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The private financial gains to entrepreneurship: Is it a good use of public money to encourage individuals to become entrepreneurs?

Thomas Åstebro

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Abstract Recent evidence comparing earnings from entrepreneurship versus wage earning shows that, after allowing for obvious observable differences, most entrepreneurs in most developed countries earn less than similar wage-earning employees. Does this mean that the decision to become an entrepreneur should be discouraged? The answer depends in part on whether we believe that entrepreneurs report their income truthfully or not. Adjusting for what is considered to be underreporting by entrepreneurs lifts entrepreneurial earnings by between 10 and 40 %, reversing the fortunes of the entrepreneur such that they appear to be earning much more than their counterparts in a wage-earning job. If this adjustment should prove to be appropriate, then there is no obvious reason to increase the incentive for individuals to become entrepreneurs (such as with tax breaks or direct start-up subsidies) in developed countries, and there is reason, instead, to discuss decreasing these subsidies.

Keywords Entrepreneurship · Income underreporting · Public policy · Financial incentives

JEL Classifications L26 · M13 · H26 · H81

T. Åstebro (✉)
HEC Paris, 1 rue de la Liberation,
78351 Jouy-en-Josas Cedex, France
e-mail: astebro@hec.fr

1 Introduction

Over the last decade, policy makers have embraced entrepreneurship as the opportunity to create new jobs and wealth under conditions of ailing national accounts and have seen the promotion of entrepreneurship as a key policy initiative.[1] But is it necessary to fiscally stimulate people to become entrepreneurs? Consider first that most people are more willing to undertake activities that generate more income for them. So, speaking against the idea of fiscal stimulation, if people earn a lot of money becoming entrepreneurs there seems to be no good reason for governments to subsidize them with additional money collected by taxing remaining wage earners. Thus, it is identifying the private gains to becoming an entrepreneur that should guide public policy.

[1] For example, Shane (2009) cites Gorge W. Bush who in 2006 stated "Small businesses are vital for our workers…. That's why it makes sense to have the small business at the cornerstone of a pro-growth economic policy…. Small Business Administration is working hard to make it easier for people to start up companies. We understand that sometimes people have got a good idea, but they're not sure how to get something started…. And so we've doubled the number of small business loans out of the SBA since I came to office."

Background Information Box The social benefits (welfare) represent all monetary value and associated well-being (such as lives saved) net of costs to all consumers and producers in the society created by an entrepreneur, while the private gains represent all monetary value net of costs obtained by the entrepreneur him-/herself.

However, if the private gains to becoming an entrepreneur are negative while, at the same time, the social benefits are clearly positive, there is an interesting conundrum. From the perspective of the public, such activities would be seen as valuable and should therefore be stimulated. On the other hand, from perspective of the entrepreneur, such activities would be seen as wasteful and should be discouraged. If the public benefits from private activities that are wasteful to the individual, then this constitutes a market failure.[2] Individuals may therefore require subsidies to be encouraged to become entrepreneurs. To provide a starting point for a critical discussion as to whether entrepreneurs should be subsidized, I summarize recent research on the evidence of the private financial gains for entrepreneurs along with other supporting evidence of the private benefits to becoming entrepreneurs.[3]

[2] The described market failure is of a general kind and encompasses a range of more precisely defined market failures, such as credit constraints. Under credit constraints, the returns to entrepreneurship are lower than optimal because the project is not funded at marginal cost, as it would be without market failures. If credit constraints are large enough, the returns to the effort drop below the opportunity cost and the prospective entrepreneur stays employed, even though the project is net present value positive for the economy (see e.g. Evans and Jovanovic 1989). In a similar manner, Edwin Mansfield was one of the first to estimate both the private and public rate of return to conducting R&D by profit-making firms. He showed a wide difference between the two rates of return, with the private return being far lower. Summarizing results, Mansfield (1991) wrote: "in each of these studies, the social rate of return from an innovation was, on the average, at least double the private rate of return to the innovator from its investment in the innovation". This body of work has been heavily cited as a major argument for why governments should subsidized R&D by profit-making firms.

[3] In a provocative paper, Shane (2009) comes to the conclusion that "Encouraging more and more people to start businesses won't enhance economic growth or create a lot of jobs because start-ups, in general, aren't the source of our economic vitality or job creation." He argues and provides convincing evidence that "Policy makers often think that creating more start-up companies will transform depressed economic regions, generate innovation, and create jobs. This belief is flawed because the typical start-up is not innovative, creates few jobs, and generates little wealth." Another paper making the same argument is by Hurst and Pugsley (2011). While this paper does not disagree with the analysis of Shane (2008, 2009) and Hurst and Pugsley (2011), this paper builds on the "market-failure" doctrine for motivating public policy.

