ARTICLE

INNOVATION OR JOBS? AN INCONVENIENT TRUTH ABOUT PUBLIC FINANCING FOR "INNOVATION"

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Public finance—whether in the form of grants, subsidies, or tax credits—is increasingly being cast as the panacea to either a world of IP and all its foibles, or a world in which innovators have insufficient incentives to undertake risky research. The idea is that, rather than supporting innovation through the gifting of exclusive rights like patents, government can use taxpayer dollars to support research and development activities directly. This article casts doubt on the notion that public finance can ever provide a suitable alternative for incentivizing innovation. It makes this point by examining financial subsidies currently offered by U.S. state governments. Each year, state governments across the U.S. purport to award billions of dollars in public financing for "innovation." But it turns out these so-called innovation incentives typically have little to do with encouraging novelty or inventiveness. They are in reality designed to promote politically attractive goals: principally, the goal of job creation. This article identifies the phenomenon—essentially, jobs programs dressed up as innovation incentives—and reveals why it could be highly problematic for innovation policy. By diverting investment towards subject matter that is labor-intensive, these incentives may end up encouraging developments that are the opposite of "innovative," in the ordinary sense of the word. Those who support relying more heavily on public finance as an innovation policy tool need to confront

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the reality that, when taxpayer money is on the line, political goals may well trump the desire to reward truly innovative endeavors.

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"*For an advanced economy such as the United States, innovation is a wellspring of economic growth.*"

–The White House, 2015[2]

"*Voters want jobs, which are hard to deliver.*"

–The New York Times, 2018[3]

INTRODUCTION

In 2014, an Ohio company that designs software to improve employee training received a $750,000 loan from the state of Ohio.[4] The company, Xcelerate Media, which is still in business, markets customized software that helps clients reduce the costs of employee training to make their workers more productive.[5] The loan was awarded through the "Innovation Ohio Loan Fund."[6] As its name suggests, the Fund is ostensibly intended to provide assistance to innovative companies that are "developing next generation products and services[.]"[7] The Innovation Ohio Loan Fund is not unique. Nearly all U.S. states offer some form of direct financing for private sector companies that are engaged in "innovation," "research," or "technology development."[8] At the national level, certain federal research agencies, such

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[2] NAT'L ECON. COUNCIL & OFFICE OF SCI. & TECH. POLICY, A STRATEGY FOR AMERICAN INNOVATION 2 (2019), https://obamawhitehouse.archives.gov/sites/default/files/strategy_for_american_innovation_october_2015.pdf.

[3] Emily Badger, *Why Cities Can't Stop Poaching From One Another,* N.Y. TIMES (June 8, 2018), at B1 (discussing research that suggests cities use financial incentives to "pick up votes by offering giveaways").

[4] *See 2014 Loan Report Compliant List*, OFF. OF THE OHIO TREASURER, http://ohiotreasurer.gov/Documents/CMS/Loan-Report-2014-Compliant-List.pdf (last visited Apr. 3, 2020).

[5] *See What We Do*, XCELERATE MEDIA, https://www.xceleratemedia.com/whatwedo. (last visited Apr. 3, 2020).

[6] *See* OFFICE OF THE OHIO TREASURER, *supra* note 4.

[7] *See generally* OHIO DEP'T OF DEVELOPMENT, INNOVATION OHIO LOAN PROGRAM: PROGRAM GUIDELINES & APPLICATION PROCESS (2011), https://development.ohio.gov/files/otf/IOF%20Guidelines.pdf.

[8] *See generally* Camilla Hrdy, *Patent Nationally, Innovate Locally*, 31 BERKELEY TECH. L. J. 1301, 1324 (2017) ("[I]ntellectual property rights are not the only incentive government can use to spur investment in innovation. Governments also use innovation finance: public financing for innovation drawn from public revenues.") (citing SUZANNE SCOTCHMER, INNOVATION AND INCENTIVES 242-243 (2004) ("[A] single innovation may be funded in two ways: by the public

as the Department of Defense (DOD), offer similar money awards through the Small Business Innovation Research (SBIR) program.[9]

Collectively, these programs represent a form of public innovation finance: government financing for innovation[10] that is funded through taxation of the general populace.[11] Within the intellectual property (IP) field, public finance is increasingly being cast as a viable alternative to IP.[12] These scholars (whose ranks include the author) concede the importance of innovation for improving standards of living and economic growth, and see a need for government incentives to support high quality intellectual production.[13] However, they also posit that government has many non-IP incentives that it could use to replace or at least supplement IP in order to avoid IP's well-known costs, such as deadweight loss and restrictions on future endeavors.[14] Non-IP alternatives discussed to date, to name just a few, include prizes for solving known problems,[15] grants to pursue research in

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sector out of general revenue, and through proprietary prices under an intellectual property regime.").

[9] *See* Camilla Hrdy, *Commercialization Awards*, 2015 WIS. L. REV. 13, 52 (2015) ("At the federal level, large research agencies like the Department of Defense (DOD), the Department of Energy (DOE), and the Department of Health and Human Services (HHS), are required to offer Small Business Innovation Research (SBIR) awards for small businesses (under 500 employees) that are developing inventions with commercial potential that fall into the agencies' research areas and similar Small Technology Transfer Research (STTR) awards for small businesses that partner with research institutions.")

[10] The article's definition of "innovation" is not confined to a new and nonobvious invention suitable for the patent system. *C.f.* 35 U.S.C. §§ 102, 103. Rather, it allows for a much broader range of new ideas or practical applications of new ideas that might add value to a firm's activities or to the economy as a whole. *See* CHRISTINE GREENHALGH & MARK ROGERS, INNOVATION, INTELLECTUAL PROPERTY, AND ECONOMIC GROWTH 4 (2010).

[11] *See* Hrdy, *Patent Nationally, Innovate Locally*, *supra* note 8, at 1324-1328 (defining innovation finance, and comparing innovation finance to intellectual property in terms of efficiency and fairness).

[12] *See, e.g.,* Lisa Larrimore Ouellette, *Patentable Subject Matter and Nonpatent Innovation Incentives*, 5 U.C. IRVINE L. REV. 1116, 1145 (2015) ("The state provides financial transfers to innovators through a vast array of nonpatent incentives, and it could provide more.").

[13] The conventional view is that, absent incentives, firms will under-invest in innovation as a result of the difficulty of appropriating the full value of their new ideas. *See infra* notes 104-106.

[14] For a recent discussion of these critiques see, e.g., Ted Sichelman, *Patents, Prizes, and Property*, 30 HARV. J. L. & TECH. 279, 279-284 (2017).

[15] *See* Michael Abramowicz, *Perfecting Patent Prizes*, 56 VAND. L. REV. 115, 119 (2003) ("[T]]he newest generation of scholars to challenge the foundations of intellectual property law has not called for simple abolition of intellectual property rights, recognizing the importance of the innovation incentives that these rights provide. Instead, they have considered the alternatives of prize or reward systems, in which the government would provide some form of monetary compensation instead of patent or copyright protection."). *See generally, e.g.,* Steven Shavell & Tanguy van Ypersele, *Rewards Versus Intellectual Property Rights*, 44 J.L. & ECON. 525 (2001);

high-salience areas,[16] tax incentives for conducting research,[17] public venture capital,[18] funding for key utilities like broadband,[19] support from charitable foundations,[20] and even insurance for prescription drugs.[21] The idea is that, rather than supporting innovation through the gifting of exclusive rights like patents, the government can use taxpayer dollars to support these outputs and activities directly. Why grant private monopolies on knowledge when government can just pay for what is needed and let new ideas and information flow freely into the public domain?

However, this article throws an unfortunate wrench into the notion that public finance could provide a suitable alternative to exclusive rights like patents. By assessing innovation incentives programs offered by U.S. state governments, this article reveals that, despite their titles, many of these "innovation" incentives are designed to promote politically attractive goals

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Michael Burstein & Fiona Murray, *Innovation Prizes in Practice and Theory*, 29 HARV. J. L. & TECH. 401 (2016).

[16] *See* Amy Kapczynski, *The Cost of Price: Why and How to Get Beyond Intellectual Property Internalism*, 59 UCLA L. REV. 970, 972 (2012) ("The field is constructed around one particular institutional approach to sustaining the production of scientific and cultural goods: exclusive rights. Yet it is not at all obvious that IP is categorically superior to other institutional approaches. Other approaches not only are possible, but also, in many cases, already play an important role in our creative ecosystem. Consider a brief example from the scientific arena. In the United States, about one-third of all research and development (R&D), including more than 80 percent of basic R&D, is funded by government and nonprofit sectors. The results are often disseminated not under property rules, but under norms of open scientific exchange. This institutional approach, which we can call government contracting, is both ubiquitous and familiar. It is employed when government agencies make grants or contract for research, in the manner commonly done by the U.S. National Institutes of Health (NIH) or by the U.S. Department of Defense."); *see* W. Nicholson Price II, *Grants*, 34 BERKELEY TECH. L. J. 1, 3 (2019) ("Grants play a key role in innovation policy.").

[17] *See, e.g.*, Daniel J. Hemel & Lisa Larrimore Ouellette, *Beyond the Patents–Prizes Debate*, 92 TEX. L. REV. 303, 321-323 (2013) (discussing the two verticals of tax incentives for R&D and other innovation activities, the ability to expense research expenditures and tax credits for certain levels of research spending are highlighted).

[18] *See* Hrdy, *Commercialization Awards*, *supra* note 9, at 67-68.

[19] *See* Hrdy, *Patent Nationally, Innovate Locally*, *supra* note 8, at 1376 ("Dozens of cities across the country are setting up municipal broadband networks. Since broadband, lab space, and research parks all involve a physical location, it is not controversial to suggest local governments should at least partly finance them.") (citing Olivier Sylvain, *Broadband Localism*, 73 OHIO ST. L.J. 795 (2012)). *See also* Christopher Yoo, *U.S. vs. European Broadband Deployment: What Do the Data Say?*, U of Penn, Inst. for Law & Econ. Research Paper No. 14-35, 23-27 (June 3, 2014) (comparing U.S. coverage for broadband to other countries, and noting cases such as Sweden where government subsidies were used to support broadband deployment).

[20] *See generally* Peter Lee, *Social Innovation*, 92 WASH. U. L. REV. 1 (2014).

[21] *See generally* Rachel Sachs, *Prizing Insurance: Prescription Drug Insurance as Innovation Incentive*, 30 HARV. J. L. & TECH. 153 (2016).

that having nothing to do with novelty or inventiveness. Principally, the main goal of such innovation incentives appears to be job creation.[22]

For example, take the Innovation Ohio Loan Fund mentioned above. Upon closer inspection, the program's self-professed goal is to "finance projects that will . . . creat[e] high-value jobs, increased tax revenues and improve the economic welfare of the State."[23] Applicants' research projects are evaluated in part based on the "[n]umber of high-value jobs to be created as a result of the successful commercialization of a new product."[24] Any company receiving a loan must continue to demonstrate a "commitment to create or retain jobs to the State of Ohio[.]"[25]

Although many commentators have observed the political economy risks inherent in using public money to finance innovation, the risks have been both under-stated and understudied.[26] This article proves that at least some existing programs that purport to use public money to reward innovation, come with serious job creation requirements. It's actually quite simple. You can't get money unless you bring jobs to the jurisdiction (or credibly promise to do so).[27]

Mixing innovation policy and political economy comes with all kinds of risks. But if the goal is really "innovation"—as in the creation of something new or at least moderately new[28]—then the tendency to reward job creation is especially pernicious. There is no inherent reason to denigrate the notion

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[22] *See infra* Part I; *see also* Appendix.

[23] *See* OHIO DEP'T OF DEVELOPMENT, *supra* note 7, at 2.

[24] *Id.* at 6.

[25] *Id.* at 3.

[26] For prior observations of the issue, see, e.g., Kenneth W. Dam, *The Economic Underpinnings of Patent Law*, 23 J. LEGAL STUD. 247, 248-249 (1994) ("[T]here is reason indeed to believe that the patent law approach is preferable to a legislative approach that involved industry by industry subsidies or other market advantages, especially in view of the rent-seeking and pork barrel features of any legislative approach[.]"); Abramowicz, *supra* note 15, at 122 ("Political considerations might interfere, and the ideal formula or procedure might be altered to benefit a key legislator's constituency or district."); Hemel & Ouellette, *supra* note 17, at 327 ("Government-set rewards also raise the significant risks of politicization, rent-*seeking*, and mismanagement[.]"); Daniel Hemel & Lisa Larrimore Ouellette, *Innovation Policy Pluralism*, 128 YALE L. J. 544, 576 (2018) ("government-set rewards like grants and prizes may diverge from social value due to failures of the 'political market.'"); *see also* B. Zorina Khan, *Inventing Prizes: A Historical Perspective on Innovation Awards and Technology Policy*, 89.4 BUSINESS HISTORY REVIEW 631, 653-654 (2015) (reviewing empirical studies based on samples of prizes and exhibits at international fairs and concluding that "the awarding of prizes tended to be proportional to the number of exhibitors and did not necessarily serve as a proxy for inventive quality or quantity.").

