ENTREPRENEURSHIP INCENTIVES FOR RESOURCE-CONSTRAINED FIRMS
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INTRODUCTION

How should entrepreneurship and innovation policy account for the fact that different firms have different access to capital? The firms that can more easily claim tax and other legal incentives targeted at encouraging innovation are often large established firms with ready access to capital. But there is no reason to think that large, established firms are best suited to the pursuit of entrepreneurial goals. To the contrary, new firms, such as resource-constrained startups, may have an advantage when it comes to pursuing entrepreneurship and innovation.[1]

The typical resource-constrained firm considered in this chapter is a new, loss-making firm. Legal incentives, including tax incentives, for entrepreneurial action often offer a deal that is unappealing to such a firm.[2] This is because such incentives often require an up-front investment in exchange for a delayed, uncertain payoff.[3] A firm must expend resources to respond to the law. But the legal incentives often do not offer any definite benefit, let alone any immediate benefit, in exchange for the up-front expenditure.

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[1] *See* Joseph Schumpeter, Business Cycles 93 (1939) (arguing that "new production functions do not typically grow out of old businesses" but acknowledging that "big … concerns [may be] shells within which an ever-changing personnel may go from innovation to innovation").

[2] Here, we mean targeted incentives, more than general rule of law policies that, for instance, protect private property. *Cf.* D. Gordon Smith & Darian M. Ibrahim, *Law and Entrepreneurial Opportunities*, 98 Corn. L. Rev. 1533, 1569 (2013) (claiming that "a legal system, in a macro sense, is crucial to entrepreneurship and emphasizing property rights as well as measures that "mitigate[e] the costs of failure" such as bankruptcy and limited liability provisions).

[3] *See* Susan C. Morse & Eric J. Allen, *Innovation and Taxation at Start-up Firms*, 69 Tax Law Rev. 357, 357 (2016) ("[C]apital-constrained startups will only use conventional income tax breaks in the event that they succeed and become profitable.").

This chapter focuses on policies under which government provides financial support for innovation.[4] The government could transfer support ex ante. The government could also provide ex post support, after a firm proves that an innovation has been successful.

The tax system has received increasing attention as a possible delivery mechanism for innovation benefits. It has been pointed out that the tax system could deliver benefits ex ante. For instance, it could use a full-offset income tax, in which the government transfers to firms reimbursement for a portion of their operating losses; [5] or it could use refundable tax credits.[6] However, in practice, these explicit ex ante mechanisms are not in place. As a result, the tax system is not systematic about its delivery of benefits ex ante as opposed to ex post.

Rather, the tax system delivers benefits ex ante to some kinds of firms, which is to say established firms with profit. Also, in some cases it allows loss firms to sell tax benefits to third parties. In other cases, and in particular for most tax benefits extended to new, resource-constrained, loss-making startup firms, the tax system only provides support ex post, in the future, and only in the event that the startup becomes profitable. This is because typically structured income tax benefits offset tax otherwise due on firm profit, such as traditional tax credits[7] or net operating loss deductions.[8]

In other words in practice, innovation-supporting tax policies generally require an up-front investment in exchange for an uncertain future payout for a loss-making firm. This policy design is the focus of this chapter. The engagement in this chapter with the problem of different access to benefits for different firms contrasts with the tendency in other literature to analyze tax benefits without considering differences in access to capital.[9] In addition to

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[4] *See, e.g.*, Ian Ayres & Amy Kapcyznski, *Innovation Sticks: The Limited Case for Penalizing Failures to Innovate*, 82 U. Chi. L. Rev. 1781, 1790 (2015) (distinguishing ex ante "government grants" and ex post government-paid "financial inducement prizes" from innovation incentives that "make information more excludable").

[5] *See* E. Domar & Richard Musgrave, *Taxation and Risk-Taking: An Expected Utility Approach*, 56 Q. J. Econ. 388 (1944) (providing a theoretical analysis of the effect of an income tax with full loss offset on risk taking).

[6] *See, e.g.*, Daniel J. Hemel & Lisa Larrimore Ouellette, *Beyond the Patent-Prizes Debate*, 92 Tex. L. Rev. 303, 311-13 (analyzing "stylized" "refundable tax credits").

[7] *See, e.g.*, Michael J. Graetz & Rachael Dowd, *Technological Innovation, International Competition, and the Challenges of International Income Taxation*, 113 Colum. L. Rev. 347, 352-55 (describing research and development credit benefits).

[8] *See* I.R.C. § 382 (providing for deductibility of net operating losses and also for limitations on such deductibility in the case of events such as a change in the ownership of the firm).

[9] *See, e.g.*, Hemel & Ouellette, *supra* note __, at 311-13 (analyzing "stylized" "refundable tax credits"); Shawn P. Mahaffy, Note, *The Case for Tax: A Comparative Approach to Innovation*

having relevance for tax policy decisions, the points made here also shed light on the interaction between capital market access and policy design for other areas of innovation policy.[10]

The financial planning tool of discounted cash flow analysis offers a way to measure the value of the investment when an up-front amount is invested in exchange for an uncertain future payout. Such an analysis reveals that a similar investment will be less valuable to a resource-constrained startup than to an established, profitable firm. This is so for two reasons.

The first reason is that a resource-constrained startup firm likely has a high discount rate.[11] Such a firm frequently faces uncertainty about future results, or even survival. Profit may arise only if the firm survives and so an ex post tax incentive may be valuable only if the firm survives. These factors mean that a future payoff for such a firm must be sharply discounted, and will be worth less than it would be in the hands of a profitable, established firm.

