



# **SuperEntrepreneurs**

And how your country can get them

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**WITH AN AFTERWORD BY PROFESSOR STEFAN FÖLSTER**

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*“Throughout history, poverty is the normal condition of man. Advances which permit this norm to be exceeded – here and there, now and then – are the work of an extremely small minority, frequently despised, often condemned, and almost always opposed by all right-thinking people.”*

Robert A. Heinlein

## SUMMARY

- This report examines about 1,000 self-made men and women who have earned at least \$1 billion dollars and who have appeared in Forbes magazine list of the world's richest people between 1996 and 2010 – the SuperEntrepreneurs. These SuperEntrepreneurs founded half the largest new firms created since the end of the Second World War.
- The proportion of SuperEntrepreneurs varies significantly across countries. Hong Kong has the most, with around three SuperEntrepreneurs per million inhabitants, followed by Israel, the US, Switzerland and Singapore. The US is roughly four times more entrepreneurial than Western Europe and three times more entrepreneurial than Japan.
- There is a strong correlation between high rates of SuperEntrepreneurship in a country and low tax rates. Equally, a low regulatory burden and high rates of philanthropy both correlate strongly with high rates of SuperEntrepreneurship.
- Active government and supranational programmes to encourage entrepreneurship – such as the EU's Lisbon Strategy – have largely failed. Yet governments can encourage entrepreneurialism by lowering taxes (particularly

capital gains taxes which have a particularly high impact on entrepreneurialism while raising relatively insignificant revenues); by reducing regulations; and by vigorously enforcing property rights.

- SuperEntrepreneurs tend to be well-educated: only 16% of US SuperEntrepreneurs lack a college degree, compared to 53% of the self-employed and 54% of salaried workers. SuperEntrepreneurs in the US are five times more likely to hold a PhD degree as the general population. 33% of US SuperEntrepreneurs have degrees from the 14 top US universities, compared to 1% of the general population.
- High rates of self-employment and innovative entrepreneurship are both important for the economy. Yet policy makers should recognise that they are not synonymous; and should not assume that policies which encourage self-employment necessarily promote entrepreneurship.
- The crucial difference is that while many successful entrepreneurs started small companies, not all self-employed people are innovative entrepreneurs (in the sense of developing successful new products and services).
- Self-employment is high in countries such as Greece, Turkey, Spain, Portugal and Italy, countries with low rates of innovative entrepreneurship. The US has significantly lower rates of self-employment. The self-employment rate in Silicon Valley is half that of the average of California.
- Policy makers should use a definition of entrepreneurship which is based on innovation. This would correspond better with what most policy makers appear to want for their countries: technological progress and economic growth to the benefit of all citizens.

## 1. INTRODUCTION

Of the 100 largest public companies in the United States, 31 were founded by an entrepreneur during the post-war era, creating over four million jobs. Of the hundred largest European firms, only seven were founded in the same period, creating about one million jobs. Similarly, on a per capita basis, the US has four times as many self-made billionaire entrepreneurs as Europe. Using a slightly different definition, 29% of US firms on the Global FT 500 list were founded after 1950, compared to 8% of the largest European firms.

At the same time, the US has significantly lower rates of self-employment than any major other industrialised country. Self-employment is the highest in Greece, Turkey, Spain, Portugal and Italy, countries with low rates of innovative entrepreneurship. Within the US, the self-employment rate in Silicon Valley is half that of the average of California.

These stark facts raise several questions. What explains these differences? Is self-employment – the most commonly used measure of entrepreneurship – a suitable proxy for innovative entrepreneurship? Do entrepreneurs contribute to economic

prosperity and social well-being? If so, is there anything a country can do to increase its rate of entrepreneurship?

To answer these questions, entrepreneurship must first be adequately defined and quantified. Following economist Joseph Schumpeter, it is defined here as the creation of innovative and growth-oriented firms. And it is quantified by looking at the creators of the most successful innovative companies. In particular, the data in this report is based on a detailed investigation of the source of wealth of all the billionaires included in Forbes Magazine's comprehensive list of the world's richest people between 1996 and 2010.

Using this method, the backgrounds and careers of the 1,000 or so most successful entrepreneurs in the world over the last two decades have been analysed. The criteria are self-made men and women who founded new firms and earned at least one billion dollars – the SuperEntrepreneurs.

SuperEntrepreneurs are found in over 50 different countries, in virtually all industries and with backgrounds ranging from Stanford PhDs to Chinese farmers. Their stories help convey the role of entrepreneurship for society. And because the number of billionaire entrepreneurs is sufficiently large, some statistical light can explain some of the important factors behind entrepreneurship.

The dataset constructed for this report has been used in several ways. For example, cross-country analysis has enabled a methodical study of which policies are correlated with a high rate of entrepreneurship (and which policies inhibit entrepreneurship). One of the most surprising conclusions is that self-employment, by far the most common measure, is often a highly misleading proxy for entrepreneurship.

Indeed, a striking result is that countries with high rates of self-employment tend to have *lower* rates of high-impact entrepreneurship. Greece, for example, is characterised by a high proportion of self-employment, not because the Greek economy favours entrepreneurship but precisely because it doesn't. Conversely, could the low US self-employment rate be in part caused by the high domestic rate of entrepreneurship?

The tendency to equate self-employment with entrepreneurship risks encouraging ineffectual entrepreneurship policies. Self-employment is extremely important for any economy. It may be the most efficient organisational form in many industries, a stepping stone towards Schumpeterian entrepreneurship, a constructive way of handling poor employment prospects, a way to escape labour market discrimination, or a way of creating greater labour flexibility. In developing countries and in certain industries in industrialised countries, self-employment may create more value than Schumpeterian entrepreneurs. Nevertheless, a country which focuses too narrowly on raising self-employment may miss the ultimately greater prize that innovative entrepreneurship represents.

## 2. DEFINING ENTREPRENEURSHIP

### **The elusive identity of innovative entrepreneurship**

What is entrepreneurship? Surprisingly, no agreed definition of the term exists. Sometimes the term is used for anyone who starts a company. Others would argue that merely starting a company may not really qualify as entrepreneurship if the company is, for example, a one man taxi-driver.

Nor is it enough to innovate. Much innovation is carried out by large publicly-owned companies without any individual entrepreneur. Creative individuals cannot be described as entrepreneurs if they lack the other skills required to convert their creative ideas into a successful business.

