How Do Taxes Affect Entrepreneurial Activity?:
A Comparison of U.S. and Swedish Law

by

Julie Berry Cullen and Roger Gordon

The rapid economic growth and high incomes generated in Silicon Valley are the envy of other U.S. cities and states, and other countries. Certainly, Silicon Valley is not unique – the Boston area had a comparable concentration of high-tech activity around route 128 in the past. Other U.S. cities, such as Austin, Minneapolis, San Diego, and Raleigh-Durham also have large high-tech sectors.[1]

The envy of this activity is appropriate. The innovative activity that is at the heart of the economy in Silicon Valley not only generates high incomes for the successful firms and individuals, but also generates important externalities both within the local economy and more broadly. Other firms can learn simply from observing the outcomes for any given project which technologies work and which don't. This information is valuable in guiding them to imitate successes and avoid failures, not only generating economic benefits to these competing firms but also benefiting customers through a lower price for the new products. Since these spillover benefits are likely to be particularly large in the immediate geographic area, localities (countries as well as cities and states) have a legitimate incentive to actively encourage such entrepreneurial activity.

This raises the important question concerning how policies plausibly available to local and national governments affect the amount of high-tech activity. Ultimately, there will be a debate about the appropriate size of any subsidy, but there is a prior issue of what forms of subsidies work best.

---

[1] Atkinson and Gottlieb (2001) rank these metropolitan areas in the top ten according to the share of total employment in high-tech jobs.

One policy that has proven to stimulate high-tech activity in the past is direct subsidies to R&D activity. There is considerable evidence that such subsidies generate an increase in reported R&D activity.[2] There is also a documented association between R&D and subsequent productivity growth.[3] Yet, the relationship is far from deterministic. Sweden, for example, has a particularly high rate of R&D expenditures, yet has not had a particularly high economic growth rate in recent years.[4]

That the high-tech centers in the U.S. tend to be near universities with strong science programs suggests a direct spillover from academic research to commercial start-ups.[5] If so, this implies an important role for government financing for academic research in the sciences and policies encouraging more students to concentrate in the sciences.[6] But, if training in the sciences at educational institutions facilitates high-tech activity, why aren't more university cities able to duplicate the success of Silicon Valley?

The objective of this paper is to explore the role of income tax policy – a less direct but potentially equally influential policy instrument – in altering incentives to engage in innovative activity. To what degree does tax policy affect the incentives existing firms face to find and invest in new products or processes? How does it affect the incentives individuals face to start up new firms, rather than work as an employee for an existing firm?[7] How does it affect how ambitious (and risky) a project is pursued by start-up

---

[2] Hall and Van Reenen (2000) survey the existing econometric evidence.

[3] See Griliches (1998) for an empirical analysis of the link at the firm, industry and economy levels.

[4] Expenditure on R&D as a percentage of GDP averaged approximately 3.5 percent in Sweden over the period 1991-2002, compared to 2.2 percent for all OECD countries. In contrast, real GDP growth over the same period averaged 1.9 percent per year for Sweden and 2.5 percent for the OECD as a whole (OECD, 2005).

[5] The links between the key centers of high-tech activity in the U.S. mentioned above and local universities is clear. Bania et al. (1993) documents such an association holds generally across U.S. metropolitan areas, at least for some high-tech industries.

[6] The Bush Administration in the U.S. has just announced its intention to pursue policies that encourage students to major in math and science, for just these reasons.

[7] While in theory an individual can pursue the same idea for a new product/process in an existing firm as in a start-up, in practice it should be much easier to do so in a new firm. In an existing firm, the other personnel and the investors have human and financial capital tied up in established technologies, and can suffer a capital loss if these technologies become obsolete. Pursuing a new idea effectively can require different forms of internal organization and compensation packages than may be appropriate within an existing firm. For these reasons, we dedicate a disproportionate share of our discussion and all of the empirical analysis to the incentives faced in new start-up firms.

firms?

In this paper, we first describe the key aspects of the U.S. income tax system that can affect the incentives individuals face in each of these contexts, and compare these to salient provisions in the Swedish law. Some of the effects may be counterintuitive and depend on how various aspects of the tax code interact. For example, despite the popular view, the concentration of innovative activity in Boston, Minneapolis, San Diego and Silicon Valley certainly doesn't suggest that low personal tax rates are essential to stimulate innovative activity, since all of these States have unusually high personal tax rates. In fact, given the U.S. income tax system, high personal tax rates can be helpful in encouraging innovative activity.

Why? This result is driven in large part by the favorable tax treatment of business losses as compared to business profits when firms strategically choose their organizational form to minimize tax liabilities. Losses, if realized in the noncorporate sector, can be deducted against other personal income under U.S. law, generating sizeable tax savings. Profits, if realized in the corporate sector, are typically subject to low effective marginal tax rates. In general, any favorable or unfavorable asymmetry in the treatment of losses vs. profits can have an important effect on innovative activity, given the high risks involved.

After describing the potential role of taxes in affecting entrepreneurial choices across a wide range of organizational forms, we present empirical results analyzing how individuals actually respond to tax incentives affecting the formation of and degree of risk-taking in small start-up firms. In past work, we have estimated how a series of tax changes in the U.S. affected the amount of such entrepreneurial risk-taking, and found a high degree of sensitivity to tax incentives.[8] This empirical evidence is based on observed changes in the amount of innovative activity in response to changes over time and across people in the relevant tax incentives. Using these prior results, we report here the estimated sensitivity of the amount of innovative activity with respect to various aspects of the tax code.

