

Taxes and Entrepreneurship

Roger Gordon, UCSD
Sarada, U Wisconsin

Presumption that there is too little entrepreneurship

- Presumption remains even given various non-tax policies such as patent law
- What is the appropriate role for tax policy in encouraging entrepreneurship?

Initial questions

- Who is an entrepreneur?
- What are the market failures that lead to too few entrepreneurs?

Who is an entrepreneur?

- Not directly observable
- Many implicit definitions have been used in the past:
 - Most common is: "self-employed individual"
 - But many self-employed are hardly "entrepreneurs"
- Theoretical definition used in this paper: Individual who starts up a new firm that pursues an innovative technology
 - Also an intensive margin: How innovative a project does each entrepreneur pursue?

What market failures lead to too little entrepreneurial activity?

- Informational spillovers to other firms
 - Implicit motivation for patents
- Spillover benefits to consumers
 - Occur when there are heterogeneous tastes for a new product
 - Can also arise due to incomplete patent protection

What market failures lead to too little entrepreneurial activity?

- Lemons problems in the equity market
 - Asymmetric information makes it hard to sell equity in a risky start-up
 - With more costly risk-bearing, there is less entrepreneurial activity.

What market failures lead to too little entrepreneurial activity?

- Lemons problems in the bond market
 - New firms find it hard to borrow during their first few years of existence.
 - Implies that only the richer individuals among those with good ideas can afford to become entrepreneurs.
 - Liquidity constraints further limit ambition of new projects.

Aim of paper

- Explore how tax provisions might best address each of these market failures in turn.
- Paper focuses on use of three different tax provisions
 - Separate tax rate on the profits of start-up firms
 - Separate effective tax rate on the losses in a start-up firm
 - Separate tax treatment of input expenses in a start-up firm (e.g. high tax rate with narrow base vs. low tax rate with a broad base)

Key complication driving analysis

- Presume that entrepreneurial firms are only a (small) subset of start-up firms.
 - Informational spillovers minimal for most start-ups, e.g. for a new local Thai restaurant
 - Consumer spillovers small for most new firms
 - Lemons problems minor for start-ups using existing technology:
 - Face much less risk, since known technology
 - Can borrow more easily, since physical capital much better collateral than new ideas
- Will assume no market failures for start-ups that use existing technology

Outline of presentation

- Start with a model of occupational choice, and choice of degree of innovation in any start-up firm, but with no market failures
 - What is the optimal choice for the above tax rates in this setting?
- Examine how forecasted policies change when add in turn each of the above market failures

Initial model

- Individuals choose among four different jobs
 - Work as an employee
 - Manage an existing firm
 - Manage a start-up firm that uses existing technology
 - Set up a new firm that first designs a new technology and then brings it to market

Decisions made by those running a start-up firm

- Degree of innovation, σ_i , where a higher σ_i implies greater design costs, a higher expected return, but more risk
 - If $\sigma_i > 0$, the firm is "entrepreneurial"
 - Otherwise the firm is using existing technology
- Fraction of equity, s_i , to sell to outside investors
- Amount to borrow
- Factor inputs

Pre-tax payoffs to each option

- Employee: w_i
- Manager of existing firm: η_i
- Manager of start-up firm: μ_i
- Entrepreneur:
 - First-period prototype design phase: $-\rho_i\sigma_i$
 - Second-period returns: $g(\sigma_i)\mu_i(1 + \sigma_i\tilde{\varepsilon}_i) > 0$, where $\tilde{\varepsilon}_i$ is entirely idiosyncratic risk

Possible tax provisions

- Except for start-up managers, all income taxed at rate t
- For start-up managers,
 - Profits taxed at rate βt
 - Losses deductible subject to rate αt
 - Inputs qualify for subsidy at rate ω

After-tax payoffs

- Employee: $(1 - t)w_i$
- Manager of existing firm: $(1 - t)\eta_i$
- Manager of start-up: $(1 - \beta t)\mu_i(1 + \gamma\omega)$
 - Here, γ equals input costs / μ_i
- Entrepreneur:
 - First-period return: $-(1 - \alpha t)\rho_i\sigma_i$
 - Second-period return: $(1 - \beta t)g(\sigma_i)\mu_i[1 + \gamma\omega - \theta_i(1 - s_i)^2\sigma_i^2]$

