006), 132.

18. Godin, 221–234.

19. For a contemporaneous example, consider Larry E. Greiner's 1972 *Harvard Business Review* article, "Evolution and Revolution as Organizations Grow," which similarly sets out to "identify a series of developmental phases through which companies tend to pass as they grow." Significantly, Greiner bases his analysis in time and "life span," divided into periods of "evolution[ary] stages of growth" and "revolution[ary] stages of crisis," rather than an ecosystemic view of the firm.

equity investment. SBA historian Jonathan J. Bean notes that surveys conducted by the Commerce Department, the Council of Economic Advisors, and Dun & Bradstreet in the mid-1950s indicated that small businessmen had little interest in outside equity investment and were reluctant "to give up control of their enterprises by issuing stock to outsiders."[20] Members of the Task Force similarly noted during their research and planning stage that

> [t]he new businessman is very unsophisticated in the matter of equity and, typically, would borrow as much as possible. Also, he would rather have 100% ownership of a very small business than 10% of a very large business, and probably would not start the business at all if he thought he had to share management or ownership. Certainly, some of these opinions on his part may be misguided, but it is very difficult to change them.[21]

Bean and others have argued the so-called "small business constituency" was, during this period, too disorganized and demographically incoherent to constitute a meaningful lobby. Rather, the "self-appointed spokesmen for small business" who made up the membership of the Congressional Small Business Committees pushed their own policy agendas and were, in many ways, the "true constituency" of agencies like the SBA.[22] I argue the Task Force itself operated in a similar capacity regarding both the developing venture capital industry and small businesses. While professional organizations such as the National Venture Capital Association came into existence in 1973, venture capitalists as a sector, like small businessmen, were far from achieving the industrial and organizational coherence necessary to engage in policy advocacy with a united voice. Via the presentation of the LCM and the Report itself, the Task Force opportunistically appointed itself as spokesmen for an otherwise deeply heteroglossic assemblage of investors and entrepreneurs.

In convening the Task Force around a "crisis" of small business funding, the SBA was repeating a pattern that has been noted by Bean and, in a slightly different framing, historian Greta Krippner. Bean notes the repeated invocations of a "crisis" throughout the history of small business legislation to justify miscellaneous interventions throughout the twentieth century.[23] Krippner further contextualizes the impact of the crises and crisis rhetoric in the 1960s and 1970s, arguing that the resulting financialization, at a coherent policy level, was "an unintended consequence" as policymakers attempted to resolve or at least shift a litany of crises in the social, fiscal, and state power arenas.[24] For both Bean and Krippner, the rhetorical construction of the "crisis" provides both motivation and cover for legislative action. Examining the LCM as a rhetorical object provides an additional view into how "crises" are mobilized by different actors in the policy space.

The LCM is presented in the context of the Report as a factual, realistic depiction of how a "growing and successful company" works, financially, organizationally, and regarding legal and regulatory considerations. Its presentation is as a generic, widely applicable model, both in the drawn schematic and the Report text. No industry or sector or product is identified;

20. Bean (1996), 157.
21. Steffes, "A View of the Beginning and Smaller Entrepreneur."
22. Bean (2001), 11.
23. Bean (1996), 169.
24. Krippner, 4.

however, the characteristics and life stages described, such as the extensive time and money dedicated to R&D, indicate a company in the high-technology sector with potential for fast growth.[25] This centering and valorization of R&D in the LCM in some ways identifies the Model and the Task Force themselves as throwbacks, as by 1976 the financial craze for R&D-powered firm securities had been tempered by economic downturns.[26] In fact, the loss of interest in R&D heavy stocks was, in part, the "crisis" the Task Force had been convened to address. Later SBA documents identify the Casey Report and the LCM as narrowly concerned with the problems of "new, high-technology firms."[27] But since the Model only identifies a "New Enterprise" and "A Growing and Successful Company," the Model itself is not restricted to any specific sector.

The LCM's generic construction allowed it to be applied to policy areas, industries, and sectors outside of high technology. Genericness, translatability, and cross-disciplinary applicability are rhetorical strengths of pictorial or schematic models.[28] Schematization "takes a particular idea and renders it transportable."[29] Once schematized, the model becomes authorless and "canonical,"[30] able to travel and become newly persuasive. Here the model form dramatizes and codifies business against a backdrop of financial policy, highlighting and centering specific policy and tax questions and financial inflection points.

The LCM addresses policy concerns of interest to specific representatives of a specific financial community, financiers interested in the growth potential of young firms while limiting their personal exposure to risk as much as possible, while telling a generic business narrative. Emphasis was placed on the importance of participating in public financial markets and institutional capital availability to venture investment. Policy outcomes argued for in the text of the Report were dramatized within the schematic of the model, with laws, regulations, and funding structures invoked by name and linked to stages of the life cycle. At the same time, the business presented appears non-specific. The Model might be extrapolated to any industry. The LCM was constructed as a generalizable schematized narrative with a specific advocacy agenda embedded within it. This approach, depicting the policy agenda as beneficial for business generically instead of a specific industry, was effective in accomplishing those policy reforms.

Embedding a policy agenda within a business narrative further meant even after the policy agenda was achieved, the LCM continued to promote those policy aims. Benoit Godin describes schematic, policy-oriented models as occupying a transdiscursive, action-oriented rhetorical space. The LCM's narrativized simplification makes concepts, assumptions, and values more portable, easily transmitted between theorists, social scientists, practitioners, and policy makers. The policy-oriented model is readily applicable, it "directs change and action"[31] through its strong narrative momentum, illustrating a "proper ordering of efforts."[32]

25. Lotfi, 1166.
26. Lotfi, 1176.
27. SBA, Minority Small Business, 95.
28. Godin, 213.
29. Godin, 213.
30. Godin, 213.
31. Godin, 219.
32. Godin, 219.

In the LCM's case, that "proper ordering" was enhanced by the life cycle metaphor. In other words, the LCM itself became a to-do list of policy solutions to a narrowly perceived economic crisis and continued to guide efforts after the policy solution had been implemented.

The LCM operates on several temporal levels. First, the business depicted takes anywhere from nine to twenty years to reach maturity. By pinning the "economic conditions" of that entire lifespan to "1975-1976,"[33] the LCM is projected both backwards and forwards in time, creating an idealized history for the financial practices shown and imagining an equally ideal financial future in which those practices thrive. Though the LCM trades in metaphors of biological or infrastructural time, it operates on the scale of what Murphy calls patriotic, "economic speculative time,"[34] where the success of the national economic project is tied together with financial speculation and forecasting. Achieving an ideal future for the nation is reliant on preparing for and acting out that patriotic future in the financial present, from the position afforded by an idealized financial and patriotic past.

In the case of the LCM, this narrative schematic sequencing was further buttressed using financial and temporal numbers. Numbers validate a model, adding layers of "scientificity"[35] and a sheen of effort and expertise. It is not clear where the Casey Task Force found the numbers and timescales used in the LCM, and Liles's letter indicated they were not the result of any study. Nonetheless, these figures would be repeated as fact by various actors within the high-technology and minority business sectors for years.