---

[8] This discussion is based on our research reported in Cullen and Gordon (2005).

Our final objective is to gauge the degree to which tax incentives generate a difference in the amount of innovative activity between the U.S. and Sweden, and to identify which differences in the tax law are most important in generating these differences. Specifically, are there aspects of the Swedish tax code that unduly discourage innovative activity that might merit change? While we cannot pretend to be experts on the Swedish tax code, we select salient aspects of the current law and draw inferences about their potential effects from lessons learned from our analysis of the U.S. tax system.

1. Taxes and innovative activity

In this section, we provide a framework and intuition for how the tax structure as a whole can affect the incentives individuals and firms face to pursue innovative projects. There are many decisions that affect productivity growth, and taxes can affect each type of decision differently. So, we look at various specific decisions in turn, starting with the decisions of multinationals regarding where to locate innovative activity. We then look at how taxes affect the incentives of domestic publicly traded and closely held corporations to pursue innovative rather than less innovative activities. Finally, we examine the tax incentives an individual faces to form a start-up firm and to pursue riskier and more innovative projects. In each case, we compare the tax incentives under U.S. and Swedish law.

Taxes and innovative activity in multinationals

How does the tax structure within a country affect the amount of innovative activity undertaken there by multinationals? We consider three stages in turn. First, where does the multinational invest in R&D activity? Second, where does it locate the resulting patents, generating royalty income for that location? Finally, where does it make use of the information contained in the patent to invest in new technology? Taxes affect each of these stages in the innovative process differently. Each can generate externalities within

4

the country, and we speculate on the relative sizes of these externalities.

Consider first how taxes affect the location of R&D. For any given pretax expense for R&D, the after-tax expense to the firm depends on the domestic tax treatment of the resulting expenditures under each country's tax law. Based on tax incentives alone, R&D should end up being located in the country where the resulting tax savings are greatest.

The tax savings depend on the statutory corporate tax rate in the country, and the presence of any targeted tax subsidies to R&D.[9] The higher the corporate tax rate, the greater the tax savings from locating R&D in that country. A country also may provide tax relief in the form of allowances against taxable income or tax credits, providing further tax savings from locating R&D there. Unlike the U.S. and many other OECD countries, Sweden has not provided any additional tax relief for R&D during the recent past.[10] In determining the relevance of different countries' policies, an important additional consideration is whether the multinational has enough taxable profits from other activities in a given country to make use of the incentives there.

Where would the resulting patent be located? As discussed in Grubert and Slemrod (1998), based on tax incentives alone a multinational would gain by locating any patents in a tax haven. By doing so, other subsidiaries must make royalty payments to the subsidiary in the tax haven, shifting taxable income from highly-taxed to lightly-taxed locations. In the U.S. case, for example, multinationals often locate patents in Puerto Rico, where they have favorable tax treatment yet still are subject to U.S. laws protecting property rights.

Finally, in which country does the resulting production occur? Any profits left net of royalty payments would be taxable in that country. To the degree to which taxable profits remain high, even with royalty payments to a subsidiary abroad, then the

---

[9] The tax treatment of foreign-source income in the multinational's home country also affects the overall incentives to engage in R&D, though this home country tax treatment is shared by all potential locations for subsidiaries. The nature of the tax treaty with the firm's home country can vary by host country, however.
[10] A limited targeted tax reduction scheme for small and medium-sized enterprises has just been introduced in Sweden this year.

multinational would again want to locate production in a country with a low statutory tax rate. The relative costs of capital and labor inputs can also vary across countries due to differences in the effective corporate tax rate on capital investments. A high cost of capital creates a comparative advantage for labor-intensive industries, and conversely. New technology has commonly been much more capital intensive than prior technologies, so such investments would be discouraged in countries whose tax structure creates an unusually high cost of capital.

To what degree does each of these stages of production generate externalities? R&D per se can certainly generate externalities, though the sign of the externality is unclear. To begin with, the tax deductibility of R&D expenditures in itself creates a revenue loss, generating a negative externality to taxpayers. On the other hand, word of mouth can convey information about successful ideas coming out of R&D more quickly in the immediate area than elsewhere. By raising demand for scientists, more people in the local economy will choose to become scientists, and be in a position to generate new products/processes.

The decision to locate a patent in a particular country creates a positive fiscal externality, since the resulting accounting profits would be taxable there. The decision to locate production facilities in a country generates positive fiscal externalities through the same mechanism. The production facilities should also generate further externalities, since workers in the firm can see how production occurs and be in a position to open a competing firm, or one using a similar technology.

In sum, we expect that R&D occurs in countries with high corporate tax rates, while the patents and production will tend to be located in countries with low corporate tax rates. Given the plausibly larger positive externalities from production, low corporate tax rates should lead to more net benefits from multinational activity. Sweden's corporate tax rate of 28 percent is a bit below average among the OECD economies, giving it a slight tax advantage in attracting firms making use of new technologies.

Taxes and innovative activity in domestic publicly traded firms

How do taxes affect the relative attractiveness to domestic publicly traded firms of pursuing innovative vs. less innovative projects? Domestic firms, unlike multinationals, locate all stages of the innovative process in the same country, so the key choice for them is simply which type of activity to pursue.

