



# How should taxes be designed to encourage entrepreneurship? ☆

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## ABSTRACT

This paper examines how tax policy should be designed to best encourage entrepreneurial activity in start-up firms. We begin by describing several presumed market failures affecting entrepreneurial firms that would lead to an under-provision of entrepreneurial activity: 1) information spillovers from innovations in entrepreneurial firms to other firms, 2) positive externalities to consumers from innovative new products sold by these firms, and 3) lemons problems in the market for both debt and equity issued by these firms. We then analyze the degree to which various tax policy measures can alleviate these failures. A key complication we focus on is the inability of the government to observe which, and the degree to which, any given start-up firm is entrepreneurial. This forces policy to target behavioral differences between entrepreneurial and non-entrepreneurial start-ups. We presume that start-up firms, to the degree they are entrepreneurial, face upfront costs in developing and marketing a new technology, and in the process face substantial risk. Our analysis then suggests the use of refundable tax savings from business losses in start-ups together with a compensating surtax on the profits of start-ups (needed in the case of lemons problems) to help alleviate the various market failures faced by entrepreneurial start-ups.

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## 1. Introduction

Economists have long presumed that there is too little entrepreneurial activity.<sup>1</sup> This presumption has justified a long history of attempts, both in practice and in the academic literature, to identify policies that will increase entrepreneurial activity. The objective of this paper is to explore how tax policy in particular can best be used to generate closer to the efficient amount of entrepreneurial activity.

The appropriate design of tax provisions to ease the problem of inadequate entrepreneurial activity inevitably depends on the specific sources of market failure leading to this under-provision. Various underlying market failures have been used to justify this presumption of insufficient entrepreneurship. One is the positive externalities generated from informational spillovers: When any given firm tries out a new product, a novel process, or even just a novel form of internal organization for a business, whether the attempt is successful or not, other firms can observe the outcome and use the resulting information to improve their

own productivity. This externality generates a social rate of return from entrepreneurship above the private rate of return to the entrepreneur.

Patents seem motivated by such informational spillovers: Patents provide protection from competition for a period of years in exchange for a public description of the firm's innovation intended to facilitate these informational spillovers. Yet patent protection, by giving the firm monopoly power in the market for its output, leads to inefficiently low consumption of the resulting product. Patent protection may also unduly restrict use of the new information in other products, given the threat of expensive lawsuits for patent infringement. The patent application process can also be very expensive and time consuming.

To what degree can tax policy be used instead, to at least partially internalize the positive externalities generated from innovative activity? Introducing tax incentives could allow an easing of patent protection (e.g. reducing the number of years of protection granted by a patent) while maintaining or even increasing the extent of entrepreneurial activity. By scaling back patent protection, its associated costs would then be eased.

A second type of market failure used to justify the presumption of too little entrepreneurial activity is utility gains to consumers from a new product. When a firm sells a new product, the firm inevitably faces a downward sloping demand curve, giving it market power (one source of market failure).

In addition, there are fixed costs in designing a new product. Entry is then profitable only if the resulting monopoly profits (while they last) in present value exceed these fixed costs. From a social perspective, though, entry is appropriate as long as the monopoly profits plus the

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<sup>1</sup> In this paper, we define "entrepreneurial activity" more specifically to be innovative activity undertaken in a start-up firm. Of course, existing firms can also pursue innovative activity. But the range of market failures and the policy options differ for new vs. existing firms. This paper focuses on the response to innovation in new firms.

increase in consumer surplus generated by the entrepreneur's efforts exceed the fixed costs of entry. The resulting insufficient entry of entrepreneurial firms is another source of market failure. Given these combined market failures, there will be too few attempts to design new products, and too few consumers gaining access to those new products that are developed due to monopoly pricing. To what degree can tax policy be used to encourage the design and sale of new products?

A third type of market failure that can be used to justify a presumption of too little entrepreneurial activity is a lack of access to outside financing by entrepreneurial firms, whether through the sale of equity or through borrowing. Without access to outside finance, an entrepreneur can pursue a new idea only if he or she has sufficient personal savings to finance start-up costs.<sup>2</sup> The failure rate among new firms is high, imposing as well substantial risk-bearing costs on an entrepreneur unless these risks can be shared with outside investors through the sale of equity in the firm.

A plausible explanation for this lack of access to outside finance is "lemons" problems arising from asymmetric information. Outside investors find it expensive to learn as much as the entrepreneur knows about the range of possible outcomes for the firm's new venture.<sup>3</sup> Asymmetric information then leads on efficiency grounds to too little entry, an inefficient allocation of the resulting risks, and less ambitious new projects.

A further challenge faced in the design of tax policy responses is how best to target tax policy towards those firms that are "entrepreneurial". Only a small fraction of start-ups generate non-trivial informational spillovers, or sell a category of product not already available to consumers. Most all new entrants will face problems with access to outside finance, whether from banks or from equity investors, if only due to asymmetric information about the ability of the manager. However, the severity of these lemons problems are likely much worse in entrepreneurial start-ups due to the large informational asymmetries about the chance of success of the previously untried projects being undertaken in entrepreneurial firms.