Godin argues on R&D statistics became proxies for successful innovation due to the prevalence of the linear model of innovation. In his analysis, the use of the linear model of innovation, and the R&D statistics it relied on, became self-perpetuating as pro-innovation policies were crafted to buoy R&D statistical measurements.[36] In this way, aided by selected statistics and the methodological rules it lays out, Godin shows how the linear model of innovation became "social fact."[37] Similarly, I argue equity investment from limited partner venture capital firms and the entrance of companies into the public financial markets became central proxies of success within the high-technology sector in part because of the continued circulation of the LCM. There is nothing intrinsic to equity investment organized through limited partner, institutionally funded firms or a well-performing IPO that make these measures particularly revealing of technological ingenuity, or indicative of the long-term commercial success of a new technology. Rather, these are indicators of the success of limited partner venture capital as a financial practice itself, and are unrelated to the sector it is active in. The continued circulation of the LCM contributed to an ideologically driven narrative of how high-technology companies had been funded in the past and should be funded in the future as well as to a broader deregulation of financial processes. This was accomplished in part because the Casey Report, the LCM, and the Task Force's other writings repeatedly framed limited partner institutionally funded venture capital as long-standing, established, and valued in American business, though there was no evidence this was the case. The continued

33. See Figure 1.
34. Murphy (2017), 13.
35. Godin, 213.
36. Godin, 213.
37. Godin, 77.

circulation of the LCM after the accomplishment of the Casey Report's main policy goals allowed it to be entrenched within the cultures of the high-technology sector, specifically within policymaking circles, where its assumptions became a social fact.

Theorizing the Model

The LCM progressed through several stages as it diffused through a set of policy debates and circuits. First, in the Casey Report itself the LCM is used as persuasive rhetoric supporting the policy goals of the Report itself. The schematic construction of the LCM contributed to its translatability and transportability between disciplines and policy areas,[38] making it an understandable and compelling tool in multiple contexts.

Second, the LCM became an object of expertise, deployed in debates surrounding participation in the SBA's minority business programs. Here, the model is used as part of an invocation and performance of expertise by the SBA's critics, particularly minoritized businessmen. These businessmen understood the LCM to be part of the "epistemic infrastructure"[39] of how businesses function and interact with government agencies. Epistemic infrastructure is the sociotechnical mesh of bureaucracies, cultural practices, technical constructs, and physical infrastructures that straddles and connects government agencies like the SBA with the world of industry and business. Professionals develop and trade knowledge of how best to interact with bureaucratic governance structures like the SBA at conferences, in professional publications, and through trade associations and correspondence.[40]

The third, final stage occurred when the economic, financial, and ideological logics and assumptions of the LCM became common-sense background knowledge regarding how venture capitalists funded high-technology firms in the United States.[41] By the 1980s, the Casey Report and Task Force were no longer cited as its source. Instead, it was attributed to a handful of federal agencies including the SBA and the OTA by bureaucrats, businesspeople, and policymakers. The status of the LCM as factual background knowledge in turn shaped the continuing professionalization of the venture capital community. As late as the mid-1980s, venture capitalists still needed to define basic aspects of their profession to policymakers and the public at large through media relations. There was still broad internal and external confusion as to what types of financial activities constituted venture capital as reflected in correspondence, government reports, and other materials like classified ads. The LCM influenced discussions of venture capital at a policy level as well as guided the evolution of the venture capital industry itself.

The Model in the Archive

Beginning in 1979, two years after the publication of the Casey Report, and extending at least until 1993, with one late outlier in 2004, the LCM was reproduced and referenced as a factual

38. Godin, 77.
39. Murphy (2017).
40. Fourcade and Khurana, 349.
41. Jack.

explanation of how the funding of innovative businesses worked. It was rarely presented in conversation with its critics, though criticisms were made. Rather, the invocations of the Model portray it as a generalized snapshot of how innovative firms are born, grow, and mature. It is described as the result of studies and analysis, rather than as a hypothetical constructed to support a set of policy goals. It was attributed most often not to a commissioned panel advocating for a set of policy outcomes but to ostensibly disinterested agencies charged with providing objective information to the government. These shifts underscore how the Model became understood over the course of several decades, not as a specific type of persuasive rhetorical object in context with policy goals but as part of expected vernacular knowledge that makes up the general economic imaginary.[42]

The remainder of this article traces the appearances of the LCM in Congressional hearings, policy reports, government research products, and the "cultural circuit of capital" as described by Nigel Thrift. Thrift's "cultural circuit" includes "business schools, management consultants, management gurus and the media."[43] This "circuit" serves several functions in the continual production and reproduction of capitalism and structures of capitalist value. A key function is reifying "virtual notions" or theories through the implementation of "solutions" or "organizational templates that, instituted as practices, roll over particular ways of doing people and things…"[44] In this case, we see the LCM deployed in a variety of contexts in the service of different arguments, including in Congressional testimony offered by both established Silicon Valley marketers and minority business people outside of the high-technology space; in research publications by tax attorneys and economists; and in publications by government agencies and bureaucrats outside the SBA.[45]

42. Jack, 514.
43. Thrift, 6.
44. Thrift, 2.
45. A consideration of the circulation and citation of the Casey Report as a whole is beyond the scope of this article. However, the circulatory afterlife of the Casey Report was extensive, and included appearances in nationally syndicated newspaper and magazine columns, academic and professional research reports in the areas of tax law, accounting, and research and development policy as well as in Congressional testimony and government research reports. Following are abridged lists of notable citations.

Newspaper and Magazine Coverage and Citations

Bonner, Richard. "Despite Many Obstacles, Small Businesses Thriving." Press Sun-Bulletin November 24, 1978: 10; Capo, Joe. "Small Business 'Should Be Put on Endangered Species List.'" The Cincinnati Enquirer May 14, 1977: B9. Syndicated in, among others, The Billings Gazette and The Atlanta Constitution; Chucker, Harold. "Purse Strings Tighten Up: Untried Ventures Scare Big Investors." The Minneapolis Star July 15, 1977: 11; Elsener, James. "Getting a Loan is Not Easy: Some Lenders Requires Potential Borrowers to Risk Their Assets Too: Good Management Attracts Investors." Dayton Daily News March 27, 1977: 68; Fuerbringer, Jonathan. "Risk Capital Is Hard To Get." The Boston Globe March 6, 1977: 48; Murphy, Thomas P. "Venture Capital: Out in the Cold." Forbes April 15, 1977: 158–159; New York Times News Service. "SEC Incumbent Willing to Stay Under Reagan." The Missoulian November 30, 1980: 56; Porter, Sylvia. "Explanation of New Mutual Funds Given." The San Bernardino County Sun January 7, 1970: 10; Schumer, Fern. "Hard Time To Start: It's Not A Piece of Cake." Chicago Tribune September 30, 1980: 29; Stephens, Mark. "'Capital Gap' threatens business." St Petersburg Times February 21, 1977: d6; Stone, Martin. "How Government Makes It Difficult to Start a Business." Colorado Springs Gazette-Telegraph August 21, 1977: 59; Tanner, Anne. "SEC Told Original Function of Market Lost." Democrat and Chronicle May 21, 1978: 59.

Borrowing methodologically from critical discourse analysis, I argue tracing the appearances of the LCM through these circuits and discourses permits us insight into the social, political, and rhetorical/discursive processes via which the "venture capitalist" and "venture capitalism" stabilized. Critical discourse analysis is a productive tool for tracing the development, spread, and influence of terms, ideas, and models through the policy space, for, as Roberta Lentz notes, "policy making is largely a communicative practice, and…policy change is rooted in words."[46] A critical discourse analysis approach allows us to consider the "extra-textual context of a text's production as well as its relationship with other texts."[47] These intertexutal relationships, manifesting through citations, quotations, repetitions, and linguistic and visual gestures, allow a view into how the incremental labors of change (policy, cultural, practical) flow through different circuits to differing but accumulating effects.

