

THE COALITION MODEL

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Entrepreneurs are agents of change, who contribute to growth at the levels of the firm, region, nation and international arenas. Small entrepreneurial firms have an important role in contributing to job creation, to generating technological innovation and to stimulating the United States economy. Unfortunately, there are many underlying challenges that the financing of young entrepreneurial firms present to prospective investors and innovators. Furthermore, there is a financing and information gap, which is termed the “Valley of Death.”

The Valley of Death describes the financial barriers of firms at the early-stage of technology development. Such difficulties are the product of the uncertainty, high-risk and information asymmetry problems, which preclude investors from backing such firms. Moreover, the markets for allocating risk capital to early stage ventures are inefficient for the reasons detailed in the paper.

There is a need for the United States Government to intervene in the market and encourage the creation (and survival) of high-growth firms. This paper proposes a “Coalition” Model, which promotes governmental intervention in the market in the form of public-private partnership policies that will bridge the financial and information gaps, as well as encourage and stimulate the development of new technologies.

The model proposes two targeted policy initiatives (strategic development tools) that can mitigate the financing challenges: the Incubator programs and the Match-Maker venture capital funds. The model's initiatives will be to complement, and not to replace, the private market efforts in financing emerging growth firms.

The model allows the government to make direct equity investments in seed ideas and projects (Incubator) and in start-up firms and venture capital funds (Match-Maker), while also encouraging various private intermediaries to participate in the financings of the such projects. The initiatives are designed to ensure effectiveness and prevent political distortions based on the successful case studies of Silicon Valley and Israel.

Another objective of the model is to join the calls advocating for a change in corporate governance philosophy from "shareholder primacy" towards a new philosophy of managerialism. The approach suggested in this paper is to incorporate the stakeholder approach to the traditional managerialism approach.

BIOGRAPHICAL SKETCH

Anat Beck joined the Cornell Law School J.S.D. program in 2007. Her principal research and teaching interests lie in the fields of organizational and financial law and economics. Professor Robert C. Hockett is the chair of her committee and Professors Saule T. Omarova and Lynn A. Stout are the readers. Professors John J. Barceló III and Theodore Eisenberg, of blessed memory, were also supervising her work.

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I. INTRODUCTION

The United States is on the verge of losing its place as a world leader in generating innovation, technology and economic growth. It is facing a “historic tipping point,”¹ where countries around the world are “stepping on the gas”² to promote innovation policies, while the United States is “slacking off,”³ lagging behind and even worse yet, scaling back on such important policies supporting growth efforts.⁴

Technological innovation is the only reliable engine that can drive change and is the fundamental source of sustained productivity and growth, according to Nobel Laureate Robert Solow.⁵ In order to successfully compete in tomorrow’s market place, promote growth, as well as increase productivity and expand the economic and social

¹ JOHN KAO, INNOVATION NATION: HOW AMERICA IS LOSING ITS INNOVATION EDGE, WHY IT MATTERS, AND WHAT WE CAN DO TO GET IT BACK 3 (2007) (“in tomorrow’s world, even more than today’s innovation will be the engine of progress. So unless we move to rectify this dismal situation, the United States cannot hope to remain a leader. What’s in stake is nothing less than the future prosperity and security of our nation.”).

² *Id.*

³ *Id.*

⁴ Richard A. Mann et al., *Starting From Scratch: A Lawyer’s Guide to Representing a Start-Up Company*, 56 ARK. L. REV. 773 (2004) (“A new business is started every eleven seconds in the United States. One in twelve Americans is currently engaged in trying to start a new business. Of the more than twenty-three million businesses in the United States, more than 98% are small businesses employing 100 employees or fewer. Most of these businesses are not long term survivors: 24% of new businesses fail within two years while 63% fail within six years.”).

⁵ Robert M. Solow, *Prize Lecture: Growth Theory and After*, Nobelprize.org , (Dec. 8, 1987), http://www.nobelprize.org/nobel_prizes/economics/laureates/1987/solow-lecture.html.

value,⁶ policymakers must institute sweeping innovation policies that will embrace new approaches to management, technologies and operating methods.⁷

Entrepreneurs are agents of change,⁸ who contribute to growth at the levels of the firm, region, nation and even international arenas.⁹ Entrepreneurial high-growth and high-technology firms (“start-ups”) are an important source of new experimentation and ideas, which would otherwise remain untapped in the economy.¹⁰ Small entrepreneurial

⁶ See Michael E. Porter & Mark R. Kramer, *Creating Shared Value: How to Reinvent Capitalism – and Unleash a Wave of Innovation and Growth*, 89 HARV. BUS. REV. 1, 5 (2011).

⁷ Fred Block, *Swimming Against the Current: The Rise of a Hidden Developmental State in the United States*, 36 POL. & SOC’Y 169 (2008), available at <http://innovate.ucsb.edu/wp-content/uploads/2010/04/Block-swimming.pdf>; See also KENT HUGHES, *BUILDING THE NEXT AMERICAN CENTURY: THE PAST AND FUTURE OF ECONOMIC COMPETITIVENESS* (Woodrow Wilson Center Press, 2005); See also Mary J. Dent, *A Rose by Any Other Name: How Labels Get in the Way of U.S. Innovation Policy*, 8 BERKELEY BUS. L. J. 128, 130-31 (2011) (“[W]e lack a deep, broad national understating of why promoting innovation should be a national priority. As a result, we fail to address innovation policies in a proactive, explicit and effective way.” Dent further discussed the “Volcker Rule” of the Dodd-Frank Act and stated that “policies that affect the innovation sector are frequently adopted as part of broader packages that have nothing to do with innovation.”); See Porter & Kramer, *supra* note 6 (“[T]he concept of shared value, ..., recognizes that societal needs, not just conventional economic needs, define markets. It also recognizes that social harms or weaknesses frequently create internal costs for firms—such as wasted energy or raw materials, costly accidents, and the need for remedial training to compensate for inadequacies in education. And addressing societal harms and constraints does not necessarily raise costs for firms, because they can innovate through using new technologies, operating methods, and management approaches—and as a result, increase their productivity and expand their markets. Shared value, then, is not about personal values. Nor is it about “sharing” the value already created by firms—a redistribution approach. Instead, it is about expanding the total pool of economic and social value.”).

⁸ See Yoram Margalioth, *Not A Panacea For Economic Growth: The Case Of Accelerated Depreciation*, 26 VA. TAX REV. 493 (2007).

⁹ See ANDRE’ VAN STEL, *EMPIRICAL ANALYSIS OF ENTREPRENEURSHIP AND ECONOMIC GROWTH* 2 (2006) (“It is currently embedded in the current European policy approach that the creativity and independence of entrepreneurs contribute to higher levels of economic activity.”); See also DAVID B. AUDRETSCH, *ENTREPRENEURSHIP: A SURVEY OF THE LITERATURE*, ENTERPRISE PAPERS, NO. 14, 5 (European Communities 2003) (“Entrepreneurship has become the engine of economic and social development throughout the world. The role of entrepreneurship has changed dramatically between the traditional and new economies”); See also, David E. Pozen, *We Are All Entrepreneurs Now*, 43 WAKE FOREST L. REV. 283 292 (2008) (“A vast crop of empirical studies have attempted to analyze the relationship between entrepreneurial activities, government policies relevant thereto, and economic performance, generally corroborating the commonsense insight that entrepreneurship can facilitate growth.”).

¹⁰ For a detailed explanation on how ideas promote growth, see CHARLES I. JONES, *GROWTH AND IDEAS*, IN *HANDBOOK OF ECONOMIC GROWTH* 1063 (P. Aghion & S. Durlauf eds., Elsevier 2005); See also Margalioth, *supra* note 8.

firms have an important role in contributing to job creation, to generating technological innovation and by and large to stimulating the United States economy.¹¹

Unfortunately, there are many underlying challenges that the financing of young entrepreneurial firms present to prospective investors and innovators.¹² Furthermore, there is a financing and information gap, which is termed in Silicon Valley, the “Valley of Death.”¹³ The Valley of Death describes the financial barriers of firms at the early-

¹¹ This rising body of evidence started in the late 1970s and accelerated in the 1980s. *See, e.g.*, David L. Birch, “Who Creates Jobs?” 65 *PUB. INT.* 3 (1981) *available at*: http://www.nationalaffairs.com/public_interest/detail/who-creates-jobs; *See* Zoltan Acs & David Audretsch, *Innovation in Large and Small Firms: An Empirical Analysis*, 78 *AM. ECON. REV.* 678 (1988); *See also* ZOLTAN ACS & DAVID AUDRETSCH, *INNOVATION AND SMALL FIRMS* (The MIT Press, 1990). The empirical analysis by Zoltan Acs and David Audretsch, of the U.S. Small Business Innovation Data Base, has increased the credibility of this evidence. Zoltan Acs and Audretsch’s analysis established the greater weight of small firms in contributing to the U.S. economy and in generating technological innovations.

¹² The following are five broad stages in the innovation process, as well as the financial sources that are usually available to start-up at these stages. First, the stage of basic research, where funding is usually available to entrepreneurs from government sources like NSF, NIH, SBIR phase I, and from private corporate resources such as funding that large corporations allocate for the purposes of research and development; Second, the stage of proof of concept or invention, where financing sources usually include private Angel investors, corporate research and development funds, government funding from SBIR phase II and technology labs; Third, the early-stage technology development stage, which is often termed as the Valley of Death because of the entrepreneur’s hardship in getting financing for this stage; Fourth, the stage of product development, where private venture capitalist traditionally invest in start-up firms; Fifth and last, the production or marketing stage, where financing sources include private venture capitalists, corporate venture capital, private equity or commercial debt.

¹³ *See* the following studies that describe the failure rates and reasons for the market failures. Arnold C. Cooper, William C. Dunkelberg & Carolyn Y. Woo, *Entrepreneurs' Perceived Chances for Success*, 3 *J. BUS. VENTURING* 97 (1988) (quoting a study by Dun and Bradstreet, which reported that 67% of new businesses fail and discontinue within four years (Dun and Bradstreet 1967)); U.S. GEN. ACCOUNTING OFFICE, *SMALL BUSINESS EFFORTS TO FACILITATE EQUITY CAPITAL FORMATION* 19 (2000), *available at* <http://www.gao.gov/assets/240/230896.pdf> (summarizing evidence that approximately 80% of new businesses fail or no longer exist within five to seven years of formation “due to a lack of financial depth, a lack of management expertise, an unworkable business idea, or some combination of these factors. The perceived high risk associated with new and rapidly growing companies is also borne out by the past performance of venture capital investments in the informal, unregulated equity capital market. According to a recent study by the National Association of Seed and Venture Funds, only about 10 percent of venture capital investments meet their expected rate of return.”); TOMMAS ZIMMERER & NORMAN M. SCARBOROUGH, *ESSENTIALS OF ENTREPRENEURSHIP AND SMALL BUSINESS MANAGEMENT* 10 (3d ed. 2002) (asserting that 24% of small businesses fail within two years and 63% fail within six years); Amy E. Knaup, BUREAU OF LABOR STATISTICS, *Survival and Longevity in the Business Employment Dynamics Data*, *Monthly Lab. Rev.* at 50, 51 (May 2005) (stating that 34% of new businesses fail within their first two years and 56% fail within four years.).

stage of technology development, which is between invention (the early stage of discovery that is generated from basic research) to innovation (the later stage of commercialization of the product or process).¹⁴ Such difficulties are the product of the information barriers that are associated with investing in start-up technology firms. They result from the uncertainty, high-risk and information asymmetry problems, which preclude investors from backing such firms.¹⁵

One of the causes of the “Valley of Death” is the fact that the markets for allocating risk capital to early stage ventures are inefficient.¹⁶ The following are several reasons that contribute to this inefficiency. First, private investors do not have an incentive to invest in early stage technology development because they cannot capture the

¹⁴ See George S. Ford, Thomas M. Koutsy & Lawrence J. Spiwak, U.S. DEP’T OF COMMERCE, Discussion Paper, A Valley of Death in the Innovation Sequence: An Economic Investigation (September 2007) available at <http://www.osec.doc.gov/Report-Valley%20of%20Death%20Funding%20Gap.pdf>; See Lewis Branscomb & Phillip Auerswald, U.S. DEP’T OF COMMERCE, *Between Invention and Innovation: An Analysis of Funding for Early- Stage Technology Development*, Advanced Technology Program, National Institute for Standards and Technology (NIST), NIST GCR 02841 (Nov. 2002), available at <http://www.atp.nist.gov/eao/gcr02-841/gcr02-841.pdf>; See also Phillip Auerswald, Lewis Branscomb, Nicholas Demos & Brian Min, U.S. DEP’T OF COMMERCE, *Understanding Private-Sector Decision Making for Early-stage Technology Development*, A “Between Invention and Innovation Project” Report, National Institute for Standards and Technology (NIST), NIST GCR 02-841A (Sep. 2005), available at <http://www.nist.gov/tpo/sbir/upload/gcr02-841a.pdf>; See also Ederyn Williams, *Crossing the Valley of Death*, INGEGIA, Dec. 30, 2004, at 21, available at <http://www2.warwick.ac.uk/services/ventures/valley.pdf> (discussing valley of death in the UK); See also Philipp Marxgut, *Interview with Charles Wessner, Director of the Program on Technology, Innovation, and Entrepreneurship at the National Academy of Sciences*, BRIDGES, Oct. 16, 2008, at 19, available at <http://ostaustria.org/bridges-magazine/volume-19-october-16-2008/item/3585-innovation-policy-in-the-us-an-interview-with-charles-wessner> (“There is great complacency in Washington about the US position in the world. There is relatively limited understanding in the policy community about the scale and scope of foreign investments in new technologies, including new institutions, such as ASTAR in Singapore or the large and apparently effective Chinese S&T Parks, or the highly successful Microelectronics center, called IMEC, in Flanders. Here in the US we do not need to do exactly what others are doing, but we do need to greatly strengthen the interaction between the government, the universities, and the private sector by providing a wide variety of incentives for cooperation on the new technologies that will be the basis of future industries.”).

¹⁵ See Branscomb & Auerswald (2002), *supra* note 14.

¹⁶ See *id.*

full benefits of such technologies.¹⁷ There is evidence that puts forward the fact that the social return on research and development (early stage technology development) is much higher than the private return on such investment.¹⁸ Additionally, large public firms are closing (or relocating) their research and development lab, as well as largely shying away from investments in research and development initiatives, due to a “shareholder primacy” philosophy. Such philosophy prevents managers of large corporations to practice and establish long-term strategic projects (or investments) with uncertain returns.¹⁹

Second, as noted, both investors and entrepreneurs experience serious information inadequacies for numerous reasons. There is uncertainty concerning the success of the entrepreneur’s product or research.²⁰ Investment in early stage technology also entails information asymmetry²¹ and uncertainty, as well agency problem,²² which contribute to

¹⁷ See, e.g., BRONWYN H. HALL, THE PRIVATE AND SOCIAL RETURNS TO RESEARCH AND DEVELOPMENT, IN TECHNOLOGY, R&D, AND THE ECONOMY 140 (Bruce L.R. Smith & Claude E. Barfield eds., The Brookings Institution 1995) (providing evidence that the social return to R&D is much above the private return); See Branscomb & Auerswald (2002), *supra* note 14; See Zvi Griliches, *The Search for R&D Spillovers*, 94 SCAND. J. ECON. 29 (Supp. 1992) (evaluating calculations of the social rates of return for research and development); See also Margaliot, *supra* note 8.

¹⁸ See Griliches (1992), *supra* note 17.

¹⁹ LYNN STOUT, THE SHAREHOLDER VALUE MYTH: HOW PUTTING SHAREHOLDERS FIRST HARMS INVESTORS, CORPORATIONS, AND THE PUBLIC (2012) [hereinafter Shareholder Value Myth] (According to Stout, the rise of shareholder primacy thinking began “in the 1970s with the rise of the so-called Chicago School of free-market economists. Prominent members of the School began to argue that economic analysis could reveal the proper goal of corporate quite clearly, and that goal was to make shareholders as wealthy as possible ...the idea that corporate performance could be simply and easily measured through the single metric of share price ...”).

²⁰ See PAUL A. GOMPERS & JOSH LERNER, THE VENTURE CAPITAL CYCLE 127 (1999), at 127. (entrepreneurs and budding companies, by their very nature, are associated with considerable levels of uncertainty. There is uncertainty concerning the success of the entrepreneur’s product or research, which in turn affects the decisions of the firm’s executives, the motivation of investors to advance capital and the intention of suppliers to extend credit.).

²¹ Laura Lindsey, *Blurring Firm Boundaries: The Role of Venture Capital in Strategic Alliances*, 63 J. FIN. 1137 (2008); See also, Gompers & Lerner (1999), *supra* note 20, at 128 (discussing the asymmetric information problem, which arises because the entrepreneur, due to her daily involvement with the firm,

“adverse selection,” where investors have difficulty screening and selecting entrepreneurs.²³

Potential “regular” (not venture capitalist) investors are inadequately equipped to measure technical uncertainties.²⁴ They may have trouble understanding the technical information necessary for the investment, as well as the innovator’s decision-making process.²⁵

Moreover, investors have difficulty quantifying market uncertainties if the innovation (technology) is radical, generating new products and new markets. The “due diligence” practice, which potential investors are required to perform, becomes very

knows more than the prospective partners, investors or suppliers, about her company’s outlook. The asymmetric information problem might also lead to a selection problem, where investors might have a hard time in screening and selecting creditable “good” entrepreneurs and companies, and therefore, are incapable of making correct and competent investment decisions.).

²² See Michael C. Jensen & William H. Meckling, *Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure*, 3 J. FIN. ECON. 305 (1976) (“[T]he problem of inducing an “agent” to behave as if he were maximizing the “principal’s” welfare is quite general. It exists in all organizations and in all cooperative efforts— at every level of management in firms, in universities, in mutual companies, in cooperatives, in governmental authorities and bureaus, in unions, and in relationships normally classified as agency relationships such as those common in the performing arts and the market for real estate. The development of theories to explain the form which agency costs take in each of these situations (where the contractual relations differ significantly), and how and why they are born will lead to a rich theory of organizations which is now lacking in economics and the social sciences generally.”).

²³ See George A. Akerlof, *The Market for “Lemons”: Quality Uncertainty and the Market Mechanism*, 84 (3) Q. J. ECON. 488, 493 (1970) (Akerlof discusses the “adverse selection” problem, as well as firms’ offerings of equity that may be associated with the “lemons” problem); See also Manuel Utset, *Reciprocal Fairness, Strategic Behavior & Venture Survival: A Theory of Venture Capital Financed Firms*, 2002 (1) WIS. L. REV. 45, 56 (2002); See also, Gompers & Lerner (1999), *supra* note 20, at 129.

²⁴ See Gompers & Lerner (1999), *supra* note 20, at 127 (entrepreneurs and budding companies, by their very nature, are associated with considerable levels of uncertainty).

²⁵ See Jensen & Meckling, *supra* note 22 (establishing that agency problems due to conflicts between investors and managers can have an effect on the interest of both equity and debt holders to supply capital and invest “[i]t is generally impossible for the principal or the agent at zero cost to ensure that the agent will make optimal decisions from the principal’s viewpoint. In most agency relationships the principal and the agent will incur positive monitoring and bonding costs (non-pecuniary as well as pecuniary), and in addition there will be some divergence between the agent’s decisions and those decisions, which would maximize the welfare of the principal.”)]; See also Utset, *supra* note 23, at 56; See also Gompers & Lerner (1999), *supra* note 20, at 127-31 (discussing the information asymmetry issue and other risks that venture capitalists face while dealing with start-ups).

difficult to carry out when the markets and technologies are constantly evolving, changing and becoming ever more complex.

Third, large sums in venture funds remain undisbursed, even as technology entrepreneurs experience an apparent shortage of funding.²⁶ It is also very alarming that due to the unstable economic environment and recent economic crisis, venture capital investors, who are special financial intermediates (that found a way to address some of these information challenges), and have traditionally invested in early innovation stages, now also resort to later stage investments.²⁷ There are also various studies that propose that approximately 90% of entrepreneurial firms, who are not able to get venture capital backing, fail within five to seven years from their formation.²⁸

For these reasons, there is a need for the United States Government to intervene in the market and encourage the creation (and survival) of high-growth firms.²⁹ As the Founder of the Kaufman Foundation, Carl Schramm³⁰ stated, “In a world of globalization

²⁶ See Branscomb & Auerswald (2002), *supra* note 14 (“Entrepreneurs report a dearth of sources of funding for technology projects that no longer count as basic research but are not yet far enough along to form the basis for a business plan—a scarcity Dr. Mary Good, former Undersecretary of Commerce for Technology, has termed an innovation gap. At the same time, venture capital firms and other investors are sitting on record volumes of resources not yet invested, with over \$70 billion currently undisbursed from funds raised during the boom years. In 2002, several premier venture capital firms have taken the unusual step of prematurely returning money to investors to reduce the size of particularly large funds.”).

²⁷ Joseph A. McCahery, Erik P.M. Vermeulen & Andrew M. Banks, Corporate Venture Capital: From Venturing to Partnering at 211, *in* The Oxford Handbook of Venture Capital (Douglas Cumming ed., 2012), *available at* <http://www.oxfordhandbooks.com/view/10.1093/oxfordhb/9780195391596.001.0001/oxfordhb-9780195391596-e-7>.

²⁸ Paul Gompers & Josh Lerner study, *The Money of Invention: How Venture Capital Creates New Wealth*, UBIQUITY, Jan. 2002, *available at* <http://ubiquity.acm.org/article.cfm?id=763904>; *See also*, U.S. Gen. Accounting Office, *supra* note 13 (approximately 80% of new businesses fail within five to seven years from their formation).

²⁹ *See also* McCahery, Vermeulen & Banks, *supra* note 27, at 1.

³⁰ Carl Shramm is the former President and CEO of the Ewing Marion Kauffman Foundation, a leading entrepreneurship advocacy group.

and outsourcing, entrepreneurship is America's remaining comparative advantage."³¹ It should be noted that the government has an additional interest to intervene, since the Valley of Death has an extensive effect on the efficiency and productivity of the government's current efforts to support research and development.³²

The government's role as a "marker actor"³³ is often overlooked. Likewise, many developmental policies are conducted mainly in the "shadows,"³⁴ since there is a fundamental belief among politicians and policymakers that private sector firms should take action instinctively and autonomously according to the indications of the market place, without the government's intervention.³⁵ For example, Lanny Davis, former presidential advisor and now political commentator,³⁶ suggests that government investment or intervention is equivalent to socialism.³⁷

³¹ See generally CARL J. SCHRAMN, *THE ENTREPRENEURIAL IMPERATIVE: HOW AMERICA'S ECONOMIC MIRACLE WILL RESHAPE THE WORLD (AND CHANGE YOUR LIFE)* (2006).

³² Ford, Koutsky & Spiwak, *supra* note 14; See Branscomb & Auerswald (2002), *supra* note 14; See also, Auerswald, Branscomb, Demos & Min (2005), *supra* note 14.

³³ Robert C. Hockett & Saule T. Omarova, "Private" Means to "Public" Ends: Governments as Market Actors, 15 *THEOR. INQ. IN LAW* 53 (2014), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2222444 ("In this capacity, governments act much as private actors do in particular markets. They employ the same means toward their ends.").

³⁴ See Block, *supra* note 7; See also Hughes, *supra* note 7.

³⁵ Block, *supra* note 7, at 2; See also Hughes, *supra* note 7; See also, MILTON FRIEDMAN & ROSE FRIEDMAN, *FREE TO CHOOSE: A PERSONAL STATEMENT* 68 (Harcourt Brace & Jovanovic, 1980) (claiming that there is no economic necessity for the government to fund research through the National Science Foundation and it should be terminated).

³⁶ Lanny J. Davis was former White House special counsel to President Clinton.

³⁷ Lanny J. Davis, The GOP Leads a 'Socialist' Bailout, *WALL ST. J.*, Sep. 22, 2008, at A21, available at <http://online.wsj.com/article/SB122204285661261373.html> (Davis claims that the GOP was leading a socialist bail out following the subprime financial crisis. "If a liberal Democratic administration had put hundreds of billions of dollars of taxpayer money at risk by bailing out Bear Stearns and nationalizing American International Group (AIG), Fannie Mae and Freddie Mac, wouldn't conservatives accuse Democrats of 'socialism'?"); See also Benjamin A. Templin, *The Government Shareholder: Regulating Public Ownership of Private Enterprise*, 62 *ADMIN. L. REV.* 1127, 1128 (2010).

There must be a sweeping change in policy and, moreover, philosophy. In order for the United States to advance and continue to produce technological innovation, there must be open governmental support for and investment in innovation programs that will create new entrepreneurial firms and increase the efforts of research and development.

There are many ways in which the government can intervene in the market.³⁸ One way of intervention, which is supported by the “endogenous growth”³⁹ theory (which maintains that economic growth is generated from within a system), is by mandating policies that can increase technological innovation, such as investment in research and development initiatives.

³⁸ Margalioth, *supra* note 8 (“Sometimes government intervention takes the form of research grants, as in the case of basic research at universities or prizes offered to people who manage to solve important problems. Intellectual property rights are an important form of government intervention aimed at making ideas at least partially excludable, to provide people with an incentive to innovate. By giving innovators monopoly power, intellectual property rights allow them to charge prices above marginal cost, as otherwise they would have no incentive to innovate. The development of intellectual property rights, a cumulative process that occurred over centuries, probably played a critical role in sparking the Industrial Revolution and is largely responsible for modern economic growth. Intellectual property rights usually cannot provide innovators with full excludability. Ideas, therefore, are only partially excludable. The same is true for grants and prizes. Inventors do not capture the full value of their inventions while society benefits from positive externalities, also known as spillover effects.”); For a discussion and comparison of the various forms of intervention, *see* SUZANNE SCOTCHMER, *INNOVATION AND INCENTIVES* (The MIT Press 2004) (“All forms of funding are implicitly incentive schemes, since they set the direction of research and encourage people to do it.”); *See also* DOUGLASS C. NORTH, *STRUCTURE AND CHANGE IN ECONOMIC HISTORY* 164-67 (W.W. Norton & Co. 1981) (an important factor that needs to be examined in economic growth theory is the institutional setting); *See also*, JOSH LERNER, *BOULEVARD OF BROKEN DREAMS: WHY PUBLIC EFFORTS TO BOOST ENTREPRENEURSHIP AND VENTURE CAPITAL HAVE FAILED-- AND WHAT TO DO ABOUT IT* (Princeton University Press 2009) [hereinafter *Boulevard of Broken Dreams*]; *See also*, McCahery, Vermeulen & Banks, *supra* note 27, at 1.

³⁹ Paul M. Romer, *The Origins of Endogenous Growth*, 8 J. ECON. PERSPECTIVES 3 (1994) (“The phrase “endogenous growth” embraces a diverse body of theoretical and empirical work that emerged in the 1980s. This work distinguishes itself from neoclassical growth by emphasizing that economic growth is an endogenous outcome of an economic system, not the result of forces that impinge from outside. For this reason, the theoretical work does not invoke exogenous technological change to explain why income per capita has increased by an order of magnitude since the industrial revolution. The empirical work does not settle for measuring a growth accounting residual that grows at different rates in different countries. It tries instead to uncover the private and public sector choices that cause the rate of growth of the residual to vary across countries. As in neoclassical growth theory, the focus in endogenous growth is on the behavior of the economy as a whole. As a result, this work is complementary to, but different from, the study of research and development or productivity at the level of the industry or firm.”).

Accordingly, this paper proposes a “Coalition” Model, which promotes governmental intervention in the market in the form of public-private partnership policies that will bridge the financial and information gaps (the “Valley of Death”), as well as encourage and stimulate the development of new technologies.

The Coalition model proposes two targeted policy initiatives (strategic development tools) that can mitigate the current fundamental challenges of financing emerging growth firms: the Incubators and the Match-Maker venture capital fund. The model’s initiatives will be to complement, and not to replace, the private market efforts in financing emerging growth firms.

The model allows the government to make direct equity investments in seed projects (Incubator) and in start-up firms and venture capital funds (Match-Maker), while also encouraging various private intermediaries to participate in the financings of the such projects. The initiatives are designed to ensure effectiveness and prevent political distortions based on the successful case studies of Silicon Valley and Israel.

The Incubator initiative is a shared-use facility, where entrepreneurs and entrepreneurial firms (following a selection process) will be located. The Incubator initiative is designed to serve the needs of entrepreneurs (seed stage companies) by providing them with access to seed capital and other resources (such as management training), which are required to successfully grow their ideas into firms, for a limited period of time (up to 2 years).⁴⁰

⁴⁰ See David A. Lewis, Elsie Harper-Anderson & Lawrence A. Molnar, U.S. DEP’T OF COMMERCE, *Incubating Success: Incubation Best Practices That Lead to Successful New Ventures* (2011) available at http://edaincubatortool.org/pdf/Master%20Report_FINALDownloadPDF.pdf.

By setting up incubators across the country, according to the Incubator initiative, the government is effectively investing in research and development projects, which will lead to the “knowledge spillover” effect (an exchange of ideas among individuals). The social return to the government from the potential radical innovation that can result from this intervention is much greater than to private investors.⁴¹ Additionally, the Incubator initiative uses the “open innovation” paradigm that allows for the participating entrepreneurs to compete, collaborate and cooperate with the stakeholders, which further facilitates a “knowledge spillover,” encouraging innovation.

The Incubator initiative will advance the formation of new entrepreneurial firms, thereby increasing economic growth and creating jobs in many areas, including areas that are not considered technology regions, which require intervention. There are several geographic regions in the United States, such as Silicon Valley around San Francisco and Route 128 in Boston, that enjoy concentrated early-stage technology development. This success can be traced to several reasons, including: robust investment in research and development efforts, availability of government funding and strong linkages between academic institutions and industry. Such areas also enjoy developed risk-capital networks together with complementary infrastructure of suppliers (for example specialized law firms).⁴²

Therefore, another objective of the Incubator initiative is to establish cross-regional national networks across the United States. These networks will also need to

⁴¹ See, e.g., Hall, *supra* note 17 (providing evidence that the social return to R&D is much above the private return); See Margalioth, *supra* note 8; See also Griliches, *supra* note 17 (evaluating calculations of the social rates of return for research and development).

⁴² See Branscomb & Auerswald (2002), *supra* note 14.

expand globally in order to ensure future innovation, sustainability and create, rather than follow, market trends.

The “Match-Maker” Initiative is a form of direct government investment in public-private venture capital funds that will create a platform for a competitive venture capital industry in the United States, with emphasis on investment in early stage technology firms (start-ups). The proposed design is intended to attract the participation of professional venture capital agents (from the private market) in the Match-Maker Initiative, in order to create public-private venture capital funds.

The Match-Maker venture capital funds will be legally independent of the government, and will focus on making equity investments in private-sector early stage start-up firms, while using government-supplied funds. It is important to include reputable managers from the venture capital industry in the Match-Maker initiative, as they play an important role in the United States innovation process.⁴³ Venture capital firms use unique contracts and organizational capabilities in order to overcome uncertainty, risk, information asymmetry, agency,⁴⁴ “lemons” and “adverse selection”⁴⁵ related problems.

Another objective of the Coalition model is to join the calls advocating for a change in corporate governance philosophy from “shareholder primacy,” which is

⁴³ See William L. Megginson, *Toward a Global Model of Venture Capital?*, 16 J. APPLIED CORP. FIN. 89 (2004).

⁴⁴ See Branscomb & Auerswald (2002), *supra* note 14; See also Gompers & Lerner (1999), *supra* note 20, at 129.

⁴⁵ See Akerlof, *supra* note 23, at 493; See also Utset, *supra* note 23, at 56; See also Gompers & Lerner (1999), *supra* note 20, at 129.

economically inefficient,⁴⁶ towards a new philosophy of managerialism (a strategic approach of setting long-term goals). In recent years, it has become very difficult for private firms to invest in research and development programs due to a philosophy of “shareholder primacy,”⁴⁷ a point of view that the fiduciary duty of managers requires them to maximize the wealth of the shareholders, precluding managers from pursuing long-term projects with uncertain returns and from considering the interests of other non-shareholder constituencies.⁴⁸ Therefore, the approach suggested in this paper is to incorporate the stakeholder approach (taking into account the needs of other non-stockholders) to the traditional managerialism approach.

The following is an overview of the chapters in this paper, and the research questions addressed in the chapters.

Chapter II of this paper provides a review of the development of entrepreneurship research. Its purpose is to lay the foundation to a new and innovative proposed “Coalition” model by presenting the historic-doctrinal review of the development of entrepreneurship research, which is the basis for this paper’s theme and discussions, as well as introduce some pioneers that have fashioned the entrepreneurship research during the past few decades. In part A, the problem of defining the concept of

⁴⁶ Margaret M. Blair & Lynn A. Stout, *A Team Production Theory of Corporation Law*, 85 VA. L. REV. 247 (1999) [hereinafter: Blair & Stout (Team Production)].

⁴⁷ *Id.* The latest contributions of scholars Lynn Stout and Margaret Blair, particularly their “team production” model, which describes the board of directors as a “mediating hierarch,” revolutionize the current philosophy by arguing that shareholder primacy is not economically efficient.

⁴⁸ See Stout (Shareholder Value Myth), *supra* note 19 (the rise of shareholder primacy thinking began “in the 1970s with the rise of the so-called Chicago School of free-market economists. Prominent members of the School began to argue that economic analysis could reveal the proper goal of corporate quite clearly, and that goal was to make shareholders as wealthy as possible ... the idea that corporate performance could be simply and easily measured through the single metric of share price ...”).

“entrepreneurship” will be discussed. Part B, analyzes the economic growth theory, which puts forth the hypothesis that innovation is a driver of economic growth. It then argues that the U.S. Government should embrace a developmental policy that will guarantee that innovations are transformed into commercial products by entrepreneurial firms and encourage advanced technology. It additionally discusses why free markets alone cannot lead to innovation and why entrepreneurial firms need financial and other

Part C will examine the various theories of economic growth that support the primary assumption of this paper that entrepreneurship and innovation are drivers of economic growth, as follows: (1) discuss the theory that innovation is a driver of economic growth; (2) survey the development of growth theory from the post-Keynesian (Harrod-Domar) to the Neoclassical (Solow) economic growth model; (3) introduce new growth theory models linking entrepreneurship and economic growth; and (4) discuss the theory that new entrepreneurial firms stimulate innovation.

Chapter III explains the call for government intervention in the market, in the form of investment in the Coalition model’s proposed initiatives, as well as investment in research and development projects that can potentially help stimulate growth and help entrepreneurs navigate through the Valley of Death. Part A, explains the financing gap and causes of the “Valley of Death,” in section (1).

The additional sections in Part A, review the factors that equity capital providers consider prior to investing in a high growth company, as follows: Section (2) discusses uncertainty, risk and information asymmetry; Section (3) explains the effects of knowledge spillovers, why private investor cannot fully reap all the benefits from investing in innovative projects and why such projects are especially beneficial to

society; Section (4) explains the difficulty of putting a price tag on the intangible assets of the entrepreneurial firm; and Section (5) describes the difficulties of getting venture capital financing due to (a) shareholder supremacy and management's emphasis on short-term results, (b) the location of the entrepreneurial firm in non-technology regions, and (c) additional factors that contribute to the financing gap.

Part B examines the following alternative financing vehicles (other than venture capital) that are available to entrepreneurs: Section (1) introduces the concept of "Angel Investors"; Section (2) explains the phenomenon of clusters of angel investors, who invest similarly to venture capitalists; Section (3) discusses the commonly used joint venture vehicle; and section (4) presents a new financing trend – the corporate venture capital.

Chapter IV presents the role of the government as a market participant. Part A discusses the public debate concerning government intervention in the market. The subsequent parts examine government intervention in the market throughout history. Part B presents the distant history of United States government intervention. Starting with the Declaration of Independence in Section (1), the Period Between 1865 and 1920 in Section (2), and a discussion of the rise of the large, vertically integrated American corporation in Section (3). Section (3) also includes two important examples, as follows: (a) the story of the Advanced Projects Research Agency (ARPA), and (b) the successful outcome of the Small Business Innovation Research (SBIR) program. Section (c) then describes the changes in the United States market from patterns of vertical corporate development (such as the example of corporations in Route 128) towards a network of

organizations (such as Silicon Valley). It also includes a discussion on the formation of regional clusters.

Part C is a review of a successful recent international government intervention as exemplified in an Israeli case study. It describes the government driven policies and initiatives, which transformed Israel to a global leader in the Internet and software industries, and are a source of inspiration for this paper's Coalition model.

Part D is a review of the recent United States history of government intervention. Section (1) surveys the recent Regional Cluster Initiatives by the United States government. Section (2) examines Startup America and additional federal initiatives that were instituted by the United States government in order to promote innovation, entrepreneurship and growth. Section (3) criticizes recent government interventions in the market.

Part E introduces the Coalition Model, which is derived from Solow's model. Solow introduced the notion that innovation stimulates growth.⁴⁹ It explains the model and the choice of the public-private-partnership form. Section (1) introduces the Incubator initiative. Section (2) introduces the Match-Maker venture capital fund initiative.

Part F is an example of how the Coalition model can be implemented in the future, by examining the Cornell NYC Tech Campus example.

Chapter V is a consideration of potential objections to the Coalition model and responses to the objections. Part A, discusses objections to the Incubator model and

⁴⁹ Robert M. Solow, *A Contribution to the Theory of Economic Growth*, 70 Q. J. ECON. 65 (1956); *See also* Robert M. Solow, *Technical Change and the Aggregate Production Function*, 39 (3) REV. ECON. & STAT. 312 (1957); *See also* Solow (1987), *supra* note 5.

subsequent cluster formation. Part B, discusses objections to government's intervention in the market in the form of government owned enterprises. Part C, is an essential aside on corporate governance theory and this section reviews the Principal-Agent, Property Rights & Team Production theories in Section (1), followed by Section (2) introducing Lynn Stout's recent work on the corporation form as a "Time Machine," and Section (3) joins the call for a return to a focus on managerialism, but with an emphasis on a stakeholder approach to strategic management.

Chapter VI will conclude.

II. THE THEORY OF ENTREPRENEURSHIP

Promoting innovation is a reliable way to drive growth⁵⁰ and must be a top United States national priority that will be turned into public policy. As noted by economist John Kao, “in tomorrow’s world, even more than today’s, innovation will be the engine of progress.”⁵¹ This paper discusses the need for encouraging entrepreneurship in order to achieve economic growth. Contemporary economists widely recognize the importance of entrepreneurship and its contribution to higher levels of economic activity.⁵² Regrettably, politicians and policy makers in the U.S. still turn to the classical and neoclassical economic theories, which do not include the entrepreneur in their analyses, and they invest according to the “flawed” Harrod-Domar⁵³ model, which was developed in order to explain the business cycle and was later on implemented as an economic growth

⁵⁰ Solow (1987), *supra* note 5.

⁵¹ See Kao, *supra* note 1, at 3 (“[I]n tomorrow’s world, even more than today’s innovation will be the engine of progress. So unless we move to rectify this dismal situation, the United States cannot hope to remain a leader. What’s in stake is nothing less than the future prosperity and security of our nation.”).

⁵² See Van Stel (2006), *supra* note 9 (“It is currently embedded in the current European policy approach that the creativity and independence of entrepreneurs contribute to higher levels of economic activity.”); See also Audretsch, *supra* note 9, at 5 (“Entrepreneurship has become the engine of economic and social development throughout the world. The role of entrepreneurship has changed dramatically between the traditional and new economies”); See also Pozen, *supra* note 9 (“A vast crop of empirical studies have attempted to analyze the relationship between entrepreneurial activities, government policies relevant thereto, and economic performance, generally corroborating the commonsense insight that entrepreneurship can facilitate growth”).

⁵³ Will be explained below.

model, in order to “stimulate” the economy.⁵⁴ According to economist William Easterly, "Domar's growth model was not intended as a growth model, made no sense as a growth model, and was repudiated as a growth model over forty years ago by its creator. So it was ironic that Domar's growth model became, and continues to be today, the most widely applied growth model in economic history."⁵⁵

This paper examines the conceptual theories of entrepreneurship with a goal of education policy makers regarding assumptions and dynamics of entrepreneurship and their impact on economic growth. Comprehension of these concepts will hopefully lead to a sweeping transformation in philosophy and, moreover, to the execution of relevant policy actions, such as those outlined in the Coalition model, to be further discussed in this paper.

A. Meaning of Entrepreneurship

Entrepreneurship, frequently coupled with the term innovation, is a concept that is widely used in academic theory, research and popular media. Many institutions of higher education are now offering programs on entrepreneurship. Various governments⁵⁶ and regulators are trying to devise ways to encourage entrepreneurial behavior.

Entrepreneurial methods are progressively being applied in both not-for-profit and for-profit organizations in order to create social and environmental value. Various

⁵⁴ See WILLIAM EASTERLY, *THE ELUSIVE QUEST FOR GROWTH* 28 (The MIT Press 2001) ("Domar's growth model was not intended as a growth model, made no sense as a growth model, and was repudiated as a growth model over forty years ago by its creator. So it was ironic that Domar's growth model became, and continues to be today, the most widely applied growth model in economic history.").

⁵⁵ *Id.*

⁵⁶ See also Jumpstart Our Business Startups Act, Pub. L. No. 112-106, 126 Stat. 306 (2012).

economic institutions, from regional to national and international bodies around the world, are encouraging entrepreneurship as a central policy goal.⁵⁷ In December 2012, the United Nations (“UN”) passed its “Entrepreneurship for Development” resolution, recognizing “that entrepreneurship should be a major tool in reducing poverty, creating sustainable development, and reinvigorating the environment.”⁵⁸ The UN’s declaration resonates with the latest work by management scholars on the principle of shared value,⁵⁹ suggesting that social and economic value can, and must be, considered as synergistic and harmonious rather than exclusive of one another.⁶⁰

1. Problem of Defining Entrepreneurship

There is no single agreed definition for the word “entrepreneur” in the literature.⁶¹ It is also unclear whether self-employment and ownership of a small firm,⁶² or self-

⁵⁷ See Amir N. Licht, *Conference: Entrepreneurship: Law, Culture, and the Labor Market: Culture, Society and Entrepreneurship: The Entrepreneurial Spirit and What the Law Can Do About It*, 28 COMP. LAB. L. & POL’Y J. 817 (2007).

⁵⁸ See Press Release, Israel Project, United Nations Passes Israeli Development Resolution Focusing On Entrepreneurship, Innovation News (December 7, 2012), *available at* <http://www.theisraelproject.org/site/apps/nlnet/content2.aspx?c=ewJXKcOUJIIaG&b=8018907&ct=12527075¬oc=1>.

⁵⁹ See Porter & Kramer, *supra* note 6 (“[T]he concept of shared value, . . . , recognizes that societal needs, not just conventional economic needs, define markets. It also recognizes that social harms or weaknesses frequently create internal costs for firms—such as wasted energy or raw materials, costly accidents, and the need for remedial training to compensate for inadequacies in education. And addressing societal harms and constraints does not necessarily raise costs for firms, because they can innovate through using new technologies, operating methods, and management approaches—and as a result, increase their productivity and expand their markets. Shared value, then, is not about personal values. Nor is it about “sharing” the value already created by firms—a redistribution approach. Instead, it is about expanding the total pool of economic and social value.”).

⁶⁰ See Porter & Kramer, *supra* note 6; See also, Licht, *supra* note 57, at 818 (noting that the empirical literature on entrepreneurship and its enhancement of economic growth is very small. That has changed to some degree thanks to the Global Entrepreneurship Monitor (GEM) project. According to Licht, “[S]tudies using the GEM data find that entrepreneurship may be conducive to economic growth, although the relations may not be monotonic.”).

⁶¹ See Licht, *supra* note 57, at 820; See Dan Johanson, *Economics without Entrepreneurship or Institutions: A Vocabulary Analysis of Graduate Textbooks*, 1 (3) ECON J. WATCH 515, 517 (2004) (“[T]here is no universally accepted definition of the entrepreneur or the entrepreneurial function.”); See

employment by itself is sufficient to describe an entrepreneur, or whether innovation is a necessary element to describe entrepreneurship.⁶³

There are many categories of entrepreneurs, from “social entrepreneurs,”⁶⁴ “policy entrepreneurs,”⁶⁵ “norm entrepreneurs,”⁶⁶ “moral entrepreneurs,”⁶⁷ as well as “capitalist entrepreneurs.”⁶⁸ This paper tries to authenticate the intellectual origin and

also Erik Hurst & Benjamin Wild Pugsley, *What Do Small Businesses Do?*, Brookings Papers on Economic Activity, 43 BROOKINGS INST. 73 (2011), available at http://www.brookings.edu/~media/files/programs/es/bpea/2011_fall_bpea_papers/2011_fall_bpea_conference_hurst.pdf (discussing the economic theory that generally deems “entrepreneurs as individuals who (1) innovate and render aging technologies obsolete (Schumpeter, 1942), (2) take economic risks (Knight (1921); Kihlstrom and Laffont (1979); Kanbur (1979), and Jovanovic (1979)), or (3) are considered jacks-of-all-trades in the sense that they have a broad skill set (Lazear, 2005). Policy makers often consider entrepreneurs to be job creators or the engines of economic growth.”); See also MERRIAM-WEBSTER’S COLLEGIATE DICTIONARY (2014) available at <http://www.merriam-webster.com/dictionary/entrepreneur> (defining entrepreneur as “one who organizes, manages, and assumes the risks of a business or enterprise.”); THE NEW OXFORD AMERICAN DICTIONARY (2014) available at http://www.oxforddictionaries.com/us/definition/american_english/entrepreneur (defining entrepreneur as “A person who organizes and operates a business or businesses, taking on greater than normal financial risks in order to do so.”).

⁶² See R. H. Coase, *The Nature of the Firm*, 4 ECONOMIA 386 (1937) (It should be noted that Coase developed a definition for the concept “firm.”); See Charles R. T. O’Kelley, *Coase, Knight, and the Nexus-of-Contracts Theory of the Firm: A Reflection on Reification, Reality, and the Corporation as Entrepreneur Surrogate*, 35 SEATTLE UNIV. L. R. 1247, 1250 (2012) (“[C]oase ... saw the firm as having an “inside” and an “outside” and a distinct central actor – the entrepreneur. ... Coase looked inside the firm and identified the entrepreneur as the central economic actor; it was the entrepreneur who consciously allocated resources within the firm by command.”).

⁶³ See also Licht, *supra* note 57.

⁶⁴ Pozen, *supra* note 9, at 283 (“social entrepreneurs” are “people who tackle civic problems through innovative methods.”).

⁶⁵ *Id.* (“policy entrepreneurs” are “those who promote new forms of legislation or government action.”).

⁶⁶ *Id.* (“norm entrepreneurs” are “those who seek to change the way society thinks or feels about an issue.”).

⁶⁷ *Id.* (“moral entrepreneurs” are “those who try to alter the boundaries of altruism or deviance.”).

⁶⁸ *Id.* (“capitalist entrepreneurs” are those “starting for-profit ventures and transforming economic markets as usual. Capital entrepreneurship no longer ends at the founding, though: once those ventures become settled concerns, employees may become “intrapreneurs” by pioneering an initiative or subsidiary within the existing corporate structure.”).

history of the concept “entrepreneur” over the past few decades while focusing on the “capitalist entrepreneur.”⁶⁹

Several authors have likened entrepreneurs to “capitalist cowboys”,⁷⁰ who respond instinctively and autonomously to the signals of the marketplace without regard for intervention (or interference) from the government. Ironically, there is a relationship between the term “entrepreneur” and government employment, association or collaboration.⁷¹ For example, according to the economist Suzanne Scotchmer, the first inventor and entrepreneur to be recognized in history was Imhotep, a government employee who invented the pyramids.⁷²

In order to propose a definition for the term “capitalist entrepreneur”, this paper will briefly describe the role played by the individual entrepreneur in the history of economic theory, beginning with the traditional “free market” ideology.⁷³ Classical and

⁶⁹ *Id.* at 284 (capitalist entrepreneurship has played a central role in work of Austrian, Schumpeterian, and institutionalist schools of economic theory, and according to Pozen, was ignored by the classical and neoclassical economists).

⁷⁰ Lerner (Boulevard of Broken Dreams), *supra* note 38.

⁷¹ See ROBERT F. HÉBERT & ALBERT N. LINK, A HISTORY OF ENTREPRENEURSHIP 9-10 (Routledge 2009) (the term “entrepreneur” was defined as “one who undertakes a project, a manufacturer, a master builder,” and was verified by the Savary’s Dictionnaire Universel de Commerce (1723). Moreover, we can even find an earlier version of the term – entrepreneur – that appears as early as the fourteenth century (Hoselitz 1960)).

⁷² See Scotchmer, *supra* note 38, at 4 (“The first known inventor was a “government employee”, Imhotep, who lived in Egypt about 2650 BC. He built the first pyramid, and was probably a Da Vinci-like genius, who serves as a priest, scholar, sculptor, carpenter, poet, and doctor. Greek and Roman writers continued to revere him, albeit as an exaggerated, wizard-like figure, well into the Christian era. Imhotep’s innovations were steadily eclipsed by later pyramid builders, all “government employees.”).

⁷³ Charles R.T. O’Kelley, *The Entrepreneur and the Theory of the Modern Corporation*, 31 (3) J. CORP. L. 753, 757 (2006).

neo-classical theories⁷⁴ support an economic and political structure that gives strong private property legal rights to the entrepreneur (and her “wealth and power”⁷⁵). According to these theories the entrepreneur can control her business assets, and, in so doing, they also put strict limitations on the power of government to control or regulate the economic activity.⁷⁶

Surprisingly, a review of the research found that classical and neoclassical economists have not assigned significance to the entrepreneur in their market models.⁷⁷ Conversely, contemporary economists, such as Baumol,⁷⁸ do not deny the importance of the entrepreneur. Baumol recognizes how important entrepreneurs are “for the workings

⁷⁴ These theories started in 1776 with the work of ADAM SMITH, *THE WEALTH OF NATIONS* (1776) and continued for almost 200 years after; *See also* O’Kelley, *supra* note 73, at 756 (“economists working in the tradition of Adam Smith (unlike corporation law scholars) continued to give the entrepreneur a central piece in their study of capitalism long after the birth of the New Deal.”).

⁷⁵ *See* O’Kelley, *supra* note 73, at 757 (according to O’Kelley, the political and economic system is “supportive of the individual entrepreneur’s wealth and power”. Additionally, it should be noted that one of the by products of this philosophy is “the perfect competition model- shows how, in a perfectly competitive free market economy, the maximizing behavior of individual producers and consumers, guided solely by price signals, would result in the best possible allocation of economic resources.”); *See also* Harold Demsetz, *The Theory of the Firm Revisited*, 142 (1) J L. Econ.& Org. 141-161 (1988).

⁷⁶ *See* O’Kelley, *supra* note 73; *See also* Demsetz, *supra* note 75.

⁷⁷ *See* Pozen, *supra* note 9, at 288-89 (commenting on Adam Smith’s work, finding that Smith (including economist David Ricardo) does not pay special tribute to the entrepreneur and moreover, that the entrepreneur is “largely absent” from his work “- he never uses the term – who elided the distinction between the creators of businesses and owners of businesses and whose depiction of an “invisible hand” leading to market equilibrium drew attention away from the entrepreneur’s self-consciously generative role.” In the same manner, if we turn to the neoclassical economists (for instance, Alfred Marshall & A.C. Pigou, and the mid-to-late twentieth century economists Milton Friedman and George Stigler), we will find that they undervalue entrepreneurship in their models (they “tended to trivialize entrepreneurship in their formal models of a steady-state economy”). Pozen further states “it remains deeply ironic that the academic discipline most focused on the capitalist process has so marginalized the entrepreneur, while lawyers, sociologists, and political scientists cannot stop talking about her.”).

⁷⁸ William J. Baumol, *Return of the Invisible Men: The Microeconomic Value Theory of Inventors and Entrepreneurs*, Allied Social Science Associations Conference (Jan. 7, 2006), available at https://www.aeaweb.org/assa/2006/0107_1015_0301.pdf.

of the free-market economy in general and for its growth and innovation in particular”⁷⁹ and has joined the call⁸⁰ for the restoration of the entrepreneurs’ place in the economic theory.⁸¹

⁷⁹ *Id.*

⁸⁰ For current endeavors to introduce the entrepreneur to the classical framework, see MARK CASSON, *THE ENTREPRENEUR: AN ECONOMIC THEORY* (1982) (A theory of the entrepreneur is needed to explain firm success or failure, firm creation and growth, economic growth and development, and income distribution. The entrepreneur is significant historically because, although he is atypical, he has altered the course of history. The essence of a theory of the entrepreneur should be both the rationalization of success and explanation of failure. A theory of the function of the entrepreneur will have an important role in a theory of economic dynamics, the competitive process, and trade cycles.), and Milo Bianchi & Magnus Henrekson, *Is Neoclassical Economics Still Entrepreneurless?*, 58 *KYKLOS* 353 (2005), available at <http://swopec.hhs.se/hastef/papers/hastef0584.pdf> (“We review and evaluate some recent contributions on modeling entrepreneurship within a neoclassical framework, analyzing how and to what extent the fundamental ingredients suggested in the social science literature were captured. We show how these approaches are important in stressing the main elements of a complex picture without being able to fully describe it. Each modeling attempt focuses only on one specific feature of entrepreneurship, and the entrepreneurial function broadly perceived eludes analytical tractability. As a consequence, the models can be useful in analyzing the effect of entrepreneurial behavior at an aggregate level, but not at explaining individual choices. From these observations we highlight how a simplistic interpretation of the existing mainstream approaches incorporating entrepreneurship runs the risk of leading to distortionary policy interventions.”); Ying Lowrey, *The Entrepreneur and Entrepreneurship: A Neoclassical Approach* (Jan. 5, 2003) (working paper)(U.S. Small Bus. Admin) available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=744785 (“This paper attempts to introduce the entrepreneur as the “economic man” into a neoclassical framework and to indicate the role of government in fostering entrepreneurship. The entrepreneur is assumed to behave as if he maximizes utility including his value and desire to succeed, subject to an income constraint, of which his physical effort in subsistent production and entrepreneurial production generate this income. Entrepreneurship, specifically, is defined as an “economic system” that consists of three components: (1) entrepreneurs, who desire to achieve their goals of economic survival and advancement; (2) the social constitution, that the entrepreneur’s right of free enterprise is granted; and (3) the government, that has the ability to adjust the economic institutions that can work to protect each individual entrepreneur and to stimulate entrepreneurs’ motive to achieve toward fostering of economic development and growth.”). For a discussion of and historical review of the establishment of the firm and the notion of entity shielding, see Henry Hansmann, Reinier Kraakman & Richard Squire, *Law and the Rise of the Firm*, 119 *Harv. L. Rev.* 1333 (2006) (Hansmann, Kraakman & Squire describe the development of entity shielding in four historical epochs: ancient Rome, the Italian Middle Ages, England of the 17th-19th centuries, and the United States from the 19th century to the present).