Of course, innovative activity occurs as well in large existing firms, and not just in start-ups. For a large existing firm, though, there is no way to distinguish income from innovative activity within the firm from income generated by production using existing technology. Start-ups, in contrast, tend to specialize in either new or existing technologies, opening up the possibility of a more targeted tax policy, the focus in this paper. In addition, existing firms are more likely to have the financial resources to implement and commercialize their innovations, avoiding market failures in the financial market. Given this, the policies aimed at stimulating entrepreneurial activity in start-ups would differ from policies aimed at encouraging innovative activity in large existing firms. We also share the common presumption that start-ups have the potential to be much more innovative than large existing firms (where technological change can undercut the value of existing assets), justifying the focus on start-up firms.

The starting point for the analysis in this paper is that tax policy cannot distinguish directly between entrepreneurial and non-entrepreneurial start-ups, or between entrepreneurial firms pursuing ambitious or relatively minor innovations. Instead, tax policy must rely on behavioral differences among these groups of firms in order to best target any interventions on (more) entrepreneurial start-ups.

<sup>2</sup> Important citations concerning the importance of liquidity constraints in limiting the number and scale of new entrepreneurial firms include Holtz-Eakin et al. (1994a, b), Evans and Jovanovic (1989), and Cagetti and De Nardi (2006). Even when financing for a new firm is limited to the assets of the entrepreneur, however, the entrepreneur may still borrow using owner-occupied housing as collateral, thereby converting an illiquid asset into liquid funds. Evidence for this role of housing collateral in enabling the observed borrowing by new firms include Black et al. (1996), Fairlie and Krashinsky (2012), Robb and Robinson (2013), and Schmalz et al. (2013).

<sup>3</sup> Entrants with the largest potential payoffs from outside finance may be willing to expend the resources needed to provide evidence on the expected profits for the firm in order to attract outside (venture capital) funding. However, only a tiny fraction of new entrants in practice attract venture capital funding (see Puri and Zarutskie, 2012).

What behavioral differences should we expect between entrepreneurial and non-entrepreneurial start-ups? For one, innovative activity is inherently a leap into the unknown, so that one attribute distinguishing an entrepreneurial start-up from a non-entrepreneurial start-up is the extent of risk taking. In our stylized model, we take this intuition to an extreme and assume that only entrepreneurial firms face risk.

Innovative activity also requires upfront investment both in the design of the new process or product and then in how best to manufacture and market this new technology. Motivated by this, we assume that entrepreneurial firms inherently face losses during their initial start-up phase, whereas start-ups using existing technology should be able to earn profits virtually from the beginning.

In trying to correct for each of these potential market failures, we focus on three possible tax provisions. One possible policy response is a differential tax rate on the profits earned by start-up firms.

A second possible policy response deals with the tax treatment of business losses. As of the 2017 tax reform in the U.S., firms can save taxes because of business losses only by offsetting these losses against the firm's profits in some other years. Many start-ups, though, fail with unused tax-loss carryforwards. Prior to the tax reform in 2017, non-corporate firms in the U.S. could deduct business losses from other personal income of the proprietor/partner. However, the progressivity of the personal tax schedule meant that taxes still discouraged risk taking. To what degree would more tax savings per dollar of losses be an effective tool to address the market failures described above?

A third policy we consider is a more favorable tax treatment of inputs employed in a start-up firm. For example, prior to the recent tax reform, the U.S. allowed expensing for up to a half million dollars of new investment per year by a firm, a provision that matters much more for smaller firms than for larger firms. Another U.S. practice is to give closely-held firms discretion in assigning a market value to shares (or options) issued to employees, a practice that reduces the tax liabilities on the resulting income.

Of course, many other policies in principle could differentially affect entrepreneurial and non-entrepreneurial firms. While our paper aims to shed light on the optimal use of this subset of possible policy responses, other types of policy responses might also be of use.

To what degree can this set of tax provisions be used to alleviate each of the market failures described above, generating greater informational spillovers, greater spillover benefits to consumers, more risk-sharing, and/or weaker credit constraints for entrepreneurial firms? In the process, though, to what degree would they distort choices made by non-entrepreneurial firms or alter the behavior of entrepreneurial firms in unintended ways?

Within the model, only entrepreneurial firms face risk and inevitably have tax losses during their initial start-up phase.<sup>4</sup> In contrast, both non-entrepreneurial and entrepreneurial start-ups can report profits. The model then shows that a more generous tax treatment of losses within a start-up firm is the policy that best addresses the market failures generated by both informational spillovers and externalities to consumers. This policy would reduce net-of-tax start-up costs, thereby raising the expected return to entrepreneurship. The higher expected return should induce more entry of entrepreneurial ventures, while the drop in start-up costs should encourage pursuit of more innovative projects. A lower tax rate on profits generated in a start-up firm, in contrast, encourages as well too much entry and production by non-entrepreneurial start-ups.

When a firm faces lemons problems in the equity market, leading to an inefficiently low reallocation of risk from a start-up firm to outside investors, the policy response suggested by the theory is to share more of the risk with the government through imposing a surtax on ex-post profits. This surtax, though, discourages entry of all start-ups. To counteract this distortion to entry decisions, the surtax on ex-post

<sup>4</sup> Lacking business-cycle fluctuations within the model, other firms with losses would quickly shut down.

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