As the LCM moves between circuits, or discourses, its meanings and interpretations are not stable but rather reinterpreted according to the norms and standards of the new discourse community.[48] Tracking these different constructions and divergences is more than following different guest appearances of a floating signifier, however. As we are concerned with how social, political, and economic figures and practices were constructed in business culture, the popular imagination, and the policy space, following and preserving the intertextual linkages

Professional and Law Review Journals

"SBA Makes Recommendations to Promote Venture Capital," *The Journal of Accountancy*, (May 1977): 10–12; Haynsworth, Harry J. "The Need for a Unified Small Business Legal Structure," *The Business Lawyer* 33 (January 1978): 849–872; National Science Foundation. "AN ANALYTICAL FRAMEWORK FOR INVESTIGATION OF FINANCIAL CONSTRAINTS ON HIGH TECHNOLOGY VENTURES" *Summaries of Projects Completed in Fiscal Year 1978*. US Government Printing Office, 1978/1979: 1048; Vernes, Georges, Roger J. Vaughan, Robert K. Yin. *Federal Activities in Urban Economic Development. R-2372-EDA*. Santa Monica, CA: RAND, April 1979, 92; Porter, David P. "Performance-Based Compensation for Investment Advisers to Business Development Companies," *Case Western Reserve Law Review* 30, no. 676 (1980); Cavanagh, Mark Edward. "Securities Regulation: Improved Financing Alternatives for Small Issuers." *Washington & Lee Law Review* 38, no. 875 (1981); Titus, Robert B. "Assessing the Impact of Securities Regulation on Small Business: How to More Effectively Bridge the Capital Gap," *University of Bridgeport Law Review* 1, no. 19 (1980); Tashjian, Richard G. "The Small Business Investment Incentive Act of 1980 and Venture Capital Financing," *Fordham Urban Law Journal* 9 (1981); Carey, Hugh L. "New Business Development," *Fordham Urban Law Journal* 9, no. 785 (1980): 678.

Congressional Hearings and Government Reports

Office of the Chief Counsel for Advocacy, US Small Business Administration. "Small Business & Innovation: A Report of an SBA Office of Advocacy Task Force." May 1979; Recommendations for Creating Jobs Through the Success of Small, Innovative Businesses: A Report to the Assistant Secretary of Commerce for Science and Technology by the Commerce Work Group on Job Creation." December 1978; Treasury Department Study Team. "Credit and Capital Formation: A Report to the President's Interagency Task Force on Women Business Owners." April 1978; U.S. Senate. Select Committee on Small Business. ""Discussion and Comments on the Major Issue Facing Small Business to the Delegates of the White House Conference on Small Business." Report. December 4, 1979; U.S. Senate. Committee on Banking, Housing, and Urban Affairs. Subcommittee on Securities. Federal Securities Law and Small Business Legislation. Hearing, June 2, 1980. Testimony of Gaylord Nelson, 684; U.S. Senate. Committee on Banking, Housing, and Urban Affairs. Subcommittee on Securities. Federal Securities Law and Small Business Legislation. Hearing, June 2, 1980. Testimony of Gaylord Nelson, 684.

46. Lentz (2013), 569.
47. Roberta Lentz (2011), 435.
48. Krippendorf, 28.

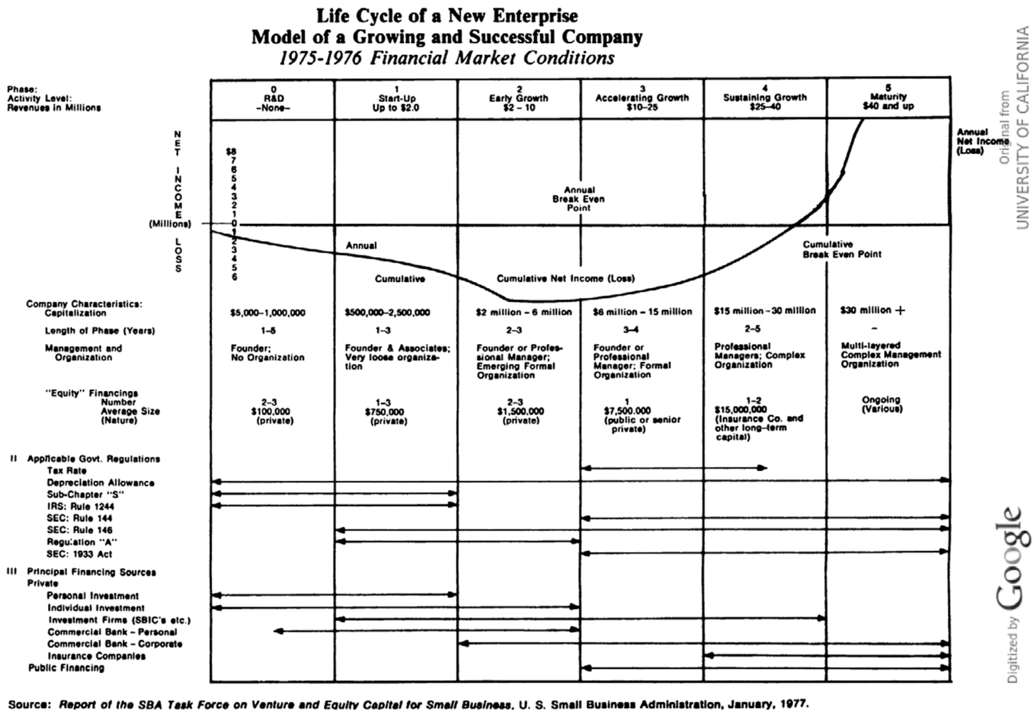


Figure 2. Life Cycle Model as it appears in Litvak and Daniels, "Innovation in Development Finance" study, 1983.

between these constructions allows us access to the false starts, the points of negotiation, and the dissenters and promotors present in the conversations and circuits.

Initial Appearances

The first appearance of the LCM outside the Report itself is a 1979 study commissioned by the Council of State Planning Agencies, later republished in a collected volume by Duke University Press in 1983, shown as Figure 2. The "Innovations in Development Finance" study by economists and entrepreneurs Lawrence Litvak and Belden Daniels described the way states might assist small innovative firms when capital markets failed to fill financing gaps. The LCM, cited to the Task Force Report and the SBA, but with no mention of Casey, appears without the "annual net income" line, though the identifier on the right side of the chart remains, and jogs where the line originally crossed the "cumulative net income" line and the section break between Phase 3 and 4 remain. There are some additional formatting changes, but the Litvak chart is otherwise identical its original published form.[49] With the exception of the deletion of the "annual net income" line, the changes are cosmetic and condense the schematic on the page.

49. Litvak and Daniels, 30.

Litvak and Daniels accept and extend the eco-biological metaphor at the core of the model, as well as the economic assumptions and processes the Model dramatizes. They write

> …as the following chart illustrates, an enterprise must be able to tap different sources and kinds of funds at different times over its life-cycle of growth. Foreclosing any one of them—particularly at its 'stage' specific time of need—can have the same effect as depriving a developing organism of a vital nutrient…financing here must largely be in equity form—that is, capital in exchange for a pro rata share in the firm's future income—rather than debt requiring periodic, regular payment of fixed interest and principal.[50]

It is unsurprising, given the Report's emphasis on pensions as a source of institutional investment capital, that Litvak and Daniels go on to identify state worker pensions as an ideal source of funds to power investment in young, high-technology enterprises.[51]

The appearance of the LCM here shows the acceptance or at least adoption by economists of the Report's key points regarding early-stage equity investment and the role of pensions in this high-risk space.