⁸¹ Baumol, *supra* note 78, at 2-4 (“There are, actually, at least two very good reasons why the entrepreneur is virtually never mentioned in modern theory of the firm and distribution. The first, and less significant reason is summed up in what I call “Baumol’s Third Tautology: Innovation is an entirely heterogeneous output.” Production of whatever was an invention yesterday is mere repetition today. So, in an analysis of entrepreneurial activities, there are none of the homogeneous elements that lend themselves to formal mathematical description, let alone the formal optimization analysis that is the foundation of the bulk of microeconomic theory. The more critical explanation of the absence of the entrepreneur is that in mainstream economics the theory is generally composed of equilibrium models in which, structurally,

A review of the various theoretical concepts reveals that there are scholars who have written about the various aspects and interpretations of the concept “entrepreneur” from differing perspectives. Joseph Schumpeter,⁸² whose theory had the utmost influence on contemporary entrepreneurship literature, described the entrepreneur as an innovator that renders aging technologies obsolete (“the function of entrepreneurs is to reform or revolutionize the pattern of production”),⁸³ by using the process of “creative

nothing is changing. But, this excludes the entrepreneur by definition. She is absent from such a model because she does not belong there. This has been definitively argued by Joseph A. Schumpeter (1911) and Israel M. Kirzner (1979) who have demonstrated that sustained equilibrium is something that the entrepreneur does not tolerate, any more than she tolerates sustained disequilibrium. Here, Schumpeter's key insight is that the entrepreneur's occupation is the search for profitable opportunities to upset any equilibrium. That is exactly what any innovation, in the broadest sense, entails. But the rest of the story is told by Kirzner, who recounts that the entrepreneur, with his critical ability—alertness—recognizes in any disequilibrium a profitable arbitrage opportunity and, by taking advantage of that opportunity, he provides the pressures that move the economy back toward an equilibrium condition. So the job of Schumpeter's entrepreneur is to destroy all equilibria, while Kirzner's works to restore them. This is the mechanism underlying continuous industrial evolution and revolution, and it is surely not the stuff of which stationary models are built. Thus, it should hardly be surprising that a stationary Walrasian model, even in a more sophisticated variant, has no room for the entrepreneur. This is particularly evident of the standard theory of the firm, which analyzes the repetitious decisions of the enterprise that is already present and fully grown. In such a scenario, the entrepreneur has already completed his job and left for other places where his firm-creation activities can be used. Even if the creator of the firm has not departed, he has transformed his role from entrepreneur to manager, so that although he, himself, remains in place, the entrepreneur has gone. I conclude that the neoclassical theory is not wrong in excluding the entrepreneur, because it is dealing with subjects for which he is irrelevant. It would, in my view, be as indefensible to require *all* microeconomic writing to give pride of place to the entrepreneur as to exclude him universally. But that does not mean that no theory of entrepreneurial is needed. Universal exclusion condemns us to leave out of our discussions what I consider to be the most critical issues that should be examined (although not exclusively) in microeconomic terms: the determinants of innovation and growth and the means by which they can be preserved and stimulated. We have left in the hands of the economic historians what I regard as the greatest and most important mystery that economics faces: Why have the free-market economies in the past two centuries been able to outstrip, probably by more than an order of magnitude, the performance in terms of growth and innovation, of all other forms of economic organization?”).

⁸² Schumpeter's theory has had the utmost influence on the contemporary entrepreneurship literature. See JOSEPH A. SCHUMPETER, CAPITALISM, SOCIALISM, AND DEMOCRACY (2nd Ed. 1947); See also JOSEPH A. SCHUMPETER, THEORIE DER WIRTSCHAFTLICHEN ENTWICKLUNG (THEORY OF ECONOMIC DEVELOPMENT) (1911); See Audertsch (2003), *supra* note 9, at 5 (“The distinguishing feature from Schumpeter is that entrepreneurship is viewed as a disequilibrating phenomenon rather than an equilibrating force.”)

⁸³ Schumpeter (1911), *supra* note 82.

destruction.”⁸⁴ Accordingly economic growth can be achieved by endogenous innovations of chief entrepreneurs, and not through the mechanisms of the invisible hand. However, society repeatedly opposes these extreme changes and innovations that the entrepreneurs create.⁸⁵

Another influential economist, Frank Knight,⁸⁶ wrote during a similar time period as Schumpeter but approached the subject of the entrepreneur at a different angle. Knight’s leading descriptions of the classic entrepreneur describe the entrepreneur as a “responsible” manager who controls and owns her business.⁸⁷ Knight⁸⁸ highlighted the

⁸⁴ *Id.* (“Creative destruction” is a “process of industrial mutation that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one.”); Pozen, *supra* note 9, at 291 (Schumpeter’s entrepreneur forces “major structural changes across markets and industries in a process of “creative destruction” vital to sustaining a dynamic economy and long-run economic growth.”); *See also* Robert M. Solow, *Heavy Thinker*, NEW REPUBLIC (May 21, 2007), <http://www.newrepublic.com/article/heavy-thinker> (“Innovation is not the same thing as invention. Anyone can invent a new product or a new technique of production. The entrepreneur is the one who first sees its economic viability, bucks the odds, fights or worms his way into the market, and eventually wins or loses. Each win means profit for the entrepreneur and his backers, and it also means a jog upward for the whole economy. In the course of this process, which cannot possibly run smoothly, many businesses, individuals, and institutions, themselves founded on earlier successful innovations, will be undermined and swept away. Schumpeter called this birth-and-death process “creative destruction,” and realized before anyone else that it was the mainsource of economic growth. There is no feasible alternative for capitalism; this is capitalism. Here is a characteristically strong statement: “Without innovations, no entrepreneurs; without entrepreneurial achievement, no capitalist returns and no capitalist propulsion. The atmosphere of industrial revolutions—of ‘progress’—is the only one in which capitalism can survive.”).

⁸⁵ *See* Solow (2007), *supra* note 84 (“Schumpeter’s main legacy to economics: [is] the role of technological and organizational innovation in driving and shaping the growth trajectory of capitalist economies. Whole subfields of economics now pursue the subject of the care, feeding, and consequences of innovation, using qualitative and quantitative, historical and mathematical methods.”); *See also* Pozen, *supra* note 9, at 291 (“[L]ike Marx, Schumpeter thought capitalism unlikely to survive”.); *See also* Audretsch (2003), *supra* note 9 (“[E]ven in his 1942 classic, *Capitalism and Democracy*, Schumpeter (p. 13) still argued that entrenched large corporations tend to resist change, forcing entrepreneurs to start new firms in order to pursue innovative activity: ‘The function of entrepreneurs is to reform or revolutionize the pattern of production by exploiting an invention, or more generally, an untried technological possibility for producing a new commodity or producing an old one in a new way...To undertake such new things is difficult and constitutes a distinct economic function, first because they lie outside of the routine tasks which everybody understand, and secondly, because the environment resists in many ways.’”).

⁸⁶ FRANK H. KNIGHT, RISK, UNCERTAINTY, AND PROFIT (1921).

⁸⁷ O’Kelley (2012), *supra* note 62, at 760 (“as early as 1916, Frank Knight understood that ‘[t]he typical form of business unit in the modern world is the corporation. Its most important characteristic is the

entrepreneur's role as a manager, creator and a bearer of risk, whereas Schumpeter essentially excluded the duties of ownership and the assumption of risk from his description of entrepreneurship.⁸⁹

It therefore becomes very difficult to come up with a clear definition of "entrepreneurship." There are multiple reasons for this difficulty, such as whether the concept has to signal that there is "commercialization" "innovation" or some degree of "change"⁹⁰ involved, and if so, what kind of change? Change to an individual, an

combination of diffused ownership with concentrated control.' Knight argued that the separation of ownership and control in the modern corporation did not mean that responsibility has been holly separated from control.").

⁸⁸ Knight continued after Cantillon's work; *See also* Pozen, *supra* note 9, at 291-92 ("Knight famously distinguished between risk, which is related to recurring events and is insurable, and uncertainty, which derives from unique events and cannot, Knight claimed, be estimated with any precision. In an economy riven with uncertainty, that is, entrepreneurs must address "the primary problem or function [of] deciding what to do and how to do it." Entrepreneurship, for Knight, was a kind of profession and public service as well as a disposition and a skill set.").

⁸⁹ *See* Pozen, *supra* note 9, at 291-92 ("Knight famously distinguished between risk, which is related to recurring events and is insurable"); *See* Knight, *supra* note 86, at 291-312; *See* O'Kelley (2012), *supra* note 62, at 760 (O'Kelley interpreted Knight's work to mean that "a reasonable approximation of the classical entrepreneur will be found in control of the typical modern corporation." However, Knight's view did not predominate. According to O'Kelley, "[T]he ascendancy of the large corporation, the horror of the First World War (coming after nearly a century free from widespread warfare), and the communist in Russia, all played a role in shaping popular sentiment."); *See also* ERIC HOBSEW, AGE OF EXTREMES: THE SHORT TWENTIETH CENTURY, 1914-1991, 6-8, 54-8, 73-4 (1994) (According to Hobsawm, "The decades from the outbreak of the First World War to the aftermath of the Second was an Age of Catastrophe for this society. For forty years it stumbled from one calamity to another. It was shaken by two waves of global rebellion and revolution, which brought to power a system to be historically predestined alternative to bourgeois and capitalist society, first over one sixth of the world's land surface, and after the Second World War over one third of the globe's population."); *See also* ADOLF F. BERLE & GARDINER MEANS, THE MODERN CORPORATION AND PRIVATE PROPERTY 117 (1932) (Berle and Means claimed that with the quasi-public corporation, individuals (such as the entrepreneur) are no longer in control. Rather, "there are no dominant owners, and control is maintained largely apart from ownership.").

⁹⁰ *See* Audertsch (2003), *supra* note 9, at 3 ("What may be perceived as change to an individual or enterprise may not involve any new practice for the industry. Or, it may represent change for the domestic industry, but not for the global industry. Thus, the concept of entrepreneurship is embedded in the local context. At the same time, the value of entrepreneurship is likely to be shaped by the relevant benchmark. Entrepreneurial activity that is new to the individual but not the firm or industry may be of limited value. Entrepreneurial activity that is new to the region or country may be significant but ultimately limited. By contrast, it is entrepreneurial activity that is new across all 9 organizational forms, all the way up to the global, that carries the greatest potential value." Audertsch maintains that "Part of the complexity involved

enterprise, an industry (global or local or regional) or new practice? According to the Kauffman Foundation definition, entrepreneurship enables the conversion of an innovation into a sustainable enterprise, which produces value.⁹¹

2. Proposed Definitions

The term “entrepreneurship” will be one that is associated with invention, but most importantly innovation⁹² (that entails business risk and uncertainty⁹³). For the

with entrepreneurship is that it involves all of these types of organizational forms. No single organizational form can claim a monopoly on entrepreneurship.”).

⁹¹ ENTREPRENEURSHIP IN AMERICAN HIGHER EDUCATION, KAUFMAN (2008), *available at* http://www.kauffman.org/~media/kauffman_org/research%20reports%20and%20covers/2008/07/entrep_high_ed_report.pdf.

⁹² I am building on Schumpeter’s theory. The entrepreneur in my definition also forces structural changes across industries and markets in a process of “creative destruction” and is therefore essential to supporting a vigorous economy and long-run economic growth.

⁹³ To my surprise, during the research review, I found that until the end of the twelfth century, risk-bearing and capital prerequisites were not associated with “entrepreneurship”, even though they are often identified with it today. *See* Hébert & Link, *supra* note 71, at 9-10 (“[A]s capitalism began to supplant feudalism, a clearer distinction emerged between the one who performed artistic and technical functions and the one who undertook the commercial aspect of a great task.” According to Hébert and Link, the first writer to use the term, entrepreneur, with specific economic substance was Richard Cantillon (See RICHARD CANTILLON, *ESSAI SUR LA NATURE DU COMMERCE GENERAL* 388 (Henry Higgs ed. & trans., Franck Cass & Co. Ltd. 1959) (1755).) Adam Smith and John Stuart Mill followed Cantillon and introduced the concept to the English language. Additionally, according to Hebert & Link, Abbe Nicholas Baudeau added being an innovator to the characteristics of being an entrepreneur. According to Baudeau, an “entrepreneur” is the “one who invents and applies new techniques or ideas in order to reduce his costs and thereby raise his profit.” Furthermore, according to Herbert & Link, the aspects of invention and innovation “anticipate the twentieth-century reformulation of entrepreneurship by Schumpeter, whose theory “creative destruction” dominates contemporary discussions of this subject.”); *See* Licht, *supra* note 57, at 820 (“[P]rominent economists from the eighteenth and nineteenth centuries have recognized the pivotal role of entrepreneurship in the economy as the source of change, development and progress.”); *See also* Robert L. Formaini, *The Engine of Capitalist Process: Entrepreneurs in Economic Theory*, Q IV ECON. & FIN. REV. 2 (Oct. 2001), at 2, *available at* <http://www.dallasfed.org/assets/documents/research/efr/2001/efr0104a.pdf> (“[M]ost historians of economic thought date the genesis of modern economic theory to the early eighteenth century in France, where a group of thinkers called the Physiocrats emerged. The most famous among them was Richard Cantillon (1680 –1734), whose 1755 work *Essai sur la nature du commerce en general* (written between 1730 and 1734) first introduced the concept of the entrepreneur into economic analysis (Spengler 1960”); *See also*, Pozen, *supra* note 9, at 287 (“Cantillon divided economic actors into two broad camps, those who receive assured incomes and those who do not. The latter, Cantillon explained are the entrepreneurs, and he gave as an example the merchants who bought goods from country farmers at a fixed price to sell to city dwellers at a price that could not be known in advance.”); *See also* Licht, *supra* note 57, at 822 (noting that Hebert & Link found several premises of an “entrepreneur” in the literature,

purposes of this paper, “capitalist entrepreneurship” can be described as the process of discovering and advancing novel opportunities, methodologies, products or services for a firm, region or industry, and – most notably – generating value and economic growth.⁹⁴ An “entrepreneurial firm” is “any entity, new or existing, that provides a new product or service or that develops and uses new methods to produce or deliver existing goods and services at lower cost.”⁹⁵

This paper will examine high-growth firms and the policies that enhance them. This choice is not intended to diminish the importance or relevance of efforts to boost microenterprises. Using these definitions and applying the aforementioned concepts and theories of entrepreneurship, this paper will demonstrate how entrepreneurship plays a key role in economic growth – beginning with Solow’s economic growth theory and

such as a person who: (1) is a supplier of financial capital; (2) assumes the risk associated with uncertainty; (3) an innovator; (4) an industrial leader; (5) a decision maker; (6) a manager or superintendent; (7) an owner of an enterprise; (8) a coordinator and organizer of economic resources; (9) a contractor; (10) an employer of factors of production; (11) an allocator of resources among alternative uses; and, (12) an arbitrageur. Perhaps this sheds a light on the reason we mention the term “entrepreneur” with the two other facets of entrepreneurship – invention and innovation.); *See also* Knight, *supra* note 86 (according to Knight, who introduced the distinction between uncertainty and risk, entrepreneurs are willing to bear uncertainty, which is not insurable); *See also* Licht, *supra* note 57 at 823.

⁹⁴ I put emphasis on the generation of new resources (products or processes). This element of generating new resources was advanced by economist Jean-Baptiste Say who described the entrepreneur as a “master-agent” that “requires a combination of moral qualities, that are not often found together,” such as “[j]udgment, perseverance, and a knowledge of the world as well as of business.” *See* JEAN-BAPTISTE SAY, A TREATISE ON POLITICAL ECONOMY, OR THE PRODUCTION, DISTRIBUTION, AND CONSUMPTION OF WEALTH 329 (C.R. Prinsep trans., Sentry Press 1964) (1803); *See also* Pozen, *supra* note 9, at 288 (“Say’s work was instrumental in identifying the entrepreneur as both a maker of markets and a creator of economic value, and in painting a picture of the entrepreneur as a rare, exceptionally talented and motivated individual.” Say was “the one most often credited with elevating the concept to prominence in economic theory.” Thanks to Say’s work, according to Pozen, entrepreneurship now “involves not only the relocation of existing economic resources but also the generation of new resources; it is a positive-sum, not a zero-sum, game.”).

⁹⁵ *See* Kauffman Report, *supra* note 91; *See also* WILLIAM J. BAUMOL, ROBERT E. LITAN & CARL J. SCHRAMM, GOOD CAPITALISM, BAD CAPITALISM, AND THE ECONOMICS OF GROWTH AND PROSPERITY 3 (Yale University Press, 2007).

empirical studies that have attempted to connect between government policies, entrepreneurial activities and economic performance, in order to establish that entrepreneurship can facilitate growth.

B. Entrepreneurship & Innovation as Drivers of Economic Growth

As noted previously in this paper, advocates of laissez-faire capitalism argue that the government has no role in promoting entrepreneurship. Even in Silicon Valley, which was established with direct government intervention (as will be discussed below), the businessman and commentator T.J. Rogers⁹⁶ stated, “Government can do only two things here: take our money, limiting our economic resources; or pass laws, limiting our other freedoms.”⁹⁷

The purpose of this chapter is to show that government does have a role in promoting innovation and entrepreneurship, building on the following important foundations: that innovation drives growth and that new entrepreneurial firms stimulate innovation and growth.

1. Innovation as a Driver of Economic Growth

This paper proposes a Coalition model, largely based on Solow’s work, with the hopes that this model will stimulate technological innovation. It assumes that technological innovation is the only reliable engine that can drive change and the fundamental source of sustained productivity and growth.⁹⁸ The hope is that U.S.

⁹⁶ Thurman John "T. J." Rodgers is the founder and chief executive officer of Cypress Semiconductor.

⁹⁷ T.J. Rogers, *Why Silicon Valley Should Not Normalize Relations with Washington D.C.*, CATO INTSITUTE (2000) available at <http://object.cato.org/sites/cato.org/files/pubs/pdf/silvalley.pdf>.

⁹⁸ See Solow (1987), *supra* note 5.

policymakers will start implementing Solow's growth theory model and will institute sweeping innovation policies that will embrace new approaches to management, technologies and operating methods.

Economists have recognized that innovation is vital to economic growth since the 1950s.⁹⁹ The pioneering work of economist Moses Abramowitz established the relationship between innovation and increases in economic growth. Abramowitz evaluated the growth in output (i.e., the amount of services and goods produced), followed by calculating the increase in inputs (i.e., factors of production, Abramowitz especially evaluated the capital and labor factors), of the American economy between 1870 and 1950.¹⁰⁰ He realized that the growth of production (outputs) could not be explained through the growth of the factors of production (inputs), such as labor and capital.¹⁰¹ His main discovery was that the surge in economic activity, during the period between 1870 and 1950, was a result of innovations - by getting more things out of corresponding factors of production (inputs).¹⁰²

⁹⁹ See Lerner (Boulevard of Broken Dreams), *supra* note 38, at 43 (The advancements of the business and technology sectors that stem from innovation have improved our daily lives tremendously. For examples, when comparing modern life to past generations, today, it is very easy to travel internationally, long-distance communications is cheap and fast, the load of household chores has significantly decreased, and advancement in medical procedures as well as medications may provide a cure to once fatal illnesses.).

¹⁰⁰ Moses Abramowitz, *Resource and Output Trends in the United States Since 1870*, 46 (2) AM. ECON. REV. 5 (1956); See also Lerner (Boulevard of Broken Dreams), *supra* note 38, at 43.

¹⁰¹ See Lerner (Boulevard of Broken Dreams), *supra* note 38, at 43.

¹⁰² See *id.*; See Abramowitz, *supra* note 100 ("between the decade 1869-78 and the decade 1944-53, net national product per capita inconstant prices approximately quadrupled, while population more than tripled. The source of the great increase in net product per head was not mainly an increase in labor input per head, not even an increase in capital per head, as these resource elements are conventionally conceived and measured. Its source must be sought principally in the complex of little understood forces which caused productivity, that is, output per unit of utilized resources, to rise.").

Following the footsteps of Abramowitz, economists in the late 1950s and 1960s, carried out similar studies.¹⁰³ The most prominent of them is Robert Solow, who won the Noble Prize for his work on economic growth theory.¹⁰⁴

C. From the post-Keynesian (Harrod-Domar) to the Neoclassical (Solow)

Economic Growth Model

Solow was able to develop a theory that proves that technological change is the only source of sustained growth by illustrating how technological progress stimulates and increases the supply of labor, thus preventing the decline of marginal returns to capital and keeping the capital-labor ration going.¹⁰⁵ As Solow stated, “Technological progress, very broadly defined to include improvements in the human factor, was necessary to allow long-run growth in real wages and the standard of living. Since an aggregate production function was already part of the model, it was natural to think of estimating it from long-run time series for a real economy. That plus a few standard parameters - like saving rate and population growth - would make the model operational.”¹⁰⁶

¹⁰³ See Lerner (Boulevard of Broken Dreams), *supra* note 38, at 44 (“These studies differed in methodologies, economic sectors and time periods, but the results were similar.”).

¹⁰⁴ See Solow (1956), *supra* note 49; See also Solow (1957), *supra* note 49.

¹⁰⁵ See Margalioth, *supra* note 8 (Solow proved that “as capital per worker increases, the marginal productivity of capital declines until the capital-labor ratio approaches a steady-state level. At that point, savings are just sufficient to replace worn out machines and equip new workers (assuming population growth), so productivity growth is zero.”).

¹⁰⁶ See Solow (1987), *supra* note 5 (he “wanted to make sure that the model could accommodate the likelihood that new technology can only be introduced with the use of newly designed and produced capital equipment, that factor proportions might be variable only at the instant of gross investment and not after capital equipment had taken some particular form, and that enough flexibility could be achieved with discrete activities, even with only one activity so long as the length of life of capital goods could be chosen economically.”).

Solow's model was groundbreaking because economists in the previous 200 years had been composing models "in which economic growth was treated as if it was primarily a matter of adding more inputs: if you just add more people and dollars, more output would invariably result."¹⁰⁷

One model still widely used today is the Harrod-Domar model. The Harrod-Domar model was originally fashioned with the purpose of analyzing the business cycle ("boom-bust" cycle). The business cycle refers to levels (upward or downward) of economic activity (fluctuations) in aggregate production, activity or trade and over a long-term period (years or months) in a market economy. The model was later adapted to explain economic growth.¹⁰⁸ According to the model, growth primarily depends on the quantity of factors of production (inputs), such as labor and capital. More investment leads to more capital, which generates economic growth. The model implies that by increasing investment (in machines and buildings for example), it will lead to more capital, which will stimulate the economy and drive growth.¹⁰⁹

¹⁰⁷ See Lerner (Boulevard of Broken Dreams), *supra* note 38, at 44.

¹⁰⁸ See Easterly, *supra* note 54, at 28 ("Domar's growth model was not intended as a growth model, made no sense as a growth model, and was repudiated as a growth model over forty years ago by its creator. So it was ironic that Domar's growth model became, and continues to be today, the most widely applied growth model in economic history.").

¹⁰⁹ See Roy F. Harrod, *An Essay in Dynamic Theory*, 49 ECON. J. 14 (1939); See Solow (1987), *supra* note 5; See also Evsey D. Domar, *Capital Expansion, Rate of Growth, and Employment*, 14 ECONOMETRICA 137 (1946) (According to Solow, the Harrod-Domar theory is based on the following: "the national saving rate (the fraction of income saved) has to be equal to the product of the capital-output ratio and the rate of growth of the (effective) labor force. Then and only then could the economy keep its stock of plant and equipment in balance with its supply of labor, so that steady growth could go on without the appearance of labor shortage on one side or labor surplus and growing unemployment on the other side." Solow further notes that, "keep in mind that Harrod's first Essay was published in 1939 and Domar's first article in 1946. Growth theory, like much else in macroeconomics, was a product of the depression of the 1930s and of the war that finally ended it. So was I. Nevertheless it seemed to me that the story told by these models felt wrong. An expedition from Mars arriving on Earth having read this literature would have expected to find only the wreckage of a capitalism that had shaken itself to pieces long ago. Economic history was indeed a

The Harrod-Domar growth theory can be characterized as a post-Keynesian model, and was challenged and refuted in 1956 by Nobel Laureate Robert M. Solow.¹¹⁰ The Harrod-Domar model is anecdotal to the period in which it was developed. It was a direct consequence of the Wall Street Crash of 1929 and the 1930s Great Depression and a product of the Second World War that finally ended it.¹¹¹ Solow began developing his model as he felt that something in the Harrod-Domar model as a growth theory was wrong.¹¹²

The Harrod-Domar model is designed to explain the business cycle. However, when the model is used as a growth model, it cannot explain or encourage growth because it uses metrics of measuring mere factors of investment. Solow rebutted the model stating that the “marginal productivity of capital actually declines as capital per worker increases, until the capital-labor ratio approaches a steady-state level. At that point, savings are just sufficient to replace worn out machines and equip new workers (assuming population growth), so productivity growth is zero.”¹¹³

Unfortunately, the Harrod-Domar growth model is still widely used inside and outside the US, by politicians and policy makers, who use aid-financed investment, to

record of fluctuations as well as of growth, but most business cycles seemed to be self-limiting. Sustained, though disturbed, growth was not a rarity.”).

¹¹⁰ See Solow (1956), *supra* note 49; See also Solow (1957), *supra* note 49.

¹¹¹ See Solow (1987), *supra* note 5.

¹¹² *Id.* (“[A]n expedition from Mars arriving on Earth having read this literature would have expected to find only the wreckage of a capitalism that had shaken itself to pieces long ago. Economic history was indeed a record of fluctuations as well as of growth, but most business cycles seemed to be self-limiting. Sustained, though disturbed, growth was not a rarity.”).

¹¹³ *Id.*

build roads, dams and other infrastructure projects, in order to drive economic growth.¹¹⁴

It is important to understand that “Domar’s growth model was not intended as a growth model, made no sense as a growth model, and was repudiated as a growth model over forty years ago by its creator. So it is ironic that Domar's growth model became, and continues to be today, the most widely applied growth model in economic history.”¹¹⁵

The ways in which we understand the fundamental elements of growth theory have changed from the Harrod-Domar growth model to the Solow growth model, which established that technological innovation is the cause of productivity and growth (the economics of ideas¹¹⁶). Exploration of new growth theory models is important to illustrate why there is a need for government intervention and why private markets are not enough to drive entrepreneurship and innovation.

1. New Theories Linking Entrepreneurship & Economic Growth

There are new economic growth theories that are built on Solow’s work and indicate that entrepreneurship will generate and stimulate economic growth.¹¹⁷ The new

¹¹⁴ See, e.g., Margalioth, *supra* note 8 (“More than a trillion dollars has been given to developing countries on the basis of a flawed theory known as the “financing gap,” founded on the Harrod-Domar model.”).

¹¹⁵ See also Easterly, *supra* note 54 (“Domar’s growth model was not intended as a growth model, made no sense as a growth model, and was repudiated as a growth model over forty years ago by its creator. So it was ironic that Domar's growth model became, and continues to be today, the most widely applied growth model in economic history.”).

¹¹⁶ See Margalioth, *supra* note 8.

¹¹⁷ Some of these theories are built on recent theories of industry evolution & efforts to model the link between market structure and R&D. They also focus on the role of firm innovative capabilities. See Margalioth, *supra* note 8, at 11 (“While traditional theories suggest that entrepreneurship will retard economic growth, these new theories suggest exactly the opposite – that entrepreneurship will stimulate and generate growth.”).

economic growth theories put a lot of emphasis on the role of new ideas and knowledge,¹¹⁸ which makes them very dynamic.¹¹⁹

The “endogenous growth”¹²⁰ theory suggests that in order to encourage economic growth, there has to be an investment in knowledge, human capital and innovation, which rely on incentives for innovators and appropriate policy measures. It focuses on spillover effects and positive externalities.

Ideas, according to these theories, are “non-rivalrous”¹²¹ in character because several people can use the ideas at the same time and commercialize on them. When one person uses an idea it does not preclude another from using the same idea (unlike using a machine).¹²² This “non-rivalry” means that the firm’s production possibilities can enhance its returns to scale; such an approach has a profound consequence for economic growth.

These new theories focus on entrepreneurship and innovation activity, which is “one of the central manifestations of change.”¹²³ Ideas (actually, the most radical ones) are intermittently implemented by entrepreneurship.¹²⁴ According to legal scholar

¹¹⁸ See Margalioth, *supra* note 8, at 11 (“Because knowledge is inherently uncertain, asymmetric and associated with high costs of transactions, divergences emerge concerning the expected value of new ideas.”).

¹¹⁹ *Id.* at 11-2 (“In the traditional theory, new knowledge plays no role; rather, static efficiency, determined largely by the ability to exhaust scale economies dictates growth.”).

¹²⁰ See Romer, *supra* note 39.

¹²¹ See also Jones, *supra* note 10.

¹²² *Id.*

¹²³ See Margalioth, *supra* note 8, at 12.

¹²⁴ *Id.*

Margaliot, “Entry, growth, survival, and the way firms and entire industries change over time are linked to innovation. The dynamic performance of regions and even entire economies is linked to how well the potential from innovation is tapped.”¹²⁵ This paper interprets the term “innovation” very broadly. To innovate means to “encompass the process by which firms master and get into practice product designs and manufacturing processes that are new to them, if not to the universe or even the nation.”¹²⁶

Entrepreneurial firms are therefore an important source, and, moreover, a vehicle for new experimentation and ideas, which would remain unused in the economy without their creation.¹²⁷ Therefore, their activities stimulate growth and commercialize on the innovations.¹²⁸

This paper highlights the importance of government intervention in the form of investment in entrepreneurial firms, for the reason that entrepreneurial firms are the agents of change. It now turns to describing the pragmatic role that the entrepreneur and entrepreneurial firms play in the innovation process, as well as the importance of entrepreneurship for innovation.

¹²⁵ *Id.*

¹²⁶ See RICHARD NELSON, NATIONAL INNOVATION SYSTEMS: A COMPARATIVE ANALYSIS (Oxford Univ. Press, 1993).

¹²⁷ See also Margalioth, *supra* note 8; See also Jones, *supra* note 10.

¹²⁸ See Margalioth, *supra* note 8 (“New ideas, in turn, allow a given bundle of inputs to produce more or better output. The reason that ideas are the engine of growth is their non-rivalrous character. The use of an idea by one person does not preclude its use by another. Physical capital, that is, machines, do not have this trait. The machine can be used by a limited number of workers and produce fixed output. Ideas, on the other hand, can be used simultaneously by an unlimited number of producers. The problem, however, is that without government intervention, people will have no incentive to innovate, because unless an idea can be made excludable, no one will want to incur the research and development costs.”).

2. New Entrepreneurial Firms Stimulate Innovation

The other foundational theory that this paper rests on is the economic hypothesis that new entrepreneurial firms are predominantly innovative.¹²⁹ In the past, economists overlooked the creative power of new firms and believed in the superiority of large established firms in driving innovation.¹³⁰ Today, however, economists and observers acknowledge the contribution of entrepreneurs and small entrepreneurial firms in driving growth and innovation.¹³¹

Entrepreneurs play a pragmatic as well dramatic role in the innovation process. By inventing, innovating, and creating new businesses, entrepreneurs stimulate the economy, introduce new products and processes, and create new industries.¹³² For example, the economist Lerner observed that small entrants and not incumbent firms are the ones that drive innovation in the Internet and biotechnology industries.¹³³ By and large, small entrepreneurial firms did not discover the Internet protocol or the key genetic

¹²⁹ See Lerner (Boulevard of Broken Dreams), *supra* note 38, at 45.

¹³⁰ *Id.* at 46 (Even, Schumpeter, the pioneer of the study of entrepreneurship, assumed “that large firms had an inherent advantage in innovation relative to smaller enterprises.” It should be noted that his assumption has failed the test of time and that “systemic studies have generated little support for his belief in the innovative advantage of large firms.”).

¹³¹ *Id.* at 45 (In many industries, such as medical devices, semiconductors, communication technologies and software, the direction is in the hands of rather young firms whose growth was largely financed by public equity markets and venture capitalists).

¹³² *Id.* at 5 (As noted earlier in this paper, Schumpeter stated that “the function of entrepreneurs is to reform or revolutionize the pattern of production by exploiting an invention, or more generally, an untried technological possibility for producing a new commodity or producing an old one in a new way.”).

¹³³ *Id.* at 46.

engineering techniques, in these industries.¹³⁴ Nor did the reputable large computer software manufacturers and drug companies.¹³⁵ To be precise, these technologies were developed with government funds at research laboratories and academic institutions.¹³⁶ Nevertheless, Lerner found that the small firms were the ones who initially seized the commercial opportunity.¹³⁷

Small entrepreneurial firms and entrepreneurs drive innovation and growth by rapidly introducing new products and processes to the market place.¹³⁸ They also play a key role in observing where new technology can meet customers' needs and by quickly acting on that information.¹³⁹

There are three relevant explanations to why entrepreneurs start new firms and why these new entrepreneurial firms are more innovative than the large incumbent established firms. First, new entrepreneurial firms are created, by entrepreneurs (economic agents), who possess the knowledge of new (radical) ideas and have an

¹³⁴ *Id.*

¹³⁵ *Id.*

¹³⁶ *Id.*

¹³⁷ *Id.* (It should be noted that even in large industries where large firms have traditionally dominated the commercialization and innovation, such as energy research, start-up firms appear to be playing an increasing role).

¹³⁸ The economists Zoltan Acs and Audertsch examined which firms developed the most important innovations of the twentieth century and found that small and new firms contributed nearly half of the innovations that they examined. They also found, that the contribution of smaller and new firms was greater in immature industries, where market power was rather unconcentrated. *See* Acs & Audertsch (1988), *supra* note 11, at 678-90 ("In an industry composed primarily of large firms, the level of innovation will be higher, though that activity will occur mostly in the smaller firms of that industry -- i.e., innovation appears to be an important competitive strategy for small firms in that environment. Results indicate that lower levels of concentration are associated with increased innovation activity. Further, as industry R&D increases, the number of innovations increases, but this increase is at a decreasing rate."); *See also* Lerner (Boulevard of Broken Dreams), *supra* note 38, at 47.

¹³⁹ *See* Acs & Audertsch (1988), *supra* note 11, at 678-90

incentive to leave their incumbent firm and start a new firm in order to try and commercialize the perceived value of their knowledge.¹⁴⁰ New start-up entrepreneurial firms recognize and take advantage of market opportunities that the managers of established firms perhaps miss or don't see,¹⁴¹ especially in emergent industries, where market power is not concentrated.¹⁴² The economist Audretsch¹⁴³ analyzes the factors that influence the rate of new firms and observes that there are industries in which small firms account for a greater percentage of the industry's innovations, in such industries, he finds that it is more likely for new startups to be formed.

Second, the Knowledge Spillover (and commercialization) theory explains the behavior of entrepreneurs in such industries. Entrepreneurs start new entrepreneurial firms because they are not able to commercialize their knowledge and new (radical) ideas

¹⁴⁰ See Margalioth, *supra* note 8, at 11 ("Why are new firms started? The traditional, equilibrium-based view is that new firms to an industry, whether they be startups or firms diversifying from other industries, enter when incumbent firms in the industry earn supranormal profits. By expanding industry supply, entry depresses price and restores profits to their long-run equilibrium level. Thus, in equilibrium-based theories entry serves as a mechanism to discipline incumbent firms.").

¹⁴¹ See Lerner (Boulevard of Broken Dreams), *supra* note 38, at 48; See also Acs & Audertsch (1988), *supra* note 11, at 678-90 (economists Acs and Audertsch found that the contribution of smaller and new firms was greater in immature industries, where market power was rather unconcentrated).

¹⁴² See Acs & Audertsch (1988), *supra* note 11, at 678-90.

¹⁴³ Audretsch analyzes the factors that influence the rate of new firm startups. See also David B. Audretsch & Max Keilbach, *The Knowledge Spillover Theory of Entrepreneurship and Economic Growth*, Indiana Univ. and the Div. of Entrepreneurship, Growth and Pub. Pol. at the Max Planck Institute of Economics (2005), available at <http://web.mit.edu/iandeseminar/Papers/Fall2005/audretschkeilbach.pdf> [it was published as follows: Max Keilback & Erik lehmann, *The Knowledge Spillover Theory of Entrepreneurship and Economic Growth*, 3 ECONOMIA E POLITICA INDUSTRIALE 25-45 (2006)] ("people start a new firm because they are not able to commercialize their ideas and knowledge within the context of an incumbent firm or organization. Entrepreneurship therefore serves as a conduit for the spillover of knowledge from the firm or organization where that knowledge was created to its commercialization in the organizational context of a new firm. Because it facilitates the spillover and commercialization of knowledge that might otherwise have remained dormant and uncommercialized within the incumbent firm generating that knowledge in the first place, entrepreneurship has a positive impact on economic growth.").

within the environment of the organization or incumbent established firm that they work for.¹⁴⁴ Why can't entrepreneurs develop their ideas for their employers? One explanation is because their managers have "blind-spots due to their single-minded focus on existing customers."¹⁴⁵ Another explanation is weak incentive systems in large incumbent firms.

When looking at the design of the incentive system among firms, Lerner¹⁴⁶ found that large firms typically have weak incentive systems compared to the smaller start-up firms, which usually have substantial compensation packages, filled with stock options.¹⁴⁷ It might be hard for established large firms to design strong incentive systems because innovation projects are inherently risky and associated with uncertainty, as there is no telling if proposed innovative projects will be successful, or how long will they last, or how many participants they will require or how complex they are going to be.¹⁴⁸

Third, new firms are likely to open new markets because they are risk takers,, which allows their managers to choose riskier projects and strategies, compared to established firms who choose more traditional ones.¹⁴⁹ Established firms may be reluctant

¹⁴⁴ *Id.*

¹⁴⁵ Lerner (Boulevard of Broken Dreams), *supra* note 38, at 48 (Lerner gives the example of the works of RICHARD N. FOSTER, *INNOVATION: THE ATTACKERS' ADVANTAGE* (Macmillan, 1986)).

¹⁴⁶ *Id.*

¹⁴⁷ *Id.*

¹⁴⁸ *Id.* ("The weak incentives of large firms may reflect the inherent riskiness and unpredictability of innovation projects, their length and complexity, and the number of parties who may make crucial contributions.").

¹⁴⁹ Debra J. Aron & Edward P. Lazear, *The Introduction of New Products*, 80 AMER. ECON. REV. (Papers and Proceedings of the Hundred and Second Annual Meeting of the American Economic Association) 421 (1990) ("new markets are likely to be opened up by new entrants ... while incumbents may be reluctant to open up new markets, they can be induced to follow into the new product line."); *See also* Lerner (Boulevard of Broken Dreams), *supra* note 38, at 48.

to open up new markets due to the risk of failure and uncertainty of results and efficiency.¹⁵⁰ However, it must be noted that established firms are encouraged to follow the new technology once developed by entrepreneurial firms.¹⁵¹

To sum up, new entrepreneurial firms stimulate innovation in many ways. One of them is by serving as a channel for the spillover of knowledge from the incumbent firm where the entrepreneur “created” the knowledge to its commercialization. New entrepreneurial firms facilitate the spillover and commercialization of knowledge (that probably would not be commercialized) from an organization or incumbent firm, therefore “entrepreneurship has a positive impact on economic growth.”¹⁵² The emphasis in this paper is that entrepreneurship is endogenous, as well as methodically produced by investments in knowledge.¹⁵³

¹⁵⁰ *Id.*; See also Thomas J. Prusa and James A. Schmitz Jr., *Can Companies Maintain Their Initial Innovation Trust? A Study of the PC Software Industry*, 76 Rev. Econ. & Stat. 523 (1994) (Prusa and Schmitz show that new firms are more effective in introducing innovative products in the software industry).

¹⁵¹ See Aron & Lazear, *supra* note 149; See also Lerner (Boulevard of Broken Dreams), *supra* note 38, at 48; See also Prusa & Schmitz Jr., *supra* note 150.

¹⁵² See Audretsch & Keilbach, *supra* note 144.

¹⁵³ See *id.*

III. THE NEED FOR GOVERNMENT INTERVENTION

New entrepreneurial startup firms, or “high growth small businesses,”¹⁵⁴ often aspire to become the next “Apple,” “Facebook,” “Cisco,” “Google” or “Intel.”¹⁵⁵ They are the primary force in the economy responsible for both job creation and economic growth.¹⁵⁶ However, if the startup firm does not have venture capital backing, the chances are high (a nearly ninety percent chance to be exact) that the firm will fail within three years from its formation, according to a study by economists Gompers and Lerner.¹⁵⁷ This alarming study, illustrates the authenticity of a well-known expression for the financing gap in the startup world called the “valley of death.” It refers to the difficulty of entrepreneurs to cover the negative cash flow in the early stages of their startup firm, before their new product or service is commercialized and brings in revenue from real customers or investors.

A. The Grounds for Government Intervention

Government intervention via investment in research and development will potentially help stimulate growth and help entrepreneurs navigate through the valley of death.

¹⁵⁴ See Dent, *supra* note 7, at 134.

¹⁵⁵ *Id.*

¹⁵⁶ *Id.*

¹⁵⁷ Gompers & Lerner (2002), *supra* note 28 (“[f]or newly launched enterprises without venture capital backing, failure is almost assured: nearly 90 percent fail within three years.”); See other studies on failure rate at *supra* note 22.

1. The Financing Gap & Causes of the Valley of Death

Raising capital in the early startup phases of a new entrepreneurial firm's life is extremely challenging.¹⁵⁸ The firm's internal cash flow is not enough to support its needs.¹⁵⁹ It cannot support the firm's fast growing technology, research and development needs, which are comprised of intangible assets.¹⁶⁰ If the entrepreneurial firm is not able to obtain an injection of new capital it will probably go bankrupt.¹⁶¹ Attracting financing via "conventional" means can be difficult for many reasons.¹⁶²

2. Uncertainty, Risk & Information Asymmetry

Equity capital providers take into account factors of uncertainty, risk and information asymmetry when considering whether or not to invest in and finance a startup. Regular investors (not venture capitalists) do not care for getting involved with the entrepreneurial firm, because it is very risky due to information asymmetry, and uncertainty.¹⁶³ There is uncertainty concerning the success of the entrepreneur's product

¹⁵⁸ Ola Bengtsson & John R. M. Hand, *CEO Compensation in Private Venture-Backed Firms* (2008), available at <http://w4.stern.nyu.edu/emplibary/Bengtsson%20Hand%20CEO-VCBCs%2020080429.pdf> (According to Bengtsson & Hand, "in the early startup phases of its life, the typical venture-backed firm cannot generate sufficient internal cash flows to support its fast growth and intangible-intensive asset structure, and the external capital markets it faces are private, illiquid and informationally opaque. This makes raising capital a critical task that requires significant skill and effort on the part of the CEO. Without multiple injections of new capital, a startup technology firm is likely to go bankrupt rather than realize its goal going public or being acquired.").

¹⁵⁹ *Id.*

¹⁶⁰ *Id.*

¹⁶¹ *Id.*

¹⁶² *Id.*

¹⁶³ See Gompers & Lerner (1999), *supra* note 20, at 127 (entrepreneurs and budding companies, by their very nature, are associated with considerable levels of uncertainty).

or research, which in turn affects the motivation of investors to advance capital and the intention of suppliers to extend credit.¹⁶⁴

Moreover, according to Jensen and Meckling's¹⁶⁵ "agency theory,"¹⁶⁶ there is always uncertainty surrounding the entrepreneur's possible mismanagement and opportunistic conduct.¹⁶⁷ The agency relationship problem, of encouraging the entrepreneur ("agent") to behave as if she is maximizing the investor's ("principal's"), interests is quite common. It exists in all cooperative efforts and in all organizations ("at every level of management in firms, universities, mutual companies, cooperatives, governmental authorities and bureaus, unions and in relationships normally classified as agency relationships such as those common in the performing arts and the market for real estate").¹⁶⁸

¹⁶⁴ See Gompers & Lerner (1999), *supra* note 20, at 127 (entrepreneurs and budding companies, by their very nature, are associated with considerable levels of uncertainty. There is uncertainty concerning the success of the entrepreneur's product or research, which in turn affects the decisions of the firm's executives, the motivation of investors to advance capital and the intention of suppliers to extend credit.).

¹⁶⁵ See Jensen & Meckling, *supra* note 52 ("[T]he problem of inducing an "agent" to behave as if he were maximizing the "principal's" welfare is quite general. It exists in all organizations and in all cooperative efforts— at every level of management in firms, in universities, in mutual companies, in cooperatives, in governmental authorities and bureaus, in unions, and in relationships normally classified as agency relationships such as those common in the performing arts and the market for real estate. The development of theories to explain the form which agency costs take in each of these situations (where the contractual relations differ significantly), and how and why they are born will lead to a rich theory of organizations which is now lacking in economics and the social sciences generally.").

¹⁶⁶ *Id.*

¹⁶⁷ See also Gompers & Lerner (1999), *supra* note 20, at 127-31; See also Utset, *supra* note 23, at 55.

¹⁶⁸ See Jensen & Meckling, *supra* note 52 ("[T]he problem of inducing an "agent" to behave as if he were maximizing the "principal's" welfare is quite general. It exists in all organizations and in all cooperative efforts— at every level of management in firms, in universities, in mutual companies, in cooperatives, in governmental authorities and bureaus, in unions, and in relationships normally classified as agency relationships such as those common in the performing arts and the market for real estate. The development of theories to explain the form which agency costs take in each of these situations (where the contractual relations differ significantly), and how and why they are born will lead to a rich theory of organizations which is now lacking in economics and the social sciences generally.").

The asymmetric information problem is caused by the fact that the entrepreneur is the one that has the daily involvement with the firm, and, therefore, knows more than the prospective partners, investors or suppliers, about her company's outlook.¹⁶⁹ Investors, however, will not be involved in the daily management and decision making and therefore, will not possess the same information as the entrepreneur.¹⁷⁰ They will be dealing with information asymmetry issues that are inherent in any agency relationship.

Information asymmetry and uncertainty associated with agency issues contribute to "adverse selection," where investors have difficulty screening and selecting credible, high-quality entrepreneurs and companies, inhibiting investors' ability to make sound and competent investment decisions.¹⁷¹

Regular investors who consider financing high-technology startups encounter even more complex information asymmetry problems than investment in regular firms, because managerial decision-making in high-technology startups requires more knowledge than the general managerial skills.¹⁷² Investors may have trouble

¹⁶⁹ Lindsey, *supra* note 21; See also Gompers & Lerner (1999), *supra* note 20, at 128 (discussing the asymmetric information problem, which arises because the entrepreneur, due to her daily involvement with the firm, knows more than the prospective partners, investors or suppliers, about her company's outlook. The asymmetric information problem might also lead to a selection problem, where investors might have a hard time in screening and selecting creditable "good" entrepreneurs and companies, and therefore, are incapable of making correct and competent investment decisions.).

¹⁷⁰ See also Utset, *supra* note 23, at 56; See also Gompers & Lerner (1999), *supra* note 20, at 127-31 (discussing the information asymmetry and other risks that venture capitalists face while dealing with startups).

¹⁷¹ See Akerlof, *supra* note 23, at 493 (Akerlof discussed the problems of "adverse selection" and "lemons"); See also Utset, *supra* note 23, at 56; See also Gompers & Lerner (1999), *supra* note 20, at 129.

¹⁷² See Jensen & Meckling, *supra* note 52 (Jensen & Meckling established that agency problems due to conflicts between investors and managers can have an effect on the interest of both equity and debt holders to supply capital and invest "[i]t is generally impossible for the principal or the agent at zero cost to ensure that the agent will make optimal decisions from the principal's viewpoint. In most agency relationships the principal and the agent will incur positive monitoring and bonding costs (non-pecuniary as well as

understanding the technical information necessary for the investment and management decision-making process.¹⁷³

The following are additional reasons for the need for government intervention in human capital, in order to stimulate knowledge. They include the fact that knowledge is the principal contributor to economic growth.

3. Knowledge Spillover

In order for America to advance and continue to produce technological innovation, there must be government support for and investment in research and development,¹⁷⁴ which in turn, create “positive externalities” (impose a positive effect on a third party).¹⁷⁵

There are six positive externalities that result from the spillover of knowledge.¹⁷⁶ First, the general increase in knowledge of a certain technology, such as occurs during reverse engineering. Second, there is a competition and hiring away of scientists and

pecuniary), and in addition there will be some divergence between the agent’s decisions and those decisions, which would maximize the welfare of the principal.”]).

¹⁷³ See also Utset, *supra* note 23, at 56; See also Gompers & Lerner (1999), *supra* note 20, at 127-31 (discussing the information asymmetry issue and other risks that venture capitalists face while dealing with start-ups).

¹⁷⁴ For short reviews of the basics of the new growth theories by three of their pioneers, see Gene M. Grossman & Elhanan Helpman, *Endogenous Innovation in the Theory of Growth*, 8 J. ECON. PERSP. 23 (1994) (“purposive, profit-seeking investments in knowledge play a critical role in the long-run growth process.”); See Romer, *supra* note 39 (“technical advance come from things people do”); See also N. Gregory Mankiw, David Romer, & David N. Weil, *A Contribution to the Empirics of Economic Growth*, 107 QUARTERLY J. ECON. 407 (1992) (they show that international disparity in levels of per capita income and rates of growth is very consistent with a standard Solow model, when it has been augmented to include human (and physical) capital as an accumulable factor.)

¹⁷⁵ See Margalioth, *supra* note 8; See, e.g., Hall, *supra* note 17; See also Griliches, *supra* note 17.

¹⁷⁶ See Hall, *supra* note 17 (describing several examples that can help with understanding these benefits).

engineers involved in developing innovative technology or processes.¹⁷⁷ Third, innovative firms are unable to behave as discriminating monopolies because of their competitive nature.¹⁷⁸ Fourth, consumers can buy new products from the innovating industry at a lower cost, as a result of competition.¹⁷⁹ Society also benefits from such innovation because it is freely disseminated and available to the public or nonprofit sector, which actually reduces the cost of innovation.¹⁸⁰ The innovation itself might not end up being lucrative to private equity investors, but is very valuable to society as a whole.¹⁸¹ Sixth, research and development raises the standard of living (i.e. advances in medicine prolonging life expectancy, household technologies making chores easier, advances in communication and transportation increasing accessibility) and generates jobs.¹⁸²

As opposed to private investors, whose primary objective is to make a profit, regardless of the degree of societal benefit, government investment takes into account the positive externalities mentioned above. When government fails to bridge the gap between pure profit-driven motives and altruism, innovations suffers. For example, possibilities for military-civilian technology spillovers have declined recently, especially since the U.S. military market no longer plays a strategic role in the computer and

¹⁷⁷ *Id.* (Hall further indicates that “the strength of these spillovers is likely to be a function of proximity, either in technology or geographic space.”).

¹⁷⁸ *Id.*

¹⁷⁹ *Id.*

¹⁸⁰ *Id.*

¹⁸¹ *See also* Lerner (Boulevard of Broken Dreams), *supra* note 38, at 71.

¹⁸² *See* Margalioth, *supra* note 8.

semiconductor industries (as compared to its position in the 1960s).¹⁸³ Additionally, biotechnology firms have a hard time surviving in the market without government support. According to economists Mowery and Rosenberg, “the costs of new product introduction and the marketing-related entry barriers faced by these firms have risen.”¹⁸⁴ The industries that biotechnology firms try to enter (e.g., food processing or pharmaceuticals) in the United States are far more heavily regulated when compared to the semiconductors market; therefore, these companies have to spend more money than semiconductor companies in order to comply with such burdens.¹⁸⁵

Furthermore, private investors may choose not to invest in certain research and development projects because they may not reap the full benefit of their investments, even when such projects would produce a substantial benefit to society.¹⁸⁶ Private firms should not, and cannot, carry the burden of investing in research and development alone.¹⁸⁷

¹⁸³ See also DAVID C. MOWERY & NATHAN ROSENBERG, THE U.S. NATIONAL INNOVATION SYSTEM *IN* NATIONAL INNOVATION SYSTEMS: A COMPARATIVE ANALYSIS 29 (Richard Nelson ed., 1993).

¹⁸⁴ *Id.*

¹⁸⁵ *Id.* (“For this and other reasons, including the greater interest for foreign firms in the technological assets of U.S. startup firms, collaborative ventures involving startup and established U.S. firms have grown considerably in recent years (Pisano et al., 1988). These ventures, frequently focus on technology exchange (often combined with the acquisition by an established firm of a substantial portion of the equity of the new firm) and/or marketing (including navigating domestic and foreign product regulations), rather than joint development of new products.”).

¹⁸⁶ See, e.g., Hall, *supra* note 41; See Margalioth, *supra* note 8; See also Griliches, *supra* note 17.

¹⁸⁷ See Margalioth, *supra* note 8 (Economic studies have concluded that “public returns from R&D can be two to five times greater than the private returns.”).

Another factor that deters regular investors from investing in entrepreneurial firms is the fact such firms have intangible assets, which are unrecoverable in the event of default.¹⁸⁸

4. Intangible Assets

Investment in a startup entrepreneurial firm means an investment in intangible assets, such as ideas, talent and trade secrets. Institutional investors, such as banks, are reluctant to invest in (or loan to) such firms because it is hard for them to perform valuation of the intangible assets involved.¹⁸⁹

In the event of default, intangible assets are worthless to institutional investors.¹⁹⁰ When investors invest in a firm that has tangible assets, such as products, machinery or buildings, they can later sell these tangible assets and recoup some of their investment. When the intangible assets are ideas or concepts that have not been fully developed or

¹⁸⁸ Lindsey, *supra* note 21; See also Gompers & Lerner (1999), *supra* note 20, at 128 (discussing the nature of the entrepreneur's asset, which affect her firm's financial and corporate strategy).

¹⁸⁹ *Id.*; See also Hedva Ber, Is Venture Capital Special? – Empirical Evidence from a Government Initiated Venture Capital Market (2002) (working paper) (Bank of Israel, Jerusalem) (“In the last few decades much has been written about banks, and it has been claimed that they are ‘special’ and enable projects to be financed that would not otherwise be implemented, even though they are economically worthwhile (because of the existence of asymmetric information). Nevertheless, empirical evidence shows that there is a segment of companies in which banks (and especially ‘anonymous’ capital markets) tend not to invest; these are firms with particularly high asymmetry of information because they are very young, operate in new and highly uncertain environment, and have a large share of non-tangible assets (start-ups). The need of these companies for finance has led to the creation of venture capital funds, which stressed their ability to solve these firms’ problems of asymmetric information. Apart from the readiness of VC funds to finance the activities of start-ups their uniqueness was also expressed in the results of the financing: empirical evidence from the US indicates that the performance of companies backed by VC is better than that of companies without it, at least in the case of companies that are publicly traded (Brav and Gompers, 1997). The existence of spillover effects from the activities of start-ups (R&D) and findings of this kind, led the public sector in some countries—including Israel—to support the VC market in various ways.”).

¹⁹⁰ Lindsey, *supra* note 21; See also Gompers & Lerner (1999), *supra* note 20, at 128 (discussing the nature of the entrepreneur's asset, which affect her firm's financial and corporate strategy).

commercialized, in the event of default, investors will not be able to recoup their investment.¹⁹¹

That is why venture capital investors play such an important role in encouraging innovation. By financing capital hungry young start-ups, who present abundant hazards and uncertainties that often deter other "regular" investors,(FN) venture capital investors can help to promote innovation.¹⁹²

5. The Difficulty with Obtaining Venture Capital Financing

Today, venture capital is considered by many scholars an essential element of the U.S. national innovation system, and is extensively imitated around the world.¹⁹³ According to economists Hsu and Kenney, the venture capital organization has even been developed into an asset category, which is commonly acknowledged by large U.S. institutional and pension funds.¹⁹⁴

The funding and support from a venture capital fund is of tremendous importance to a budding start-up, not only because it provides the startup with cash,¹⁹⁵ but also, and more importantly, because the venture capital managers provide services, such as

¹⁹¹ See Lindsey, *supra* note 21; See also Gompers & Lerner (1999), *supra* note 20.

¹⁹² It should be noted that professional venture capital funds also face the same information asymmetry issues. According to a report by U.S. Gen. Accounting Office, *supra* note 13, only 10% of VCs manage to get a return on their investment.

¹⁹³ See David H. Hsu & Martin Kenney, *Organizing Venture Capital: The Rise & Demise of American Research and Development Corporation, 1946-1973*, 14 (4) INDUSTRIAL & CORP. CHANGE 579 (2005) (discussing the evolution of the first VC firm ARD. ARD was created as a response to the Great Depression crisis.