[27] *See infra* Part I.C.

[28] It is admittedly difficult to provide an objective definition of innovation, but some component of novelty is key. *See infra* Part I.C.

of subsidizing employment for its own sake.[29] But the reality is that innovation can have a severely negative impact on employment for certain individuals; for certain sectors of the economy; or within certain regions. This phenomenon is often referred to as technological unemployment.[30] True, a lot of recent research pushes back on the simplistic idea that "innovation kills jobs."[31] The more nuanced story is that innovation creates new and better jobs in the long-run, even if it takes away certain jobs as they become "antiquated."[32]

But without coming out one way or the other on the age-old technological unemployment debate, we can surely agree that using public money to reward both innovation and jobs, at the same time, is problematic. On its face, it creates a contradiction in policy goals.[33] In the best case, rewarded companies are *both* innovators and job creators; but it is unlikely that the money will ever go to the best example of either. From an innovation policy perspective, the ironic result could be that government creates incentives to implement labor-generating technology, rather than to invest in generating new ideas. At the least, the public is simply being misled about what these incentives, and their tax dollars, are really designed to do.[34]

The observations in this Article are of importance for at least two different groups of people. First, state and local government law scholars, as well as state and local politicians themselves, have expressed concern for some time about the enormous amount of money states and cities spend each year

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[29] *See, e.g.,* OREN CASS, THE ONCE AND FUTURE WORKER: A VISION FOR THE RENEWAL OF WORK IN AMERICA 166-167 (2018) (proposing government subsidies for those who work); *see also* Cynthia Estlund, *What Should We Do After Work? Automation and Employment Law*, 128 YALE L.J. 254, 312-313 (2018) (discussing "wage subsidies" and other affirmative subsidies for low-wage work funded through general tax revenues); Camilla A. Hrdy, *Intellectual Property and the End of Work*, 71 FLA. L. REV. 303, 350-362 (2019) (discussing strategies to promote job creation in the face of automation). *C.f.* Lochner v. New York, 198 U.S. 45, 76 (1905) ("[T]he state . . . may not unduly interfere with the right of the citizen to enter into contracts that may be necessary and essential in the enjoyment of the inherent rights belonging to everyone, among which rights is the right . . . to live and work where he will, to earn his livelihood by any lawful calling, to pursue any livelihood or avocation.'").

[30] For a thorough review of the literature on "technological unemployment," see generally Hrdy, *Intellectual Property and the End of Work, supra* note 29, at 309.

[31] *See* Dennis Crouch, *Hrdy: A Response to 'Innovation Kills Jobs'*, PATENTLY-O (March 15, 2018), https://patentlyo.com/patent/2018/03/response-innovation-kills.html ("innovation, and thus intellectual property, both create and eliminate jobs. Historically, we have had more of the former than the latter.").

[32] *See, e.g.*, ROBERT ATKINSON & STEPHEN EZELL, INNOVATION ECONOMICS: THE RACE FOR GLOBAL ADVANTAGE 280-281 (2012) (arguing that in fact "[i]f economies want to create jobs, innovation—including innovation that drives efficiency and productivity—is a key way to do so.").

[33] *See infra* Part III.

[34] *See infra* Part III.

on business subsidies.[35] They should be interested to see the disparity between how these programs are framed, and what they actually do. Second, as mentioned above, within the IP field, many scholars have been exploring alternative mechanisms for promoting innovation besides exclusive rights like patents.[36] They—we—must come face-to-face with what these programs seek to accomplish in the real world. Both groups should begin to think about the broader innovation policy impacts of programs that divert money to job creation.

The article proceeds as follows. Part I shows that U.S. state programs ostensibly designed to support "innovation" in fact lack a coherent notion of what innovation is and are at least partially directed towards the goal of job creation. Part II explores hypotheses for this conflation of innovation and job creation incentives by drawing on public choice theory. It begins from the perspective of federalism, probing whether states, as governments of small jurisdiction, might have special reasons to reward job creation as part of their innovation policies. But it argues the phenomenon is more pervasive, extending to national programs as well. A more broadly applicable hypothesis, instead, is that the design of these programs is the result of rent-seeking by interest groups, and responsive pandering by politicians. This can theoretically occur at any level of government.[37] Part III explores the impact of this situation. While the article recognizes the possibility that these incentives are in the public interest, and merely "kill two birds with one

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[35] For example, in her book reflecting on her experience as governor of Michigan, Jennifer Granholm described her attempts to keep jobs in the state and attract new businesses into Michigan using a combination of tax incentives, breaks, credits and regulatory waivers, but ultimately concluded that this strategy resulted in a "state-versus-state competition" for jobs that did nothing to help Michigan outcompete Mexico, China, and Korea. *See* JENNIFER M. GRANHOLM AND DAN MULHERN, A GOVERNOR'S STORY, THE FIGHT FOR JOBS AND AMERICA'S ECONOMIC FUTURE 74 (2011). *See also, e.g.*, Peter D. Enrich, *Saving the States from Themselves: Commerce Clause Restraints on State Tax Incentives for Business*, 110 HARV. L. REV. 377, 380-381 (1996) (arguing that the accelerating use of state tax incentives to attract and retain businesses is costly and unproductive and that the Supreme Court should interpret the Commerce Clause as restraining state tax incentives that seek to promote in-state business at the expense of other states); NATHAN M. JENSEN & EDMUND J. MALESKY, INCENTIVES TO PANDER: HOW POLITICIANS USE CORPORATE WELFARE FOR POLITICAL GAIN 58-82 (2018) (arguing that state business incentives are best understood as attempts by politicians to achieve electoral success at little political cost, and that politicians tend to provide too many and too generous incentives); Max Schanzenbach & Nadav Shoked, *Reclaiming Fiduciary Law for the City*, 70 STAN. L. REV. 565 (2018) (arguing cities should be subject to fiduciary duties when selling public assets and pursuing privatization, more generally.).

[36] *See, e.g.*, Hrdy, *Commercialization Awards*, *supra* note 9, at 17 (assessing commercialization awards as an alternative way for government to encourage commercial risk taking in technology development).

[37] *See generally*, MAXWELL L. STEARNS ET AL., LAW AND ECONOMICS: PRIVATE AND PUBLIC 655-684 (2018).

stone," the more likely possibility is that they are detrimental to innovation policy. By diverting investment towards subject matter that is in fact labor-intensive, these incentives may end up encouraging developments that are the opposite of "innovative," in the ordinary sense of the word. Part IV turns the tables a bit, and questions whether there is really something structural about the mechanism of public financing, versus exclusive rights, that makes such incentives more vulnerable to the tendency to pursue near-term political goals. Perhaps IP is not quite as immune to these pressures as we sometimes think.[38] The article concludes with general observations and suggestions for further research.

I. INCENTIVES FOR "INNOVATION" THAT ARE REALLY INCENTIVES FOR JOB CREATION

This paper analyzes an important segment of innovation finance programs: state financing for private businesses that is ostensibly intended to promote "innovation." It shows many of these programs are in fact geared towards job creation rather than production of scientific knowledge or new information.

A. *Programs Assessed*

The thirty-five programs assessed in the article consists of state money financing in the form of grants, loans, or equity directed towards "innovation," "technology" or "technology development," or "research." The programs are usually directed at private companies, but may also be available for individuals and/or institutions, depending on the program.

The award amounts provided by each program vary significantly. For instance, the InnovateMass fund, operated by the Massachusetts Clean Energy Center ("MassCEC"), offers awards in the amount of $250,000.[39] Meanwhile, the Innovation, Development, and Entrepreneurship

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[38] *See infra* Part IV.

[39] InnovateMass provides "grant funding of up to $250,000 per project and technical support for projects that are developing new clean energy technologies or innovative combinations of existing technologies that demonstrate a strong potential for commercialization while providing significant measurable clean energy, clean water and/or climate benefits." *Request for Proposals: InnovateMass*, MASS. CLEAN ENERGY CTR. (April 17, 2018), http://files.masscec.com/2%20-%20InnovateMass%20VI-b%20RFP.PDF

Advancement ("IDEA") Funds, operated by the Missouri Department of Economic Development, offer awards of up to $3 million.[40]

There are also significant differences in how states select funding recipients and in their review criteria. Some states solicit only within specific fields, industries, or clusters. Others permit any type of inventions to qualify. For example, the Innovation Ohio Loan Fund (IOF Loan) provides loans from $500,000 to $1,500,000 to existing Ohio companies "within certain Targeted Industry Sectors": "Advanced Materials, Instruments, Controls and Electronics Power and Propulsion, Biosciences, Information Technology."[41] Meanwhile, Florida's Innovation Incentive Program makes "long-term investments in industry clusters that are critical to Florida's future of economic diversification."[42]

Importantly, the article does not assess all possible forms of U.S. state incentives that provide financing for innovation. There are a multitude of state incentives that might be available for companies investing in innovative technologies. Programs *not* assessed include: subsidies targeting job creation, but that *do not* purpose to support innovation[43]; research tax incentives rather

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[40] The IDEA Fund contains four different programs, each designed for different stages in a company's progress. Funding increases with each stage. TechLaunch provides pre-seed funding. Individual awards, which come in the form of equity or convertible debt, will not exceed $100,000. The Seed Capital Co-Investment Fund and the Venture Capital Co-Investment Fund provide up to $500,000 and $2,500,000, respectively, in the form of equity or convertible debt. Lastly, the High-Tech Industrial Expansion Fund provides *up to $3,000,000*, typically in the form of a secured low-interest loan. *Missouri Idea Funds*, MISS. TECH. CORP., available at https://www.missouritechnology.com/docs/idea-funds/idea-one-pager.pdf?sfvrsn=2

[41] *Innovation Ohio Loan Program: Program Guidelines & Application Process*, OH. DEP'T OF DEV., https://development.ohio.gov/files/otf/IOF%20Guidelines.pdf (Last updated Feb 9, 2011).

[42] *Strategic Business Development*, THE FLORIDA LEGISLATURE: GOVERNMENT PROGRAM SUMMARIES, available at http://www.oppaga.state.fl.us/government/print.aspx?prog=6112 (last updated June 9, 2019).

[43] For example, the Idaho Opportunity Fund is a discretionary grant program with the goal of serving as a "deal closing fund" to "strengthen Idaho's competitive ability to support expansion of existing Idaho businesses and recruit new companies to the state, ultimately creating new jobs and economic growth in Idaho." However, the fund does not claim to have innovation or technology as criteria for receiving funding. Eligible projects include, for instance, construction of new sewer systems, renovations to infrastructure, or environmental hazard mitigation. *Business Incentives Manual 2018*, IDAHO DEP'T OF COMMERCE (2018), https://commerce.idaho.gov/content/uploads/2017/09/Business-Incentive-Manual-2018.pdf.

than direct money financing[44]; and incentives that use other structures besides direct government-to-company financing, such as "funds of funds."[45]

B. *Methodology in Selecting Programs*

In order to identify state innovation programs to assess, I initially consulted a proprietary dataset operated by the Council for Community and Economic Research (C2ER), a nonprofit organization focused on "excellence in research for community and economic development."[46] I then independently visited program websites. I also independently searched the internet for state sponsored websites discussing programs.

I selected only those programs that referenced "innovation" or a derivative of "innovation", "technology", or "research", in that order. I looked first at titles of the programs, but also included programs that referenced one or more of these key words in the criteria for financing.

For states with multiple qualifying programs, I included only one representative program for purposes of efficiency and space. I chose the program utilizing the word "innovation" or some derivative first.

I ended up with thirty-five programs from different states. Some programs I identified were discontinued or altered while my research was still in progress. I note when this occurred and, in some cases, cite to archived websites. It is likely that this obsolescence will continue to occur, so some of the programs assessed herein may no longer exist by the time of readership.

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[44] *See* MICHAEL D. RASHKIN, RESEARCH AND DEVELOPMENT TAX INCENTIVES: FEDERAL, STATE, AND FOREIGN 275-532 (2007); *see also, e.g.*, LEGIS. ANALYST'S OFFICE., AN OVERVIEW OF CALIFORNIA'S RESEARCH AND DEVELOPMENT TAX CREDIT (2003) (concluding that "state-level subsidization of R&D activities is difficult to justify because spillover effects cannot be confined to within a state."); Geosyntec Consultants, Inc. v. United States, 776 F.3d 1330, 1334 (11th Cir. 2015) ("The [federal] research tax credit was enacted … to incentivize American industry to invest in research.").

[45] Some states, many in conjunction with the federal SBIC program, provide funding for third party investment funds that fund innovative companies. For example, the Florida Fund of Funds program invests in private venture capital funds that target qualifying investment opportunities within Florida, with a specific focus on investments that contribute to Florida's economic development and that "[f]oster the creation, retention, and growth of companies and jobs in Florida[.]" *About Fund of Funds*, FLORIDA OPPORTUNITY FUND, http://www.floridaopportunityfund.com/About.asp. The effect of a fund of funds is arguably similar to direct state-to-company financing with a private sector matching requirement. However, a fund of fund does not entail a state entity directly selecting which companies to finance. So I exclude these.