The second reason is that, because capital is often available to a resource-constrained firm in discrete portions, a resource-constrained firm such as a startup generally faces a zero-sum tradeoff between seeking legal incentives for entrepreneurial activity and funding otherwise advisable business spending now.[12] Without continuous access to capital, the firm cannot fund all investments whose return exceeds a certain discount rate. Instead of funding all projects with positive net present value, it must choose the project(s) with the greatest positive net present value.[13] The resource-constrained firm may therefore refuse to fund some legal incentive investment projects even if they have a positive net present value.

These problems that resource constrained firms face when they pursue legal incentives for innovation may sometimes simply be a disadvantage of a

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Policy, 123 Yale L. J. 812, 813 (2013) (arguing that tax "[s]ubsidizes experimentation" while patent protection "[s]ubsidizes success"); Jacob Nussim & Avraham Tabbach, *Tax-Loss Mechanisms*, 81 U. Chi. L. Rev. 1509, 1544-45 (2014) (arguing that offset, transferability, or refundability rules for tax losses can achieve similar results and admitting only a small exception for "last-period losses" under an offset regime).

[10] For instance, patent law and other policies that seek to adjust the market incentives for producing intellectual property also face decisions about the up-front investment level that will be required to claim benefits and about the timing of benefits that may be delivered.

[11] A typical measure of a firm's discount rate is the rate that an investor would charge to invest in the firm or in a similarly risky project. *See* Richard Brealey, Stewart Myers & Franklin Allen, Principles of Corporate Finance 109-11 (12th ed. 2016).

[12] Brealey & Myers 5.4.

[13] *See* Brealey et al., *supra* note 11, at 119-22.

particular innovation policy, which should be accounted for together with all of the other costs and benefits of the policy. Using government benefits such as those delivered through the tax system, to promote innovation is not a presumptively good idea. The unevenness of the ability of taxpayers, for example, to use traditional tax benefits is a disadvantage of using tax benefits to promote innovation.

Sometimes, however, a policy maker may wish to go forward with a policy. In this case the law might mitigate the problems posed by firms' different resource constraints. If it is desirable to design an innovation policy with resource-constrained firms in mind, at least three strategies should be considered.

First, the policy might minimize the transaction costs required to enter into a particular program or offer a staged structure in which incremental investments are required to sustain the option of benefiting from the program. Second, the timing of the benefits might be shifted so that they are delivered earlier. Third, third parties might be allowed to finance the investment in exchange for sharing the benefit of the legal incentives.

This chapter first sets forth how an established firm might decide whether to pursue a certain legal incentive based on whether the project has a positive net present value. It outlines why resource-constrained firms with high discount rates and a high probability of failure are less likely than established firms to pursue legal incentives. Finally, it presents design ideas that can mitigate the problem that different firms have different access to capital and thus different capacity to pursue incentives offered by innovation policy.

I. Evaluating Legal Incentives With Net Present Value Analysis

A. An Established Firm With a 5% Discount Rate

A large majority of firms reportedly use net present value analysis and/or its cousin, internal rate of return analysis, when considering investment decisions.[14] Both techniques rely on the idea of time value of money. They discount future cash flows, or in other words adjust the cash flows to present value dollars, in order to measure the value of a project. When a firm decides to make an investment in a project that will pay off with future legal incentives, it can similarly consider the value of this payoff using discounted cash flow analysis.

[14] Brealey & Myers 5.1.

The discount rate is the rate that an investor could earn on an asset with risk similar to that of the project.[15] If the firm is large and established, the risk of the investment in legal incentives is likely to be lower compared to the risk of such an investment if the firm is a startup. For instance, if the legal incentive comes in the form of tax savings, the applicable discount rate takes account of the likelihood that a firm will be profitable enough to utilize the tax savings. A more established firm is more likely to be able to use the tax savings.[16]

Assume for the sake of illustration that an investment in a legal incentive undertaken by an established firm should be evaluated using a discount rate of 5%, because that discount rate reflects the rate of return an investor could earn on a similar-risk project. Assume further that the investment will cost $30,000 at the beginning of Year 1, and that the investment will have a payoff of $100,000 at the end of Year 5. The net present value[17] is about $48,000.

If the 5% discount rate represents not only the rate of return an investor could earn on a similar-risk project, but also the rate at which the firm can borrow in capital markets, then the project appears to be worthwhile, as it returns more than the cost of borrowing. "Soft" budget constraints such as the internal project budgeting process may make the practicalities of accessing capital markets to finance a legal investment problematic for any firm, even an established firm.[18] Nevertheless, a firm with borrowing capacity has a clear incentive to make an investment that gives a rate of return that exceeds the borrowing rate. This is consistent with the idea that firms should finance all projects with positive net present value.[19]

B. A Resource-Constrained Firm with a 25% Discount Rate

A firm that is not as established may also consider investing in the same project that will produce a payoff in the form of a legal incentive. One important difference compared to the established firm is that the investment of the less-established firm in a project that would produce a legal incentive is more risky

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[15] Id.
[16] *See* E. Cary Brown, Tax Incentives for Investment, 52 Am. Econ. Rev. 335, 338 (1962) (explaining that for a profitable firm, an income tax cut could be expressed as equivalent to an interest rate cut that would affect the present value calculation for an investment).
[17] I.e., in dollars at the start of Year 1.
[18] *See, e.g.*, Timothy F. Malloy, *Regulating by Incentives: Myths, Models, and Micromarkets*, 80 Tex. L. Rev. 531, 574 (2002) (arguing that large established firms ration capital because of internal information and incentive problems).
[19] Brealey & Myers 5.1

than the same investment undertaken by the more established firm. The less established firm is more likely to fail; and a failed firm no longer exists, and generally cannot claim a legal incentive. Also, some incentives, like income tax incentives, depend on profitability; and a less established firm is less likely to become profitable.[20]

The increased riskiness of an investment in a legal incentive at a less-established firm means that such a firm should use a higher discount rate to calculate the present value of the investment. To illustrate, assume, as in the above example, that the cost of the investment is $30,000 at the start of Year 1 and that the payoff of the investment is $100,000 at the end of Year 5.[21] But assume a discount rate of 25%, rather than 5%, to account for the greater risk of the investment in the resource-constrained firm's legal strategy. The net present value equals about $2800. Compared with the more established firm, the less established firm has less reason to undertake the project.