¹⁹⁴ See *id.*

¹⁹⁵ DAN SENOR & SAUL SINGER, *START-UP NATION: THE STORY OF ISRAEL'S ECONOMIC MIRACLE* 161 (Grand Central Publishing 2009).

mentoring and presenting the young company to networks of additional investors, potential acquirers, new partners and customers.¹⁹⁶ A skillful venture capital fund will help the start-up develop the company.¹⁹⁷ The funding of venture capital innovation is very important, often successful, and therefore dominates the entrepreneurial finance literature.¹⁹⁸ However, it is not that easy to get venture capital backing due to short-termism and geographic factors.¹⁹⁹

¹⁹⁶ See *id.*, at 161; See also Lindsey, *supra* note 21 (discussing & adding to the literature that explores the value added by venture capitalists by way of support, advice and enhanced governance. According to Lindsey, “[P]reviously documented mechanisms include venture capitalists helping firms to recruit key managers (Gorman and Sahlman, 1989, Hellmann and Puri, 2002), monitoring and advising through service on the company’s Board of Directors (Lerner, 1995, Baker and Gompers, 2003), and implementing other strong governance mechanisms (Hochberg, 2004). Facilitating strategic alliances is an additional channel through which venture capitalists add value.”); See also Yael V. Hochberg, Alexander Ljungqvist & Yang Lu, *Networking as a Barrier to Entry and the Competitive Supply of Venture Capital*, 65 (3) J. FIN. 829 (2010) (they “examine whether strong networks among incumbent venture capitalists (VCs) in local markets help restrict entry by outside VCs, thus improving incumbents’ bargaining power over entrepreneurs. More densely networked markets experience less entry, with a one-standard deviation increase in network ties among incumbents reducing entry by approximately one-third. Entrants with established ties to target-market incumbents appear able to overcome this barrier to entry; in turn, incumbents react strategically to an increased threat of entry by freezing out any incumbents who facilitate entry into their market. Incumbents appear to benefit from reduced entry by paying lower prices for their deals.”).

¹⁹⁷ See Senor & Singer, *supra* note 195, at 161; See also Lindsey, *supra* note 21.

¹⁹⁸ Darian M. Ibrahim, *Financing the Next Silicon Valley*, 87 WASH. U. L. REV. 717, 720 (2010), reprinted in 2011 Securities Law Review § 3.2.

¹⁹⁹ Ola Bengtsson & David H. Hsu, *How Do Venture Capital Partners Match with Startup Founders?* (2010)(working paper) (Management Department) (According to Bengtsson & Hsu, “personal similarity matters in the VC matching market. We find that a match between a founder and a VC partner is twice as likely when both share the same ethnic background. A match is also more likely if both attended a top ranked university. As further evidence of the importance of similarity, we show that when the founder and VC partner share an ethnic tie or have both attended a top ranked university the VC’s investment represents a larger fraction of its aggregate investments in all portfolio companies. These linkages are significant only for early stage investments in industries with higher levels of intangible assets, for which information costs are likely to be more pronounced. These linkages are also more important when the distance between VC and company is greater. These subsample findings suggest that the economic role of similarity is reduce information costs. We infer that lower information costs associated with similar personal characteristics allow VCs to make larger investments.”); See also Ola Bengtsson, *Repeated Relationships between Venture Capitalists and Entrepreneurs* 3-5 (Working Paper No. 1 2007) (Bengtsson examined data on 1500 serial entrepreneurs. He found that a failed entrepreneur is twice as likely to repeat VC relationships (as evaluated against a successful entrepreneur.)

a. Shareholder Supremacy & Management's Emphasis on Short-term Results

The American²⁰⁰ corporate law tale begins with technology dictating that a few well-off individuals alone cannot provide enough capital to large public enterprises.²⁰¹ Capital, therefore, must be pulled from many estranged shareholders.²⁰² Ownership is further dispersed due to shareholders who diversify their own holdings.²⁰³ In the last twenty years, corporate governance scholars have been requiring managers of public companies to maximize shareholder value by putting emphasis on short-term results.²⁰⁴ Policymakers, practitioners and academics alike hold strong views that investors' emphasis on stock market liquidity, which is evidenced by the growing high frequency and algorithmic trading activity and short-term holding periods, encourages a focus on short-term results.²⁰⁵ As a result, large public companies are shying away from investing in research and development, which require long-term strategic planning and potential failures that can affect the price of the company's stock price. The short-term focus of

²⁰⁰ See Ron Harris, *The Private Origins of the Private Company: Britain 1862-1907*, 33(2) OXFORD J. OF LEGAL STUD. 339 (2013) (according to Harris, "contrary to a common misconception, business corporations did not begin small (and private) and only then grew bigger (and public)." [Harris examines the origins of the private company in Britain]).

²⁰¹ Mark J. Roe, *A Political Theory of American Corporate Finance*, 91 COLUM. L. REV. 10, 11 (1991).

²⁰² See *id.*

²⁰³ See *id.*

²⁰⁴ Lynn A. Stout, *The Corporation As Time Machine: Intergenerational Equity, Intergenerational Efficiency, and the Corporate Form*, (forthcoming) (will be published at the Sixth Berle Symposium by the Seattle Law Review) [hereinafter: Stout (Time Machine)].

²⁰⁵ See Stout (Shareholder Value Myth), *supra* note 19.

investors and corporate boards is currently one of the key issues in the corporate governance debate.²⁰⁶

The probability of receiving any kind of financing, including venture capital, today depends, among other factors, on whether the market is liquid.²⁰⁷ Unfortunately, the United States and other Western countries have been dealing with a liquidity crisis in the last few years. The focus on shareholder value also affects the young entrepreneurial startup that usually has to struggle with finding investors (equity capital providers) who would agree to invest in its ideas or technology, for the following reasons.

Stout,²⁰⁸ Mowery and Rosenberg,²⁰⁹ criticize the U.S. venture capital market for not providing adequate support to technology development over the long run and for breeding “managerial myopia” (a significant concentration on short term results).²¹⁰

²⁰⁶ For discussion on shareholder value, *see* COLIN MAYER, *FIRM COMMITMENT: WHY THE CORPORATION IS FAILING US AND HOW TO RESTORE TRUST IN IT* (Oxford Univ. Press 2013); *See also*, Ira M. Millstein, Re-examining Board Priorities in an Era of Activism, N.Y. TIMES, March 8, 2013 *available at* http://dealbook.nytimes.com/2013/03/08/re-examining-board-priorities-in-an-era-of-activism/?_r=0 (“corporate boards around the country should re-examine their priorities and figure out to whom they owe their fiduciary duties ... Some activists are using their newfound power to sway and bully management to focus on the short term, meet the quarterly targets and disgorge cash in extra dividends or stock buy backs in lieu of investing in long-term growth”).

²⁰⁷ Bengtsson (2007), *supra* note 199, at 3.

²⁰⁸ Stout (Shareholder Value Myth), *supra* note 19, at 7 (“influential economic and legal experts are proposing alternative theories of the legal structure and economic purpose of public corporations that show how a relentless focus on raising the share price of individual firms may be not only misguided, but harmful to investors.”).

²⁰⁹ *See* Mowery & Rosenberg, *supra* note 183, at 65 (They note that “revival of faith in the “magic of the market” within U.S. policymakers circles during the 1980s paradoxically has been combined with more frequent expressions of concern over the impact of efficient U.S. capital market on growth of new, high-technology firms.” Mowery & Rosenberg also note that “[o]ther critics suggest that the reliance on startup firms for the development of new technologies within the U.S. economy has resulted in excessive transfer of technological know-how to the foreign firms (often, Japanese firms) that recently have expanded their investments in these enterprises. In this view (which is by no means universally held), many of the widely remarked difficulties of the U.S. economy in commercializing new technologies stem in part from an excessive reliance on startup firms for commercialization.”).

²¹⁰ *Id.*

They question the wisdom of chasing short-term profit goals (shareholder value) and shareholder-primacy philosophy.²¹¹

Therefore it is not surprising that recent empirical research already shows that even profitable technology companies increasingly prefer to stay private as long as possible in order to avoid the pressures of short-term strategies that result from public ownership.²¹² This affects the exit strategy for investors. Empirical research also shows that technology companies going public not only tend to be older, but also are more likely to have dual class of share structures, because their founders are pushing for control over the firm.²¹³

b. Location, Location, Location! Formation of Industrial Geographic Clusters

Venture capital funds do not have a nationwide presence, and are frequently organized as small partnerships.²¹⁴ They are “hands on” investors who monitor their investments very closely.²¹⁵ They provide mentoring and management services for the

²¹¹ Stout (Shareholder Value Myth) *supra* note 19, at 7 (“influential economic and legal experts are proposing alternative theories of the legal structure and economic purpose of public corporations that show how a relentless focus on raising the share price of individual firms may be not only misguided, but harmful to investors.”) Stout also expresses this concern with regards to the innovation ability of large public companies. Stout posits that “America’s public corporations are losing their innovative edge” as a result of the shareholder-primacy ideology.).

²¹² *Rival Versions of Capitalism, The Endangered Public Company, the Rise and Fall of a Great Invention, and Why it Matters*, ECONOMIST, May 19, 2012, <http://www.economist.com/node/21555562>; See also, Thomas J. Chemmanur & Yawen Jiao, *Dual class IPOs: A theoretical analysis*, 36 J. BANKING & FIN. 305-19 (2012) available at <https://www2.bc.edu/~chemmanu/paper/Dual%20Class%20IPOs.pdf>.

²¹³ Joann S. Lublin & Spencer E. Ante, A Fight in Silicon Valley: Founders Push for Control, WALL ST. J., July 11, 2012, available at http://online.wsj.com/news/articles/SB10001424052702303292204577519134168240996?mod=ITP_marketplace_0&mg=reno64-wsj&url=http%3A%2F%2Fonline.wsj.com%2Farticle%2FSB10001424052702303292204577519134168240996.html%3Fmod%3DITP_marketplace_0.

²¹⁴ *Id.*

²¹⁵ *Id.*

startups that they invest in, such as accounting, networking, finding partners, investors and even new management.²¹⁶ Therefore, venture capital funds usually prefer to invest in startups that are close to their geographic location, which allows them to provide services more easily.²¹⁷

Venture capital funds are “highly specialized financial intermediaries.”²¹⁸ They offer “optimal services” to an entrepreneurial firm that is positioned within the fund’s concentrated industry, which is usually very narrowly defined.²¹⁹

Location and industry concentration account for the appearance of technology regions and hubs in certain geographic locations (they are also referred to as “clusters”, a concentration of specialized industries in certain regions). Therefore, it is very difficult for startups which are located and operating in non-technology regions to obtain venture capital funding.²²⁰

²¹⁶ *Id.*

²¹⁷ See Bengtsson (2007), *supra* note 199, at 3; See also Avraham Ravid & Ola Bengtsson, *The Geography of Venture Capital Contracts* (2009) (under review) available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1361827; See also Bengtsson & Hsu (2010), *supra* note 199 (“[A] central feature of the venture capital market is that matching between borrower and investor is two-sided. On the financial capital supply side, venture capitalists (VCs) select which handful of startups to fund among the several hundred business plans it reviews every year (Fried & Hisrich, 1994; Boocock & Woods, 1997). This selection is difficult because startup quality is widely dispersed and hidden quality problems can be severe in that entrepreneurs may have better information about project quality relative to investors (Gompers & Lerner, 2001; Cochrane, 2006). On the demand side, the entrepreneur must make a decision on which VCs will most reliably provide not only financial capital but also professional services which can spur startup corporate development (Macmillan et al., 1989; Gorman & Sahlman, 1990; Hellmann & Puri, 2000, 2002; Brander et al, 2002).”).

²¹⁸ See Bengtsson (2007), *supra* note 199, at 3.

²¹⁹ *Id.*

²²⁰ The case of Israel is an exception in this regard, as discussed in the paper; See Ibrahim (2010), *supra* note 198, at 741.

c. Additional Factors

Another factor influencing investment opportunity is the supply and demand for high-technology goods in the future. According to Mowery and Rosenberg the changes in market structure for high-technology goods has also reduced significantly the ability of new firms to grow in size and scope.²²¹

Mowery and Rosenberg are also concerned with the fact that established U.S. and foreign firms are acquiring more startups. They claim that these changes in public policy environment in the United States will diminish the role of entrepreneurial startup firms and their formation may be reduced in the future.²²²

The above difficulties in obtaining financing coupled with other concerns, such as the rising costs of new product development and commercialization (especially in the microelectronics and biotechnology fields), reduces the role of the venture capital market as a source of support for startup firms.²²³ As a result, various new market trends have

²²¹ According to Mowery & Rosenberg, *supra* note 183, at 57 (“[t]o the extent that postwar U.S. antitrust policy before the 1980s tended to discourage acquisitions by large industrial firms as a means to develop and commercialize new technologies, relaxation of this policy under the Reagan and Bush Administrations (see below) may increase the likelihood that startup firms will be acquired by larger enterprises, rather than remaining independent. Similarly, the effects of the 1980s to strengthen domestic protection for intellectual property may reduce the viability of startup firms in at least one industry in which they have been very important. The passage of the Semiconductor Chip Protection Act of 1984 significantly strengthened protection for chip designs in microelectronics. In response, established semiconductor firms have become far more uncertain, however, and litigation over intellectual property may pose less of an obstacle to the establishment of new firms in these industries.”).

²²² *See id.*

²²³ *See id.* at 57 (“[a]cquisition of startups by established U.S. and foreign firms also has become more common. Particularly in biotechnology, new firms rarely have developed into mature enterprises rather than being acquired.”).

recently evolved in order to serve as an alternative financing vehicle for entrepreneurial firms.

B. Alternative Financing Vehicles to Entrepreneurs

Alternative financing vehicles and new market trends have developed in response to a relative dearth of and difficulty in obtaining venture capital investments.

1. Angel Investors

Angel investors are typically high net worth individuals, who are sometimes considered “accredited investors,” as defined under the securities laws (SEC Rule 501²²⁴), who invest personal funds in the early stages of growth of a start-up company.²²⁵

An immense amount of entrepreneurial funds actually come from angels, especially for early stage firms, whereas the venture capitalists are the ones who get all the press, according to economists Van Osnabrugge and Robinson.²²⁶ Legal scholar Darian Ibrahim writes extensively on the role of the individual angel investors in aiding and facilitating the establishment of technology regions (such as Silicon Valley and Route 128) as well as the creation of the venture capital industry.²²⁷ According to

²²⁴ Rule 501(a), 17 C.F.R. § 230.501(a) (2007).

²²⁵ See Ibrahim (2010), *supra* note 198, at 740.

²²⁶ See MARK VAN OSNABRUGGE & ROBERT J. ROBINSON, ANGEL INVESTING: MATCHING STARTUP FUNDS WITH STARTUP COMPANIES--THE GUIDE FOR ENTREPRENEURS AND INDIVIDUAL INVESTORS 5 (2000).

²²⁷ See Ibrahim (2010), *supra* note 198, at 740, (“[I]nformal angel investing financed many of the foundational start-ups in Silicon Valley and Route 128. Until the formal venture capital industry came about in the late 1960s, individual angels were a common source of innovation funding in Silicon Valley. If we begin Silicon Valley’s history with the founding of the Hewelett-Packard Company (HP) in 1938, we learn that HP’s founders were not only mentored by Frederick Terman, but that he was an angel investor in the company. If we date Silicon Valley’s beginnings back even earlier to the founding of Federal Telegraph Company (FTC) in 1909, we learn that the initial funding for FTC was provided by Stanford president David Starr Jordan and several Stanford faculty members, all angel investors... Individual angel investors

Ibrahim, in Silicon Valley, angel investors such as Frederick Terman (angel to Hewelett-Packard) and Stanford president David Starr Jordan (angel to Federal Telegraph Company), were the primary financiers of innovation, prior to the formation of the venture capital industry in the late 1960s.²²⁸

Angel investors typically invest in the valley of death early-stages of the start-ups. Their incentive stems from familiarity with the startup firms technology (usually the angel has relevant expertise in the business) and due to the potential great rate of return on the investment.²²⁹ Angels also prefer to invest in the local community, which results in a wide geographic distribution of early-stage investment, which is beneficial to entrepreneurs that are located in non-technology regions.²³⁰

So why is this paper advocating for government intervention when entrepreneurs can simply turn to angel investors? There are high search costs associated with angel investing, as most angels do not advertise in the yellow pages that they are willing to invest in budding companies.²³¹ Angel investments often have an informal nature due to the angel's preference for anonymity.²³²

were also an early source of finance in Boston. For example, Alexander Graham Bell was able to start the Bell Telephone Company in Boston in 1877 after receiving two angel investments.”).

²²⁸ *Id.*

²²⁹ *Id.*

²³⁰ *See id.* at 721.

²³¹ *See id.* at 742.

²³² *Id.*

There are also different types of angel investment in terms of “smart money” versus “dumb money,” and the value added services that come with such investment.²³³ Some angels come from a professional background - they are successful serial entrepreneurs or have previous business background in the field of the venture.²³⁴ The “professional” angels (“smart money”), like venture capitalists, provide value added services to the firm, such as strategic planning, introduction to a network of connections in order to get additional, customers, suppliers, or financing.²³⁵ The “non-professional” angels (“dumb money”) can be friends, family, lawyers, accountants, other wealthy individuals without a business background in the field of the venture, who do not provide such added value services.²³⁶

Surprisingly or not, in recent years, angel investors have formed investment groups referred to as “clusters of angel investors” (i.e., professional investors who are organized into regional angel investor groups).²³⁷

2. Clusters of Angel Investors

Angel investor clusters are comprised of individual angels who join the group in order to invest collectively. There are many forms and different industries in which

²³³ *Id.*

²³⁴ *Id.*

²³⁵ *Id.*

²³⁶ *Id.*

²³⁷ *See id.*

clusters of angel groups invest.²³⁸ Nevertheless, angel investment clusters have the following characteristics in common. They meet on a regular basis in order to review business proposals and decide collectively on which entrepreneurs will be allowed to perform their pitch. They collaborate in order to perform a due diligence to authenticate the statements, plans, and history of the potential entrepreneurial team, and eventually reach a conclusion regarding investment in the firm.

The market behavior of angel clusters seems to be similar to that of venture capital funds in that they take equity (ownership) stake in the entrepreneurial firms. However, according to the Angel Capital Association,²³⁹ there are many differences between venture capital funds and Angel clusters. Venture capitalists invest funds gathered from external sources, such as insurance companies and pension funds, whereas Angel investor groups risk their own individual members' capital.²⁴⁰ Additionally, as previously noted, venture capitalists commonly invest in later-stage entrepreneurial firms,

²³⁸ FAQs on Angel Investing, ANGEL CAPITAL ASSOCIATION, http://www.angelcapitalassociation.org/entrepreneurs/faqs/#What_are_angel_groups_ (last visited December 9, 2014) ("The size of angel group investments in entrepreneurial firms varies widely. A survey of member organizations of our companion organization, the Angel Capital Association, found that the median investment per round per angel group in 2008 was about \$277,000. Many angel groups co-invest with other angel groups, individual angels and early-stage venture capitalists to make investments of \$500,000 to \$2 million per round. Groups invest in innovative firms in a range of industries. The most common areas are software, medical devices, telecommunications, and manufacturing. While some groups focus on a specific industry area, the majority are open to a variety of areas and select those markets with which some of their members have expertise.").

²³⁹ *Id.* (The Angel Capital Association (ACA) is an industry alliance of over 200 of angel investor groups in the United States. It was founded in 2004, and funds an annual summit meeting in a diverse city every year. At the annual meetings, leaders of organized angel investor groups, in cooperation with academics, government leaders, and VCs, exchange best practices and build new ideas. It should be noted that ACA is the representative US member of the World Business Angels Association. Moreover, membership in the ACA is limited to organized groups of angel investors, which must meet its' requirements, i.e., not open to single individual investors. ACA's website lists angel groups across the U.S., which organize investors in certain local regions or particular industries. More information can be found on ACA's web-site.).

²⁴⁰ *Id.*

whereas Angel investor clusters invest in early-stage firms, such as in the seed and start-up stages.²⁴¹ The size of investment and financing rounds also vary among angels, angel clusters and venture capitalists.²⁴² Individual angels usually make small investments of \$5,000 to \$100,000, whereas venture capitalists usually invest \$2 million and up in a financing round.²⁴³ Angel clusters may make investments in the mid-range, between most individual angels and venture capitalists.²⁴⁴

3. Joint Ventures

There is extensive interest of late by policymakers, institutional investors and academics to encourage forms of ownership other than the conventional investor-owned corporation. Much of this interest centers on “alliances,”²⁴⁵ “hybrids of organizational arrangements,”²⁴⁶ “network organizations,”²⁴⁷ and particularly “joint ventures.”²⁴⁸ There

²⁴¹ *Id.*

²⁴² *Id.*

²⁴³ *Id.*

²⁴⁴ *Id.*

²⁴⁵ See Benjamin Gomes-Casseres, *Entry for Alliances (inter-firm)*, ROUTLEDGE ENCYCLOPEDIA OF INT’L POL. ECON. (forthcoming), available at <http://www.alliancestrategy.com/PDFs/BGC%20AllianceDef%20Encyc02.pdf> (“An inter-firm alliance is an organizational structure to govern an *incomplete contract* between *separate firms* and in which each firm has *separate control*. Because the partners remain separate firms, there is no automatic convergence in their interests and actions. As a result, to deal with unforeseen contingencies inherent in the incomplete contract, the partners need to make decisions jointly.”); See also Robert Pitofsky, *A Basic Foundation for Joint Venture Analysis: A Framework for Antitrust Analysis of Joint Ventures*, 54 ANTITRUST L.J. 893 (1985); See also George T. Harris, *The Post-Capitalist Executive: An Interview with Peter F. Drucker*, 71(3) HARV. BUS. REV. 114 (May 1993) (“Today businesses grow through alliances, all kinds of dangerous liaisons and joint ventures, which, by the way, very few people understand.”); See also Joseph A. McCahery & Erik P.M. Vermeulen, *Corporate Governance and Innovation Venture Capital, Joint Ventures, and Family Businesses* (ECGI working paper 2006) (discussing corporate governance for joint ventures).

²⁴⁶ Su Han Chan, John Kensinger, Art Keown, and John Martin, *Do Strategic Alliances Create Value?* 46 J. FIN. ECON. 199, 200 (1997); See also Somnath Das, Pradyot K. Sen & Sanjit Sengupta, *Impact of Strategic Alliances on Firm Valuation*, 41 ACAD. MGMT. J. 27 (1998) (they found that “announcements of technological alliances enjoyed greater abnormal returns in the stock market than marketing alliance announcements ... abnormal returns were negatively correlated with firm profitability and size, indicating

is no uniform legal standard concerning the definition, formation or regulation of “joint ventures” in the U.S.²⁴⁹ However, for the purposes of this paper, the following definition, which was developed by legal scholar Brodley²⁵⁰ (for antitrust purposes),²⁵¹ will be used: “[A joint venture is an] integration of operations by two or more firms where: (1) the enterprise is under the joint control of the parent firms, which are not under related control; (2) each parent makes a substantial contribution to the joint enterprise; (3) the enterprise exists as a business entity separate from its parents; and (4) the joint venture creates significant new enterprise capability in terms of new productive capacity, new technology, a new product, or entry into a new market.”²⁵²

that investors perceived more profitable, larger firms as capturing less of the gain generated in alliances. Indeed, the smaller partners in technological alliances appeared to benefit the most. Finally, investor uncertainty increased following alliance announcements for marketing alliances but not for technological alliances.”).

²⁴⁷ M. Jensen & W. Meckling, *Specific and General Knowledge, and Organizational Structure*, in MAIN CURRENTS IN CONTRACT ECONOMICS (Werin & Wijkander, Eds. 1991) (Reprinted in Journal of Applied Corporate Finance, (Fall 1995) and Michael C. Jensen, *Foundations of Organizational Strategy*, (Harvard University Press, 1998).)

²⁴⁸ Nichols, *Joint Ventures*, 36 VA. L. REV. 425, 425 (1950), Comment *Joint Venture or Partnership*, 18 FORDHAM L. REV. 114, 115 (1949) (citing ROWLEY, MODERN LAW ON PARTNERSHIP § 1001 (1916)).

²⁴⁹ See also *id.*, at 428 (“No federal or state statutes have been found either authorizing, defining or limiting joint ventures.”).

²⁵⁰ See Alvin F. Lindsay, III, *Tuning in to HDTV: Can Production Joint Ventures Improve America's High-Tech Picture?* 44 U. MIAMI L. REV. 1159, 1164 (1990) citing Brodley, *Joint Ventures and Antitrust Policy*, 95 HARV. L. REV. 1523, 1526 (1982). The definition is used for antitrust purposes.

²⁵¹ See *id.* (the definition is used for antitrust purposes).

²⁵² There is no legal uniform standard concerning the definition, formation or regulation of joint ventures. However, some scholars have defined joint ventures narrowly for certain purposes, such as the following definition: “[A joint venture is an] integration of operations by two or more firms where: (1) the enterprise is under the joint control of the parent firms, which are not under related control; (2) each parent makes a substantial contribution to the joint enterprise; (3) the enterprise exists as a business entity separate from its parents; and (4) the joint venture creates significant new enterprise capability in terms of new productive capacity, new technology, a new product, or entry into a new market.” See Lindsay, *supra* note 251, 1164 (citing Brodley, *supra* note 251, at 1526). The definition is used for antitrust purposes.

The joint venture structure allows independent firms to group their resources for a limited point in time or purpose without completely discarding their sovereign corporate structure.²⁵³ Business partners to the joint venture typically agree to a certain degree of integration under the combined management of their firms.²⁵⁴

Many of the largest U.S. public firms,²⁵⁵ as well as small entrepreneurial firms,²⁵⁶ undertake joint ventures for the following reasons. Joint ventures have significant advantages to large firms in the national and international business community over either mergers that may be politically or commercially difficult to implement or contractual arrangements, which require anticipation and design of future contingencies and outcomes.²⁵⁷ Joint ventures accordingly allow new and established firms to access new markets²⁵⁸ and to reach economies of scale.²⁵⁹ According to the transactional cost

²⁵³ *Id.*

²⁵⁴ Pitofsky, *supra* note 245; See also John J. McConnel & Timothy J. Nantell, *Corporate Combinations and Common Stock Returns: The Case of Joint Ventures*, 40 J. OF FIN. 519 (1985).

²⁵⁵ They account for approximately ten to twenty percent, of the annual income, revenues and assets of public firms in the U.S; See J. Bamford & D. Ernst, *Governing Joint Ventures*, THE MCKINSEY QUARTERLY (Special Edition: Value and Performance 2005); See also CalPERS and Water Street Partners, *Global Principles of Accountable Corporate Governance: Joint Venture Governance Guidelines* 1, at 3 available at <http://www.calpers-governance.org/docs-sof/marketinitiatives/2009-03-26-joint-venture-governance-guidelines.pdf> (According to CalPERS, there are more than one thousand JVs in the market, with more than one billion dollars in invested capital or annual returns); See also McConnel & Nantell, *supra* note 254.

²⁵⁶ Vikas A. Aggarwal & David H. Hsu, *Modes of Cooperative R&D Commercialization by Start-Ups* 30 STRATEGIC MGMT. J. 835 (2009) (they examine “the determinants of heterogeneous firm-level cooperative R&D commercialization strategies. While the volume of interfirm collaboration has increased dramatically in recent decades, the determinants of firm-level choices among alternate modes of such cooperative activity remain relatively understudied.”)

²⁵⁷ Pitofsky, *supra* note 245.

²⁵⁸ See DAVID J. BEN-DANIEL, ARTHUR H. ROSENBLUM & JAMES J. HANKS JR., *INTERNATIONAL M&A JOINT VENTURES & BEYOND: DOING THE DEAL* (2002) (Joint ventures contribute to cooperation and trade facilitation among firms, states and even countries. International JVs are subject to trade laws and anti trust consideration, as well as the host country’s laws and regulations).

theory of the firm,²⁶⁰ incomplete contracts are the reason for the creation of the firm. In this case, incomplete contracts amid diverse firms are the reason for the creation of joint ventures.²⁶¹

Established firms²⁶² use this vehicle in order to gain access to innovation and technology (of the entrepreneurial firm), to reduce costs, and spread their risk.²⁶³ New entrepreneurial firms use it to enhance their market power and operating efficiency.²⁶⁴ Both firms can accomplish financial objectives along with spreading their risks by using this vehicle.²⁶⁵

Investment in entrepreneurial firms is very risky and there is a high degree of uncertainty, therefore, both the established and new firm gain significant transaction advantages by entering into joint ventures, when the value of the contribution of each parent and the foreseeable outcome is hard to measure. The joint venture allows them to

²⁵⁹ Lindsay, *supra* note 250, at 1165; *See also* Bamford & Ernst, *supra* note 255 (JVs save time for large companies who can combine their resources and focus on future products or efficient distribution. Additionally, when the market is illiquid and credit is hard to obtain, perhaps financial institutions will be willing to lend credit to a consortium of several firms, rather than to a single firm).

²⁶⁰ *See* Coase, *supra* note 62.

²⁶¹ Gomes-Casseres, *supra* note 245.

²⁶² Joint ventures are exceedingly common in certain U.S. industries, such as gas and oil. *See* CalPERS and Water Street Partners, *supra* note 255, at 3 (The eight largest publicly traded oil and gas companies, with six metals and mining companies have more than five hundred billion dollars of assets in joint ventures (“JVs”). JVs in the alternative energy, conventional petroleum, basic materials, aerospace and chemical industries account for thirty to fifty percent of these industries economic activity. In the international arena, JVs are commonly used in India, China, Korea, Russia, Latin America and the Middle East).

²⁶³ *See id.*

²⁶⁴ McConnel & Nantell, *supra* note 254.

²⁶⁵ Bamford & Ernst, *supra* note 255.

cooperate and share profits while they are not obligated to share various kinds of fixed fees that may be highly detrimental to their earnings.²⁶⁶

The picture is not always rosy though. Joint ventures are quite risky and highly unstable²⁶⁷ due to their high failure rates, which are estimated to be approximately fifty percent.²⁶⁸ There are various challenges to the joint venturers (new and established firms) from such collaboration, which are associated with protecting the established firm from agency problems of information asymmetry,²⁶⁹ whereas the new firm has to protect itself from expropriation risks (such as theft of their proprietary information),²⁷⁰ and

²⁶⁶ Pitofsky, *supra* note 245; *See also* Bamford & Ernst, *supra* note 255 (both firms can accomplish financial objectives along with spreading their risks by using this vehicle).

²⁶⁷ Seung Ho Park & Gerardo R. Ungson, *The Effect of National Culture, Organization Complementarity, and Economic Motivation on JV Dissolution*, 40 ACAD. MGMT. J. 279 (1997) (they examine “the effects of partner nationality, organizational dissimilarity, and economic motivation on the dissolution of joint ventures.”); *See also* Rebecca M. Guidice & Neal P. Mero, *Governing Joint Ventures: Tension Among Principals’ Dominant Logic on Human Motivation and Behavior*, 11 (3) J. MGMT. & GOVERNANCE 261 (September 2007) (“insight into the role of cognitive styles in understanding students’ career preferences by two complementary studies”).

²⁶⁸ Guidice & Mero, *supra* note 267; *See* Park & Ungson, *supra* note 267; *See also* Seung Ho Park and Gerardo R. Ungson, *Interfirm Rivalry and Managerial Complexity: A Conceptual Framework of Alliance Failure*, 12 ORG. SCI. 37 (2001) (They center “on two primary sources of alliance failure: interfirm rivalry and managerial complexity.” They suggest that “strategic alliances fail because of the opportunistic hazards as each partner tries to maximize its own individual interests instead of collaborative interests. Also, strategic alliances fail because of the difficulties in coordinating two independent firms (i.e., coordination costs), and in aligning operations at the alliance level with parent firms’ long-term goals (i.e., agency costs).”). It should be noted that JVs are not destined to failure, if they are crafted and designed properly, perhaps it can encourage stability and mitigate certain factors that would otherwise cause joint ventures to fail. *See* Park & Ungson, *supra* note 267; *See also* J. Michael Geringer & Louis Hebert, *Control and Performance of International JVs*, 20 J. INT’L BUS. STUDIES 235 (1989).

²⁶⁹ Lindsey, *supra* note 21; *See also*, Gompers & Lerner (1999), *supra* note 20, at 128 (discussing the asymmetric information problem, which arises because the entrepreneur, due to her daily involvement with the firm, knows more than the prospective partners, investors or suppliers, about her company’s outlook. The asymmetric information problem might also lead to a selection problem, where investors might have a hard time in screening and selecting creditable “good” entrepreneurs and companies, and therefore, are incapable of making correct and competent investment decisions).

²⁷⁰ Lindsey, *supra* note 21, at 1137-8; David H. Hsu, *What Do Entrepreneurs Pay for Venture Capital Affiliation?* 59 J. FIN. 1805 (2004).

inequitable revenue sharing.²⁷¹ Here too, the startup, due to its small size, lack of experience and capital, has to deal with high transaction and search costs that are associated with locating the right partner²⁷² for the joint venture, so that the joint venture can be successful.²⁷³

Antitrust issues may also arise with joint ventures. Some activities are unacceptable as they facilitate the entrance of a new competitor into the market in the form of two or more firms' collaboration where none would otherwise exist.²⁷⁴ Firms can attempt to exploit the flexible joint venture format in order to engage in collusive practices such as price fixing, output restriction, and monopoly-creating market

²⁷¹ Hsu (2004), *supra* note 270, at 1806.

²⁷² See Jensen & Meckling, *supra* note 22 (“[T]he problem of inducing an “agent” to behave as if he were maximizing the “principal’s” welfare is quite general. It exists in all organizations and in all cooperative efforts— at every level of management in firms, in universities, in mutual companies, in cooperatives, in governmental authorities and bureaus, in unions, and in relationships normally classified as agency relationships such as those common in the performing arts and the market for real estate. The development of theories to explain the form which agency costs take in each of these situations (where the contractual relations differ significantly), and how and why they are born will lead to a rich theory of organizations which is now lacking in economics and the social sciences generally.”); See also Hsu (2004), *supra* note 270 (“[B]y now the strategic and organizational benefits of inter-firm collaboration—extending reach to complementary assets, conserving resources, obtaining new competencies/learning—have been well-documented across a number of locations and industries (e.g., Hagedoorn, 1993; Gulati, 1998; Khanna, Gulati, and Nohria, 1998; Kale, Singh, and Perlmutter, 2000; Dyer, 2000). Scholars who have examined performance effects associated with cooperative commercialization in the context of start-ups have also documented beneficial effects (e.g., Stuart, Hoang, and Hybels, 1999; Stuart, 2000) while recognizing that the necessary network resources changes along with the development of the new venture (Hite and Hesterly, 2001).”).

²⁷³ See Hsu (2004), *supra* note 270. Moreover, the weakness of the financial markets, and the financing availability matters for the partnership. See Josh Lerner, Hilary Shane, & Alexander Tsai, *Do equity financing cycles matter? Evidence from biotechnology alliances*, 67 J. FIN. ECON. 411 (2003) (they found that in “periods characterized by diminished public market financing, small biotechnology firms appear to be more likely to fund R&D through alliances with major corporations rather than with internal funds (raised through the capital markets). Agreements signed during periods of limited external equity financing are more likely to assign the bulk of the control to the larger corporate partner, and are significantly less successful than other alliances. These agreements are also disproportionately likely to be renegotiated if financial market conditions subsequently improve.”).

²⁷⁴ Pitofsky, *supra* note 245.

division.²⁷⁵ These concerns should be addressed while firms decide on forming joint ventures. However, a complete discussion of such anti-trust concerns and considerations is outside the scope of this paper.

The joint venture investment model is not a new phenomenon.²⁷⁶ In fact, large corporations have already invested in high growth entrepreneurial companies in the early nineties, following the footsteps of the successful and long-established venture capitalists.²⁷⁷

The parties involved with the joint venture, for the sake of this paper's discussion, are the entrepreneurial firm and the established firm. The entrepreneurial firm will stand to gain from such collaboration for following reasons. The entrepreneurial firm can enjoy the benefits that the established U.S. firm brings to the venture, such as its reputation, credibility and financial stability.²⁷⁸ The capital that will be infused to the venture can be used for everything from marketing, distribution to facilities.²⁷⁹ The established firm also stands to benefit from the entrepreneur's research drive, technology and innovation (as noted earlier many large firms lack the innovation drive and capability).²⁸⁰

²⁷⁵ Lindsay, *supra* note 250, at 1166; *See also* Pitofsky, *supra* note 245.

²⁷⁶ *See also* McCahery, Vermeulen & Banks, *supra* note 27.

²⁷⁷ *Id.* ("multinationals established CVC divisions, usually as corporate subdivisions of the listed parent company with the instruction to take minority positions in strategic and financially attractive businesses.").

²⁷⁸ Wendy C. Shiba, *Comment: Representation of Joint Ventures: A Practical Perspective from in-House Counsel*, 53 CASE W. RES. 971 (2003).

²⁷⁹ *Id.*

²⁸⁰ *See also id.* (It should also be noted, that there are many current advocates for the movement of Collaborative Economy, such as Jeremiah Owyang, who listed on his web-site examples of companies that have harnessed Collaborative Economy devices in order to complement their business strategy of innovation, further information is available at: <http://www.web->

4. Corporate Venture Capital

In recent years, large firms have halted their research and development efforts due to short-termism and shareholder supremacy,²⁸¹ which has led to a revival in another alternative investment vehicle, referred to by economists as “corporate venture capital.”²⁸²

“Corporate venture capital” is used to describe an “investment of corporate funds directly in external start-up companies”, according to Chesbrough.²⁸³ He notes that this definition includes “investments made in start-ups that a company has already spun off as independent businesses.”²⁸⁴ What is the difference between alliances, such as the previously noted joint venture, and the corporate venture capital form? An alliance is a voluntary agreement between two or more independent firms that exchange and share resources (in order to co-develop, innovate, etc.) Whereas, the corporate venture capital

strategist.com/blog/2013/02/26/collaborative-economy-brand-edition/. Further discussion and research is needed on this topic.).

²⁸¹ Stout (Shareholder Value Myth), *supra* note 19, at 7 (“influential economic and legal experts are proposing alternative theories of the legal structure and economic purpose of public corporations that show how a relentless focus on raising the share price of individual firms may be not only misguided, but harmful to investors.”).

²⁸² See Mowery & Rosenberg, *supra* note 183.

²⁸³ See Henry W. Chesbrough, *Making Sense of Corporate Venture Capital*, 80 (3) Harvard Business Review (Magazine Article, March 2002), available at <https://hbr.org/2002/03/making-sense-of-corporate-venture-capital/ar/1>.

²⁸⁴ See *id.* (According to Chesbrough, “This definition excludes investments made through an external fund managed by a third party, even if the investment vehicle is funded by and specifically designed to meet the objectives of a single investing company. it also excludes investments that fall under the more general rubric of “corporate venturing”, for example, the funding of new internal ventures that while distinct from a company’s core business and granted some organizational autonomy remain legally part of the company.”).

vehicle is a minority equity investment (sponsorship) in an entrepreneurial firm by an established firm.²⁸⁵

Unfortunately, many of the corporate venture capital investment efforts in high growth companies usually end up in dissolution or failure,²⁸⁶ perhaps due to the significant differences between the corporate venture capital vehicle and the traditional venture capital.

First, and foremost, the venture capitalist manages her fund from a return-on-investment stance, whereas the corporate venture capital manager is required to successfully achieve a blend of financial and strategic goals.²⁸⁷ In the event that the corporation has difficulty with directing its corporate venture capitalists on the objectives of the potential investment (financial versus strategic goals), then the corporate venture capitalists will be inclined to not follow through and pull the plug on the investment.²⁸⁸ There is a difference between investment for financial purposes (as VC investors) or for strategic purpose (for example, in order to acquire a complementary technology).

²⁸⁵ See Gary Dushnitsky, Corporate Venture Capital in the 21st Century: An Integral Part of Firms' Innovation Toolkit, *in* THE OXFORD HANDBOOK OF VENTURE CAPITAL (Douglas Cumming ed., 2012) available at http://dushnitsky.com/uploads/2/7/8/3/2783896/dushnitsky_2012_oup_handbook_of_vc.pdf.

²⁸⁶ See also McCahery, Vermeulen & Banks, *supra* note 27.

²⁸⁷ Ernst & Young, Global corporate venture capital survey 2008-09, Benchmarking programs and practices, EY.COM (2009) available at [http://www.ey.com/Publication/vwLUAssets/SGM_VC_Global_corporate_survey_2008_2009/\\$FILE/SGM_VC_Global_corporate_survey_2008_2009.pdf](http://www.ey.com/Publication/vwLUAssets/SGM_VC_Global_corporate_survey_2008_2009/$FILE/SGM_VC_Global_corporate_survey_2008_2009.pdf).

²⁸⁸ CVCs, are more dependant on the ongoing sponsorship of their corporate owners, because the sponsors can abandon the CVC without due cause, and for reasons that are utterly removed from the operations of the CVC fund itself.; See, e.g., McCahery, Vermeulen & Banks, *supra* note 27 (when a multinational company had difficulty with establishing the objectives of the investment (financial versus strategic) and the success metrics, the management of the corporate venture capital pulled the plug on the initiative).

Additionally, corporate venture capitalists do not enjoy the same kind of longevity that venture capitalists enjoy; their lifespan is significantly shorter and much more volatile.²⁸⁹

Second, typically large corporations do not have the “venture-capital like” dedication to the portfolio companies, or the expertise to deal with such investment.²⁹⁰ According to an Ernst & Young study,²⁹¹ large corporations don’t select the investment opportunities alone, but rather piggyback and form syndicates with renowned venture capital funds in order to make such selections.²⁹²

Additionally, there is a negative spillover effect when the start-up firm in question has a competing (or adjacent) technology to the established firms.²⁹³ Empirically, in cases of direct competition between the startup and the corporate venture capital firm, the start-up retains more board seats for itself and is reluctant to award board power to the investors.²⁹⁴ Strategically, however, corporate venture capital investors are more interested in investing in competing technologies, even though the corporate venture

²⁸⁹ See McCahery, Vermeulen & Banks, *supra* note 27.

²⁹⁰ *Id.* (“investing in risky businesses and high-growth companies does not belong to a multinational’s core business.”).

²⁹¹ See Ernst & Young, *supra* note 287 (“Our respondents’ preferred method of investing is through a syndicate with an independent VC leading the deal and doing much of the leg work. Where this is not possible, the next options are either to lead a syndicate with independent VC members or to invest fully on an individual basis.”).

²⁹² *Id.*

²⁹³ See also, McCahery, Vermeulen & Banks, *supra* note 27.

²⁹⁴ Ronald W. Masulis & Rajarishi Nahata, *Financial Contracting with Strategic Investor: Evidence from Corporate Venture Capital Backed IPOs*, 18 J. FIN. INTERMEDIATION 599-631 (2009) (“start-up insiders commonly limit the influence of competitive CVCs, awarding them lower board power, while retaining higher board representation for themselves.”); See also, McCahery, Vermeulen & Banks, *supra* note 27 (when observing cases of direct competition between the start-up and the corporate venture capital investor, there is a higher pre-money valuation due to a fear of opportunistic behavior of the part of the corporate venture capital investors. As a result, a lower number of preferred shares are issues because the syndicates had to accept a higher price per share.).

capital will conceivably be more successful with investments in complementary technologies.²⁹⁵

Third, there is a difference in governance and incentive systems between the corporate venture capital vehicle, which does not have the compensation systems or the efficient governance structures to incentivize its division managers to act and maximize profits,²⁹⁶ and the venture capital vehicle, which gives incentives to its managers and has built in governance mechanisms. The decision to use a subsidiary structure for the corporate venture capital, rather than the limited partnership (which is used by traditional venture capital) makes a significant difference.²⁹⁷ General partners in a (venture capital) limited partnership usually have an incentive to act, whereas managers of a subsidiary (of the corporate venture capital) are characterized by risk-averse behavior.²⁹⁸ A contributing factor is the manager performance fees. Venture capitalists are experts in tying a manager's salary to her performance,²⁹⁹ whereas the corporate venture capitalists do not tie the manager's performance to her salary (instead the manager fee is included in the corporate fee-structure plans).³⁰⁰

²⁹⁵ See McCahery, Vermeulen & Banks, *supra* note 27.

²⁹⁶ *Id.*

²⁹⁷ *Id.*

²⁹⁸ Additionally, if we look at the inherent agency problems between institutional investors and the limited partnership's management, the limited partnerships are able to mitigate such agency problems, by using provisions in the limited partnership agreements that contain assignment of rights and responsibilities for a period of approximately ten years; See also McCahery, Vermeulen & Banks, *supra* note 27.

²⁹⁹ By frequently offering 1-2% fixed fees plus 20% fund profits. See *id.*

³⁰⁰ According to McCahery, Vermeulen and Banks, for this reason, top fund management talent is repeatedly recruited to profitable VC funds and away from successful CVC funds. See *id.*

Fourth, investment strategies differ between corporate and traditional venture capital funds, in regards to specialization, diversification and timing. Corporate venture capital funds are less diversified and encompass a much more narrow ground of operation (specialization), as their fields are essentially determined by the parent company's operations.³⁰¹ Corporate venture capitalists tend to invest in later financing rounds, which is often too late in the game. If, for any reason, the corporate venture capital fund decides not to partake in subsequent financing rounds, they can transform their investment from a strategic participation into a mere financial investment. The existence of "pay-to-play provisions" (provisions that punish investors that do not participate in their full pro-rata percentage of the financing) could oblige the corporate venture capital fund to convert their preferred shares into common shares, essentially forfeiting their privileges.³⁰²

Despite these challenges to corporate venture capital investors, it seems that established U.S. and foreign investors are continuously acquiring more startup firms. Economists Mowery and Rosenberg are concerned with this development and argue further that changes in public policy environment in the United States will diminish the role of entrepreneurial startup firms and their formation may be reduced in the future.³⁰³

³⁰¹ Additionally, unlike VCs, CVCs managers sometimes don't allow entrepreneurs to use their preferred IPO exit, but rather the managers control the terms of the exit strategy by using the drag-along and redemption. According to McCahery, Vermeulen and Banks, the evidence confirms that VC investment returns tend to be higher than those of CVC funds. *See id.* ("A CVC manager has less freedom and the fund is much less diversified as a result.").

³⁰² *See id.*

³⁰³ *See Mowery & Rosenberg, supra note 183.*

It is time therefore for the government (federal, state and local) to step on the gas in order to prevent entrepreneurial relocation and to make an effort to start the innovation market in local communities around the U.S.³⁰⁴

³⁰⁴ See Ibrahim (2010), *supra* note 198; See also Russell Nichols, *State Governments: The Latest Venture Capitalists - With venture capital firms scaling back, state governments are stepping in to fund early-state, high-risk startups*, GOVERNING MAGAZINE (March 2011), available at <http://www.governing.com/topics/economic-dev/State-Governments-Latest-Venture-Capitalists.html>.

IV. THE GOVERNMENT AS A MARKET PARTICIPANT

A. *The Debate Concerning Government Intervention*

The U.S. has a long history of conflict with regard to the national policy and political structure concerning the government's development efforts. The conflict can be traced to the times of the beginning of the Republic,³⁰⁵ to the difference in philosophy between founding fathers Alexander Hamilton and Thomas Jefferson. According to legal scholar Hockett,³⁰⁶ Jefferson³⁰⁷ suggested that governments work best when they govern the least (favoring the non-interventionist government), while Hamilton³⁰⁸ advocated for a strong centralized government with powers to work for the common benefit of all (favoring the interventionist government).

³⁰⁵ See Robert C. Hockett, *A Jeffersonian Republic by Hamiltonian Means: Values, Constraints & Finance in an Authentic American "Ownership Society"*, 32 CORNELL LAW FORUM 2 (2005) [hereinafter: Hockett (Jeffersonian Republic)]; See also Robert C. Hockett, *Whose Ownership? Which Society?*, 27 CARDOZO L. REV. 1 (2005); See also Robert C. Hockett, *A Jeffersonian Republic by Hamiltonian Means: Values, Constraints, and Finance in the Design of a Comprehensive and Contemporary American "Ownership Society"*, 79 S. CAL. L. REV. 45 (2005); See also Alexander Hamilton, *Report on the Subject of Manufactures*, in Hamilton Writings, op. cit., at 647-734 (2001) (the report presented validations for the encouragement of domestic manufacturing and made explicit plans for government action.).

³⁰⁶ See Hockett (Jeffersonian Republic), *supra* note 305 (According to Hockett, there are fundamental differences in economic philosophies of the founding fathers, as follows: Jefferson suggested that governments work best when they govern the least, while Hamilton advocated for a strong centralized government with powers to work for the common benefit of all.).

³⁰⁷ See *id.* (According to Hockett, Thomas Jefferson was a member of the Southern planter aristocracy, and as a result was somewhat prejudiced towards the "yeoman republic". Jefferson was suspicious of a central government and objected to the idea of heavy industry and over-crowded large cities, while aspiring to a civic republic comprised of small landowners, who contracted using common-interest agreements via mutual discourse.)

³⁰⁸ See *id.* (According to Hockett, Hamilton envisioned a meritocratic republic, such as the one in which Hamilton himself had flourished and thrived in. The foundation for a national supremacy should be a strong, industrialized economy, where the nation can produce its own goods.)

Block claims that this tension was resolved fairly³⁰⁹ in the twentieth century, when developmental policies were formed within the context of national defense.³¹⁰ Hockett argues that the U.S. has advanced to integrate the ideals of both founders.³¹¹ For the purposes of this paper, the result of such integration is embedded in the grants and funds that were invested by the U.S. government in countless advanced technologies, such as jet planes, computers, lasers, civilian nuclear energy, and biotechnology.³¹²

However, there is still public debate concerning the role of the government in relation to the market. There are three ways to describe that role. First, there is a “supervisory”³¹³ view of the government, which differentiates between the government and the market, and separates between the public and private spheres.³¹⁴ Government interventions accordingly are considered exogenous, because the government is changing the ordinary “way of things.”³¹⁵

³⁰⁹ It should be noted that politically the debate is still ongoing in the U.S. with Republicans saying they want to do away with big government and Democrats wishing for big government.

³¹⁰ See Block, *supra* note 7, at 6.

³¹¹ See Hockett (Jeffersonian Republic), *supra* note 305.

³¹² See Block, *supra* note 7, at 6 (according to Block, following World War II, the Pentagon worked intimately and cooperated with other national security agencies such as the atomic Energy Commission and the National Aeronautics and Space Agency (NASA), and such cooperation and funding had a key role in developing these technologies.).

³¹³ See Hockett & Omarova, *supra* note 33 (the term was introduced by Hockett & Omarova).

³¹⁴ See Hockett & Omarova, *supra* note 33 (“Governments in this sense taken for “external” to markets, while “we,” the public – for unexplained reasons categorically distinguished from “our” government – are counted as “internal” to the practices of market exchange. Call this “supervisory,” or “dues ex machina” view of government in its relation to markets.”).

³¹⁵ *Id.* (“[g]overnments “step in” from the “outside”).

Second, there is a “constitutive” or “foundational” view, by which governments are “internal” to and even create the markets by developing the “rules of the game.”³¹⁶ According to this view, the law is “foundational” to operating markets, and the market performance is actually enhanced when regulated by the law.³¹⁷

The third is a view of the government’s role as a “marker actor.”³¹⁸ According to legal scholars Hockett and Omarova this view is often overlooked.³¹⁹ When the government acts as a market participant, it does so, “for public rather than private ends,” and in doing so, it defies the “venerable but misleading” separation between the private and public spheres.³²⁰ Our society perhaps allows the government to act as a market participant, because the government is able to have more effect (influence) on the market than private parties.³²¹

There are four recurring types of government participation (intervention) in private markets (for public ends), according to Hockett and Omarova: “market-

³¹⁶ *Id.* (these rules “even define markets from the “ground up.”).

³¹⁷ *Id.*

³¹⁸ *Id.* (“In this capacity, governments act much as private actors do in particular markets. They employ the same means toward their ends. They do so, however, for public rather than private ends, thereby defying, in limited ways, such venerable but misleading dichotomies as the “public/private” divide.”).

³¹⁹ *Id.*

³²⁰ *Id.* (“In this capacity, governments act much as private actors do in particular markets. They employ the same means toward their ends. They do so, however, for public rather than private ends, thereby defying, in limited ways, such venerable but misleading dichotomies as the “public/private” divide.”).

³²¹ *Id.* (“[t]hey do so, moreover, with greater influence than private parties are typically able – or permitted – to bring to bear. And we permit our government this form of market power, in turn, precisely because it is public rather than private power – power wielded on behalf of and in the name of us all.”).

making,”³²² “market-moving,”³²³ “market-levering,”³²⁴ and “market-preserving.”³²⁵ This paper will review these types and will illuminate the “market-acting role” of the US government. The notion of the United States government acting as a catalyst or even a venture capitalist is not a novel one. Throughout United States history, governments have played the role of venture capitalists, at the State and local levels, and even at the Federal level, suggesting that public intervention in the market is acceptable and perhaps even necessary.³²⁶

B. The Distant History of the United States Government as a Market Participant

A nation’s innovative system has a tendency to mirror its deliberate determination to maintain and expand its’ economic strength.³²⁷ This part provides a historic-doctrinal

³²² *Id.* (“market-making” means “government’s playing a particular risk-bearing role that private actors themselves sometimes but not always are able to play either (a) makes a publicly beneficial market possible, or (b) facilitates an incipient such market’s growth to critical mass.”).

³²³ *Id.* (“market-moving” means “government action affects certain market prices in certain publicly beneficial ways that we cannot ordinarily trust profit-driven private actors to pursue.”).

³²⁴ *Id.* (“market-levering” means “government action enables existing private markets to do better, or to do more of, what they already do in more limited or otherwise suboptimal manners.”).

³²⁵ *Id.* (“market-preserving” means “government action- typically temporary and only in extremis – prevents complete liquidation or collapse of a normally well-functioning market whose collapse would impose negative externalities.”).

³²⁶ *See* Lerner (Boulevard of Broken Dreams), *supra* note 38, at viii.

³²⁷ Scholars found that the national security concerns of the nations had been central in shaping their innovation systems; *See* Nelson, *supra* note 126, at 508; *See also*, PETER DRUCKER, INNOVATION AND ENTREPRENEURSHIP 257 (Harper & Row 1985) (“There must be an economy full of innovators and entrepreneurs, with entrepreneurial vision and entrepreneurial values, with access to venture capital, and filled with entrepreneurial vigor.”).

review of the processes that shaped the U.S. national innovation system, focusing on the role of the U.S. government as a “market actor.”³²⁸

1. The Declaration of Independence

In the course of gaining its independence, the United States government was also able to establish institutional support, by which ingenuity could thrive.³²⁹ There were several factors that contributed to changes in the innovation market during the period of independence. This paper will address the following two. First and foremost, was the United States Constitution, which instituted far-reaching changes and guaranteed an internal joint market, allowing residential entrepreneurial ventures to expand and supply the national market.³³⁰

³²⁸ See Hockett & Omarova, *supra* note 33. (“In this capacity, governments act much as private actors do in particular markets. They employ the same means toward their ends. They do so, however, for public rather than private ends, thereby defying, in limited ways, such venerable but misleading dichotomies as the “public/private” divide.”). It should also be noted that President Obama’s administration has taken interest in government-facilitated multi-stakeholder processes with regards to the Internet. See Internet Task Force, U.S. DEP’T OF COMMERCE, Green Paper, Commercial Data Privacy and Innovation in the Internet Economy (2010) available at <http://www.commerce.gov/sites/default/files/documents/2010/december/iptf-privacy-green-paper.pdf> (“The United States has developed a model that facilitates transparency, promotes cooperation, and strengthens multi-stakeholder governance that has allowed innovation to flourish while building trust and protecting a broad array of other rights and interests.”); See also Marc Berejka, *The 11th Annual Digital Broadband Migration: Symposium: The Dynamics of Disruptive Innovation: A Case for Government Promoted Multi-Stakeholderism*, 10 J. TELECOMM. & HIGH TECH. L. 1 (2012).