[46] *By-Laws*, THE COUNCIL FOR COMMUNITY AND ECONOMIC RESEARCH, https://www.c2er.org/about/C2ER_Bylaws_-_06-09-2006.pdf (last updated June 9, 2006).

C. *Key Findings*

The table in the Appendix provides a list of all state programs considered, and summarizes key information about them: state, program name, provider, stated policy objective, and job creation requirements, if any. This section discusses the key findings.

1. A Baseline Definition of True "Innovation"

As a threshold matter, in order to decide how well the state programs I'm about to describe promote "innovation," we need to define the term. Innovation is accepted as an important public policy goal for many reasons, not least because innovation improves standards of living and reduces costs, leading to consumer surplus (savings), and has been shown to be correlated with economic prosperity across nations and over time.[47] But "innovation" can be conceptualized in a variety of different ways. Indeed, as two IP scholars recently observe, "innovation" lacks a uniform definition, even within the field of intellectual property law, and could reasonably mean many things, ranging from advancement of scientific and technological knowledge (patent law's traditional conception), to economic growth, to improved social welfare more broadly.[48]

IP scholars, legislators, and economists tend to zoom in on patent law, because patent law has comparatively clear minimum standards for what

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[47] *See, e.g.*, JOSH LERNER, THE ARCHITECTURE OF INNOVATION: THE ECONOMICS OF CREATIVE ORGANIZATIONS 16 (2012); INTELLECTUAL PROPERTY AND THE U.S. ECONOMY: 2016 UPDATE, UPDATING INTELLECTUAL PROPERTY AND THE U.S. ECONOMY: INDUSTRIES IN FOCUS 1 (2012) ("Innovation, the process through which new ideas are generated and put into commercial practice, is a key force behind U.S. economic growth and national competitiveness.").

[48] *See* Camilla A. Hrdy, *Challenging What We Think We Know About "Market Failures" And "Innovation"*, WRITTEN DESCRIPTION (March 17 2020), https://writtendescription.blogspot.com/2020/03/challenging-what-we-think-we-know-about.html (discussing Brett Frischmann & Mark McKenna, *Comparative Analysis of Innovation Failures and Institutions in Context*, 57 HOUSTON L. REV. 313, 321-322 (2019).)

counts as "innovation."[49] Patent law's novelty[50] and nonobviousness[51] principles, in particular, insist that to count as an innovation, a product or a process has to be new or at least relatively new within the jurisdiction.[52] While by no means the only way, or even the best way, to measure innovation, patents are often used as a proxy for the amount and value of innovation, in a variety of fields.[53] Patents usually reward technological experimentation, like that done in a laboratory and related to science and engineering. But patents can (and in some instances do) reward market experimentations, such as introduction of a product that has never been tested in the market—so long as some degree of novelty and nonobviousness are involved.[54]

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[49] *C.f.* 35 U.S.C. §§ 101, 102, 103 (2011).

[50] Section 102 requires inventions to meet the Act's "novelty" standard. 35 U.S.C. § 102 (2011) ("A person shall be entitled to a patent unless", among other things, "the claimed invention was patented, described in a printed publication, or in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention . . ."). *See generally* Sean B. Seymore, *Rethinking Novelty in Patent Law*, 60 DUKE L.J. 919 (2011); *see also* Dan L. Burk & Mark A. Lemley, *Inherency*, 47 WM. & MARY L. REV. 371, 374 (2005) ("[T]he inherency cases are all ultimately about whether the public already gets the benefit of the claimed element or invention. If the public already benefits from the invention, even if they don't know why, the invention is inherent in the prior art.").

[51] In modern U.S. patent law, an invention has to be more than novel. It also must be not "obvious" to a person having ordinary skill in the art. 35 U.S.C. § 103 (2011); *see also* Graham v. John Deere Co. of Kansas City, 383 U.S. 1 (1966). The general idea is that patents shouldn't be available for something that is relatively easy, cheap, or very low risk, and that would be generated anyway without an extra incentive. Robert P. Merges, *Uncertainty and the Standard of Patentability*, 7 HIGH TECH. L.J. 1, 2–3 (1992) (suggesting patents' incentive value should be judged on whether the existence of a patent system causes the marginal inventor to undertake R&D whose technical and commercial success is highly "uncertain" at the outset); Michael Abramowicz & John F. Duffy, *The Inducement Standard of Patentability*, 120 YALE L.J. 1590, 1593-94 (2010) (interpreting nonobviousness as assessing whether an incentive is needed to induce the activity).

[52] Patent law does not necessarily need to require novelty on a universal level. Camilla A. Hrdy, *State Patent Laws in the Age of Laissez Faire*, 28 BERKELEY TECH. L.J. 45, 56 (2013) (discussing early policymakers' interest in patents for imported inventions); Edward Walterscheid, *Patents and Manufacturing in the Early Republic*, 80 J. PAT. & TRADEMARK OFF. SOC'Y 855, 860–78 (1998) (explaining complex origin of U.S. patent law's requirement of novelty). Only in 2011 did the U.S. Patent Act fully eliminate its own domestic bias. Prior to 2011, inventions that were known or used in a foreign country were not necessarily preempted by that prior art from qualifying for a U.S. patent. *See* Margo A. Bagley, *Patently Unconstitutional: The Geographical Limitation on Prior Art in a Small World*, 87 MINN. L. REV. 679 (2003).

[53] *See, e.g.*, Peter Lee, *Social Innovation*, 92 WASH. U. L. REV. 1, 6 (2014) (noting "[p]atent law's pervasive focus on discrete inventorship, novelty, and traditional categories of technology neglects other significant expressions of human ingenuity.").

[54] *See* Michael Abramowicz & John Duffy, *Intellectual Property for Market Experimentation*, 83 N.Y.U. L. REV. 337, 339 n. 4 (2008) (urging broader notion of innovation that would include "market experimentation," such as the commercial test of a new product, as distinguished from

Economists, meanwhile, although they might well use patents to proxy for innovation,[55] actually conceptualize innovation differently—as new ideas, or the practical applications of new ideas, *that add economic value to a firm's activities in the form of higher profits.*[56] This could mean introduction of a patentable *or unpatentable* process that leads to greater productivity (lower cost per output), or the introduction of patentable *or unpatentable* new products that consumers are willing to buy (e.g. a cancer-fighting drug or an improved toy water gun).[57]

That said, even under this definition, with its focus on productivity and economic growth, some component of novelty would be required. This could mean novelty at the level of scientific advancement. But it could also mean novelty at the level of the relevant product market, region, or potentially even just within a single firm. Otherwise there would be little value added.[58]

2. Divergent Standards for What Counts as "Innovation"

The innovation finance programs considered in this article do not typically utilize a strict standard for what counts as "innovation." Needless to say, none of them uses precisely the same standard as patent law. Although several programs view ownership of patents or other intellectual property as

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merely "technological experimentation, which could occur in a laboratory and which would test feasibility as a matter of science and engineering.").

[55] *See generally,* Petra Moser, *Innovation Without Patents: Evidence from World's Fairs*, 55 J.L. & ECON. 43, 44 (2012) ("[E]mpirical analyses typically use counts of patents per year as a measure of innovation."); *see also* David S. Abrams, Ufuk Akcigit, & Jillian Popadak, *Patent Value and Citations: Creative Destruction or Strategic Disruption?* (Nat'l Bureau of Econ. Research, Working Paper No. 19647, 2013) ("Over the last several decades, a number of pioneering efforts were made to overcome the challenges inherent in measuring the value of innovation. Given that patent records contain a wealth of information on each patented invention as well as citations to previous patents, patent counts and citation-weighted patent counts have become popular proxies for the value of innovation.").

[56] GREENHALGH & ROGERS, *supra,* at 10.

[57] *Id.*

[58] *See, e.g.*, Stuart Graham, Cheryl Grim, Alan Marco & Javier Miranda, *Business Dynamics of Innovating Firms: Linking U.S. Patents with Administrative Data on Workers and Firms*, 27 J. OF ECON. & MANAGEMENT STRATEGY 372, 374 (2018) ("Innovative firms are believed to play an important role . . . introducing *new* products or services that satisfy a previously *unmet* need or processes that provide existing goods and services in *new* and more efficient ways.") (emphasis added); INTELLECTUAL PROPERTY AND THE U.S. ECONOMY: INDUSTRIES IN FOCUS 1, U.S. PATENT AND TRADE OFFICE (2012) ("Innovation, the process through which *new* ideas are generated and put into commercial practice, is a key force behind U.S. economic growth and national competitiveness.") (emphasis added).

signals of the technical or commercial merit of the applicant's project,[59] the defining characteristic of an innovation is *not* the novelty or inventiveness of the subject matter as compared to what is already known publicly or known within an industry.[60] There is virtually no assessment of questions like "is an incentive actually needed to induce this activity," as might occur in patent law's" obviousness" component.[61]

A quick look at Arkansas' innovation finance program illustrates the problem. The Arkansas Science & Technology Authority's "Technology Development Program" supplies cash awards of up to $100,000 to "qualified applicants" for "technology development projects."[62] The Authority defines "technology development" as "the evolution of innovative products and processes."[63] The Authority then explains how this process occurs, categorizing several stages of development, from the "laboratory/workshop stage . . . usually before a working prototype i[s] developed," to the "late startup/scaleup stage . . . during which limited production an[d] market testing of products are paramount."[64]

Allusions to "laboratory," "prototype," and "market testing" impart the notion that there will be significant uncertainty as to success, necessitating testing. Yet the observer is left unclear as to precisely what it means for a product or service to be "innovative" enough to obtain funding from the state of Arkansas. Totally new to the jurisdiction? New to a firm only? New *and*

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[59] For example, the Alabama Innovation Fund includes in its review criteria "[p]otential creation of patentable or other intellectual property capable of successful commercialization[.]" *Alabama Innovation Fund*, ALABAMA EPSCOR, available at https://web.archive.org/web/20190802014124/http://alepscor.org/alabama-innovation-fund/ The New Hampshire Granite State Technology Innovation Grant's review criteria includes assessing whether the company has the potential to "[c]reate a patentable or licensable technology[.]" *Criteria for selecting NHIRC Projects*, NEW HAMPSHIRE INNOVATION RESEARCH CENTER, available at http://www.nhirc.unh.edu/succes-criteria.html.

[60] Patent law, in contrast, views novelty as a, if not the, defining feature of an innovation. *See e.g.*, 35 U.S.C. § 102 (2011). *See* Timothy R. Holbrook, *Possession in Patent Law*, 59 SMU L. REV. 123, 169 (2006) ("The patentee cannot capture that which is already in possession of the public, as is the case in assessing the novelty and obviousness of an invention."); Seymore, *supra* note 50, at 930 ("A bedrock principle of patent law is that a patent cannot issue if it would remove technology that is already in the public domain.").

[61] Nonobviousness in patent law is intended to ensure incentives are awarded only for those innovations "which would not be disclosed or devised but for the inducement" of an incentive, whether it be a patent or a prize. Abramowicz & Duffy, *supra* note 51, at 1593-94 (quoting Graham v. John Deere Co. of Kansas City, 383 U.S. 1 (1966)).

[62] *Technology Development Program Rules*, ARKANSAS SCIENCE & TECHNOLOGY AUTHORITY, available at https://www.arkansasedc.com/docs/default-source/s-t/tdp_rules08.pdf?sfvrsn=f30f323f_2.

[63] *Id.* § 2.2.1.

[64] *Id.*

nonobvious? Just generally creative? Can a restaurant researching a new food dish get funding? What about a medical technology firm developing a diagnostic tool using well-known methods? We do not know from the definitions provided.

True, "innovation" is often discussed in public policy and in academic literature with reference to a qualifying activity, such as such "research and development," rather than with reference to the result.[65] Research and development tax incentives, for example, can be offered based on research that is undertaken well before a winning result is achieved.[66] For these incentives, merely engaging in research that is "directed toward" an as-yet-unknown end goal of achieving novelty is what matters, not whether it is actually achieved.[67] But at the end of the day, these programs must care about the results. It would not matter, for innovation policy, how much "research" a company does, if the end result is well-known or obvious or otherwise valueless. So it should be somewhat alarming that these state awards have no real benchmark for what qualifies as research, let alone the end result to be achieved.

Most states are like Arkansas in this respect—except they do not say nearly as much about what activities, let alone what outputs, qualify for funding. They use the term innovation, and related adjectives such as "new

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[65] For example, Lewis Branscomb and Philip Auerswald describe a five-stage model for the process of innovation, from basic research, to early-stage technology development, to marketing and production. LEWIS BRANSCOMB & PHILIP AUERSWALD, BETWEEN INVENTION AND INNOVATION 32-34 (2002).