As with multinational firms, the tax structure can affect a firm's cost of capital, so that high tax rates on capital income favor labor-intensive over capital-intensive activities. While production using the latest technology may be particularly capital-intensive, the research process is plausibly more labor-intensive, requiring human capital more than physical capital. The net effect of a higher corporate tax rate and cost of capital on the relative size of the high-tech sector is unclear. Regardless, Sweden's corporate tax rate is not out of line with that in other countries, so plausibly does not create important pressures one way or the other. However, Sweden provides less generous R&D tax incentives than other developed countries, so that the higher effective tax rate on industries with more R&D may shift domestic firms out of these sectors.

Given that innovative activity is risky, another avenue through which taxes can matter is by affecting the relative attractiveness of pursuing risky vs. less risky projects. Projects of both types must earn a risk-free return sufficient to compensate capital and labor inputs. A risky project, though, must earn enough more so that workers or outside investors are willing to bear the associated risk. Imposing a proportional tax on this random excess return over that available on a risk-free project is equivalent to sharing the risks with additional outside shareholders. Just as an outside shareholder would, the government receives a fraction of any extra profits and bears the same fraction of any shortfalls.[11] If the financial market has allocated risk efficiently across investors, then the market will compensate for any reallocation of risk by the government to preserve this

---

[11] The fraction going to the government depends on its tax rate, while the fraction going to outside shareholders depends on the fraction of shares they own. The risk-free return is taxable for both a risky and a risk-free project, so this tax does not affect their relative rates of return.

efficient allocation of risk. A proportional tax on the ex post return should then not affect the relative attractiveness of risky projects.

Existing taxes on the random excess return on a risky project are rarely proportional, though, due in part to the lack of full loss offset. In practice, firms that suffer a large enough loss on a project end up with overall tax losses under the corporate tax. If provisions allowing losses to be carried over to prior or future tax years do not ultimately allow the firm to recoup the same fraction of losses through tax savings as it would have paid in taxes on profits, then the lack of full loss offset discourages risk-taking. Similarly, if realized capital losses on sales of corporate equity cannot be deducted in full from taxable capital income, so that capital losses are not shared with the government in the same proportion as capital gains, then this asymmetry in the capital gains treatment again discourages risk-taking.

Holding constant the expected tax payments when the firm has profits, the degree to which the tax schedule is progressive should not affect the incentives to pursue innovative activity in a publicly traded firm. When shareholders are fully diversified, the cost to them of bearing the risky return on a project depends on the degree to which these returns come when the market as a whole is doing well or badly. Paying extra taxes is easier for the shareholder when he or she is rich rather than poor. However, while the return on an innovative project may be very risky, the degree to which a project is a success or failure is likely to be largely independent of the performance of the overall stock market. If so, all that matters for such well-diversified shareholders is expected taxes on profits, not the shape of the tax schedule.

On net, taxes discourage publicly traded firms from undertaking risky innovative projects primarily to the extent that the tax treatment of profits and losses is not symmetric. One feature of the Swedish system that is detrimental from this perspective is the restriction that firms can carry losses forward but not backward in time, so that the taxes saved on

8

excess losses are less valuable because they are deferred in time.[12] A second feature that works in the same direction is the limited deductibility of large capital losses.

Taxes and innovative activity in closely held corporations

How do these forecasts about the effects of taxes on a firm's incentives to engage in innovative projects differ if the firm is closely held?

Three new issues come up in considering the tax treatment of closely held corporations compared with publicly traded corporations. First, closely held firms are owned by just a few shareholders, and commonly these shareholders have a large fraction of their personal wealth invested in these firms. Second, closely held firms tend to be much smaller than publicly traded firms, and size alone can affect a firm's tax treatment. Third, since the owners of closely held firms also tend to be managers within the firm, they are in a position to reclassify their labor income as capital income for tax purposes. Consider each of these additional complications in turn.

First, that a firm is closely held strongly suggests a "lemons" problem in the financial market for shares in the firm. If all investors agree on the range of possible outcomes for the firm, then investors should in equilibrium be fully diversified across all risky investments, and no firms will be closely held. This will not be the case, however, if potential outside investors know less than the current owners about the future prospects for the firm. Then, investors may fear that insiders will be more likely to try to sell their shares when these shares are overvalued by the market. The fact that current owners want to sell sends a signal that discourages outside investors from buying. The result is a closely held firm owned mainly by those who can easily monitor the prospects of the firm, presumably individuals working in the firm or close relatives.

---

[12] Loss deductibility is made more complete than it otherwise would be by provisions that allow for shifting of profits between affiliates and across time through tax allocation reserves.

These owners will likely have a significant share of their own funds invested in the firm, and so will be highly dependent on the success or failure of the firm. The costs of exposing their families to such risks may be sufficient to discourage them from pursuing an innovative project even when the expected returns are high. A proportional tax reduces any extra profits and any extra losses on a risky project by the same amount, relative to the after-tax returns on a riskless project. This lessens the disparity in after-tax income across successful and unsuccessful outcomes. Risk-averse individuals find it less onerous to undertake small gambles than large ones, so that a proportional tax should increase willingness to take on additional risk when the firm's owners are undiversified. Through this channel, high tax rates may in fact encourage innovative activity among closely held firms by providing a means of sharing risk with the government when it is difficult to share risk with the market.