Background Information Box Entrepreneurs are those which start own and operate new businesses. Entrepreneurs include the self-employed who do or do not employ others, those people who own sole proprietorships and incorporated businesses, and those who own various forms of partnerships. Because the situation for the unemployed is grave, and the public costs of unemployment are large, this article does not cover the public benefits for supporting those transitioning from unemployment to entrepreneurship. This exclusion is inconsequential for the overall picture as most entrepreneurs originate from either prior employment or other activities. For example, in Sweden 62 % of individuals who became entrepreneurs during the period 2000–2005 came from prior employment, 12 % came from prior entrepreneurship, 16 % came from non-employment (e.g., from completing studies) and only 9 % came from unemployment (Åstebro and Tåg 2015)

2 Discussion

Most recent academic studies show that entrepreneurs report earning less than similar persons working as wage employees. The estimates range between −4 and −15 % per year across prior studies (for an example, see Hamilton 2000).[4] For a recent estimate of the relative distribution of reported earnings between wage workers and entrepreneurs, see Fig. 1. This figure is based on individuals who have been in their job for at least 10 years, meaning that this pattern cannot be accounted for purely by lack of time for some entrepreneurs to learn they have low ability and subsequently exit (as in Jovanovic 1982).

The figure compares the total annual gross earnings in thousand Danish kroner (x-axis) of wage employees to those of self-employed individuals in 2005. *Data:* Integrated Database for Labor Market Research (IDA). The database is maintained by the Danish government and consists of an annual panel of all individuals and firms in Denmark. The analysis is

[4] For a detailed review of the evidence reported in this section, see Åstebro (2012) and Åstebro and Chen (2014).

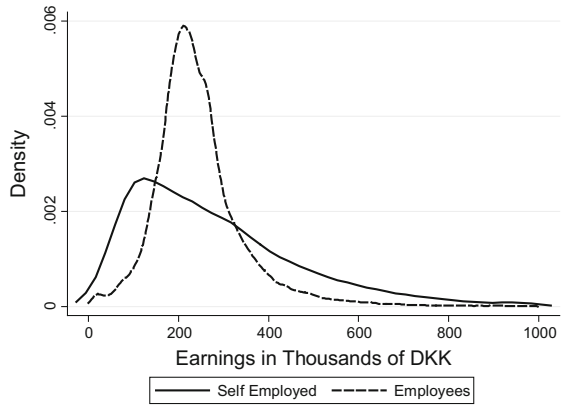

Fig. 1 Comparison of wage versus self-employment earnings (Denmark)

based on a 10 % random sample of all employees and entrepreneurs in 1995, but is then conditioned on individuals whose tenure at their job is at least 10 years—in order to compare individuals who would be presumed to have a good match to their job. Figure 1 documents very high dispersion of earnings among the self-employed, including a large number of individuals whose earnings are lower than that of the typical wage employee. Source: Åstebro et al. (2014), Fig. 2. Copyright: American Economics Association. Reprinted with permission.

At the same time, entrepreneurs experience a significantly higher-income risk, work longer hours and persist at what they are doing despite the possibility of typically earning more in wage work

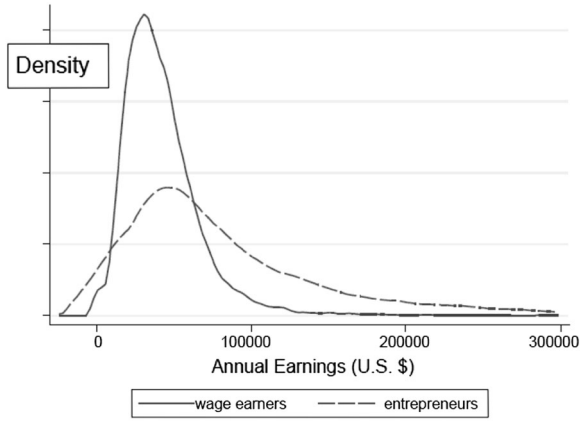

Fig. 2 Underreporting-corrected comparison of wage versus self-employment earnings (USA)

(Åstebro and Chen 2014; Åstebro et al. 2014; Hamilton 2000). Entrepreneurial earnings are dominated by a large proportion of individuals reporting their earning to be less than they would be earning by staying employed, with a relatively small proportion of them earning substantially more, as illustrated in Fig. 1. Furthermore, future entrepreneurial earnings are found to rise less quickly over time than do earnings for wage workers (Hamilton 2000). Taken together, these findings raise a critical question: why do individuals become entrepreneurs when working as an employee is both more financially rewarding and less risky for most?