The term entrepreneurship is generally credited to the French economist Richard Cantillon, who in his *Essai sur la nature du commerce en général*, described the entrepreneur as someone who undertakes a new venture. Cantillon's entrepreneur will buy a product at a certain price and plan to sell it, uncertain of what the price will be. Another French economist, Jean-Baptiste Say, helped popularise the concept of the entrepreneur as the creator of new organisations. While Adam Smith's classical *The Wealth of Nations* does not use the word entrepreneur, a similar

concept – the “enterpriser” – is used to refer to individuals who undertake the formation of an organisation for commercial purposes. For Smith, enterprisers were those in society who react to economic changes and transforms demand into supply.

Perhaps the most important theorist of entrepreneurship has been the Austrian economist Joseph Schumpeter who revived and revolutionised the theory of entrepreneurship in his book *The Theory of Economic Development*. He defined the entrepreneur as an innovator and an agent of change. The economic role of the entrepreneur is to take society from one equilibrium – a state where things are stable but also stagnant – to another: the entrepreneur, through creating new firms and new products, thereby fosters economic progress. However, existing companies could be hurt by new competitors and even go under, a process which Schumpeter called “creative destruction”. Through creative destruction, established economic structures are shattered and replaced by new and (normally) improved methods of doing things.

Schumpeter’s theory is still relevant today. Washington Post columnist Jennifer Rubin has provided a powerful description of the destructive forces which Steve Jobs represented:<sup>1</sup>

*“Steve Jobs was perhaps the most creatively destructive force on the planet in the last twenty years. That dude is still destroying entire industries even after he’s dead. Imagine if you worked for a company that made compact disc players or in music publishing when the iPod debuted. Imagine if you worked for Motorola’s flip-phone division when*

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<sup>1</sup> The Washington Post (2012).

*the iPhone arrived. Look at what is currently happening in the laptop computer market since the iPad came out. Steve Jobs single-handedly destroyed hundreds of thousands of jobs all around the world. Far more than he created at Apple and Pixar. Do we mourn those lost jobs? No, because they were technological advances that freed up labor and capital for more productive uses. That's capitalism."*

The process of creative destruction can include social and political entrepreneurs that do not accumulate a personal fortune or perhaps do not even start a company. One example is Muhammad Yunus, the founder of Grameen Bank, which gives out micro-loans to the poor in developing countries. Muhammad has revamped the banking industry, inspiring the creation of a series of for-profit banks that lend to the poor. Another is Harry Dexter White, a US Treasury official who was the architect of the IMF and the World Bank. This influential class of entrepreneurs is outside the scope of this book, which deals more narrowly with business entrepreneurs.

Schumpeter's definition of entrepreneurship requires some level of innovation. Simply starting a small firm which does nothing new is not true entrepreneurship. Consequently, most self-employed individuals who do not innovate, or who do not disrupt markets, are not entrepreneurs. From a Schumpeterian perspective, entrepreneurship is defined as the economic function of creating change, whereas self-employment is defined by the legal form of working for oneself rather than for somebody else.

Of course the definition of SuperEntrepreneurs used in this report has its own limitations. It is not self-evident that all self-

made billionaires have been innovative, even though there is likely to be a strong correlation. Further, this measure inevitably focuses only on successful entrepreneurs. Data limitations prevent us from studying those potential entrepreneurs who either never tried, or those who did everything right but failed due to bad luck.

### **Conflating self-employment and entrepreneurship**

Most studies that analyse entrepreneurship tend to measure something quite different: the number of self-employed. This may at least in part be because the self-employed are easily identified with plenty of data available in tax records and other public sources. In contrast, official statistics are short of information on innovative entrepreneurship, making systematic comparison difficult.

Self-employment is defined in terms of the legal employment status of an individual, rather than the economic function. There is some merit to this approach. Self-employed individuals, including entrepreneurs, rarely work for someone else; they operate a business and need to wrestle with issues such as risk, uncertainty and responsiveness to opportunity. Unlike those employed by others, the self-employed have no guaranteed monthly income and their effort tends to be more directly linked to their income. If their business does badly, they tend to lose rather than earn money. If entrepreneurship were defined merely as creating a business, it would make sense to equate it with self-employment.

But, as described above, entrepreneurship also includes the ambition to innovate and grow. And in this respect, the majority of self-employed individuals are not really entrepreneurial: the majority of the self-employed – the taxi drivers, builders, farmers, plumbers, shop owners, gardeners, fast food vendors,

hairdressers, and the white collar class of lawyers, doctors, consultants and accountants – would not claim to innovate and have limited potential and ambition to rapidly grow their business.<sup>2</sup> When asked directly, four out of five business owners would not even define themselves as entrepreneurs. And approximately nine out of ten of the self-employed report that their firm does not engage in any innovative activity.<sup>3</sup> So while a percentage of self-employed are true or potential entrepreneurs, not all of them are.

Conversely, not all entrepreneurs are self-employed. For example, the late Steve Jobs, whilst retaining some residual rights of control over Apple, would in his last years be classified as an employed CEO and not as self-employed.

This conflation of self-employment with entrepreneurship may in part explain why previous studies on entrepreneurship that have relied on self-employment have been unable to establish conclusive evidence about entrepreneurship policy.<sup>4</sup>

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<sup>2</sup> Hurst et al. (2011), Henrekson and Sanandaji (2014).

<sup>3</sup> Henrekson and Sanandaji (2014).

<sup>4</sup> A large number of papers have relied on self-employment or similar metrics as an empirical proxy for entrepreneurship. Some prominent papers taking this approach include Evans and Jovanovic (1989), Evans and Leighton (1989), Holtz-Eakin et al. (1994), Blanchflower and Oswald (1998), Quadrini (1999), Carroll et al. (2000), Gentry and Hubbard (2000), Hamilton (2000), McMillan and Woodruff (2002), Moskowitz and Vissing-Jorgensen (2002), Bruce and Schutze (2004), Gentry and Hubbard (2004), Hurst and Lusardi (2004), Lazear (2004), Bitler et al. (2005), Djankov et al. (2006), Cagetti and De Nardi (2008), Paulson and Townsend (2006), Ardagna and Lusardi (2008), Kitao (2008), Cagetti and De Nardi (2009), Glaeser (2010), Glaeser and Kerr (2009) and Djankov et al. (2010).