One might think that the less established firm should still undertake the project, since it has positive net present value. Even if the less established firm must borrow at the high rate of 25% interest, it will still have a project with positive net present value, and therefore one worthy of investment. But the idea that such a firm will fund all projects with positive net present value also breaks down, because such a firm typically faces resource constraints, as explored below.

C. Resource Constraint and Choosing Among Investments

The lack of access to capital markets yields a resource constraint known as a capital constraint. Established firms may face internal controls that produce "soft" budget constraints.[22] Emerging firms are more likely to face "hard" budget constraints. This means that access to capital markets is blocked not just be internal procedure but also by information barriers that produce an illiquid market.[23]

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[20] *See, e.g.*, Myron S. Scholes, Mark A. Wolfson, Merle Erickson, Michelle Hanlon, Edward L. Maydew & Terry Shevlin, Taxes and Business Strategy 126-27 (5th ed. 2015) (illustrating how tax rules disadvantage new companies with net operating losses). There may be some incentives, such as small business incentives, that are more likely to pay off in less established firms. Even so, within a subset of firms capable of claiming such incentives, the riskier firms will be less able than the more stable firms to predict that they will benefit.

[21] Note that various costs of pursuing legal incentives could be independent of the size of the firm.

[22] *See* Malloy, *supra* note __.

[23] Some empirical evidence supports the idea that "small and young firms" are more capital constrained due to "asymmetric information in capital markets." Carlos Carriera & Filipe Silva, *No Deep Pockets: Some Stylized Empirical Results on Firms' Financial* Constraints, 24 J. Econ. Surveys 731, 735 (2010). The information barriers could result simply because it is more costly to

Many startups, for instance, instead of having continuous access to capital (at whatever rate), instead raise discrete portions of equity capital in a lumpy fashion. This allows external investors to require the satisfaction of certain benchmarks as a prerequisite to additional capital and to adjust terms based on changed information.[24] Studies of startup finance generally assume successive stages of success, consistent with the idea of discontinuous access to capital.[25]

The ability of such firms to raise this capital is often plausibly unaffected by their investment in legal incentives. In other words, investors care about firms' satisfaction of business objectives such as revenue goals or product development rather than about the firm's pursuit of legal incentives. The custom of valuing firms based on revenue or on operating income measures such as EBITDA[26] confirms the importance of business success rather than legal planning. Often, a legal incentive strategy that might provide savings in the future is not the driving force for a current business investment; rather, business performance drives an investment decision.

Raising discrete portions of capital produces successive resource constraints for a firm. The resource constraints force the firm to choose among projects. Under conventional net present value analysis, it will choose the project(s) that produce the highest net present value. For instance, assume a resource-constrained firm that might invest in the legal incentive outlined above, which costs $30,000 and has a net present value of about $2800.[27] The firm will

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research small and new firms. Arrow's information paradox offers a related theory: if firms share their information with investors, they lose exclusive access to their intellectual property. *See, e.g.*, Kenneth J. Arrow, Essays in the Theory of Risk Bearing 152 (176) (noting that information's "value to the purchaser is not known until he has the information, but then he has in effect acquired it without cost").

[24] *See* Robert H. Keeley, Sanjeev Punjabi & Lassaad Turki, *Valuation of Early-Stage Ventures: Option Valuation Models vs. Traditional Approaches*, 5 J. Entrepreneurial & Smal Bus. Fin. 115, 121-25 (1996) (proposing a multistage call option valuation approach for startups).

[25] *See, e.g.*, Rafael Repullo & Javier Suarez, *Venture Capital Finance: A Security Design Approach*, 8 Rev. Fin. 75, 79 (2004) (describing three entrepreneurial stages: the "start-up phase," the "expansion stage" and the "cash-out stage").

[26] EBITDA means "earnings before interest, taxes, depreciation and amortization"). *See* Julia Grant & Larry Parker, *EBITDA! in* 15 Research in Accounting Regulation 205 (Gary G. Previts, Thomas R. Robinson & Nandini Chandar, eds. 2002) (describing and criticizing the uses of EBITDA, including in company valuation). EBITDA will account for legal incentives only if they are not delivered through the mechanism of taxes or other excluded items and are reflected in earnings. For instance, a legal strategy such as patent protection that reduces the chance of a future adverse litigation result will often not be reflected in current EBITDA (or most other current measures of income).

[27] Calculated, as above, at a 25% discount rate.

not fund that legal incentive project if some other project that costs $30,000 to invest in has a net present value that is greater than $2800.

In a recent paper, Eric Allen and I analyzed this zero-sum trade off using the illustration of an investment in a tax incentive that would reduce a firm's tax rate to zero in the event of any future profits. We assumed that a firm would choose between this tax planning investment and otherwise advisable business investment by selecting the investment with the largest net present value. The advantage of business investment, we suggested, was that more resources for business investment would translate into more time. In other words, the firm would have more time to seek the next stage of success, which in our illustration was marked by the next equity investment or by a successful exit from private ownership. In contrast, if a firm chose to invest in eliminating all future income tax, it would have fewer resources to invest in core business investment and less time to seek the next stage of success.[28]

We used assumptions that included an empirically supported negative exponential function for a firm's ability to secure additional investment over additional time.[29] And we showed that in some cases a firm would not invest in tax planning even if the investment had a positive net present value. For instance, we showed that a startup firm with a $100,000 endowment and a burn rate of $10,000 per month would not spend $33,000 to eliminate future income tax liability forever.