One simple answer is that entrepreneurs significantly underreport their income to both tax authorities and in surveys.[5] To illustrate the degree of underreporting, Feldman and Slemrod (2007) indicate that 99.5 % of "conventional" employment wages and salaries were voluntarily reported to US tax authorities in 1987, while only 51 % of known self-employment earnings were voluntarily reported. Entrepreneurs also seem to underreport their incomes in surveys. For example, in the panel survey of British households, entrepreneurs underreport their household income by approximately 35 % (Pissarides and Weber 1989).

If underreporting of entrepreneurial income is taken into account, the evident financial loss to entrepreneurship therefore becomes a rather large average gain. Indeed, across Australia, Canada, Finland, Spain, Sweden, UK, and the USA, adjusting for underreporting by using observed differences in (primarily food) expenditures between entrepreneurs and employees (as in Pissarides and Weber 1989) lifts entrepreneurial average earnings by between 10 and 40 %, turning most previously reported average "deficits" through entrepreneurship into gains (Åstebro 2012). An example of how the distribution of earning changes with such an adjustment is reported in Fig. 2.

The figure shows the density (y-axis) of adjusted annual earnings in US dollars (x-axis) for US male household heads by wage work and entrepreneurs. Earnings for entrepreneurs have been adjusted upward by dividing each report with 0.68, reflecting the

[5] Alternative answers are that people enjoy the non-monetary benefits of entrepreneurship, such as the degree of autonomy, independence, flexibility, or ability to work on a number of different tasks. For a review of these alternative explanations, see Åstebro et al. (2014).

estimated degree of underreporting of income by entrepreneurs. The figure indicates that with this correction, the average earnings are indeed higher for entrepreneurs than for wage workers. Other features of the earnings distribution remain: the standard deviation is larger, and the positive skew of the distribution is larger for entrepreneurs than for wage workers. Source: Åstebro and Chen (2014), Fig. 1. Copyright: Elsevier. Reprinted with permission.

Needless to say, researchers do not actually observe the true earnings of entrepreneurs. The original method developed by Pissarides and Weber (1989) used food expenditures to infer underreporting. In essence, the authors observe how much money is spent on food (and other consumption) and if the entrepreneur reports much more food consumption for a given reported income than the wage earner, this is taken to indicate a higher unreported income proportional to the observed difference in food consumption. The model rests on a number of assumptions to make the inference that real entrepreneurial earnings are higher than those reported. Researchers have tested these assumptions. For example, Hurst et al. (2014) reported that prior results remain valid even with a number of changes in the estimation procedures, use of different expenditure data and across three different data sets. Another group (Lyssiotou et al. 2004) found that removing the assumption that wage earners and entrepreneurs have the same preferences for food did not affect results. However, Tedds (2010) found that underreporting varies with income and that those with higher incomes underreport substantially less, thus questioning a key assumption in Pissarides and Weber (1989). When relaxing the assumption of a constant fraction of income underreported, the average Canadian household with self-employed income in the mid-1990s underreported only by approximately $3000. This study therefore finds that overall the underreporting phenomenon is rather small. Finally, Åstebro and Chen (2014) estimate that the underreporting fraction drops by 30 % if the focus is only on food eaten at home (rather than on both food eaten at home *and* eaten out since the amount of food eaten out may be differentially affected by the different tasks of entrepreneurs and wage earners), again suggesting that the magnitude of the previously described underreporting fraction has been overestimated.

Researchers are left, then, with the implication that under some restrictive modeling assumptions, entrepreneurs appear to underreport a large fraction of their income in surveys. But under some alternative and less restrictive assumptions, this fraction may be significantly smaller. Nevertheless, in either case, if in fact entrepreneurs do better financially when taking into account unreported income, there seems to be no strong reason to support these entrepreneurs with public subsidies to get started or to operate.