In 1981, the LCM jumped professional boundaries and was cited in professional legal journal *The Business Lawyer* in an article summarizing the findings of a conference on small business tax law convened in Hot Springs, Virginia, in March of 1980. The conference was organized to "bring together individuals from a variety of disciplines and backgrounds to examine specific tax-related topics pertaining to small business with emphasis on capital formation and retention."[52] Under the heading, "Tax Incentives for Innovation," attorneys Chernin and Morse did not reproduce the LCM schematic, but its assumptions regarding the length and capitalization needs of the research and development phase were cited and relied upon to construct a set of tax policy recommendations regarding the treatment of R&D and equipment costs by "small innovative enterprises."[53]

The 8(a) Debates and the LCM as Performance of Expertise

Also beginning in 1981, businessmen began to use the Casey model to criticize proposed changes, including participation term limits, to the SBA's 8(a) preferential federal subcontracting program intended to assist minority owned businesses. These citations took place in a series of Congressional hearings regarding the 8(a) program from 1981 through at least 1987. A full analysis of the 8(a) program and the debates surrounding it are beyond the scope of this article; however, a few points are worth noting. Unlike the other citations, these invocations included reference to both the context of the original Casey Report and to Casey himself. As an example, in 1981 Philadelphia attorney and African American community leader Rotan E. Lee testified before a House subcommittee, criticizing the term limit proposal.[54] Lee's invocation of the LCM was linked to its original context in the Report, unlike other citations, which would

50. Litvak and Daniels, 30.
51. Litvak and Daniels, 34.
52. Cherin and Morse, 485.
53. Cherin and Morse, 515.
54. Hearing: Small Business Administration's 8(a) Program, testimony of Rotan Lee, 89.

come later. He relied on and played up the prestige of the Casey Report and its authors, saying "…Mr William J. Casey, who is now the head of the Central Intelligence Agency, and this report very clearly stated that you need about 15 or 20 years in order for you to really reach that cycle of business growth where you can claim that you have matured." Lee emphasized that the Casey Report was not about minority businesses as a credit to its reliability: "The report I was referring to may be given greater credence because they don't speak about minority small businesses. They talk about economic life cycles, the life cycle of a business, how long it takes."[55] Here he implies reports written with a focus on minority business might be biased, and a report with a general economic focus would be less so.

Lee's use of the LCM in this context gives us a view into how the Casey Report and the LCM had filtered out of the high-technology policy world and into what Thrift refers to as the broader "business discourse,"[56] those "corporate boards, business magazines, consulting firms, and business schools….whose business it is to produce a narrative about the purpose of the corporation and justifications for how to make money."[57] The testimony of Lee and others indicates the diffusion of the LCM narrative was not restricted to debates regarding the high-technology sector or the role of venture capitalists. Rather, it appears from this case that broader swathes of the American business world treated LCM and the Casey Report as a reliable source of facts.

Lee's invocation of the LCM here, and testimonies delivered by others on this topic over the next six years, constituted a performance of expertise. Government reports include textual and metatextual elements that establish, perform, and defend prestige and expertise. These elements include the associations and prestige of the authors, their special interests in the issues at hand, and claims made as to the rigor of the studies conducted.[58] The reputation of its authors during the LCM's development and in their later careers (Lee's pointing to Casey's new position as the head of the CIA), and the SBA's position as the Model's commissioning authority were invoked as an argument for why the 8(a) term limits were inappropriately short, and should not be implemented. The SBA responded by attempting to discredit the LCM within the 8(a) debate. This was successful in some ways and unsuccessful in others and did not appear to impact citations of the LCM in areas outside the 8(a) debate.

The LCM continued to spread within cultural circuits pertaining to high technology, innovation, and finance. Along this path, the LCM was separated from the Casey Report and its specific authorship and was deployed as an expert source of factual context. Outside the 8(a) debate, where the expertise of the model resided in its provenance, the LCM continued to drift from its authorial context. Multiple actors, including policymakers, federal officials, and businesspeople credited it to a handful of different federal agencies, including the SBA. It was cited as a source of fact partially because of its lack of authorship. In this way, the LCM follows another one of Godin's characterization of models, which become a "perspective that has become canonical, to the extent that no one knows the origin of the perspective…."[59] This

55. Hearing, 89.
56. Fourcade and Khurana, 49.
57. Fourcade and Khurana, 349.
58. Hilgartner.
59. Godin, 211.

genericizing of the LCM rendered it as a common-sense, shared assumption about how business works. This allowed the LCM, created by the Casey Task Force to advocate for their policy recommendations, to continue to impact the evolving professional culture of the venture capital industry as it engaged in a dance of mutual influence with policy makers, the world of high technology, and other financial actors.

The 1982 GAO Report and Its Descendants

In August of 1982, the General Accounting Office (now the Government Accountability Office [GAO]) produced at the request of Senator Lloyd Bentsen and the Joint Economic Committee a report entitled "Government-Industry Cooperation Can Enhance the Venture Capital Process."[60] The GAO is the final, nonpartisan audit authority of the United States federal legislative branch, and the office that legislators and other federal agencies turn to for fact checking, audits, technical evaluations, and other investigative services.

The 1982 GAO report is a significant citation of the LCM for several reasons. First, the GAO's report devotes extensive space to the reproduction and analysis of the LCM schematic, interpreting a level of detail and rigor not present in its original construction and contexts of publication. Here, the GAO retroactively reads deeper expertise and intellectual engagement into the original LCM, possibly based on ways the venture capital industry had evolved since the Model's publication. Second, the body of the GAO report itself further repeats the logics of the Casey Report and the LCM regarding the irreplaceable role of public financial markets in the growth and maturity of companies and the specialness of venture capitalists as financial actors. Third, by re-releasing the LCM under the imprimatur of the GAO, the LCM appears more objective, more rigorous, and less tied to specific policy outcomes than it was originally. The 1982 GAO Report anchored a its own citation stream for the LCM, and an additional avenue of influence for the logics and assumptions of the Casey Report, as the GAO Report itself was cited and referenced in subsequent hearings, reports, and other popular and business media.

The 1982 GAO Report is also an illuminating document in the history of venture capital, given its detailed description of the state of the industry in the early 1980s. The GAO's analysis is based on interviews with venture capitalists and examinations of 72 venture capital funded high-technology firms, presenting a snapshot of what "venture capital experts believe"[61] about their industry, its growth, and its interactions with regulatory bodies, as well as analysis presented as the results of the GAO's own "studies."[62] That the LCM appears in this latter section indicates the degree to which the LCM was considered an objective finding, at least by the staff of the GAO and potentially by the venture capitalists interviewed.

The GAO Report describes a growing, influential industry still struggling with professionalization, maintenance of internal norms and standards, and interactions with policymakers and government regulators. It is interesting to note even in 1982, basic terms, including "venture capital" itself, were required clarification, with the GAO stating, "The term 'venture

60. GAO Report, 4.
61. GAO Report, 4.
62. GAO Report, 1.

capital' is commonly taken to mean any or all forms of investment in business enterprise. For this report to have relevance or even to be understood, it is essential to distinguish between the venture capital process to create high-technology, high-growth firms, and all other forms of venturing."[63] A survey of business media from the 1960s through the 1980s reveals multiple practices falling under the label "venture capital," including loans,[64] real estate development, equipment leasing,[65] expansion financing,[66] or other general business capital needs.[67] Firm organization was also diverse. Ads and articles described venture or "risk capital" firms with multiple structures, including publicly traded corporations, traditional equity partnerships, and as following the new institutionally supported limited partnership model. Venture capital appears to have been understood as any capital for new ventures at least through the early 1980s. This capital could and commonly did take the form of a loan rather than an equity investment. Thus, the GAO's clarification is illuminating as to the goals of its report, which was partially to discipline the definitions of the industry.