## The Forbes dataset

Forbes Magazine annually compiles a comprehensive list, “The World’s Billionaires”. This is updated each year by 50 journalists gathering information about the size of the fortune, individual variables and the source of wealth.

This report’s dataset is constructed from all the billionaires who appeared at least once on the Forbes list from 1996 to 2012: a total of 1,723 individuals. It excludes all those who inherited wealth, retaining only those that Forbes designates as self-made. Of this class of self-made billionaires, the great majority (94%) are entrepreneurs, in the sense that they appear to have acquired their wealth by creating a company.<sup>5</sup> “The dataset in this report also excludes a category referred to as “inherited and growing”, those who inherited some wealth and managed to grow it into billions, such as Donald Trump. These individuals are not included as entrepreneurs, since they inherited large wealth.

Having narrowed the list to self-made billionaires, the source of wealth for each billionaire was analysed. In many cases the source of the wealth had been briefly described by Forbes. If Forbes did not provide this data, encyclopaedias, Wikipedia and Google searches were used. In those cases where the source of wealth could not be identified, the billionaire was defined as a

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<sup>5</sup> In some cases, the billionaires became rich through developing an existing firm from an early state rather than founding one. In other cases a small firm was acquired from or taken over from parents and grew into a large company. If the inherited wealth is not a significant part of the fortune, Forbes defines the individual as self-made.

non-entrepreneur. This left a total of 996 SuperEntrepreneurs in 53 countries.<sup>6</sup>

Two other measures are used to check the robustness of this approach: the share of the largest public companies in each country or region founded by entrepreneurs during the post-war era (1945 or later); and venture capital investments as a percentage of GDP.

The list of entrepreneurial firms is in and of itself powerful evidence validating Adam Smith's notion that private wealth creation tends also to create value for society. US companies founded by billionaire entrepreneurs include Microsoft, Apple, Intel, Google, Yahoo, Oracle, Cisco, Sun Microsystems, Bloomberg, PayPal, AOL, Facebook, E-bay, Dell, Hewlett-Packard, Gateway, Priceline, Amazon, Wal-Mart, Home Depot, Best Buy, Family-Dollar, GAP, Urban Outfitters, Ralph Lauren, Nike, Trader Joe's, Starbucks, Subway, Blackstone, Bridgewater, KKR, CNN, Fox News, Univision, HBO, The Weather Channel, Black Entertainment Television, DreamWorks, LucasArts, Ultimate Fighting Championship, Ty Inc. (Beani Babies), Conair, Enterprise Rent-A-Car, Dolby Laboratories, Bose, University of Phoenix and FedEx.

Europeans firms include IKEA, Aldi, Zara, Armani, Benetton, Red Bull GmbH, Swatch Group and Virgin group. Other examples are Japan's Sony, Honda and Softbank, Canada's Research in Motion (Blackberry) and Cirque du Soleil, Israeli's Check Point Software and Hong Kong's Cathay Pacific Airways.

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<sup>6</sup> The methodologies used in this report, and that of Forbes, are detailed in Appendix 1.

### 3. “FAIRNESS” AND ENTREPRENEURSHIP

Some observers believe the rich become rich by exploiting the poor and unjustly diverting social resources into their own pockets. Some economists have even argued for draconian taxes to “curb the grabbing hand” of the rich.<sup>7</sup> US Senate Leader Harry Reid has argued that “Millionaire job creators are like unicorns” in that they “don’t exist”.

Do the rich earn their wealth by creating value and creating jobs for others, or do they grab it from others? Is most top wealth earned or pilfered? If wealth is earned by creating new value and benefiting society, income differences are more legitimate. If wealth is taken from others, wealth disparities are obviously less acceptable.

The conclusions are clear: the richest individuals in capitalist market economies to a surprisingly large extent appear to earn their wealth by creating new value, rather than inheriting it or acquiring it illegitimately. In total, 58% of the billionaires in Forbes sample are self-made entrepreneurs, while the rest

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<sup>7</sup> See for example Picketty (2009).

inherited their wealth or sometimes accumulated their wealth without entrepreneurship. In Western Europe 42% of the billionaires are self-made entrepreneurs, with most of the rest having inherited their wealth. In the US, 70% of billionaires are self-made entrepreneurs. In countries such as China that have only recently opened up to capitalism, virtually all billionaires are self-made entrepreneurs.

The results indicate the American Dream – the notion that it is possible for individuals to rise to the top through effort, luck and genius – is not yet dead. Self-made billionaire entrepreneurs have created millions of jobs, billions of dollars in private wealth and probably trillions of dollars of value for society. Moreover, the American Dream is increasingly the Global Dream. What is especially striking is that until very recently almost all billionaires were Western, but today the majority comes from outside the US and Europe.

However, it should be recognised that some billionaires have not earned their wealth by particularly fair means, with oligarchs in Eastern Europe being an obvious example. These types of billionaires are common in societies with high corruption and insufficient protection of property rights. It does however not appear to be common in advanced industrialised economies with strong institutions, where billionaire entrepreneurs tend to create productive and innovative companies (such as those listed above).

Polling evidence suggests that the public has a more favourable view of entrepreneurs than they do of other wealthy individuals. A 2010 Gallup survey in the US showed that only 49% of Americans had a positive view of big business and 61% of capitalism. But an impressive 84% had a positive view of entrepreneurs. Unlike big business and capitalism, entrepreneurship is supported almost equally by both the left and the right.

### **How entrepreneurship benefits society**

Shortly after the iPod, iPhone and iPad were launched, the market value of Apple surpassed that of Microsoft. These products have clearly created value for users. But what would have happened if Steve Jobs hadn't existed, or if he had been less skilled at running Apple? Some economists argue that, sooner or later, other firms would have launched similar products, though perhaps requiring another genius entrepreneur.

Thus, some claim that the growth effect attributed to Steve Jobs only reflects the fact that iPads were brought to the market a few years earlier. Note though that this reasoning assumes that Jobs himself would not have been around to invent the iPad, but that the generally favourable climate for other entrepreneurs to replace him remains in place.

The effects for an individual country may differ from the effects for mankind. Steve Jobs' contribution may have propelled Apple into a position of technological leadership that allowed it to earn high profits for a long time, perhaps decades. In fact, this effect may not be confined to Apple. It may also give thousands of employees and nascent entrepreneurs in California an edge when they start their own firms or move to other employers where their skills are put to good use. For these reasons, Steve Jobs' contribution to US growth may have been much larger than the i-products' value added to the world as a whole.