Our analysis illustrates that a resource-constrained firm is encouraged to invest in a legal incentive only if the investment beats out other investments, by showing a better net present value. In a resource-constrained firm, investing in a legal incentive can reduce the chance of business success, for instance by reducing the time a firm has to make it to the next stage of success. Some investments in legal incentives will not be funded, even if they have positive net present value.

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[28] See Morse & Allen, supra note __, at 368. The assumptions in our model included: rational, risk neutral firm managers; break point goals of VC funding and successful exit from private ownership; a finite endowment and set cash burn rate; a low probability of success; and external investment decisions that turn on business performance alone and not on tax planning. *See id.* at 363-65.

[29] *See id.* at 369-71.

II. DESIGNING LEGAL INCENTIVES FOR RESOURCE-CONSTRAINED FIRMS

A. Possible Responses When Firms Have Different Resource Constraints

The structure of requiring an investment now in exchange for a government-provided benefit later is a feature of many innovation policies, particularly in tax. The feature of delaying the benefit can be important and intentional. For instance, sometimes a delayed benefit supports a goal of only rewarding successful investments.[30]

But policies that require an investment now in exchange for a benefit later tend to favor established firms over resource-constrained firms. This is partly due to the higher discount rate of resource-constrained firms such as startup firms. It is also because of capital constraints that force resource-constrained firms to choose among projects, so that the firm will not fund all projects with positive net present value.

When a policy maker considers whether an entrepreneurship or innovation policy with an upfront investment and a delayed benefit makes sense, the unevenness of such a policy because of different firms' different access to capital investment is one factor that should be considered. Generally, it is not a point in favor of the policy. Favoring one firm over another can cause various distortive effects. As one example, favoring established firms over startups may have a large distortive effect on the labor market, so that established firms rather than startups will be able to hire the best talent. Targeted government support for innovation delivered through the tax code is not a systematically sensible policy.[31] Depending on other relevant factors, the unevenness of the policy as applied to different firms could be a cost that helps support the conclusion that the policy is unwise and should not be pursued.

When a policy's delayed benefit feature disadvantages resource-constrained firms, could this disadvantage be offset by other policy features?

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[30] Ayres & Kapzinski. Or sometimes it may facilitate a benefit paid for by a certain group, such as consumers of a successful product. This is a feature of patent protection. Hemel & Ouellette.

[31] *See, e.g.*, David Hasen, *Taxation and Innovation – A Sectorial Approach*, forthcoming, U. Ill. L. Rev. (2016) (emphasizing that special tax rules produce deadweight loss); Stephen E. Shay, J. Clifton Fleming, Jr. & Robert J. Peroni, *R&D Tax Incentives: Growth Panacea or Trojan Horse*, 69 Tax L. Rev. ___ (2016) (cataloguing and questioning tax incentives for research and development).

Sometimes a patchwork of benefits, some of which may support different types of firms, can succeed.[32] But it can be problematic to develop offsetting provisions that favor resource-constrained firms. Targeting such an offsetting provision at small firms or new firms, for instance, adds the problem of correctly identifying firms that deserve a boost to the problem of correctly identifying the innovation that the policy seeks to promote.[33] Underinclusion and overinclusion are sure to result.

Another alternative is to restructure the delayed benefit policy in a way that mitigates the disadvantage the policy presents to resource-constrained firms by adjusting the capital access parameters of the policy. There are at least three approaches. First, reducing or delaying transaction costs required to take advantage of a legal incentive can make it more accessible to resource-constrained firms. Second, government benefits can be provided earlier to resource-constrained startups as well as to established firms. Third, the government can allow firms to sell the rights to legal incentives to third parties.

B. Reduce or Delay Transactions Costs

When a firm decides to pursue a legal incentive, the required investment, or cost, of pursuing the legal incentive is more difficult for a resource-constrained firm to pay. The cost falls into several different categories. These include the cost of the business investment that fits the terms of the legal incentive; the cost of researching and complying with the terms of the law; and costs directly charged by the government in order to apply for the legal incentive.

To illustrate, assume that the legal incentive is a tax credit equal to a percentage of expenditures for a certain technology. One set of costs involves the costs the firm incurs in order to invent the technology – the salaries of its scientists, for instance. A second set of costs involves the fees, such as lawyers', accountants', and internal staff fees necessary for the firm to research and claim the credit. A third set of costs might be costs charged by the government for a

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[32] John M. Golden & Hannah J. Wiseman, *The Fracking Revolution: Shale Gas as a Case Study in Innovation Policy*, 64 Emory L. J. 955, 1020-21 (2015) (explaining how government support supported the innovation of fracking, including through private property rights, tax benefits, regulatory exemptions and investment in pipeline infrastructure, and arguing that the support was particularly important for natural gas producers who lacked "the comparatively generous research and development budgets characteristic of the majors").

[33] *See, e.g.*, Mirit Eyal-Cohen, *Legal Mirrors of Entrepreneurship*, 55 B.C. L. Rev. 719, 746 (2014) (arguing that no advantage in pursuing innovation supports a "historical preference for small firms" although such a preference is reflected in many different provisions of law).

ruling confirming that the costs undertaken by the firm qualify for the tax credit program.