By the time the GAO Report was released, five years had passed since the original publication of the Casey Report and the majority of their policy recommendations had been implemented. The GAO report repeats a narrative of a cohered industry that experienced significant professional and financial shifts since the economic downturn of the 1970s. Privately held venture capital firms, rather than small business investment companies (SBICs), publicly traded firms, or corporate subsidiaries, had become "the dominant institutionalized source of classic venture capital activity. Most are limited partnerships…." The GAO report goes on to describe pension funds as a major source of capital, with a "a life expectancy for a [investment] fund of about 10 to 12 years."[68] The rise in pension investment and the shift in firm structure in venture capital during the post-ERISA 1979-1988 period is significant and well documented. Financial economist Paul Gompers has noted pension fund investments in venture capital rose from $32.7 million in 1978, or 15 percent of capital raised by dedicated venture capital firms, to $1.38 billion in 1988, or 46 percent of capital raised by dedicated venture capital channels.[69] This rise in pension investment, framed by the Task Force as a way to allow these institutional investors to transfer the risk of these investments to "sophisticated" risk savvy venture capitalists, simultaneously allowed the independent limited partnership firm structure to rise from managing 35 percent of the venture capital pool in 1977 to 75 percent by 1987.[70]

63. GAO Report, app 2, 2.

64. Fuerbringer, Jonathan. "Risk Capital Is Hard To Get." *The Boston Globe* March 6, 1977: 48.

65. Concept Capital Resources, Co. "BUSINESS CAPITAL For Any Worthwhile Projects." Ad. *The Post-Star* January 27, 1978: 14.

66. Heizer, Bob/Heizer Realty. "WHEN your bank can't help--." Classified Ad. *Caspar Star-Tribune* September 14, 1978: 41.

67. Business historian Martin Kenney has noted that "venture capital" was conflated with loans and lending almost as soon as the term was coined, with a 1938 *Wall Street Journal* editorial stating, "there is no 'venture capital' to speak of [in the US economy] because there is no venture spirit on the part of capital owners or those who normally would be borrowers of that capital." (Kenney, 1686). Kenney does not mention that this confusion as to the equity nature of venture capital persisted until the 1980s.

68. GAO Report, app 2, 4.

69. Gompers, 13.

70. Reiner, 399.

The main argument of the GAO Report, emphasized on its first page, was "dialog between the Government and the [venture capital] industry must be improved," noting "…both Government and the venture capital industry must be alert to other issues that will influence whether the complex venture capital process works successfully."[71] Explaining this "complex venture capital process" was left to the LCM, reproduced under the section heading "How the venture capital process works."[72] This is prefaced by an extended narrative description of, among other characteristics, a venture capitalist's selection process for investments, the active role a venture capitalist expects to take in assembling and mentoring a company's management team, and the role equity compensation (payment in stock or stock options) is expected to play in venture funded firms. Following this discussion, the LCM is introduced as showing "the life cycle of a new enterprise under fairly ideal conditions. The chart shows the kinds of milestones that must be met to proceed from one phase to the next, the kinds of activities that are occurring, what the sales and capitalization looks like, and where capital resources come from."[73]

The GAO's "Chart 12"[74] is not an exact copy of the original version of the LCM schematic, but an adaptation with grayscale shading added and the "1975-196 Financial Market Conditions" disclaimer missing. It is shown as Figure 3.

Over the next eight pages, half the chapter, the GAO Report explains each of the LCM's six stages in detail using the life story of a hypothetical technology firm that could easily be mistaken for the popular corporate mythologies of Fairchild or Hewlett Packard. Each LCM stage is narratively dramatized and accompanied by a reproduction of its corresponding chart section:

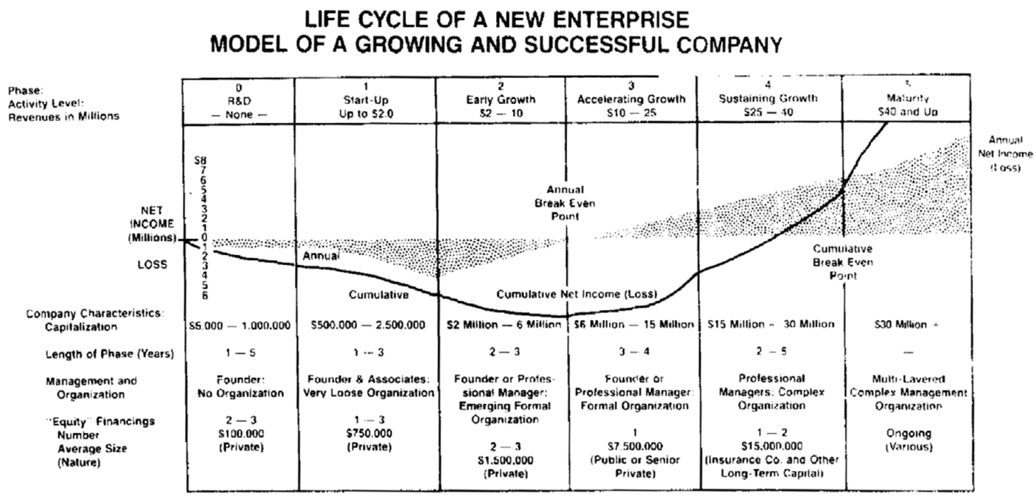
> Assume that two or three bright scientists and engineers in an existing large company develop a good idea for a new product. The company, however, does not give the idea a high priority and the inventors decided to strike out on their own. (Such individuals could come from Government, universities, or research institutes, or simply be 'garage' inventors.)[75]

Hung on the scaffolding of the LCM, this corporate biography provides an illustration of how the LCM had become a common sense understanding of how high-technology businesses operated and grew, and the central role of venture capital therein.

The narrative presented in the GAO report hews closely to the LCM and, in so doing, to the logics and assumptions of the Casey Report. The fictional company's difficulty in acquiring bank loans and their need for equity investment rather than more debt is described, as is their preparation of a business proposal to present "to a venture capitalist who reviews" it "against the venture criteria described earlier [in the GAO Report],"[76] primarily the potential for rapid growth. The willingness to accept equity venture investment, giving up a "50 percent or more"

71. GAO Report, 1.
72. GAO Report, 13.
73. GAO Report, app 2, 20.
74. GAO Report, app 2, 21.
75. GAO Report, app 2, 21.
76. GAO Report, app 2, 22–123.