As noted earlier, however, existing taxes are not proportional. Firms with losses do not receive corporate tax rebates, and any tax savings resulting from tax-loss carry forwards are reduced in present value by the deferral. This is an even more important issue for owners of closely held firms than for owners of publicly traded firms. Since a large fraction of the owners' wealth is often invested in the firm, when the firm does badly the owners are doing badly overall. Any restriction on the deductibility of losses then harms these owners when they are most in need of help.

For any given tax treatment of losses, a progressive tax schedule on profits, holding expected taxes constant, should encourage risk-taking. With progressive rather than proportional taxes, the owners get to keep a smaller fraction of large profits but a larger fraction of small profits. If expected tax payments are held fixed, this is a trade-off that any risk-averse individual gains from making. If expected tax payments go up, though, in shifting to a progressive tax schedule, the extra taxes owed on profits along with no change in the taxes saved on losses discourage risk-taking.

The U.S. tax law has two special provisions affecting the taxation of capital gains on shares held in small firms that together provide an important asymmetry favoring risk-

taking by these firms. One provision cuts in half the tax rate on capital gains on shares held in small firms. The second allows capital losses on shares held in small firms to be deducted in full from ordinary taxable income, up to a fairly high limit. With a much higher sharing of capital losses than capital gains with the government, risk-taking is encouraged.

In Sweden, in contrast, capital losses result in tax savings in proportion to the 30 percent tax rate on capital income, or a reduced 21 percent tax rate if the losses are large enough.[13] Capital gains are again taxable at the tax rate on capital income unless they (together with past dividends) are larger than the allowed rate of return on capital invested in the firm. Excess capital gains are taxed at the average of the tax rates on capital and labor income. Together, these provisions create an asymmetry penalizing rather than encouraging risk-taking.

We now turn to the issue that closely held firms may be treated differently under the tax law simply because of their smaller size. In the U.S., as an example, the corporate tax schedule is progressive. The initial tax rate is only 15 percent, but increases in steps up to 35 percent when profits become high enough. A lower tax rate certainly raises the net-of-tax return on any investments in closely held firms. In particular, for any given tax treatment of losses, reducing the tax rate on profits encourages more risk-taking in small compared with large firms. In Sweden, in contrast, the corporate tax rate is proportional.

The remaining novel issue arising with closely held firms is that manager-owners can easily convert labor income into capital income when doing so is advantageous for tax purposes. Rather than paying wages to these managers taxable under the personal and payroll taxes, the firm can instead retain the income, so that it is subject to corporate taxes and then personal taxes on the resulting dividends or capital gains.[14] This conversion of labor income into capital income is attractive to the extent that the tax rate

---

[13] The maximum tax savings equal the initial amount of tax payments on earned income.

[14] In the U.S., the effective tax rate is lower on capital gains, discouraging dividend payments. In Sweden, a limited amount of dividend payments are tax-free (equal to seventy percent of the government bond interest rate times the book equity in the firm). Otherwise, as in the U.S., the effective tax rate is lower on capital gains.

on labor income exceeds that on corporate income, taking into account personal, corporate, and payroll taxes.[15]

In both Sweden and the U.S., most entrepreneurs will face higher tax rates on labor income than on corporate income, so would gain from such income shifting. There is no effective limit to such income shifting under U.S. law. In Sweden, though, to the extent that dividend and capital gains income generated from shares in a closely held business are high enough, any excess income is at least partly taxed as labor income.[16]

This opportunity to convert labor income into capital income lowers the effective tax rate on profits, in itself lowering the tax penalty to risk-taking. Similarly, when the firm has losses, it has an incentive to lower wage payments, converting highly taxed labor income into lightly taxed (or even untaxed) corporate income. Through this income shifting, losses generate more tax savings in a closely held firm than in a publicly traded firm.

In summary, risk-taking is encouraged by higher overall tax rates. To the degree that capital losses are shared less with the government than capital gains, however, risk-taking is discouraged. Facing a more progressive tax schedule on profits helps by lowering taxes when the individual is doing less well.

Taxes and innovative activity in start-up firms

When an individual first chooses whether or not to start up a new business, the choice goes beyond simply whether to pursue a risky vs. a less risky project. One additional consideration is the choice of organizational form, a choice ignored in the above discussion.

---

[15] Conversely, if the tax rate on corporate income exceeds that on labor income, then the firm can pay out all of its profits as wages, converting capital income into labor income.

[16] Under Swedish law, the maximum amount of dividend plus capital gains income on corporate equity that can be taxed as capital income equals the book equity owned by the entrepreneur times the sum of the interest rate on long-term government bonds plus .05. Any extra dividend income is taxed as labor income, while excess capital gains are taxed at the average of the rates on labor income and capital income. However, there is a maximum amount of capital gains income that can be reclassified as labor income.

How do taxes affect this choice of organizational form? So far, we have simply assumed that firms always operate as corporations. But particularly for a start-up firm, operating as a partnership or a sole proprietorship is a readily available alternative. Which choice makes sense on tax grounds?[17]

When a firm has profits, it has an incentive to seek out that form of organization where these profits face the lowest tax rate. In contrast, when the firm has losses, it has an incentive to choose that form of organization that yields the greatest tax savings as a result of the tax losses. Since the choice of organizational form potentially increases the sharing of losses with the government and lowers the fraction of profits going to the government, with this choice taxes are more likely to favor a risky over a less risky project. As long as the choice of organizational form changes under some conditions relative to what has been assumed above (always corporate), then taxes are more supportive of risk taking than found above.