Background Information Box There are many public policies subsidizing individuals (paying part of the cost for people) to become entrepreneurs in various ways. For example, government loan guarantee schemes have been set up in most OECD countries, including Canada, Germany and the UK. These programs guarantee loans at low interest rates for new firms that are not able to obtain bank financing because the projects are too risky. By fixing the interest rate at levels that do not represent the risk, the borrowers are subsidized. For an example evaluation of these types of programs, see Cowling (2010). As another example, investors in entrepreneurial firms (typically the entrepreneurs themselves) are sometimes credited with tax breaks. In Sweden, capital income was until 2006 taxed at a flat rate of 30 %. After 2006, the capital income from unlisted shares in closely held corporations (primarily held by entrepreneurs) was taxed at only 20 %, representing a tax incentive for entrepreneurs. The real cost of financing is reduced, and the money for this subsidy is raised by taxing others. The UK government would not be bested by the Swedes and reduced the effective capital gains tax on business assets held for more than 2 years from 40 to 10 % in 2008. Governments have also created their own venture capital funds to invest directly in new firms. The Israeli (Yozma program), USA, and UK (e.g., 3i) venture capital industries were started this way. The Japanese government spent considerable effort to build its venture capital industry during the 1990s and early 2000s. In Chile, the program Start-Up Chile began in 2010 offering foreigner entrepreneurs a stipend of $40,000 a year, a 1-year residency visa and a dedicated team of seven people to guide them when they arrived in the country. The program has since been copied by Canada. All these programs represent monetary incentives for individuals to become entrepreneurs. For an evaluation of Start-Up Chile, see Gonzalez-Uribe and Leatherbee (2015). The authors find no support for a causal effect of providing cash and co-working space on business success. For further illustrations of misdirected public programs to stimulate entrepreneurship, see Parker (2007), Lerner (2009) and Acs et al. (2016).

Technological entrepreneurs generally provide more social welfare than others, and astute policy analysts might argue that supporting these entrepreneurs is particularly worthwhile. For example, inventions such

as integrated circuits or penicillin have provided enormous public benefits. Indeed, it has been estimated that an excess of 90 % of the benefits of a breakthrough invention go to society as a whole, rather than the individual inventor, their partners or their financial backers (Baumol 2002; Nordhaus 2004). Supporting entrepreneurs which commercialize inventions would therefore seem like a good use of public money. However, these entrepreneurs are in strong minority (Shane 2009; Hurst and Pugsley 2011).[6] Most entrepreneurs are tradespeople, restaurant owners, storekeepers and service providers such as drycleaners where the social welfare benefits are likely to be small. The entrepreneurs who provide significant social welfare represent much less than 5 % of all entrepreneurs.[7]

Background Information Box Public programs to finance technological entrepreneurs have been rising in number and fund volume. France implemented a program to support university start-ups with soft monies in 1999; Germany started the EXIST program in 2000; Italy incorporated the Quantica Fund in 2005; and Belgium created a spin-off program for postdocs in 2002, largely modeled on the German experience. EXIST is a federally funded part of the German government's "Hightech Strategy for Germany" and is co-financed by the European Social Fund. EXIST provides several forms of support. For example, Gründerstipendium is a 1-year salary stipend of 2500€ per month for recently graduated Ph.D.'s who become entrepreneurs (2000€ for Master's degree graduates, 800€ for current students) for up to three founders plus an additional maximum of 32,000€ for other start-up costs. For an evaluation of this program, see Ayoub et al. (2016). Ayoub et al. find that these start-ups are smaller by two full-time employees, generate 1.7 times higher losses and have nearly three times lower return on capital than science-based entrepreneurial firms with comparable characteristics.

Even if social welfare from invention is high, it is not clear that there is a need to subsidize those who *commercialize* these inventions. One needs to draw a distinction here between public support for invention and public support for commercialization. While there are many known reasons for publicly supporting the creators of inventions (e.g., Nelson 1959; Mansfield 1991), the argument for why entrepreneurs should be subsidized rests on less solid empirical grounds. Maybe the entrepreneurs would undertake these commercialization efforts regardless of subsidies? Indeed, one estimate (Åstebro et al. 2012) of the earnings of US entrepreneurs who were previously engaged in academic work in science, engineering or medicine (STEM) found that the average difference in their earnings compared to their peers staying in academia was not significant. In addition, entrepreneurship was found to be widespread across universities, and the difference between entrepreneurial earnings and wage work did not differ much between individuals from different universities. Another study (Åstebro et al. 2013) looked at all individuals working at Swedish universities in science, engineering and medicine who quit to become full-time entrepreneurs between 1999 and 2008. Through tax filings, it was possible to learn their reported wages, business income, dividends and capital gains (losses) on entrepreneurial ventures. The difference in individuals' total earnings before and after becoming an entrepreneur was insignificant in most specifications. Thus, both of these two studies find no strong evidence that technological entrepreneurs have a significant monetary private disincentive to commercialize their inventions. In addition, in the second study, more than 60 % of the individuals becoming entrepreneurs exited from entrepreneurship within 2 years. Of those leaving entrepreneurship within 2 years, fully 66 % returned to academia. These additional data show that technological entrepreneurs can easily move out of entrepreneurship and back to academia. Coupled with the apparently small difference in financial gains from staying employed in academia, the evidence so far does not motivate substantial subsidies for these types of entrepreneurs to commercialize new ideas. Nevertheless, one is wary of the many potential market failures which looms around the commercialization of inventions, such as frictions in the allocation of funding due to information asymmetries. We do not argue here that there is no case for supporting technological entrepreneurs. We argue instead that technological entrepreneurs would be the only obvious case where public policy would be motivated, and these individuals are far from the average entrepreneur.