The first set of costs, relating to subsidizing the cost of the business investment that meets the terms of the policy, is addressed below, in the next subparts of this Chapter.[34] But government could also make a legal incentive more attractive to a resource-constrained firm by reducing the second and third sets of costs. These are transaction costs, meaning the firm's costs relating to researching and complying with the law. They may be charged by lawyers and other service providers or by the government. The government might reduce the fees charged by lawyers and others by making the law simpler and/or easier to understand. It can also reduce government fees. Lowering transaction costs reduces the required up-front investment and eases the burden of resource-constrained firms relative to established firms in order to access the legal incentive.

As an example, consider the business entity income tax regime. It includes both entities that are "passthroughs," meaning that the entities themselves do not pay tax; and C corporations, which are subject to an entity-level tax. Pass through structures, including limited liability companies (LLCs) and S corporations, allow tax losses resulting from entity-level operations to pass through to equity owners. This can reduce the income tax owed by owners of the pass-through entity. This is advantageous for a loss-making startup firm.[35]

One can think of pass-through business structures as providing an incentive for innovative activity because these structures provide a mechanism for monetizing losses, which are disproportionately generated by risky and potentially innovative investments. Passthrough structures can improve the treatment of losses as between startup firms and established firms. Established firms can use their losses to offset income on other lines of business and thus reduce tax, even if they are organized as C corporations. Passthrough structures similarly allow the immediate use of losses generated by a startup firm, although by equity owners instead of the entity itself.[36]

Transaction costs are a consideration for firms considering organizing in a passthrough structure, but the tax rules have over time reduced the transaction costs. For instance, before 1958, the only way for a business entity to claim passthrough treatment was to organize as a partnership; various disadvantages

[34] *See* Parts II.C and II.D.
[35] *See infra* Parts II.C, II.D.
[36] This transfer of losses involves certain efficiency costs. *See infra* Part II.D.

attached to this, including possibly complex drafting and an absence of limited liability for equity owners.[37] But after 1958, S corporation status could reduce transaction costs for passthrough treatment for a narrowly defined type of simple firm. Eligible corporations must meet requirements including having only common stock and no corporate shareholders. They may elect S corporation and thus pass-through status by filing a simple form.[38]

The government has also taken steps to reduce the transaction costs required in order to organize as a partnership. Prior to the late 1970s, it was generally necessary to accept the disadvantage of unlimited liability for at least some partners in order to organize a firm as a partnership. Then, the limited liability company, or LLC, was invented.[39] Initially, a firm organized as an LLC could claim the tax advantage of pass-through tax treatment if it showed (often by obtaining a costly legal opinion) that it possessed two out of four characteristics of pass-through entities in order to be treated as a tax partnership. In 1996, a simpler "check-the-box" rule[40] replaced the cumbersome four-factor regulation, thus making it easier for a firm, including a resource constrained firm, to be taxed as a passthrough.[41]

As applied to startup firms, there is some indication that the rule, and other measures to make passthrough organization easier, has worked. For instance, new firms overwhelmingly organize as flow-through entities. But reducing transaction costs has not resulted in a de facto loss offset regime for all firms, either. For instance, firms that plan to seek venture capital financing historically have not used passthrough entity structures.[42]

Another approach to lowering the transaction costs of pursuing a legal incentive involves staging the required cost so that the required costs more closely corresponds to the firm's available resources. For instance, if the government charges a fee to apply for a certain legal incentive, it has a choice about whether to charge a larger fee at the beginning of the application process, or a smaller fee

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[37] *See* David R. Sicular, *Subchapter S at 55 – Has Time Passed This Passthrough By? Maybe Not*, 68 Tax Law. 185, 192-195 (2014) (giving early history of Subchapter S).
[38] *See* I.R.C. §§ 1361 et seq.
[39] *See* Susan Pace Hamill, The Story of LLCs: Combining the Best Features of a Flawed Business Tax Structure, in Business Tax Stories 295, 295-29 (Steven A. Bank & Kirk J. Stark eds., 2005).
[40] *See* Treas. Reg. §§ 301.7701-2, -3.
[41] *See* Heather M. Field, *Checking in on "Check-the-Box"*, 42 Loy. L. A. L. Rev. 451 (2009). There have been unintended consequences of the check-the-box rule, particularly as applied to established firms who undertake complex international tax planning *See* Lawrence Lokken, Whatever Happened To Subpart F? U.S. CFC Legislation after the Check- the-Box Regulations, 7 Fla. Tax Rev. 185 (2006).
[42] *See infra* notes 54-57 and accompanying text.

at the beginning of the application process and follow-on fees later in the application process. Charging a larger fee at the beginning of the application process will likely disadvantage the resource-constrained firm relative to the established firm. Charging a staged fee should help level the playing field.[43]

C. Make Benefits Ex Ante, Even for Resource-Constrained Firms

When established firms take risks and suffer losses, the government promptly steps in to cushion the blow. This is simply a function of how the income tax system works. So long as the firm has not only a loss-making sector but also a profitable business, the losses offset the profits from the other sector and reduce income taxes due. The benefit of a lower tax bill converts to cash within a year or so of the initial loss, when the related tax return is filed.

In contrast, when a startup firm that has never been profitable takes a risk and suffers a loss, the startup firm accumulates so-called net operating losses, or NOLs. These NOLs cannot be used to offset income, since the startup has no income from another line of business (and has never had any). Instead, the startup must wait to use its net operating losses. It must wait until it has profit, which might never occur, or might occur at a point far into the future.[44]

Consider an investment of $30,000 at the start of year 1 that produces a loss of $30,000 in year 1 for the firm. The established firm will see a lower tax bill, probably sometime in year 1 or year 2. It will be lower by an amount equal to the tax rate multiplied by $30,000, say 35% multiplied by $30,000, or $10,500. If the benefit translates into a lower cash tax amount due at the start of year 2, and the discount rate is 5%, the tax benefit of the loss has a present value benefit of $10,000 to the established firm.