[66] Hemel & Ouellette, *supra* note 17, at 333-334.

[67] For instance, when companies apply for a federal research and development tax credit, their expenditures must be undertaken in pursuit of activities that fall within the statutory definition of "qualified research" as defined in the Internal Revenue Code. *See* 26 U.S.C. § 41(d) ("The term 'qualified research' means research . . . which is undertaken for the purpose of discovering information—(i) which is technological in nature, and (ii) the application of which is *intended* to be useful in the development of a new or improved business component of the taxpayer, and (C) substantially all of the activities of which constitute elements of a process of experimentation for a purpose [such as a new or improved function].") (emphasis added); *see also* Evan Wamsley, *The Definition of Qualified Research Under the Section 41 Research and Development Tax Credit: Its Impact on the Credit's Effectiveness*, 87 VA. L. REV. 165, 173 (2001) (discussing case law in which courts held taxpayer's research did not qualify for research tax credit because it "amounted to 'more or less routine modification of a commercially-available software package,' thus falling short of the standard, even if 'evolutionary' research is allowed to qualify.") (quoting United Stationers v. United States, 163 F.3d 440, 445 (7th Cir. 1998), cert. denied, 527 U.S. 1023 (1999)).

and innovative"[68] or "next generation."[69] They may reference activities that are believed to occur during the process of innovation, such as "basic research, applied research, or some combination of both."[70] But ultimately they provide no strict criteria for what standards the applicants must meet in terms of the outputs sought or achieved.

The District of Columbia provides one of the most striking examples. It suggests that the standard is just not very high—or, by way of foreshadowing, that innovation isn't the principal goal. The District of Columbia's Innovation Finance Program gives no set definition of innovation in the ordinary sense. Its target appears to be general entrepreneurship. The fund provides capital for "start-ups and emerging companies that seek financing alternatives to traditional commercial financing." Investor companies must "[d]emonstrate a track record of positive return on investment . . . ."[71] Applying this standard, the District of Columbia gave a financial award to a new Indian restaurant, described as offering "new fast casual Indian food"; and a new "neighborhood grocery store," Good Food Markets. The Indian

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[68] The Maine Seed Grant, operated by the Maine Technology Institute (MTI), provides the following information about "Eligible Projects" that may qualify for Seed Grants of up to $25,000. The guidelines states that Seed Grants will be available for "specific projects leading to the development of new and innovative products, processes or services that may include" among other things, "R&D activities such as proof of concept work, prototype development, field trials, prototype testing, pilot studies." This indicates only that the state expects the applicant's project to be "new and innovative" and to involve "R&D activities." *Seed Grant Application Instructions*, ME. TECH. INST., at 4 (Apr. 30, 2018), https://www.mainetechnology.org/wp-content/uploads/2015/05/Seed-Grant-Application-Instructions-rev-APR-2018.pdf.

[69] The Innovation Ohio Loan Fund, discussed in the introduction, provides loans to companies that are "developing next generation products and services." The program guidelines indicate that "[e]ligible projects include those related to industry, commerce, distribution or research activities," and that allowable uses of the state loan include, among other things, "[c]reating and protecting intellectual property including costs of securing appropriate patent, trademark, trade secret, trade dress, copyright or other forms of intellectual property protection for an eligible innovation project or related products or services." It further stipulates that "[r]etail projects are **ineligible** for the IOF Loan." OHIO DEP'T OF DEV., *supra* note 7, at 2-3.

[70] The Montana Board of Research and Commercialization Technology invests in "research and commercialization projects" (and reports having about $800,000 available to grant in fiscal year 2019 for such projects). The Board states that it seeks to reward the applicant who "[d]evelops or employs an innovative technology[,]" but provides no further definition of innovative. The application must contain

> [a] description of whether the grant is to be used for basic research, applied research, or some combination of both. Applied research is defined as research that is conducted to attain a specific benefit or solve a practical problem, and basic research is defined as research that is conducted to uncover the basic function or mechanism of a scientific question. MONT. BD. OF RESEARCH AND COMMERCIALIZATION TECH., *Request for Proposals: Research and Commercialization Projects*, at 1, 3 (Dec. 14, 2017) (on file with author).

[71] *DC BizCAP - Innovation Finance Program*, DC.GOV: DEP'T INS., SEC. & BANKING, https://disb.dc.gov/page/dc-bizcap-innovation-finance-program (last visited Apr. 1, 2020).

restaurant received a $100,000 investment. The grocery store received a $50,000 investment.[72]

How is an Indian restaurant or a grocery store an innovation? The answer requires reformulating our definition. Under patent law's traditional standards, there is no question these fail. Under broadened criteria, such as attention to "market experimentation," an incoming Indian restaurant or even a grocery store might qualify. After all, a new Indian restaurant in a town that lacks an Indian restaurant is "new" and maybe even "inventive" from the perspective of that town and the relevant market of dining options.[73]

But I suspect that this funding may not actually be rewarding technological or commercial risk-taking at all. Or at least this isn't the primary goal. Instead, these programs have more parochial goals.[74]

3. Job Creation as the Ultimate Criteria

The criteria of the studied programs that stands out most prominently is that nearly all of them take into account the potential impact of the applicant's project on jobs in the state. Importantly, not all programs targeting innovation assess job creation.[75] But a significant number of them (around twenty of the programs listed in the Appendix) do so expressly.

For example, the Alabama Innovation Fund supports what it calls a "Research Program" that provides awards to universities in the state in "a competitive review process that determines the most meritorious proposals."[76] The projects are reviewed based on the following criteria:

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[72] *District Announces Innovation Finance Program Investment in Rasa Indian Grill*, DC.GOV: DEP'T INS., SEC. & BANKING, https://disb.dc.gov/release/district-announces-innovation-finance-program-investment-rasa-indian-grill (last visited Apr. 1, 2020).

[73] For the argument that commercial risk-taking is a form of innovation that should be rewarded under patent law, see Abramowicz & Duffy, *supra* note 54.

[74] For similar conclusion based on assessment of Michigan technology financing fund, see Bo Zhao & Rosemarie Ziedonis, *State Governments as Financiers of Technology Startups: Implications for Firm Performance*, 49 RES. POL'Y (forthcoming May 2020), at 4-8, available at http://ssrn.com/abstract= 2060739.

[75] For example, the North Dakota Department of Commerce explicitly states that the Small Business Technology Program, which provides favorable loans of up to $50,000 for "[a]ny start-up primary sector business in [the] technology field," "[d]oes not have a job requirement." This is in contrast to other North Dakota Department of Commerce financing programs. In total, the North Dakota Department of Commerce's Development Fund offers six separate business financing options, including the Small Business Technology Program. Two other programs, the North Dakota Development Fund and the Revolving Rural Loan Fund, do set loan amounts "based on job creation." *NDDF Programs*, ND.GOV: ECON. DEV. & FIN., https://www.business.nd.gov/development_fund/NDDFPrograms/#ND%20Small%20Business (last visited Apr. 2, 2020).

[76] *Alabama Innovation Fund*, *supra* note 59.

1. Strength of the partnership between university and private business;
2. Potential creation of patentable or other intellectual property capable of successful commercialization;
3. Probability to stimulate further research and development within the state;
4. *Possibility of future job creation;*
5. Expertise of the research team in fields;
6. Research team experience with similar projects *that led to successful commercialization and job creation;*
7. Technological, economic, human and intellectual property resources available to research team;
8. *Positive contribution to State's economy.*[77]

As can be seen, several of these criteria, such as the potential to generate intellectual property and expertise of the research team, resemble what one would expect from a state alleging to be investing in some new innovation.[78] But the rest of the criteria—possibility of future job creation and positive contribution to the state's economy—have little to do with the technological merit or novelty of the project. They are instead about enhancing the economic well-being of the state, in particular by creating jobs for residents.

Several other examples illustrate a similar procedure. The Arkansas Technology Development Program provides that the applicant for funding must include a "statement of economic impact (e.g. potential job creation, export potential, value added to existing products)," and answer the following questions: "Will the product impact Arkansas economy? Does it have job creation potential? …"[79]

The TEDCO Seed Investment Fund, intended to support Maryland companies, provides that the company's product must "incorporate[] a novel

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[77] *Id.* (emphasis added).

[78] *See, e.g.*, Darian M. Ibrahim, *Financing the Next Silicon Valley*, 87 WASH. U. L. REV. 717, 736-39 (2010) (discussing the optimal role of state-sponsored venture capital in encouraging local investment in innovation).

[79] ARKANSAS SCIENCE & TECHNOLOGY AUTHORITY, *supra* note 62, §§4.1.2.10, 5.4.

and proprietary technology" and must have "the potential to grow the Maryland economy and create jobs."[80]

The New Hampshire Granite State Technology Innovation Grant Program provides that it "was created in 1991 by the New Hampshire Legislature to support innovations through industry and university collaborations, thereby increasing the number of quality jobs in the state." The program criteria for selecting projects includes answering the question "Will this project: Create jobs?"[81]

The Utah Technology Commercialization & Innovation Program explicitly requires the granting agency to consider potential for job creation, providing in its guidelines that "3 (b) Each proposal shall receive the best available outside review. (4) (a) In considering each proposal, the office shall weigh **technical merit**, the **level of matching funds from private and federal sources**, and the **potential for job creation and economic development**."[82]

Even if some programs do not expressly provide that job creation is to be considered, the granting agencies may still do so in practice. For example, Rhode Island provides Innovation Vouchers, which are awarded by the Rhode Island Commerce Corporation. The Innovation Vouchers consist of grants of up to $50,000 for small businesses. The grants are to be used to purchase "fund an internal R&D project."[83] The Rhode Island Commerce Corporation website states that "[g]rants can be applied to

1. support for commercialization of a new product, process, or service
2. access to scientific, engineering, and design expertise
3. scale-to-market development of your innovative idea"[84]

The website says nothing about job creation potential.

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[80] *Seed Investment Fund*, TEDCO, formerly available at http://tedco.md/program/seed-funding-program/ (archival capture of website on file with author).

[81] *Research Partnership Opportunities*, U.N.H., https://innovation.unh.edu/research-opportunities (last visited June 13, 2020). *See also* Success Criteria, N.H. INNOVATION RES. CTR, http://www.nhirc.unh.edu/succes-criteria.html (last visited June 13, 2020).

[82] *TCIP Grant Open for Applications*, UTAH GOVERNOR'S OFF. ECON. DEV., https://business.utah.gov/tcip/ (last visited Apr. 2, 2020); *Technology Commercialization & Innovation Program: Guidelines for Review of Applications for Grant Funding*, UTAH GOVERNOR'S OFF. ECON. DEV. 1 (Sept. 13, 2016) https://business.utah.gov/wp-content/uploads/2018/01/TCIP-Application-Review-Guidelines-FINAL-September-2016.pdf.

[83] *Innovation Incentives*, R.I. COMM. CORP., https://commerceri.com/innovation-incentives/ (last visited Apr. 2, 2020).

[84] *Id.*

However, a review of the successful projects suggests that job creation potential was at least sometimes considered. For example, the Rhode Island Commerce Corporation recommended in January 2016 that defense electronics company Applied Radar, Inc. receive $10,000.00 for an Innovation Project entitled "Lean Manufacturing for Catalog Microwave Electronic Components & Systems Derived from Defense R&D." The project goal was "to establish a lean manufacturing facility to support catalog sales of microwave electronic systems and components derived from an established defense R&D business." As described by the Rhode Island Commerce Corporation, the development of "lean manufacturing" would "lead to increased efficiencies and improved quality, furthering [the company's] sales and value proposition to customers, *and leading to increased jobs* and taxable commercial activity."[85] Thus, even though the project's job creation potential was not a written criterion for obtaining funding, the granting agency nonetheless considered it.

II. WHY IS THIS HAPPENING?

The crux of these findings is that innovation incentives offered by U.S. states are not necessarily going towards true innovation, or at least not only or primarily that. They are being directed at recipients who promise to create jobs. Why are these innovation incentives designed this way? This part tackles these questions through the lens of public choice theory.[86]

A. *Is It Just the States?*

One tempting hypothesis is that maybe it's just the states. Hypothetically, it could be that U.S. states are more likely than the federal government to pursue job creation rather than true innovation, because states are limited in jurisdiction and thus cannot internalize the benefits of funding on inventions and ideas that can be copied and used outside the jurisdiction.[87]

At a conceptual level, this hypothesis is highly compelling. An important piece of public choice theory deals with the issue of jurisdiction. Given that laws are passed in response to the demands of constituents within a particular

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[85] *Innovation Voucher Award Fact Sheet*, R.I. COMM. CORP. 1 (Jan. 25, 2016) https://commerceri.com/wp-content/uploads/2018/03/Innovation-Voucher_Summaries_20160125.pdf.

[86] Broadly speaking, "public choice theory" refers to the application of economic principles in order to explain how political behavior and the incentives of politicians, voters, and interest groups shapes laws and regulations. *See* STEARNS ET AL., *supra* note 37, at 655-684.