³²⁹ Louis P. Cain, *Entrepreneurship in the Antebellum United States*, in DAVID LANDES, JOEL MOKYR & WILLIAM BAUMOL, *THE INVENTION OF ENTERPRISE - ENTREPRENEURSHIP FROM ANCIENT MESOPOTAMIA TO MODERN TIMES* 331 (2010) (“There was general agreement among the new country’s leaders that the national government was not functioning efficiently under the Articles of Confederation, so a constitutional federal system was introduced relatively quickly.”).

³³⁰ *Id.* (“The representatives of the individual states conscientiously guarded their powers and, in Article I, Section 8, relinquished to the federal government only those rights they believed were essential. Article I, Section 10, restricts individual state’s dealing with foreign powers and prohibits the creation of state paper money. It included the famed contract clause that establishes the sanctity of contract, the deliberate protection of property rights, and the equally famed commerce clause that prohibits restrictions on interstate commerce.”).

Another important evolution and invention during that period was patent law, as noted by the historian Steven Lubar “[n]ineteenth-century patent law embodied a delicate balance of monopoly, to encourage invention; the dissemination of new ideas, to encourage the increase of knowledge; and ease of use of patents, to encourage innovation.”³³¹

2. The period between 1865 and 1920

During the period between 1865 and 1920, the State governments (rather than the Federal) had an active role in subsidizing transportation, making western lands accessible to those who wanted to develop them, mapping the location of raw material properties and financing education (and institutions) in order to supply technological knowledge, according to economic historian Lamoreaux.³³² During that period, holders of intellectual property enjoyed strong protection, provided by the US patent laws. In addition to the modest cost protection, the creation of a strong patent law system helped to spread the vast information of novel technologies.³³³

An additional important development during that period was the establishment of the National Banking System. By creating the National Banking System, the Federal

³³¹ Steven Lubar, *The Transformation of Antebellum Patent Law*, 32 (4) Tech. & Culture 934 (1991); See also Cain, *supra* note 329, at 331.

³³² Naomi R. Lamoreaux, *Entrepreneurship in the United States, 1865-1920*, in DAVID LANDES, JOEL MOKYR & WILLIAM BAUMOL, *THE INVENTION OF ENTERPRISE - ENTREPRENEURSHIP FROM ANCIENT MESOPOTAMIA TO MODERN TIMES* 391-2 (2010) (according to Lamoreaux, state and local governments, from approximately 1865-1920, played a more dynamic part in the economy, but even at those levels, governments mainly got involved in ways that improved the security and transparency of economic transactions. That policy changed only with the rise of big business, when governments started taking a considerable regulatory function – first at the state level and then at the federal level.).

³³³ *Id.*

government succeeded in instituting a standardized national currency that decreased transactions costs in interregional trade.³³⁴ Despite the fact that at that period the National Banking System had some wretched consequences that enhanced economic uncertainty,³³⁵ the end result of creating a national standardized currency was overall beneficial.

3. The Rise of Large, Vertically Integrated American Corporations

The market economy in the twentieth century in the United States has classically been characterized as the “harnessing of technology by entrepreneurs working for large vertically integrated American corporation”, according to historian Graham “at first as a wholly private sector phenomenon, and then in cooperation with an increasingly interventionist federal government.”³³⁶

Graham divided that period into three different parts with respect to entrepreneurship.³³⁷ The first, characterized as the fiscally frenzied interwar period, covers the years of 1920 to 1941.³³⁸ According to Graham, the U.S. government tried to push for productivity and supplied many opportunities in the fast-growing industries.³³⁹ However, this development was followed by a rapid downfall of the numerous new

³³⁴ *Id.*

³³⁵ *Id.*

³³⁶ Margaret B.W. Graham, *Entrepreneurship in the United States, 1920-2000*, in DAVID LANDES, JOEL MOKYR & WILLIAM BAUMOL, *THE INVENTION OF ENTERPRISE - ENTREPRENEURSHIP FROM ANCIENT MESOPOTAMIA TO MODERN TIMES* (2010).

³³⁷ *Id.*, at 404.

³³⁸ *See id.* (according to Graham, this era is characterized by a search for economic self-regulation).

³³⁹ *See id.*

companies prior to and throughout the Great Depression. The era ended with the U.S. entering into World War II.³⁴⁰

The second period covers the years between 1941 until 1974, from World War II until the commencement of a lengthy phase of inflation, which began with the Vietnam War.³⁴¹ According to Graham, during that period, large corporations did not regard innovation as a high priority. Moreover, innovation was unsolicited and unwelcomed in various sectors of the U.S. industry, excluding areas selected for “high-tech” businesses, which were desirable to the U.S. military advancements, and were at times crossovers that could commercialize technology that was initially developed for military purposes for civil products.³⁴²

The third period, between 1975 and 2000, is sometimes referred to as the third industrial revolution.³⁴³ This period is distinguished from the previous two due to the combination of the information revolution and globalization trends.³⁴⁴ It began with a period of stagflation and was perpetuated by the U.S. financial institutions’ insurgency.³⁴⁵ It concluded in a sequence of financial bubbles and the collapse of the

³⁴⁰ *Id.*

³⁴¹ *Id.*

³⁴² *See id.* (according to Graham, there was constant national mobilization during that era; however, there was fairly stagnant economic equilibrium, highlighting optimization).

³⁴³ *See id.*

³⁴⁴ *Id.*

³⁴⁵ *Id.*

telecommunications industry and the dot-com craze.³⁴⁶ The following are examples of successful government intervention in the market during this period.

a. Advanced Projects Research Agency (ARPA)

The Advanced Projects Research Agency (ARPA) example is an illustration of a successful intervention of a U.S. government policy during the 1960s, which was responsible for the invention of the Internet.³⁴⁷ The Pentagon created the ARPA in order to provide funding for technologies following the Soviet Success with Sputnik.³⁴⁸

The initiatives of ARPA computer offices cultivated a diverse and distinct government model that funded research. It took a proactive approach to innovation, in stark contrast to other federal agencies, which were generally reactive. It was highly active in determining the course of the research.³⁴⁹ Its goal was to generate a scientific community in order to focus on specific technological challenges, with audiences in the public sector, universities and private corporations.³⁵⁰ ARPA operated small offices

³⁴⁶ *Id.*

³⁴⁷ *See id.*; *See also* Block, *supra* note 7 (according to Block, in 1962, ARPA's Information Processing Techniques Office (IPTO) was originally established, and played a central role in the development of computer science. IPTO granted funds to establish computer science departments at major universities and financed a series of research project that successfully pushed forward developments in human-computer interface.).

³⁴⁸ *See* Block, *supra* note 7, at 7.

³⁴⁹ *See id.* (According to Block, "ARPA did not leave most of the initiative in the hands of the research community, therefore, it's policy was different from other federal agencies, such as the National Science Foundation, which relied on peer review of research proposals.").

³⁵⁰ *Id.*

staffed with top engineers and scientists, who were given extensive budget autonomy to sponsor promising ideas.³⁵¹

ARPA did not draw a line between “basic research” and “applied research.”³⁵² Funding was granted to various groups such as start-up firms, university-based researchers, and industry syndicates.³⁵³ In order to prevent abuse or waste, ARPA staff transferred resources from unproductive groups to more promising, productive and profitable ones.³⁵⁴

APRA provided firms with venture capital-like services including mentoring, strategic planning, technological and business brokering services.³⁵⁵ It assisted firms in reaching the phase of commercial capability.³⁵⁶ It made cooperative connections among resources, ideas and people from diverse development and research sites, which is an essential component to this paper’s proposed “Coalition” model.³⁵⁷

The government played the crucial role of a “market-maker,”³⁵⁸ as it took the risk-bearing role (that private actors during that period were not able to play) and essentially made the high technology world and Internet that we know and use today possible.

³⁵¹ *Id.*

³⁵² *Id.* at 8.

³⁵³ *Id.*

³⁵⁴ *Id.* (according to Block, ARPA employed visionary and creative technologists and gave them the autonomy to grant research funds).

³⁵⁵ *Id.*

³⁵⁶ *Id.*

³⁵⁷ *Id.*

³⁵⁸ *See* Hockett & Omarova, *supra* note 33 (according to Hockett & Omarova, “market-making” means “government’s playing a particular risk-bearing role that private actors themselves sometimes but not

b. The Small Business Innovation Research (SBIR) Program

The Small Business Innovation Research (SBIR) program is another example of successful government intervention in the market via the creation of legislation aimed at stimulate (“market-moving” and “market leveraging”) an existing market or even start a “market-making.”³⁵⁹ It is also a leading example of a United States public-private partnership that stimulates innovative new technologies.³⁶⁰

The SBIR program was founded in 1982, and was intended³⁶¹ to encourage “small businesses”³⁶² to develop new products and processes as well as present valuable research

always are able to play either (a) makes a publicly beneficial market possible, or (b) facilitates an incipient such market’s growth to critical mass.”).

³⁵⁹ There is a long list of important federal legislation concerning innovation Bayh-Dole Act, Pub. L. No. 96-517, 94 Stat. 3015-28 (codified as amended at 35 U.S.C. §§200-201 (2000 & Supp. II 2002)); Stevenson-Wydler Technology Innovation Act of 1980, 15 U.S.C. § 3701 (1980); Small Business Innovation Development Act of 1982, 15 U.S.C. § 638 (2006); National Cooperative Research Act, Pub. L. No. 98-462, 98 Stat. 1815 (1984) (codified at 15 U.S.C. §§ 4301-05); NSF Establishes Program for Engineering Research Centers (1985); Small Business Technology Transfer Act of 1992, Pub. L. No. 102-564, 106 Stat. 4249 (codified as amended 15 U.S.C. § 638 (2006)); Department of Commerce Advanced Technology Program (ATP) (1988); Manufacturing Extension Program (1988); Defense Industrial and Technology Base Initiative (1991); High Performance Computing Act of 1991, Pub. L. No. 102-194, § 102, 105 Stat. 1495, 1598-99 (codified at 15 U.S.C. § 5512) (1991); Small Business Research and Development Enhancement Act of 1992, 15 U.S.C. § 638 (1992). For further details on this legislation *see* Block, *supra* note 7, at 11-2.

³⁶⁰ *See* CHARLES WESSNER, SBIR AND THE PHASE III CHALLENGE OF COMMERCIALIZATION: REPORT OF A SYMPOSIUM (National Academics Press 2007), *available at* http://www.nap.edu/openbook.php?record_id=11851&page=10 [hereinafter SBIR and the Phase III Challenge] (according to Wessner, “[c]ommercializing SBIR-funded technologies though federal procurement is no less challenging for innovative small companies. Finding private sources of funding to further develop even successful SBIR Phase II projects—those innovations that have demonstrated technical and commercial feasibility—is often difficult because the eventual “market” for products is unlikely to be large enough to attract private venture funding. As Mark Redding of Impact Technologies noted at the conference, venture capitalists tend to avoid funding firms focused on government contracts citing higher costs, regulatory burdens, and limited markets associated with government contracting.”).

³⁶¹ SBIR ,SBIR Mission and Program Goals, SBIR/STTR, *available at* <http://www.sbir.gov/about/about-sbir> (The following are the programs objectives: “Stimulate technological innovation; Meet Federal research and development needs; Foster and encourage participation in innovation and entrepreneurship by socially and economically disadvantaged persons; and Increase private-sector commercialization of innovations derived from Federal research and development funding.”).

for the nation's research and development efforts.³⁶³ The program mandates the 11 federal agencies (with extramural research budgets in excess of \$100 million) to allocate a certain percentage³⁶⁴ of their total extramural research and development budgets for grants or contracts to small businesses³⁶⁵ conducting research and development that have commercialization potential and meet the needs of the United States Government.³⁶⁶

The SBIR program continues to play an important strategic role in the United States' innovation efforts. In the words of its founder Roland Tibbetts, "[t]he US leads the world in three areas important to economic growth - basic research, small high tech firms and venture capital. SBIR pulls them together."³⁶⁷ There are many examples of successful companies that received early-stage financing from SBIC, such as Symantec, DaVinci, Qualcomm and iRobot.

³⁶² "Small businesses" for the purpose of the Act are businesses with less than 500 people.

³⁶³ See Wessner (SBIR and the Phase III Challenge), *supra* note 360 ("SBIR grants and contracts are intended to stimulate innovative new technologies to help agencies meet the specific research and development needs of the nation.")

³⁶⁴ For example, 2.8% of such budget in 2014.

³⁶⁵ It should be noted that the SBIR does not fund 'Phase III' innovation, which is a stage of development when the company and technology is expected to obtain private funding or government contracts. Instead, funding is targeted to the pre-commercial stage of technology development.; See Matthew R. Keller & Fred Block, *Explaining the transformation in the US innovation system: the impact of a small government program*, 11 SOCIOECON. REV. 629 (2013), available at <http://ser.oxfordjournals.org/content/11/4/629> ("Initially, the program provided up to \$50,000 (now \$150,000 under the 2011 authorization) in 'Phase I' support – generally up to 6 months – to 'explore (sic) the technical merit or feasibility of an idea or technology.' Phase I awardees could subsequently apply for up to \$500,000 (now \$1,000,000) of 'Phase II' funding – generally up to 2 years of work – during which 'R&D work is performed and the developer evaluates commercialization potential.'").

³⁶⁶ This program facilitates the award of approximately \$2.5 billion every year.; See Keller & Block, *supra* note 365(the federal agencies "were given considerable leeway to determine how they met their obligations under the Act; they could provide funds as grants or contracts and they could solicit proposals with narrow or broad specifications of relevant research.").

³⁶⁷ See SBIR, *supra* note 361.

Participation in the SBIR program affords many benefits (in addition to funding) including advanced networking and protection of intellectual property. Participants in the program “get preferential access to federal procurement opportunities.”³⁶⁸ There are protections for participating companies in the program (who do not yet have patent rights), which protect their innovative ideas from theft by competitors or peer reviewers.³⁶⁹ It should be noted that the government (for a fee) has the right to license the technology of the small company that participates in the SBIR program. However, the technology itself remains property of the company.³⁷⁰

There are several events and legislations that contributed to the establishment of the SBIR program. In 1958, the Small Business Investment Companies (SBICs) Act³⁷¹ was enacted in order to offer matching federal funds for private investment (it was used by individual angels in order to fund innovation).³⁷² In 1977, the United States National Science Foundation (NSF) responded to various processes in the market and shifted its policy, from focusing on research and sciences to establishing a pilot, the SBIR program,

³⁶⁸ See Keller & Block, *supra* note 365 (“agencies that engage in substantial procurement, such as the Department of Defense (DOD), would expect to purchase successful technologies, or link them to projects pursued by prime contractors. SBIR legislation fostered such relationships by providing awardees with preferential access to federal procurement opportunities.”).

³⁶⁹ See *id.* (“These protections helped to assure small firms that peer reviewers and potential competitors such as prime defense contractors would be less inclined to ‘borrow’ ideas from firms that have not yet obtained patents (Wessner 2007, 2008).”); See also Wessner (SBIR and the Phase III Challenge), *supra* note 360.

³⁷⁰ See Keller & Block, *supra* note 365.

³⁷¹ Small Business Investment Companies Act of 1958, ch. 14A, 72 Stat. 384 (codified as amended at 15 U.S.C. §§ 681-687h (1958)).

³⁷² SBIC was used by individual angels in order to fund innovation. See Ibrahim (2010), *supra* note 198, at 741.

which was designed to encourage small firms to develop their ideas and innovations into products and processes.³⁷³

The NSF's SBIR initiative was a response to the following factors and events. First, in the late 1970s, the American economy suffered through two oil supply shocks, recessions, rising prices, and stagnant productivity, in addition to facing rising international competition from Japan and Germany.³⁷⁴ These economic crises and challenges invoked a nationwide reaction and established novel public policies, which centered on long-standing productivity growth.³⁷⁵

Second, there was an increase in appreciation of the fact that small firms drive innovation.³⁷⁶ Third, there were constant deliberations within the Executive Branch on how to encourage innovation and stimulate the United States market³⁷⁷ due to concerns about a diminishing competitiveness of the United States (during the period of stagflation).³⁷⁸

³⁷³ See Keller & Block, *supra* note 365 (according to Keller & Block, "NSF had traditionally focused on academic science and engineering research, and the pilot program represented a significant shift.").

³⁷⁴ See Hughes, *supra* note 7.

³⁷⁵ *Id.* at 2.

³⁷⁶ See Keller & Block, *supra* note 365.

³⁷⁷ *Id.* ("As early as the Nixon Administration, there was recognition of the urgency of capitalizing on US technological leadership to strengthen competitiveness. Hurt (2011) shows that many ideas about the use of public-private partnerships to facilitate technology development emerged in a comprehensive review carried out by the Nixon Administration, but they were not implemented when the Administration was overcome by Watergate.").

³⁷⁸ *Id.* ("these ideas re-emerged during the Carter Administration in the Domestic Policy Review on Industrial Innovation that was itself a response to concerns about declining US competitiveness (Turned 2006). Headed by Jordan Baruch, Assistant Secretary of Commerce, the review began in 1978 and culminated in a series of Industrial Innovation Initiatives Proposed by Carter in October, 1979. Two immediate results of the effort were the passage by Congress in 1980 of the Stevenson-Wydler Technology Innovation Act and the Bayh-Dole Act. Stevenson-Wydler authorized Commerce and NFS to create Centers for Industrial Technology and to promote cooperative research between corporations and publicly

The pilot program was very successful, and during the 1980s the United States Congress passed several laws that allowed the NSF to institute the SBIR program. The first legislation was the Bayh-Dole Act (1980),³⁷⁹ which allowed scientists, for the first time, to keep the intellectual property rights of innovation that was developed from federal funds. Scientists who received funds from the federal government to conduct research could form new startup firms that could profit from discoveries that arose from the federally funded research and even own the intellectual property. In that way the Bayh-Dole Act encouraged startup formation.³⁸⁰

The second legislation was the Stevenson-Wydler Technology Innovation Act (1980),³⁸¹ which was the first technology transfer law. It was enacted in order to improve and develop cooperative research between publicly funded entities and corporations, by requiring federal laboratories to actively engage in technology transfer.³⁸² It allowed

funded entities.”); *See also* James Turner, *The Next Innovation Revolution: Laying the Groundwork for the United States*, 1 INNOVATIONS: TECH., GOVERNANCE, & GLOBALIZATION 123-144 (2006).

³⁷⁹ Bayh-Dole Act, *supra* note 359.

³⁸⁰ While the SBIR provided a flow of government dollars to support startups, the legislation of the Bayh-Dole Act, actually encouraged startup formation. The Bayh-Dole Act authorized university-based scientists to form new startup firms that can exploit the discoveries that transpired from the federally funded research, while their startup company would own the intellectual property; *See* Keller & Block, *supra* note 365 (“Parallel efforts were designed to shift the focus of scientists and engineers at government laboratories toward technologies with commercial potential. If these efforts were successful, SBIR would be a source of funding.”).

³⁸¹ Federal Technology Act of 1986, Pub. L. No. 99-502, 100 Stat. 1785 (codified as amended at 15 U.S.C. § 3710c (1989)).

³⁸² The Stevenson-Wydler Technology Innovation Act compels federal laboratories to set apart a certain percentage of the laboratory budget exclusively for technology transfer activities. Stevenson-Wydler Act, *supra* note 359.

federal laboratories to transfer technology to nonfederal entities easily. It also authorized the NSF to create Centers for Industrial Technology.³⁸³

The third legislation was the Small Innovation Development Act (1982),³⁸⁴ which recommended and then formed the SBIR (then NSF pilot) program. It also called for larger federal backing for small innovative firms.³⁸⁵

The fourth legislation was the Small Business Technology Transfer (STTR) Act,³⁸⁶ which was created in order to enhance collaboration between small firms and a university or federal laboratory.

In the past, the tone from other (than NSF) federal agencies towards the SBIR was hostile. According to Keller & Block, “[a]dministrators saw it as a tax on research funds; it reduced their discretion and added considerable costs of screening applications and contracting with multiple small firms since the legislation provided no funds to cover administration.”³⁸⁷

Nevertheless, federal agencies changed their attitude towards SBIR (especially ones that were directly involved with the programs). Thanks to the successful SBIR program, officials quickly learned that “small firms were often able to deliver new

³⁸³ See Keller & Block, *supra* note 365 (“This recommendation was implemented in 1982, under Roland Reagan, when the Small Innovation Development Act was signed into law. The legislation had bipartisan support, but Senator Kennedy played a central role in marshalling it through the Senate (Obermayer 2009).”); See also Arthur Obermayers, *Senator Ted Kennedy’s Role in the Birth of the Small Business Innovation Research Program* (Aug. 28, 2009) available at http://www.zyn.com/sbir/Kennedy_&_SBIR.pdf.

³⁸⁴ Small Business Innovation Development Act, *supra* note 359.

³⁸⁵ *Id.*

³⁸⁶ Small Business Technology Transfer Act, *supra* note 359. The STTR provides aid to collaborations between a university or federal lab and a small firm.

³⁸⁷ See Keller & Block, *supra* note 365, at 7.

capabilities, more quickly than large, established contractors which tended to be slower and more bureaucratic.”³⁸⁸

To sum up, according to economists Keller and Block,³⁸⁹ this small government program (SBIR) played a central role³⁹⁰ in revolutionizing of the role of innovation in the United States economy via four distinctive mechanisms: encouraging engineers and scientists to become entrepreneurs; direct funding; signaling opportunities for private investors (and certification); and creating pathways to government procurement.³⁹¹

SBIR was a federal government initiative that changed the United States innovation system during the 1980s. Federal, state and local government initiatives influenced innovation and development efforts in states such as Massachusetts and California.

4. Regional Clusters and a Shift in United States Business Firms’ Growth From Patterns of Vertical Corporate Development (Route 128) Towards a Network of Organizations (Silicon Valley)

When one thinks about innovation and entrepreneurship in the U.S. context, “Silicon Valley”³⁹² and “Route 128”³⁹³ immediately come to mind.³⁹⁴ There are various

³⁸⁸ *See id.*

³⁸⁹ *See id.* (They suggest the term “social resonance” in order to show “how even small government programs can play an important role in altering large scale institutional dynamics.”)

³⁹⁰ *See id.* (Keller & Block propose the term “social resonance” to capture the catalytic role that the SBIR, a government program, played given the right circumstances).

³⁹¹ *See id.*

³⁹² The term “Silicon Valley” is credited to Ralph Vaerst, who coined it in 1971. Its first published use is attributed to Don Hoefler. The “Silicon” piece of the term refers to the large concentration in the area of semiconductor companies (silicon is used to make the majority of semiconductors) and computer

theories that attempt to explain the ways in which Route 128 and Silicon Valley were established.³⁹⁵ This paper suggests that it was an assortment of events and processes that perhaps caused the emergence of industrial districts around U.S. universities, which originated both in Silicon Valley and Route 128. Stanford University and the Harvard / MIT complex provided the respective nuclei around which each district grew.³⁹⁶

In assessing the technology sector and trying to understand the creation of technology regions, a lot of research³⁹⁷ is aimed at trying to answer the following questions. Why do certain technology firms gravitate to a certain region, such as Silicon Valley and how do some manage to flourish even when economic hardships hits and other regions, while others fail?

The creation of technology hubs, as described in the work of information scholar AnnaLee Saxenian,³⁹⁸ is one main reason. Following the Second World War, and the

industries. Silicon Valley by and large includes all of the southern San Francisco Peninsula, Santa Clara Valley, and southern sections of the East Bay region.

³⁹³ “Route 128” is used to refer to the high-tech industry, which developed between the 1960s to the 1980s, in the suburban areas along the Boston, Massachusetts, beltway.

³⁹⁴ See ANNALEE SAXENIAN, *REGIONAL ADVANTAGE: CULTURE AND COMPETITION IN SILICON VALLEY AND ROUTE 128* (Harv. U. Press 1996) [hereinafter *Regional Advantage*] (“[d]uring the 1970s Northern California’s Silicon Valley and Boston’s Route 128 attracted international acclaim as the world’s leading centers in innovation in electronics.”).

³⁹⁵ The reasons and theories to why Silicon Valley became an innovation hub vary from culture, location, laws, weather, cool, hippy, anti-establishment, immigration, casual dress, less hierarchy and bureaucracy, to philanthropy. The reasons for the creations for Route 128 also vary from legal, social, to cultural, etc...

³⁹⁶ See Ronald J. Gilson, *The Legal Infrastructure of High Technology Industrial Districts: Silicon Valley, Route 128 and Covenants not to Compete*, 74 N.Y.U.L. REV. 575, 588 (1999); See also Saxenian (*Regional Advantage*), *supra* note 394, at 13.

³⁹⁷ See Saxenian (*Regional Advantage*), *supra* note 394; See also Gilson, *supra* note 396; See also Richard A. Booth, *Give Me Equity Or Give Me Death – The Role of Competition and Compensation in Silicon Valley*, 1 ENTREPREN. BUS. L.J. 265, 271 (2006).

³⁹⁸ AnnaLee Saxenian, is the Dean of UC Berkeley School of Information. She is known generally for her work on social networks and technology clusters in Silicon Valley.

subsequent Cold War, the key event that helped shape the creation of technology hubs in Route 128 and Silicon Valley, was the U.S. government's intervention of boosting defense spending on technology.³⁹⁹

Professor Vannevar Bush of MIT was an important player in establishing the innovation hub in Route 128. He served as the head of the government funding agency the U.S. Office of Scientific Research and Development (OSRD)⁴⁰⁰ during World War II. He is given credit for securing funding for and hence the creation of Route 128. According to scholar Gilson, thanks to Professor Bush, "MIT received more military funding during World War II than any other university."⁴⁰¹

The US government's intervention, by supplying capital, facilitated the creation of the main research laboratories in Route 128. In 1940, MIT formed the Radiation Laboratory, mainly funded by the National Defense Research Committee (NDRC).⁴⁰²

³⁹⁹ See also Saxenian (Regional Advantage), *supra* note 394, at 11 ("[M]ore than two centuries of industrialization laid the foundation for the postwar surge of activity in electronics in the Boston area. Several leading technology firms were formed in Massachusetts during the nineteenth century; by the 1940s the region was home to a sizeable group of electronics manufacturers. The Santa Clara Valley, by contrast, remained an agricultural region as late as the 1940s, famous primarily for its apricots and walnut orchards. Aside from a handful of small electrical firms, the only local industry was small-scale food processing and distribution."); See Gilson, *supra* note 396, at 588; See also Saxenian (Regional Advantage), *supra* note 394, at 13.

⁴⁰⁰ In Vannevar Bush, *Science, The Endless Frontier*, U.S. Gov. Printing Office (1945) (Professor Bush called for an increase of government support for science, and pressed for the formation of the National Science Foundation).

⁴⁰¹ See Gilson, *supra* note 396, at 588.

⁴⁰² Radiation Laboratory MIT, WIKIPEDIA (Sept. 22, 2014, 08:32 AM), http://en.wikipedia.org/wiki/Radiation_Laboratory_%28MIT%29 ("The Radiation Laboratory, commonly called the Rad Lab, was located at the Massachusetts Institute of Technology (MIT) in Cambridge, Massachusetts and functioned from October 1940 until December 31, 1945. Alfred Lee Loomis, a millionaire and physicist who headed his own private laboratory, selected the location for the laboratory on the campus, named it the MIT Radiation Laboratory, and arranged funding for the Rad Lab until federal money was allocated. It was formed by, and initially operated under, the National Defense Research Committee (NDRC), a commission established by U. S. President Franklin D. Roosevelt with Vannevar

Likewise, in 1951, during the Cold War period, the Air Force funding led to the creation of the Lincoln Laboratory⁴⁰³ at MIT.⁴⁰⁴

The origin of Silicon Valley is typically attributed to the founding of the Hewlett-Packard (HP) Company in 1937.⁴⁰⁵ One of the main factors that fashioned Silicon Valley into the technology hub that we know of today is the unique public, private and academic (university) partnership that characterize its formation.⁴⁰⁶ Rao and Scaruffi give special credit to Fred Terman,⁴⁰⁷ who followed the footsteps of his MIT mentor, Vannevar Bush,

Bush as its chairman. In 1941, the NDRC was enlarged to become the Office of Scientific Research and Development (OSRD), with Bush remaining as chairman.”); *See also* Gilson, *supra* note 396, at 588.

⁴⁰³ MIT Lincoln Laboratory, WIKIPEDIA (Sept. 19, 2014, 11:44PM), http://en.wikipedia.org/wiki/MIT_Lincoln_Laboratory (the Lincoln Lab was “[C]reated in 1951 as a federally funded research and development center of the Massachusetts Institute of Technology, Lincoln Laboratory was focused on improving the nation's air defense system through advanced electronics. The laboratory's inception was prompted by the Air Defense Systems Engineering Committee's 1950 report that concluded the United States was unprepared for the threat of an air attack. Because of MIT's management of the Radiation Laboratory during World War II, the experience of some of its staff on the Air Defense Systems Engineering Committee, and its proven competence in electronics, the U.S. Air Force suggested that MIT could provide the research needed to develop an air defense that could detect, identify, and ultimately intercept air threats.”).

⁴⁰⁴ *See* Gilson, *supra* note 396, at 588 (according to Gilson, as a result of these events, by the mid-1960s, Boston area university-related research labs employed some 5000 scientists and engineers, and the area proved a fertile ground for commercial technology development. Lincoln Lab scientists founded more than fifty companies, and scientists from the MIT Instrumentation Lab founded another fifty-five).

⁴⁰⁵ *See also* Saxenian (Regional Advantage), *supra* note 394, at 20 (“The small Palo Alto garage where two Stanford graduate students started an electronics instrumentation business has become a Silicon Valley landmark. The legend surrounding the company’s origins captures the key elements of the region’s ascent, particularly the distinctive role played by Stanford University and the value placed on entrepreneurship.”).

⁴⁰⁶ ARUN RAO & PIERO SCARUFFI, A HISTORY OF SILICON VALLEY: THE GREATEST CREATION OF WEALTH IN THE HISTORY OF THE PLANET (2011); *See also* Saxenian (Regional Advantage), *supra* note 394, at 21-2 (“After the war, Terman intensified his efforts to promote the development of the region’s base of technology and industry. He left his faculty position at Stanford in the early 1940s to take up a wartime post as director of Harvard’s Radio Research Laboratory, and returned to Stanford in 1946 as Dean of Engineering. Terman’s experience in the East exposed him to military electronics research and convinced him of the weaknesses of West Coast industry and universities.”).

⁴⁰⁷ Rao & Scaruffi, *supra* note 406.

and “single handedly created the university, government, private industry partnership model that still characterizes Silicon Valley in the twenty-first century.”⁴⁰⁸

Terman was able to create Silicon Valley by taking the following steps. First, he helped to build “a community of technical scholars”⁴⁰⁹ in the region of Stanford University, by increasing Stanford’s role in sustaining technology-based industries. Second, he was utilized his relationships with Washington DC in order to draw federal contracts for university labs (and local firms) in the region.⁴¹⁰ Third, Terman decided to concentrate on creating collaborative regional relationships between Stanford and the local industry.⁴¹¹ This factor was unique to Silicon Valley and was not implemented in Route 128 at that time. The reason for this new development was that Route 128 firms

⁴⁰⁸ *Id.*; See also Saxenian (Regional Advantage), *supra* note 394, at 21-2. According to Saxenian, “After the war, Terman intensified his efforts to promote the development of the region’s base of technology and industry. He left his faculty position at Stanford in the early 1940s to take up a wartime post as director of Harvard’s Radio Research Laboratory, and returned to Stanford in 1946 as Dean of Engineering. Terman’s experience in the East exposed him to military electronics research and convinced him of the weaknesses of West Coast industry and universities.”).

⁴⁰⁹ See Saxenian (Regional Advantage), *supra* note 394, at 22 (quoting Terman: “Such a community is composed of industries using highly sophisticated technologies, together with a strong university that is sensitive to the creative activities of the surrounding industry. This pattern appears to be the wave of the future.”).

⁴¹⁰ *Id.* (“Stanford’s research and development programs benefited directly from the growth of federal spending for the Korea conflict and the space race, as did local electronics producers.”).

⁴¹¹ See *id.* at 23 (“Three institutional innovations during the 1950s reflect the relationship that Terman pioneered in the region. First, Stanford established the Stanford Research Institute (SRI) to conduct defense-related research and to assist West Coast businesses... Second, Stanford opened its classrooms to local companies through the Honors Cooperative Program. The university encouraged engineers at electronics companies to enroll in graduate courses directly or through a specialized televised instructional network, which brought Stanford courses into company classrooms... Third, Terman promoted the development of the Stanford Industrial Park, one of the first such parks in the country. While initially a source of income to support the rapid growth of the land-rich but cash-poor university, the industrial park helped to reinforce the emerging pattern of cooperation between the university and electronics firms in the area.”).

had quite an advantage over Silicon Valley firms, in dealing with federal bureaucrats, mainly due to California's distance from Washington.⁴¹²

The results of such multi-faceted collaborations between an academic institution (Stanford University) and private (entrepreneurial risk-taking in the form of new local firms) and public (due to continued military spending in technology) partners were amazing.⁴¹³ During the 1950s, clusters of industrial activities grew rapidly around Stanford University, especially in the semiconductor fields.⁴¹⁴ In the early 1970s, the term "Silicon Valley" was given to the area, due to "silicon," a key element of the semiconductor industry.⁴¹⁵ By the 1970s, Silicon Valley was the nation's primary center of semiconductor production and innovation, outshining Route 128.⁴¹⁶

There are many theories and explanations regarding the rise of Silicon Valley and the demise of Route 128. According to Saxenian, one of the reasons is attributed to the fact that Silicon Valley did not rely exclusively on public government contracts and financing, stating that "Venture Capital replaced the military as the leading source of financing for Silicon Valley start-ups by the early 1970s."⁴¹⁷

⁴¹² See *id.* at 22-3.

⁴¹³ See *id.* at 24-5.

⁴¹⁴ *Id.*

⁴¹⁵ *Id.*

⁴¹⁶ *Id.*

⁴¹⁷ See *id.* at 26 ("Government purchases, which had accounted for half of total semiconductor shipments during the 1960s, dropped to only 12 percent in 1972, and continued to fall throughout the decade. Silicon Valley, never as dependant on defense markets as Route 128, thus managed to achieve a gradual transition to commercial production during the 1960s and 1970s.").

Gilson and Booth,⁴¹⁸ who also based their theories on the work of Saxenian, presented additional explanations for the formation of high technology industrial clusters in Silicon Valley. First, that the Silicon Valley technology cluster was created due to the rapid employee mobility, which contributed to knowledge spillovers between firms.⁴¹⁹ Second, that California firms tied their employees to the region by offering them equity and stock options (prospect of equity), thereby binding them with “golden handcuffs.”⁴²⁰

During the early 1980s, both Silicon Valley and Route 128 suffered economic hardships.⁴²¹ On the one hand, Silicon Valley was able to overcome these hardships. It was able to spawn new computer and semiconductor startups that worked in conjunction with reputable companies.⁴²² On the other hand, Route 128 did not show signs of recovery.⁴²³ Despite similar origins and technologies, Silicon Valley and Route 128 evolved fundamentally different industrial systems after World War II. There are many reasons for this evolution. This paper focuses on Saxenian’s explanation the diverse local dynamics of industrial adaptation which resulted in the divergence of these two regions and their endurance (or lack thereof) through economic hardships.

⁴¹⁸ See Gilson, *supra* note 396; See also Booth, *supra* note 396.

⁴¹⁹ California doesn’t enforce post-employment covenants not to compete, unlike Massachusetts (Route 128); See Gilson, *supra* note 396.

⁴²⁰ See also Booth, *supra* note 396, at 271.

⁴²¹ See Saxenian (Regional Advantage), *supra* note 394, at 1. (“during the early 1980s, when the leading producers in both regions experienced crises of their own. Silicon Valley chipmakers relinquished the market for semiconductor memory to Japanese competitors, while Route 128 minicomputer companies watched their customers shift to workstations and personal computers.”).

⁴²² *Id.* (“The dramatic success of start-ups such as Sun Microsystems, Conner Peripherals, and Cypress Semiconductor, and the continued dynamism of large companies such as Hewlett-Packard and Intel, were evidence that Silicon Valley has regained its former vitality.”).

⁴²³ See *id.* at 2 (“start-ups failed to compensate for continuing layoffs at the region’s established minicomputer companies, Digital Equipment Corporation, Data General, Prime, and Wang.”).

The main difference between the regions deals with a vertical corporate hierarchies philosophy (Route 128) versus the idea of extensive social networks and horizontal communication among firms (Silicon Valley). The Route 128 industrial system is rooted in a small number of independent integrated firms, which produce a large scope of activities internally.⁴²⁴ The relationships between Route 128 firms and their stakeholders (suppliers, customers) and competitors are governed by practices of corporate loyalty and secrecy.⁴²⁵ Route 128's regional culture encourages corporate hierarchy, self-reliance and stability, which guarantees that information flows vertically and corporate authority is maintained centralized.⁴²⁶ According to Saxenian, "[t]he boundaries between firms and local institutions thus remain far more distinct."⁴²⁷

The regional network-based industrial system of Silicon Valley on the other hand, encourages adjustable modification and collective learning between the specialist creators of the interrelated technologies.⁴²⁸ Silicon Valley's open labor markets and solid social

⁴²⁴ See *id.* at 3.

⁴²⁵ *Id.*; See also Erica Gorga & Michael Halberstam, *Knowledge Inputs, Legal Institutions and Firm Structure: Towards A Knowledge-Based Theory of the Firm*, 101 Nw. U.L. Rev. 1123 (2007) ("Silicon Valley's high-tech firms also need to bind knowledge to the firm." Gorga & Halberstam argue that "a reciprocal relationship exists between non-competes, on the one hand, and compensation—and ultimately ownership—structures, on the other hand. If non-competes cannot be enforced, and firms are unable to appropriate K by legal means, then firms will be forced to use alternate organizational strategies to retain employees. Silicon Valley firms responded by offering stock options, a type of equity compensation that is specifically designed to constrain the departure of employees. On the other hand, where noncompetes are enforceable, stock options, or similar equity compensation, are likely to be less common. Stock options are a crucial tool for startups in the high-tech industry to retain knowledgeable employees. Their use may constrain *leakage* from firm knowledge resources to other competitors.").

⁴²⁶ See Saxenian (Regional Advantage), *supra* note 394, at 2.

⁴²⁷ *Id.*

⁴²⁸ See *id.* at 2.

networks drive entrepreneurship and experimentation.⁴²⁹ Silicon Valley firms use informal collaborative and communication practices, which allow them to learn about changing technologies and markets, while also competing intensely with each other.⁴³⁰ Silicon Valley firm's team structures are loosely connected, this structure advances horizontal communication with outside stakeholders (suppliers and customers) and among the firms' divisions.⁴³¹ According to Saxenian, in Silicon Valley's network system, the boundaries amongst the firms are "porous," as well as the boundaries amongst "firms themselves and between firms and local institutions such as trade associations and universities."⁴³² This allows Silicon Valley to swiftly adapt to innovative revolutionary technologies and markets.⁴³³

Another factor allowing for rapid adaptation in Silicon Valley is the dramatic change in global labor markets and the globalization of entrepreneurial networks, due to the high concentration of foreign-born entrepreneurs,⁴³⁴ who transfer the institutional and

⁴²⁹ *Id.*

⁴³⁰ *Id.*

⁴³¹ *See id.* at 2-3.

⁴³² *Id.* at 3.

⁴³³ *See also id.* at 9 ("In a network-based industrial system like that in Silicon Valley, the region – if not all the firms in the region – is organized to adapt continuously to fast-changing markets and technologies. The system's decentralization encourages the pursuit of multiple technical opportunities through spontaneous regroupings of skill, technology and capital. Its production networks promote a process of collective technological learning that reduces the distinctions between large and small firms and between industries or sectors.").

⁴³⁴ *See AnnaLee Saxenian, The New Argonauts, available at* http://people.ischool.berkeley.edu/~anno/Papers/IMF_World_Bank_paper.pdf [hereinafter: Argonauts] ("High-profile start-ups such as Sabeer Bathia's Hotmail, Jerry Yang's Yahoo and Min Zhu's Webex are only the most visible reflections of the extent to which Silicon Valley's immigrant engineers have mastered the region's entrepreneurial business system.").

technical know-how between the distant regional economies.⁴³⁵ They do so even “faster and more flexibly than most multinationals,” according to Saxeninan.⁴³⁶

In the past (as recently as the 1970s), mostly established large firms were able to expand to international markets by establishing factories or offices overseas.⁴³⁷ Today, however, due to low costs of communication and transportation, and the disintegration of production, small firms are also able to expand overseas and compete in the international markets. Therefore many small firms in Silicon Valley are global actors.⁴³⁸ The challenge that small firms today have is in locating the right partner for the international collaboration.⁴³⁹

As a result of these market trends, there are new emerging cross-regions, who posses local resources and institutions,⁴⁴⁰ which are combined with Silicon Valley’s

⁴³⁵ *Id.* (“Falling transport and communication costs allow high- skilled workers to work in several countries at once, while digital technologies make it possible to exchange vast amounts of information across long distances cheaply and instantly. International migration, traditionally a one-way process, has become a reversible choice, particularly for those with scarce technical skills, while people can now collaborate in real time, even on complex tasks, with counterparts far away.”).

⁴³⁶ *Id.* (the central characters in this process are not large corporations but the “new Argonauts: the foreign-born engineers, entrepreneurs, managers, lawyers and bankers who have the linguistic and cultural abilities as well as the institutional knowledge to collaborate with their home-country counterparts.”).

⁴³⁷ *See id.*

⁴³⁸ *See id.* (stating that many small Silicon Valley startups are global actors, by subcontracting their manufacturing or software development, raising capital, and marketing their services or products outside the US).

⁴³⁹ *Id.* (the challenge once the right partner is located is also to “manage complex business relationships and teamwork across cultural and linguistic barriers. This is particularly challenging in high-tech industries where products, markets, and technologies are continually redefined – and where product cycles are often shorter than nine months.”).

⁴⁴⁰ *Id.* (“In the 1980s, Taiwan was known for its cheap PC clones and components; today, it is recognized for the flexibility and efficiency of its IC and electronic-systems producers. In the 1990s, China was known for me-too internet ventures; now, Chinese producers are poised to play a lead role in developing wireless technology. In the 1990s, India was a provider of labor-intensive software coding and maintenance; today, local companies are mobilizing the thousands of underemployed English-speaking Indian engineers to manage large-scale software services projects for leading global companies. Whereas in the 1980s, Israel

industrial system.⁴⁴¹ Furthermore, according to Saxenian the “rise of entrepreneurship-led growth suggests that the regional cluster may be replacing the national economy as the locus of economic growth.”⁴⁴² Silicon Valley firms, as well as firms in new technology regions, are progressively partnering with each other.⁴⁴³ United States firms and technology producers are looking into foreign markets, such as Israel, Taiwan, India and China, in order to partner and co-develop (not simply for low-cost or low-level implementation).⁴⁴⁴

Silicon Valley is currently at the center of this diversifying network of economies. However, this status quo might change, due to the openings of new markets and the emergence of new international relationships.⁴⁴⁵ For this reason, this paper’s Coalition

was a low-cost research location, since then, local entrepreneurs have applied the fruits of the country’s advanced military research to pioneer sophisticated Internet and security technologies.”).

⁴⁴¹ *Id.* (the new regions are able to utilize “Silicon Valley’s new product vision, technology architecture, marketing, and research-and-development.”).

⁴⁴² *See id.* (“The old pattern of one-way flows of technology and capital from the core to the periphery is being replaced by a far more complex and decentralised two-way flow of skill, capital and technology between regional economies with different specialities.”).

⁴⁴³ *See id.* (“A Taiwanese semiconductor firm invests in Israeli start-ups specialising in digital-speech-processing chips, while an Israeli company contributes intellectual- property components to a chip-design firm in India. These collaborations deepen both partners’ capabilities and over time can support a process of reciprocal innovation and upgrading.”).

⁴⁴⁴ *See id.* (“Even the largest Silicon Valley companies participate in all these regions not simply as competitors but also as investors and partners. An established firm such as Cisco designs and sources critical parts of its operating-system software from India; buys application-specific ICs for its high-end routers from Israel; and has most of its hardware manufactured in Taiwan and China. Like Intel and Acer, it also invests in foreign start-ups with promising technologies.”).

⁴⁴⁵ *See id.* (“The fast-growing Asian market for wireless communication, for example, has enabled firms in China and India to contribute to how the technology and its applications are developed – even though they do not yet define its leading edge. Over time, producers in developing regions may be able to build independent capabilities and define entirely new specialisations and markets.”).

model is based on the Silicon Valley model, especially due to its admirable adaptability to economic waves.⁴⁴⁶

C. Recent Israeli History of Government Intervention

The country of Israel is a recent example of a successful direct and targeted government intervention that led to technology innovation and economic growth. Additionally, Israel is an example of cross-regional entrepreneurship, where the government is an active partner in catalyzing the country's globalization development, bringing economic prosperity in a time of world economic distress.

In 2000, Israel experienced a high-tech boom that helped transform its economy⁴⁴⁷ from a "global basket case," whose market focused primarily on agriculture and artillery,⁴⁴⁸ with an inflation rate of 500% per year and the world's record largest foreign debt per capita of \$21 billion,⁴⁴⁹ into a high-tech powerhouse.

Today, Israel enjoys the largest established venture-capital industry outside Silicon Valley (with \$4 billion investments annually), high rates of innovation, growth,

⁴⁴⁶ See *id.* at 9 ("In a network-based industrial system like that in Silicon Valley, the region – if not all the firms in the region – is organized to adapt continuously to fast-changing markets and technologies. The system's decentralization encourages the pursuit of multiple technical opportunities through spontaneous regroupings of skill, technology and capital. Its production networks promote a process of collective technological learning that reduces the distinctions between large and small firms and between industries or sectors.").

⁴⁴⁷ See Michael A. Hiltzik, *Israel's High Tech Shifts Into High Gear*, L.A. TIMES (Aug. 13, 2000) at A1, available at <http://articles.latimes.com/2000/aug/13/news/mn-3778>.

⁴⁴⁸ Lesha R. Chaifetz, *The Promised Land: An Examination of the Israeli High-Tech Industry*, 23 U. PA. J. INT'L ECON. L. 385, 388 (2002).

⁴⁴⁹ *Id.*

and new firm formation.⁴⁵⁰ It is known around the world as a leader in the Internet and software industries, with leading firms such as Checkpoint (security software) and Mirabilis (a developer of instant-messaging programs).⁴⁵¹

How was Israel able to transform its market so that Tel Aviv trumped Boston as the urban area with the most venture activity following San Francisco? According to columnists Senor⁴⁵² and Singer,⁴⁵³ “VC was the match that sparked the fire,”⁴⁵⁴ In order to illustrate how this occurred, it is necessary to understand the role of the Israeli government in initiating the venture capital (“VC”) market in Israel.⁴⁵⁵

⁴⁵⁰ See Saxenian (Argonauts), *supra* note 434; See also Gil Avnimelech & Morris Teubal, *Evolutionary Targeting*, 18 J. EVOL. ECON. 151 (2008) [hereinafter *Evolutionary Targeting*] (“VC emergence led the transformation of Israeli high tech during the 1990s toward a ‘Silicon Valley’ type of high tech cluster involving a considerable number of startups and a wide variety of support structures (Avnimelech and Teubal 2004a, 2006). VC emergence, however, was not automatic: beyond the favorable set of conditions which evolved during 1969–1992, success was also the result of a successful targeted policy, i.e. the Yozma program implemented during 1993–1998.”).

⁴⁵¹ See Saxenian (Argonauts), *supra* note 434.

⁴⁵² Daniel Samuel “Dan” Senor is an American columnist, writer and political adviser. He was chief spokesperson for the Coalition Provisional Authority in Iraq and senior foreign policy adviser to U.S. Presidential candidate Mitt Romney during the 2012 election campaign. A frequent commentator on Fox News and contributor to The Wall Street Journal, he is co-author of the book *START-UP NATION: THE STORY OF ISRAEL’S ECONOMIC MIRACLE* (2009).

⁴⁵³ Saul Singer is an American-Israeli journalist and author. Formerly editorial page editor at The Jerusalem Post, Singer co-wrote with Dan Senor *Start-up Nation: The Story of Israel’s Economic Miracle*, a best-seller which investigates Israel’s innovative prowess.

⁴⁵⁴ See Senor & Singer, *supra* note 195.

⁴⁵⁵ See Chaifetz, *supra* note 448 (“from October 1999 to October 2000, Israel experienced a growth in its electronics and computer industry of nearly 140%. Manufacturing and software accounted for seventy-three percent of Israel’s exports in 1999, making high technology the largest export in a country, which, thirty years ago, depended on oranges for more than half of its export earnings. Agriculture as a whole now makes up only three percent of Israeli exports, and citrus foods account for less than 0.5%.”); See also Ministry of Finance, *A Graphic Presentation of the Israeli Economy in Recent Years 1*, available at <http://www.mof.gov.il/hachnasot/matsav.pdf> (last visited Nov 3, 2012) [hereinafter Ministry of Finance].

1. Office of the Chief Scientist

In 1984, the Israeli government enacted the Law for the Encouragement of Industrial Research and Development (1984), which establishes the Office of the Chief Scientist (“OCS”), of the Ministry of Economy (formerly known as the Ministry of Industry, Trade and Labor).⁴⁵⁶ The Office of the Chief Scientist was established in order to supervise and execute the government’s policy for support of industrial research and development (“R&D”).⁴⁵⁷ The OCS’s main goals and incentives are to: (1) aid in the development of technology in Israel as a means of promoting economic progress; (2) increase the knowledge base of industry in Israel; (3) encourage entrepreneurship and technological innovation; (4) strengthen Israel’s scientific potential; and (5) fuel high value-added research and development and finally stimulate research and development partnerships both in the national and international communities.⁴⁵⁸

⁴⁵⁶ See Hedva Ber, *supra* note 189 (“a public committee had recommended various ways of encouraging venture capital in order to boost economic growth in general, and the high-tech industry in particular (Securities Authority, 1989). The committee stressed that government support for the VC industry should have two aims—to make it easier to obtain finance for VC investment, and to create the conditions for the development of a VC market, specializing primarily in managing investment and encouraging the participation of specialized financial entities. In this context, it was decided in 1991 to support the establishment of VC funds that would undertake and manage investments in R&D; this would be achieved by providing government guarantees for the purchase of shares in funds via the “Inbal” government insurance company.⁸ In this framework, three VC funds were founded in 1991–93, whose investments were guaranteed by the state.⁹ At the next stage, in 1992, at the initiative of the Ministry of Commerce and Industry, the “Yozma” government VC fund was set up in order to establish VC funds in cooperation with private foreign investors, and was allocated equity of \$ 100 million. Until its dissolution, the fund, which was set up for a limited period of seven years, supported the establishment of ten private VC management funds,¹⁰ which together had raised capital of \$ 2.7 billion by 2000.”).

⁴⁵⁷ See Israeli Office of the Chief Scientist, MATIMOP – THE ISRAEL INDUSTRY CENTER FOR R&D, available at <http://www.matimop.org.il/ocs.html>.

⁴⁵⁸ *Id.*

Additionally, the OCS constantly develops and offers a variety of ongoing support programs that enable Israel to lead in high technology entrepreneurship, both in the national and international arenas, and collaborate in the cross-regional development and research efforts.⁴⁵⁹ Two of the main strategic development programs, established in 1991-2, were the Technology Incubator program⁴⁶⁰ and the Yozma funds initiative.⁴⁶¹

Economists Avnimelech and Teubal argue that Yozma (a government targeted program) and the emergence of a venture capital industry in Israel are distinctive examples that may possibly inspire future government design of a set of “infant industry support programs.”⁴⁶² These examples, moreover, can play a significant role in distinguishing the guidelines for “evolutionary targeting,”⁴⁶³ and identifying the “required set of pre-emergence conditions of industry emergence.”⁴⁶⁴

⁴⁵⁹ See About MATIMOP, MATIMOP – THE ISRAEL INDUSTRY CENTER FOR R&D, available at http://www.matimop.org.il/about_matimop.html, (There are many programs, such as the following: the Hezrek-Seed Fund (the government matches an investment in a seed company, and later on, when the company is successful, gives the investors the option of purchasing the government’s shares;) the Tnufa Program (is intended to aid the entrepreneur in her preliminary endeavors to build a prototype, design a business plan, and register a patent;) the Magneton and Noffar programs (are designed to encourage applied academic research in order to promote technology transfer to industry;) and the Magnet Program (encourage formation of consortia that is comprised of academic institutions and individual firms in order to develop pre-competitive technologies).).

⁴⁶⁰ See Chaifetz, *supra* note 448, at 389.

⁴⁶¹ Yozma Group, Overview, THE YOZMA GROUP (2000) available at <http://www.yozma.com/overview/>.

⁴⁶² Avnimelech & Teubal (Evolutionary Targeting), *supra* note 450.

⁴⁶³ *Id.* (“Evolutionary Targeting is one aspect of the application of the system-evolutionary perspective to ITP and to innovation-led and knowledge-based economic growth. Based on market-led development processes accompanied by policy-enhancements at critical points, it involves the design and implementation of targeted programs the objective of which is promoting the emergence of a multiagent structure. Evolutionary Targeting operates by triggering and enhancing cumulative processes. The central idea behind the actual targeting is to leverage existing high quality (Class A) market forces for the purpose of building multiagent structures. Evolutionary Targeting differs from the old “picking-winners” policy and from Korea’s post 1960s targeting (both of which are based on policy-led mechanisms), and from fully unprompted market-led processes. It is based on a new, market- friendly and bottom–up view of targeting

2. The “Yozma” Funds Initiative

In 1992, the Israeli government decided to intervene in the market and act as a venture capitalist.⁴⁶⁵ The Israeli government established a \$100 million fund, which was wholly owned by the public sector, called the Yozma Venture Capital Ltd.⁴⁶⁶ The main goals of the Yozma initiative were to create a platform in order to stimulate and encourage international venture capital investments in Israeli firms, as well as establish ten new venture capital funds in order to encourage future formations of local Israeli venture capital funds.⁴⁶⁷

The Yozma program has the following three innovative fundamental characteristics. First, the Israeli government deliberately established privately owned (and managed) venture capital funds, which had a clear government component.⁴⁶⁸ The Yozma initiative is an example of a successful private-public-partnership model. Each of the ten original drop-down funds participating in the Yozma program had to be

industries. It operates by enhancing market-led variety and pre-selection through horizontal policies, and accelerating market-led selection and development/reproduction processes through coordination activities, targeted incentives, institutional changes, and other policies. Evolutionary Targeting involves a number of policies and policy actions related to multiagent structures: (1) promotion of pre-emergence conditions to generate policy targeting candidates (variation); (2) determination of relevant criteria for socially desirable multiagent structures and selection of those to be targeted; (3) identification of system and market failures blocking the unaided emergence of selected multiagent structures; (4) determination of targeted policy objectives, design, timing, and implementation oriented to triggering (or reinforcing) and sustaining cumulative emergence processes; and (5) termination of targeted support.”).

⁴⁶⁴ *Id.*

⁴⁶⁵ *Id.* (“Yozma is a case of a successful targeted program, which followed 24 years horizontal grants to business sector R&D programs...The motivation for this program was the need to solve a specific problem—the post R&D commercial failure of large numbers of Israeli startups during the second half of the 1980s.”).

⁴⁶⁶ See Lerner (Boulevard of Broken Dreams), *supra* note 38.

⁴⁶⁷ See Senor & Singer, *supra* note 195.