This points to a wider impact: each innovation that an entrepreneur launches may give further entrepreneurs ideas and opportunities. The original entrepreneur will often directly invest in some of these. To the extent that this effect is important, one would expect clusters of entrepreneurship such as Silicon Valley to be particularly successful, which they often appear to be.

On top of that there may be a more general inspirational effect. When tennis player Björn Borg won a series of Wimbledon championships, he became an inspiration to other young Swedes to play tennis. Some of them such as Mats Wilander and Stefan Edberg did very well. Similarly, successful entrepreneurs presumably inspire others.

Of course, new technologies are not all invented and implemented by entrepreneurs, with innovations coming from existing as well as new companies. Economists such as William Baumol argue that new and established companies complement each other.<sup>8</sup> Entrepreneurs have an advantage in radical innovation, while large existing companies are better at incremental improvement and cost reducing mass-production.

The reason why entrepreneurs appear to be better at radical innovation is not fully understood. Large companies have many advantages, such as capital, thousands of highly educated employees and existing distribution channels. Perhaps innovation occurs at a moderate pace in large companies as they may not want to undermine the profitability of their current products by introducing new ones. Alternatively, existing companies can be over-bureaucratic; or internal groupings may defend current technology – with the all too common “not invented here” syndrome. New companies set up by entrepreneurs are comparatively unburdened and can thereby accelerate the adoption of new technologies.

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<sup>8</sup> Baumol (1990, 1993, 2002).

## Entrepreneurship and job creation

One of the most often cited benefits from entrepreneurship is job creation. Some have questioned this role, and the related conclusion that private business wealth creation should be tolerated because of its role as a new employment machine. During the 2012 election, President Barack Obama argued that private-equity firms *create wealth*, not *jobs* and that “The goal of Romney economics has always been about wealth creation, not job creation”. He is of course right to say that the aim for companies is not to create jobs, but to earn profits. However, setting up a dichotomy between job creation and wealth creation betrays a fundamental misunderstanding of private enterprise.

For the simple truth is that job creation is necessary in order for entrepreneurs to reach their goal of private wealth creation or the development of ideas. To state the obvious, Bain Capital and Mitt Romney could not possibly have been able to make money out of the Staples office supply business had the company not hired tens of thousands of workers to staff its stores.<sup>9</sup>

Of course, as Adam Smith pointed out, the private pursuit of wealth tends to benefit others as in well-functioning market

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<sup>9</sup> Office supply provider Staples was co-founded by Leo Kahn and Thomas Stemberg in 1985. The core innovation was that small businesses and other users of office supplies would find it convenient to buy what they needed directly from a supermarket for office supplies, rather than order it from suppliers or rely on smaller suppliers. Mitt Romney, who had recently founded Bain Capital with the aim of investing in high potential start-ups, helped finance the company, sat on its board and worked a few shifts in its first store. Staples turned out to be a success currently having 2,000 stores and 90,000 employees.

economies: it is difficult to become rich without creating value for others. In economies characterised by the rule of law and private property protection those who want to become rich must create value.

This is confirmed by the Forbes data: the 31 largest entrepreneur founded companies in the US together with the 7 European and 11 Japanese largest companies together employ 6 million workers.

A separate question is whether entrepreneurship affects aggregate net job creation. Entrepreneurship also destroys jobs through creative destruction. New jobs created by new firms tend to replace old jobs in varying degrees. Churning of employment is vital to prevent the economy from stagnating. It may be more accurate to say that entrepreneurs create better, new jobs than to say that they create jobs.

Some recent research has emphasised that it is a misunderstanding that most new jobs are created by small firms. Haltiwanger et al. (2013) account for the age of the company as well as size. New companies tend to be both small and young, which makes this distinction important. It turns out that small companies are not disproportional job creators once accounting for their age. Rather it is young and newly created companies that create most new jobs as they grow from small to larger firms. This reinforces the point that self-employment and small business activity should not be seen as synonymous with entrepreneurship. Haltiwanger et al. (2013) find that start-ups alone account for only 20% of gross job creation in US.

### **Entrepreneurship is not always good**

Economist William Baumol has pointed out that while most entrepreneurship in advanced countries is mostly productive,

this was not the case historically.<sup>10</sup> It is also often not the case in the third world today. In essence, entrepreneurship is about doing new things. But innovation does not always improve life. So the question is not just how many people become entrepreneurs and how successful they are. It is also necessary to consider to what extent entrepreneurs exert their energy in positive-sum enterprises rather than negative-sum transfers of wealth from others.

All societies have had, or have, unusually entrepreneurial individuals who are willing to take risks, who are creative, intelligent and have the charisma and leadership ability to organise others. The entrepreneurs choose what activity to perform based on expected private gain.

Historically, few countries have had the preconditions which favour productive entrepreneurship. In medieval Europe a talented individual who today might become a successful entrepreneur perhaps would have been an all-conquering warlord. During much of China's history, the imperial bureaucracy rather than industry attracted the most brilliant individuals. Today in corrupt countries, those with talent are often attracted to government work where they can extract rents from others.

Dictators and organisers of criminal groups are obvious examples of entrepreneurial individuals who lower social output. The same is true for businessmen who create monopolies or use illicit methods to remove rivals. Although Forbes has removed dictators from its list of billionaires, there are still some drug-lords and gun-smugglers. That this source of wealth is more common in poorer countries is unlikely to be a coincidence.

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<sup>10</sup> Baumol (1990, 1993, 2002).

There are also destructive entrepreneurs in the private sector, or in the grey zone between politics and business. The former Soviet Union is particularly characterised by billionaires who appear to have become rich by taking over previous government companies after the fall of communism. Corruption and political connections have played an important role in their wealth formation. Many Russian billionaires have at best taken assets from the public, rather than contributing to economic growth. Others appear to be a mix of creators and rent seekers.