[87] For this argument, see Camilla Hrdy, *Patent Nationally, Innovate Locally*, *supra* note 8.

polity, the jurisdiction that best internalizes the costs and benefits of its regulations should be responsible for crafting them.[88] For example, because national security benefits everyone in the country, it makes sense for politicians responsive to everyone to take charge on this issue. Why? Because those who benefit should pay. If smaller units of government were responsible, they might not take action, given that national security benefits everyone in the country, not just their voters.

With this insight, it makes sense that states would require recipients of funding for innovation to provide localized benefits like job creation. It would be difficult for small governments to capture the full value of innovations, in the sense of new ideas and new applications of ideas.[89] So when states do fund innovation, we might expect them to attach conditions that aid local constituents in more concrete ways.[90]

Yet I don't think federalism, on its own, is the end of this story. My research suggests the states are not the only ones that consider job creation potential when ostensibly promoting "innovation." The federal government does so too. At the federal level, federal research agencies like the Department of Defense (DOD) offer similar innovation awards for companies through programs like the Small Business Innovation Research (SBIR) program.[91] A review of an SBIR-granting agency's solicitations shows at least some of these agencies motivated by a job creation goal.

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[88] *See* STEARNS ET AL., *supra* note 37, at 991-998. *See also* ROBERT COOTER, THE STRATEGIC CONSTITUTION 105–09 (2000) (discussing national versus local public goods and implications for optimal allocation of governmental authority).

[89] Hrdy, *Patent Nationally, Innovate Locally*, *supra* note 8, at 1357 ("Federally funded research is limited to those cases in which innovation produces such significant national benefits that states alone are not . . . willing to fund it . . . ."); *see also* Brian Galle & Joseph Leahy, *Laboratories of Democracy? Policy Innovation in Decentralized Governments*, 58 EMORY L. J. 1333, 1335 (2009) ("State and local governments can be thought of as inventors without patents: because anyone can steal their new ideas, what incentive have they ever had to invent?").

[90] Hrdy, *Patent Nationally, Innovate Locally*, *supra* note 8, at 1336 ("The explicit goal of U.S. state innovation incentives is to spur jobs and business activity *in the region*, potentially at the expense of others.").

[91] In SBIR, Congress mandates that certain federal agencies set aside a portion of their funding to provide competitive research grants to small businesses. *See* 15 U.S.C. § 638(f). Each of these agencies then operates its own SBIR program, and solicits submissions for SBIR awards, with significant freedom. SBIR's guiding statute merely lays out a general definition of qualifying activities, providing definitions of "research," "research and development," and "commercialization." *See id.* § 638(e)(5) (defining "research" as "any activity which is (A) a systematic, intensive study directed toward greater knowledge or understanding of the subject studied; (B) a systematic study directed specifically toward applying new knowledge to meet a recognized need; or (C) a systematic application of knowledge toward the production of useful materials, devices and systems or methods, including design, development, and improvement of prototypes and new processes to meet specific requirements . . . ."). Then SBIR-granting agencies

For example, the National Science Foundation (NSF) is certainly an agency we would think would be interested in idea-generating research. The NSF operates an SBIR program, called "America's Seed Fund," which provides seed funding for qualifying small businesses.[92] According to the Seed Fund's "Peer review guidelines", "[a]ll proposals are reviewed under the NSF merit review criteria," which include three separate criteria: "the quality of research **(intellectual or technical merit)**, . . . its potential impact on society **(broader impacts)**, and commercial potential of the project **(commercial impact)**."[93] The first peer review criterion is the only one that hints at a traditional notion of innovation in the patent law sense.[94]

The NSF/SBIR Seed Fund's solicitation—where funding applicants go to see whether their project fits into the agency's specific criteria—provides further details. For example, for projects falling within the "Chemical And Environmental Technologies" topic, the NSF's solicitation states that the proposed project must involve "novel, discontinuous, disruptive innovations and be built on a firm framework involving chemistry and chemical engineering approaches."[95] Yet the Solicitation also states that the project must have "*the strong potential to catalyze and accelerate U.S. job creation* through scalable business growth."[96] Job creation potential is also a stated criteria for other specific sub-topics supported by the NSF.[97]

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may then further refine this definition of qualifying activities to meet their goals. *See* Hrdy, *Commercialization Awards*, *supra* note 9, at 52-53.

[92] NSF SBIR: AMERICA'S SEED FUND, https://seedfund.nsf.gov (last visited Apr. 2, 2020).

[93] *Peer Review Guidelines*, AMERICA'S SEED FUND, https://seedfund.nsf.gov/resources/review/peer-review/ (last visited Apr. 5, 2020).

[94] "The Intellectual Merit criterion," the guidelines state, "encompasses the potential to advance knowledge." *Id.* This criterion considers questions such as, "[w]hat is the potential for the proposed activity to advance knowledge and understanding within its own field or across different fields (Intellectual Merit)?" and "[t]o what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?" *Id.* The "Broader Impacts" criterion asks questions such as, "[w]hat is the potential for the proposed activity to benefit society or advance desired societal outcomes (Broader Impacts)?" *Id.* "The Commercial Impact criterion focuses on the potential of the activity to lead to significant outcomes in the commercial market." *Id.* It considers questions like, "[i]s there a significant market opportunity that could be addressed by the proposed product, process, or service?", and "[d]oes the company possess a significant and durable competitive advantage, based on scientific or technical innovation, that would be difficult for competitors to neutralize or replicate?" *Id.* This suggests "innovation" here is meant in the sense of commercial innovation that might lead to economic profits for the recipient. That's not inherently problematic, if we accept a broader definition of innovation as including non-technical features of a business that lead to greater profitability.

[95] *Solicitation Topics & Subtopics*, AMERICA'S SEED FUND (Mar. 2018), https://seedfund.nsf.gov/assets/files/applicants/combined-topics-03-2018.pdf (last visited June 13, 2020).

[96] *Id.* at 12 (emphasis added).

[97] For instance, the sub-topic, "Human-Centric Industrial Technologies," seeks proposals

A much more prominent instance of the federal government conflating innovation and job creation goals can be seen in the "National Innovation Act." This Senate bill, drafted in 2005-2006, would have created a federal "Innovation Acceleration Grants Program" to "support and promote innovation in the United States." Though it never passed, the National Innovation Act strikingly resembled the state programs assessed above. The bill expressly defined "innovation" as "a process for incremental or significant technical advance or change, which provides enhancement of measurable economic value . . ." It referenced job creation multiple times, asserting that the legislation would "ensure that as innovations occur, America is poised to reap the benefits via the creation of new jobs and investment . . ." The bill further stated that, in evaluating proposals for funding "the Executive agency shall consider the extent to which the program funded by the grant met the goals of quality improvement and job creation."[98]

This all suggests that, for at least some federal programs, job creation is as much a goal as it is for equivalent state agencies. This casts doubt on federalism as the sole explanation for why so-called innovation subsidies would go towards job creation.

B. *The Rent-Seeking Story*

A second hypothesis, which could theoretically apply at both the state and the federal level, is that these programs are the result of rent-seeking and responsive pandering by politicians to appease disparate interest groups.[99] Public choice theory is skeptical of the notion that legislation and regulations are the result of selfless and beneficent regard for the public interest.[100] Rather, it views laws and regulations as the product of rent seeking by firms

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"aimed at combining the reach of the internet with a new ability to directly connect and seamlessly integrate the modern industrial landscape . . . . Such proposals may aim at (but are not limited to) *development of innovative technologies that would promote creation of entirely new types of industrial jobs requiring complementary human-digital workforce . . .*" *Id.* at 5 (emphasis added). *See also id.* at 19. (referencing a job-creation goal in another NSF-SBIR subtopic, "Emotional Intelligence (EI) Enhancing Educational Innovations[.]")

[98] National Innovation Act, S. 2390, 109th Cong., 2d Sess. (2006), https://www.congress.gov/bill/109th-congress/senate-bill/2390/text.

[99] For a compelling argument in this regard with respect to business subsidies, *See generally* NATHAN JENSEN & EDMUND MALESKY, INCENTIVES TO PANDER: HOW POLITICIANS USE CORPORATE WELFARE FOR POLITICAL GAIN (2018) (arguing that a major reason for government incentives is "pandering" to voters).

[100] *See* STEARNS ET AL., *supra* note 37, at 656-60.

and individuals. Rent-seeking is defined as seeking rents (loosely, profits) by obtaining some benefit that would not exist in a naked market.[101] A common way to seek rents is by lobbying for favorable legislation.[102] The Wilson-Hayes Matrix[103] predicts that lawmakers are more likely to support special interest legislation, such as business subsidies for particular industries, if they confer benefits on small, well-organized interest groups, while imposing the costs on large, widely distributed groups.[104]

Applying these concepts, the innovation finance-come-job creation programs assessed in this article could be interpreted as the result of rent-seeking by two large interest groups: companies who receive money through the programs, and workers who get jobs at those companies.[105] On this view, innovation subsidies are simply the outcome of a two-sided transaction: government benefits in exchange for political support.[106] On the "demand side," firms seek financial awards (rents) by spending resources on lobbying and influence and by representing themselves as "innovators" in some way.[107] On the "supply side," legislators appease and garner support from industry by fashioning "innovation" incentives that fit the bill. They also get to claim credit for funding a public good ("innovation"), just as they would for funding a bridge or a highway.[108] Meanwhile, the other large interest group at play here are workers in the region who might be hired by those companies, or fired or not hired if the companies leave or never arrive. By attaching job creation requirements to the innovation incentives, legislators make the expenditure of public money more politically palatable to a broader segment of the population. Giving a boon to workers can be interpreted simply as

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[101] Economic rents are defined as a return on an activity in excess of the opportunity cost of the income-producing asset. Profit is a similar concept. But rents take into account opportunity cost. *Id.* at 423.

[102] *Id.* at 423-24.

[103] *Id.* at 659-67 (summarizing JAMES O. WILSON, POLITICAL ORGANIZATIONS 332-37 (1973); MICHAEL T. HAYES, LOBBYISTS AND LEGISLATORS: A THEORY OF POLITICAL MARKETS (1981).)

[104] *Id.* at 659-60.

[105] To be clear, I have no evidence to support or refute this interpretation. I have not spoken with the drafters of these programs or those who work with them.

[106] *Id.* at 19-20 (viewing politics and the legislative process as an exchange model in which voters, interest groups, and lobbyists offer support to elected officials who in exchange agree to give them the government benefits they seek).

[107] *Id.* at 660 (applying this theory to explain tariffs and business subsidies), *Id.* at 661-62 (discussing "demand side" of the model).

[108] *Id.* at 665-66 (discussing "credit claiming").

"conflict avoidance"[109] or alternatively as "logrolling."[110] The point is that, from the politicians' perspectives, they presumably prefer to make as many voters happy as possible in order to achieve political success. As with natural selection, only the politicians who play the game get re-elected.[111]

Meanwhile, there are few voices to object. The main population who must bear the costs of these innovation incentives/job subsidies are general taxpayers. While they are the ones who actually pay for the programs, most taxpayers will not benefit, or at least not directly, from either the promised innovation or the promised job creation, unless they happen to work for one of the rewarded companies. General taxpayers are also widely dispersed and so unlikely to organize in opposition.[112] They thus experience a sort of "forced riding," paying for benefits that they don't themselves directly experience.[113]

An apt analogy can perhaps be drawn to the financing of sports stadiums. The taxpayers "including those who could care less about sports, pay and pay" for massive sports stadiums that only some well-organized interest groups actually want.[114]

III. A PROBLEM FOR INNOVATION POLICY

Not all rent-seeking is bad. For example, the race to obtain patents from the government in order to exclude others from a certain invention is a form of rent-seeking.[115] But the patent system also brings benefits in the form of new inventions. Likewise, here, there could possibly be a major upside to the rent-seeking activity depicted above.

It's not hard to tell a salubrious story about the effects of incentives that both incent innovation and jobs, at the same time. At least in theory, government can offer subsidies that do two things that are good for public policy: pay for innovation and pay for high quality, high paying jobs. The story would go like this. Innovation is undeniably a laudable public policy

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[109] *Id.* at 666-67 (noting that successful legislators avoid conflicts between constituents by bargaining with adversely affected groups).

[110] *Id.* at 31-32 (defining logrolling as where "private interests attach unrelated narrowly focused private benefits to larger public-regarding legislation")

[111] *Id.* at 665.

[112] *Id.* at 660 (noting consequences of widely distributed costs).

[113] On forced riding, *See id.* at 17-18.

[114] Gregory Bresiger, *Stadium Socialism*, THE FREE MARKET 17, NO. 11 (Nov. 1999) (quoting Jesse Ventura, Governor of Minnesota).