In contrast, consider a startup firm that invests $30,000 at the start of year 1. Assume that if the firm succeeds it will have profit in year 10, and that, in order to reflect the high likelihood that it will not succeed and show profit at all, the appropriate discount rate is 25%. The benefit of $10,500 that may be realized in year 10 has a present value benefit of about $1100 to the startup firm – about a tenth of its value to the established firm, in this hypothetical.

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[43] The patent prosecution process provides an example of a staged fee approach. *See infra* note 64.

[44] *See, e.g.*, E. Cary Brown, *Tax Incentives for Investment*, 52 Am. Econ. L. Rev. 335, 336-67 n. 1 (noting that a small firm faces "considerable uncertainty" over the value of future depreciation deductions).

These differences are not supported by a theory as to why the present value of a benefit ought to be less than for an established firm. For instance, it has not been shown that the behavior of the startup firm is more elastic than that of the established firm and therefore can be influenced by a smaller payout. To the contrary, the frontloading of the benefit for the established firm means that the government is providing capital earlier to a firm that needs it less.

One solution is to change the timing of the benefit offered to the startup firm, in other words to offer it earlier. Perhaps the benefit should be offered at the same time as the established firm would enjoy the benefit. This would not eliminate the difference between the different firms' valuation of the benefit, but it would alleviate it. In the loss offset hypothetical presented above, if both firms received a benefit of $10,500 one year after spending $30,000, the present value of $10,500 would be $10,000 for the established firm with the 5% discount rate and $8400 for the resource-constrained firm with the 25% discount rate.

This tax benefit is enjoyed by profitable established firm because of the ability to deduct losses generated by investments immediately. One way to offer a similar benefit to resource-constrained startups is to extend a "full loss offset," or refundable income tax, to all firms. A "full loss offset" would give firms tax refunds in the amount of the tax rate multiplied by losses, even if the firm has no profit from other sectors. This is a solution often favored by economists as a method of increasing the amount of risk-seeking behavior (i.e., innovation).[45] But even all agree that the solution is efficient, a problem with a full loss offset is that it is expensive. Of course, the cost of giving tax refunds to loss companies could be offset somewhere else in the tax law. But the idea presents one or both of a daunting revenue loss disadvantage or a significant political economy challenge.

A related idea is to change the design of entrepreneurship benefits that are currently delivered via tax deductions or traditional, non-refundable tax credits. The change would convert them into refundable credits. It would be fairly straightforward to make such a change revenue neutral.

As an example, bonus tax depreciation schemes might aim to increase capital investment, including capital investment in innovative activities. The benefit of depreciation is a tax deduction that systematically favors profitable

[45] See, e.g., Domar & Musgrave, Proportional Income Taxation and Risk-taking, 58 Q. J. Econ. 388 (1944); J. E. Stiglitz, The Effects of Income, Wealth, and Capital Gains Taxation on Risk-Taking, ___ Q. J. Econ. 263 (___).

established firms over startup or other resource-constrained firms.[46] If the policy means to target resource constrained firms such as startup firms as well as profitable established firms, then a refundable tax credit, rather than bonus depreciation, would better advance the goal.[47]

A refundable tax credit would give a prompt benefit to all firms rather than making the tax benefit contingent on firm profit.[48] The refundable tax credit structure thus largely addresses the unevenness presented by different firms' access to capital. Note also that it need not cost more than the bonus depreciation scheme. This is because amount of the credit can be adjusted so that the revenue lost equals the revenue lost under the bonus depreciation scheme. For instance, percentage at which the credit is granted can be chosen so that the tax expenditure of the credit equals the tax expenditure of the bonus depreciation scheme.

D. Allow Firms to Transfer Benefits to Third Parties

The ideas of refundable credits and full loss offsets, explored above, would give resource-constrained startup firms government support earlier. These ideas aim to match the time at which a startup firm may claim these benefits to the time at which an established firm claims the benefits. The direct approach outlined above would change the time at which government delivered benefits directly to firms. However, political economy or other reasons may make it difficult to pay such benefits directly to a loss-making firm. If this is the case, then a less efficient alternative is to allow a resource-constrained firm to sell government benefits to third parties.

With respect to tax credits, a concrete and widespread practice of selling the benefits of credits to investors exists. The mechanism used to sell the tax

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[46] *See, e.g.*, E. Cary Brown, *Tax Incentives for Investment*, 52 Am. Econ. L. Rev. 335, 336-67 n. 1 (noting that a small firm faces "considerable uncertainty" over the value of future depreciation deductions).

[47] The tradeoff is between a smaller tax credit benefit offered to more taxpayers (i.e., including resource-constrained firms), or a bigger tax deduction benefit offered to fewer taxpayers. One point in favor of a refundable tax credit is that resource-constrained startup firms' investment decisions might be as elastic, or perhaps more elastic, than the decisions of profitable established firms. Another reason is that, under certain assumptions, a larger number of small subsidies generates less deadweight loss than a smaller number of large subsidies. *See* Lily L. Batchelder, Fred T. Goldberg, Jr. & Peter R. Orszag, *Efficiency and Tax Incentives: The Case for Refundable Tax Credits*, 59 Stan. L. Rev. 23, 46-48 (2006).