⁴⁶⁸ Avnimelech & Teubal (Evolutionary Targeting), *supra* note 450.

represented by the following private and public partners. The public party was the Israeli government and the private parties were Israeli venture capitalists in training, a foreign venture capital firm, and an Israeli investment company or a bank.⁴⁶⁹

Second, the Israeli government required Israeli venture capital firms to partner with foreign venture capital firms.⁴⁷⁰ The Yozma initiative was able to attract foreign investors by using a relatively unique financial model whereby the Israeli government agreed to match funds to any foreign international venture capital fund (as well as local Israeli venture capitalist) that agreed to invest money in the partnership. The Israeli government would match a significant portion of the joint investment; however, the partnership would also have to include an Israeli investment group⁴⁷¹ so that the Israelis could learn from the seasoned foreign venture capitalists. The Israeli government generally took a forty (40) percent equity stake in the newly established private-public partnership venture capital fund.

Third, the Israeli government shared the risk in establishing the funds with the private actors, as well as provided additional “incentives to the upside” to the private actors.⁴⁷² It should be noted that the long-term goal of the Israeli government was not to continue and remain an equity holders in the private-public partnership venture capital funds. Instead, the government would present the private partners with the option of

⁴⁶⁹ Additionally, the Israeli government designated one \$20 million Yozma fund solely to directly invest in technology companies.; *See* Senor & Singer, *supra* note 195.

⁴⁷⁰ Avnimelech & Teubal (Evolutionary Targeting), *supra* note 450.

⁴⁷¹ *Id.*

⁴⁷² *Id.*

inexpensively buying out its equity stake, in the event that the fund was profitable.⁴⁷³ The ingenuity of the Yozma initiative was in the risk-reward model. While the Israeli government collectively shared the risk with the foreign (and local) investors, it offered the investors the potential to reap all of the reward.⁴⁷⁴ The Israeli government could be bought out once it had served its primary function (to attract foreign investment and start the fund, rather than carry on indefinitely). The “upside” was that in the event that the future venture capital funds became profitable, then the private investors have a “call option” on the Israeli government’s shares. The call option was for a period of 5 years, at cost, plus a 5-7% interest.⁴⁷⁵ Therefore, from an investor’s standpoint it was an extremely good deal.⁴⁷⁶

a. The Need for Israeli Government Intervention in the Market

Why did the Israeli government decide to intervene in the market? Prior to Yozma, there was only one venture fund active in the nation, Athena Venture Partners.⁴⁷⁷ During that period (around 1993), Israeli entrepreneurs had difficulty with getting venture capital financing.⁴⁷⁸ In order to get funding for their projects, Israeli entrepreneurs had to

⁴⁷³ *Id.*

⁴⁷⁴ *Id.*

⁴⁷⁵ *Id.* (According to Avnimelech & Teubal , Yozma “did not provide guarantees nor tax benefits; nor was it accompanied by new regulation rules for Pension Funds (Capital Gains tax was relatively low at the time and Pension Funds were allowed to invest a small amount on VC subject to Government regulation. In both respects Israel's situation was 'level playing field' with that of other countries at the time.”).

⁴⁷⁶ *Id.*

⁴⁷⁷ See Lerner (Boulevard of Broken Dreams), *supra* note 38.

⁴⁷⁸ Avnimelech & Teubal (Evolutionary Targeting), *supra* note 450 (“During pre-emergence (1985–1992) a number of critical dynamic sub-processes operated which led to ‘selection’ or ‘identification of focal points’ of the future high tech cluster. Thus, through the activity of numerous market agents who undertook

turn to the following limited avenues: Apply to the Office of the Chief Scientist (OCS) for matching grants,⁴⁷⁹ apply for Israel-U.S. Binational Industrial Research and Development (“BIRD”) foundation grants,⁴⁸⁰ use connections and personal resources (the art of “bootstrapping”),⁴⁸¹ or depend on bank debt financing,⁴⁸² which was seldom granted to entrepreneurs with immature and uncertain ideas or projects.

The problem that the Israeli government tried to solve was that, even though entrepreneurs were meeting their scientific objectives and working on promising

trial and error activities with respect to organization of VC and startup companies, and through government policy experimentation and learning, a consensus was arrived at as to the desirable characteristics of VC and startup companies—born global startups, which also focus on global capital and product markets; and LP VCs oriented to early phase finance and support of high tech startup (with an additional focus on software and communications technologies). At some point during early emergence (1993–1995) this led to an accelerated entry of VC companies fed by a cumulative process with positive feedback. It is then that the industry attained a size, which enabled it to sustain a large number of supporting institution and services. The strong selection and reproduction processes that operated during the emergence led both to acceleration of activity and to the reconfiguration of the high tech cluster.”).

⁴⁷⁹ See Senor & Singer, *supra* note 195.

⁴⁸⁰ See The Israel-U.S. Binational Industrial Research and Development Law (“BIRD”) (1978) (in Hebrew); See also BIRD Foundation - Israel-U.S. Binational Industrial R&D mission statement on its website (What is BIRD), available at <http://www.birdf.com/?CategoryID=317&ArticleID=374> (According to the BIRD Foundation’s statement, it “was established by the U.S. and Israeli governments in 1977 to generate mutually beneficial cooperation between the private sectors of the U.S. and Israeli high tech industries, including start-ups and established organizations. BIRD provides both matchmaking services between U.S. and Israeli companies, as well as funding covering up to 50 percent of project development and product commercialization costs... BIRD supports approximately 20 projects annually. The cumulative sales of products developed through BIRD projects have exceeded \$8 billion. Since its inception in 1977, BIRD has approved over 800 projects with leading companies in the U.S., for example: ADM, American Red Cross, Applied Materials, Avaya, Bayer Pharmaceutical, Becton Dickinson, Bio-Rad Laboratories, Eastman Kodak, General Dynamics, General Electric, Guidant, IBM, J&J, KLA- Tencor, Molex, Motorola, Procter & Gamble, SanDisk, Spansion, Telcordia, Texas Instruments, Tyco and others.”); See Senor & Singer, *supra* note 195 (“[Y]et 74% of high-tech exports out of Israel were generated by just 4% of high-tech companies.”)

⁴⁸¹ See Senor & Singer, *supra* note 195.

⁴⁸² See Lerner (Boulevard of Broken Dreams), *supra* note 38.

technologies, they were unable to raise the funds to in order to further develop and commercialize their products.⁴⁸³

The other major objective for Yozma was to attract foreign venture capital funds to invest in Israeli firms.⁴⁸⁴ Venture capital investors traditionally invested in firms in close proximity to their geographic location. Therefore, the Israeli government needed to give foreign venture capital investors substantial incentives in order to buy into the Yozma program. It was not financing alone that the government wanted to encourage, but also the venture capital value added services that traditionally accompanied the investment, such as mentoring, networking, evaluation of business plans and commercial feasibility of the invention.⁴⁸⁵

b. Inbal (Israeli Government Intervention that Failed) led to Yozma

Israeli policy makers came up with the Yozma model, following experimentation and an extensive lengthy preparation, which involved the search for the possible causes

⁴⁸³ *Id.*; See also Gil Avnimelech, *A Five-phase Entrepreneurial Oriented Innovation and Technology Policy Profile: The Israeli Experience*, 16 EUROPEAN PLANNING STUDIES 81 (2008) (“policy-makers believed that the way to overcome these deficiencies was to foster a domestic VC industry, which then became a strategic priority. The outcome was two VC-directed programmes - Inbal (since 1991), which failed; and Yozma (implemented during 1993–1997), which was very successful and was credited with triggering the creation of the domestic VC industry (for a detailed analysis of Yozma and Inbal programmes see Avnimelech and Teubal, 2008). The critical design dimensions of the Yozma programme dealt with the specific system failures blocking the VC emergence in Israel.”).

⁴⁸⁴ See also *id.* (“During Israel’s VC industry pre-emergence phase (1985–1992), a considerable amount of business experiments took place; which facilitated identification of the basic design features of the future VC targeted programme (Yozma). These experiments pertained to start-up and VC companies and activities. There was learning about a new start-up business model, which is oriented from “day-one” to global product and capital markets with strong implications for its strategy. For example, it became increasingly important and recognized that start-ups must from year one search for linkages with the leading high-tech clusters and markets. Moreover, it became increasingly important to adopt US security and exchange commission standards and accountancy rules and other attire of US high-tech companies. Some of the start-ups were successful and pointed the way to others. Business experiments and learning also occurred in relation to VC companies and activities.”).

⁴⁸⁵ *Id.*

for the problem of the weak “economic impact of companies having received R&D subsidies from the OCS.”⁴⁸⁶ According to economist Avnimelech, Israeli policy makers tried to learn from the successful story of Silicon Valley, and accordingly, many OCS officers visited Silicon Valley, conducted interviews with various US stakeholder groups, such as venture capitalists, entrepreneurs, officers of the small business administration, and with investment banks.⁴⁸⁷

The first Israeli government targeted attempt at creating a venture capital industry, which was via the implementation of the Inbal program, was actually unsuccessful. The Inbal (government insurance company) program, which was launched in 1991, prior to Yozma, was an effort by the Israeli government to stimulate publicly traded venture capital funds by essentially “guaranteeing the downside of their investments.”⁴⁸⁸ The Israeli government (via Inbal) guaranteed up to 70% of the initial capital assets of the four Inbal venture capital funds that were traded on the Israeli stock market.⁴⁸⁹

⁴⁸⁶ *Id.* (“The high impact of these search and learning processes was underpinned by the successful development of experience-based policy capabilities at the OCS—the result of over 20 years of operational experience in managing incentive programmes in support of R&D and innovation.”).

⁴⁸⁷ *Id.* (“The high impact of these search and learning processes was underpinned by the successful development of experience-based policy capabilities at the OCS—the result of over 20 years of operational experience in managing incentive programmes in support of R&D and innovation.”).

⁴⁸⁸ *Id.*

⁴⁸⁹ See Gil Avnimelech & Moris Teubal, *From Direct Support of Business Sector R&D/Innovation to Targeting Venture Capital /Private Equity: A Catching-Up Innovation and Technology Policy Life Cycle Perspective*, 17 (1&2) ECON. INNOV. NEW TECHN. 153 (2008) [hereinafter: Avnimelech & Teubal (Targeting VC)] (“Inbal funds valuations in the stock market were low, similar to holding companies’ valuations; and the funds encountered bureaucratic problems. More significant was the fact that the program did not attract any ‘adding value’ agents or capabilities. Moreover, the funds did not succeed financially and did not raised additional capital. Eventually all four ‘Inbal’ funds quit the program.”); See also, Gil Avnimelech & Morris Teubal, *Evaluating Venture Capital Policies: Methodological Lessons from the Israeli Experience*, Speech at the DRUID Summer Conference 2003 on Creating, Sharing and Transferring Knowledge The Role of Geography, Institutions and Organizations (June 12-14, 2003) [hereinafter: Avnimelech & Teubal (Methodological Lessons)].

Moreover, the managers of the Inbal funds had to deal with certain restrictions on their investments, as well as with government bureaucracy and preparation of lengthy and cumbersome periodic reports.⁴⁹⁰ The Inbal venture capital funds and the program were not successful.⁴⁹¹

Israeli policy makers were able to draw the following conclusions due to the failure of Inbal, which led to the development of Yozma.⁴⁹² They needed to develop a mechanism that will draw the participation of professional venture capital agents in the Yozma program, in order to produce venture capital funds that can provide Silicon Valley like added services, such as mentoring, networking, evaluation of business plan.⁴⁹³ They decided to select the limited partnership form (instead publicly traded funds), for the formation of the venture capital funds, and put emphasis on early stage investment. According to economists Avnimelech and Teubal, another reason for selecting the limited partnership model for Yozma had to do with the experiences with the Inbal publicly traded venture capital funds, that were “exposed to 'stock market sickness' & short-term thinking,” which resulted in very low “social impact.”⁴⁹⁴

⁴⁹⁰ See Avnimelech & Teubal (Targeting VC), *supra* note 489; See also Avnimelech & Teubal (Methodological Lessons), *supra* note 489.

⁴⁹¹ See Avnimelech & Teubal (Targeting VC), *supra* note 489; See also Avnimelech & Teubal (Methodological Lessons), *supra* note 489.

⁴⁹² See Gil Avnimelech, VC Policy: Yozma Program 15-Years perspective, Speech at the DRUID Conference (2009) [hereinafter: Avnimelech (Yozma Program)] (“Four sets of factors seem to have been responsible for Yozma to become an effective trigger of Israel's ICT Cluster: a) favorable background conditions; b) policy and market forces’ experimentation during the pre-emergence period; c) timing - the time overlap between Yozma implementation on the one hand and the rising Nasdaq index and expanding market for ICT on the other; and d) the successful design and implementation of the Yozma program.”).

⁴⁹³ *Id.*

⁴⁹⁴ See also Avnimelech & Teubal (Methodological Lessons), *supra* note 489.

The Inbal program had several weaknesses that Yozma was able to deal with. First, investors in publicly traded venture capital funds had difficulty with contributing to the operation of the fund.⁴⁹⁵ Second, publicly funded venture capital funds (as compared to private ones) encountered more difficulty with swiftly exploiting the reputation that is usually earned from early exits, and, therefore, with raising new capital.⁴⁹⁶ Third, Inbal's failure was also due to the limits that it placed on the funds' management compensation as well as their decision-making ability.⁴⁹⁷ Finally, Inbal was lacking in incentives for the "upside" and therefore did not attract professional venture capitalists.⁴⁹⁸

The Yozma fund was accordingly designed in 1992 to overcome the abovementioned challenges, and especially to create a platform for a competitive venture capital industry in Israel.⁴⁹⁹ The Yozma program was intended to create venture capital funds, which will be active and invest a critical mass of capital in the Israeli market, while also collaborating with (as well as learning from) foreign limited partners, and growing a network of international contacts and connections.⁵⁰⁰

c. The Successful Yozma Design

The results of the Yozma initiative exceeded expectations and are noteworthy. Yozma I was created in 1993 and in the following three years established ten drop-down

⁴⁹⁵ *Id.*

⁴⁹⁶ *Id.*

⁴⁹⁷ *Id.*

⁴⁹⁸ *Id.*

⁴⁹⁹ See Avnimelech (Yozma Program), *supra* note 492.

⁵⁰⁰ *Id.*

funds.⁵⁰¹ The initial Israeli government owned Yozma I venture capital fund was established a \$100M investment, as follows: \$80M of the investment was directed at the ten drop-down funds, whereas the remaining \$20M was to be invested directly in Israeli high-tech companies.⁵⁰² The ten initial Yozma I funds, which were created between the years 1992 to 1997, raised just over \$200 Million with the funding support of the Israeli government.⁵⁰³

The following is a description of the structure of the ten drop-down Yozma funds. One of the requirements for the establishment of the Yozma funds was that each of the resulting funds would have to assign at least two limited partners, one from an established Israeli financial institution and the other from an established foreign institution. It should be noted that the new entity, the venture capital fund, had to be an autonomous new organization, which was not owned by any of the existing financial institutions.⁵⁰⁴

The “upside” incentive that Yozma provided to private investors was that they could leverage their profits through acquisition of government shares, because each of the

⁵⁰¹ See Yozma Group, *supra* note 461 (according to Yozma’s web-site “With the backing of prominent American, European and Israeli investors, Yozma successfully launched its second fund, Yozma II, which commenced operations in September 1998 and its third fund, Yozma III in 2002. Yozma II & III continued the successful strategy of making direct investments in technology companies and to play a significant role as a value added investor by recruiting senior managers, formulating business strategies, raising additional capital rounds and attracting strategic and financial investors to its portfolio companies.”).

⁵⁰² See Avnimelech (Yozma Program), *supra* note 492 (“The basic thrust was to promote the establishment of domestic LP VC funds that invested in very young Israeli high tech startups with the support of government and with the involvement of reputable foreign VC investors.”).

⁵⁰³ See Senor & Singer, *supra* note 195.

⁵⁰⁴ See Avnimelech (Yozma Program), *supra* note 492 (“this was made to assure a competitive industry, which is not lacked-in to the old financial system’s routines... When a fund fulfilled these conditions, the Government would invest (through Yozma) 40% (up to 8M\$) of the funds raised. Thus the \$100M of Government funds would draw at least \$150M of private sector funds (domestic and foreign).”).

10 Yozma funds had a call option on Government shares, at cost (plus interest), for a period of five years.⁵⁰⁵ The Yozma I fund and ten drop-down funds were autonomous and independent Israeli venture capital limited partnerships.⁵⁰⁶ They also had an emphasis on early-stage investment in Israeli high-technology companies. Each of the 10 Yozma Israeli venture capital funds was managed by a local Israeli management team, which partners with an established Israeli financial institutions and a reputable foreign venture capitalist.⁵⁰⁷

The ten original Yozma funds were managing Israeli funds totaling \$2.9 billion, one decade following their inception, and the Israeli venture market has also expanded to 60 additional funds, which were managing approximately \$10 billion.⁵⁰⁸ According to Senor and Singer, the “magnitude of this success shows that the ratio of VC investment to GDP is far higher in Israel than elsewhere.”⁵⁰⁹

Another feature that set the Yozma initiative apart from other Israeli government programs at that time was that it eliminated many of the bureaucratic hurdles. It was all about simplicity, employing a user-friendly governmental application system and a

⁵⁰⁵ See *id.* (“The incentives to the ‘upside’ also stimulated entry of professional VC firms and managers (when you have higher returns the government incentive becomes more significant). The program also assured the realization of learning through the compulsory participation of foreign financial institutions (most of them were well-experienced foreign VC companies.”).

⁵⁰⁶ See *id.*

⁵⁰⁷ See *id.*

⁵⁰⁸ See Yozma Group, *supra* note 461 (Yozma also helped a large number of its portfolio companies go public on major stock exchanges in Europe and the US. Additionally, Yozma was committed to placing its portfolio companies for an investment or acquisition by leading corporations such as America On Line, Cisco, Computer Associates, ECI Telecom, General Instruments, Johnson & Johnson, Medtronic, Microsoft, Sequoia Capital and Benchmark.).

⁵⁰⁹ *Id.*

simple reporting mechanism. There were no cumbersome application processes or complex reporting requirements.⁵¹⁰

Moreover, Yozma not only “imitated” the Silicon Valley success story, it also adopted US venture capital friendly legal structures that would attract foreign investors, which was key to its success.⁵¹¹ There are examples of foreign government programs, such as in Malaysia, which were designed to encourage entrepreneurship but failed⁵¹² because they tried to simply “import” a design from another country without changing the legal or tax structures, ultimately wasting taxpayers’ money. Some of the Yozma fund’s legal features included: (1) a fixed life of 10 (or seven) years, (2) a limited partnership, modeled after Delaware partnership law, which was the standard practice in the United States, and (3) a flow through tax status.⁵¹³ The payment to the venture capital funds managers were also modeled after the Silicon Valley “2 and 20” rule, and were

⁵¹⁰ See Lerner (Boulevard of Broken Dreams), *supra* note 38; See also Avnimelech (Yozma Program), *supra* note 492 (Avnimelech is comparing between Yozma and Inbal, and describing the bureaucracy that Inbal fund managers had to deal with.).

⁵¹¹ See Ber, *supra* note 189 (“The structure of the funds’ activity in Israel is almost identical with that in the US. The Israeli funds were set up for a limited period of seven years (as compared with ten years in the US), at the end of which they are liquidated (although the management funds may continue functioning). During this period they invest in firms in order to bring them to a stage where they can realize their investment (henceforth, exit). In other words, the activity of the funds—from the time the firms are selected and throughout the stage of investment in them—is undertaken for one purpose. Because the lifetime of each fund is limited, the management fund tend to open a new one every three years. The funds are set up as limited partnerships so that the capitalists (limited partners) are not involved in the current activity of the fund, and just receive periodic statements. The payment to the managers of the VC funds is usually divided into two: current annual payment as a percentage of the fund’s capital (which in Israel is 2–2.5 percent), and a percentage of the yield on successful investments (20–25 percent), which is usually received only after the initial capital has been repaid to the capitalists (i.e., not at the first exit).”).

⁵¹² See Lerner (Boulevard of Broken Dreams), *supra* note 38, at 111 (“[T]he frequent failures among public programs to stimulate entrepreneurship and venture capital suggest that many pitfalls face these efforts. The stark truth is that many more initiatives have been unsuccessful than successful.”).

⁵¹³ See Senor & Singer, *supra* note 195.

typically divided as follows: annual payment as a percentage of the fund's capital (2–2.5 %), and a percentage of the yield on successful investments (20–25 %), which is obtained only after the initial capital was repaid to the investors (capitalists).⁵¹⁴ Had the government not adopted these new legislation features and the Israeli treasury department resisted them, it is unlikely that the program would have become successful.⁵¹⁵

d. Yozma vs. Silicon Valley

The emergence of the Israeli high tech industry in the 1990s is very similar to that of Silicon Valley.⁵¹⁶ Both Israel and Silicon Valley emerged from multi-faceted collaborations between academic and research institutions, private local firms and public intervention (such as grants and continued military spending in technology). However, according to Avnimelech and Teubal, Silicon Valley didn't have a background "backbone" program that parallels the Israeli government's implementation of its horizontal research and development grants scheme.⁵¹⁷ There are US government programs that support research and development and small entrepreneurial firms, such as the SBIR,⁵¹⁸ which was discussed above, and was a federal government initiative that

⁵¹⁴ See Ber, *supra* note 189.

⁵¹⁵ See Senor & Singer, *supra* note 195.

⁵¹⁶ Gil Avnimelech & Morris Teubal, *Venture Capital Policy in Israel: A Comparative Analysis & Lessons for Other Countries*, Presented at the International Conference: Financial Systems, Corporate Investment in Innovation and Venture Capital, Brussels (2002) [hereinafter: Avnimelech & Teubal: Comparative Analysis].

⁵¹⁷ *Id.*

⁵¹⁸ See also Josh Lerner, *The Government as Venture Capitalist: The Long-Run Impact of the SBIR Program*, 72 J. BUS. 285-318 (1990) [hereinafter: Lerner (Venture Capitalist)] (SBIR "has provided over \$7 billion to small high-technology firms between 1983 and 1997... awardees enjoyed substantially greater employment and sales growth than the matching firms.").

changed the United States innovation system during the 1980s. SBIR, for example, was not a targeted policy, such as Yozma, because it was not designed to create a venture capital industry.⁵¹⁹

Avnimelech and Teubal compared Yozma to other international (including US) government programs that supported the venture capital industry, such as programs that provide supply and risk sharing incentives to investors.⁵²⁰ There are several unique features of Yozma. First, its main incentive - the 'upside' – if the future venture capital funds became profitable, then the private investors had a “call option” on the Israeli government’s shares. The call option was for a period of 5 years, at cost, plus a 5 to 7% interest.⁵²¹ Second, Yozma guaranteed a “leaning from others” process (or a realization of 'supply side learning,') because it mandated the participation of a foreign financial institution.⁵²² Third, the Yozma funds were structured to allow informal interaction amongst the different managers of the funds.⁵²³ Fourth, there was active participation of the government, the OCS (The Chief Scientist was the founder of Yozma - Yigal Erlich), and the other OCS officers at the board meetings of all the Yozma funds.⁵²⁴ Fifth, there

⁵¹⁹ There were other general policies that had an effect on venture capital formation in the US, such as the reduction in capital gains tax, but they are not targeted policies.; *See* Avnimelech & Teubal (Comparative Analysis), *supra* note 516.

⁵²⁰ *Id.* (Yozma “did not provide guarantees nor tax benefits; nor was it accompanied by new regulation rules for Pension Funds (Capital Gains tax was relatively low at the time and Pension Funds were allowed to invest a small amount on VC subject to Government regulation. In both respects Israel's situation was 'level playing field' with that of other countries at the time.”).

⁵²¹ *Id.*

⁵²² *See* Avnimelech & Teubal (Comparative Analysis), *supra* note 516.

⁵²³ *Id.*

⁵²⁴ *Id.*

was aggressive investment policy and steady stimulation of co-investment between the Yozma Funds.⁵²⁵ Sixth, on the ‘demand side,’ the support for the industry was provided by other Israeli government ‘backbone’ research and development support programs as well as by the Technological Incubators Programs,⁵²⁶ discussed below.

3. Israeli Business Technology Incubators

The Israeli business technology incubator program is a strategic policy tool used by the Israeli government in order to encourage innovation and stimulate growth, by providing seed capital (small amount of preliminary capital that is used in order to start a business)⁵²⁷ for companies (or entrepreneurs) that have an idea and need the seed capital in order to survive the early stages (valley of death). The companies often need capital in order to invest in research and development, to pay for initial operating expenses, and to eventually attract the interest of venture capitalists. The programs are designed to offer early-stage (seed) temporary support to budding entrepreneurs, which is usually limited to two years.⁵²⁸

⁵²⁵ *See id.*

⁵²⁶ *Id.*

⁵²⁷ It should be noted that, in Israel, incubators usually provide seed capital, whereas start-up capital is provided by venture capital funds. *See also* Amnon Frenkel, Daniel Shefer & Michal Miller, *Public vs. Private Technological Incubator Programs: Privatizing the Technological Incubators in Israel* (Paper presented at the 4th Congress of the European Regional Science Association, 23-27 August 2005, Amsterdam) (2005).

⁵²⁸ See Manuel Trajtenberg, R & D Policy in Israel: an Overview and Reassessment, NBER (Oct. 2000) (working paper No. 7930) (According to Trajtenberg, the “premise is that the technological incubator would significantly enhance the entrepreneur’s prospects of raising further capital, finding strategic partners, and emerging from the incubator with businesses that can stand on their own. Of course, this initial stage is the riskiest, and certainly in the early 1990s there were virtually no other sources of finance in Israel for such ventures.”).

The Israeli technology incubators program was designed as a shared-use facility, where the companies have an office or lab in the incubator facility.⁵²⁹ It is intended to accelerate the progress and development of the participating seed (very early stage) entrepreneurial firm via a range of business support resources and services, which are developed by the incubator program manager (or management) according to the participating firm's needs. The main goal of the business incubation program is to generate successful firms that can leave the facility (within the program's time frame, depending on the technology, location and the firm) in a financially and organizationally self-sustained and viable state.

The incubator manager provides a variety of (venture capital like) services, which are tailored to the specific needs of the participating firm, and also depend on the firm's level of management skills, overall development of innovation, industry sector, as well as its geographic regional location. The services include mentoring, assistance with the research and development or business plan, hiring new management, clerical services, organizational analysis, legal and accounting guidance, and networking (introducing entrepreneurs to potential partners and investors.)

The Israeli Office of the Chief Scientist initiated the program in order to provide integration and employment to the following groups. First, to the engineers and scientists who immigrated to Israel from the former Soviet Union.⁵³⁰ According to economists

⁵²⁹ The OCS established about twenty-four incubation centers, which finance entrepreneurial ideas that are accepted by the program.

⁵³⁰ See Frenkel, Shefer & Miller (2005), *supra* note 527; See also, Trajtenberg (2000), *supra* note 528 ("Many of these immigrants were scientists and skilled professionals that came to Israel with highly valuable human capital as well as with plenty of ideas for innovative products. However, they were lacking in virtually all other dimensions required for commercial success, from knowledge of the relevant

Avnimelech, Schwartz and Bar-El, the intention of the program was to “reduce unemployment among scientists and engineers who had immigrated to Israel from the former Soviet Union.”⁵³¹ Second, to provide employment to engineers from the military sector who were laid off and tried to integrate into the civil sectors. In 1986, the Israeli military “Lavi” project (the Israeli-designed fighter airplane) was closed down, which caused several thousands of military engineers to integrate into the civil sector.⁵³² These engineers were “transformed” into technological entrepreneurs.⁵³³

a. Governance

There are several models of incubators, ranging from public non-profit, quasi-public, to private for-profit. The original Israeli incubator was formed as a not-for-profit entity. It was often also sponsored by any of the following stakeholder: a university or research institution, a local municipality, or a large private firm.⁵³⁴

The companies participating in the programs had to go through a selection process. It is the responsibility of incubator’s manager, who often is assisted by a group

languages (e.g. Hebrew and English) and of commercial practices in western economies, to managerial skills and access to capital. Even though it targeted new immigrants, the program is open to all.”).

⁵³¹ See Frenkel, Shefer & Miller (2005), *supra* note 527 (the initial requirements of the program were to have a minimum of 50% from the participants in the incubator be comprised of new immigrants, in order to facilitate their integration and access into the Israeli business market. As a result, many of the incubator programs were opened in peripheral regions, because immigrants were residing in these areas (“while there was no deliberate policy to create these incubators in peripheral areas, many of them were created in such areas.”) They referenced the Ministry of Industry and Trade (1998) policy.).

⁵³² See DANIEL SHEFER & AMNON FRENKEL, AN EVALUATION OF THE ISRAELI TECHNOLOGICAL INCUBATORS PROGRAM AND ITS PROJECTS – FINAL REPORT, IFISE ISRAELI FINANCING INSTRUMENTS FOR THE SUPPORT OF ENTREPRENEURSHIP, THE S. NEAMAN INSTITUTE FOR ADVANCED STUDIES IN SCIENCE AND TECHNOLOGY, TECHNION – ISRAEL INSTITUTE FOR ADVANCED STUDIES IN SCIENCE AND TECHNOLOGY (2003), available at <http://ifise.univ.it/Download/final-draft3.pdf>.

⁵³³ *Id.*

⁵³⁴ *Id.*

of professional advisors, to select 8 to 12 projects from a multitude of applicants.⁵³⁵ The incubator has no industrial sector designation or limitation, and therefore, can support between 8 to 12 different projects.⁵³⁶

Following the selection process, the incubator manager, the professional advisors and the entrepreneur are in charge of drafting a “project folder,” which is then submitted to the incubator’s steering committee.⁵³⁷ Each incubator has a steering committee, which is usually chaired by the incubator’s manager.⁵³⁸ The committee is usually composed of members from the following stakeholder groups: research institutions and academia, industry representatives, and community leaders.⁵³⁹

The Central Incubators Administration, which is a body of experts located in the Office of the Chief Scientist, is the one that gets to make the final decision on which projects can participate in the incubator programs.⁵⁴⁰ Prior to making their determination, based on the submitted project folder, they can also request for additional advice from experts, depending on the industry and research objectives.⁵⁴¹

Each of the projects that gets accepted to the incubator program is evaluated on a yearly basis. Seed capital is usually limited for up to two years of operation.⁵⁴² However,

⁵³⁵ *Id.*

⁵³⁶ *Id.*

⁵³⁷ *Id.*

⁵³⁸ *Id.*

⁵³⁹ *Id.*

⁵⁴⁰ *Id.*

⁵⁴¹ *Id.*

⁵⁴² *Id.*

in limited circumstances, mainly when the project is from the biotech field, a third year of government support can be granted.⁵⁴³

In order to get accepted into the program, the project (idea) has to be based in research and development, and capable of being commercialized and exported to the appropriate market.⁵⁴⁴ Even though the entrepreneur (or entrepreneurial firm) receives 85% of the project funding from the Israeli government, it is the entrepreneurial firm, and not the government, that owns the technology. The firm is required to pay the Israeli government royalties (in order to repay the grant) once successful. In the event that the new venture fails, the government does not require repayment of the money invested.⁵⁴⁵ It should be noted that the Israeli culture does not punish failure. The Israeli culture recognizes that it is very likely that entrepreneurs and start-up firms will fail several times before they reach a successful outcome.

b. Financing Mechanisms

For the Israeli public incubator model, the government provides financial support both to the incubator's management, as well as to the programs' participants. The Israeli government provides annual grants to the incubators (management), up to the amount of \$175,000 per year, to each incubator.⁵⁴⁶ It also provides grants to the seed companies

⁵⁴³ *Id.*

⁵⁴⁴ *Id.*

⁵⁴⁵ *Id.*

⁵⁴⁶ *Id.*

that participate in the program, up to the amount of \$150,000 per year, to each participating company (or project) for a maximum of two years.⁵⁴⁷

The participating firm (or project) has a certain amount of approved budget that is dedicated to the project. The Israeli government allocates a grant to the project that can reach up to 85% of the approved budget of the project.⁵⁴⁸ The additional 15% of the approved budget, which is termed “complementary financing,”⁵⁴⁹ is to be supplied by the entrepreneur (or by a private partner that is brought in by the entrepreneur, in return for a certain amount of equity in the project).⁵⁵⁰

The Israeli government established 28 incubators between the years 1990 and 1993.⁵⁵¹ The incubator’s geographic locations range from metropolitan areas to peripheral ones.⁵⁵² The program was also intended to stimulate and encourage linkages

⁵⁴⁷ *Id.*

⁵⁴⁸ *See* Frenkel, Shefer & Miller (2005), *supra* note 527.

⁵⁴⁹ *See id.*

⁵⁵⁰ *See id.* (According to Miller, Shefer & Frenkel “From a small annual budget of \$2 million at the beginning in 1991, the technological incubator program increased its annual budget to \$32 million in 2002. As of 2003, total government grants to the program amounted to \$285 million (see: www.incubators.org.il). At the end of 2003, more than 200 projects were in operation in incubators, which employed more than 2,000 workers. One third of the initiatives were based on ideas brought by new immigrants, all of whom had an academic education (most with a Master’s or Ph.D. degree).”).

⁵⁵¹ *See id.*

⁵⁵² *See id.* (“The aim of the technological incubator program, as a development program “from below”, is to foster entrepreneurial activities from the very beginning of a project’s initiation. Therefore, the incubator has the advantages and drawbacks typical of this kind of program. It can help to create a healthy entrepreneurial culture by empowering local people and encouraging them to develop their own firms locally. A technological incubator located in a remote region may be able to provide a number of functions that are seldom found in peripheral areas, such as venture capital supply, business and legal consultation, and the filtering of valuable ideas. Obviously, however, it cannot help in increasing the supply of skilled labor.”).

and cooperation between entrepreneurs, academic institutions, private industry and public sectors (government procurement).⁵⁵³

In 2003, economists Shefer and Frenkel, conducted a study, which concluded that the technological incubator programs were able to attract non-government financing sources, by attracting private investors, and by collecting fees from “royalties, sale of shares and dividends, and strategic partnerships.”⁵⁵⁴

c. Privatization

The Israeli Technological Incubator programs were privatized in 2002. Initially, Israeli incubators were not-for-profit quasi-governmental entities,⁵⁵⁵ and managed by the incubator’s manager, as well as by its stakeholders, who were public actors, such as research institutions, universities, or municipalities. The public managers provided budding companies with start-up resources, such as low-cost facilities or labs, as well

⁵⁵³ The academic peer review of the marketable research gauges whether the idea or a project in question can be commercialized, thereby strengthening the relationship between academic research and private industry.

⁵⁵⁴ See Shefer & Frenkel (2003), *supra* note 532 (Shefer and Frenkel assessed the successes of the Israeli Technological Incubator Program in 2003, which was ten years following its establishment. They concluded that generally the program has fulfilled its purpose, because approximately 86.4% of the projects (during the years 1999 to 2001) have graduated from the program, while 7% of these projects were also able to secure immediate financial support following graduation. According to Shefer & Frenkel, these statistics indicate that the programs were successful. It should be noted, however, that incubators that were located in geographic areas that are considered the periphery, actually experiences lower levels and rates of success (when compared with programs located in central regions). According to Shefer & Frenkel, these findings suggest that vast government support is still needed in the initial stage of the incubator programs. However, government support in the programs can be gradually reduced over time, especially once private financing sources are attained. Yet, there is a caveat, it seems that technological incubators that are located in peripheral regions do require more public support, as well as for a longer period of time (as compared to incubators located in central regions of the country).

⁵⁵⁵ Catarina Wylie, *Vision in Venture: Israel’s High-Tech Incubator Program*, 10 CELL CYCLE 855 (March 15, 2011) available at <http://www.landesbioscience.com/journals/cc/Israeli-IncubatorCC10-6.pdf?nocache=1570288485>.

equipment and administrative services. Today, however, many Israeli incubators belong to private groups due to the following.

The privatization of the Israeli public business technology incubators, according to economists Frenkel and Shefer, was a result of the access and participation of private capital in the funding of the incubators, and guided by the rationale that there is no need for further government intervention (financing) where the private sector is able to successfully take the government's role in financing the incubators.⁵⁵⁶

Using the vehicle of a public-private partnership, in the form of an incubator joint company, many of the Israeli incubator programs were privatized.⁵⁵⁷ The incubator joint company reduced its shares via an increase of capital from external investment.⁵⁵⁸ It did not have tradable shares.⁵⁵⁹ In addition to this privatization process, Frenkel and Shefet describe a situation where wholly privately owned incubator models started to emerge in Israel.⁵⁶⁰

After the privatization, a dramatic rise was seen in the success rates of entrepreneurial firms that participated in the private or quasi-public technology incubator

⁵⁵⁶ See Frenkel, Shefer & Miller (2005), *supra* note 527 ("Privatization means a reduction in the government's role in producing goods and services, as well as limiting its control and regulation of the economy. It is commonly understood that government usually does not manage its resources efficiently. Therefore, public companies will be less efficient than private companies. Thus, turning public companies to private enterprises could increase their efficiency and thereby, the efficiency of the whole economic system (Eckstein et al., 1998). Results have shown though, that privatization increases efficiency and innovation if it is done in a wise manner (Kikeri et al., 1994).").

⁵⁵⁷ *See id.*

⁵⁵⁸ *Id.*

⁵⁵⁹ *Id.*

⁵⁶⁰ *Id.*

programs.⁵⁶¹ Success rates were measured by the ability of entrepreneurial firms, after graduation from the program, to obtain subsequent funding as well as continue growing their operations.⁵⁶² Following graduation from the incubator program, many companies were able to create jobs and attract international venture capital funds.⁵⁶³

The Israeli government further privatized the programs by establishing a franchise system, whereby the government licenses the incubators to experienced equity investment firms, who grant management support to the portfolio companies and extensively invest in the incubator startup projects.⁵⁶⁴

Since 2002, the Israeli government has continued to develop this franchise model, for example, by initiating a new repayment mechanism.⁵⁶⁵ Originally, the Israeli government granted funding for projects directly to the public technological incubator program.⁵⁶⁶ In that way, the program was the agent in charge of transferring the government funding to the individual companies. Moreover, the program, not the startup firm, was the one accountable for paying off the grant, usually within a four-year period from the date in which the startup firm graduated from the program.⁵⁶⁷ In order to guarantee that the money will be repaid, the Israeli government held shares in each of the

⁵⁶¹ *Id.*

⁵⁶² *Id.*

⁵⁶³ *Id.*

⁵⁶⁴ See Wylie, *supra* note 555. According to the Director of the Technological Incubators Program, Yossi Smoler.

⁵⁶⁵ Interview with Yossi Smoler, *see* Wylie, *supra* note 555.

⁵⁶⁶ See Wylie, *supra* note 555.

⁵⁶⁷ *Id.*

funded startup firms, and if the incubator didn't repay the grant within the said four-year period, the government had the right to decide on whether or not to sell its stake in the startup. According to Yossi Smoler, the Director of the Technological Incubators Program, the repayment mechanism was "too complex and wasn't something in which the government wanted to be involved in."⁵⁶⁸ Today, the repayment mechanism has changed so that the government now allocates funds directly to the startup company and the company pays off the amount via royalties (usually three to five percent plus market-rate interest).⁵⁶⁹

d. The Differences between Israeli Public & Private Incubator Models

There are various differences between public or quasi-public incubators and private incubators. They range from differences in industry specialization and field (or project) activities, the number of projects that are active in (accepted to) the incubator, the sources of capital for management as well as for the participating projects, to size, management and incubator initiator.⁵⁷⁰

There is also a difference in terms of which entrepreneurs will probably apply (and get accepted) to a public or private incubator. Frenkel and Shefer hypothesize that entrepreneurs, from the private industry are likely to apply and join private incubators,

⁵⁶⁸ *Id.*

⁵⁶⁹ *Id.*

⁵⁷⁰ See Frenkel, Shefer & Miller (2005), *supra* note 527.

whereas, entrepreneurs, from the public sphere, such as research institutions, will probably elect to join the public incubators.⁵⁷¹

Another important aspect is the difference in the stage and level of investment as well as the degree of risk taking. Frenkel and Shefer further assume that public incubators are expected to support high-risk projects because they can benefit society and need a longer period for maturation (i.e., the field of biotechnology). On the other hand, private incubators are expected to invest in lower-risk promising projects (for high profitability), which are likely to result in a short-term result for the investors as well as experience rapid growth (i.e. software industry).

With regards to the ability of public versus private incubators to attract venture capital financing for their graduating project, Frenkel and Shefer hypothesize that it is likely that private incubator will attract more follow-on venture capital investment than public incubators. Mainly because venture capital funds center on short-term results that can maximize their investors' returns.⁵⁷² Additionally, the venture capital industry will not substitute the need or role of the public incubators; rather, they would serve as a complementary source for the funding granted by the public incubators (who invest in order to advance national and social goals).⁵⁷³

In summary, the Yozma and Technology Incubator programs exceeded the initial goals of their founders, facilitating the development of a world-class high tech industry in Israel. The OCS's mission to encourage cross-regional (international bilateral or

⁵⁷¹ *Id.*

⁵⁷² See Frenkel, Shefer & Miller (2005), *supra* note 527.

⁵⁷³ *Id.*

multilateral cooperation on) innovation was and continues to be extremely successful. The OCS continues to expand the research and development initiatives with international partners (via bilateral or multilateral cooperation) and contributes to the expansion of global innovative markets. Among these expanding markets, quite notably, have been the United States, China and India.⁵⁷⁴ The Israeli government has been instrumental in setting up offices around the world, and especially in the USA, in order to promote trade, and has been actively investing outside its borders. Israel has transitioned from being a “capital-importing” country to a “capital-exporting” country.⁵⁷⁵ Israel’s strategy in the past few years has been to undertake a wide-range of pro-competition and pro-market reforms.⁵⁷⁶ Due to these reforms and the continued success of the high-technology sector in Israel, even in 2007 and 2008, during times of global economic slowdown and financial crisis, the total number of Foreign Direct Investment inflows to Israel continued to be high.⁵⁷⁷

⁵⁷⁴ Matimop, the Israeli Industry Center for R&D, operates international R&D agreements on behalf of the OCS with Italy, Belgium, Ireland, Germany, Holland, Spain, Portugal, Finland, France, Sweden, Denmark, India, Turkey, Brazil, Argentina, Uruguay, Greece, China, Russia, the Czech Republic, Hungary, Ontario (Canada), Maryland (USA) and Victoria (Australia).

⁵⁷⁵ *Id.*

⁵⁷⁶ See Efraim Chalamish, *An Oasis in the Desert: The Emergency of Israeli Investment Treaties in the Global Economy*, 32 LOY. L.A. INT’L & COMP. L. REV. 123, 126 (2010) (“[A]s a result, the Israeli government’s need to sign BITs in order to protect and increase foreign investment has diminished significantly. Indeed, the total inflows of foreign investments in 2006 increased three fold over the total inflows in 2005, indicating sustainable long-term investments. The increase in total inflows of foreign investments was boosted by direct investments in the rapidly expanding high-tech sector in Israel, and portfolio investments in Israel’s capital markets, primarily through the Tel Aviv Stock Exchange, which have been “free from almost all exchange controls since 1998.” The total number of FDI inflows continued to be high in 2007 and 2008, even in times of financial crisis and global economic slowdown.”).

⁵⁷⁷ *See id.*

4. Civilian-Military Collaboration

Computer software is a clear example of an industry that has evolved due to military-civilian spillovers, in Israel, as well as in the United States.⁵⁷⁸ In Israel, the military plays an important role in driving innovation and growth. The Israeli government spends approximately 10 to 15 percent of its GDP on defense.⁵⁷⁹ The majority of the funds that are allocated to the Israeli military are spent on its communications industry.⁵⁸⁰ The communications technology that the Israeli military develops is often used for the benefit of its citizens.⁵⁸¹ It should be noted that Israel was recently ranked in the top 10 of the largest and strongest armies in the world.⁵⁸²

Israel has a mandatory military draft policy. This mandatory draft is also one of the reasons Israel has such high technology capabilities and innovation and reinforces its public-private collaboration model because of the following reasons. First, by enforcing a mandatory draft at the age of 18, the army is responsible for training the labor force. During their military service, many Israelis gain experience in learning how to develop, procure and manage the various multibillion-dollar procurement and research programs, which eventually make their way into the civilian communications, biomedical or other

⁵⁷⁸ David C. Mowery & Richard N. Langlois, *Spinning off and spinning on(?): the federal government role in the development of the US computer software industry*, 25 RESEARCH POL. 947 (1996) (According to Mowery & Langlois, the military-civilian spillovers that occurred in the computer science industry have flowed from defense related funding of academic research in this field).

⁵⁷⁹ See Chaifetz, *supra* note 448.

⁵⁸⁰ *Id.* at 388.

⁵⁸¹ *Id.*

⁵⁸² See Global Firepower available at <http://www.globalfirepower.com>; See also Walla News available at <http://news.walla.co.il/?w=/2689/2582108>.

technological industries.⁵⁸³ Second and more importantly, the Israeli army experience is known for contributing to the development of the soldier's leadership, responsibility and individual decision-making skills.⁵⁸⁴ These skills are attributed to educating and producing a new generation of calculated risk-taking entrepreneurs.

It should be noted that there are many similarities between in Israel and the United States. For example, the fact that defense spending contributes to civilian-military cooperation and knowledge spillovers. It was thanks to the United States Department of Defense (DoD) spending that the United States was able to develop of the Internet (See ARPA example), and to the form of high-technology regions in Silicon Valley and Route 128. Additionally, the Department of Defense is the leading agency that supports the SBIR program, and spends approximately \$1 billion in SBIR grants annually.⁵⁸⁵

Today, however, the military and commercial demands in the United States have diverged drastically since the inception of the computer software industry.⁵⁸⁶ According to economists Flamm and McNaugher (1989,) changes in the research and development policy of the Department of Defense have contributed to the declining civilian-military

⁵⁸³ See Chaifetz, *supra* note 448, at 399 ("The Israeli army can hand-pick the best and brightest students to work in its high-tech operations. These students, intelligent to begin with, and now trained in the complex areas of telecommunications and software, leave the army after their service is completed and put their newly-acquired knowledge to use in the capital market.").

⁵⁸⁴ See Senor & Singer, *supra* note 195.

⁵⁸⁵ See *SBIR/STTR Award Size Flexibility*, SBIR/STTR (September 15, 2014), *available at* http://www.sbir.gov/sites/default/files/3_award_size-ipc_report.pdf.

⁵⁸⁶ Kenneth Flamm & Thomas L. McNaugher, *Rationalizing technology investments*, in *RESTRUCTURING AMERICAN FOREIGN POLICY*, (J. D. Steinbruner, ed. Washington, D.C.: The Brookings Institution) (1989) (Flamm & McNaugher cite declines in the share of basic research in DoD research and development spending, as well as increase in the Congressional demand for military research and development programs to yield near-term applications in weapons systems.)

technology spillovers.⁵⁸⁷ As noted above, economists Mowery and Rosenberg are concerned with the fact that the United States military market no longer plays a strategic role in the computer and semiconductor industries (as compared to its position in the 1960s).⁵⁸⁸

D. Recent United States History of Government Intervention

1. Recent Regional Cluster Initiatives by the United States Government

From 2008 on, the federal government had programs that were partly designed in order to stimulate regional economies.⁵⁸⁹ There were about 250 overlapping, but not coordinated programs that were worth approximately \$77 billion.⁵⁹⁰ However, in the last few years, the Obama Administration has shifted its strategy to redistributing the existing resources rather than to allocating significant new funds.⁵⁹¹ Overall, according to

⁵⁸⁷ *Id.*

⁵⁸⁸ See Mowery & Rosenberg, *supra* note 183.

⁵⁸⁹ KAREN G. MILLS, ANDREW REAMER & ELISABETH B. REYNOLDS, CLUSTERS AND COMPETITIVENESS: A NEW FEDERAL ROLE FOR STIMULATING REGIONAL ECONOMIES (2008), *available at* <http://www.brookings.edu/research/reports/2008/04/competitiveness-mills> (“The federal government has the reach and the resources to stimulate the growth of cluster initiatives and to address the various barriers that limit cluster development and growth. However, current federal programs do very little to support competitive regions in general and competitive clusters in particular. They have evolved in a wildly ad hoc, idiosyncratic, and uncoordinated fashion. Further, the few federal programs that do focus on cluster and network development remain inadequate to the task.”).

⁵⁹⁰ See Mills, Reamer, & Reynolds, *supra* note 589.

⁵⁹¹ See Mills, Reamer, & Reynolds, *supra* note 589.

Chatterji, Glaeser, and Kerr, the U.S. Government has been actively undertaking strategic efforts towards efficiency and greater impact in reorganizing regional cluster efforts.⁵⁹²

The central agency that is behind promoting these regional cluster efforts is the United States Department of Commerce's Economic Development Agency (EDA), which was established in order to support economically depressed rural and urban areas, in 1965. The America COMPETES Reauthorization Act of 2010⁵⁹³ requested the Secretary of Commerce to launch a strategic regional development innovation program in order to establish regional innovation clusters as well as science and research parks.⁵⁹⁴ The government also allocated \$50 million to EDA in order to support regional innovation clusters. In 2011, the Obama Administration integrated additional government agencies into its regional clusters strategy.⁵⁹⁵

The agencies have been investing in programs intended to promote this strategic regional clusters policy. For example, the Department of Energy established the Energy Innovation Hubs program, which was funded through the Recovery Act.⁵⁹⁶ That program

⁵⁹² Aaron Chatterji, Edward Glaeser, & William Kerr, *Clusters of Entrepreneurship and Innovation* (April 2013) (working paper No. 19013).

⁵⁹³ America COMPETES Reauthorization Act of 2010, Pub. L. No. 111-358, § 105, 124 Stat. 3982, 3989-93 (codified at U.S.C. § 3719 (2010)).

⁵⁹⁴ *See id.*

⁵⁹⁵ Sarah Rahman & Mark Muro, *Budget 2011: Industry Clusters as a Paradigm for Job Growth*, (last visited Dec. 9, 2014 at 7:43PM), <http://www.newrepublic.com/blog/the-avenue/budget-2011-industry-clusters-paradigm-job-growth>.

⁵⁹⁶ There are other examples of regional innovation cluster investments in the amounts of several million dollars in Florida (Space Shuttle Shutdown Transition) and Ohio (Water Technology Innovation Cluster). *See* Chatterji, Glaeser & Kerr, *supra* note 592.

has made a large investment in the amount of \$129 million,⁵⁹⁷ over a five-year period, in the cluster initiative called the Energy Regional Innovation Cluster in Philadelphia.⁵⁹⁸ There are other federal agencies participating in the program by providing technical assistance or smaller amounts of capital.⁵⁹⁹ The Greater Philadelphia Innovation Cluster is the cluster consortium that was formed as the result of the program and is comprised of the following stakeholders: academic institutions, government bodies, and regional development groups, who are the recipients of the funding and technical assistance.⁶⁰⁰

In 2010, the SBA launched a major initiative, which established 10 pilot regional clusters each with an investment of \$1 million. Three of the 10 clusters are focused on Advanced Defense Technologies.⁶⁰¹ In 2011, the SBA, Labor and Commerce departments sponsored another cluster initiative, called the Innovation Accelerator Challenge, which supports 20 clusters with investments totaling \$37 million.⁶⁰²

⁵⁹⁷ \$122 million come directly from the Innovation Hubs program. See Chatterji, Glaeser & Kerr, *supra* note 592.

⁵⁹⁸ Sean Pool, *A Win for Regional Innovation*, Science Progress (Aug. 25, 2010), <http://scienceprogress.org/2010/08/a-win-for-regional-innovation/>.

⁵⁹⁹ For example to contribution of other agencies, the Department of Labor provide technical assistance via its *One-Stop Career Centers*. See also Chatterji, Glaeser & Kerr, *supra* note 592.

⁶⁰⁰ See *id.*

⁶⁰¹ News Release, *Administrator Jackson, SBA Administrator Mills Announce Launch of Water Technology Innovation Cluster/Smart environmental protection creates jobs*, EPA (Jan. 18, 2011), available at <http://yosemite.epa.gov/opa/admpress.nsf/0/5C6E98E36238C0898525781C005B7B73>; Catherine Clifford, *A Cluster of Clusters: Where the SBA Is Investing in Regional Economies*, ENTREPRENEUR (Jan. 7, 2013), available at <http://www.entrepreneur.com/slideshow/225398>.

⁶⁰² See Chatterji, Glaeser & Kerr, *supra* note 592 (the Department of Labor provided \$19.5 million for technical skill development, Commerce's EDA provided \$14.5 million for economic adjustment assistance, and the SBA added \$3 million in technical assistance. The winning clusters provided matching funds of \$13 million.).

In March 2012, existing funds were redirected to establish initiatives, which involved more competitive grant applications and an emphasis on public-private partnerships as follows. In March 2012, the Rural Jobs and Innovation Accelerator Challenge was established with \$15 million of funding. In May 2012, the 3rd Jobs and Innovation Accelerator Challenge was established with a \$20 million investment and was focused on advanced manufacturing.⁶⁰³

In summary, the Obama Administration has strategically been attempting to encourage regional cluster innovation by spending over \$225 million on various related projects.⁶⁰⁴ In the 2014 budget, the SBA was awarded \$5 million for its Regional Innovation Clusters program.⁶⁰⁵

2. Startup America & Additional Federal Initiatives Intended to Promote Innovation, Entrepreneurship and Growth

In recent years, efforts were made by the Obama administration to boost innovation, by encouraging technology incubation and venture capital. President Obama⁶⁰⁶ launched the “Startup America” program, a national drive to present mentorship and funding in order to grow new businesses.

⁶⁰³ Most of the clusters funded by these grants existed formally or informally before receiving funding. The participation of the SBA in these initiatives is specifically designed to increase opportunities for small businesses in the clusters by leveraging specific SBA services, such as those provided by Small Business Development Centers (SBDCs).

⁶⁰⁴ See Chatterji, Glaeser & Kerr, *supra* note 592 (“This is a small amount of money in the context of the overall budget but is consistent with an emphasis on reorganizing existing funding streams more strategically to support clusters.”);

⁶⁰⁵ See Fiscal Year 2014 Budget of the U.S. Government, OFFICE OF MGMT. & BUDGET, at 165, *available at* <http://www.whitehouse.gov/sites/default/files/omb/budget/fy2014/assets/budget.pdf>.

⁶⁰⁶ See Nichols (2011), *supra* note 304 (As part of his State of the Union pledge to “win the future” by boosting innovation, President Obama stated: “Part of the mission of the program is to eliminate the capital

Startup America is an umbrella initiative that includes the following efforts. First, it centers on increasing entrepreneurial education and mentorship.⁶⁰⁷ Second, it includes proposals to boost entrepreneurs' access to capital.⁶⁰⁸ Third, it attempts to limit regulatory barriers to starting and growing companies.⁶⁰⁹ Fourth, it prompts technology commercialization efforts by universities.⁶¹⁰ Finally, it aims at generating new entrepreneurial opportunities in crucial industries such as education, healthcare and energy.⁶¹¹

On September 27, 2010, Congress and President Obama⁶¹² signed into law the Small Business Jobs Act (the "Act"),⁶¹³ which authorizes the establishment of the Small Business Lending Fund Program (that is administered by the Treasury Department) in order to "make capital investments in eligible institutions, in order to increase the

gains tax on some small business investments and speed up the patent process. The U.S. Small Business Administration was directed \$2 billion to match private-sector investment capital for under-the-radar startups and firms with high-growth potential.").

⁶⁰⁷ See Chatterji, Glaeser & Kerr, *supra* note 592.