[115] *C.f.* Michael Abramowicz, *The Uneasy Case for Patent Races over Auctions,* 60 STAN. L. REV. 803, 862 (2007) ("Rent seeking is an activity in which the competition for rents, for example from an exclusive government franchise, dissipates the benefits of those rents.").

goal.[116] Job creation is also a laudable public policy goal, especially in an age of increasing automation.[117] What is more, some research suggests innovation and jobs can actually complement each other, because wages in the innovation sector tend to be higher.[118] So if government is going to subsidize work, why not subsidize jobs in the innovation sector? It's hard to deny incentives can have this effect. For example, the software company mentioned in the introduction that received an "Innovation Loan Fund" went on to create both a software program (perhaps a somewhat new one, presumably a commercially viable one), and 33 jobs, 24 of which jobs were retained—just as the company initially promised.[119] Whether the jobs will stay in the long term, and whether the government paid too much per job, are separate, hugely important issues.[120] But in theory at least, it can work.

The final part of the story is the concept of "spillovers." Some assert that, when companies locate in a region and hire local, the whole community benefits when companies buy local products and workers spend in shops, restaurants and yoga studios. So it's not just the 24 jobs that came to Ohio

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[116] *See*, e.g., LERNER, *supra* note 47, at 16; *see also* GREENHALGH & ROGERS, *supra* note 10, at 17–23.

[117] As Oren Cass of the Manhattan Institute puts it in his recent book laying out a socioeconomic agenda in favor of the "future worker," "If society wants more from the labor market, it must consider paying for it." OREN CASS, THE ONCE AND FUTURE WORKER: A VISION FOR THE RENEWAL OF WORK IN AMERICA 56 (2018); *see also* Cynthia Estlund, *What Should We Do After Work? Automation and Employment Law*, 128 YALE L. J. 2 , 254 (2018) (asking "Why not affirmatively subsidize human labor and job creation?"); And *see* Camilla A. Hrdy, *Intellectual Property and the End of Work*, 70 FLA. L. REV., 303 (2019) (proposing using intellectual property law to promote job creation).

[118] *See, e.g.,* ENRICO MORETTI, THE NEW GEOGRAPHY OF JOBS 72-97 (2012) (showing that people living in "brain hubs"—metropolitan areas with higher shares of college-educated workers and often higher shares of patents—have higher salaries., making "between $70,000 and $80,000 a year, or about 50% more than college graduates in the bottom group."). *See also* INTELLECTUAL PROPERTY AND THE U.S. ECONOMY: 2016 UPDATE, UPDATING INTELLECTUAL PROPERTY AND THE U.S. ECONOMY: INDUSTRIES IN FOCUS, 2012, at ii, 19 ("Private wage and salary workers in IP-intensive industries continue to earn significantly more than those in non-IP-intensive industries. In 2014, the average weekly wage of $1,312 was 46 percent higher (up from 42 percent in 2010) than for workers in non-IP-intensive industries[.]").

[119] *Award and Recipient Compliance List by Ohio Treasurer*, OHIO TREASURER, http://ohiotreasurer.gov/Documents/CMS/Loan-Report-2014-Compliant-List.pdf.

[120] *See, e.g.,* Kasia Tarczynska, *Show Us the Local Subsidies: A Second Evaluation of City and County Online Disclosure Practices of Economic Development Subsidy Programs*, GOOD JOBS FIRST (Mar. 2017), at 19-38, available at https://www.goodjobsfirst.org/hide/show-us-local-subsidies-second-evaluation-city-and-county-online-disclosure-practices-economic (estimating the performance and cost per job of various local subsidies). For recent discussion among experts about the complexities involved in subsidizing employment, see the transcript of the Brookings Institute's and the Hamilton Project's joint panel, *From Job Guarantees to Wage Subsidies: Exploring Policy Options to Promote Employment*, THE HAMILTON PROJECT (Dec. 6, 2018), http://www.hamiltonproject.org/assets/files/120618-BROOKINGS-JOBS.pdf.

because one company got a grant from the government. It's the economic activity, and other jobs, that those 24 workers support.[121]

There is, however, a major problem. Providing incentives for companies to both generate innovation and to create jobs is a strategy that is at best inconsistent. At worst it is contradictory, a snake eating its own tail. The reason is that innovation and jobs are not necessarily compatible goals, and in fact may be directly inimical to one another. Some of the most important innovations in history, from the cotton gin to the computer, have not been job creators. They have been labor-saving; they increase productivity by reducing the human labor required to achieve a given task.[122] Indeed, some commentators argue that the most important threat to human work today is automation: where technology replaces paid human workers by performing human-like tasks.[123] Technologies are increasingly capable of performing tasks that would otherwise be done by paid humans. The range of automation technology runs the gamut of tasks we perform in our daily lives, from childcare to collecting and analyzing data.[124]

Although the long-run effects of innovation on employment have historically been positive, the short-term effects for people in the here and now can be very bad, especially for certain types of occupations.[125]

To give an example, in 2012, a robotics startup called Momentum Machines invented a machine that can make "400 made-to-order hamburgers in an hour. . . . [T]he robot can slice toppings, grill a patty, and assemble and bag the burger without any help from humans." This could allow a burger restaurant to "replace two to three full-time line cooks" and save "up to $90,000 a year in training, salaries, and overhead costs." The company is now opening a restaurant using the machine—and presumably higher fewer line cooks as a result.[126]

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[121] MORETTI, *supra* note 117, at 55-63 (discussing the "multiplier effect" associated with technology sector jobs). *See also, e.g.,* CASS, *supra* note 29, at 162 (explaining the argument in favor of subsidies for work in order to generate local spillovers).

[122] *See* Hrdy, *Intellectual Property and the End of Work, supra* note 29, at 303, 309-327.

[123] *See id.* at 312-315, 319-322.

[124] *See generally* Darrell M. West, *What Happens if Robots take the Jobs? The Impact of Emerging Technologies on Employment and Public Policy*, CTR. FOR TECH. INNOVATION AT BROOKINGS 1, 2-6 (2015).

[125] *Id.* at 315-318 (citing, *e.g.,* David Autor, *Why Are There Still So Many Jobs? The History and Future of Workplace Automation*, 29 J. ECON. PERSP. 3, 3-4 (2015) (discussing a variety of reasons why there are still jobs despite increasing improvements in automation)).

[126] *See* Melia Robinson, *This Robot-Powered Restaurant Could Put Fast Food Workers out of a Job*, BUS. INSIDER (June 30, 2016), https://www.businessinsider.com/momentum-machines-is-hiring-2016-6. *See also Food Robotics Feeding Latest Kitchen Automation Solutions*, NANALYZE (Dec. 12, 2019), https://www.nanalyze.com/2019/12/food-robotics-kitchen-automation/.

As I showed in prior work, a large number of the patents filed with the U.S. Patent & Trademark office look something like this. They are "labor-saving" in the sense of reducing the costs of achieving some output. Labor-saving patents include, to name just a few, patents on the cotton gin during the Industrial Revolution, patents on the automated teller machine in the 1980s, and patents on self-driving cars today.[127]

When seen in this light, it is hard to justify a policy of funding both innovation and job creation at the same time, let alone within the same program, with respect to the same applicants. A program that is ostensibly rewarding innovation, but that comes with job requirements, has real potential to distort investment away from true innovation, and to actually create incentives for companies to invest in labor-generating applications. A simple example illustrates this.

Imagine a small software company run by about five people that is developing new automation software that makes the workplace more productive. Assume the software company seeks financing from Ohio's "Innovation Loan Fund." If the software company succeeds, this would mean negative impacts for human workers, who would eventually be replaced by the software. In contrast, imagine that another applicant is a large manufacturing company deploying tried-and-true methods to manufacture steel in ways that require hundreds, potentially thousands, of humans to function. Given that the software company is deriving a way to mechanize tasks that would otherwise be done by people, a state like Ohio that is really worried about job creation should probably choose *not* to grant this software company an award. After all, Ohio's Innovation Loan Fund specifically requires a "commitment to create or retain jobs to the State of Ohio . . . ." The official would thus be forced to weigh the project's intellectual merit against its economic merit, and might well select the manufacturing company that promises to bring more jobs to the state of Ohio. This is so even if she knows the software company is the one doing the more groundbreaking research.

The famous quote by Milton Friedman comes to mind. The anecdote goes that, while visiting a worksite where a new canal was being built, Friedman was shocked to see that, instead of modern tractors and earth movers, the workers had shovels. He asked why there were so few machines. The government bureaucrat explained: "You don't understand. This is a jobs program." To which Milton replied: "Oh, I thought you were trying to build

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[127] Hrdy, *IP and the End of Work*, *supra* note 29, at 334-335 (citing exemplary labor-saving patents).

a canal. If it's jobs you want, then you should give these workers spoons, not shovels."[128]

In a world where innovation incentives are actually jobs programs, companies would be given incentives direct investment away from job-displacing "shovels," and towards job-generating "spoons." At best, companies might be led to invest in highly innovative, job-generating technologies. For instance, imagine a company that is developing a new self-driving car that requires two humans to be sitting in the car in order to operate it. Maybe this is the type of innovation voters want: new technologies deliberately designed to be inefficient.[129] But I don't think this is what IP scholars are thinking about when they propose innovation prizes and the like.

IV. IS INTELLECTUAL PROPERTY ANY BETTER?

A final question is whether there is something structural about public financing, as opposed to intellectual property, that makes it vulnerable to the temptation to reward job creation. There are some reasons to think this is the case.

With IP rights, taxpayer money is not directly used to finance innovation. Instead, users themselves pay in the form of higher prices due to the existence of exclusive rights.[130] In addition, with IP, government plays very little role in deciding which innovations get support. The government merely reviews innovations (in the case of patents) for the criteria of novelty, nonobviousness, etcetera, without weighing the public benefits or harms of the technology in terms of metrics like employment.[131]

In their influential article, *Beyond The Patents-Prizes Debate*, Professor Lisa Ouellette and Professor Daniel Hemel crystallize these points into a

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[128] Stephen Moore, *Missing Milton: Who Will Speak for Free Markets?*, WALL ST. J. (May 29, 2009), https://www.wsj.com/articles/SB124355131075164361. Thanks to T.J. Chiang for drawing this anecdote and quote to my attention.

[129] Notably, the result will be not dissimilar to the types of distortions we could see from a "robot tax." Companies might choose not to utilize robots instead of people in order to avoid the tax. *See, e.g.*, Ryan Abbott & Bret Bogenschneider, *Should Robots Pay Taxes? Tax Policy in the Age of Automation*, 12 HARV. L. & POL'Y REV. 145, 146–47 (2018)

[130] As Professor Suzanne Scotchmer explained, the innovations that are covered by IP rights, whether video games or pharma drugs, are ultimately financed directly by users of the innovation rather than general taxpayers. In contrast, innovation finance mechanisms like procurement and prizes draw on general taxpayer revenues to finance innovations that benefit some taxpayers but not others. SCOTCHMER, *supra*, at 38; *see also* Hemel & Ouellette, *supra* note 17, at 307-308.

[131] Hemel & Ouellette, *supra* note 17, at 307-308. *See also* Hrdy, *IP and the End of Work, supra* note 29, at 329-330 (comparing early version of patent utility doctrine with modern hands-off approach).

useful framework.[132] They observe that incentives for innovation differ on three dimensions. First, an incentive can be "market set," meaning companies decide which innovations to pursue and by how much, or "government set," where government decides what to award and how much to value it. Second, an incentive can be awarded *before* success, like a grant or a tax credit, or only *after* success is achieved, like a prize or a patent. Third, incentives differ in terms of who pays—general taxpayers or only the specific users or other direct beneficiaries of the innovation. The former we might call "everyone-pays"; the latter are "user-pays."[133]

The public financing mechanisms studied in this article are both government-set—with government officials responsible for choosing and valuing winners—and funded from general tax revenues. They are "everyone pays." These features seem to be precisely what makes these incentives vulnerable to the rent-seeking pressures discussed above.[134] If everyone in the jurisdiction is paying for the programs, government has to explain and justify the programs and particular funding decisions to taxpayers. Responding that government is "creating jobs," and pointing to specific recipients who are job generators, sounds really good. We see it when government finances stadiums; so why shouldn't we see it when government finances innovation?

In contrast, with IP rights, users are paying for exactly what they want; and market actors, not government actors, are deciding what types of innovations to supply. It just isn't necessary to justify every patent given out; and government has little control over what types of inventions go forward.

To make this concrete, take my situation. I am a taxpaying resident of Akron, Ohio, who pays the taxes that support the Innovation Ohio Loan Fund. I certainly care what government does with my tax money. "Job creation," especially in a region like Akron, sounds like a meaningful, public-facing goal, worthy of public support. But I don't have to be convinced that the public will benefit from every patented invention. (This is fortunate, since many of them are silly.) Instead, if I want a patented product, I just pay more for it, assuming I can afford it, and only if I want it.

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[132] Hemel & Ouellette, *supra* note 17, at 307-308.