## 4. WHO HAS MOST ENTREPRENEURS?

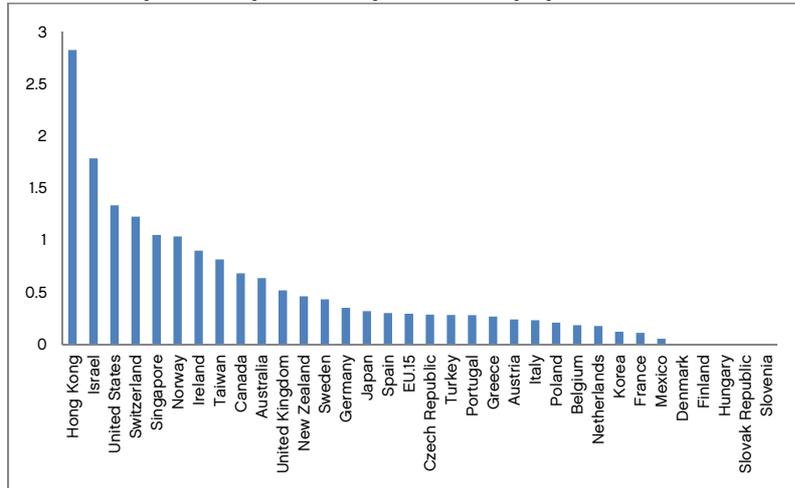
Two samples were used to calculate cross-border rankings of entrepreneurship: the first consisted of all 159 countries with more than one million inhabitants (those with fewer than one million inhabitants are excluded from the analyses); the second was a smaller sample, restricted to the 33 rich industrialised economies, mainly OECD countries plus Singapore, Taiwan and Hong Kong.<sup>11</sup>

Chart One shows how the number of SuperEntrepreneurs varies significantly across countries. Hong Kong has the most, with around three SuperEntrepreneurs per million inhabitants. The second highest rate of entrepreneurship is found in Israel, where there are close to two SuperEntrepreneurs per million inhabitants, followed by the US, Switzerland and Singapore. Some nations, such as Finland and Slovakia, do not have a single billionaire entrepreneur. Mexico with a population of over 100 million only has six SuperEntrepreneurs, or 0.06 per million inhabitants.

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<sup>11</sup> The advantage of the second smaller sample is that billionaires in those countries are more likely to have earned their wealth through innovative entrepreneurship, rather than rent-seeking or corruption.

**Chart 1: SuperEntrepreneurs per million population, 1996-2010**



Source: Henrekson and Sanandaji (2013).

This measure of entrepreneurship is far from perfect: billionaire entrepreneurs are rare, which makes it hard to compare small countries. However, the per capita rate of SuperEntrepreneurship corresponds well with the two other ways in which high-impact entrepreneurship can be measured: the percentage of the largest public firms founded by an entrepreneur since 1945; and venture capital investments as a percentage of GDP. These three definitions correlate very strongly with each other, with a correlation coefficient around 0.7 to 0.8. Using updated venture capital data calculated by Lerner and Tåg (2013) who have a larger sample, increased the correlation further.

When comparing large regions, the gap in Super-Entrepreneurship can be more clearly seen. The US is roughly four times as entrepreneurial as Western Europe and three times as entrepreneurial as Japan, measured either in terms of SuperEntrepreneurs, large firm founders or Venture Capital investment as percentage of GDP.

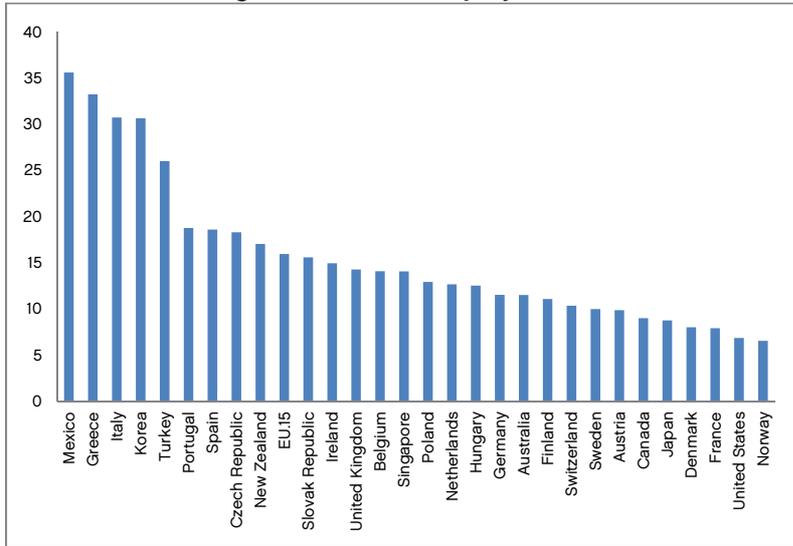
### **Self-employment and Superentrepreneurship**

Western Europe has a significantly higher rate of self-employment than the US. This is particularly true in Greece, Italy, Turkey, Portugal and Spain, with a 20% to 30% self-employment rate outside of agriculture. By contrast, the US, Canada, Japan and Switzerland have low rates of self-employment, of around 10% to 15% of workers. Greece and the other countries have few SuperEntrepreneurs per capita, compared with the US, Canada, Japan and Switzerland.

The negative association between self-employment and entrepreneurship is illustrated by a comparison of Chart One (plotting entrepreneurship levels) with Chart Two (plotting self-employment levels measured by the International Labour Organisation). Clearly, the higher the percentage of self-employees tends to be, the lower the percentage of SuperEntrepreneurs tends to be. Equally, nations with low levels of SuperEntrepreneurs – such as Mexico, Greece, Italy and Korea – are those that have the highest percentage of self-employed.

Chart Three shows the negative correlation between the percentage of SuperEntrepreneurs and of self-employed in rich countries only, this time using OECD statistics on self-employment (which are close to but not identical with ILO figures). Clearly, the higher the percentage of self-employees tends to be, the lower the percentage of SuperEntrepreneurs tends to be.