[48] There is still a delay of the period between the claiming of the expense and the filing of the related tax return to claim a refund, which might be about one year. It is possible to accelerate the delivery of government benefits still more, for instance by extending a reduction in payroll taxes due.

credits is a tax credit partnership. In a tax credit partnership, a firm engages in an activity that produces tax credits, such as the construction of low-income housing[49] or solar arrays.[50] Often, the firm's activity is loss making, certainly initially and perhaps indefinitely. Thus the credits could not be used if they were confined to the role of reducing tax otherwise due on the firm's business income.

Instead, in a tax credit partnership, the credits are allocated to the limited partners who are the "money" partners. The limited partners invest cash in the venture, and in exchange receive not only some portion of the return if the venture becomes profitable but also, in any case, the tax credits generated by the partnership's activities. These tax credits can be used to reduce the tax due on the limited partners' unrelated income, regardless of the source from which it was derived. The venture has in effect sold its tax credits to its limited partners.[51]

The tax credit partnership solution, under which investors in effect buy tax credits from firms, is a systematically inferior solution compared to granting refundable tax credits directly to firms. Buyers will not pay face value for such credits. This is in part because of transaction costs, such as the cost of forming a complex partnership investment vehicle. It is in part because a buyer must discount the value of the credit to account for the possibility that the buyer will not be able to use the credit.[52] Ideally, buyers who fully value the tax credits would populate the market. But so long as the market includes some buyers who are less likely to use the credits, these less enthusiastic buyers will depress the market price for the credits. The results is that the firm cannot capture the full face value of the credits, although the government may be required to pay out that full amount.[53]

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[49] *See* I.R.C. Section 42 (providing low-income housing credit); Treas. Reg. 1.42-4 (providing that profit motive is not a prerequisite to claiming low-income housing credit).

[50] *See* I.R.C. Section 46 (providing alternative energy credit). The credit was originally refundable for wind and solar projects, but the refundability feature was later repealed. *See* Thomas W. Giegerich, *The Monetization of Business Tax Credits*, 12 Fla. Tax Rev. 726-27 (2012).

[51] *See generally* Thomas W. Giegerich, *The Monetization of Business Tax Credits*, 12 Fla. Tax Rev. 709 (2012) (providing a history of tax credit partnership and other provisions designed to allow firms to monetize tax credits).

[52] *See, e.g.*, Alvin C. Warren Jr. & Alan J. Auerbach, *Transferability of Tax Incentives and the Fiction of Safe Harbor Leasing*, 95 Harv. L. Rev. 1752, 1774 (1982) (noting that absent a "complete program of transferability," investors in tax credit partnerships must "bear the risk of being unable to use the tax attributes in the future).

[53] This is similar to the problem observed in the municipal bond market, where the purchasers of municipal bonds have on average a lower rate than the top individual income tax rate. *See* Peter Fortune, *Municipal Bond Yields: Whose Tax Rates Matter*, 41 Nat'l Tax J. 219, 231 (1988) (finding that personal income tax rates affect municipal bond rates at the highest brackets, not confined to the maximum individual tax rate); Calvin H. Johnson, *Repeal Exemption for Municipal Bonds*, __ Tax Notes 1257, 1258 (Dec. 24, 2007) ("The purpose of section 103 is to

The idea of selling benefits to investors is relevant not only for tax credits, but also for tax losses. Flow-through entities enable the goal of transferring the benefit of losses from the firms that generate the losses to investors in the firms. When loss companies are organized as flow-through entities, such as partnerships or LLCs, owners of flow-through entities can claim the benefit of deductions arising from tax losses. In this way, the tax law of pass-through entities can support a de facto full loss offset regime.[54]

As in the case of tax credits, a regime that allows the effective sale of losses is less efficient than a direct loss offset regime. Firms will likely receive less value from investors in exchange for the losses than the government will be required to pay in foregone tax revenue when investors use the losses to reduce taxes on unrelated income.[55] Nevertheless, allowing firms to transfer the benefit of losses may be an appropriate second-best solution in some circumstances; and the existing passthrough business entity structure within the income tax code stands ready to support it.

There are several barriers to the transfer of the tax benefit of loss offset from passthrough entities to their owners. Presumably because of these barriers, at least in part, startups that seek venture capital financing historically have not organized as passthroughs, but rather have organized as C corporations with extremely limited ability to use NOLs. One barrier appears to be that passthrough entities, such as partnerships and LLCs, have irreducible complexity in their economic and governance logistics.[56] Another barrier is that the losses are not as valuable to all potential investors, since investors have different tax rates and in some cases investors' tax rate equals zero.[57]

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subsidize some borrowing, but the exemption wastes most of the federal cost because the intended beneficiaries cannot capture the cost.").

[54] *See* Julie Berry Cullen & Roger Gordon, Taxes and Entrepreneurial Risk-Taking: Theory and Evidence for the U.S., 91 J. Pub. Econ. 1479, 1480 (2007) (discussing the option value of first organizing as a pass-through in order to claim tax losses at higher individual rates and later incorporating to take advantage of a lower corporate tax rate on profits); *see also* Calvin H. Johnson, *Why Do Venture Capital Funds Burn Research and Development Deductions*, 29 Va. Tax Rev. 29, 40 (2009) (noting that if C corporations invested in startups (directly or indirectly) they might benefit from startuup losses).

[55] *See supra* notes 52-53 and accompanying text.

[56] *See* Joseph Bankman, *The Structure of Silicon Valley Startups*, 41 UCLA L. Rev. 1737, 1738 (1994).