[133] *Id.*

[134] Nicholson Prize observes that a similar critique is often leveled at research grants, generally. *See* Price, *supra* note 16, at 13 (noting that a common critique of grants is that "leaving funding decisions in the hands of bureaucrats may result in cronyism, favoritism, and political pressure shaping the process of grant funding and scientific progress.").

This logic supports the conclusion that IP might be shielded from some of the pressures that otherwise hound government officials charged with spending public money.

That said, we should not be led into a nirvana fallacy. It isn't clear that IP law itself is really immune to the impulse of legislators to reward job creation, simply by virtue of the fact that it utilizes a user-pays and market-set mechanism.[135] I am just not sure it is. A quick review of the legislative history surrounding recent amendments to two of the major federal intellectual property regimes — patents and trade secrets — shows that legislators talk about job creation when they grant IP rights too.

The message from the federal legislators who passed patent reform in 2011 is that patents create jobs. In a representative quote, Senator Leahy stated to his colleagues that strengthening the patent system would, among other things, "create jobs ...."[136] The Obama White House made similar assertions that reforming the patent system would "help grow our economy and create good jobs."[137]

The public got a similar message in 2016 from the federal legislators who passed a new federal trade secret law. According to the Senate Report, "[b]y improving trade secret protection, the Defend Trade Secrets Act of 2016 [would] incentivize future innovation while protecting and encouraging the creation of American jobs."[138] Likewise, the House Report stated that a federal trade secret law would "equip companies with the additional tools they need to protect their proprietary information, to preserve and increase jobs and promote growth in the United States ..."[139]

Meanwhile, the U.S. Patent & Trademark Office (USPTO) has issued multiple reports asserting that "IP-intensive industries," those with more patents, copyrights, and trademarks for their size, create more jobs than other industries; and that wages in IP-intensive industries are forty-seven percent higher.[140]

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[135] Hemel & Ouellette, *supra* note 17, at 345-350.

[136] Statement by Senator Leahy, March 8, 2011, 3 Patent Reform A Legislative History of the America Invents Act (William H. Manz ed., 2012).

[137] Administration of Barack Obama, 2011, Statement on Senate Passage of Patent Reform Legislation, March 8, 2011, 2 Patent Reform: A Legislative History of the Leahy-Smith America Invents Act (William H. Manz, ed.) 1 (2012).

[138] *See* S. REP. 114-220, S. REP. NO. 220, 114th Cong., March 7, 2016, at *3. "This same report found that trade secret theft has led to the loss of 2.1 million American jobs each year and that the illegal theft of intellectual property is undermining the means and incentive for entrepreneurs to innovate." *Id.* at *2.

[139] *See also* H.R. REP. NO. 114-529.

[140] *See* Hrdy, *IP and the End of Work, supra* note 29, at 306 (discussing INTELLECTUAL PROPERTY AND THE U.S. ECONOMY: 2016 UPDATE, (ECONOMICS & STATISTICS ADMINISTRATION/U.S. PATENT AND TRADEMARK OFFICE), 2016..

These words could be empty padding, just the type of rhetoric that inevitably accompanies any piece of legislation. But I think these words matter. They suggest that, when government creates incentives, whether through money or through exclusive rights, it tries at some level to give the people what it thinks the people want, and that goal affects how reward programs are structured. One of the things people want is jobs. But the reality is that the goals of innovation and jobs are clearly in tension, and at worst are simply incompatible. Whether the two should really be discussed together, as if they were best friends, is an open question that should be seriously examined.

CONCLUSION

Can public finance be used to support innovation, perhaps even in lieu of intellectual property laws like patents? Some have suggested the answer is yes.[141] But analysis of the public financing currently offered by U.S. state governments offers a note of caution. Despite their titles, many of these so-called "innovation" incentives have little to do with promoting novelty or inventiveness, and come with relatively stringent job creation requirements attached to them.

Why is this happening? One hypothesis is that states, as opposed to the national government, can't internalize the benefits of new ideas, so seek localized benefits to justify their expenditures.[142] But the answer may not just be localism. At least some federal innovation incentives also show a tendency to reward job creation versus true innovation. Instead, the more likely culprit is rent-seeking. On the demand side, companies seek rents in the form of business subsidies; on the supply side, pandering politicians supply them, but attach job creation requirements to make them more politically palatable.[143] While it's theoretically possible for innovation incentives to achieve both goals—innovation and jobs at the same time—there appears to be an inherent conflict here. Innovation and jobs have historically been seen as inimical to one another. Many famous inventions in the patent record, from steamboats to self-service kiosks, have been associated with some level of technological unemployment.[144]

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[141] *See supra* notes 11-20.

[142] For this argument, *see* Camilla Hrdy, *Patent Nationally, Innovate Locally*, 31 BERKELEY TECH. L. J. 1301 (2017).

[143] *See* STEARNS ET AL., *supra* note 37, at 656-660.

[144] Hrdy, *IP and the End of Work*, *supra* note 29, at 334-335. I call this "technological un/employment," to emphasize the job creation, as well as the job loss, that can come with a new technology. *Id.* at 309-310.

The lesson is two-fold. For state policymakers, the lesson is that they should probably be quite wary about conflating innovation and job creation goals when designing incentives. At least, they should consider more transparency for taxpayers and greater candor in communicating their goals: be honest about the fact that these are (at best) jobs programs, instead of hiding behind labels like "Innovation Voucher," "Innovation Accelerator," "Innovation Incentive Program, or "Proof of Concept Fund."

For IP scholars, the lesson is that they should be mindful of the political realities in which a given incentives program is designed, and its impacts for innovation policy. This is true both for non-IP incentives and also perhaps with respect to IP itself. We tend to assume IP law is more resilient to rent-seeking for a variety of reasons—in particular because, with IP, innovation is not directly funded by general taxpayers.[145] Yet it is not clear there is anything truly special about the mechanism of exclusive rights that immunizes politicians from the impulse to reward short-term goals and tout the job creation potential of government programs.[146] IP scholars have hardly ignored political incentives and rent-seeking that shape IP systems. For instance, Dan Burk and Mark Lemley's book on patents argued that the U.S. Patent Office has been captured by hard-lobbying industry groups who urge stronger patent rights, and that this affects the scope of those rights.[147] It could be a good idea to consider more broadly how other political pressures, in particular the goal of job creation, shape IP systems as well.

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[145] *See* Part IV.

[146] *Cf. Intellectual Property and the U.S. Economy: 2016 Update* (ECONOMICS & STATISTICS ADMINISTRATION/U.S. PATENT AND TRADEMARK OFFICE), 2016.

[147] DAN BURK & MARK LEMLEY, THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT (2011). *See also, e.g.*, Landes & Posner, *supra*, at 408-409 (discussing lobbying for stronger patent and copyright terms).

APPENDIX

State	Program Name	Provider	Policy Objective	Job Creation Considered (Y/N)	Details of Job Creation Criteria	Website
Alabama	Innovation Fund	Alabama Department of Commerce	To "maximize the use of the State's economic development resources by leveraging annual research and development expenditures by public institutions of higher education to generate high technology resources which can be used to support economic development activities."	Y	Projects applying to the Research Program for funding are reviewed for several criteria including, "Possibility of future job creation" and "Positive contribution to State's economy."	http://alepscor.org/alabama-innovation-fund/ Program discontinued. Details on file with the author.
Alaska	Emerging Energy Technology Fund Grant Program	Alaska Energy Authority	To "promote the expansion of energy sources commercially available to Alaskans."	None indicated	"Projects can either: test emerging energy technologies or methods of conserving energy; improve an existing technology; or deploy an existing technology that has not previously been demonstrated in the state. EETF grants must be for demonstration projects of technologies that have a reasonable expectation of becoming commercially viable within five years. Energy technology can include technologies related to renewable sources of energy, conservation of energy, enabling	http://www.ak-ea.org/Portals/0/Programs/Grants%20and%20Loans/EEFT/EETFFactSheetApr2019.pdf?ver=2019-06-19-134404-843 http://www.ak-ea.org/Portals/0/Programs/Grants%20and%20Loans/EEFT/EETFProjectUpdatesFeb2016.pdf?ver=2019-06-21-112636-297

					technologies, efficient and effective use of hydrocarbons and integrated systems."	
Arizona	Arizona Innovation Accelerator Fund (AIAF)	Arizona Commerce Authority	"The goal of this program is to stimulate financing of small businesses and manufacturers, while fostering business expansion and job creation in the state of Arizona."	Y	Eligibility includes "potential to create or retain employment opportunities for Arizonans."	http://www.azcommerce.com/programs/arizona-innovation-accelerator-fund http://www.azcommerce.com/media/392619/AICFundProgram.pdf On file with author.
Arkansas	Technology Development Program	Arkansas Economic Development Commission/ Science & Technology Authority	"To assist in commercializing new technology-based products and processes through technology development activities."	Y	Application criteria include "job creation potential"	https://www.arkansasedc.com/docs/default-source/s-t/tdp_rules08.pdf?sfvrsn=f30f323f_2
California	Energy Innovations Small Grant Program	California Energy Commission	"The Energy Innovations Small Grant (EISG) Program provides up to $150,000 for hardware projects and $75,000 for modeling projects to small businesses, non-profits, individuals and academic institutions to conduct research that establishes the feasibility of new, innovative energy concepts."	N	No job creation goal or eligibility criteria indicated	https://energyarchive.ca.gov/research/innovations/

Colorado	Advanced Industries Accelerator Programs	Colorado Office of Economic Development and International Trade	"To support job creation and innovation…in one of Colorado's seven advanced industries," such as Advanced manufacturing, Aerospace, and Bioscience.	Maybe	Program goal includes to "support job creation"	https://chooseecolorado.com/doing-business/incentives-financing/advanced-industries/
Connecticut	Connecticut Bioscience Innovation Fund (CBIF)	Connecticut Innovations	To "speed commercializable bioscience breakthroughs to market."	Y	Application requires answering the question, "As a result of Bioscience funding, how many anticipated future jobs will this project create, and over what timescale?"	https://ctinnovations.com/obtain-funding/venture-solutions/connecticut-bioscience-innovation-fund/ ; http://ctinnovations.com/wp-content/uploads/2017/05/Revised-Bioscience-Fund-Academic-Full-App-v3.9-FINAL.docx

Delaware	Delaware Technical Innovation Program (DTIP)	Delaware Economic Development Office	To support "business research through funding transition grants that will bring innovative new products, jobs and revenue to Delaware."	Y, probably	For each grant, the Office collects records on Jobs to be created; Total jobs to be created and maintained	https://business.delaware.gov/wp-content/uploads/sites/118/2017/09/FY16CDF-Summary-Report-14Oct16.pdf
District of Columbia	District of Columbia Innovation Finance Program	Department of Insurance, Securities and Banking	To "assist small businesses and entrepreneurs who were adversely affected by the economic recession of 2008 and the credit crisis that followed."	Y, probably	Enhanced Investment available if certain economic development goals are met, e.g. business "hiring targets residents and [the] hard to hire."	https://disb.dc.gov/page/dc-bizcap-innovation-finance-program
Florida	Innovation Incentive Program	Florida Department of Economic Opportunity	"To ensure that sufficient resources are available to allow the state to respond expeditiously to extraordinary economic opportunities and to compete effectively for high-value research and development, innovation business, and alternative and renewal energy projects."	Y	Application must include: "The number of net new full-time equivalent jobs in this state the applicant anticipates having created as of December 31 of each year in the project and the average annual wage of such jobs."; "The total number of full-time equivalent employees currently employed by the applicant in this state, if applicable." ; There is also a (waivable) minimum wage requirement for the jobs: "The jobs created by the project must	http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=0200-0299/0288/Sections/0288.1089.html

					pay an estimated annual average wage equaling at least 130 percent of the average private sector wage."	
Illinois	Invest Illinois Venture Fund	Illinois Department of Commerce and Economic Opportunity	To, for example, "[a]ccelerate the commercialization of research discoveries and growth of start-up companies in Illinois" and "[c]reate sustainable high-paying jobs"	Y	"Supports early stage companies which hold promise for job creation"	http://www.libertyville.com/DocumentCenter/View/12560/Invest-Illinois-Venture-Fund
Iowa	Iowa Innovation Acceleration Fund	Iowa Economic Development Authority	"[P]romotes formation and growth of businesses that engage in the transfer of technology to [facilitate] competitive, profitable companies that create high-paying jobs."	N	None indicated	https://www.iowaeconomicdevelopment.com/Entrepreneurial/SSBCIInnovation
Kentucky	High-Tech Pool Funding Resources	Kentucky Economic Development Finance Authority (KEDFA)	"To build and promote technology-driven and research-intensive industries by recruiting and retaining high-tech companies that produce jobs, new products and services, and develop new and improved processes."	Y	"In order to participate in this program, a company must create a minimum of seven new, high-tech full-time;(Kentucky resident);jobs within three years and maintain those positions for three additional years."	http://thinkkentucky.com/kyedc/pdfs/KBIFactSheet.pdf?21
Maine	Seed Grants	Maine Technology Institute	To "support entrepreneurs/companies who are engaging in Research and Development activities leading to commercialization or follow-on funding."	Y	Projects are assessed for "creation or retention of jobs"; awardees must have "definitive plans to create and/or retain quality jobs in Maine."	https://www.mainetechnology.org/wp-content/uploads/2015/05/Seed-Grant-Application-Instructions-rev-APR-2018.pdf