**Chart 2: ILO non-agricultural self-employment, 2008**



**Chart 3: Entrepreneurship & self-employment, OECD countries**

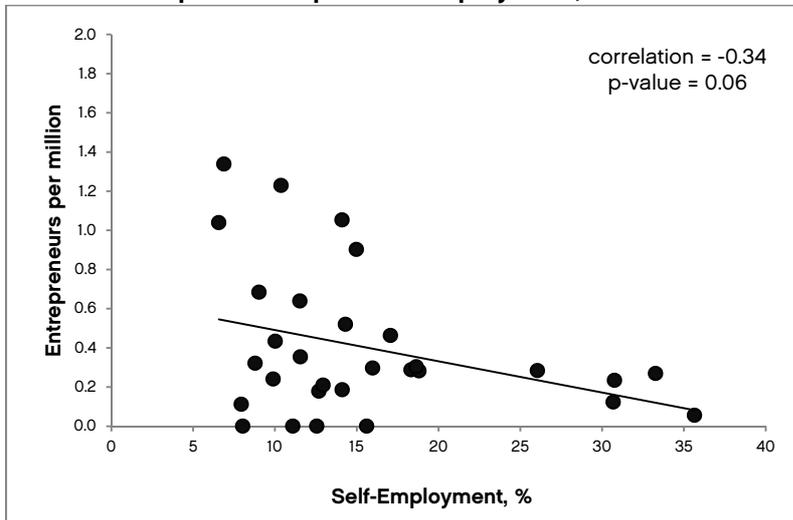
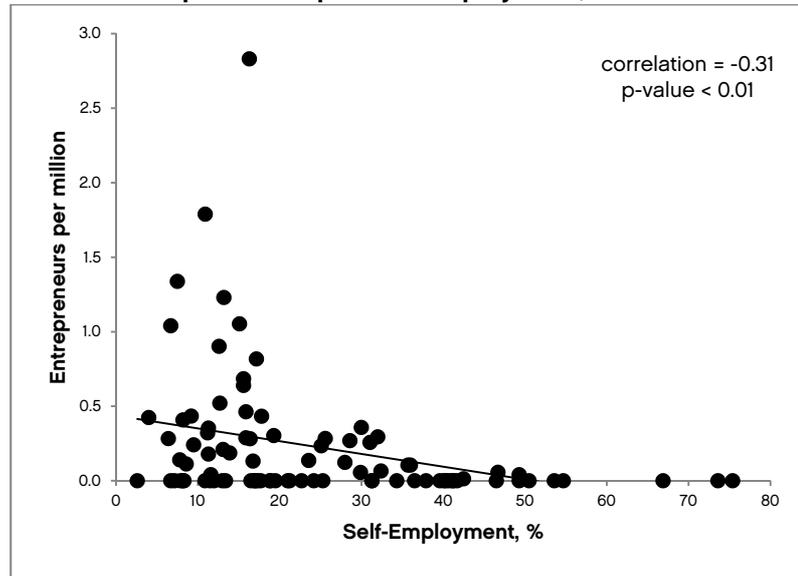


Chart Four shows that the same relation also holds if all countries are analysed using the ILO rather than OECD definition of the self-employment rate.

**Chart 4: Entrepreneurship & self-employment, all countries**



## 5. THE RIGHT PRECONDITIONS

### **The legal framework**

In an influential study, Harvard economists Andrei Shleifer and Edward Glaeser identified the legal origin of societies as an important determinant of economic outcomes. They argued that countries with different legal origins tend to vary in the strength of property rights and degree of rule of law; and that most countries are influenced by a small number of legal regimes. To simplify their analysis, legal origins can be divided into four categories: English, French, German and Scandinavian.

The UK, former British colonies such as the US, Canada and Australia and several other countries are characterised by English legal origins. French legal origins have influenced a larger set of countries: France itself, Belgium, the Netherlands and Italy, and a large number of countries in Africa and Asia. Spain was also heavily influenced by French legal views and practice, and spread these further to its many colonies in Latin America and elsewhere.

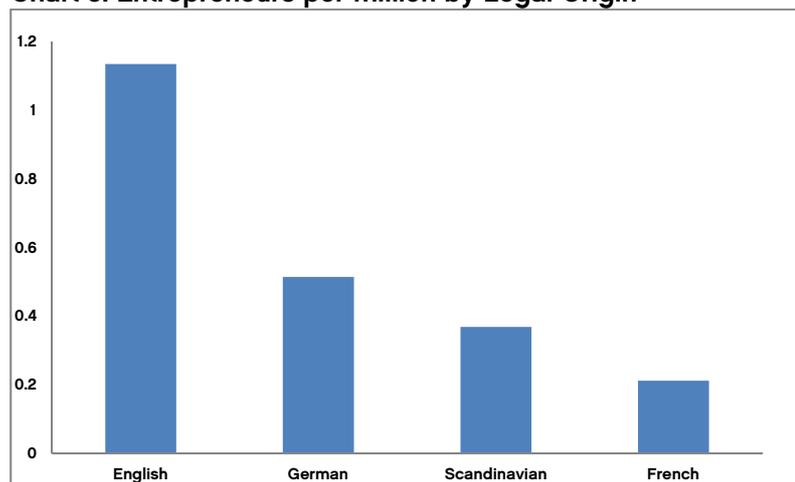
Germany influenced the legal systems of Austria, the former Czechoslovakia, Greece, Hungary, Italy, Switzerland, Yugoslavia, Japan, Korea and Taiwan. Japan, China and Taiwan also relied on

German laws during modernisation. Lastly, Scandinavian legal origins are found amongst the Scandinavian nations.

Chart Five compares the percentage of high-impact entrepreneurs in nations within these broad groups and shows that in the nations with English legal origins the rate of SuperEntrepreneurship is over twice as high compared to those with German legal origins. Compared to the Scandinavian nations, the nations with English legal origins have almost three times as many SuperEntrepreneurs.

The lowest share is found amongst nations with French legal origins, which is less than one-fifth of that of nations with English legal origins. The popular notion that Anglo-Saxon nations are more entrepreneurial is hence strongly supported by an analysis of legal origin, but of course this cannot determine *why* this is the case. Could it be due to the legal system itself, or instead to other factors (such as culture or economic policy) that are correlated with legal origin?

**Chart 5: Entrepreneurs per million by Legal Origin**



### **Institutional quality and protection of property rights**

Institutions consist of both the formal legal rules (such as constitutions) and the informal social norms (such as work ethic) that influence individual behaviour and structure social interactions. In recent years, economists have increasingly focused on institutional quality as an important determinant of growth. Many economists believe property rights are an important explanation for variations in economic performance across countries and across time.

In rich western countries today, it is easy to take strong protection of property rights for granted. However, historically in the west, and in most of the rest of the world today, property rights have been, and are, far from secure. Property rights matter because individuals will rarely invest the massive amounts of time and money needed to creating an entrepreneurial company if there is an imminent risk that their firm will be taken from them in the event it becomes valuable. In economies with weak protection of property rights and corrupt states, firms tend to stay small and informal, which of course inhibits high growth entrepreneurship.