Chart 12



SOURCE: Small Business Administration

Figure 3. Life Cycle Model as it appears in the GAO Report in the first instance, August 12, 1982.

equity share in their company, "quickly separates those individuals content to manage a small, independent business from those who aspire to build a significant growth business."[77] The ability to offer equity positions or compensation in the form of stock options is emphasized as a necessity for enticing "talent to give up secure positions for ones in which success depends entirely on skills and personal drive."[78] Additional infusions of venture capital in exchange for equity occur. These, along with the shifts in management structure and revenue described in the LCM, are described as "critical milestones" in the fictional firm's development "because they reinforce earlier projections of markets, growth potential, and return-on-investment calculations" on the part of the venture capitalist.[79] But "most important[ly]," the GAO Report describes "progress to this point" as "dictat[ing] success in the next phase: the new firm's move to acquire expansion capital through a public stock offering."[80]

The company's entrance into the public financial markets is described as essential for both the company and the venture capitalist. For the company, an IPO marks a new phase of growth with "new permanent capital in the form of increased equity investment; new borrowing capacity through an improved debt to equity ratio; working capital; and capital for expansion, marketing, and perhaps acquisitions of its own."[81] The GAO notes "for the venture capitalist, liquidation is the payoff" through a "public offering or at least an upward merger"—which can then be repeated to account for inevitable failures: "Obviously, to achieve high returns, a

77. GAO Report, app 2, 23.
78. GAO Report, app 2, 23.
79. GAO Report, app 2, 25.
80. GAO Report, app 2, 25.
81. GAO Report, app 2, 26.

venture capitalist must have a number of big successes to offset failures and marginal successes."[82]

The GAO Report does not treat the LCM as a theory or hypothesis of how a venture capital-backed enterprise might evolve. It treats the LCM as the expected, and proven, ideal. This is a life cycle to be aspired to and planned for, far from the hypothetical "generalized notion" Liles described in his 1981 letter.[83]

Further, the GAO re-emphasized claims found in the Casey Report regarding the specialness of the venture capital process, its fundamental ties to the technology sector and the American free-enterprise system in general, and implications for the industry's capacities for self-governance. A key contention of the Casey Report was that venture capitalists were special actors in both the financial markets and the technology sector, with a unique capacity to manage risk and to identify and foster successful technologies and companies. The GAO Report makes similar points, stating, "Clearly, the role of the venture capitalist is far more than that of a supplier of capital to an entrepreneur to develop and market product"[84] due to their active involvement in company management, and knowledge of the technology sector and "myriad" applicable financial laws and policies.[85] To further underscore the GAO's acceptance and ventriloquizing of the Casey Report's point that the venture capitalist was a unique and key figure in the American economic landscape, it is worth noting its analysis of the LCM occurs under the chapter title, "The venture capital process—a unique free enterprise approach to entrepreneurial activity in the United States,"[86] and offers this description:

> The process epitomizes the American free enterprise system through a highly sophisticated methodological approach of combining technology, entrepreneurial talent, and capital resources to meet an identified market need.[87]

This aligned with statements made in the Casey Report and by Task Force members in their public writings and Congressional testimonies which characterized the venture capitalist figure as uniquely American with a long historical standing in the American free enterprise economic imaginary.

In addition to describing the equity investment limited partnership venture capital model as an ideal manifestation of the American free market system, the GAO argued the industry was under threat from its own success. The GAO noted the loosening of ERISA prudence standards had unleashed a wave of institutional capital from pension funds, and repeated arguments from venture capitalists that the increase in capital was not matched by an increase in the "number of experienced venture capitalists available to manage the growing supply…."[88] A primary concern articulated by venture capitalists in the GAO Report was this

82. GAO Report, app 2, 25.
83. Liles, 402.
84. GAO Report, 5.
85. GAO Report, 5.
86. GAO Report, app 2, 2.
87. GAO Report, app 2, 2.
88. GAO Report, 5.

excess capital supply would attract inexperienced or incompetent novices to the industry, "which would hurt the industry's image and lessen the success of the process. To avoid this, professional standards must be strengthened to ensure that new entrants are fully qualified to manage the process."[89] This need for stronger professional standards did not extend to an openness to government regulation. Rather, the presence of inexperienced venture capitalists was a risk to the profession because it could attract the wrong kind of government attention, resulting in "[g]overnment rules and regulations that stifle entrepreneurship and [which] could affect the public securities market."[90] Here the GAO again echoes deregulatory positions found in the Casey Report: well-meaning government regulations, such as SEC rules 144 and 146, which were a reaction to predatory practices and intended to limit harmful speculation in unregistered securities, had unintended, deleterious effects on this uniquely effective financial industry, and the best way forward for everyone was for government to keep out of industry's way.

The GAO Report, like the Casey Report from which it drew so much, became a frequent citation in academic, popular, and policy publications. It was cited in Congressional hearings regarding venture capital, industrial policy, and financial policy nearly a dozen times in the decade following its publication, and the GAO Report itself was cited as an authoritative source on the impact and state of venture capital in academic, business, and legal publications from the late 1980s through at least 2011.[91] Given its reliance on the LCM, citations of the GAO report serve as an additional trail of influence for the LCM and the logics and assumptions of the Casey Report itself.

89. GAO Report, 6.

90. GAO Report, app 2, 36.

91. A selected bibliography of documents that reference the GAO Report follows: The President's Task Force on Private Sector Initiatives. *Investing in America: Initiatives for Community and Economic Development*, eds. Renee Berger, Kirsten Moy, Neal Peirce, Carol Steinbach, December 1982, 83; GAO. Report to the Ranking Minority Member, Subcommittee on Federal Services, Post Office, and Civil Service, Committee on Governmental Affairs, U.S. Senate. *Public Pension Plans: Evaluation of Economically Targeted Investment Programs.* March 1995, 66; U.S. Congress. Joint Economic Committee. Subcommittee on International Trade, Finance, and Security Economics. *Role of the Venture Capital Industry in the American Economy.* Hearing. September 30, 1982, 64. Testimony of Kip Hagopian, founder of venture capital firm Brentwood Associates. Describes the GAO report as "one of the most comprehensive and insightful works ever done on the venture capital industry"; U.S. Congress. Joint Economic Committee. *Industrial Policy Movement in the United States: Is It the Answer?* Staff Study. June 1984, 81; U.S. Senate. Subcommittee on Savings, Pensions, and Investment Policy. *Promotion of High-Growth Industries and U.S. Competitiveness.* Hearings. January 1983, 168. Testimony of Morton Collins, general partner of DSV Associates, a limited partnership venture capital firm, and director of NVCA. Collins quotes a full page of the GAO Report; U.S. Congress. Joint Economic Committee. *Industrial, Policy, Economic Growth and the Competitiveness of U.S. Industry.* Hearings. July 1983, 50. Testimony of H. William Tanaka; U.S. House. Committee on Merchant Marine and Fisheries. *Maritime Policy and Regional Economic Development: Capital Formation in the Maritime Industry.* Hearings. April 1984, 413. Testimony of Donald N. Ross; Thompson, Chris. "The Geography of Venture Capital." *Progress in Human Geography.* March 1989; Ibanez, Fernan, "Venture Capital and Entrepreneurial Development." Background Paper or the 1989 World Development Report. *Policy, Planning, and Research, The World Bank.* 1989, 7. Refers to the GAO Report as "the most complete study, so far" of venture capital's contributions to entrepreneurship; Florida, Richard, and Martin Kenney. "Venture Capital and High Technology Entrepreneurship." *Journal of Business Venturing.* 3, issue 4 (Autumn 1988); Yusuf, Shahid, Koaru Beshima, and M. Anjum Altaf. "Global Change and East Asian Policy Initiatives." *The World Bank*, July 2004.