To what degree does the tax treatment of profits and losses differ between proprietorships and closely held corporations? When are proprietorships favored for tax purposes?

In the U.S., noncorporate profits are taxable as ordinary income under the personal tax and also taxable under the payroll tax, whereas corporate profits are taxable under the corporate tax and then under the personal tax as dividends or realized capital gains.[18] Given the low initial bracket under the corporate tax,[19] and the very low effective tax rates on realized capital gains,[20] most firms save on taxes on net through incorporating

---

[17] Of course, there are a variety of nontax considerations affecting this choice as well. To begin with, corporate shareholders have limited liability whereas owners of a noncorporate firm do not. Our empirical evidence (reported in Cullen and Gordon (2005)) suggests that these nontax considerations are of minor importance, at least for small start-up firms.

[18] For tax purposes, receiving the income as capital gains is clearly preferable.

[19] In practice, firms with enough income to push them into a higher corporate bracket can often split into several separate corporations so that each one is taxed at the minimum corporate tax rate. See Sommerfeld and Jones (1991) for a discussion of how this can be done.

[20] Capital gains on equity in a "small" corporation face half of the normal capital gains tax rate, benefit from deferral and become tax exempt if the gains have not been realized at death. In addition, if the firm as a whole is sold, the buyer gets to write up the basis of the assets of the firm to their current market value for

when they have profits.

In Sweden, the comparison is more complicated. If the individual's tax rate on labor income exceeds the tax rate paid on profits earned within a closely held corporation, then the individual gains by setting up two firms. One, a noncorporate firm, should own all of the capital and earn profits at most equal to the imputed amount of capital income. These earnings are taxed as capital income, and avoid the double taxation of capital income earned within a corporation. However, if any further earnings were reported as noncorporate income, they would be taxable as labor income under the personal tax and also subject to payroll taxes. The individual does better by allocating any further profits to a closely held corporation. These profits are first subject to corporate taxes. Further personal taxes are minimized by retaining the profits, ultimately receiving them as realized capital gains.

What about when the firm has tax losses? In the U.S., if the firm chooses to be noncorporate, these losses can be deducted from other personal taxable income, providing an immediate tax savings.[21] If the firm instead incorporates, then no corporate taxes are owed.[22] However, realized capital losses when the shares in a "small" firm are sold (or written off) can be deducted against other personal taxable income, up to a maximum amount set in the tax law. Normally, the firm saves more on taxes by being noncorporate.

In Sweden, in contrast, there are limited means of saving taxes due to business losses, regardless of the choice of organizational form. If the firm is sold, generating a capital loss, then these capital losses result in tax savings in proportion to the tax rate on capital income.[23] Otherwise, business losses result in no immediate tax savings, though reduce the book equity within the firm. If the book equity turns negative, then the firm can

---

purposes of depreciation, providing a tax savings that roughly offsets any capital gains taxes owed.
[21] If, due to large business losses, the individual has negative taxable income, then "net operating losses" can be carried back or carried forward into other tax years.
[22] Losses can be carried forward and backward, and used to reduce taxable profits, if any, in other years.
[23] If the resulting losses are large enough, the tax savings equal 21 percent of the excess losses, up to a maximum equal to the taxes otherwise due on earned income.

reduce other capital income by a limited amount,[24] resulting in some tax savings.

On net, in the U.S. the choice of organizational form provides a valuable opportunity to avoid personal plus payroll taxes, converting this income instead into lightly taxed corporate income. In addition, the deductibility of noncorporate losses under the personal tax implies that start-up firms are much less constrained by no-loss-offset provisions under the corporate tax than are larger firms that inevitably remain corporate. In Sweden, in contrast, the opportunities to gain through the choice of organizational form are more limited.

Given that an entrepreneur chooses an organizational form to minimize taxes, to what degree is self-employment income per se taxed more favorably than wage and salary income and/or passive income from financial investments? To what degree does the tax system affect the attractiveness of risky vs. less-risky projects?

Consider first the relative tax treatment of labor and capital income received by employees compared with the tax treatment of self-employment income, even ignoring risk. In the U.S., wage and salary income is subject to both personal and payroll taxes. By becoming self-employed, the individual can instead pay taxes on this income at the corporate rate, plus further taxes on realized capital gains. The resulting tax savings from reclassifying labor income as corporate income can be substantial. In addition, income from capital invested in a small business is taxed at least as favorably as income from passive financial investments. On net, there is a strong tax incentive encouraging self-employment.

In Sweden, the opportunities to save on taxes through becoming self-employed exist but are much more limited.[25] What tax provisions would yield the same net tax treatment for self-employment income as that faced by employees who invest in financial assets, and

---

[24] The reduction in other capital income at most equals the sum of the government bond rate plus .01 times the (negative) book equity in the firm.