⁶⁰⁸ *Id.*

⁶⁰⁹ *Id.*

⁶¹⁰ *Id.*

⁶¹¹ *Id.*

⁶¹² Press Release, WhiteHouse.gov, President Obama Signs Small Business Jobs Act – Learn What's In It, *available at* <http://www.whitehouse.gov/blog/2010/09/27/president-obama-signs-small-business-jobs-act-learn-whats-it> (According to President Obama, the act is "important because small businesses produce most of the new jobs in this country. They are the anchors of our Main Streets. They are part of the promise of America – the idea that if you've got a dream and you're willing to work hard, you can succeed. That's what leads a worker to leave a job to become her own boss. That's what propels a basement inventor to sell a new product – or an amateur chef to open a restaurant. It's this promise that has drawn millions to our shores and made our economy the envy of the world.").

⁶¹³ Small Business Jobs Act of 2010, Pub. L. 111-240 (2010).

availability of credit for small businesses.”⁶¹⁴ While from the outset it is admirable that the administration was concerned with small businesses and introduced legislation aimed at boosting the economy by creating jobs, there are some issues with the Act that should be addressed.

For example, there should be a distinction between an entrepreneurial firm as defined in this paper and a small business owner.⁶¹⁵ As journalist Annie Lowery puts it, “[s]cupper the image of Mark Zuckerberg handcrafting a new service to revolutionize how we socialize and adding thousands of jobs to the economy. Replace it with the image of a gas-station owner, servicing a crowded market, happy to be able to make his kid's soccer games without a boss breathing down his neck, and more wary of innovation than eager for it.”⁶¹⁶

As noted above, several scholars⁶¹⁷ have attempted to define what constitutes an “entrepreneur,” and show that the classic small business owner is different than the

⁶¹⁴ The Act authorizes the creation of the Small Business Lending Fund Program administered by the Treasury Department to make capital investments in eligible institutions, in order to increase the availability of credit for small businesses. *See id.*

⁶¹⁵ *See* Annie Lowrey, *Why Small Businesses Aren't Innovative*, SLATE, http://www.slate.com/articles/business/small_business/2011/09/why_small_businesses_arent_innovative.htm (last visited Dec. 9, 2014) (“The bulk of small businesses being created, in short, are not particularly innovative ones. Few spend any money on research or development, getting a patent, or otherwise trademarking a new idea. Most simply help provide already-crowded markets with familiar goods such as legal work or gas or nearby groceries. Nor are they *growing* businesses either.”).

⁶¹⁶ *See id.*

⁶¹⁷ *See* Hurst & Pugsley, *supra* note 61, (“economic theory usually considers entrepreneurs as individuals who (1) innovate and render aging technologies obsolete (Schumpeter, 1942), (2) take economic risks (Knight (1921); Kihlstrom and Laffont (1979); Kanbur (1979), and Jovanovic (1979)), or (3) are considered jacks-of-all-trades in the sense that they have a broad skill set (Lazear, 2005). Policy makers often consider entrepreneurs to be job creators or the engines of economic growth.”).

entrepreneur.⁶¹⁸ Hurt & Pugsley⁶¹⁹ demonstrate in a new study that the distinction between the small business owner and a true entrepreneur is very important because most small businesses do not innovate, remain small in size throughout their existence and do not provide the desired job creation that policy makers are intending to create. Moreover, Hurt & Pugsly also illustrate how very few of the small businesses in the market actually spend resources on innovation, such as intellectual property filings (such as registering for a patent, copyright or trademark) or investing in research or development.⁶²⁰

The Jumpstart Our Business Startups (the “JOBS”) Act,⁶²¹ which was signed into law by President Barack Obama on April 5, 2012, is another legislative effort worthy of mention. This Act has been met with mixed reviews and reactions.⁶²² On one hand, entrepreneurs and emerging growth companies are able to use novel practices in order to raise capital (the difficulty of raising capital has been previously discussed). On the other hand, critics (securities regulators, consumer and investor advocates) worry about Ponzi

⁶¹⁸ *Id.* (discussing the distinction between small businesses that intend to innovate and small business participants that “provide a relatively standardized good or service to an existing customer base. Specifically, these industries primarily include skilled craftsmen (e.g., plumbers, electricians, contractors, painters), skilled professionals (e.g., lawyers, accountants, and architects), insurance and real estate agents, doctors, dentists, mechanics, beauticians, restaurateurs, and small shop keepers (e.g., gas station owners and grocery store owners).”).

⁶¹⁹ *Id.* (explaining that “nearly half of all new businesses report providing an existing good or service to an existing market.”).

⁶²⁰ *Id.*

⁶²¹ Jumpstart Our Business Startups Act of 2012, Pub. L. No. 112-106, 126 Stat. 315 (2012) (codified in scattered sections of 15 U.S.C.).

⁶²² See Chatterji, Glaeser & Kerr, *supra* note 592 (“The focus of the JOBS Act was on reducing the financial reporting requirements for small firms and facilitating crowd funding, making it easier for individuals to invest in or contribute funds to start-ups. It raised the limit of Regulation A securities offerings to \$50 million, lifted the ban on general solicitation, and created a new class of companies—called emerging growth companies—that will have fewer disclosure requirements.”).

schemes and the future potential fraud to unaccredited investors. The media focuses on the aspect of crowdfunding;⁶²³ however, there are various new ways of raising capital according to the JOBS Act.⁶²⁴ A comprehensive discussion of such securities laws concerns, as well as other legal considerations, are outside the scope of this article, and should be explored in additional research and commentary.⁶²⁵

3. Criticism

Since the beginning of the financial crisis in 2008, governments have experimented with vast public interventions, both in the U.S. and other Western

⁶²³ The SEC will make a final determination on this issue following a 90-day period for the public to issue comments.

⁶²⁴ See Op-Ed by Chris Brummer & Daniel Gorfine, *The JOBS Act Isn't All 'Crowdfunding'*, FORBES MAGAZINE (10/08/2013), available at: <http://www.forbes.com/sites/realspin/2013/10/08/the-jobs-act-isnt-all-crowdfunding/> (discussing the JOBS Act and explain some of the main impacts, as follows: 1) There are special rules for 'Emerging Growth Companies' in order to encourage initial public offering (IPO). Twitter just used this provision for its IPO. 2) There will be significant changes to rules governing private offerings with regards to General Solicitation and Accredited Investors. 3) The legalizing of crowd investing (vs. crowdfunding). 4) Regulation A. 5) Private companies can remain private for a longer period of time as the Act increases the limit on the number of shareholders that a company may have prior to being subject to the Exchange Act annual reporting requirements.).

⁶²⁵ See Chatterji, Glaeser & Kerr, *supra* note 592 ("The federal government has also taken other lower profile steps, under the banner of Startup America, to explicitly to promote high-growth entrepreneurship. The Obama Administration modified the Small Business Investment Company program to offer two new \$1 billion funds to invest in high-growth businesses. Several government agencies, including the SBA, Veterans Affairs, and the Department of Energy have sponsored business accelerators. The USPTO also announced a new fast track 12-month patent application process that is especially targeted at entrepreneurial firms. The National Institutes of Health have simplified the process to license technologies for biomedical start-ups.").

economies.⁶²⁶ The U.S. government, like many Western governments,⁶²⁷ focused on financing the mainly inadequately run and very troubled firms in the economy.⁶²⁸

Both the Bush and Obama administrations tried to restart the market by dealing with the "troubled assets" that were overcrowding the banks' balance sheets, mainly due to housing-related loans and securities.⁶²⁹ In September 2008, the Bush Administration proposed to use \$700 billion of public funds on direct purchases of these troubled assets.⁶³⁰ However, the Bush administration eventually decided to call off this plan, after running into forceful opposition, especially since it seemed it would be hard for the U.S. Treasury to assess the worth of these troubled assets.⁶³¹

In March 2009, the Obama Administration announced a plan called the "Public-Private Investment Program" for investing up to \$ 1 trillion in order to finance competing and privately managed funds devoted to buying these troubled assets.⁶³² If the current crisis calls for immense public resources to be used for interventions perhaps the funds

⁶²⁶ See also Lerner (Boulevard of Broken Dreams), *supra* note 38, at 1.

⁶²⁷ Swiss government infusion of \$60 Billion into UBS in exchange for 10 percent of the firm's equity. See *id.* at 1 ("UBS Given an Infusion of Capital.").

⁶²⁸ See *id.* (The US Government invested over \$150 Billion in AIG in September and October in exchange of 81 percent of the firm's stock.).

⁶²⁹ Lucian A. Bebchuk, *Essays from the Weil, Gotshal & Manges Roundtable on the Future of Financial Regulation, Yale Law School, February 13, 2009: Buying Troubled Assets*, 26 YALE J. ON REG. 343, 344 (2009).

⁶³⁰ *Id.*

⁶³¹ *Id.*

⁶³² *Id.*

should be dedicated to advancing new enterprises instead of exclusively being used for bailing out troubled entities?⁶³³

This paper calls for an intense focus on entrepreneurship and venture capital as means of innovation that are the building blocks of our economy. In order to advance significantly and reliably, U.S. regulators, as well as their international counterparts, should concentrate on reviving the start-up market, with an emphasis on innovative technology, venture capitalists and high-growth entrepreneurial firms.

⁶³³ See also Lerner (Boulevard of Broken Dreams), *supra* note 38, at 1.

E. Introducing the Coalition Model

This paper calls the United States Government to intervene in the market, in the form of direct investment in the Coalition model's proposed strategic development tools (the initiatives). The model's proposed procedures for intervention will take the form of public-private partnership policies. These policies will bridge the financial and information gaps, in order to facilitate development of new technologies and stimulate economic growth by helping entrepreneurs and investors navigate through the Valley of Death.

The Coalition Model derives the core concept of Solow that technological innovation is the only reliable engine that drives change and is a fundamental source for productivity and sustained economic growth.⁶³⁴ It builds on this model and adds that government intervention is required because it is a powerful market actor,⁶³⁵ and can alleviate the discussed current market inefficiencies. A detailed analysis of each initiative and the market inefficiency that it tries to mitigate is provided below. Society becomes a stakeholder in economic growth because it empowers the government to act on its behalf. As noted above, government intervention is not a new concept because the government takes risk-bearing roles that private actors are not always able (or willing) to take for one reason or another.⁶³⁶

⁶³⁴ See Solow (1987), *supra* note 5.

⁶³⁵ See Hockett & Omarova, *supra* note 33.

⁶³⁶ See *id.*

It also builds on the notion that the government needs to invest in knowledge, human capital and innovation, in order to encourage knowledge spillovers,⁶³⁷ by encouraging the formation (and survival) of new entrepreneurial firms, which are mostly innovative and stimulate growth.⁶³⁸

Therefore, the United States Government needs to intervene in the market in order to increase growth, entrepreneurship and innovation.⁶³⁹ The model is a designed policy tool for government intervention that takes the form of the proposed public-private partnerships, which allow for strategic planning to benefit society for future generations.

In order to develop the coalition, the conventional community of stakeholders is expanded to include: the private sector (entrepreneurial and established firms); management; academia and research community; industry and economic development organizations; federal, state, regional and local governments; the financial sector including investment banks, angel groups and venture capital groups. On top of the traditional stakeholder groups, which include: customers, employees, creditors, suppliers and shareholders.

The Coalition model is designed as a public-private-partnership, which describes a relationship wherein private and public resources are combined to achieve goals that will benefit both parties. Public-private-partnerships have been used to contribute to

⁶³⁷ See Audretsch (2003), *supra* note 9, at 9 (discussing “knowledge spillover” and how “small firms account for a disproportional share of new product innovations given their low R&D expenditures.”).

⁶³⁸ Lerner (Boulevard of Broken Dreams), *supra* note 38.

⁶³⁹ See Hockett & Omarova, *supra* note 33.

public benefit in national economies since the beginning of recorded history.⁶⁴⁰ In the United States, technology clusters in Silicon Valley and Route 128 emerged thanks to government intervention in the market (in the form of public-private-partnerships) as noted above. Moreover, much of the technological advancement, which revolutionized the market and our lives, such as the Internet,⁶⁴¹ was made possible thanks to public-private-partnerships.

Public-private-partnerships are defined as “contractual agreements between a public agency or public-sector authority and a private-sector entity that allow for greater private participation in the delivery of public services, or in developing an environment that improves the quality of life for the general public.”⁶⁴²

The Coalition model is a form of public-private-partnership that uses various methods of collaboration, which combine the government’s forward-thinking policies and

⁶⁴⁰ Louis Witters, Revital Marom & Kurt Steiner, *The Role of Public-Private Partnerships in Driving Innovation*, in THE GLOBAL INNOVATION INDEX OF 2012, 81 (WIPO 2012), available at http://www.wipo.int/edocs/pubdocs/en/economics/gii/gii_2012.pdf (discussing the following examples of public-private-partnerships (PPPs) “in the city-state of Athens in the 4th century BC, prominent citizens made major contributions in order to stage public festivals and religious events and to build public buildings and monuments. Some centuries later, when the Roman army conquered large parts of Europe and the Mediterranean region, civilians worked hand-in-hand with the army to exploit the new territories and build needed infrastructure. PPPs have a long history in the United States of America (USA) as well: the principle that government and political leaders should use and support private businesses—in order to develop scientific advancement and innovations for the benefit of the society—was well established at the time the country’s constitution was written. One of the first instances of a PPP in the New World occurred in 1742 when Benjamin Franklin established the American Philosophical Society of Philadelphia, which—together with the Pennsylvania House of Representatives—sponsored the founding of the University of Pennsylvania, the first medical school in the British colonies. The purpose of this collaboration was to make advancements in agriculture, science, and medicine available to all citizens. Another, more recent, renowned project that brought the business world and government together in the public interest was the building of the Paris metro: the tunnels were constructed by the city, while the tracks, energy, signalling, and rolling stock were provided by the operator, a Belgian entrepreneur.”).

⁶⁴¹ See The Advanced Projects Research Agency (ARPA) example (a) above

⁶⁴² Witters, Marom & Steiner, *supra* note 640, at 81 (“Under such a legal construction, the partners share risk, reward, and responsibility for a shared investment. These partnerships are not simply tools for funding projects, but they require full commitment from all partners for the entire undertaking.”).

the private sector's innovative efforts, as well as the support from nonprofit organizations and private intermediaries. The Coalition model is centered on two initiatives (that complement each other) to stimulate growth and innovation in the United States by reducing the challenges of financing emerging growth firms: the Incubator and Match-Maker. They are based on the successful case studies of Silicon Valley and Israel.

It should be noted that the two initiatives merely complement, and not substitute, the private market efforts in financing emerging growth firms. The initiatives are designed to allow the government to make direct equity investments in seed projects (Incubator) and in start-up firms and venture capital funds (Match-Maker), but at the same time encouraging different private intermediaries to take part in the financings of the such projects. As illustrated below, these initiatives are designed to guarantee effectiveness, and more importantly attempt to deter political capture and distortions.

The Incubator initiative will allow the government to make seed investments in research and development projects, which will develop into new entrepreneurial firms. The Match-Maker initiative will authorize the government to establish public-private venture capital funds that will create a platform for a competitive venture capital industry in the United States, and invest in early stage technology firms (start-ups). The Matchmaker and Incubator initiatives are both expected to be sustainable within a few years of launching, however, each initiative will have different time-lines and objectives. The initiatives are also expected to generate capital from private sources, as discussed below.

Another main objective of the Coalition model is to replace the current corporate governance emphasis on shareholder value with an emphasis on managerialism as the

leading business philosophy.⁶⁴³ Thanks to the latest economic crisis, which was attributable to abuses by financial institutions and large corporations, the public is showing an “increasing skepticism”⁶⁴⁴ in large corporations and particularly in their executives.⁶⁴⁵ In addition, as of late, large corporations are shying away from projects that require long-term strategic planning. Due to regulatory burdens, overwhelming costs and more importantly a rise in managerial myopia,⁶⁴⁶ many firms closed down their research laboratories or transferred their development efforts to other nations.⁶⁴⁷

Without a radical transformation in philosophy, managers of public corporations nowadays cannot realistically pursue long-term projects, such as research and development, because such projects cannot generate immediate financial returns to their shareholders.⁶⁴⁸ Legal scholars for the past twenty years⁶⁴⁹ have been using shareholder

⁶⁴³ Stout also refers to the work of corporate scholar Edward Rock, who stated that “[m]anagers now largely think and act like shareholders.” See also Edward B. Rock, *Adapting to the New Shareholder Centric Reality*, 161 U. PA. L. REV. 1907, 1988 (2013).

⁶⁴⁴ See also Kent Greenfield, *The Third Way: Beyond Shareholder or Board Primacy*, 37 SEATTLE L. REV. 749 (2014) (“[T]his moment, has been engendered because of increasing skepticism the public is showing toward corporations and the people who manage them. The skepticism springs from shocks in the economic and political fields that revealed the risks of unbridled corporate power, short-termism, managerial opportunism and shareholder (read Wall Street) supremacy.”).

⁶⁴⁵ *Id.*

⁶⁴⁶ See Stout (Shareholder Value Myth), *supra* note 19 (according to Stout, the rise of shareholder primacy thinking began “in the 1970s with the rise of the so-called Chicago School of free-market economists. Prominent members of the School began to argue that economic analysis could reveal the proper goal of corporate quite clearly, and that goal was to make shareholders as wealthy as possible ... the idea that corporate performance could be simply and easily measured through the single metric of share price ...”).

⁶⁴⁷ See, e.g., Hall, *supra* note 17; See Margalioth, *supra* note 8; See also Griliches, *supra* note 17.

⁶⁴⁸ Stout’s observations contribute to the development of the Coalition Model in that, she criticizes large corporations and venture capitalists for underfunding and shying away from technological development because of chasing short-term profit goals due to “shareholder primacy philosophy.” Furthermore, she argues, because of stock market liquidity emphasis, management focus on short-term profitability and not enough on strategic, long-term research efforts for long-term sustainability and future innovation, which is an inefficient use of corporate structure and economic growth methodology. Her theory maintains that the focus on rising share prices may actually be harmful for long-term shareholders and economic growth. See

primacy as the focal corporate governance model,⁶⁵⁰ which mandates management to pursue short-termism and shareholder supremacy goals,⁶⁵¹ ignoring the interests of all the other stakeholders.⁶⁵²

As a result, current empirical research shows that lucrative technology companies choose to stay private as long as possible in order to escape the pressures of short-term

Stout (Time Machine), *supra* note 204 (“Rather than owning corporations, shareholders own shares, which are a contract with the corporate entity. Similarly, the corporate entity is its own residual claimant. While the idea of shareholder “ownership” of the firm might be forgiven as a convenient and harmless metaphor when describing a company with a controlling shareholder, it is grossly misleading when applied to a board-controlled company.”).

⁶⁴⁹ See Stout (Time Machine), *supra* note 204 (“Toward the end of the twentieth century, however, American public companies began to change. The shift began in academia with the rise of the Chicago School of free market economists. Influential economic thinkers like Milton Friedman and Michael Jensen, apparently viewing the public corporation rather like a gigantic sole proprietorship, argued that the absence of shareholder power in public companies noted by Berle and Means was a problem to be solved rather than a deliberate legal strategy to achieve asset lock-in.”).

⁶⁵⁰ Such as scholars Hansmann & Kraakman. See Henry Hansmann & Reinier Kraakman, *The End of History of Corporate Law*, 89 GEORGETOWN L. REV. 439, 440-1 (2001); See Stout (Shareholder Value Myth), *supra* note 19 (the short-term focus of investors and corporate boards is currently one of the key issues in the corporate governance debate. See Mayer, *supra* note 207; See Millstein, *supra* note 207. Therefore it is not surprising that recent empirical research already shows that even profitable technology companies these days increasingly prefer to stay private as long as possible in order to avoid the pressures of short-term strategies that result from public ownership); See, Rival Versions of Capitalism, *supra* note 212 (Empirical research also shows that technology companies going public not only tend to be older, but also are more likely to have dual class of share structures, because their founders are pushing for control over the firms.); See Lublin & Ante, *supra* note 213.

⁶⁵¹ See, e.g., Hansmann & Kraakman, *supra* note 650; See Greenfield, *supra* note 644; See also Stout (Time Machine), *supra* note 204 (maximizing “shareholder value” is meant maximizing the increase of share price and dividends. (“this assumption is tantamount to assuming that shareholders act like psychopaths who are indifferent to the consequences that their investing decisions impose on others.”).

⁶⁵² Stout’s observations contribute to the development of the Coalition Model in that, she criticizes large corporations and venture capitalists for underfunding and shying away from technological development because of chasing short-term profit goals due to “shareholder primacy philosophy.” Furthermore, she argues, because of stock market liquidity emphasis, management focus on short-term profitability and not enough on strategic, long-term research efforts for long-term sustainability and future innovation, which is an inefficient use of corporate structure and economic growth methodology. Her theory maintains that the focus on rising share prices may actually be harmful for long-term shareholders and economic growth. See Stout (Time Machine), *supra* note 204 (“Rather than owning corporations, shareholders own shares, which are a contract with the corporate entity. Similarly, the corporate entity is its own residual claimant. While the idea of shareholder “ownership” of the firm might be forgiven as a convenient and harmless metaphor when describing a company with a controlling shareholder, it is grossly misleading when applied to a board-controlled company.”).

strategies that stem from public ownership,⁶⁵³ which has an affect on the exit strategy of potential investors. It further shows that technology companies who decide to go are likely to have dual class of share structures, since their founders want to avoid the pressures (of short-termism) and are pushing to have more influence on their management and firms.⁶⁵⁴

The model's suggestion to return to the managerialism philosophy, which includes a stakeholder approach, is further discussed in the next chapter, at the aside on corporate governance.

1. The Incubator Initiative

The Coalition model generally advocates for targeted policy initiatives that can help mitigate the fundamental challenges of financing emerging growth firms. The incubator initiative is designed to deal with the problem of the valley of death, which results from any of the following shortcomings of entrepreneurs: poor management skills, lack of capital or a lack of understanding of the marketplace.⁶⁵⁵

The incubator initiative is designed to complement, and not to replace, the private market efforts in financing emerging growth firms. It allows the government to make direct equity investments in seed projects (ideas that need to be transformed into a company) for a short period of time (2 years), while also encouraging private

⁶⁵³ Rival Versions of Capitalism, *supra* note 212; *See also* Chemmanur & Jiao, *supra* note 212.

⁶⁵⁴ Lublin & Ante, *supra* note 213.

⁶⁵⁵ *See* Gil Avnimelech, Dafna Schwartz & Raphael Bar-El, *Entrepreneurial High-tech Cluster Development: Israel's Experience with Venture Capital and Technological Incubators*, 15 EUROPEAN PLANNING STUDIES 1181 (2006), available at https://www.academia.edu/852416/Entrepreneurial_High-tech_Cluster_Development_Israels_Experience_with_Venture_Capital_and_Technological_Incubators.

intermediaries to participate in the financing of the seed projects. This initiative is devised to insure effectiveness, and to prevent political distortions.

Joseph Mancuso established the first U.S. business incubator, the Batavia Industrial Center in Batavia, New York, in 1959.⁶⁵⁶ The use of the “technology business incubators”⁶⁵⁷ as a strategic development tool, in the U.S., became popular in the mid-1980s.⁶⁵⁸ It is used in order to create jobs and encourage innovation by serving the needs of entrepreneurs (seed stage companies) and by providing them with access to resources required to successfully grow their ideas (firms).⁶⁵⁹

The incubator initiative is a shared-use facility, where entrepreneurs and entrepreneurial firms will be located. The shared facilities will encourage cooperation among the participating entrepreneurs as well as between entrepreneurs and various ‘stakeholder’ groups. For the purpose of this initiative, the term “stakeholders” will be used in order to refer to the following groups of public and private partners that will

⁶⁵⁶ See Lewis, Harper-Anderson & Molnar, *supra* note 40 (“The first U.S. business incubator opened in 1959, when Joseph Mancuso started the Batavia Industrial Center in Batavia, New York. Since that time, business incubation programs have emerged as successful economic development tools throughout the country and around the world. As of October 2006, approximately 1,400 business incubators operated in North America, including 1,115 in the U.S. Approximately 7,000 incubation programs are now in operation around the world.”).

⁶⁵⁷ For the purpose of this paper, the term “business incubator program” is taken from the working definition of David A. Lewis, Elsie Harper-Anderson & Lawrence A. Molnar, to mean the following: “Business incubation programs are designed to accelerate the successful development of entrepreneurial companies through an array of business support resources and services, developed or orchestrated by incubator management, and offered both in the incubator and through its network of contacts. A business incubation program’s main goal is to produce successful firms that will leave the program financially viable and freestanding. Critical to the definition of an incubator is the provision of management guidance, technical assistance, and consulting tailored to young, growing companies.” See Lewis, Harper-Anderson & Molnar, *supra* note 40.

⁶⁵⁸ See Avnimelech, Schwartz & Bar-El, *supra* note 655; See also DAVID A. LEWIS, DOES TECHNOLOGY INCUBATION WORK?: A CRITICAL REVIEW (REVIEWS OF ECONOMIC DEVELOPMENT LITERATURE AND PRACTICE) 11 (2001).

⁶⁵⁹ See Lewis, Harper-Anderson & Molnar, *supra* note 40.

partake in forming the incubator: management, private sector, academia, industry, government, financial sector and other traditional stakeholders.

The incubator's managers are tasked with facilitating the collaboration and coordination efforts.⁶⁶⁰ The incubator initiative is based on the "open-innovation"⁶⁶¹ paradigm, which will enable the participating entrepreneurial firms in the incubator to use internal and external ideas in order to develop their technology, product or process, as well as take advantage of shared-use facilities. This open innovation cooperation will encourage knowledge spillovers and collaboration among the participating firms and stakeholders.

Entrepreneurs, who are "agents of change,"⁶⁶² will be encouraged to share their ideas (which are "non-rivalrous" in character⁶⁶³) research methodologies, as well as their developments and manufacturing processes with the other entrepreneurs and stakeholders. The ideas generated in the incubators will contribute to growth at various

⁶⁶⁰ It is further proposed that the hubs should offer affordable and comfortable housing in order to attract talent.

⁶⁶¹ The term "open innovation" was coined by Henry Chesbrough, adjunct professor and faculty director of the Center for Open Innovation at the Haas School of Business at the University of California. According to Chesbrough "Open innovation is a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology." See HENRY WILLIAM CHESBROUGH, OPEN INNOVATION: THE NEW IMPERATIVE FOR CREATING AND PROFITING FROM TECHNOLOGY (Harvard Business School Press March 2003).

⁶⁶² See Margalioth, *supra* note 8.

⁶⁶³ See *id.* ("New ideas, in turn, allow a given bundle of inputs to produce more or better output. The reason that ideas are the engine of growth is their non-rivalrous character. The use of an idea by one person does not preclude its use by another. Physical capital, that is, machines, do not have this trait. The machine can be used by a limited number of workers and produce fixed output. Ideas, on the other hand, can be used simultaneously by an unlimited number of producers. The problem, however, is that without government intervention, people will have no incentive to innovate, because unless an idea can be made excludable, no one will want to incur the research and development costs."); See also Jones, *supra* note 10.

levels, including the entrepreneurial firm, region, nation and even international arenas.⁶⁶⁴

They will create products or services, which would otherwise remain untapped in the economy.⁶⁶⁵

There are six distinct advantages for emerging growth firms that will be using the open innovation paradigm. First, using this paradigm can reduce the cost of carrying out research and development.⁶⁶⁶ Second, it can improve the progress and productivity of the development. Third, it can facilitate the early incorporation of customers in the development process.⁶⁶⁷ Fourth, it can boost the accuracy of customer targeting and market research. Fifth, it increases the possibility for synergism between external and internal innovations.⁶⁶⁸ Sixth, it increases the potential for viral marketing.⁶⁶⁹

⁶⁶⁴ See also Kao, *supra* note 1, at 198 (Kao suggests a \$20 Billion investment by the government, and states that the innovation hubs “would help grow regionally relevant capabilities by channeling investment in human and intellectual capital while building new forms of social relationships that lead to collaboration and a culture of shared risk – taking and innovation.”).

⁶⁶⁵ See also Margalioth, *supra* note 8; See also Jones, *supra* note 10.

⁶⁶⁶ Firms that are using open innovation are able to leverage the basic research that was done by other firms, while exploiting both external and internal sources of innovation. Examples of firms that were successful in open innovation are: Intel, Cisco and Microsoft. See Chesbrough, *supra* note 661.

⁶⁶⁷ According to Marais, firms are struggling with finding efficient ways in order to identify the wants and needs of their target market. Therefore, they should use practical and “realistic” product testing or prototype. See Stephan Marais & Corne Schutte *The Development of Open Innovation Models to Assist the Innovation Process*, University of Stellenbosch, South Africa 96 (2010) (In 23rd Annual SAIIE Conference).

⁶⁶⁸ See Joel West & Scott Gallagher, *Patterns of Open Innovation in Open Source Software*, in OPEN INNOVATION: RESEARCHING A NEW PARADIGM 82 (Henry Chesbrough, Wim Vanhaverbeke & Joel West, eds., Oxford University Press, 2006) (According to West and Gallagher, firms produce internal innovations (from internal knowledge), and various models have been developed in order to try and explain how firms can also exploit external knowledge; Eric von Hippel, *The Sources of Innovation* (Oxford University Press 1988), there are four sources of external knowledge: first, supplier and customer; second, university, government and private laboratories; third, competitors; and fourth, other nations.).

⁶⁶⁹ See Marais & Schutte, *supra* note 667 (“Idea Bounty puts a lot of emphasis on marketing, not only to retain existing community members, but also to attract new members. As is the nature of the service offering, all marketing efforts are done through the use of Web 2.0 technologies – blogs, micro-blogs and social networking sites. The advantages hereof are two fold: it is inexpensive, and it targets the correct

a. *The Advantages of an Incubator Program*

Technology business incubation programs typically provide a wide range of business services and resources to the entrepreneurs (or seed stage companies), which are selected to participate in the program, such as access to seed capital, marketing, mentoring, networking, management guidance, technical assistance, and consulting.⁶⁷⁰

The following are additional ways in which incubators create value. First, incubators select and monitor new firm talent.⁶⁷¹ Second, incubators diagnose new firm's needs.⁶⁷² Third, incubators provide entrepreneurs with access to business networks as well as to potential financing and capital.⁶⁷³ Fourth, incubators help their portfolio companies by exposing them to entrepreneurial networks.⁶⁷⁴ Entrepreneurs and companies that enter the incubator program develop credibility.⁶⁷⁵ Fifth, incubators facilitate cooperation and networking among participating firms, as well as among firms

target market. The individuals that Idea Bounty wants to attract to its creative community are ones that make use of these services. They are the creative types that are willing to participate in such an e-participatory environment and, more importantly, who serve as viral marketers themselves. As the Idea Bounty community basically consists of web content creators, their social interactions via their own personal social networking activities serves as an excellent form of viral marketing.”).

⁶⁷⁰ See Lewis, Harper-Anderson & Molnar, *supra* note 40; See also Avnimelech, Schwartz & Bar-El, *supra* note 655 (“The principle of the incubation concept is that premature ventures require temporary support to gain strength and become more efficient.”); See also Lois Peters, Mark Rice & Malavika Sundararajan, *The role of incubators in the entrepreneurial process*, 29 J. TECH TRANSFER, 83 (2004).

⁶⁷¹ See Avnimelech, Schwartz & Bar-El, *supra* note 655.

⁶⁷² See *id.*

⁶⁷³ *Id.*

⁶⁷⁴ *Id.*

⁶⁷⁵ *Id.*

and stakeholders.⁶⁷⁶ Sixth, the start-up survival rate is enhanced as well as the regional development.⁶⁷⁷ Finally, incubators help with attracting highly skilled individuals to region in which they are located.⁶⁷⁸

It is also regarded as an economic development tool intended to foster “cluster”⁶⁷⁹ formation.⁶⁸⁰ A well-designed incubator model is a low-cost⁶⁸¹ method that can stimulate collaboration,⁶⁸² increase productivity, innovation,⁶⁸³ entrepreneurship,⁶⁸⁴ and new

⁶⁷⁶ *Id.*; See also Ranjya Gulati, Nitin Nohria & Akbar Zaheer, *Strategic Networks*, 21 STRATEGIC MGMT. J. 203 (2000) (according to Gulati, Nohria and Zaheer, “networks of relationships in which firms are embedded profoundly influence their conduct and performance.” They further identify “five key areas of strategy research in which there is potential for incorporating strategic networks: (1) industry structure, (2) positioning within an industry, (3) inimitable firm resources and capabilities, (4) contracting and coordination costs, and (5) dynamic network constraints and benefits.”).

⁶⁷⁷ See Avnimelech, Schwartz & Bar-El, *supra* note 655.

⁶⁷⁸ *Id.*

⁶⁷⁹ MICHAEL PORTER, *THE COMPETITIVE ADVANTAGE OF NATIONS* (1990) (Approximately 20 years ago, Michael Porter, a Harvard Business School professor, introduced and popularized the concept of “clusters.”); PAUL R. KRUGMAN, *GEOGRAPHY AND TRADE* (1991) (Economist Paul Krugman also brought attention to the significance of geographical economics.); It should be noted that economists also refer to underlying concept as agglomeration economies (which explain the benefits that firms gain by locating close to each other), which dates back to the work of Alfred Marshall in 1890. Regional clusters are defined as “geographic concentrations of inter-connected companies and institutions in a particular field,” which include “governmental and other institutions.”)

⁶⁸⁰ See Hal Wolman & Diana Hincapie, *Clusters and Cluster-Based Development: A Literature Review and Policy Discussion*, (George Washington Institute of Public Policy Working Paper) (2010).

⁶⁸¹ See Porter, *supra* note 679 (“clusters not only reduce transaction costs and boost efficiency, but improve incentives and create collective assets in the form of information, specialized institutions and reputation. Clusters enable innovation and speed productivity and growth.”).

⁶⁸² Berna Demiralp, Mark Turner & Alexandre Monnard, *The Evaluation of the U.S. Small Business Administration’s Regional Cluster Initiative, Year One Report* (June 2012), available online at: <http://www.sba.gov/sites/default/files/files/Y1%20Pilot%20Cluster%20Evaluation.pdf>. It should be noted that collaboration should be encouraged between participating firms and stakeholders, as well as amongst participating firms. For example, based on the lessons learned from the SBA initiative, according to Markeeva Morgan, the Huntsville Defense Cluster administrator, who has encouraged collaborations between participating firms in the cluster: “We’ve identified cases where integration between two or more small businesses enables them to provide a fairly unique, high-quality solution, and those businesses had never talked to one another before, had never considered doing business together.”

economic activity in non-technology (peripheral) regions, which is crucial to the U.S. national prosperity.⁶⁸⁵

Cluster formations promote innovation for the following five reasons.⁶⁸⁶ First, clusters can foster competition thereby encouraging firms to innovate.⁶⁸⁷ Second, clusters can form many networks and linkages that can speed knowledge spillovers and innovation relevant to their industry.⁶⁸⁸ Third, clusters can provide information (such as market research and supply chain analysis).⁶⁸⁹ Fourth, clusters create environments that help entrepreneurial firms and encourage new firm formation.⁶⁹⁰ Fifth and finally, by

⁶⁸³ See Mark Muso & Bruce Katz, *The New "Cluster Moment": How Regional Innovation Clusters Can Foster the Next Economy*, BROOKINGS (September 21, 2010), available at: <http://www.brookings.edu/research/papers/2010/09/21-clusters-muro-katz> ("strong clusters foster innovation through dense knowledge flows and spillovers.").

⁶⁸⁴ *Id.* ("strengthen entrepreneurship by boosting new enterprise formation and start-up survival.").

⁶⁸⁵ See also Mark Muso, *Regional Innovation Clusters Begin to Add Up*, BROOKINGS (February 27, 2013), available at: <http://www.brookings.edu/blogs/up-front/posts/2013/02/27-regional-innovation-clusters-muro>; See also Muso & Katz, *supra* note 683.

⁶⁸⁶ See Porter, *supra* note 679; See Harald Bathelt, Anders Malmberg & Peter Maskall, *Clusters and knowledge: local buzz, global pipelines and the process of knowledge creation*, 28 PROGRESS IN HUMAN GEOGRAPHY 31-56 (2004) (Innovation is the process of commercializing new ideas, including the traditional notion of science- and technology-based breakthroughs, which can lead to new products, services, and production processes, as well as new ways of organizing activities, structuring organizations, and finding new supply sources for raw materials.).

⁶⁸⁷ See Bathelt, Malmberg & Maskall, *supra* note 686 (which strongly encourages and pressures companies to innovate both to stay competitive and to increase profitability).

⁶⁸⁸ *Id.* (because cluster entities share an industrial focus, they tend to be in an excellent position to make use of knowledge and innovation relevant to an industry).

⁶⁸⁹ *Id.* (that individual companies would lack without access to the cluster's resources and/or expertise).

⁶⁹⁰ *Id.* (These small and young firms are often more open to—and more in need of—new ideas. These new ideas also tend to have a greater chance of making their way into practice due to the greater flexibility and more direct exchange of ideas among the various levels of the managerial hierarchy in smaller firms).

relying on their social capital, clusters offer another forum for the trade of intellectual property (including other intangible assets).⁶⁹¹

Therefore, if the incubator initiative is implemented, it will lead to the following positive results. First, it will foster geographic connections between technology and non-technology regions. Second, it will encourage cluster formation. Third, it is a low-cost method to stimulate collaboration between entrepreneurs and various stakeholders. Forth, it can foster innovation through dense knowledge flows & spillovers.⁶⁹² Fifth, it can boost new enterprise formation.⁶⁹³ And finally, sixth, it can foster competition & encourage firms to innovate.⁶⁹⁴

b. Governance Structure

There are many different forms of business incubators. They can generally be divided into the following four types, ranging from “virtual incubators”⁶⁹⁵ (with no

⁶⁹¹ *Id.* (as opposed to businesses relying on the market place and its potentially costly and lengthy enforcement of intellectual property rights).

⁶⁹² See Muso & Katz (2010), *supra* note 683.

⁶⁹³ *Id.*

⁶⁹⁴ See Porter (1990), *supra* note 679; See Bathelt, Malmberg & Maskall (2004), *supra* note 686.

⁶⁹⁵ See Lewis, Harper-Anderson & Molnar, *supra* note 40 (the terms “virtual incubators” and “Incubators without walls” are synonymous. The virtual incubators are “business incubators that do not offer on-site space for clients, although they may have a central office to coordinate services, house the management staff, meet with clients, and perhaps even provide conference rooms for clients. Virtual incubators may or may not be located in the same geographic area as their client companies, since a virtual presence is what defines an incubator without walls. Virtual incubation programs tend to be less expensive to operate than traditional business incubators that have additional expenses related to the operation and management of a physical plant. In rural areas – where the client base is often spread out over large areas, making commutes difficult – virtual incubation may be a good alternative. Also, some entrepreneurs prefer not to locate in an incubator facility because they already have established offices elsewhere or need access to specialized equipment or facilities not present in the incubator. For these firms, virtual incubation or participation in an affiliate program at an incubation program with walls is a better option. One significant challenge of virtual incubation is encouraging networking among clients. Having strong networks provides an environment that facilitates peer-to-peer learning, mutual support, and potential collaboration, as well as camaraderie – all of

walls), “incubators with walls,”⁶⁹⁶ “accelerators”⁶⁹⁷ to “international incubators.”⁶⁹⁸ This initiative can be implemented to any of the above incubator types.

There are also several financing models of incubators, ranging from public non-profit, quasi-public, to private for-profit. This initiative centers on public and quasi-public incubator models, due to the need of the government to intervene in the market and act as a market participant. Government intervention is extremely crucial because it will finance basic research and seed companies, even if their research initiatives will not produce immediate revenues.⁶⁹⁹

which are critical to client success. In addition, having clients located in close proximity within the incubator facility makes it easier for the incubator staff to deliver entrepreneurial support services. Some have compared virtual incubation with well-operated Small Business Development Centers. As with incubators with walls, virtual business incubation programs also face significant funding challenges.”).

⁶⁹⁶ See *id.* (An “incubator with walls” is defined as a “business incubation program with a multitenant business incubator facility and on-site management. Although an incubator with walls offers entrepreneurs space in which to operate their businesses, the focus of the program remains on the business assistance services provided to the start-ups, not on the building itself.”).

⁶⁹⁷ See *id.* (Stating there is no definitive definition of ‘business accelerator’ in the literature. However, the term accelerator may be generally defined “either as: (1) a late-stage incubation program, assisting entrepreneurial firms that are more mature and ready for external financing; or (2) a facility that houses a modified business incubation program designed for incubator graduates as they ease into the market. A third definition – which is both more expansive and less measurable – is similar to the virtual incubator model. Finally, some industry professionals use the terms business incubator and business accelerator interchangeably.”).

⁶⁹⁸ It should be noted that there is no clear definition of the terms ‘international business incubator’ or ‘accelerator’ in the literature. Additionally, there is no clear empirical research or evaluation of these models. This paper will address the accelerator and current efforts to explain it. See Lewis, Harper-Anderson & Molnar, *supra* note 40 (the international form of business incubation program has recently emerged, in order to help foreign firms to enter the U.S. market. They further claim that the “international business incubators provide the same set of entrepreneurial services as a typical incubator, but they concentrate on providing a “soft landing” for international firms that want to access U.S. markets, partner with U.S. firms, or access other resources. Some specialized services offered by international incubators that are above and beyond typical business incubation services include translation services, language training, help obtaining business and driver’s licenses, cultural training, immigration and visa assistance, and housing assistance. Immigration services are often extended to trailing spouses and children, making it easier for foreign entrepreneurs to settle into their new location.”).

⁶⁹⁹ Fillipo Belloc, *Innovation in State-owned Enterprises: Reconsidering Conventional Wisdom*, 48 J. ECON. ISSUES 821 (2014).

The government is not a profit-maximizing entity, and is neutral to profit variations.⁷⁰⁰ Therefore, it is in a better position (than private investors) to deal with situations of uncertainty and investments in radical innovation.⁷⁰¹ The government is not more efficient than private firms,⁷⁰² but can drive innovation and technical progress due to the following reasons. It can monitor economic progress and market trends, and moreover, direct local systems and intra-industrial innovation according to its mission needs.⁷⁰³ This initiative encourages government investment in long-term development strategies that will serve as ‘bridge builder’ between private business and innovative industries.⁷⁰⁴

The incubators are designed as not-for-profit corporations because such ventures are able to “lock in” their assets, by protecting their stakeholders from the risk of shareholders attempting to withdraw assets.⁷⁰⁵ The following is the governance structure of the initiative.

⁷⁰⁰ See Lewis, Harper-Anderson & Molnar, *supra* note 40 (“Most high-achieving incubators are not-for-profit models. All but one of the top- performing incubators in this study were nonprofits, as were 93% of the respondent population. This finding suggests that incubation programs focused on earning profits are not strongly correlated to client success. Instead, the most important goals of top- performing incubation programs are creating jobs and fostering the entrepreneurial climate in the community, followed by diversifying the local economy, building or accelerating new industries and businesses, and attracting or retaining businesses to the host region.”).

⁷⁰¹ *Id.*

⁷⁰² *Id.*

⁷⁰³ *Id.*

⁷⁰⁴ See Kao, *supra* note 1, at 198 (“They will serve as bridge builders between creative industries and the business mainstream, following models such as the Learning Lab in Denmark, and Arts & Business in the UK. They would be mechanisms for linking federal, regional, and urban development strategies.”).

⁷⁰⁵ See further discussion of the theory introduced by Stout (Time Machine), *supra* note 204, in the next part, discussing corporate governance.

(1) Federal Government & Central Incubators Administration

There will be a federal government agency that will be tasked with spearheading the initiative and setting up the incubators in various geographic regions across the US, based on the agency's mission and strategic goals. The federal agency will form an administrative body, which can be termed the "Central Incubators Administration,"⁷⁰⁶ which will be in charge of heading the initiative and making the final decisions on the projects to be selected to participate in the various incubators.

The Central Incubators Administration will be composed of experts from the private and public sectors. In order for the Administration to evaluate the desirable and appropriate type of incubator for a particular region (there can be multiple types of incubators in a region), and to be able to select the appropriate incubator management, it needs to take into account the following issues.

First, who are the incubator's potential clients (the entrepreneurs and firms that will want to participate in the program)? Which industry sectors are they from? What is their level of development?⁷⁰⁷ What is their level of management skills?

Second, in which region will the incubator be located? Is it a technology or non-technology oriented region? Is it considered a central or periphery geographic area? What is the industrial capacity of the region?⁷⁰⁸

⁷⁰⁶ This term is taken from the Israeli case study.

⁷⁰⁷ See SBIR, *supra* note 361 (For comparison SBIR guidelines, Phase I definition and eligibility for funding: "Phase I. The objective of Phase I is to establish the technical merit, feasibility, and commercial potential of the proposed R/R&D efforts and to determine the quality of performance of the small business awardee organization prior to providing further Federal support in Phase II. SBIR Phase I awards normally do not exceed \$150,000 total costs for 6 months.").

⁷⁰⁸ See Lewis, Harper-Anderson & Molnar, *supra* note 40 (It should be noted that according to the *report* the following are some predictors for the incubator's outcomes. ("All measures of the growth or size of a

Third, who are the various stakeholders (as defined below) and potential sponsors (partners) in the region? How do they vary in terms of resources, missions, and requirements?

There is no one known incubator practice or policy, which absolutely guarantees great results. However, in order to produce an optimal outcome, this paper proposes to learn from the Israeli case study, as well as from the work of Lewis, Harper-Anderson and Molnar, who analyzed and surveyed the top performing incubation programs in the U.S., and accordingly develop a targeted policy that will take into account the synergy among the multiple following stakeholder groups, geographic considerations, potential clients, services to be provided and best practices. In an effort to provide a better design and answer some of the challenges experienced by the SBA's cluster initiative.⁷⁰⁹

As a word of caution, this model is not intended to create incubators (subsequent clusters) in areas where there is no suitable industry to support them,⁷¹⁰ like the

host region's economy are poor predictors of incubation program outcomes. Incubator management practices are better predictors of incubator performance than the size or growth of the region's employment or GDP. Only the aggregate host region employment in 2007 was a strong predictor of any incubator outcome – change in affiliate firm FTE from 2003 to 2008. Collectively, measures of a region's capacity to support entrepreneurship have limited effect on incubation program outcomes. Compared with incubator quality variables, regional capacity variables have less predictive power. Among the regional capacity measures studied, only the proxies for urbanization, work force skills, availability of locally controlled capital, and higher educational attainment have moderate influence on incubator client outcomes.”)).

⁷⁰⁹ See also, Demiralp, Turner & Monnard, *supra* note 682.

⁷¹⁰ See Muso & Katz, *supra* note 683 (“Clusters can’t be created out of nothing and cluster initiatives should only be attempted where clusters already exist. The preexistence of a cluster means that an industry hotspot has passed the market test. By contrast, efforts at wholesale invention will likely be fraught with selection issues, inefficiency, and probable failure and waste.”). It should be noted, that many people, such as Hoopengardner (in Alaska), are calling for intervention in “rural America or in areas off the beaten, high-tech track.” See Merrill F. Hoopengardner, *Nontraditional Venture Capital: An Economic Development Strategy for Alaska*, 20 ALASKA L. REV. 357 (2003) (citing studies that show “in 1999, more than sixty-seven percent of all venture capital investments were made only in four states: California, Massachusetts, New York and Texas.”) However, it is outside the scope of this paper. There are many reasons for why it is difficult to get venture capital investments in rural areas. See DAVID FRESHWATER ET.

international example of the Malaysian “Valley of Bio-Ghosts”⁷¹¹ or the United States national example of continuing grants by SBIR to Beltway “mills,” which ultimately generate very few innovations.⁷¹²

The incubators designed according to this initiative will have their own unique different characteristics, which will depend on its regional and historical influences, as well as their stakeholders.⁷¹³ The incubators will be autonomous organizations with independent managements that will set goals, supervise, and most of all limit the dangers

AL, RURAL POLICY RESEARCH INT., NONTRADITIONAL VENTURE CAPITAL INSTITUTIONS: FILLING A MARKET GAP, *available at* <http://policy.rutgers.edu/faculty/rubin/Establishing%20nontraditional%20vc%20institutions%20part%20b%202001.pdf> (Freshwater et al discussing why traditional venture capital funds select not to invest in rural areas: “Investment opportunities with profit potential below that sought by traditional venture capital funds. Small market areas do not provide the investment environment venture capitalists prefer: a large number of firms with high projected growth rates and the likelihood of lucrative exits. Too few investments to provide adequate deal flow. In sparsely populated areas, few firms need and qualify for venture capital investments. As a result, the cost of searching out promising entrepreneurs and identifying prospective deals is higher. Too great a physical distance between investment opportunities. Venture capital investing is a hands-on process that often requires frequent contact with portfolio companies. If a traditional venture capital investor cannot travel easily and quickly to visit a firm, the investment is not likely to be made. Inadequate infrastructure to support venture capital investment. Attorneys, accountants, bankers, and business consultants are often needed to help put a deal together and ensure the success of the investment. Such a business service infrastructure is limited outside larger urban places. Difficulty in defining a viable exit strategy. Most businesses located in rural or small market areas are unlikely to provide rapid, lucrative exits. For example, IPOs are not a viable exit strategy for many traditional manufacturing enterprises and businesses found there. Limited interest by many small business owners in accepting the conditions set by the venture fund in order to get its money. To many rural business owners, particularly in family-owned businesses, giving up any ownership stake in exchange for capital is unacceptable. Concerns about the intergenerational transfer of the firm may make a business owner unwilling to accept the terms of a venture investment. Difficulty in attracting venture capital staff to the region. A venture capital institution is only as good as its management team. In more isolated regions, venture institutions may have difficulty attracting and keeping the qualified staff needed to invest successfully. Recruiting management for portfolio companies when an injection of new leadership is required may also be more difficult.”).

⁷¹¹ Lerner (Boulevard of Broken Dreams), *supra* note 38, at 114 (Malaysia’s government effort to stimulate biotechnology by building its BioValley compound failed due to lack of appropriate planning, as follows “the lack of properly trained people to operate research facilities, the uncertain nature of intellectual property rights in Malaysia, and the absence of a national tradition of high-technology entrepreneurship...”).

⁷¹² See Sean Silverthorne, Government’s Positive Role in Kick-Starting Entrepreneurship, HARV. BUS. SCH. (December 7, 2009), *available at*: <http://hbswk.hbs.edu/item/6318.html>.

⁷¹³ See Kao, *supra* note 1, for more suggestions.

of political pressures and abuse.⁷¹⁴ Their managements will set a clear (and well-defined) mission statement, investment processes and goals, in addition to a robust plan for fees that will be collected from rents and other services.

(2) Incubator's Management Team

The incubator's management team, which will include the executive director and other professional advisors, will select a certain number (depending on the size and capital of the incubator) of projects to participate in the incubator.⁷¹⁵

In order to get accepted into the program, the project (idea) has to be innovative, based in research and development, and capable of being commercialized and exported to the appropriate market. The industry scope is the core activity or common denominator that links the participating actors.⁷¹⁶ The incubator can concentrate on a specific sector, such as technology or defense needs, but is encouraged to go beyond the industry scope and support various different projects from various industries. It is up to the discretion of the incubator's management group.⁷¹⁷

i. Incentives to Prevent Political Capture

In order to avoid “waste” (i.e., management gets paid by government no matter how well the projects do) as well as political capture (i.e., managements gets pressured

⁷¹⁴ See Silverthorne, *supra* note 712.

⁷¹⁵ See Israeli Incubator Model, as discussed in Frenkel & Shefer (2003), *supra* note 527.

⁷¹⁶ See Thomas Andersson, Sylvia Schwaag-Serger, Jens Sörvik, & Emily W. Hansson, *The Cluster Policies Whitebook*, IKED - International Organisation for Knowledge Economy and Enterprise Development (2004), available online: http://www.clusterplattform.at/fileadmin/user_upload/clusterbibliothek/916_TheClusterPoliciesWhitebook.pdf.

⁷¹⁷ Frenkel & Shefer (2003), *supra* note 527.

from local stakeholders to accept friends and relatives to program), the following incentives are designed for the management to be diligent in selecting the companies that will join the incubator portfolio.

First, the management of the incubator must be autonomous in order to set clear and well-defined strategic long-term goals for running the incubator. Its duties will include supervising the funding from the various stakeholder groups, providing venture capital-like support services to the portfolio companies, such as preparing the business plan, research and development strategy, clerical services, organizational analysis, legal and accounting guidance.⁷¹⁸ Additionally, in order to accelerate the formation and growth of the seed companies, the management will need to integrate education and workforce training functions into the incubator's operations, which is where academia and the research community can also play important roles.

Second, based on lessons learned from Israeli example and following the recent successful market trend of the accelerator model, the management will also be expected to invest a certain amount in the portfolio companies, including the use of their own capital, in return for an equity stake in the companies.⁷¹⁹ This initiative is built on the belief that once management invests capital into the portfolio incubator companies, they

⁷¹⁸ See also Muso & Katz, *supra* note 683 ("Clustering is a dynamic of the private economy in the presence of public goods. Cluster strategy should be pursued with humility as a matter of supporting, connecting, filling gaps, and removing obstacles to private enterprise while making sure certain public and quasi-public goods are available."); See also, Lerner, capture problems can be reduced by "passing the funds onto intermediaries such as venture capital funds that make the real investment decisions. By keeping individual awards relatively modest, they limit efforts to misdirect these funds."); See also Lerner (Boulevard of Broken Dreams), *supra* note 38.

⁷¹⁹ For example, an accelerator program, AlphaLab, a nationally-ranked startup accelerator program based in Pittsburgh, PA, receives 5% common stock in the companies it invests in, in return for a \$25,000 investment in each company from Innovation Works (AlphaLab's parent organization), plus space and services. Information available at <http://alphalab.org/faq/>.

would have a stake in making sure that they do not pick “lemon,” as well as limit the dangers of abuse and political pressures from the various stakeholders.⁷²⁰

Third, the managers will be expected to line up investments from other private and public sources. It will benefit the management as well as the portfolio companies in the incubator. With regards to private investors, getting private capital to partake in government investment will increase the total capital introduced into the market, as well as provide networking opportunities (perhaps follow on investments from such sources) for the portfolio companies.

In order to contribute to the incubator program’s success, there is a need to raise additional funding from various local and regional stakeholder groups (such as colleges or universities, other government agencies, economic development groups, or any other potential incubator sponsors). According to a study by Lewis, Harper-Anderson and Molnar, public sector support will contribute to incubator program’s success.⁷²¹ Moreover, the study illustrates that incubator programs that enjoy larger budgets (both revenues and expenditures) naturally outperforms incubators that have to deal with budget constraints.⁷²²

⁷²⁰ See Lerner (Boulevard of Broken Dreams), *supra* note 38.

⁷²¹ See Lewis, Harper-Anderson & Molnar, *supra* note 40 (“this research suggests that some level of public sector investment contributes to greater incubator outcomes in terms of job creation, graduation rates, etc.”).

⁷²² *Id.* (“Programs with more financial resources have more capacity to deliver critical client services and are more stable. However, the sources of incubation program revenues and the ways the incubator uses these resources also are important. This study found that incubators receiving a larger portion of revenues from rent and service fees perform better than other programs. On the expenditure side, the more programs invest in staffing and program delivery – relative to building maintenance or debt servicing – the higher the probability of improved client outcomes.”).

Fourth, the managers will be free to select projects that might take a long time to produce results, because they will not be subject to the threat of losing their jobs if the projects do not produce immediate results and profits.⁷²³ Such emphasis on investment in long-term research and development will provide current and future generations with the ability to enjoy the wealth generated from the innovative projects.⁷²⁴

A general objective of the Coalition model is to encourage the adoption of the stakeholder approach to strategic management,⁷²⁵ which is intended to give managers a framework within which to deal with constant changes in the environment, society, technology and industry.⁷²⁶ Incubator managers will be able to actively design a new direction for the incubator, which will take into account how the incubator can have an

⁷²³ See Stout (Time Machine), *supra* note 204.