Individual behavior if no market failures

- $s_i = 1$
 - Gains but no costs from risk diversification
- First-order condition for σ_i :

$$g'\mu_i(1 - \beta t) \leq \rho_i(1 - \alpha t)$$

Optimal policies when no market failures

- Objective function: Sum of (certainty equivalent) incomes of individuals plus government revenue
- Optimal policies: $\alpha = \beta = 1, \omega = 0$
 - Optimal policies avoid production distortions by imposing a uniform tax on all source of income
 - No favoring of entrepreneurial (or start-up firms more broadly), in spite of innovations and all job "growth" occurring in start-up firms

Information spillovers

- Key assumption: Externalities from a firm equal to $e(g(\sigma_i) - 1)\mu_i$
- If everything observable, then the only change is to provide a subsidy to each start-up firm equal to $S \equiv e(g(\sigma_i) - 1)\mu_i$
- But $(g(\sigma_i) - 1)\mu_i$ is not observable.

Informational spillovers

- Efficiency now requires $g'\mu_i(1 + e) = \rho_i$
- Can be implemented by setting $1 + e = \frac{1-\beta t}{1-\alpha t}$
- To avoid distorting non-entrepreneurial start-ups, set $\beta = 1$ and $\alpha > 1$

Consumer spillovers

- Assume that the extent of spillovers, and therefore of externalities, is an increasing function of $(g(\sigma_i) - 1)\mu_i$
- Again, want to implement a subsidy of the form $e(g(\sigma_i) - 1)\mu_i$
- Can again do this by setting $1 + e = \frac{1-t}{1-\alpha t}$

Lemons problems in equity market

- For example, assume managerial skill, μ_i , unobservable to investors. Focus on a separating equilibrium where better managers keep a larger fraction of the shares
- Now, entrepreneurs bear too much risk, due to lemons problems, discouraging entrepreneurship
- Conditional on the allocation of risk, though, entry and innovation decisions are efficient

Lemons problems in equity market

- Respond by cutting tax rate on profits in a start-up firm??
 - Induces excessive entry by start-up firms
 - Net-of-tax risk faced by entrepreneurial firms goes up, since less risk absorbed by government
 - Equilibrium share of this higher risk absorbed by the entrepreneur unchanged (given the model), raising risk-bearing costs on net

First-best policy response

- If everything were observable, ideal would be to impose a surtax on $Y_i - EY_i$
 - No effect on decisions by non-entrepreneurial firms or by risk-neutral entrepreneurs
 - Risk-bearing costs fall
- While ex post income observable, though, expected income is not observable

Second-best policy response

- While cannot observe EY_i , can use input costs as a proxy for EY_i
- On net, forecast a higher tax rate on start-up firms but a narrower tax base for these firms to restore entry incentives.
- Trade off subsidy to inputs with risk-sharing benefits

Lemons problems in bond market

- Assume NO ability to borrow to finance first-period costs
- Decision to become an entrepreneur and to undertake a more innovative project now both constrained by personal assets
 - Yet entry decisions still efficient *conditional* on self-finance

Second-best policy response

- Relax liquidity constraints by raising α , thereby lowering after-tax start-up costs
- To avoiding distorting choice for σ_i , need the same increase in β
- To maintain undistorted entry decisions (on average) among start-up firms, again need a suitably narrower tax base, achieved through a more generous tax treatment of inputs.
- These policies again distort input choices, leading to trade-offs among these various distortions

Discussion

- Shared among the optimal responses to each of these four market failures is a more generous treatment of tax losses
- Yet current policies typically do not provide close to full-loss offset for tax losses, let alone a higher effective tax rate on losses than on profits. Why?

Potential problems when losses lead to tax savings

- Artificial losses, e.g. hobbies masquerading as for-profit firms
 - Leads to optimal $\alpha < 1$ in the initial model (ignoring market failures)
 - With market failures, want a higher α : First-order gains from greater entrepreneurial activity, but only second-order costs

Potential problems when losses lead to tax savings

- When $\alpha > \beta$, firms face various tax avoidance opportunities, e.g.
 - Invest in risky "financial assets"
 - Shift receipts into some years and expenses into other years
- Still have first-order gains and second-order costs
- Various supplementary policies often seen
 - Impose surtax on income from purely financial assets above some threshold
 - Favorable treatment of capital losses rather than of income losses

Summary

- When face a combination of the above four market failures, optimal policy will involve:
 - More generous tax treatment of tax losses
 - To help address two of the market failures, also want a compensating increase in the tax rate on profits of start-up firms combined with a narrower tax base in order to achieve the desired entry incentives for both entrepreneurial and non-entrepreneurial start-ups.

Summary

- Forecasted policies sharply contrary to standard recommendations
 - Forecast higher (rather than lower) tax rate on the profits of start-up firms
 - Forecast a narrower tax base on these firms