[25] In addition, the self-employed are not eligible for certain social benefits available to employees, such as unemployment benefits. While also to some degree true in the U.S., the far more generous programs in Sweden make these differential benefits more of an issue there.

how do these provisions compare with actual Swedish tax law?   For an employee, wage and salary income is taxed as labor income while income from financial assets is taxed at a flat capital income tax rate of 30 percent. If the individual's entire income were simply reclassified as self-employment income, then the individual would be left with just the same net-of-tax income (though after portfolio readjustments) if the risk-free interest rate times the capital stock were taxed at this 30 percent tax rate while the remaining income were taxed at a flat rate equal to the average tax rate the employee would have faced on labor income. This remaining income consists of the original labor income plus any difference in the return to capital from the risk-free return. The only change from the tax treatment of an employee is then that the excess return on capital is taxed at a rate different from the original 30 percent. However, the tax rate on this excess return has no net effect on the possible net-of-tax returns individuals can earn, if they can flexibly adjust their portfolio, leaving them with the same after-tax income they would have had as an employee.[26]

In contrast to such provisions, under actual Swedish tax law the imputed capital income is higher, equaling the amount invested times the sum of the government bond rate *plus* an extra five percent. This implies that by investing more in the firm the individual is able to convert some labor income into capital income. However, when self-employment income net of imputed capital income is negative, this amount is not deductible against other earned income for tax purposes, contrary to the above neutral tax structure.

Taxes can also affect the incentives to pursue more risky activities. Risk-taking is discouraged for a risk-neutral individual to the extent that the tax rate on profits is higher than the fraction of losses shared with the government. Consider the incentives faced by an individual in the top tax bracket in either the U.S. or Sweden.[27]

---

[26] If the tax rate were higher, the distribution of possible excess returns is shrunk proportionately towards the risk-free rate, exactly as would have occurred if the individual instead had reduced the amount invested in risky assets. To offset this net reduction in risk-taking, the individual can expand the fraction of her portfolio invested in risky activities to yield the same net-of-tax risk taking as faced as an employee.
[27] According to the U.S. data, a substantial fraction of entrepreneurial income is received by individuals who would have been in the top tax bracket had they instead been an employee.

Under U.S. law, if a firm has losses, it will choose to be noncorporate so that the losses are deductible against other taxable personal income. The fraction of the losses shared with the government then equals the top personal tax rate, which currently equals 35 percent. If instead the firm has profits, then on tax grounds the firm should incorporate so that these profits are taxed at the corporate tax rate, with further capital gains taxes due when the gains are realized. Special tax provisions imply both a low corporate tax rate and a low capital gains tax rate on investments in a small corporation, yielding an effective tax rate of roughly 17 percent.[28]

Under Swedish law, losses result in tax savings in proportion to the tax rate on capital income if the entrepreneur realizes the capital loss on her business. The government then absorbs at best 30 percent of these losses. For an entrepreneur in the top tax bracket, profits should end up being reported as corporate income so would be subject to corporate taxes plus future capital gains taxes, implying an effective tax rate of roughly 44 percent.[29]

For individuals in the top tax bracket, risk taking in start-up firms is heavily subsidized in the U.S. but tax penalized in Sweden.

For a risk-averse individual, taxes have further effects on the net costs of risk-bearing arising from self-employment. Risk-averse individuals would be particularly concerned to reduce the size of any large losses they might face if they become self-employed. Here, there is somewhat greater cushioning of large losses in the U.S. than in Sweden for the richest entrepreneurs, with normally 35 percent of losses shared with the government in the U.S. and at most 30 percent in Sweden.

---

[28] The corporate tax rate for a small firm, assuming it can easily divide into several corporations to take full advantage of the initial bracket under the corporate tax, is 15 percent. The statutory capital gains tax rate on equity in small businesses is 7.5 percent. Feldstein, Dicks-Mireaux, and Poterba (1983) argue that the savings from deferral and possible exemption of the gains if the shares are still held at death reduce the effective capital gains rate to about a quarter of this, yielding an overall tax rate of .15+(1-.15)(1-.25*.075).

[29] The corporate rate is 28 percent. The statutory capital gains tax rate is the average of the tax rates on capital income and labor income, so roughly 43 percent, though this rate should be reduced roughly in half by deferral to an effective rate of about 22 percent. The overall tax rate is then .28+(1-.28)*.22, or about .44.

Evidence on the importance of taxes for entrepreneurial activity in the U.S.

In Cullen and Gordon (2005), we focused on the effects of the U.S. tax law on the incentives faced by individuals to create a start-up firm engaged in risky innovative activity. By deriving more formally the effects of the tax structure on entrepreneurial risk-taking, we found that tax effects can be summarized by three different terms.

One term measures any difference in the tax treatment of labor and capital income received as an employee investing in the financial market compared with the tax treatment of the equivalent income coming through a firm set up by the individual. To the extent that the firm pays less in tax, perhaps through the appropriate choice of organizational form, then self-employment activity of any sort is encouraged.

The second term focuses on the asymmetric tax treatment of gains and losses that might arise due to the project. To the extent that gains are taxable at a low tax rate and losses can be deducted from taxable income that would have been taxed at a high tax rate, taxes encourage risk-taking, and conversely.

The final tax term captures the degree of risk sharing with the government. This term only enters for firms that are not able to diversify their risks with outside investors through the financial market. A high overall tax rate, by reducing the amount of risks faced by a risk-averse entrepreneur, makes it easier to undertake a risky project.

Cullen and Gordon (2005) then use these expressions to test empirically for the role of taxes in affecting the amount of risk undertaken by self-employed individuals, using tax return data on several million individuals covering twenty-two years between 1966 and 1993. The data suggest that behavior in fact is very sensitive to the tax law.