⁷²⁴ See *id.* (Stout gave examples of the ways in which the results of research and development by large public corporation have benefited current and future generations (“IBM and AT&T likely incurred very high levels of “wasteful” agency costs while operating their Big Blue and Bell Labs research divisions during the 1950s and 1960s. Nevertheless, those costs have been repaid many times over by the gains to multiple generations of shareholders (and others) from developing the computer and the transistor. Similarly, multiple future generations may benefit enormously from current corporate projects to develop self-driving cars, commercial space transport, and algal biofuels.”)).

⁷²⁵ See also R. Edward Freeman & John McVea, A Stakeholder Approach to Strategic Management (Working Paper No. 01-02), available at <http://faculty.wvu.edu/dunnc3/rprnts.stakeholderapproach.pdf> (“The impetus behind stakeholder management was to try and build a framework that was responsive to the concerns of managers who were being buffeted by unprecedented levels of environmental turbulence and change. Traditional strategy frameworks were neither helping managers develop new strategic directions nor were they helping them understand how to create new opportunities in the midst of so much change. As Freeman observed “[O]ur current theories are inconsistent with both the quantity and kinds of change that are occurring in the business environment of the 1980’s...A new conceptual framework is needed.”[Freeman, 1984, pg. 5] A stakeholder approach was a response to this challenge.”).

⁷²⁶ See also *id.* (“The purpose of stakeholder management was to devise methods to manage the myriad groups and relationships that resulted in a strategic fashion. While the stakeholder framework had roots in a number of academic fields, its heart lay in the clinical studies of management practitioners that were carried out over ten years through the Busch Center, the Wharton Applied Research Center, and the Managerial and Behavioral Science Center, all at The Wharton School, University of Pennsylvania by a host of researchers.”).

effect on the environment in addition to how the environment possibly will affect the incubator.⁷²⁷

ii. *Selecting Management Team*

The selection process of the managers is extremely important and should be very straightforward.⁷²⁸ The prospective executive managers will compete for the right to participate in the incubator initiative and a competitive bidding process will be used.⁷²⁹

The bidding process will take into account the following: maximum fraction of capital that the executive manager (or management group) will be willing to invest in the incubator portfolio companies, as well as the size of incubator that the manager seeks to establish. When selecting the managers, the Central Incubators Administration will also need to consider the following. The reputation and experience of the manager, particularly with: the region in question; the industries (or research) that the agency would like to promote in the region; seed investments and training entrepreneurial firms; as well as the manager's ability to bring on additional investments from local and regional stakeholders.

The managers will get a base salary for the managerial services that they will provide, in addition to a certain equity stake in the portfolio companies (in return for a

⁷²⁸ *Id.* (“The findings provide empirical evidence that business incubation best practices are positively correlated to incubator success. Specifically, practices related to the composition of advisory boards, hiring qualified staffs that spend sufficient time with clients, and tracking incubator outcomes result in more successful incubation programs, clients, and graduates.”).

⁷²⁹ See Fannie Chen, *Structuring Public-Private Partnerships: implications from the “Public-private Investment Program for Legacy Securities”*, 46 COLUM. J.L. & SOC. PROBS. 509 (2013) (“building a process whereby private parties compete for participation in a PPP through an auction-like mechanism can help government actors to accurately gauge the level of private sector risk aversion ex ante and calibrate the optimal amount of financial incentive needed to attract private sector participation.”).

certain investment in the portfolio company).⁷³⁰ The amount of percentage of equity will be determined by the managers and will take into account private industry practice (not public government practice), the region and fields of research and development. The incubators' managers will also be subject to the oversight of the private market, because if the portfolio firms are successful in the future, then the managers will be compensated with their equity stake.

(3) Advisory Board (Steering Committee)

Each of the established incubators is to have an Advisory Board (Steering Committee), which according to the Israeli example is usually chaired by the executive manager of the incubator's management group.⁷³¹ Additionally, according to the study by Lewis, Harper-Anderson and Molnar, the advisory board composition matters to the future success of the incubator. The following is the suggested board composition: first, there should be a technology transfer specialist and an incubator graduate firm; second, an accounting, intellectual property (patent assistance), and general legal expert; third, representatives from the various stakeholder groups, such as local government and economic development agency representatives;⁷³² fourth, research institutions and

⁷³⁰ See AlphaLab example in *supra* note 719.

⁷³¹ Frenkel & Shefer (2003), *supra* note 527.

⁷³² See Lewis, Harper-Anderson & Molnar, *supra* note 40 ("play key roles in enhanced client firm performance, as their presence ensures that the incubator is embedded in the community, which is necessary for its success. Local government and economic development officials also help educate critical funding sources about the incubation program and its successes.").

academia; and fifth, industry representatives and other stakeholders involved with the incubator.⁷³³

(4) Idea (Firm) Selection Process & Financing Mechanism

The incubator management should select the portfolio companies that will participate in the program, based on the factors discussed above, including cultural fit, potential for success, etc.

Following the initial selection process, which will be done by the incubator's management, the chosen entrepreneurs (with the help of the management) will draft a proposed "project folder," outlining the project and proposed budget, which will then be submitted to the incubator's Advisory Board for approval.⁷³⁴

There will be a subsequent selection process, following the decision of the Advisory Board, which will be done by the Central Incubators Administration, in order to try to mitigate issues of political capture. The Central Incubators Administration will get to make the final decision on which projects will participate in the program and get funding. Before making their final determination, the Central Incubators Administration can also request for additional advice from independent experts, depending on the industry and research objectives.⁷³⁵

Each of the projects that gets accepted to the incubator program will be evaluated on a yearly basis. Seed capital is frequently limited to up to two years.⁷³⁶ It should be

⁷³³ Frenkel & Shefer (2003), *supra* note 527.

⁷³⁴ *Id.*

⁷³⁵ *Id.*

⁷³⁶ See Israeli example in Frenkel & Shefer (2003), *supra* note 527.

noted that accelerator capital is even for a shorter time period of a few months (i.e., 5 months or less). However, in very limited and rare circumstances, (i.e., if the project is from the biotech field), a third year of government support can be granted.⁷³⁷

The incubator model can be adopted in the field of research of life sciences. However, the design of the incubator for life sciences will be different in that it will advance academic peer review of marketable research in order to gauge an idea or a project and successively reinforce the connection between the academy and the industry (i.e., funds will be distributed to research projects that are deemed worthy by scientists, rather than business people).⁷³⁸

It should be noted that the timeline for biotechnology research is very different than in the high-technology industry. For example, at the National Institute of Health (NIH),⁷³⁹ grants are usually given for five years, reflecting the far slower progress, when the work in a laboratory setting may involve the manipulation of living organisms.⁷⁴⁰ The NIH model is another good example of a successful, close collaboration between the

⁷³⁷ Frenkel & Shefer (2003), *supra* note 527.

⁷³⁸ See Block, *supra* note 7 (According to Block, the NIH officials and policy makers rely heavily on the peer review model, in which funds are distributed to research projects that were deemed worthy by scientists); See also AN ASSESSMENT OF THE SMALL BUSINESS INNOVATION RESEARCH PROGRAM AT THE NATIONAL INSTITUTES OF HEALTH (Charles Wessner ed., National Academics Press 2009), available online: <http://www.ncbi.nlm.nih.gov/books/NBK11455/>.

⁷³⁹ See Block, *supra* note 7, at 9 (According to Block, when NIH officials realized the magnitude of the disease fighting possibility of genetic engineering, they were aggressive in advancing that technology, both with the research conducted inside their labs and with grants that they bestowed).

⁷⁴⁰ *Id.*

public stakeholders (government), scientists and business firms, where the government is investing in the production of ideas (innovations).⁷⁴¹

The participating entrepreneur (or entrepreneurial firm) will receive grants from the government agency, the Central Incubators Administration. However, it is the entrepreneur or entrepreneurial firm, and not the government, who will own the technology. The firm will be required to pay royalties (in order to repay the grant) to the government once successful, such as three to five percent plus market-rate interest (this is based on the lessons from the Israeli example).⁷⁴² In the event that the new venture fails, the government does not require repayment of the money invested.⁷⁴³ It is very likely that entrepreneurs and start-up firms will fail several times before they reach a successful outcome.

The difference between the Israeli incubator model, as compared to other models, is that the government learned from its previous dealing with the incubator management and with political issues, and therefore, invested the grant directly in the hands of the firm, and not in the hands of the incubator management. Therefore, it is recommended that the firm in this initiative will also get the grant directly from the government.

(5) National Networks for Incubation

Collaboration and cooperation among the various incubators across the United States is important. The Administration will be in charge of developing platforms that

⁷⁴¹ See *id* (according to Block, the NIH raised no objections when Herbert Boyer, the founder of the first biotech start-up Genentech (startup was created to commercialize genetic engineering), in 1976, continued to use his NIH funded lab at UCSF for Genentech's first commercial project.)

⁷⁴² See Israeli Incubator's example in the article of Wylie. See Wylie, *supra* note 555.

⁷⁴³ *Id.*

will allow the various incubator managers to meet, share their progress, difficulty, achievements, as well as share their resources, so that they can create a true system of national networks. The national platforms of networks (innovation hubs) can be titled the “National Networks for Incubation” Such collaboration will encourage research and development, formation of new entrepreneurial firms and promote growth.

(6) International Networks for Incubation

There is controversy on the issue of whether foreign companies or entrepreneurs should be able to participate in programs that are funded by American taxpayers. However, in today’s global economy, such collaborations are necessary and even inevitable.⁷⁴⁴ Therefore, international firms should be able to participate (as partners of American firms).

(7) The Stakeholders of the Incubator

As noted earlier, this paper uses the term “stakeholders” in order to refer to the following groups of public and private partners that will partake in forming and will be a part of the incubator.

i. Academia & Research Community

The academic and research communities will include higher education institutions, such as universities, community colleges, and other research institutions, such as government research facilities and laboratories.

⁷⁴⁴ See above discussion on cross-regional collaboration.

Nelson is adamant about the significance role that higher education institutions (and national systems of innovation⁷⁴⁵) should play in the new knowledge economy.⁷⁴⁶ Nelson claims that the “standard” growth theory in economics concentrates on the roles of the business firms (including the constraints and incentives that are provided by competition in a market setting) and is blind to a wide range of other institutions that have played key roles in stimulating growth and driving innovation, like higher education institutions.⁷⁴⁷

On the other hand, Philippe Larédo and Philippe Mustar contest the role of universities and government laboratories in leading research initiatives, stating that higher education institutions control research strategy and missions, and that their “monopoly”⁷⁴⁸ over research strategy should end, because “even fundamental research becomes driven by ‘problem solving.’”⁷⁴⁹

The Coalition model encourages incubator managers to collaborate with higher institutions and research agencies because higher education institutions have a key role in the new knowledge economy,⁷⁵⁰ especially since they can provide innovative solutions

⁷⁴⁵ The term “systems” means a “set of institutional actors that, together, play the major role in influencing innovation performance.” See Nelson, *supra* note 126.

⁷⁴⁶ Some of the scholars who promote the ideas of national systems of innovation, often are adamant that higher education institutions will have a significant role in the new knowledge economy. See Nelson, *supra* note 126; See also Philippe Larédo & Philippe Mustar, *Public Sector Research: A Growing Role In Innovation Systems*, 42 MINERVA 11 (2004).

⁷⁴⁷ Laredo & Mustar, *supra* note 746.

⁷⁴⁸ See *id.*

⁷⁴⁹ See also *id.*; See also MICHAEL GIBBONS ET AL., *THE NEW PRODUCTION OF KNOWLEDGE: THE DYNAMICS OF SCIENCE AND RESEARCH IN CONTEMPORARY SOCIETIES* (1994).

⁷⁵⁰ See also Laredo & Mustar, *supra* note 746; See Nelson, *supra* note 126; NATIONAL SYSTEMS OF INNOVATION: TOWARDS A THEORY OF INNOVATION AND INTERACTIVE LEARNING (Bengt-Åke Lundvall ed.,

and address the particular needs of the region's core industry. Therefore, the academic entities in this category will play a variety of roles within the incubator. They will encourage collaboration, cooperation, open innovation, shared-use facilities and technology transfer from the participating research institutions to marketable products or manufacturing process. Also, they will provide guidance to the businesses involved in the incubator.

ii. Industry & Economic Development Organizations

Industry and other organizations for collaboration include, but are not limited to, industry consortia and trade groups, economic development organizations, labor organizations, chambers of commerce,⁷⁵¹ professional associations, and university alumni associations. These organizations can promote incubator initiatives through marketing, outreach, and collaboration with other similar organizations. They usually specialize in providing forums in which incubator participants can collaborate and network.

iii. Federal, State, Regional & Local Government

The government stakeholders can take a range of forms. Regional, state and federal governments are likely to be present through initiatives such as research and development grants and other funding. These initiatives are executed by various agencies such as commerce, labor and economic development, whereas economic development

Anthem Press 1992) (first person to use term; national system of innovation is social and dynamic); SYSTEMS OF INNOVATION: TECHNOLOGIES, INSTITUTIONS AND ORGANIZATIONS (Charles Edquist ed., 1997).

⁷⁵¹ According to the lessons learned from the SBA cluster initiative, chambers of commerce are an important factor that can help the clusters with marketing and outreach. Information is available online at: <http://www.sba.gov/sites/default/files/files/Y1%20Pilot%20Cluster%20Evaluation.pdf>.

companies usually represent the local government. All these government entities can serve as a future client or provider for certain firms in the incubator.

The following are four significant additional roles that government stakeholders can play in order to successfully implement the proposed cluster initiative, which were suggested by economists Muso and Katz.⁷⁵² First, federal policymakers may provide incubator stakeholders around the nation with information and foundational resources.⁷⁵³ This implies that the managers of the incubators should recruit the involvement of federal agencies, and in particular, the following: Commerce (DOC/NIST), Defense (DOD), Education (ED), and Energy (DOE); the National Aeronautics and Space Administration (NASA); and the National Science Foundation (NSF).

Second, at the state level, policymakers are to strategically invest resources in the cluster and encourage regional collaboration.⁷⁵⁴ The state government's mission is to encourage university-industry partnership, to leverage federal and academic research

⁷⁵² Muso & Katz, *supra* note 683 (the different government stakeholders should align their efforts horizontally in addition to “vertically.” “The cluster paradigm can—and should—be used to organize the disconnected policy offerings of any one level of government in service of clusters’ needs in a region, but it also provides a framework for coordinating them up and down the tiers of federalism to avoid policy conflict, redundancy, or missed opportunities for synergy.”)

⁷⁵³ *Id.* (“Going forward, the federal government should move aggressively to build the information base necessary for cluster activity and policymaking; create effective forums for best practice sharing; enhance the capacity of regional cluster intermediaries with planning and other assistance; employ cluster paradigms on major national challenges; coordinate disparate cluster-relevant programs; and ensure the overarching cluster effort is visibly prominent.”)

⁷⁵⁴ *Id.* (“States can make clusters a central component of economic development planning; target investments strategically to clusters of state significance; and adjust metropolitan governance to ease regional collaboration.”)

funds, to build a technically educated workforce and to ease regulations to create a more fertile ground for technology.

Third, regional leaders are delegated the work of coordinating all the cluster actors and identifying the various cluster challenges.⁷⁵⁵ Fourth and finally, local policymakers need to implement the strategic cluster-oriented economic development policy as well as have some bearing on its performance.⁷⁵⁶

iv. Financial sector

The financial sector involves various financial investors and institutions, such as angel groups, traditional and corporate venture capitalists, investment banks and others. They can take on several roles to help the entrepreneurial firms that reside in the incubator such as providing seed, angel and venture capital funding, making loans, and creating follow on investment funds.

v. Traditional stakeholders

These stakeholders include customers, employees, creditors, suppliers, and other non-shareholder groups, which will supply the partnership with resources (such as funding, labor, expertise, infrastructure, etc.).⁷⁵⁷

⁷⁵⁵ *Id.* (“Regional intermediaries should work to identify and describe local clusters, identify their binding constraints, and facilitate regional joint action to implement needed exchanges and initiatives.”).

⁷⁵⁶ *Id.* (local policy makers “should manage zoning and permitting issues to benefit the physical infrastructure in which clusters exist, and they should keep an eye out for the broader demographic and social context in which new industry clusters might form and to which existing ones must adjust.”).

⁷⁵⁷ *See also* Stout (Time Machine), *supra* note 204 (definition of “stakeholders”)

2. The Match-Maker Public-Private Investment Fund Initiative

The “Match-Maker” Initiative is a targeted policy effort aimed at designing a platform for a competitive venture capital industry in the United States that promotes venture capital investment in early stage technology firms (start-ups). The proposed design is intended to attract the participation of professional venture capital agents (from the private market) in the Match-Maker Initiative, in order to produce public-private venture capital funds. The Match-Maker venture capital funds will be legally independent of the government, and will focus on making equity investments in private-sector early stage start-up firms, while using government-supplied funds.

Another benefit of the Match-Maker funds would be the advancement of continuous procurement relationships between the government agency that will provide the funding and the technology companies that the funds will invest in. This initiative will allow the government agencies to secure innovative technology that will be updated according to the constantly developing needs of the commercial market as well as meet the needs of the government agency for keeping up with technology as well as allow it to fund according to its research and development missions.

The purpose of this initiative is not to create a new high-technology industry, but rather to create a platform for investment in existing early stage technology innovations, capabilities, research and development. It is based on the design of the successful Israeli Yozma Program,⁷⁵⁸ as well as on the lessons from the success story of Silicon Valley.⁷⁵⁹

⁷⁵⁸ See Avnimelech & Teubal (Evolutionary Targeting), *supra* note 450 (“the Yozma program implemented during 1993–1998.”). It was a policy that essentially created the platform for the Israeli venture capital industry.; See Avnimelech & Teubal (Methodological Lessons 2003), *supra* note 489. It should be noted that the purpose of the Yozma Program was not to create a new high-technology industry, rather the

a. The Reasons for Government Intervention in the Current Market

The following are various reasons that require government intervention in the market in the form of the proposed Match-Maker Initiative. First, economic analysis encourages government to present subsidies to small high-technology firms because the social returns from such firm's research and development expenses might surpass their private returns.⁷⁶⁰ The social return to the government is much greater than to private investors,⁷⁶¹ because private investors cannot reap the full benefits of their investment through profits when radical innovation is concerned.⁷⁶² Moreover, some scholars suggest that the spillover problems are predominantly acute among small firms, because they are commonly incapable of effectively defending their intellectual property or extracting the majority of the rents in the product market.⁷⁶³

Second, by giving awards to start-up firms, the government is certifying these start-ups to the private market. The offering of a start-up company's equity may be associated with the "lemons" problem and "adverse selection."⁷⁶⁴ As noted earlier in this

venture capital industry evolved from an existing Israeli foundation of high-technology capabilities, innovation, research and development.

⁷⁵⁹ See Saxenian (Regional Advantage), *supra* note 394; See also Gilson, *supra* note 396; See also Booth, *supra* note 400.

⁷⁶⁰ See Lerner (Venture Capitalist), *supra* note 518; See also Griliches, *supra* note 17.

⁷⁶¹ See, e.g., Hall, *supra* note 17; See Margalioth, *supra* note 8. See also Griliches, *supra* note 17.

⁷⁶² See, e.g., Hall, *supra* note 17; See Margalioth, *supra* note 8; See also Griliches, *supra* note 17.

⁷⁶³ See Lerner (Venture Capitalist), *supra* note 518; See also Edwin Mansfield et al., *Social and Private Rates of Return from Industrial Innovations*, 91 QUARTERLY J. ECON. 221 (1977).

⁷⁶⁴ See Akerlof, *supra* note 23; See also Utset, *supra* note 23, at 56; See also Gompers & Lerner (1999), *supra* note 20, at 129.

paper, there is a financing and information gap, which is called the “Valley of Death.”⁷⁶⁵

The Valley of Death describes the financial difficulties that start-up firm experience in the early-stage of their company’s technology development, which is the stage between the early stage of discovery (that is generated from basic research) to the later stage of commercialization of the product or process. It results from the uncertainty, high-risk and information asymmetry problem, which is associated with investing in start-ups, and precludes investors from backing such firms.

The following are five broad stages in the innovation process, as well as the financial sources that are usually available to start-up at these stages. First, the stage of basic research, where funding is usually available to entrepreneurs from government sources like NSF, NIH, SBIR phase I, and from private corporate resources such as funding that large corporations allocate for the purposes of research and development; Second, the stage of proof of concept or invention, where financing sources usually include private Angel investors, corporate research and development funds, government funding from SBIR phase II and technology labs; Third, the early-stage technology development stage, which is often termed as the Valley of Death because of the entrepreneur’s hardship in getting financing for this stage; Fourth, the stage of product development, where private venture capitalist traditionally invest in start-up firms; Fifth and last, the production or marketing stage, where financing sources include private venture capitalists, corporate venture capital, private equity or commercial debt.

⁷⁶⁵ See *supra* note 13 for several following studies that describe the failure rates and reasons for the market failures: Cooper, Dunkelberg & Woo ; U.S. Gen. Accounting Office, Zimmerer & Scarborough; Knaup.

The Valley of Death can have a considerable effect on the productivity of government supported research and development efforts,⁷⁶⁶ especially since an alarming study by Gompers and Lerner explains that there is a 90% failure rate among early-stage firm who could not get venture capital backing.⁷⁶⁷ If the government will intervene and give awards to such firms, it will also certify the firms to private investors. Such certification can tackle the informational asymmetries problem that otherwise precludes investments.⁷⁶⁸

Therefore, there is a market need for government intervention in order to encourage the creation, survival and growth of entrepreneurial firms, since the government already spends money (in the first innovation stage) in trying to boost research and development initiatives and ‘knowledge spillovers’ “(an exchange of ideas among individuals).

Third, government intervention is primarily necessary at these times when private investors effectively have no appetite for investing in risky start-up companies.⁷⁶⁹ In recent years, large public firms are shying away from investments in research and development initiatives due to a philosophy of “shareholder primacy,” which precludes managers from pursuing long-term projects or investments in entrepreneurial firms with

⁷⁶⁶ Ford, Koutsky & Spiwak, *supra* note 14; See Branscomb & Auerswald (2002), *supra* note 14; See also Auerswald, Branscomb, Demos & Min (2005), *supra* note 14.

⁷⁶⁷ Gompers & Lerner (2002), *supra* note 28; See also U.S. Gen. Accounting Office, *supra* note 13 (approximately 80% of new businesses fail within five to seven years from their formation).

⁷⁶⁸ See Lerner (Venture Capitalist), *supra* note 518.

⁷⁶⁹ See McCahery, Vermeulen & Banks, *supra* note 27, at 4.

uncertain returns,⁷⁷⁰ because they are “exposed to 'stock market sickness' & short-term thinking,” which results in very low “social impact.”⁷⁷¹

Fourth and finally, due to the recent economic crisis and unstable economic environment, even venture capital investors, who might traditionally invest in such early innovation stages, are also reluctant to partake in such funding and prefer later stage investments.⁷⁷²

b. The Role of the Venture Capital Industry in the U.S. Innovation Process

The venture capital industry has played, and continues to play, an important role in the United States innovation process for the following reasons.

First, venture capitalists are active investors, who provide many value added services to the technology companies that they invest in. Such services can vary, and include: strategic planning, mentoring, guidance, selecting management, lawyers, accountants, writing a business plan, etc.⁷⁷³ Second, venture capitalists are fundamental to the formation of startup firms.⁷⁷⁴ Third, venture capitalists are actively engaged with the following innovation networks: global as well as local technology markets,⁷⁷⁵

⁷⁷⁰ See Stout (Shareholder Value Myth), *supra* note 19 (the rise of shareholder primacy thinking began “in the 1970s with the rise of the so-called Chicago School of free-market economists. Prominent members of the School began to argue that economic analysis could reveal the proper goal of corporate quite clearly, and that goal was to make shareholders as wealthy as possible ...the idea that corporate performance could be simply and easily measured through the single metric of share price ...”).

⁷⁷¹ See also, Avnimelech & Teubal (Methodological Lessons), *supra* note 489.

⁷⁷² See McCahery, Vermeulen & Banks, *supra* note 27, at 4.

⁷⁷³ See also, Gompers & Lerner (1999), *supra* note 20, for further info on services provided by VCs.

⁷⁷⁴ See Avnimelech & Teubal (Methodological Lessons), *supra* note 489.

⁷⁷⁵ See *id.*

financial institutions,⁷⁷⁶ specialized labor markets⁷⁷⁷ and professional business service markets.⁷⁷⁸ Finally, venture capital investment spurs more technological innovation than corporate venture capital investment.⁷⁷⁹

As noted earlier in this paper, venture capital firms use unique contracts and organizational capabilities in order to overcome the uncertainty, risk, information asymmetry, agency,⁷⁸⁰ “lemons” and “adverse selection”⁷⁸¹ related problems.

The following are a few examples of studies that describe the successful outcomes from the relationship between venture capital investors and their portfolio firms in the United States (as compared to startup firms that were not backed by venture capitalists).⁷⁸² First, startup companies that are backed-up by venture capitalists enjoy a greater access to global markets.⁷⁸³ Second, venture capital investors enable their portfolio companies to go public faster (it seems that investor uncertainty is reduced due

⁷⁷⁶ *See id.*

⁷⁷⁷ *See id.*

⁷⁷⁸ *See id.*

⁷⁷⁹ *See* Samuel S. Kortum & Josh Lerner, *Assessing the Contribution of Venture capital to Innovation*, 31 RAND J. ECON. 674 (2000) (Kortum & Lerner found that on average each dollar invested by Venture Capital contributes to the rate of patents 3 to 4 times more than corporate R&D. Moreover, from the late 1970's to the mid 1990's VC represented only 3% of corporate R&D, but are responsible for 10%-12% of privately funded innovation.); *See also* Joseph Bankman & Ronald J. Gilson, *Why Start-ups?*, 51 STAN. L. REV. 289 (1999) (reviewing tax treatment of startups).

⁷⁸⁰ *See* Gompers & Lerner (1999), *supra* note 20, at 129..

⁷⁸¹ Akerlof, *supra* note 23; *See also* Utset, *supra* note 23, at 56; *See also* Gompers & Lerner (1999), *supra* note 20, at 129.

⁷⁸² It should be noted that the research based on the Israeli VC industry showed similar results concerning the performance of venture capital backed firms. (according to Avnimelech & Taubel, this includes “higher success rate (Exit rate: IPO or M&A), younger age at IPO, higher IPO valuation, and higher growth in sales”).

⁷⁸³ *See* Avnimelech & Teubal (Methodological Lessons), *supra* note 489.

to venture capital presence and monitoring), and in effect help their portfolio companies to get lower interest rates on bank loans.⁷⁸⁴ Third, there is a superior overall post initial public offering performance of venture capital backed portfolio firms, both in terms of overall growth rate and stock price.⁷⁸⁵ Finally, venture capital backed firms invest a larger fraction of their total expenses in research and development, as well as have higher growth rates in terms of revenues and assets.⁷⁸⁶

c. *The Initiative – Governance Mechanisms*

The initiative proposes to establish public-private equity funds, which will be organized as independent not-for-profit corporations, in order to bridge the financial and information gap between budding commercial innovation and the technology needs of a

⁷⁸⁴ See William L. Megginson & Kathleen A. Weiss, *Venture Capitalist Certification in Initial Public Offerings*, 46 J. FIN. 879 (1991); See also Christopher B. Barry et al., *The Role of Venture Capital in the Creation of Public Companies: Evidence from the Going-Public Process*, 27 J. FIN. ECON. 447 (1990) (“it appears that venture capitalists are able to bring public the firms they back earlier than would have otherwise been possible. This likely occurs because of the industries in which the venture capitalists focus. Venture capitalists take a monitoring role, demonstrated by serving on the board, maintaining the investment beyond the IPO, and holding a large equity position in a portfolio firm... investor uncertainty is reduced with the quality of the venture capitalist's monitoring skill. A decrease in investor uncertainty was found to decrease IPO underpricing. These findings support the notion that venture capitalists play an important role in new enterprise.”).

⁷⁸⁵ See Megginson & Weiss, *supra* note 784 (comparing of venture capital backed IPOs with a non-venture capital backed IPOs from 1983 through 1987, which are “matched as closely as possible by industry and offering size.” They conclude that the presence of venture capitalists (in the issuing firms) serves to “lower the total costs of going public and to maximize the net proceeds to the offering firm.”); See also Avnimelech & Teubal (Methodological Lessons), *supra* note 489.

⁷⁸⁶ See William L. Megginson, *Toward a Global Model of Venture Capital?* 16 J. APPLIED CORP. FIN. 89 (2004) (“Venture capitalists create value through their role as active investors, and government and business leaders around the world have come to realize that venture capital and private equity investing can be a significant force in promoting economic development and technological progress. In general, countries with English common law codes offer greater protection to investors; the ratio of venture capital spending to GDP for common law countries is nearly double that in civil law countries. Government efforts to promote venture capital would probably be better focused on eliminating regulatory road-blocks, lowering taxes, and providing a favorable investor climate.”); See also Avnimelech & Teubal (Methodological Lessons), *supra* note 489.

participating government agency.⁷⁸⁷ There is extensive literature on regulatory capture, which suggests that government involvement in the market may be distorted as a result of politicians or interest groups that wish to use the intervention for their own private benefit.⁷⁸⁸ The following design will try to prevent the regulatory capture from the government investment, by structuring the Match-Maker funds as independent bodies with autonomous management (and private market incentives).⁷⁸⁹

⁷⁸⁷ See John T. Reinert, *In-Q-Tel: The Central Intelligence Agency as Venture Capitalist*, 33 NW. J. INT'L L. & BUS. 677 (2013) (noting that there are attempts/desires by government agencies (Army, NASA & USA Postal Service) to invest in technology ventures. He cites Deals & Deal Makers—Memo to Techies: This Army Wants Your Energy Ideas, WALL ST. J., May 9, 2003, at C5; News Release, *NASA Forms Partnership with Red Planet capital, Inc.*, NASA (Sept. 20, 2006), available at http://www.nasa.gov/home/hqnews/2006/sep/HQ_06317_red_capital.html; See also Marc Kaufman, NASA Invests in Its Future with Venture Capital Firm, WASH. POST Oct. 31, 2006, at A19; Joe Davidson, Postal Service Desperate for Good Ideas, WASH. POST, June 23, 2010, at B03.

⁷⁸⁸ See George Stigler, *The Economic Theory of Regulation*, 2 BELL J. ECON. 3 (1971); See Sam Peltzman, *Towards a More General Theory of Regulation*, 19 J. L. & ECON. 211 (1976); See also See Lerner (Venture Capitalist), *supra* note 518 (“the theory of regulatory capture suggests that direct and indirect subsidies will be captured by groups that stand to gain substantial benefits and whose collective political activity is not too difficult to arrange.”).

⁷⁸⁹ BUS. EXEC. FOR NAT'L SEC., ACCELERATING THE ACQUISITION AND IMPLEMENTATION OF NEW TECHNOLOGIES FOR INTELLIGENCE: THE REPORT OF THE INDEPENDENT PANEL ON THE CENTRAL INTELLIGENCE AGENCY IN-Q-TEL VENTURE 6 (C. Lawrence Meador et al. eds., 2001), available at <http://www.iqt.org/attachments/BENS%20Report.pdf> [hereinafter BENS Report] ; See also, IAN MACMILLAN ET AL., NAT'L INST. OF STANDARDS & TECH., CORPORATE VENTURE CAPITAL: SEEKING INNOVATION AND STRATEGIC GROWTH (2008), available at: http://www.atp.nist.gov/eao/gcr_08_916_nist4_cvc_073108_web.pdf. In this study, the U.S. federal government pays attention to the rising role of corporate venture capital (CVC) in technology innovation; See also The Advanced Technology Program (ATP) public-private partnership example (from 1990 to 2007), where the US government attempts to act as a catalyst for innovation, by providing funding to research institutions.); See also Maryann P. Feldman & Maryellen R. Kelley, *Leveraging Research and Development: Assessing the Impact of the U.S. Advanced Technology Program*, 20 SMALL BUS. ECON. 153 (2003) (evaluating the successful results of the ATP program & the companies that received funding from ATP); In 2007, ATP was replaced by the Technology Innovation Program (TIP) Program; See generally TECHNOLOGY INNOVATION PROGRAM, <http://www.nist.gov/tip>; See also America Competes Act, Pub. L. No. 110-69, § 3012, 121 Stat. 572, 593 (2007); See also, Josh Lerner, *When Bureaucrats Meet Entrepreneurs: The Design of Effective “Public Venture Capital”*, 112 ECON. J. F73, F80 (2002) [hereinafter *Bureaucrats Meet Entrepreneurs*]; See also Samuel Kortum & Josh Lerner, *Assessing the Contribution of Venture Capital to Innovation*, 31 RAND J. ECON. 674, 675 (2000).

(1) The “General Partner”

Each participating federal agency will appoint independent private investment professionals to manage its Match-Maker fund. Reputable and established private equity managers (and staff) will be recruited from the private venture capital industry, and will be granted competitive (compared to private industry) compensation schemes.⁷⁹⁰

The track record of a venture capital fund manager is extremely important for several reasons. First, entrepreneurs prefer to work with fund managers who have a good track record by making successful deals and a lot of money in the past. These managers will stand a better of getting into the best deals in the future, than managers with no experience in the industry. Additionally, managers with good records will typically have already built strong networks, so they can help their portfolio companies with introductions to potential customers and possible partners. Finally, the government agency must take into account the manager’s commitment as well as past experience with early-stage investment in entrepreneurial firms.

The managers will act similarly to “general partners” (who invests and manages the fund), whereas the government will act similarly to a “limited partner” (who is passive and only invests the money).

i. Compensation

It is extremely important to make sure that the Match-Maker managers will be properly compensated for the fund to be successful and to prevent the situation of a

⁷⁹⁰ See Lerner (Bureaucrats Meet Entrepreneurs), *supra* note 789.

revolving door (when a manager in a public position leaves for a higher paid private position). Therefore, based on the Israeli case study, and the Silicon Valley successful venture capital model, the managers will be compensated with a share of the profits generated by the fund. The government will pay them an annual management fee of 2% and a carried interest of up to 20% of the profits of the fund (some private equity funds today even pay more than that to their management).⁷⁹¹

The mission of compensating managers of public funds in democracies can be particularly difficult, according to Lerner.⁷⁹² For example, the story of the first government funded venture capital firm, In-Q-Tel, illustrates the hardships of modeling government funds after private equity funds.⁷⁹³

1. In-Q-Tel (the CIA VC fund) Example

In-Q-Tel was established in 1999⁷⁹⁴ in order to provide the U.S. Central Intelligence Agency (“CIA”) with access to innovating technologies, by investing in

⁷⁹¹ This incentive mechanism is very common in Silicon Valley and is called “2 and 20”. See, e.g., Laura Saunders, Billionaires Decry “Carried Interest”, Wall St. J., Jan. 20, 2012, *available at* <http://blogs.wsj.com/totalreturn/2012/01/20/billionaires-decry-carried-interest/>; See also DOUGLAS J. CUMMING & SOFIA A. JOHAN, VENTURE CAPITAL AND PRIVATE EQUITY CONTRACTING: AN INTERNATIONAL PERSPECTIVE 3 - 5 (2009).

⁷⁹² See Lerner (Boulevard of Broken Dreams), *supra* note 38, at 176.

⁷⁹³ See *id.*

⁷⁹⁴ During the time of its establishment, the idea of a government-funded venture capital firm was entirely novel. See Steve Henn, *In-Q-Tel: The CIA's Tax-Funded Player In Silicon Valley*, NPR (July 16, 2012), <http://www.npr.org/blogs/alltechconsidered/2012/07/16/156839153/in-q-tel-the-cias-tax-funded-player-in-silicon-valley> (“Whether you have realized it or not, over the past 13 years In-Q-Tel has changed your life. ‘Much of the touch-screen technology used now in iPads and other things came out of various companies that In-Q-Tel identified,’ Smith says.”); See also Lerner (Boulevard of Broken Dreams), *supra* note 38, at 176 (“For many of the start-ups, which had targeted corporate customers, the challenges of breaking into government procurements were daunting.”).

emerging firms (small stake investments) and by using venture-like processes.⁷⁹⁵ In order to encourage recruitment of established managers and staff from the venture capital industry, and to prevent them from leaving to more lucrative private positions, the CIA offered a rewarding compensation scheme, which was very unusual compared to typical government jobs.⁷⁹⁶ The compensation included a flat salary, a bonus paid based on how well In-Q-Tel met government needs, and an employee investment program, which took a pre-specified portion of each employees salary and invested alongside the portfolio.⁷⁹⁷ After a few successful years, newspapers, like the New York Post⁷⁹⁸ criticized this compensation model, accusing its managers of using taxpayers' money for their own personal benefit,⁷⁹⁹ even though the model was successful and very acceptable in the private world.

⁷⁹⁵ See Lerner (Boulevard of Broken Dreams), *supra* note 38, at 176 (In-Q-Tel also served as a bridge that was able to present new firms to the portfolio of the CIA and to underline the role of the government as a new customer for products developed that were by emerging growth firms); See also Bens Report, *supra* note 789 (comparing between the In-Q-Tel model and the traditional VC model. "Unlike a true venture capital model, In-Q-Tel is more aptly described as a "technology accelerator," seeking speed and agility in discovering innovative IT solutions for the Agency. In-Q-Tel differs from private venture capital models in the following ways. In-Q-Tel: Places its value proposition on obtaining IT solutions, not foremost on return on equity or asset; Deals always result in a product or service (e.g. feasibility assessment, test product or prototype); Investments are more likely to provide value to the portfolio companies beyond cash: - Investment is "smart money" in its portfolio companies; that is, In-Q-Tel provides portfolio companies with intellectual capital, technology-related experience and the Agency as a potential test-bed; and Due diligence process is more strict: - In-depth investigation into the company's structure and financial status as well as the ability of the proposed technology to meet the Agency problem domain is completely evaluated before forming a contract.").

⁷⁹⁶ See Lerner (Boulevard of Broken Dreams), *supra* note 38, at 176.

⁷⁹⁷ For example, in 2012, its CEO, Christopher Darby, earned roughly \$1 million; See Henn, *supra* note 794.

⁷⁹⁸ Christopher Byron, Pennsy Stock Spies, N.Y. POST, April 25, 2005, *available at* <http://www.rgmcom.com/articles/nypost17.html>.

⁷⁹⁹ See *id.* (These compensation arrangements, especially allowing the In-Q-Tel employees to invest alongside the portfolio investments, according to the New York Post, was "almost identical to the so-called 'Raptor' partnerships through which top officials at Enron Corp were able to cash in personally on

ii. Incentives & Safeguards

Despite potential criticism, this paper recommends compensating the managers of the Matchmaker fund according to the private market, so that the managers will have incentives for the fund to grow. It is important to note further that there is an inherent risk for possible abuses by management or conflict of interest. Therefore, the following four important safeguards will need to be instituted.

First, in order to hold the managers accountable to their investment decisions, they will be required to bring their own capital to the fund. The participating federal agency of each Match-Maker fund will determine the amount of capital required as well as initiate a competitive bidding process for the post of fund managers.

Second, in addition to bringing their own capital, the managers will be required to line up investments from other private investors and legitimate accountable sources. If a considerable share of the Match-Maker funds arrives from the private managers, then they are expected to concentrate on making sure that their investments thrive, as noted earlier by Lerner⁸⁰⁰ and the Israeli government's example. Lerner describe the reasons for

investment activities of the very company that employed them.”); *See also* Lerner (Boulevard of Broken Dreams), *supra* note 38, at 178.

⁸⁰⁰ *See* Lerner (Boulevard of Broken Dreams), *supra* note 38, at 138-40 (“[M]any examples can illustrate the real danger that the fund managers will have the wrong incentives. The Discovery Fund, for instance, was a \$76 million fund organized by New York City in 1995, with funding entirely from the public sector and public utilities that focused on doing business in the city. The city hired a local venture group, Prospect Street Ventures, to run the fund, which was launched with a great deal of fanfare, including Mayor Rudy Giuliani’s pledge that it would generate 4,000 jobs. Yet the effort is generally regarded as a failure... It was natural to wonder whether the lack of demand for matching funds and the failure to set a mandate that matched city’s economic development needs intensified the problems that the fund encountered.”).

the failure of the New York City Discovery Fund, which did not demand the fund's managing groups to match any funds that were invested by the city.⁸⁰¹

Third, it is important to design the model so that the private sector partners only do well if the investments generate a good return. Fourth, the future investment goals must be clear and defined, and linked to the wider targets of the federal agency that launches of this model.⁸⁰²

iii. Bidding Process

The following are the ways in which the prospective Match-Maker fund managers can compete for the right to participate in the program. First, they will need to commit a certain maximum portion of capital that they will be willing to commit and contribute as private equity capital. Second, they will need to specify the size of the fund that they seek to establish. Third, there will be an evaluation of the managers' reputation, previous achievements and previous dedication to small and medium enterprises and involvement with the other stakeholders. Fourth and finally, the federal agency will also consider factors relating to the fund's long-term strategic investment objective, as well as the industries and research that they would like to promote.

iv. Matching Component & Another Incentive to the "Upside"

The following suggestion is based on the successful incentive mechanism that was used by the Israeli government in the Yozma program. The creativity of Yozma was

⁸⁰¹ *Id.*

⁸⁰² *See id.* at 138.

in the design of the risk-reward model. While the Israeli government collectively shared the risk with the foreign (and local) investors, it offered the investors the potential to reap all of the reward. In the same way, the federal government agency will share the risks associated with establishing the Match-Maker funds with the private actors, while also providing them with “incentives to the upside.”⁸⁰³

The long-term goal of the federal government agency, in this initiative (unlike the In-Q-Tel example), is not to continue and remain an equity holder in the funds. Instead, the agency would present the private managers (general partners) with the option of inexpensively buying out its equity stake, in the event that the fund becomes profitable.⁸⁰⁴ The agency stake in the fund could be bought out once it had served its primary function (to attract professional venture capital investors to invest in early stage technology firms) rather than carry on indefinitely.

The “upside” is that the private fund managers have a “call option,” for a period of 5 years, on the agency’s stake in fund. Therefore, in the event that the fund becomes profitable, then the private managers can buy the agency’s stake at cost, plus a 5 to 7% interest.⁸⁰⁵ For that reason, from the fund manager’s standpoint it is an extremely good deal.

The government agency will match a significant portion of the private management investment in the fund. In the Israeli Yozma example, the matching ratio

⁸⁰³ See Avnimelech & Teubal (Evolutionary Targeting), *supra* note 450 (discussing Yozma’s incentives to the “upside”).

⁸⁰⁴ See Lerner (Boulevard of Broken Dreams), *supra* note 38, at 178 (discussing In-Q-Tel employees equity compensation).

⁸⁰⁵ See Avnimelech & Teubal (Evolutionary Targeting), *supra* note 450.

was 1:1 and the government only maintained a 40 percent equity stake in the Yozma funds.

This paper supports the idea of private capital entities partaking in government investment because it will increase the total capital introduced into the market, and it gives the managers of the public-private funds incentives to do well.

Additionally, the Matchmaker managers are encouraged in certain situations to invest in conjunction with other venture capital firms.

(4) *The Limited Partners*

i. The U.S. government agency

There has to be a government agency that will be in charge of supervising, forming as well as encouraging other agencies to take part in Match-Maker venture capital funds initiatives.

It is highly recommended that there is a specific agency will be tasked with supervising and managing this initiative. There are several examples for the need to have a designated agency in charge of a government initiative to support entrepreneurial firms, and research and development. For example, the successful SBIR program, which was in charge of mandating the 11 federal agencies (with extramural research budgets in excess of \$100 million) to assign a certain percentage⁸⁰⁶ of their total extramural research and development budgets for grants or contracts to small businesses.⁸⁰⁷

⁸⁰⁶ For example, 2.8% of such budget in 2014.

⁸⁰⁷ See Wessner (SBIR and the Phase III Challenge), *supra* note 360. The SBIR program does not fund 'Phase III' innovations, which is a stage of development that is targeted under this initiative. Instead, funding is targeted to the pre-commercial stage of technology development.; *See also* Keller & Block, *supra* note 365.

Another example is the Advanced Technology Program (ATP), which is another successful public-private partnership example,⁸⁰⁸ of United States government providing funding to research institutions in order to encourage innovation. Moreover, in 2007, ATP was replaced by the Technology Innovation Program (TIP) Program, which “provides cost-shared funding to speed the development of high-risk, high-reward, transformative research. This research is targeted to key societal challenges that are not being addressed elsewhere.”⁸⁰⁹ TIP is part of the National Institute of Standards and Technology (NIST).

The agency will encourage other agencies to start their own or co-invest in Match-Maker funds. There already is an example of a successful public-private venture capital fund. See In-Q-Tel, the CIA’s venture capital fund, which was discussed above.⁸¹⁰ There are also other attempts and desires by various government agencies, such as the United States Army and the Postal Service, to start their own public-private venture

⁸⁰⁸ The ATP is an example of the US government acting as a catalyst for innovation, by providing funding to research institutions; *See* Feldman & Kelley, *supra* note 789 (evaluating the successful results of the ATP program & the companies that received funding from ATP); In 2007, ATP was replaced by the Technology Innovation Program (TIP) Program.

⁸⁰⁹ TECHNOLOGY INNOVATION PROGRAM: TRANSFORMING AMERICA’S FUTURE THROUGH INNOVATION 1 (2009), *available at* http://www.nist.gov/tip/upload/tip_2009_annual_report.pdf (TIP defines a societal challenge as “a problem or issue confronted by society that when not addressed could negatively affect the overall function and quality of life of the Nation and as such justifies government attention.”); *See also* Reinert, *supra* note 787.

⁸¹⁰ However, it must be noted that the CIA enjoys a distinctive grant of discretionary power, which according to Reinert, was made by the Second Continental Congress to Ben Franklin & to the Committee of Secret Correspondence. *See* Reinert, *supra* note 787 (citing the CIA Act, which grants the CIA an extensive authority to expend funds “for purposes necessary to carry out [the CIA’s] functions.”); *See* Cent. Intelligence Agency Act of 1949, ch. 227, § 8(a), 68 Stat. 208, 212 (*codified* as amended at 50 U.S.C. § 403(j) (2006)).

capital funds.⁸¹¹ Other agencies, like NASA, have also started their own venture capital firm (Red Planet Venture Capital firm).⁸¹²

I. Mission & Supervision

This initiative is also built on the belief that the private managers will be subject to the oversight of the private market. Therefore, the Match-Maker fund managers are not subject to the same formal supervision process that is suggested for the Incubator Initiative, because the two initiatives have different goals, objectives and operations.

The Match-Maker fund should nevertheless be reviewed annually by the government agency (limited partner) in order to determine the progress of the fund and whether additional funding is required. Another option is to appoint an outside firm that will review the Match-Maker fund on an annual basis.⁸¹³ It should be noted that the funds require long-term strategic goals. In order to evaluate if the portfolio companies in the fund are meeting their expected rate of return, it is common to allow technology companies five years and biotechnology companies ten years. Moreover, usually only about 10 percent of the venture capital fund's investment meet their projected rate of return, but they are supposed to make up for the rest of the portfolio companies that weren't as successful.⁸¹⁴

⁸¹¹ See Reinert, *supra* note 787.

⁸¹² See *id.* For more information see NASA News Release, *supra* note 787; See also Kaufman, *supra* note 787.

⁸¹³ See example of current administration – the LLC that gives yearly reports on the SBAs cluster initiative

⁸¹⁴ See U.S. GEN. ACCOUNTING OFFICE, *supra* note 13 (citing a recent study by the National Association of Seed and Venture Funds, “only about 10 percent of venture capital investments meet their expected rate of return.”).

The Match-Maker initiative will also serve as a vehicle that will take to the government agency privately developed innovative projects that can serve the agency's needs. The Initiative establishes a channel for private firms to access government procurement and development, and for the government firm to be able to catch up with the market's technological advancements.

A major benefit of the Match-Maker fund to both parties is the introduction to continuous procurement opportunities between the government agency (that provides the funding) and the private technology companies that the fund will invest in. However, the fund should not be measured on whether the government agency was able to use the technology and improve its commercial needs. For that purpose, there should be another arm within the agency, which will be in charge of implementing these changes.⁸¹⁵

2. User-friendly Application Process

The Matchmaker initiative must have a user friendly and straightforward application process (based on the Yozma vs. Inbal example), without burdensome bureaucratic hurdles, reporting requirements and paperwork, which are frequently coupled with other governmental programs.

ii. Private Investors

The Match-Maker management is encouraged to bring on additional sources of funding, including from private investors, who will also act as limited partners. This initiative is built on the belief that other private investors will be willing to trust the

⁸¹⁵ This suggestion is given due to recent critics who maintain that part of In-Q-Tel's responsibilities (and metrics for success) is to improve the agency's technological advancement.

Match-Maker fund managers, and accordingly invest in the fund, because the managers will be subject to the oversight of the private market.

***F. Application of the Coalition Model in the Future – The Cornell
NYC Tech Campus Example***

There is a current effort to transform New York State into a technology region by using the approach of the Coalition model. On December 2011, former New York City Mayor Michael R. Bloomberg, Cornell University President David J. Skorton, and the Technion - Israel Institute of Technology (“Technion”) President Peretz Lavie announced a public-private-partnership to build a two-million-square-foot engineering and applied science campus on Roosevelt Island, in New York City.⁸¹⁶ On April 22, 2013, Dr. Irwin Mark Jacobs gave a gift to the parent institutions in order to create the Jacobs Technion-Cornell Institute, which will be located on the Cornell Tech Campus, and will offer a global perspective on entrepreneurship, technology transfer, and commercialization.⁸¹⁷

Former New York City Mayor Bloomberg wanted to increase the city’s aptitude for applied sciences and transform its economy by using the Jacobs Technion-Cornell Institute as a new model of cross-regional public-private partnership. The Technion, which is located in Israel’s “Silicon Wadi,”⁸¹⁸ is the ultimate partner for such

⁸¹⁶ See *Cornell wins NYC Tech Campus Bid*, CORNELL (Dec. 19, 2011), <http://www.news.cornell.edu/stories/Dec11/NYCrelease.html>.

⁸¹⁷ See *Jacobs Technion-Cornell Institute*, CORNELL, available at http://tech.cornell.edu/jacobs-technion-cornell-institute_ (“On April 22, 2013, Dr. Irwin Mark Jacobs, Founding Chairman and CEO Emeritus of Qualcomm, and his wife, Joan Klein Jacobs, announced a \$133 million gift to Cornell University and the Technion to create the Joan & Irwin Jacobs Technion-Cornell Institute.”).

⁸¹⁸ The Technion was established in 1912 and is a public research university, located in Haifa, Israel. The following information on the establishment of the Technion is from its website and is available at <http://www.technion.ac.il/en/> (“36 years before Israel declared independence, a ceremony took place on the

collaboration as it is one of the main drivers of technology, innovation, and new venture formations in Israel's high-technology industry.⁸¹⁹ Technion's graduates comprise the bulk of Israeli-educated engineers and scientists, comprising over 70% of Israel's managers and founders of high-technology industries.⁸²⁰

Additionally, on October 2, 2012, the U.S. Department of Commerce ("DoC") and the Patent and Trademark office announced on a partnership with Cornell NYC Tech.⁸²¹ According to Acting U.S. Commerce Secretary Rebecca Blank, "[F]or the first time, the resources of a U.S. government agency and a major research institution will join forces to give students and researchers at Cornell's New York City Tech Campus (Cornell NYC Tech) direct access to resources that will help them bring their ideas to market and grow their businesses."⁸²²

barren slopes of Mount Carmel near the port of Haifa, which was then occupied by the Ottoman Empire. The story of the "Technikum" – the original German name of the Technion - is a tale of the century. The second industrial revolution created the printing presses and communications infrastructure allowing Jews scattered across the globe to organize in face of rising anti-Semitism. As Jews were often barred from technical education, the establishment of a technical school was a first priority to rebuilding a Jewish homeland. The Technion was to become unique worldwide as a university that would precede, create, shape, and protect a modern state. The cornerstone laid on April 11, 1912, set in motion a century of progress responding to national and global needs. Technion would grow rapidly, becoming a global pioneer in fields such as biotechnology, stem cells, space, computer science, nanotechnology, and energy. Three Technion professors have won Nobel Prizes.").

⁸¹⁹ See *Israeli innovators build new 'Silicon Valley'*, CN PUBLICATIONS, June 30, 2011, reprinted from TerraNet Plus, Lebanon, available at <http://cnpublishings.net/2011/06/30/israel-leads-in-high-tech-2/>.

⁸²⁰ See Laurent Zecchini, *The Secret Of Israel's High-Tech Success*, WORLD CRUNCH, Aug. 31, 2011, <http://www.worldcrunch.com/secret-israel-s-high-tech-success/culture-society/the-secret-of-israel-s-high-tech-success/c3s3672/#.VDVYy6VRxuY>; See also Jacobs Technion-Cornell Institute, *supra* note 817.

⁸²¹ See *U.S. Commerce Department Announces Partnership with Cornell NYC Tech to Help American Entrepreneurs Innovate, Grow, and Create Jobs*, U.S. DEP'T OF COMMERCE (October 2, 2012), available at <http://www.commerce.gov/news/press-releases/2012/10/02/us-commerce-department-announces-partnership-cornell-nyc-tech-help-am> ("First-of-its-kind campus collaboration will provide USPTO and Commerce resources directly to students, faculty and industry, help accelerate commercialization of new technologies.").

⁸²² See *id.*

There are several unique and groundbreaking aspects about this partnership. The DoC will install its agent (from the Patent and Trademark office) at the campus, in order to speed the commercialization of ideas, and to serve as the innovation and outreach coordinator for the greater New York region. This representative will help Cornell Tech faculty and students, with applying for government grants and locating early stage investors.⁸²³ This is an important and comprehensive example of how a Coalition model can be implemented. Given sound management and ongoing cooperation, it can be predicted that all stakeholders will benefit from this collaboration.

What is thrilling about this partnership is that, according to Cornell President David Skorton, is that it “is a conduit for the U.S. government to be working directly with the innovation community. So that we have city government in the City of New York, the federal government, the private sector and academia all working together to figure what’s the right place for intellectual property in one of the areas of our economy that is growing like crazy right now.”⁸²⁴

One of the challenges that this model will have to overcome has to do with protecting the intellectual property of the technology that will result from these collaborations. Will it be open-source software, trade secrets or patents?

In summary, the Cornell Tech campus is an innovation model in that it involves the following stakeholders: the local government, New York State, the federal

⁸²³ See Caroline Shin, *Cornell NYC Tech and the Commerce Department partner to spur job creation*, CORNELL CHRONICAL, Oct. 4, 2012, <http://www.news.cornell.edu/stories/Oct12/NYCDOC.html> (“The DOC is also supporting programming initiatives for the public in areas related to multidisciplinary research, industry mentorship opportunities, commercialization strategies and educational outreach in STEM (science, technology, engineering, mathematics) fields.”).

⁸²⁴ *Id.*

government, U.S. Department of Commerce, local academia (higher education institution,) Cornell University, international academia, Technion - Israel Institute of Technology (“Technion”),⁸²⁵ the private sector, international and local entrepreneurs and industry.⁸²⁶

It should be noted that this partnership has drawn protests and opposition due to the collaboration with the Israeli Technion.⁸²⁷ Israel has its fair share of adversities and conflicts, official and unofficial, with its neighbors, neighboring nations and in recent years with the Boycott, Divestment and Sanctions (“BDS”) efforts by some anti-Israel organizations and governments throughout the world. One of these groups is the New Yorkers Against the Cornell-Technion Partnership (“NYACT”), which was formed in February 2012, in order to facilitate an academic boycott on Israel and in response to the BDS calls.⁸²⁸

⁸²⁵ The Technion – Israel Institute of Technology (Technion) was established in 1912 and is a public research university, located in “Silicon Wadi” (“Wadi” is an Arabic word for valley as well in colloquial Hebrew; The term is a pun rooted in Silicon Valley) and cited as one of the main factors responsible for the development of Israel's high-tech industry. As noted earlier in this paper, Israel has the highest concentration of high-technology startup firms outside of Silicon Valley. *See Israeli innovators build new ‘Silicon Valley’*, *supra* note 819 (The Technion graduates comprise the bulk of Israeli-educated engineers and scientists, comprising over 70% of the Israel’s managers and founders of high-technology industries.) *See Zecchini*, *supra* note 820; *See also* Jacobs Technion-Cornell Institute, *supra* note 817.