Genericization in the 1980s

Through the 1980s, the LCM continued to move through circuits of capital as its own object, separate from both the Casey Report and the GAO report. In 1983, the LCM was cited in a House hearing regarding Japanese involvement in the American equity and venture capital markets, credited to the SBA in general rather than to the Task Force. This is another example of the LCM being held up as an objective reflection of reality produced by a government body, in this case by a member of the high-technology sector itself. Silicon Valley marketing guru, Regis McKenna, who by this time had worked with Apple and Genentech, among other Silicon Valley companies, was called to offer expert testimony on the growth and financing of Silicon Valley technology firms. McKenna's testimony included several charts drawn (and branded) by his firm, pertaining to the "Typical Product Life Cycle for High Technology Product," "ROI Generation for Reinvestment in Next Round of R&D," and "Impact of Japanese Entry on Capital Formation of Competing US Firms."[92]

McKenna included an adapted version of the LCM schematic,[93] shown here as Figure 4, which he introduced as "prepared by the SBA, I believe," and showing "the requirements for capital…. There's a lot of capital, there's almost 2 billion dollars of venture capital out there, and getting early financing is easy." The veracity of the model was set, its logics now common sense: "[T]here are enormous requirements for capital as industry develops; and [to become] more competitive in that industry, you need to have a lower cost of capital [for further rounds of investment]."[94] The text in this version of the graphic is essentially identical to the LCM's original publication, with slight changed in punctuation and spacing. What McKenna is describing here is a financial landscape already shaped by the policy recommendations animated in the LCM.

In this hearing, the Chairman of the Economic Stabilization Subcommittee, New York Representative John LaFalce, jumped in, noting "[The LCM] was done not by the SBA but by the SBA Task Force on Venture Capital in January of 1977… the chairman of that Task Force is the present head of the CIA, Bill Casey."[95] McKenna responded, "[A]s there's a number of other charts in there, I won't go into detail…" and moving on, "[T]o remain competitive internationally—and we must remain competitive internationally—the competitive cost of capital… is the major requirement."[96]

LeFalce's insistence on Casey's authorship here is reminiscent of that of Rotan Lee and others in the 8(a) debates, who used Casey's association with the LCM and the Report as point of prestige and expertise to support their arguments. However, it is an outlier in this citation chain.

92. Hearing, Industrial Policy, testimony of Regis McKenna, 688.
93. Hearing, Industrial Policy, 689.
94. Hearing, Industrial Policy, 689.
95. Hearing, Industrial Policy, 689.
96. Hearing, Industrial Policy, 689.

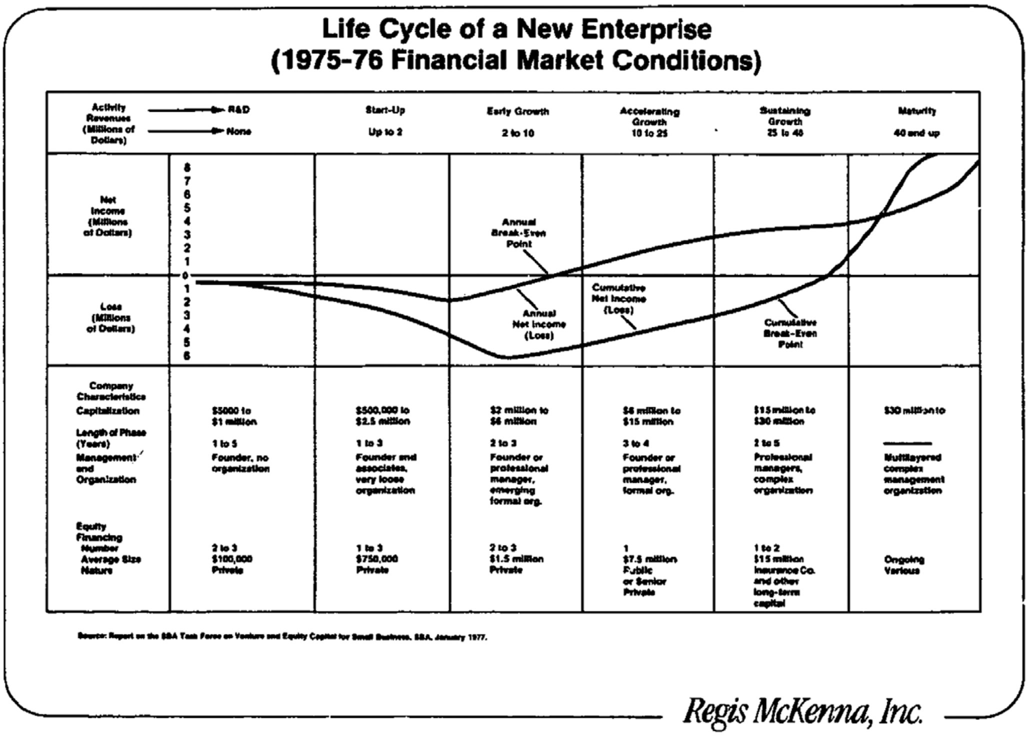


Figure 4. Life Cycle Model as it was presented by Regis McKenna, August 19, 1983.

Citations Post-1990

The LCM was subsequently divorced from its authorial origins in a 1993 working paper from the Office of Science and Technology Policy (OSTP). This paper, entitled "Aspects of Performance in the High Technology Sector," featured an adapted version of the LCM schematic under the section heading "Sources of Financing,"[97] shown here as Figure 5. Identified in the paper as "Figure 8," it is an adaptation of the LCM schematic. The figure retains the first two sections of the original title, "Life Cycle of a New Enterprise/Model of a Growing and Successful Company," and features the now familiar six-stage life cycle, though here the "R&D" stage is identified as the "Seed" stage. The "Cumulative" and "Annual" "Net Income" curves differ slightly from other replications of the schematic but are nonetheless recognizable. The most significant change introduced in the Figure 8 version of the LCM is the introduction of "Angel," "Venture," and "Public Financing" terminology to replace the much more detailed articulations of the various equity financing modes in the original.

Figure 8 is labeled as "Adapted from U.S. Congress, OTA, 1984." However, there is no reference to the SBA or the Task Force, under any name, anywhere in the OSTP working paper

97. Broz, 32.

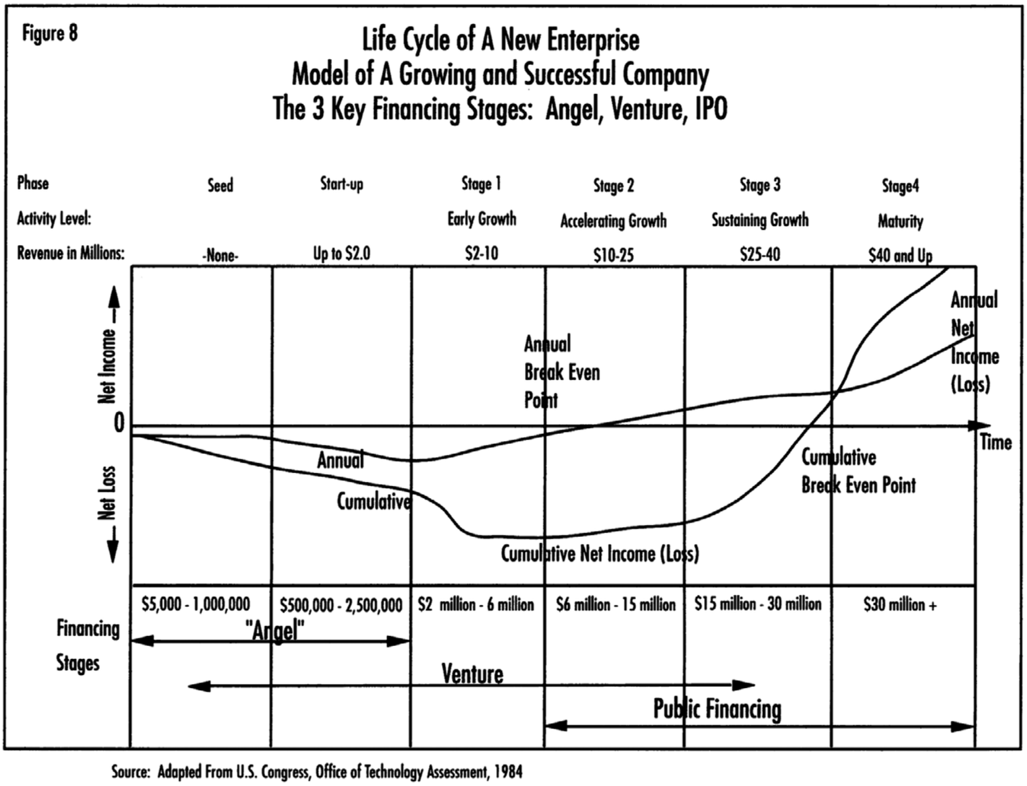


Figure 5. Life Cycle Model as adapted and presented in the OSTP working paper, 1993.