[6] For example, Shane (2009, p. 30) reports that every year only about 7 % of new companies in the USA are started in industries considered "high tech." Similarly, Hurst and Pugsley (2011) report from two different surveys that only between 2.7 and 4.9 % of new or small businesses acquire any type of patent.

[7] For example, Scherer and Harhoff (2000) report that of all Harvard patents, which are already an extremely select group of patents, the top 10 percent provided 84 % of the total economic value of those patents.

3 Limitations

This paper does not cover policies directed at the unemployed aiming to start a new business. Such policy initiatives may have clear motivations (see, e.g., Caliendo and Künn 2011). Regarding the detection of income underreporting among entrepreneurs, several technical estimation problems remain unresolved (Åstebro and Chen 2014). Alternative empirical models may need to be developed before it can be sufficiently concluded that the reason entrepreneurs *appear* to earn significantly less than comparable wage earners is because they underreport their income, and that, in fact, the real income of entrepreneurs is typically higher than for comparable wage earners.

4 Summary and policy advice

Estimates of differences in reported income between entrepreneurs and wage earners (taking into account obvious differences due to the nature of the work and person involved) typically indicate that entrepreneurs are worse-off financially. In most developed countries, the entrepreneurs' annual income ranged between 4 and 15 % less than those of comparable wage earners. Nevertheless, the fact that there is a large number of entrepreneurs who would earn more if they returned back to wage earning, coupled with the observation that many of these entrepreneurs persist with their efforts despite reporting earning significantly less and prefer to stay entrepreneurs because they enjoy the life, suggests that public policies toward increasing the rate of entrepreneurship through economic subsidies may be misguided.

Furthermore, a number of studies suggest that if underreporting of entrepreneurial income is taken into account, the evident financial loss to entrepreneurship becomes a rather large average gain. If in fact entrepreneurs do economically well when taking into account unreported income, there would be no good reason to support them with public subsidies to get started. The logic goes as follows: suppose the social welfare do not change with a change in the estimate of the private returns when taking into account underreporting. Indeed, there would be no reason to think that the social welfare in terms of lives saved from a new drug, for example, would differ if one changes the way which private income for the entrepreneur is computed (while the realized income stays the same). While the social welfare remains the same, the estimated private returns are now significantly positive, and there seems to be no clear argument for why governments would need to subsidize entrepreneurs to earn even more. A further implication is that if these estimates of real incomes are true, there are large gains to be made by tighter scrutiny of entrepreneurs' accounts by tax authorities.

Some entrepreneurs are likely to provide vastly more social welfare than others, and supporting their efforts is worthwhile. For example, the inventors of recombinant DNA and the mp2 digital compression algorithm have provided enormous social benefits in terms of lives saved and benefits to music listeners, although these inventors clearly weren't paid for all the value created. Nevertheless, studies of entrepreneurs who were formerly employed as academics in the USA and Sweden found that their total private earnings as entrepreneurs, including dividends and capital gains, did not differ much from what they would have earned if they had remained employed at their universities. And even though there are large income risks involved, academics appear to easily switch out of the risky activity and back to employment in the academic sector. It may be a bit surprising, then, to discover that supporting academic entrepreneurship with public funds may not matter much in affecting the choices made by these individuals. Instead, it appears that academics could be left alone to do what they enjoy best. This does not mean that some individuals should not be stimulated to become entrepreneurs. But the currently available results raise the burden of proof for policy makers and policy advisors to clearly show that these inventions would not have been commercialized had public subsidies not been in place and that the alternate use of those monies are worse for the economy.

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