Another reason is that in countries with weak institutions and low levels of interpersonal trust, firms cannot rely on the web of contracts and trustworthiness essential to effectively managing their employees. When the level of trust and contract protection in a society is low, it becomes more important to monitor employees closely or rely on your own or family labour, which encourages small firms to stay small. The British economist Alfred Marshall anticipated the advantage of smaller firms: “the master’s eye is everywhere; there is no shirking by his foremen or workmen, no divided responsibility, no sending half-understood messages”. Where hired strangers cannot be

trusted, entrepreneurs will find it much harder to expand their firms rapidly around innovative ideas.

In economies with weak institutions, companies tend to rely on the capital of the owner, or at best from family networks, which again inhibits growth. External capital from banks, venture capital and stock market capital raised through initial public offerings will be scarce if property rights do not protect investors. However, there is no guarantee that the person with the most original innovation or the best managerial talent is the same individual who just happens to have a rich uncle. With weak institutions, it is mostly the already rich rather than the most talented who are able to found new companies. This is of course both unfair and extremely inefficient.

Similarly, high-tech innovative companies must be confident that the technology or product will not simply be copied by competitors. Nobel prize winner Douglas North convincingly argued that intellectual property rights were the key advantage that enabled Western Europe to be the birthplace of the industrial revolution. Without a guarantee that intellectual property rights are protected, companies will be reluctant to invest in new technology. Intellectual property rights remain weak in many developing countries, and are not fully protected even in many developed countries.

This matters as it is often impossible to predict whether a new idea will succeed. For each idea that generates a valuable innovation, a company will pursue many that lead to dead ends. For the approximately 5,000 to 10,000 chemical compounds that enter the research and development pipeline of medical companies, in the long run only 250 enter pre-clinical testing. Of these 250 projects, on average only one receives approval and is marketed as a medicine. Furthermore, only about 15% of

drugs that are approved and enter the market are profitable enough to pay for their research and development costs.<sup>12</sup>

Is there is a reliable way to measure the effect of institutions on an economy? Hernando de Soto has developed a comparative index to quantify property rights protection. The “International Property Rights Index” measures the significance of both physical and intellectual property rights in 129 countries. It focuses on three areas: the legal and political environment; physical property rights; and intellectual property rights. Countries in the third world and former communist countries tend to have the lowest protection of property rights. A comparison of the rates of entrepreneurship and the level of property right protection suggests a strong positive correlation, as shown in Chart Six.

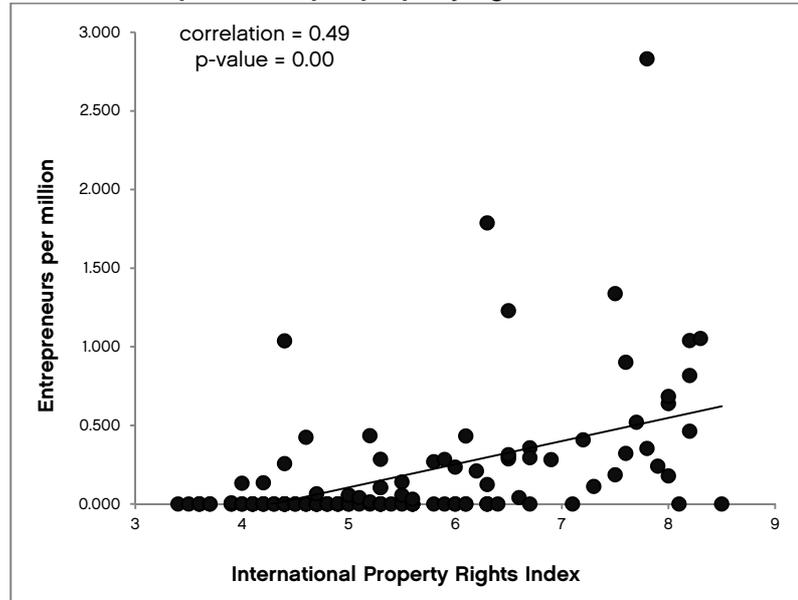
This suggests that developing countries need to strengthen property rights in order to encourage – or even enable – high growth entrepreneurship. Improving property right protection costs very little and has few negative consequences. This is particularly true for intellectual property rights, which are vital for innovative entrepreneurship and yet remain the least protected form of property, even in advanced economies.

If property rights are strong, talented individuals are therefore more likely to find it attractive to engage in activities that create social value. In other words, when private and social interests align, the SuperEntrepreneur prospers. As does the rest of society.

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<sup>12</sup> See [innovation.org, Drug Discovery and Development, 2007](http://www.innovation.org/drug_discovery/objects/pdf/RD_Brochure.pdf) at [http://www.innovation.org/drug\\_discovery/objects/pdf/RD\\_Brochure.pdf](http://www.innovation.org/drug_discovery/objects/pdf/RD_Brochure.pdf)

Chart 6: entrepreneurship & property rights, all countries



## 6. THE RIGHT TAX RATES

Trying your luck as an entrepreneur is not costless. In addition to investing their savings, a nascent entrepreneur will probably have to leave his or her job. Moreover, entrepreneurs with high potential will often have attractive career options in larger companies. They will have to give up their income, security and seniority to start a new business which, more often than not, will fail. Research in the US has shown that three-quarters of entrepreneurial start-ups earn nothing at exit.<sup>13</sup>

In the simplest possible terms, potential entrepreneurs must choose between a high risk, high effort option with little likelihood of success, and a generally well-paid and secure job. When taxes eat away a sizable part of the return from the rare cases of great success, the cost-benefit calculus inherent in this dilemma is altered.

Successful entrepreneurs also tend to be competitive individuals who are economically oriented in their thinking and responsive to financial incentives. Research has consistently

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<sup>13</sup> Hall and Woodward (2010).

shown that business owners reduce their output more in reaction to taxes than do workers. They are, in the terminology of economists, more responsive. This is probably due to a combination of factors – namely having more control over their reported income, greater ability to avoid taxes, more control over how much effort they put in and being more responsive to economic incentives.

For many entrepreneurs, wealth is also a sign of success, of recognition by peers and by society. It represents more than merely the material goods that wealth can buy. Indeed, 73% of entrepreneurs surveyed reported that economic profits were motivating factors.<sup>14</sup> As Ted Turner, founder of CNN, said: “Money is a way of keeping the score.”

Even for entrepreneurs who only care about their firm and disregard the profit motive, taxes are likely to matter. This is because taxes limit the ability of the company to grow, to attract capital and to recruit talent.