or in any OTA report from 1983, 1984, or 1985.[98] Because of this, it is unclear what the OSTP's source was for its version of the LCM schematic. It is impossible to say where the attribution break took place: if the OTA originally cited the LCM back to the SBA or to the Task Force, if the OTA was the source of the "Angel"/"Venture"/"Public Financing" terminology, or if the attribution break and terminology addition occurred at the point the OSTP working paper was written.

However it happened, the attribution break stuck. In 2004, D. Allan Bromley, the director of the OSTP at the time the Figure 8 working paper was released, published a paper in the scholarly journal *Technology in Society*. The paper's intention was to provide a "clearly articulated statement of US technology policy," along with "some historical context."[99] This "context" covered the period from chemical magnate Pierre Samuel DuPont DeNours' arrival in the US in 1800 to Bromley's service in the first Bush administration and NAFTA in a breezy nine pages. One figure appears in the paper: a copy of Figure 8 from the OSTP working paper,

98. The OSTP working paper lists in its bibliography a July 1984 OTA report entitled *Technology, Innovation, and Regional Economic Development.* However, the copy of this report I was able to locate does not contain any version of the Life Cycle Model schematic and does not make mention of the Casey Report or Task Force by any name, nor are there any indications that pages are missing.

99. Bromley, 455.

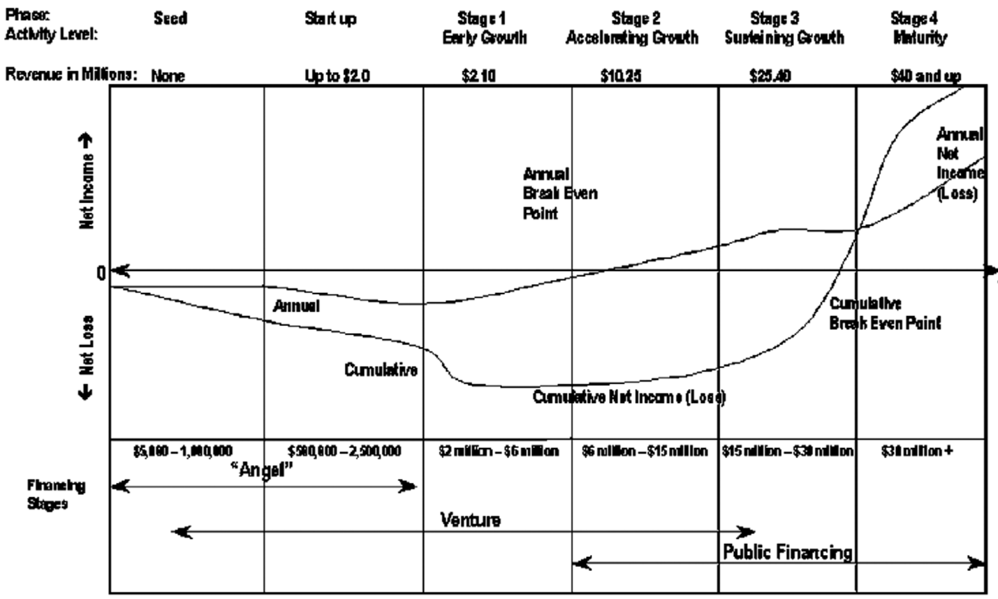


Figure 6. Life Cycle Model as it appears in Bromley's academic history of U.S. technology policy, 2004.

now captioned, "Life cycle of a new enterprise. Model of a growing and successful company. The three key financial stages: Angel, Venture, IPO." It is shown here as Figure 6.

In Bromley's text, he explains that during the first Bush administration the OSTP discovered, despite broad consensus that smaller and younger companies were a major source of job creations within the US, there was no systemic study or statistical database of small companies to support this assumption. "Therefore," Bromley writes, "OSTP undertook such a study…"

> which illustrates the early life cycle of a typical, new, high-technology enterprise. We found that typically the first tranche of support came from angel investors (uncles, aunts, and mothers-in-law) with an average net worth of less than US$300,000, who, having established the new entity, in a relatively short time sold off their equity in it, and moved to a new startup. The second tranche typically came from venture capitalists, while the third came from SBIRs or other government sources.[100]

Again, this paper fails to mention the Casey Report or Task Force by any name nor is the SBA mentioned in connection with the creation and publication of this model. The "Angel"/"-Venture"/"Public Financing" or "IPO" language used in both the Figure 8 paper and Bromley's 2004 paper do not represent a significant diversion from the "Principal Financing Sources" identified in the LCM's original 1977. To review, in the original publication, the "Principal Financing Sources" identified were "Personal Investment" and "Individual Investment" (analogous here to "Angel"); "Investment Firms (SBIC's, etc)", "Commercial Bank—Personal" and "Commercial Bank—Corporate" (analogous here to "Venture); and "Insurance

100. Bromley, 464.

Companies," and "Public Financing" (analogous here to "Public Financing" or "IPO"). It remains unclear where the OSTP and Bromley originally encountered the LCM or what OSTP "study" Bromley is referring to here, as the version of the LCM that appears in both the Figure 8 paper and Bromley's paper reproduces not only the linear schematic of the original LCM but also the specific financial figures for "Revenue" and "Financing" through each of the six life cycle stages.

The attribution break confirmed the LCM as a sourceless object, whose influence and utility persisted for years past the point when the policy goals it had been designed to support had been achieved. That it continued to be cited and reproduced after it was severed from its contexts of creation indicates its influence and utility were not dependent on the prestige of its original creators.

Tracing the afterlives of the LCM illustrates how a specific policy argument became a generalized support structure for an economic imaginary that in turn undergirded the material transformation of the relationship between finance, technology, and business development in the US. The repeated appearances of the LCM illustrate how a policy argument and its motivating assumptions became part of a set of assumed, authorless ground truths about how business, finance, and the high-technology sector worked in the US. As the LCM moved further away from its contexts of creation, there was less and less interest in contesting it. Rather, it was reproduced as a fact, held at various points to be simultaneously idealized, generalized, and accurate. It was a type of Panglossian mirror, always showing the best of all possible worlds, which might be this one, or one to which we might economically aspire or return. The LCM's diffusion, coupled with the success of the Casey Report's policy agenda, set the conditions by which the use and reference to the LCM in economic and financial policy made the activities of the high-technology sector more like the LCM in terms of the pursuit of venture capital by start-ups, the participation of institutional investors in venture capital funds, and the pursuit of the IPO as the primary criterion for success. It is critical to track the appearances of the LCM separately from the Casey Report's regulatory influence in general, as it is the diffusion and acceptance of the LCM that explains why the Casey Report's regulatory influence persisted when it might have otherwise been rolled back.

M.R. Sauter is an assistant professor at the University of Maryland College of Information. E-mail: mrsauter@umd.edu

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