[57] *See* Victor Fleischer, *The Rational Exuberance of Structuring Venture Capital Start-Ups*, 57 Tax. L. Rev. 137, 153-55 (2003) (explaining that investors generally cannot currently use losses due to rules applicable to different kinds of investors, including tax-exempt and foreign investors)

One limitation on the effective transfer of loss offset benefits to the owners of a pass-through entity is that a separate provision of tax law blocks the ability of passive, non-corporate investors to claim such losses. The so-called passive activity loss limitation suspends such losses (except to the extent of gains from other passive activities) until the related activity has been shut down.[58] Repealing the passive activity loss rules is one measure that could be taken to try to allow resource-constrained, loss-making firms such as startups to monetize tax losses currently and match established firms' capacity to monetize tax losses by offsetting them against unrelated income. It is difficult to predict the extent to which the repeal of the passive activity loss rules would motivate startups to organize as passthroughs, monetize losses, and use the resulting increased ex ante government funding to support innovation and entrepreneurship. But, the repeal of these rules is an example of a measure should help level the playing field by allowing resource-constrained, loss-making firms such as startups to monetize tax losses as established firms are able to monetize tax losses by offsetting the losses against unrelated income.

E. What if Ex Post Benefits Are Important to the Policy Goal?

Some of the ideas outlined above would seek to ease the disadvantage of resource-constrained firms compared to established firms by shifting the time at which the benefits were paid so that they were paid sooner rather than later. The suggestion to implement a full loss offset or a refundable tax credit not contingent on firm profit fits this description.[59] So does the suggestion to allow firms to transfer the benefit of firm losses to taxpaying investors through the mechanism of a passthrough entity, or to enable firms to sell the benefit of traditional tax credits to taxpaying investors through a tax credit partnership structure.[60]

It is not always consistent with an underlying policy to shift the payment timing of benefits so that the benefits are paid sooner rather than later. An ex post benefit that is contingent on profit gives the firm an incentive to make a success out of the product. Perhaps the government's innovation policy is a "prize" strategy that means to require proof of success before the payment of any benefits. Patent protection is a classic example of a prize strategy.[61]

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[58] *See* I.R.C. Section 469 (providing so-called "passive activity loss" restrictions on the ability of individual investors other than operator-owners in business activities to deduct losses from those activities).
[59] *See supra* Part II.C.
[60] *See supra* Part II.D.
[61] *See* Hemel & Ouellette, *supra* note __, at 333-34 (comparing ex ante and ex post incentives). Some tax benefits might qualify as prize strategies, such as capital gains tax breaks for small firms that have value only if equity in the firm is later sold at a profit. *See* I.R.C. Section 1202

If the government policy intends to deliver benefits only after ex post proof of success, then the policy should presumably be designed as a prize policy regardless of whether a firm is profitable or loss-making, established or a startup. Firm-level tax benefits, which are the kinds of benefits analyzed in this chapter, generally are not good choices for such a "prize" policy. This is because they give current benefits to profitable, established firms even though, under current law, such firm-level tax benefits can operate like prizes for loss-making, resource-constrained startups, since they are only valuable if and when the firm becomes profitable.

In addition, if the policy aims to provide a prize by delivering benefits ex post, then it is not advisable to make the policy more accessible to resource-constrained firms by accelerating benefits; shifting the timing forward would defeat a core design principle of the policy. Instead the policy needs to accept that resource-constrained firms may have less of an incentive to pursue the legal incentives offered by the policy compared to established firms with ready access to capital.[62]

Even where a core part of the policy goal involves the delivery of ex post benefits, one suggestion offered in this Chapter still has relevance for helping to mitigate the disadvantage faced by a resource-constrained firm. This is the suggestion that the policy could reduce the transaction costs of pursuing the legal incentives offered by the policy.[63] Reducing or delaying transaction costs, such as complexity and government fees, will tend to address the disadvantage faced by resource-constrained startup firms. The staged government fees charged in the patent prosecution process provide an example of a design that delays transaction

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(providing a 50% reduction in the capital gains tax due on certain sales of "qualified small business stock").

[62] One might consider expanding access to capital by allowing investors to buy a narrow interest in a resource-constrained firm's legal incentive strategy in exchange for all or a share of the return from the strategy down the road. There is some evidence of contractual sharing of tax savings, for instance in supercharged IPOs, *see* Victor Fleischer & Nancy Staudt, *The Supercharged IPO*, 67 Vand. L. Rev. 307 (2014); and so-called "Up-C" transactions, *see* Gregg Polsky & Adam Rosenzweig, *The Up-C Revolution* (working paper 2016) (describing tax receivables agreements in which owners of an LLC entity that is placed within a corporate structure receive the benefit of a portion of corporate-level benefits made possible by exchanges of LLC interests for corporate stock). It is possible that this kind of specialized investment would allow investors to become expert in, say, helping a firm to implement a certain legal incentive strategy or diversifying risk by investing in a large number of firms' legal incentive strategies. But investors would still face information problems and demand a much higher rate of return for an investment in the resource-constrained firm's riskier legal incentive planning, which continues to disadvantage the resource-constrained firm compared to the established firm.

[63] *See supra* Part II.B.

costs and thus may improve resource-constrained firms' access to the prize of patent protection.[64]

CONCLUSION

[To come.]

[64] *See* Michael D. Frakes & Melissa F. Wasserman, *Does Agency Funding Affect Decisionmaking? An Empirical Assessment of the PTO's Granting Patterns*, 66 Vand. L. Rev. 67, 78-79 (explaining that the Patent and Trademark Office (PTO) charges fees "at the time an application is filed … at the time a patent application is granted … and periodically over the lifetime of an issued patent). This structure may promote resource-constrained firms' access to patent protection, but it can also have other, adverse consequences. Frakes and Wasserman find that it biases the PTO toward granting, rather than denying, patent applications. *See id.* at 109.