⁸²⁶ *See* Shin, *supra* note 823 (The consortium pairs two of the world's top institutions in the fields of technology, science, engineering and research. Both institutions have a remarkable record in applied science innovation and spinning out new businesses. The Mayor was also impressed by the financing capability of the consortium, the focus of the consortium on the partnership between academia and the private sector, and the by and large ability of the partnership to execute this project (the “Cornell NYC Tech”)).

⁸²⁷ Tyler Alicea, *New York City Coalition Decries Cornell-Technion Partnership*, CORNELL DAILY SUN March 1, 2013, <http://cornellsun.com/blog/2013/03/01/new-york-city-coalition-decries-cornelltechnion-partnership/>; *See also* Adam Hudson, *Cornell NYC Tech's Alarming Ties to the Israeli Occupation*, THE NATION, March 1, 2013, <http://www.thenation.com/article/173157/cornell-nyc-techs-alarming-ties-israeli-occupation#>.

⁸²⁸ *See also* Anna Calcutt, *Technion's role in U.S. militarization and domestic spying*, MONDOWEISS (Nov. 17, 2013), <http://mondoweiss.net/2013/11/partnership-technions-militarization>.

Most of the negative attention has been focused on Israel because of its ongoing need to protect its citizens and sovereignty from military threats at significant portions of borders and dealing with an enemy who refuses to accept the existence of the internationally created state in 1948.⁸²⁹ However, despite these challenges, Israel has been able to defy many adverse global economic trends, and to grow economically as a leader in the high-tech market.⁸³⁰

⁸²⁹ See Chaifetz, *supra* note 448, at 386.

⁸³⁰ *Id.*

V. OBJECTIONS TO THE “COALITION” MODEL & CORPORATE GOVERNANCE THEORY

The following are potential objections to the Coalition model, as well as suggestions to address these objections.

A. Objections To The Incubator Model And Subsequent Cluster Formation

There are three significant potential objections to the idea that government should encourage cluster formation. First, clusters can reduce competition, and thus innovation, by excessively focusing on cooperation.⁸³¹ Incubator managers must be very careful about balancing between cooperation and competition of the Incubator’s participants. If the delicate equilibrium is tilted towards excessive cooperation, that will reduce the competition among the participants and therefore, will manifest in less innovation.⁸³²

Second, Incubator managers must be vigilant in recognizing, following and even encouraging new market trends. According to economists Andersson, Serger, Sörvik, & Hansson, successful clusters sometimes experience a self-sufficiency syndrome, which following their success, they actually fail to identify new market trends and significant changes in technology.⁸³³

Third, there is a possibility that an Incubator will focus excessively on its geographical scope, and therefore, will not encourage cross-regional collaboration and

⁸³¹ See Andersson, Serger, Sörvik, & Hansson (2004), *supra* note 716.

⁸³² *Id.*

⁸³³ *Id.*

exchange of knowledge. The Incubator will essentially “lock-in” conventional practices and will not be able to adjust to the changing market.⁸³⁴

Answer

There are three steps that the Incubator management can take in order to try to overcome the challenges that are presented by Andersson, Serger, Sörvik, & Hansson. First, management should keep up with upcoming market trends, by continuously and actively aggregating relevant outside information. Hiring professional personnel based on their experience and reputation can also help.

Second, Incubator managers can also take advantage of the connections with the various stakeholder groups, such as the research community and government agencies, by organizing forums, training sessions and lecture series.

Third, as proposed in the model, the management should invest time and effort in stimulating cross-regional collaboration, whether it is in the national or international areas or both, as well as outside its industry scope.

B. Objections to the Government’s Intervention in the Market in the Form of Government Owned Enterprises

There are many who oppose the idea of an interventionalist government. Moreover, there are several arguments that criticize government owned enterprises, like

⁸³⁴ Andersson, Serger, Sörvik, & Hansson (2004), *supra* note 716 (“Excessive reliance on local contacts and tacit knowledge in combination with neglect of external linkages and lack of foresight may account for lock-in effects due to dominance of established practices.”).

the ones suggested in this paper (i.e., the Incubator and Matchmaker), due to their inefficiency and even wastefulness. The following are some of these arguments.

1. The problem of Inadequate Monitoring of Public Management

There are several theories that deal with the problem of inadequate monitoring of public managers, in this case, the managers of the Incubator or Matchmaking models. Agency theory deals with the shirking behavior of agents.⁸³⁵ The government as a stakeholder in the Coalition model must deal with the uncertainty surrounding the actual innovation development,⁸³⁶ on top of the potential opportunistic conducts of the managers.⁸³⁷

Managers of the Incubator and Matchmaker must deal with information risks - the “adverse selection” challenge⁸³⁸ - prior to any engagement with or investment in a startup or idea. The managers will be in charge of acquiring information about the potential portfolio companies, ideas, technology and processes. They will also be required to select the appropriate venture or idea based on the information provided and make sure that the venture is not investing in “lemons”.

Property rights theory also discusses the problem of inadequate monitoring of managers. In the Coalition model, the monitoring issue arises, as a result of the

⁸³⁵ See, e.g., Bengt Holmstrom, *Moral Hazard and Observability*, 10 Bell J. Econ. 74-91 (1979).

⁸³⁶ See discussion above on financing methods; See also Utset, *supra* note 23.

⁸³⁷ See also Gompers & Lerner (1999), *supra* note 20, at 127-31; See also Utset, *supra* note 23, at 55.

⁸³⁸ Akerlof, *supra* note 23 (firms’ offerings of equity may be associated with “lemons” problem). Akerlof discussed “adverse selection at 493. See also Utset, *supra* note 23, at 56; See also Gompers & Lerner (1999), *supra* note 20, at 129.

government ownership stake that is not traded in the market, therefore, excluding the transferability of the ownership.⁸³⁹

Finally, public managers have to deal with challenges of complying with formal decision-making procedures and bureaucracy that are associated with getting government funding or grants.⁸⁴⁰

Answer

First, according to Jensen and Meckling, agency problem is a common problem and exists in all enterprises and cooperation forms.⁸⁴¹ Therefore, it is not a unique characteristic of a public or quasi-public enterprise.

The analysis of the Agency theory assumes that the main problem is to align the interests of the principal and agent, and to get the agent to follow the principle's orders, without taking into account the agent's interests. Perhaps it would be wise to also take into account the agent and its interests, in order to make sure that the principle will keep its end of the bargain. The Coalition model addresses this concern, as discussed in this paper.⁸⁴²

⁸³⁹ See also Jensen & Meckling, *supra* note 22.

⁸⁴⁰ See Belloc, *supra* note 699.

⁸⁴¹ See Jensen & Meckling, *supra* note 22 (“[T]he problem of inducing an “agent” to behave as if he were maximizing the “principal’s” welfare is quite general. It exists in all organizations and in all cooperative efforts— at every level of management in firms, in universities, in mutual companies, in cooperatives, in governmental authorities and bureaus, in unions, and in relationships normally classified as agency relationships such as those common in the performing arts and the market for real estate. The development of theories to explain the form which agency costs take in each of these situations (where the contractual relations differ significantly), and how and why they are born will lead to a rich theory of organizations which is now lacking in economics and the social sciences generally.”)

⁸⁴² See discussion of Agency Theory in section V. C. below (An Aside on Corporate Law).

Second, it is possible that the fact that the shares of the Incubator or Matchmaker are not easily transferrable, can cause poor monitoring of the management because it provide ownership stability and hence not enough incentives for management to work hard and maximize profit.⁸⁴³ However, it is also possible that ownership instability can weaken and decrease managements' incentive to innovate.⁸⁴⁴

There is empirical evidence that suggests that active markets actually have a negative effect on innovative investment strategies, as follows. While a firm is not listed on the market, management is in reality more inclined to invest in innovating research because it has more tolerance towards failures,⁸⁴⁵ mainly because outside investors cannot observe (or closely) monitor the rate of project advancements.⁸⁴⁶ Managers may abstain from investing in risky innovation if they are under a constant threat of loosing their jobs and of a change in both ownership and management.⁸⁴⁷

As noted in this paper, the information asymmetry problems are even more complex in the Incubator and Matchmaker examples, as compared to other public

⁸⁴³ See Belloc, *supra* note 699.

⁸⁴⁴ See *id.*

⁸⁴⁵ See Daniel Ferreira, Gustavo Manso, Andre C Silva, *Incentives to Innovate and the Decision to Go Public or Private*, 27 (1) Rev. of Financial Studies 256 (2014) (“We show that it is optimal to go public when exploiting existing ideas and optimal to go private when exploring new ideas. This result derives from the fact that private firms are less transparent to outside investors than are public firms. In private firms, insiders can time the market by choosing an early exit strategy if they receive bad news. This option makes insiders more tolerant of failures and thus more inclined to invest in innovative projects. In contrast, the prices of publicly traded securities react quickly to good news, providing insiders with incentives to choose conventional projects and cash in early”); See also Belloc, *supra* note 702. According to Belloc, “In contrast, publicly traded securities imply disclosure of all the relevant information and quickly react to business successes and failures, so encouraging insiders to choose conventional projects.”).

⁸⁴⁶ See Ferreira, Manso & Silva, *supra* note 845; See also Belloc, *supra* note 699.

⁸⁴⁷ Andrei Shleifer & Lawrence Summers, *Breach of Trust in Hostile Takeovers*, in CORPORATE TAKEOVERS: CAUSES AND CONSEQUENCES 33-56 (A. Auerbach (ed), Univ. of Chicago Press 1998), available at <http://www.nber.org/chapters/c2052.pdf>.

enterprise initiatives, due to the fact that the managerial decision-making in high-technology requires more knowledge than the general managerial skills.⁸⁴⁸ The startup manager is required to apply, verify and understand the technical information necessary for the managerial decision-making process.⁸⁴⁹ That is one of the reasons why the Coalition model strongly suggests that the managers appointed will have the requisite professional private sector experience, know-how and involvement. It should be noted that professional venture capital funds also face and are able to overcome the same information asymmetry issues.⁸⁵⁰

Moreover, security markets are often inefficient.⁸⁵¹ In the event that public managers' performance is measured by the securities market, managers might increase their emphasis on short-term profits, which will, in turn, sacrifice long-term innovative investment strategies because they would like to avoid being replaced.⁸⁵²

⁸⁴⁸ See Jensen & Meckling, *supra* note 22 (Jensen & Meckling established that agency problems due to conflicts between investors and managers can have an effect on the interest of both equity and debt holders to supply capital and invest ["[i]t is generally impossible for the principal or the agent at zero cost to ensure that the agent will make optimal decisions from the principal's viewpoint. In most agency relationships the principal and the agent will incur positive monitoring and bonding costs (non-pecuniary as well as pecuniary), and in addition there will be some divergence between the agent's decisions and those decisions, which would maximize the welfare of the principal."]). For further discussion on agency problems and strategies to reduce them see also HENRY HANSMANN & REINIER KRAAKMAN, AGENCY PROBLEMS AND LEGAL STRATEGIES, IN THE ANATOMY OF CORPORATE LAW: A COMPARATIVE AND FUNCTIONAL APPROACH (Reinier H. Kraakman et al. eds., Oxford University Press 2d ed. 2009).

⁸⁴⁹ See also Utset, *supra* note 23, at 56; See also Gompers & Lerner (1999), *supra* note 20, at 127-31 (discussing the information asymmetry issue and other risks that venture capitalists face while dealing with start-ups).

⁸⁵⁰ According to a report by U.S. Gen. Accounting Office, *supra* note 13, only 10% of VCs manage to get a return on their investment.

⁸⁵¹ See Lynn Stout, *Are Stock Markets Costly Casinos? Disagreement, Market Failure and Securities Regulations*, 81 VA. L. REV. 611 (1995).

⁸⁵² J.C. Stein, *Takeover Threats and Managerial Myopia*, 96 J. POL. ECON. 61 (1988).

Third, government owned firms can (and are advised to) reduce the amount of bureaucratic decision- making processes. See the examples of In-Q-Tel and the Israeli case study above.

2. Lack of Market Discipline of Government-Owned Firms

There is a long debate in economic literature on the relationship between innovation production and market competition.⁸⁵³ The argument against implementation of the Coalition model is that there is no market discipline on government owned firms because of the “soft budget constraint problem.”⁸⁵⁴ As a result of the soft budget constraint problem, managers of the Coalition model will not be concerned with the portfolio firm’s financial conditions and will subsequently undertake reckless strategies.⁸⁵⁵

⁸⁵³ Phillippe Aghion et al., *Competition and Innovation: An Inverted-U Relationship*, 120 QUARTERLY J. ECON. 701 (2005); See also Belloc, *supra* note 699.

⁸⁵⁴ See J. Kornai, *Resource-Constrained Versus Demand-Constrained Systems*, 47 ECONOMETRICA 801 (1979) (The budget constraint of a firm is soft if the government helps the firm out of trouble - i.e. the government covers firm’s losses - through subsidies, tax exemption, credit granted at soft conditions, etc.); See also Belloc, *supra* note 699.

⁸⁵⁵ See Belloc, *supra* note 699 (citing Laffont and Tirole, 1993; Shleifer and Vishny, 1994; Shirely, 1995); See also Albert Shleifer & Robert W. Vishny, *Politicians and Firms*, 109 QUARTERLY J. ECON. 995 (1994) (analyzing political influence on firms); See also MARY SHIRELY, BUREAUCRATS IN BUSINESS: THE ECONOMICS AND POLITICS OF GOVERNMENT OWNERSHIP, WORLD BANK POLICY RESEARCH REPORT (Oxford University Press 1995) (“many governments did not reward managers who attained contract targets; where bonuses or other rewards were offered, soft targets frequently undermined their impact... politicians carefully weigh any change in state enterprise policies, preferring those that benefit their constituents and help them remain in power.”). This argument has been largely used to support privatization initiatives as a commitment device of the government to harden the budget constraint of firms (citing Schmidt, 1996a, 1996b); See Klaus M. Schmidt, *The Costs and Benefits of Privatization: An Incomplete Contracts Approach*, 12 J. L. ECON. & ORG. 1 (1996) (Schmidt argues that “different allocations of ownership rights lead to different allocations of inside information about the firm, which in turn affect both allocative and productive efficiency. Privatization is seen as a commitment device of the government to credibly threaten to cut back subsidies if costs are high in order to give managers better cost-saving incentives (a “harder budget constraint”). The cost of privatization is that allocative efficiency is distorted.”).

Answer

As for the issue of the unrestricted budget, a hard budget constraint can be imposed in practice.⁸⁵⁶ Furthermore, Belloc notes that in order to encourage innovation, there is a need to center on long-term investment and strategy, therefore “an excessive short-term attention to cash flows” might actually discourage innovation.⁸⁵⁷ Moreover, according to Aghion et al. (2009), the incentives of management to innovate might in reality increase if they are ‘insulated’ from penalties for failure of the portfolio innovative projects.⁸⁵⁸

3. Illegal Behavior & Corruption of Public Managers

Public managers’ actions can have serious effects on economic activity.⁸⁵⁹ There are many examples of public manager’s misbehavior, such as rent-seeking, corruption or other illegal activities, that can not only hamper the manager’s decision-making process, but may also reduce the incentives and opportunities to invest in innovation.⁸⁶⁰ It should

⁸⁵⁶ See Belloc, *supra* note 699 (“to the best of our knowledge, how a soft budget constraint influences specifically innovation activity has never been investigated.”); See also, Kornai (1979), *supra* note 854.

⁸⁵⁷ See Belloc, *supra* note 699 (citing the work of Kochnar and David, 1996; Zahra, 1996; Hoskisson et al., 2002; Yafeh and Yosha, 2003).

⁸⁵⁸ Phillipe Aghion, John Van Reenen & Luigi Zingales, *Innovation and Institutional Ownership*, 103 AM. ECON. REV. 277 (2013).

⁸⁵⁹ See Belloc, *supra* note 699.

⁸⁶⁰ There are many examples of causes to possible corruption of public managers, such as ones resulting from pressures of interest groups, lobbies or even individual persons influence. See Belloc, *supra* note 699 (citing Shleifer and Vishny, 1993; Mauro, 1995); See also, Albert Shleifer and Robert W. Vishny, *Corruption*, 108 QUARTERLY J. ECON. 599 (1993) (Shleifer & Vishny introduce “two propositions about corruption. First, the structure of government institutions and of the political process are very important determinants of the level of corruption. In particular, weak governments that do not control their agencies experience very high corruption levels. Second, the illegality of corruption and the need for secrecy make it much more distortionary and costly than its sister activity, taxation. These results may explain why, in some less developed countries, corruption is so high and so costly to development.”).

be noted that the illegal behavior might also result from various conflicts of interest of public managers.⁸⁶¹

Answer

It is true that managers in general, whether public or private, can behave illegally for various reasons. Additionally, public managers can also be involved in situations of conflict of interest, “but it is difficult to say a priori whether this happens to a greater (or lower) extent than for private managers,” according to Belloc.⁸⁶² Managers of private firms also have their fair share of conflicts of interest with other stakeholders, for example, due to their investment in securities or derivatives of other firms.⁸⁶³

In the Coalition model, the managers are dealing with industrial sectors and hence with business objectives that similar to those of private managers in the market. Therefore, their behavior can be analogous to their private manager counterparts.⁸⁶⁴

⁸⁶¹ See Belloc, *supra* note 699.

⁸⁶² *Id.*

⁸⁶³ Iman Anabtawi & Lynn A. Stout, *Fiduciary Duties for Activist Shareholders*, 60 STAN. L. REV. 1255 (2008) (“greater shareholder power should be coupled with greater shareholder responsibility... the rules of fiduciary duty traditionally applied to officers and directors and, more rarely, to controlling shareholders, should be applied to activist minority investors as well.”); See also Belloc, *supra* note 699 (There are many forms of self-dealing by corporate insiders in private corporations, including appropriation of corporate opportunities, excessive compensation, self-serving financial transactions and outright theft of corporate assets (citing for example Djankov et al., 2008)); See also Simeon Djankov, Rafael LaPorta, Florencio Lopez-de-Silanes, & Andrei Shleifer, *The Law and Economics of Self-Dealing*, 88 J. FIN. ECON. 430 (2008) (“those who control a corporation, whether they are managers, controlling shareholders, or both, can use their power to divert corporate wealth to themselves, without sharing it with the other investors. Various forms of such self-dealing include executive perquisites to excessive compensation, transfer pricing, taking of corporate opportunities, self-serving financial transactions such as directed equity issuance or personal loans to insiders, and outright theft of corporate assets.”).

⁸⁶⁴ See Belloc, *supra* note 699 (On the call for for public governance to gain knowledge of private governance see the new public management literature (citing Hood, 1991; Metcalfe, 1993; Box, 1999), whereas for criticism (citing Frey and Benz (2005)); See Christopher Hood, *A Public Management for All Seasons?* 69 PUB. ADMIN. 3 (1991) (discussing the group of ideas known as ‘new public management’ (NPM), as well as their criticism). NPM is a movement that encourages public administrations and non-

4. Political Capture of Business Objectives

The main argument for the privatization of government owned firms has been the political capture of business purposes and objectives.⁸⁶⁵ There are several examples of politicians who control government (particularly state) owned firms. Politicians, who would like to make their constituencies happy, are concerned with job creation. Therefore, they have a tendency to push for more recruitment than necessary in order to create jobs and spend more (in excess) than the private market would on an initiative.⁸⁶⁶ Moreover, politicians can also push for initiatives, projects and corporations that will essentially be tools to transfer wealth to their supporters, partners or relatives.⁸⁶⁷ These examples can seriously hamper the innovation process and diminish the productive

profit firms to implement pay-for-performance programs; *See also* Bruno S. Frey & Matthias Benz, *Can Private Learn from Public Governance?* 115 *ECON. J.* 377 (2005) (According to Frey & Benz, “in view of recent corporate scandals, private governance can learn from public governance: (1) Goal-oriented intrinsic motivation of agents should be supported by fixed incomes and an extensive selection process of employees; (2) Extrinsic, but non-monetary incentives (e.g. conferring orders and titles) can be used; (3) The power of actors should be restricted by a clear division of power, appropriate rules of succession and institutionalised competition for positions in firms.” Frey & Benz further critic the current private sector management compensation that “has often increased still more, even though share prices have plummeted. This suggests that, in actual fact, the compensation of managers has little to do with performance. Rather, the reason for the steady increase in compensation is now widely seen in the fact that managers are able to exert considerable control over how much money they get (Bebchuk and Fried, 2003). Some managers even resorted to unlawfully misrepresenting their firms’ accounts in order to raise their private incomes. A particularly troubling aspect is that, in many instances, extended pay-for-performance plans have created the very incentives to commit fraud, by making it attractive to produce short-term increases in share prices (Efendi et al., 2004; Erickson et al., 2003; Johnson et al., 2003)”).

⁸⁶⁵ *See* Andrei Shleifer, *State Versus Private Ownership*, 12 *J. ECON. PERSP.* 133 (1998) (arguing that the “importance of ownership as the source of capitalist incentives to innovate; and state firms are inefficient not just because their managers have weak incentives to reduce costs, but because inefficiency is the result of the government's deliberate policy to transfer resources to supporters.”).

⁸⁶⁶ *See* Belloc, *supra* note 699.

⁸⁶⁷ *See id.*

process.⁸⁶⁸ Moreover, governments can elect to pay higher wages to government workers (higher than are customary in the private market), which will surpass the productivity levels.⁸⁶⁹

Answer

It is true that one of the main concerns of the Coalition model is the fear of political abuse. As discussed in the proposed model, in terms of governance, autonomous Incubator and Matchmaker organizations must be formed, and the management must be independent in order to set goals, supervise, and most of all limit the dangers of political pressures and abuse.⁸⁷⁰

Additionally, according to Belloc, there are actions, such as increasing wages and employment or settling production plants in depressed areas, which government can take that do not lessen the social welfare, but to correct market failures or internalize negative externalities.⁸⁷¹ It should be noted, that it is not the intention of this paper.

Moreover, Belloc discusses the fact that the uncertainty of re-election gives politicians an incentive to behave.⁸⁷² There are several factors that can contribute to the citizens' ability to hold politicians accountable for abuse of power,⁸⁷³ such as free

⁸⁶⁸ See Shleifer (1998), *supra* note 865 (arguing that "Governments throughout the world have long directed benefits to their political supporters, whether in the form of jobs at above-market wages or outright transfers.").

⁸⁶⁹ Giacomo Corneo & Rafael Rob, *Working in public and private firms*, 87 J. PUB. ECON. 1135 (2003).

⁸⁷⁰ See also Lerner (2009), *supra* note 38.

⁸⁷¹ See Belloc, *supra* note 699 (citing the work of Atkinson, A.B. and Stiglitz, J.E. (1980)).

⁸⁷² See Belloc, *supra* note 699 (Belloc argues politicians react to incentives, such as economic and non-economic, and cultural, like any other individual does).

⁸⁷³ *Id.*

press,⁸⁷⁴ political framework,⁸⁷⁵ and participation rights.⁸⁷⁶ Therefore, a public manager can be prevented from misbehaving if appropriate incentive institutional and economic systems are designed and put in place.

C. An Essential Aside on Corporate Governance Theory

Due to the recent economic instability, which was caused by abuses of large corporations as well financial institutions, there has been renewed interest in the corporate governance practices of modern corporations. The public is showing an “increasing skepticism”⁸⁷⁷ in corporations and especially in the executives who manage them.⁸⁷⁸

Since the end of the twentieth century,⁸⁷⁹ legal scholars, such as Milton Friedman⁸⁸⁰ and Michael Jensen,⁸⁸¹ have been using shareholder primacy as a corporate

⁸⁷⁴ Aymo Brunetti & Beatrice Weder, *A free press is bad news for corruption*, 87 J. PUB. ECON. 1801-1824 (2003).

⁸⁷⁵ See Belloc, *supra* note 699 (citing Torsten Persson & Guido Tabellini, *Constitutions and Economic Policy*, 8 J. ECON. PERSP. 75-98 (2004)).

⁸⁷⁶ See Belloc, *supra* note 699 (citing Bruno Frey, *A Constitution for Knaves Crowds Out Civic Virtues*, 107 ECON. J. 1043-1053 (1997)).

⁸⁷⁷ See also Kent Greenfield, *supra* note 644.

⁸⁷⁸ *Id.*

⁸⁷⁹ See Stout (Time Machine), *supra* note 204 (“Toward the end of the twentieth century, however, American public companies began to change. The shift began in academia with the rise of the Chicago School of free market economists. Influential economic thinkers like Milton Friedman and Michael Jensen, apparently viewing the public corporation rather like a gigantic sole proprietorship, argued that the absence of shareholder power in public companies noted by Berle and Means was a problem to be solved rather than a deliberate legal strategy to achieve asset lock-in.”); See also, e.g., HENRY HANSMANN & REINIER KRAAKMAN, WHAT IS CORPORATE LAW? IN REINIER KRAAKMAN, PAUL DAVIES, HENRY HANSMANN, GERARD HERTIG, KLAUS HOPT, HIDEKI KANDA, AND EDWARD ROCK, THE ANATOMY OF CORPORATE LAW: A FUNCTIONAL AND COMPARATIVE ANALYSIS (Oxford University Press, 2004).

⁸⁸⁰ See Milton Friedman, *The Social Responsibility of Business is to Increase Its Profits*, NY TIMES MAG., September 13, 1970, available at <http://www.umich.edu/~thecore/doc/Friedman.pdf>; See also Stout (Shareholder Value Myth), *supra* note 19, at 18.

governance model,⁸⁸² which mandates the management of large public firms to maximize managerial opportunism, shareholder (“read Wall Street”) supremacy and short-termism.⁸⁸³ Therefore, management cannot realistically pursue long-term projects, such as research and development, because such projects cannot produce instant financial returns to the shareholders.⁸⁸⁴

Moreover, scholars⁸⁸⁵ who advocate for “shareholder primacy” focus solely on the shareholders as the “sole residual claimants” and “owners” of the corporations, ignoring all the other stakeholders.⁸⁸⁶ They suggest that investors focus on short-term results due to their emphasis on stock market liquidity.⁸⁸⁷ In the words of Lynn Stout,

⁸⁸¹ Michael C. Jensen & William H. Meckling, *Theory of the Firm: Managerial Behavior, Agency Cost and Ownership Structure*, 3 J. FIN. ECON. 305 (1976). See also Stout (Shareholder Value Myth), *supra* note 19, at 18.

⁸⁸² See also Hansmann & Kraakman, *supra* note 650, at 440-1.

⁸⁸³ See Kent Greenfield, *supra* note 644; See also Stout (Time Machine), *supra* note 204 (maximizing “shareholder value” is meant maximizing the increase of share price and dividends. “This assumption is tantamount to assuming that shareholders act like psychopaths who are indifferent to the consequences that their investing decisions impose on others.”); See also Hansmann & Kraakman, *supra* note 650.

⁸⁸⁴ See Stout (Time Machine), *supra* note 204.

⁸⁸⁵ See *id.* (“Toward the end of the twentieth century, however, American public companies began to change. The shift began in academia with the rise of the Chicago School of free market economists. Influential economic thinkers like Milton Friedman and Michael Jensen, apparently viewing the public corporation rather like a gigantic sole proprietorship, argued that the absence of shareholder power in public companies noted by Berle and Means was a problem to be solved rather than a deliberate legal strategy to achieve asset lock-in.”).

⁸⁸⁶ See *id.* (“Rather than owning corporations, shareholders own shares, which are a contract with the corporate entity. Similarly, the corporate entity is its own residual claimant. While the idea of shareholder “ownership” of the firm might be forgiven as a convenient and harmless metaphor when describing a company with a controlling shareholder, it is grossly misleading when applied to a board-controlled company.”).

⁸⁸⁷ See Stout (Shareholder Value Myth), *supra* note 19. (The short-term focus of investors and corporate boards is currently one of the key issues in the corporate governance debate.); See Mayer, *supra* note 207; See Millstein, *supra* note 207. . Therefore it is not surprising that recent empirical research already shows that even profitable technology companies these days increasingly prefer to stay private as long as possible in order to avoid the pressures of short-term strategies that result from public ownership. See, Rival Versions of Capitalism, *supra* note 212; See Lublin & Ante, *supra* note 213.

“shareholder value thinking had replaced managerialism as the dominant business philosophy.”⁸⁸⁸

Leading scholars from around the world are calling for a radical change in the theory and philosophy of current corporate governance theory.⁸⁸⁹ The corporate patterns and theories that we observe today are not merely products and consequences of the technology or development narratives, but lie in politics and economic philosophy as well.⁸⁹⁰ Therefore, one of the goals of this paper is to bring back the focus on managerialism and allow boards of directors to plan for a long-term strategy of growth that can benefit the society as a whole.

The following is an overview of three competing theories that attempt to explain why firms exist. The Coalition model works best when using the foundations and analysis of the Team Production approach.

1. Principal-Agent, Property Rights & Team Production

There are many competing economic theories that try to explain why firms exist.⁸⁹¹ The main three are the principal-agent approach,⁸⁹² property rights approach⁸⁹³ and team production approach.⁸⁹⁴

⁸⁸⁸ Stout also refers to the work of corporate scholar Edward Rock, who stated that “[m]anagers now largely think and act like shareholders. *See also* Rock, *supra* note 643, at 1988.

⁸⁸⁹ The initiative is led by Professors Lynn Stout & Margaret Blair; *See also*, Stout (Shareholder Value Myth), *supra* note 19; Kent Greenfield, *supra* note 644. *See also*, Kent Greenfield, *The Stakeholder Strategy*, Democracy: A Journal of Ideas (2012).

⁸⁹⁰ An examination of classic corporate governance theory will demonstrate that “the public corporation is as much a political adaptation as an economic or technological necessity.” *See* Roe, *supra* note 201, at 11.

⁸⁹¹ *See* Coase, *supra* note 62; *See* O’Kelley, *supra* note 62, at 1250 (“[C]oase ... saw the firm as having an “inside” and an “outside” and a distinct central actor – the entrepreneur. ... Coase looked inside the firm and identified the entrepreneur as the central economic actor; it was the entrepreneur who consciously allocated resources within the firm by command.”); *See* Blair & Stout (Team Production), *supra* note 46

The principal-agent and property rights approaches are highlighted extensively in current economics and law writings.⁸⁹⁵ However, according to scholars Blair and Stout, when these theories are applied to public firms, they are lacking and therefore there is a need to center on the team production approach.⁸⁹⁶

a. Principal-Agent

Agency problems are viewed today as the main issue that corporate law scholarship has to resolve.⁸⁹⁷ Contemporary scholars⁸⁹⁸ use agency law in order to

(According to Blair & Stout, “Coase answered that a key feature of production in a firm is a “hierarchical” structure under which an entrepreneur who needs to acquire materials and services retains the right to direct the exact details of what and how products or services are delivered. A firm, therefore, consists of the systems of relationships which come into existence “when the direction of resources ... becomes dependent on the buyer... Firms emerge, Coase speculated, when it would be too costly and complicated to write contracts that give the buyer of the product or services the necessary degree of control. Coase’s analysis focuses on why entrepreneurial firms exist.” According to Blair & Stout “Coase’s entrepreneur could solve her problem (the need to direct or control the product or service she is buying) using separate employment contracts between the entrepreneur and each employee... Hence, Coase’s theory of the “firm” does not tell us why “corporations” are needed.”).

⁸⁹² See Blair & Stout (Team Production), *supra* note 46, at 256 (this approach “explores contracting problems that arise whe one actor hires another to act on her behalf.”).

⁸⁹³ See *id.* (This path “examines problems associated with coordinating productive activities where it is too costly to write and enforce complete contracts, focusing especially on the role played by the property rights as a solution for closing contractual gaps.”).

⁸⁹⁴ See *id.* (This path “considers the role hierarchy may play in policing against shirking problems that may arise in coordinating team production.”).

⁸⁹⁵ *Id.* at 258.

⁸⁹⁶ *Id.*

⁸⁹⁷ See Stout (Time Machine), *supra* note 204 (“Indeed, a casual reader could be forgiven for concluding that the *only* problem posed by corporate entities is the challenge of eliminating the waste that results when corporate managers fail to run firms in an optimal fashion (usually assumed to be a profit-maximizing fashion).”); See also Rock, *supra* note 643, at 1909 (recounting the ways in which agency costs are viewed as “the central problem of U.S. corporate law.”).

⁸⁹⁸ The subsequent are examples of scholars that utilize the principal-agent model. In legal theory: FRANK H. EASTERBROOK & DANIEL R. FISCHER, *THE ECONOMIC STRUCTURE OF CORPORATE LAW* (1991); Lucian A. Bebchuck, *Federalism and the Corporation: The Desirable Limits on State Competition in Corporate Law*, 105 HARV. L. REV. 1435 (1992). In economics: Eugene F. Fama, *Agency Problems and the Theory of the Firm*, 88 J. POL. ECON. 288 (1980) (Fama states that “[T]he firm is viewed as a set of contracts among

explain the notion that the corporation is comprised of collections of assets that are jointly owned by the principals (shareholders), who hire the agents (directors and officers) to manage the corporation's assets on their behalf.⁸⁹⁹ They further contend that the shareholders are "powerless," because they don't have the same knowledge on the firm's operations as managers do. The managers, therefore, always have the potential for exercising abusive behavior such as cheating, mismanaging and stealing from the shareholders. According to legal scholar Easterbrook, "[e]ven when they do not, the potential of misconduct remains."⁹⁰⁰

The Agency's solution to such problems is to give shareholders powers over directors, such as to remove boards that do not perform according to shareholder expectations, or by way of strapping executive pay to shareholder profits.⁹⁰¹

There are four problems with Agency's solution. First, the Agency theory doesn't take into account that in many cases directors are actually motivated by a desire to serve

factors of production, with each factor motivated by its self-interest... In the classical theory, the agent who personifies the firm is the entrepreneur who is taken to be both manager and residual risk bearer. The main thesis of this paper is that separation of security ownership and control can be explained as an efficient form of economic organization within the "set of contracts" perspective.").

⁸⁹⁹ See Blair & Stout (Team Production), *supra* note 46; See Jensen & Meckling, *supra* note 22

⁹⁰⁰ See Easterbrook & Fischel, *supra* note 898 at 1.

⁹⁰¹ See, e.g., Lucian Bebchuk, *The Myth of the Shareholder Franchise*, 93 VA. L. REV. 675, 700 (2007) (arguing that shareholders should have added powers to remove boards of directors); see LUCIAN BEBCHUK & JESSE FRIED, *PAY WITHOUT PERFORMANCE: THE UNFULFILLED PROMISE OF EXECUTIVE COMPENSATION* (2004) (arguing that shareholder returns should be tied to executive pay); See Lucian A. Bebchuk, *The Case for Increasing Shareholder Power*, 118 HARV. L. REV. 833 (2005) (arguing that "as part of their power to amend governance arrangements, shareholders should be able to adopt provisions that give them additional power to intervene, down the road, in specific business decisions. Power to intervene in game-ending decisions (to merge, sell all assets, or dissolve) could address management's bias in favor of the company's continued existence. Power to intervene in scaling-down decisions (to make cash or in-kind distributions) could address management's tendency to retain excessive funds and engage in empire-building. Shareholders' ability to adopt, when necessary, provisions that give themselves additional power to intervene could thus produce benefits in many companies."); See Stout (Time Machine), *supra* note 204.

the corporation and the stakeholders to the best of their ability, in order to keep their reputation and position.⁹⁰² Second, as a result of the emphasis on the interests of “present-day shareholders,” managers and directors are having difficulty with pursuing long-term strategies.⁹⁰³

Third, sometimes the agent in a public corporation is the one that has trouble with getting the principle to keep her end of the deal.⁹⁰⁴ Fourth, there is fundamental ambiguity in public corporations with regards to which party has control over the other, and which party is the one who is contributing the productive inputs.⁹⁰⁵

b. Property Rights

The firm is defined as a “bundle of assets under common ownership,”⁹⁰⁶ which has a “contractual structure” with: “1) joint input production; 2) several input owners; 3) one party who is common to all the contracts of the joint inputs; 4) who has the right to

⁹⁰² See Stout (Time Machine), *supra* note 204 (“The primary motivation for directors to do their best to serve corporate entities may be some combination of the desire to keep the entity healthy so they can keep their board positions, the desire to maintain and build their own status and reputations as business leaders, and the altruistic desire to benefit the executives, employees, customers, and shareholders to whom they may feel a sense of obligation. History has proven that this imperfect set of incentives can be sufficient to allow board-controlled nonprofit and for-profit corporate entities to survive and thrive for decades and even centuries, and play major roles in the global economy.”); See also, Lynn A. Stout, *On the Proper Motives of Corporate Directors (Or, Why You Don’t Want Homo Economicus on Your Board)*, 28 DEL. J. CORP. L. 1, 6 (2003) (Stout is discussing the effects of the business judgment rule, because of the business judgment rule, directors can still shirk, by devoting inadequate time and attention to the corporate entity.).

⁹⁰³ See Stout (Shareholder Value Myth), *supra* note 19 at 7 (“influential economic and legal experts are proposing alternative theories of the legal structure and economic purpose of public corporations that show how a relentless focus on raising the share price of individual firms may be not only misguided, but harmful to investors.”).

⁹⁰⁴ See Blair & Stout (Team Production), *supra* note 46.

⁹⁰⁵ *Id.*

⁹⁰⁶ *Id.* at 258; See also Sanford J. Grossman & Oliver D. Hart, *The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration*, 94 J. Pol. Econ. 691-719 (1986); See also Oliver D. Hart, *Contractual Freedom in Corporate Law: Articles & Comments; An Economist’s Perspective on the Theory of the Firm*, 89 COLUM. L. REV. 1757 (1989).

renegotiate any input's contract independently of contracts with other input owners; 5) who holds the residual claim; and 6) who has the right to sell his central contractual residual status.”⁹⁰⁷

According to Blair and Stout, this theory does not distinguish between ownership and control of shareholders in a public corporation. In reality, the shareholders do not directly control the public corporation. Additionally, it is hard to view the shareholders of public corporations as owners of the firm (a bundle of assets), because of the intangible nature of the key assets of the public corporation, which are the intellectual property, human-capital and know-how. It is very hard to put a price on, evaluate and if need be sell these intangible assets to a third party, in order for the shareholders to retrieve any portion of their investment.⁹⁰⁸ Viewing the public corporation as a bundle of assets under common management is misleading, according to scholars Blair and Stout.⁹⁰⁹ Therefore, they propose a different approach called “team production.”

c. Team Production

“Team production” proposes to view the public corporation as a “nexus of firm-specific investments.”⁹¹⁰ According to the team production theory, the public corporation should be regarded as a “team of people who entered into a complex arrangement to work

⁹⁰⁷ Armen A. Alchian & Harold Demsetz, *Production Information Costs and Economic Organization*, 62 AM. ECON. REV. 777, 794 (1972).

⁹⁰⁸ *Id.*

⁹⁰⁹ See Blair & Stout (Team Production), *supra* note 46, at 277.

⁹¹⁰ *Id.*

together for mutual gain.”⁹¹¹ The public corporation, therefore, is viewed as a team of employees, shareholders, and other stakeholders, who contracted to partake in a process of dispute resolution and internal goal setting.⁹¹²

Directors of public corporations are trustees who take into account the interests of all the stakeholders and are regarded as “mediating hierarchs.”⁹¹³ Therefore, directors should not solely concentrate on maximizing shareholder returns and instead settle the competing claims of all stakeholders. They are “hired” to “control shirking and rent-seeking among team members.”⁹¹⁴

This theory leads to the next theory that was developed Lynn Stout, “the corporation as time machine.”⁹¹⁵

2. The Corporation as “Time Machine” & The Need for Long-Term Strategic Planning

The Coalition model encourages an emphasis on long-term strategic planning for the private, public, urban, regional, and even federal participants. In order to encourage corporate managers to focus on long-term strategies, this paper will build on Stout’s theory that suggests that one of the main purposes of the corporate entity is to “transport wealth between different time periods.”⁹¹⁶

⁹¹¹ *Id.*

⁹¹² *See id.* (According to Blair and Stout, they “entered into a “pactum subjectionis” under which they yield control over outputs and key inputs (time, intellectual skills, or financial capital) to the hierarchy.”).

⁹¹³ *See id.* at 277.

⁹¹⁴ *Id.*

⁹¹⁵ *See* Stout (Time Machine), *supra* note 204.

⁹¹⁶ *Id.*

According to Stout, the corporation form is a “savings/investment technology” because it allows individuals to collect resources and invest them in the corporation, thereby locking in these assets.⁹¹⁷ Stout coined the term “asset lock in” to mean, assets that are unavailable for current consumption because they have been transferred from a human person to the corporate entity, in order to be invested in projects that will generate wealth in later time periods.⁹¹⁸

This model protects corporate shareholders and stakeholders from the risk that the shareholders will try to withdraw assets from the team.⁹¹⁹ And more importantly it allows current as well as future generations to be able to enjoy the wealth that is and will be generated by the firm.⁹²⁰

However, as noted above, the latest emphasis on the “shareholder value” approach in the way in which public corporations should be governed has started to diminish the abilities of public companies to lock in their assets.⁹²¹ As a result, there is also damage to the capability of public corporations to transfer wealth between

⁹¹⁷ *Id.* It should be noted that it is very hard to lock in assets when there is a controlling shareholder.

⁹¹⁸ *See* Stout (Time Machine), *supra* note 204 (“This future wealth may be consumed by the human persons who originally committed resources to the corporate entity. But the future wealth generated by a corporation with perpetual life can also be consumed by a future generation of human beings.”).

⁹¹⁹ *Id.*

⁹²⁰ *Id.* (Stout gave examples of the ways in which the results of research and development by large public corporation have benefited current and future generations (“IBM and AT&T likely incurred very high levels of “wasteful” agency costs while operating their Big Blue and Bell Labs research divisions during the 1950s and 1960s. Nevertheless, those costs have been repaid many times over by the gains to multiple generations of shareholders (and others) from developing the computer and the transistor. Similarly, multiple future generations may benefit enormously from current corporate projects to develop self-driving cars, commercial space transport, and algal biofuels.”)).

⁹²¹ *Id.*

generations as well as time periods,⁹²² because without the lock in ability, the public corporations are extremely sensitive to the market's evaluation of their stock.⁹²³

There are a few dreadful scenarios that can result in the event that market underestimates the corporation's shares. First, shareholders who are not patient because they are interested in selling their stock quickly, will ask directors to pursue short-term strategic planning so that there will be an instant gain in share price, on the expense of future benefits.⁹²⁴ Second, managers and directors whose compensation packages are tied to shareholder returns and are also affected by market share price (which is common practice today) will request the directors to forsake long-term strategic planning that can lead to growth, and instead pursue short-term plans that can lead to stock price appreciation.⁹²⁵ Third and finally, in the event that the shareholders and executives are patient and would like the company to pursue long term strategic planning and hence growth, the fact that the company's stock is undervalued can attract short-term investors, such as hedge funds (who invest with the aim of achieving a positive return on their investment).⁹²⁶ The hedge funds can buy the undervalued stock on the market and then

⁹²² *Id.*

⁹²³ *Id.* at 24

⁹²⁴ *Id.* (According to Stout, shareholders who are planning to sell their shares soon will ask the board to abandon long-term plans. "For example, shareholders may ask boards to cut expenses for marketing, research, and employee development; take on debt to fund a large dividend or share repurchase program; or even sell off all or part of the company. Moreover, even if a company's existing shareholders are patient, an undervalued firm risks attracting unwanted attention from short term investors like hedge funds that can buy on the open market for the sole purpose of pressuring boards to pursue such measures."); *See also* William W. Bratton, *Hedge Funds and Governance Targets*, 95 GEO. L. J. 1375 (2007) (discussing the debate between advocates of aggressive monitoring by actors in the capital markets and advocates of management empowerment, which is triggered by activist head fund shareholders).

⁹²⁵ *See* Stout (Time Machine), *supra* note 204, at 25.

⁹²⁶ *Id.*

pressure the board to pursue short-term strategic planning, so that the stock price will rise again.⁹²⁷

Therefore, shareholder primacy, according to Stout, “may have a much larger economic cost if it destroys the public corporation’s ability to invest efficiently in the future.”⁹²⁸ One of its devastating results is the effect on the innovation and competitiveness of American public companies in the market.⁹²⁹ This is a dangerous and slippery slope. Instead of focusing on “empire building”⁹³⁰ and collecting resources, American companies today are focusing on dispensing cash to shareholder and “unlocking assets.”⁹³¹

As a result of these actions, there are less American public companies on the market, and the ones who are there are very fragile.⁹³² American companies are having a hard time to surviving, as evidenced by the fact that the average “life expectancy of big companies has been cut by more than 75 percent.”⁹³³ Moreover, American companies do

⁹²⁷ *Id.*

⁹²⁸ *Id.*

⁹²⁹ *Id.*

⁹³⁰ See Rock *supra* note 643, at 1915.

⁹³¹ See Stout (Time Machine), *supra* note 204, at 25-6. (“From 1993 on, American nonfinancial companies have routinely disgorged \$50 to \$200 billion more cash annually to shareholders through repurchase programs that they have raised through equity issuances. This conservative figure excludes corporate cash disgorged to shareholders through dividends.”)

⁹³² See *id.* (“Over the last fifteen years the population of U.S. listed firms has dropped by more than half, from nearly 9,000 firms in the late 1990s to only around 4000 today.”); See also Gerald F. Davis, *After the Corporation*, 4 POL. & SOC. 283, 291 (2013) (Fig. 2 U.S. listed Companies. Davis lays out the case for corporate collapse and suggests a more local and democratic path going forward.).

⁹³³ See Stout (Time Machine), *supra* note 204, at 26 (“In mid-twentieth century, the average Fortune 500 company could expect to remain on that list for 60 years or more. Today the average Fortune 500 firm stays in the 500 for only fifteen years.”); See also, Steven Denning, *Peggy Noonan on Steve Jobs and Why Big*

not invest in research and development as they used to. Today they retain less than 10% of their profits for research and development, compared with 60% during the 1950s.⁹³⁴

Turning to the Coalition model, the proposed models of Incubator and Match-Maker are intended to facilitate collaboration and cooperation between the various stakeholders, not just shareholders. Moreover, the model put emphasis on facilitating and encouraging investment in long-term development strategies,⁹³⁵ because the nonprofit corporation can also lock in assets and therefore pursue long-term projects.⁹³⁶ The objective of the model is to benefit today's shareholders and stakeholder as well as the future generation, by implementing the stakeholder approach to strategic management.

Companies Die, FORBES (Nov. 19, 2011), <http://www.forbes.com/sites/stevedenning/2011/11/19/peggy-noonan-on-steve-jobs-and-why-big-companies-die/>.

⁹³⁴ See Stout (Time Machine), *supra* note 204, at 26; See also, e.g., *The rise and fall of corporate R&D: Out of dusty labs*, THE ECONOMIST (March 1, 2007), <http://www.economist.com/node/8769863>; Bill Buxton, *The Price of Forgoing Basic Research*, BUSINESS WEEK (December 17, 2008), <http://www.businessweek.com/stories/2008-12-17/the-price-of-forgoing-basic-researchbusinessweek-business-news-stock-market-and-financial-advice>; David Ciepley, *Beyond Public And Private: Toward a Political Theory of the Corporation*, 107 AM. POL. SCI. REV. 139, 149 (2013).

⁹³⁵ See Kao, *supra* note 1.

⁹³⁶ See Stout (Time Machine), *supra* note 204.

3. Stakeholder Approach to Strategic Management

This paper advocates for the adoption of the stakeholder approach to strategic management, which came to light in the mid-1980's, with Edward Freeman's seminal work, *STRATEGIC MANAGEMENT- A STAKEHOLDER APPROACH* (1984).⁹³⁷ The stakeholder approach movement is intended to give managers a framework within which to deal with constant changes in the environment, society, technology and industry.⁹³⁸

In order to develop business strategies that will encourage long term success, managers need to take into account all stakeholders and not merely stockholders.⁹³⁹ This approach defines "stakeholders" as "any group or individual who is affected by or can affect the achievement of an organization's objectives."⁹⁴⁰ There is an ongoing debate

⁹³⁷ Edward Freeman, *STRATEGIC MANAGEMENT- A STAKEHOLDER APPROACH* (1984) (Freeman built his work on the writings of Ian Mitroff & Richard Mason, *CHALLENGING STRATEGIC ASSUMPTION*. (New York: Wiley, 1982). and James Emshoff, *MANAGERIAL BREAKTHROUGHS* (New York: AMACOM, 1978)). *See also* Freeman & McVea, *supra* note 725 ("The impetus behind stakeholder management was to try and build a framework that was responsive to the concerns of managers who were being buffeted by unprecedented levels of environmental turbulence and change. Traditional strategy frameworks were neither helping managers develop new strategic directions nor were they helping them understand how to create new opportunities in the midst of so much change. As Freeman observed "[O]ur current theories are inconsistent with both the quantity and kinds of change that are occurring in the business environment of the 1980's...A new conceptual framework is needed." *See* Freeman (1984), at 5 ("A stakeholder approach was a response to this challenge.").

⁹³⁸ *See also* Freeman & McVea, *supra* note 725 ("The purpose of stakeholder management was to devise methods to manage the myriad groups and relationships that resulted in a strategic fashion. While the stakeholder framework had roots in a number of academic fields, its heart lay in the clinical studies of management practitioners that were carried out over ten years through the Busch Center, the Wharton Applied Research Center, and the Managerial and Behavioral Science Center, all at The Wharton School, University of Pennsylvania by a host of researchers.").

⁹³⁹ The stakeholder approach theory has four main building blocks: corporate planning, systems theory, corporate social responsibility and organizational theory. *See* Freeman & McVea, *supra* note 725 .

⁹⁴⁰ *Id.*.

between scholars of the traditional view of fiduciary duty,⁹⁴¹ who claim that management is responsible for protecting the interests of the shareholders,⁹⁴² and scholars of the stakeholder approach, who claim that management is responsible for protecting the interest of all stakeholders.⁹⁴³

The stakeholder approach is a “strategic management process” and not merely a strategic planning process.⁹⁴⁴ The strategic management process allows management to actively design a new direction for the firm, which will take into account how the firm can have an effect on the environment in addition to how the environment possibly will affect the firm.⁹⁴⁵

This paper suggests that the management of the proposed Coalition models will put into practice the stakeholder approach in order to be able to center on long-term strategic planning, encourage research and development and invest in vehicles to benefit the current as well as future generations.

⁹⁴¹ See also Victor Brudney, *Contract and Fiduciary Duty in Corporate Law*, 38 B. C. L. REV. 595 (1997).

⁹⁴² *Id.*; See also OLIVER WILLIAMSON, *THE ECONOMIC INSTITUTIONS OF CAPITALISM* (Free Press. 1984) (“Williamson [1984] used a transaction cost framework to show that shareholders deserved special consideration over other stakeholders because of “asset specificity.” He argued that a shareholder’s stake was uniquely tied to the success of the firm and would have no residual value should the firm fail, unlike, for example, the labor of a worker.”).

⁹⁴³ Freeman & McVea, *supra* note 725 (“Freeman and Evan [1990] have argued, to the contrary, that Williamson’s approach to corporate governance can indeed be used to explain all stakeholders’ relationships. Many other stakeholders have stakes that are, to a degree, firm specific. Furthermore, shareholders have a more liquid market (the stock market) for exit than most other stakeholders. Thus, asset specificity alone does not grant a prime responsibility towards stockholders at the expense of all others.”); See also William M. Evan & Edward R. Freeman, *A stakeholder theory of the modern corporation: Kantian capitalism*, in Tom Beauchamp & Norman E. Bowie, *Ethical Theory and Business* 75 (5th ed. Prentice Hall, 1993)

⁹⁴⁴ Freeman & McVea, *supra* note 725 (“Strategic planning focuses on trying to predict the future environment and then independently developing plans for the firm to exploit its position.”).

⁹⁴⁵ *Id.*

VI. CONCLUSION

At a time when the American economy continues to try to ramp up and recover economically, the proposed Coalition Model is intended to pave the way for policymakers to consider and institute new initiatives that can encourage innovation, drive growth, create new entrepreneurial firms and increase the overall productivity, profitability and sustainability of American businesses.

It is based on the economic growth theory offered by Solow.⁹⁴⁶ Solow postulated that technological innovation is the only reliable engine that can drive change and is the fundamental source of sustained productivity and growth.

The Coalition Model builds on Solow's postulations by adding the following: first, the government needs to invest in knowledge, human capital and innovation, in order to encourage knowledge spillovers;⁹⁴⁷ second, there is a need to encourage the formation and survival of new entrepreneurial firms, because they are predominantly innovative and stimulate growth;⁹⁴⁸ and third, the United States Government has an important role in developing growth in the market.⁹⁴⁹ This paper calls the government to take part in the proposed public-private partnerships and to take into account strategic planning that can benefit society for future generations. To this end to form the coalition,

⁹⁴⁶ Solow (1987), *supra* note 5.

⁹⁴⁷ Audertsch (2003), *supra* note 9.

⁹⁴⁸ Lerner (Boulevard of Broken Dreams), *supra* note 38.

⁹⁴⁹ See Hockett & Omarova, *supra* note 33.

a traditional community of stakeholders is enlarged to include: the private sector (entrepreneurial and established firms); management; academia and research community; industry and economic development organizations; federal, state, regional and local governments; the financial sector including investment banks, angel groups and venture capital groups. These are in addition to the traditional stakeholder groups, which include: customers, employees, creditors, suppliers and shareholders.

Operationally, these concepts are configured through the Coalition model's Incubator (government investment in seed companies) and Match-Maker (government investment in start-ups) Initiatives. The Incubator is a public-private shared-use facility that will house and host budding entrepreneurs, set them up for entry to the marketplace, connect them with each other and stakeholders, as well as create forums and networks for cross-regional (national and international) cooperation. The Match-Maker is a private-public equity investment fund that will function to invest in early stage firms, while also addressing the commercial strategic development needs articulated by the funding governmental agency. It also establishes a channel for private firms to access government procurement and development. Both initiatives will function as autonomous bodies, and are designed to prevent political capture.

This Coalition Model, based on emerging variations in Israel, Silicon Valley and New York, is proving to be successful in addressing economic growth and sustainability in America.

This paper also joins the call for a return to a basic “managerialism” philosophy.⁹⁵⁰ Managers of public corporations nowadays cannot realistically pursue long-term projects, such as research and development, because such projects cannot generate immediate financial returns to their shareholders. Therefore, this model calls for management to take into account the interests of all stakeholders.

While this Model tries to address a number of solutions to grow the economy and encourage innovation, it has limitations. The one-model fits all format for the various regions, states and government agencies can run into problems given geopolitical realities at the local, state, federal and international levels which can confound these relations at any given level.

Also, legal scholars will be challenged in the future in terms of rewriting reinterpreting intellectual property laws, but that is not within the scope of this paper.

Using the Coalition Model and its variants should, as seen from encouraging preliminary results, develop into a new high bar standard for helping to expand strategic and sustained economic growth, innovation and development for generations to come.

⁹⁵⁰ See Lynn A. Stout, *On the Rise of Shareholder Primacy, Signs of Its Fall, and the Return of Managerialism (in the Closet)*, 36 SEATTLE U. L. REV. 1169 (2013).

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