To give a sense of the estimated sensitivity of the amount of risk-taking in small

businesses to tax incentives, we used these prior results to simulated how the amount of risk-taking would change in response to a variety of different changes in tax rates. For example, starting from the U.S tax law in 2005, we simulated how behavior would change if the tax rates in each of the tax brackets under the personal income tax were increased by five percentage points. Here, we forecast that entrepreneurial activity would have increased by almost 90 percent. Given U.S. law, entrepreneurs would tend to report losses under the personal income tax, but profits under the corporate tax. A higher personal tax rate provides more sharing of losses with the government. In addition, it lowers net-of-tax wage and salary income, while not much affecting any profits from self-employment that are reported as corporate income, making self-employment activity more attractive. Both effects encourage more risk-taking.

We next simulated the impact of increasing the corporate tax rate by five percentage points. Since business profits are largely subject to the corporate tax, increasing this tax rate discourages entrepreneurial risk-taking. We forecast that risk-taking falls by over a fifth.

Business profits are also subject to capital gains taxes under the personal tax, so that any increase in the capital gains tax rate that applies to equity in small firms should also discourage entrepreneurial activity. We forecast that if this tax rate were raised from the current statutory tax rate of 7.5 percent to 15 percent (the rate on other capital gains), then entrepreneurial activity would fall by about 5 percent.[30]

Fundamental tax reform is very much under discussion in the U.S. and in many European countries, particularly given the adoption of a flat tax in some Eastern European countries. We therefore tried simulating the effects of adopting a flat tax in the U.S. on entrepreneurial activity. In particular, we simulated the effects of imposing a flat tax at a 19 percent tax rate (a rate chosen to leave overall tax revenue unchanged) on both personal and corporate income, while otherwise leaving the definition of taxable income

---

[30] The effect is so small in part because we assumed that the effective tax rate is reduced to a quarter of the statutory rate, following the argument in Feldstein, Dicks-Mireaux, and Poterba (1983).

unchanged. We forecast that on net entrepreneurial activity would increase by about 5 percent.[31]

Swedish tax rates differ dramatically from those in the U.S. We do not feel we yet know enough of the details in the Swedish tax law to attempt to simulate the incentives under actual Swedish law. Instead, we tried simulating the effects of adopting in the U.S. some salient elements of the Swedish tax code, while leaving the rest of the U.S. tax code in place.

To begin with, we imposed the Swedish tax rates on corporate, personal, and capital gains income, while leaving U.S. tax law otherwise unchanged. In particular, we set the corporate tax rate equal to 28 percent, the effective tax rate on capital gains equal to half (due to deferral) of the average of the tax rates on capital and labor income, and then imposed the Swedish personal income tax schedule, correcting for exchange rate differences. On net, we forecast that entrepreneurial activity would jump dramatically, to 2.6 times the level in the U.S. Much of this effect is coming from the very high personal tax rates, which create strong incentives to shift into entrepreneurial activity in order to escape these high rates. The high tax rates in Sweden per se do not seem to explain the perceived lack of entrepreneurial activity.[32]

In this simulation, however, we continue to follow U.S. tax law in allowing noncorporate business losses to be deducted in full against other taxable income under the personal income tax, allowing for carryback/carryforward of any "net operating losses" not currently resulting in tax savings, and allowing the realized capital loss on equity in a small business to be deducted from personal taxable income. Tax savings arising from business losses are much more limited in Sweden. Our empirical estimates suggest that entrepreneurial activity is particularly sensitive to the tax treatment of tax losses, since

---

[31] This small net effect hides larger offsetting changes. In particular, the reduction in the personal tax rate for those previously in higher tax brackets discourages their entrepreneurial activity, while the increase in the personal tax rates for the rest of the population has a more than offsetting positive effect.

[32] Note that our forecasts are intended to measure the amount of entrepreneurial risk-taking relative to the wage and salary income the individual would otherwise have earned, and they ignore any changes in the interest rate. As such, they ignore any effects of the high tax rates on overall labor supply or savings, so ignore any effects of these taxes on the overall size of the economy.

these losses occur when the individual most values any extra income. We therefore added to the prior simulation our interpretation of the tax savings that are available in Sweden on business losses, in particular assuming that individuals can realize these capital losses and then receive a tax credit equal to the size of the capital loss times .3 against their personal tax payments, as long as they still owe personal taxes on net.[33] Taking into account this limitation on the tax savings arising from business losses relative to U.S. tax law, we forecast that the amount of activity would drop substantially, to only one third of the amount in the U.S.

Both of these simulations are based on extrapolations from the experience in the U.S., so must be treated with caution since the U.S. has no experience with such high tax rates or such severe limitations on the deductibility of business losses. The results certainly suggest, though, that allowing more generous tax treatment for business losses could be an effective and well-targeted means of stimulating more entrepreneurial activity.[34]

We fully realize that there can be many other aspects of the Swedish tax law, as it functions in practice, that have not been taken into account in the above simulations. For example, we have assumed that start-up firms remain entirely subject to domestic taxes. Tax evasion could be more important in Sweden, given the higher tax rates, so that self-employment activity may be more understated in Sweden than in the U.S. In addition, even small firms in Sweden might avoid Swedish taxes by setting up a subsidiary abroad and shifting profits to this subsidiary.[35] We have left in place in these simulations the U.S. payroll tax provisions. Since all wage and salary income in the U.S. (below a stated maximum) is subject to the payroll tax, while self-employment activity largely avoids this tax, a higher payroll tax rate should encourage entrepreneurial activity. By our calculations, however, the effective marginal payroll tax rate in Sweden is below that in

---

[33] This ignores the more limited credit (at a 21 percent rate) given for large losses.