Maryland	Seed Investment Fund	Maryland Technology Development Corporation (TEDCO)	To "support certain types of Maryland companies in their effort to develop and commercialize new technology-based products"; to "increase the companies' valuation and lead to follow-on investment, sustainability, and job creation."	Y	The funded company must have "the potential to grow the Maryland economy and create jobs."	https://www.tedcomd.com/funding/seed-fund This program was discontinued. The prior eligibility criteria are on file with the author.
Massachusetts	InnovateMass	Massachusetts Clean Energy Center (MassCEC)	Purpose is to "accelerat[e] the success of clean energy technologies, companies and projects in the Commonwealth—while creating high-quality jobs and long-term economic growth for the people of Massachusetts."	Y, probably	Evaluation criteria include: "Demonstration of meaningful economic development impacts to the Commonwealth resulting from successful completion of the proposed project." A primary goal of MassCEC is "creating high-quality jobs and long-term economic growth for the people of Massachusetts."	http://www.masscec.com/innovatemass http://files.masscec.com/2%20-%20InnovateMass%20VI-b%20RFP.PDF
Michigan	Michigan Emerging Technologies Fund	Michigan Small Business Development Center (MI-SBDC)	"To encourage companies to pursue SBIR/STTR grants and contracts, increase Michigan's competitiveness in obtaining SBIR/STTR funds, increase commercial success of Michigan SBIR/STTR projects, and stimulate early stage technology investing activity in Michigan."	Y	ETF Award Recipients must provide yearly reports describing, among other things, the "number of jobs created" and the "number of jobs retained"	https://www.mietf.org/#/content/etf-guidelines
Minnesota	Innovation Voucher Award Program	Minnesota Department of	To "to help businesses purchase technical assistance and services	None required	Eligibility criteria state that "the business is not	https://mn.gov/deed/newscenter/social

		Employment and Economic Development	from Minnesota-based public higher education institutions and non-profit entities to assist in the development or commercialization of innovative new products and services."		required to have any employees"	-media/deed-developments/?id=1045-348705 This program was discontinued. The prior eligibility criteria are on file with the author.
Missouri	Missouri IDEA (Innovation, Development, and Entrepreneurship Advancement) Funds	Missouri Department of Economic Development	To "promote the formation and growth of businesses that engage in the transfer of science and technology into job creation."	Y	The High-Tech Industrial Expansion Fund (one of four IDEA programs) "supports industrial expansion efforts in Missouri that result in significant capital investment and high-paying jobs in its targeted biotech and high-tech clusters with an emphasis on those that leverage Missouri's rich agricultural history."	https://ded.mo.gov/financial-professional-services/incentives-financing/loans http://www.missouritechnology.com/docs/idea-funds/idea-one-pager.pdf?sfvrsn=2
Montana	Montana Board of Research and Commercialization Technology Trust Fund (MBRCT)	Montana Department of Commerce	To encourage "economic development through investment in research projects that" have "a clear path to commercialization."	None indicated	N/A	http://marketmt.com/MBRCT
Nebraska	Nebraska Research and Development (R&D) Grant	Nebraska Department of Economic Development	Offers "Nebraska businesses a matching competitive grant for research and development activities done in conjunction with a Nebraska college or university." Research	None indicated	N/A	https://opportunity.nebraska.gov/program/nebraska-academic-research-and-development-grant/

			"should be directed toward," inter alia, "[c]ommercialization of new projects" and "Improvement of existing processes that may provide a new source of revenue to Nebraska businesses."			https://opportunity.nebraska.gov/wp-content/uploads/2017/05/NEDED-Academic-RD-Grant-Guidelines.pdf
Nevada		Nevada Governor's Office of Economic Development (GOED); and Battle Born Ventures	Battle Born Ventures "cannot invest in Startups based outside of Nevada, or operating in industries outside of the target ones listed above, for instance, neither a Californian firm nor a retail store would fit our mandate." Battle Born Ventures, moreover, prioritizes "companies whose high-growth products and services have an enduring sustainable advantage over competitors, that have traction with customers, and that have teams with a proven track record in their industry."	None indicated; but there is an implicit requirement of job creation.	To the extent that Battle Born Ventures doesn't invest in companies based outside of Nevada, there is an implicit requirement of job creation or, at a minimum, job retention in Nevada.	http://www.diversifynevada.com/programs/technology-commercialization/
New Hampshire	Granite State Technology Innovation Grant	New Hampshire Innovation Research Center	To "support innovations through industry and university collaborations, thereby increasing the number of quality jobs in the state."	Y	Criteria for selecting projects includes answering "Will this project:" "Create jobs?"	http://www.nhirc.unh.edu http://www.nhirc.unh.edu/succes-criteria.html

New Jersey	Edison Innovation Fund	New Jersey Economic Development Authority	"The Edison Innovation Fund seeks to develop, sustain, and grow technology and life sciences businesses that will lead to well-paying job opportunities for New Jersey residents."	Y	Requirements for obtaining funding through an Edison Innovation Fund program includes: "Company must employ 75% of its W-2 employees in New Jersey or commit to growing 10 high-paying jobs over two years (minimum salary of $75k)."	https://www.njeda.com/technology_lifesciences/edison-innovation-fund; https://www.njeda.com/financing_incentives/technology_lifesciences/edison_innovation_fund/Edison-Innovation-VC-Growth-Fund-(1)
New Mexico	Innovation Vouchers	Technology Research Collaborative and the New Mexico Economic Development Department	"[T]o enable early stage science and technology companies to overcome business development barriers."	None indicated	N/A	https://gonm.biz/business-development/edd-programs-for-business/office-of-science-technology/new-mexico-innovation-voucher https://gonm.biz/uploads/documents/programs/Innovation_Voucher_Nov2018.pdf
New York	Matching Grants Leverage Program	Empire State Development's Division of Science,	"[T]o attract more federal R&D funding to support technology development	Y	Application requires applicant for grant to "Describe any potential economic	https://esd.ny.gov/doing-business-ny/innovatio

		Technology, and Innovation (NYSTAR)	and commercialization efforts in New York State."		impacts or opportunities this project may lead to (for example: anticipated jobs created/retained (both academic and private industry) ... Provide both short term (less than five years) and long term (up to 10 years) impacts especially if the project is in the early stages of development)…"	n-development-support https://esd.ny.gov/matching-grants-leverage-program https://esd.ny.gov/sites/default/files/MatchingFundsApplicationFormE.PDF
North Carolina	One North Carolina Small Business Program	North Carolina Department of Commerce, Office of Science, Technology, and Innovation	"[H]elps small businesses develop and commercialize innovative technologies to benefit the general population. In the process, it helps high-tech businesses attract more funding to the state—keeping home-grown technologies in North Carolina and creating more well-paying jobs."	None indicated, though a goal is to foster job creation	A stated purpose is to "foster job creation and economic development in North Carolina by increasing the competitive position of North Carolina small businesses in attracting SBIR and STTR grant funding . . ."	https://www.nccommerce.com/grants-incentives/technology-funds/one-north-carolina-small-business-program https://files.nc.gov/nccommerce/documents/NC-Science--Technology Grants-Management-Documents/SciTech/Solicitations/ONCSBP_Match_Solicitation_FY2019.pdf

North Dakota	ND Small Business Technology Investment Program	North Dakota Department of Commerce	"The Development Fund offers a number of flexible financing options for new or expanding primary sector businesses in North Dakota." ND Small Business Technology Investment Program lends to any start-up primary sector business in technology field	N, job creation is explicitly not considered	"Keeping pace with rapid changes in the technology arena and integrating those advances benefits all North Dakotans. North Dakota's IT industry contributes significantly to the state's overall growth and economic strength."	https://www.business.nd.gov/development_fund/NDDFPrograms/#NDDF https://www.business.nd.gov/development_fund/ https://www.business.nd.gov/technology/
Ohio	Innovation Ohio Loan Fund	Ohio Development Services Agency	"[P]romotes assistance to existing Ohio companies in developing next generation products and services within certain Targeted Industry Sectors"	Y	"[R]equires a commitment to create or retain jobs to the State of Ohio through the IOF Loan program." While there is not a specified dollar per job ratio, the number of jobs committed, as well as the annual payroll will be considered when determining the funding amount.	https://jobsohio.com/why-ohio/incentives/state-loan-and-grant-programs/innovation-ohio-loan-fund/ https://development.ohio.gov/files/otf/IOF%20Guidelines.pdf
Oklahoma	Accelerate Oklahoma! Fund	i2E; Oklahoma Center for the Advancement of Science and Technology (OCAST)	"[G]rowing innovative small businesses in Oklahoma and making a positive impact on the state's economy." "[T]o create more high paying jobs in Oklahoma while diversifying our economy."	Y	"The Accelerate Oklahoma! Program is designed to: invest in innovative startup companies that promise sustained revenue and increased employment."	https://i2e.org/about-i2e/; https://i2e.org/access-to-capital/
Pennsylvania	Keystone Innovation	Pennsylvania Department	Innovation Grants are to be used for the following	Y	"All grant recipients will be required to	https://dced.pa.gov/down

	Zone Innovation Grant Program	of Community and Economic Development	purposes: [t]o provide seed capital in the form of grants or loans for faculty and students to perform proof of concept efforts including business plan analysis, marketing analysis, prototyping, patent research and filing, intellectual property, licensing and royalty agreements and other uses to be approved by DCED upon request…" and "To provide seed capital in the forms of grants or loans for Keystone Innovation Zone companies that are licensing/ transferring technology from a Pennsylvania IHE, academic medical center and non-profit research institution."		provide semi-annual reports quantifying the progress toward accomplishing approved deliverables . . . The report template will include Innovation Grant impacts in the following areas… [including] Increased Employment . . . ."	load/innovationgrantguidelines-year-2009-archived-2/?wpdmdl=56043
Rhode Island	Innovation Voucher	Rhode Island Commerce Corporation	"Grants can be applied to: 1. support for commercialization of a new product, process, or service 2. access to scientific, engineering, and design expertise 3. scale-to-market development of your innovative idea"	Y	Rules and Regulations for the Innovation Voucher Program (870-RICR-20-00-4), 4.9C, state that a factor to be considered in in determining whether to award a voucher is the "potential for the Innovation Project to result in the creation of new full-time jobs[.]"	https://commerceri.com/innovation-incentives/ ; https://rules.sos.ri.gov/regulations/part/870-20-00-4
South Dakota	Proof of Concept Fund	South Dakota Governor's Office of Economic Development	Provides "up to $25,000 investments for eligible applicants to conduct research demonstrating the technical and economic feasibility of an innovation significantly enhancing the	Y	Application requires applicant to "Clearly identify the economic impact on South Dakota's economy in terms of job creation, partnerships with	https://sdreadytowork.com/about-us/public-records/proof-of-concept-fund/

			likelihood of commercialization of the innovation."		existing SD firms, etc."	https://sdreadytowork.com/wp-content/uploads/2019/06/South-Dakota-Proof-of-Concept-Application-2019.pdf
Utah	Technology Commercialization and Innovation Program (TCIP)	Utah Governor's Office of Economic Development	To "catalyze and enhance growth of technologies by encouraging interdisciplinary research activity and targeted areas, facilitating the transition of technologies out of the higher education to enhance job creation, and to support the commercialization of technologies developed by small businesses to enhance job creation."	Y	Assessment of job creation potential is mandated by statute: "In considering each proposal, the office shall weigh technical merit, the level of matching funds from private and federal sources, and the potential for job creation and economic development." Criteria for funding includes assessment of, *inter alia*, "Does the company's product, service, and market have a strong connection to leveraging the talent, industry, and other resources (the "cluster") within the state of Utah such that there is a strong probability that the company can grow in Utah, create jobs here, and stay here over the long haul?", "Is the sales model and technology scalable	https://business.utah.gov/tcip/ https://business.utah.gov/wp-content/uploads/2018/01/TCIP-Application-Review-Guidelines-FINAL-September-2016.pdf

					such that it could create rapid job creation in the state of Utah?" and "Why [sic] types of jobs are being created? Are they high-quality and high-paying jobs of the type we would like to create in Utah?"	
Vermont	ThinkVermont Innovation Grant Program	Vermont Department of Economic Development	"The ThinkVermont Innovation Grant Program is designed to fund projects in areas that have been identified as crucial to the growth needs of Vermont's small businesses."	Y	Areas that have been identified for funding include, among others, projects to "[p]rovide workforce training and recruitment [and to] [e]stablish or enhance a facility (co-working, makerspace, innovations center, etc.) . . . ."	https://www.thinkvermont.com/2018/10/25/innovation-grant-program/