[34] In particular, business losses require not only self-employment activity but also risks sufficient to generate overall losses under some outcomes. Entrepreneurial activity is inherently very risky.

[35] One Swedish economist suggested to us that Peru was the current location of choice for such a subsidiary.

the U.S. for most individuals.[36] By imputing a high return to capital invested in a closely held firm, the Swedish tax code introduces tax incentives not present under U.S. law, so that U.S. experience provides no guidance about the effects of such distortions.

We have also focused on the incentives to work and invest in risky vs. less risky activities *given* the overall levels of labor supply and savings, so have ignored any effects of differences in the tax structures in the two countries on the fraction of people in the labor force and on overall savings rates. Due to the higher tax rates and more generous safety net benefits in Sweden, however, the fraction of the population in the labor force is inevitably smaller. With fewer people working, there will also be fewer people who are self-employed and engaged in risky activities. The least skilled are more likely to have left the labor force, however, and at least based on U.S. data the least skilled are very unlikely to become self-employed anyway so that this effect should be minor.

Of course, taxes are not the only important institutional difference between U.S. and Sweden affecting entrepreneurial activity. For example, in the U.S. there is no safety net for an entrepreneur whose business fails (unless the entrepreneur is a single mother), but Sweden provides a generous safety net. While such a safety net may be attractive enough to keep some individuals out of the labor force, this safety net should also substantially reduce the potential downside risks for an entrepreneur, thereby encouraging risk-taking. As documented in White and Fan (2003), the generous bankruptcy protection for individuals in the U.S. encourages entrepreneurial activity, while European bankruptcy provisions are often much less generous. U.S. labor laws make it easy for a firm to fire workers, so that a new firm can easily go in and out of business. In many European countries, it is hard for a firm to lay off workers, making it more costly for a new firm to hire workers to explore an activity that may well fail. In the U.S. workers who quit a job to try out self-employment can normally readily find a comparable job again if their new

---

[36] The statutory payroll tax rate in Sweden is twice that in the U.S. According to Swedish Tax Agency (2005) about two-fifths of this tax payment is offset by future retirement benefits, in contrast to an estimate by Diamond and Gruber (1999) that half of U.S. Social Security taxes but none of the Medicare taxes are offset at the margin by future benefits. However, the entire payroll tax payment is deductible from personal taxable income in Sweden, but only half is deductible in the U.S. By our calculations, the effective marginal payroll tax rate is lower in Sweden throughout the income distribution.

firm fails. In many European countries, in contrast, workers may be reluctant to quit a job in order to take a chance setting up a new firm, given the difficulties of finding a job again if the new firm fails, and the costs of the resulting loss of seniority in the new job.

In the end, only comparable empirical work using Swedish data can provide convincing evidence on the role of the Swedish tax system in affecting entrepreneurial activity in Sweden. We hope to attempt such a project at some point, due to the much better data available in Sweden than in the U.S. and due to the larger potential effects of taxes in Sweden on entrepreneurial activity.

References

Atkinson, Robert D. and Paul D. Gottlieb, 2001, The Metropolitan New Economy Index: Benchmarking Economic Transformation in the Nation's Metropolitan Areas, The Progressive Policy Institute, Washington, D.C.

Bania, Neil, Randall W. Eberts, and Michael S. Fogarty, 1993, "Universities and the Startup of New Companies: Can We Generalize from Route 128 and Silicon Valley?," The Review of Economics and Statistics, 75(4), 761-66.

Cullen, Julie Berry and Roger H. Gordon, 2005, "Taxes and Entrepreneurial Activity: Theory and Evidence for the U.S.," mimeo.

Diamond, Peter and Jonathan Gruber, 1999, "Social Security and Retirement in the U.S," In Social Security and Retirement around the World, ed. by Jonathan Gruber and David Wise. (Chicago: University of Chicago Press)

Feldstein, Martin, Louis Dicks-Mireaux, and James Poterba, 1983, "The Effective Tax Rate and Pretax Rate of Return," Journal of Public Economics, 21(2), 129-58.

Griliches, Zvi, 1998, R&D and Productivity: The Econometric Evidence, University of Chicago Press, Chicago.

Grubert, Harry and Joel Slemrod, 1998, "The Effect of Taxes on Investment and Income Shifting to Puerto Rico," The Review of Economics and Statistics, 80(3), 365-73.

Hall, Bronwyn and John Van Reenen, 2000, "How Effective are Fiscal Incentives for R&D? A Review of the Evidence," Research Policy, 29(4-5), 449-69.

OECD, 2005, OECD Factbook 2005: Economic, Environmental and Social Statistics, OECD, Paris.

Sommerfeld, Ray M. and Sally M. Jones, 1991, <u>Federal Taxes and Management Decisions</u>, 1991-2 Edition, Richard D. Irwin, Inc., Homewood, IL.

Swedish Tax Agency. 2005. *Taxes in Sweden: 2005.*

White, Michelle J. and Wei Fan, 2003, "Personal Bankruptcy and the Level of Entrepreneurial Activity," <u>Journal of Law & Economics</u> 46, pp. 543-67.