It should therefore be no surprise to find a clear relation between taxes on profits and the distribution of high-impact entrepreneurs. Those countries that have the highest tax rates tend to be those that have the lowest rates of entrepreneurship.

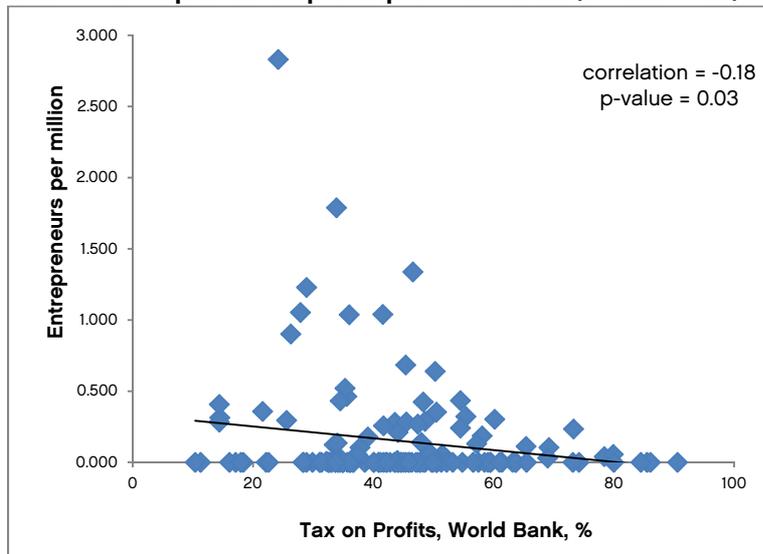
While high tax rates appear to diminish entrepreneurship, they seem to have no robust relation to self-employment. To the contrary, several studies have found that high tax rates tend to be associated with higher rates of self-employment.<sup>15</sup>

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<sup>14</sup> Gartner (1990).

<sup>15</sup> See, for example, Bruce and Schuetze (2004). Note that higher tax rates tend to make self-employment more attractive, in part because the self-

**Chart 7: entrepreneurship and profit tax rates (all countries)**



### **Venture capital, taxation and entrepreneurship**

The venture capital industry is a surprisingly recent development. While bank lending to small firms has grown little since 1975, adjusted for inflation, venture capital funds in the US have increased a 100 fold since 1975.<sup>16</sup>

The finance and expertise offered by venture capitalists dramatically increases the likelihood that a venture is successful. One important contribution of venture capital is to make it possible to scale up to project. When and where a

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employed can more easily avoid or evade taxes than employees. A correlation between high rates of tax and high rates of self-employment is therefore no reason to infer that high tax rates are correlated with high rates of entrepreneurship.

<sup>16</sup> Gompers and Lerner (1998, 2001).

business idea is good enough for one city, why not expand it to the entire country, or even internationally? With the financial resources and human capital provided by venture capitalists, the best entrepreneurial firms can grow rapidly, rather than depending on reinvesting profits from previous years.

This new financial infrastructure has had a significant impact on innovation and new business activity. In the last decade, of the entrepreneurial companies in the US successful enough to be involved in an Initial Public Offering and thereby becoming part of the stock market, 63% had been venture capital funded. Interestingly, only around 0.1% of US firms ever receive venture capital financing. The striking fact that the majority of successful entrepreneurial firms belong to this tiny subgroup reinforces the point that not all firms are equally entrepreneurial.<sup>17</sup>

Entrepreneurial firms tend to be knowledge-intensive and require top talent, not only from the entrepreneur, but also from key employees. Yet entrepreneurial firms tend to have relatively limited funds to pay high wages, and instead rely on option programmes to reward their employees if the firm is successful. Taxes that make option contracts prohibitively expensive impair the complex contractual design and damage the venture capital-entrepreneurship sector<sup>18</sup>. High tax rates thereby limit the ability of companies with important innovations to attract the human capital needed to develop the project.

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<sup>17</sup> Kaplan and Lerner (2010).

<sup>18</sup> Henrekson and Sanandaji (2012).

A similar story is true for venture capital and private equity funds. This can be crucial, particularly in certain industries: in the bio-tech sector, it is virtually impossible for entrepreneurs to succeed without venture capital finance. Venture capital is involved in the majority of the highest growth firms in the US, and increasingly in Europe and other developed countries.

In their ground breaking research on the venture capital industry, Harvard economists Paul Gompers and Josh Lerner show how sensitive it is to economic incentive and to the return on investments.<sup>19</sup> One interesting finding is that the return on capital in the venture capital industry is approximately the same as the return on capital in the stock market.

This implies that the flow of capital into venture capital is determined by the economic rate of return, and therefore likely to be negatively impacted by high capital gains taxes. Another important finding is that many of the investors in US venture capital are precisely those who are exempt from capital gains taxes. These so-called institutional investors account for about half of all funding to venture capital and private equity. This shift of ownership is yet another indication that investors are sensitive to taxes. A separate study by Harvard economists Gompers and Lerner has found that capital gains taxes significantly affect the flow of funds to the venture capital industry and the financing of entrepreneurial firms.<sup>20</sup>

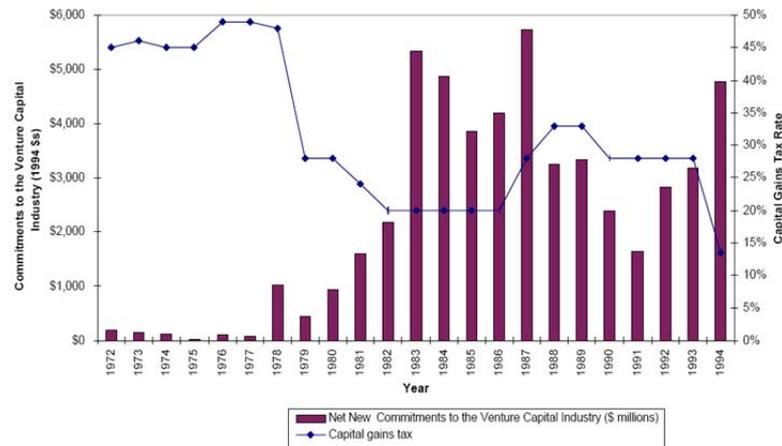
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<sup>19</sup> Gompers and Lerner (1998, 2001).

<sup>20</sup> Gompers and Lerner (1998).

Chart Eight shows the annual commitment to the venture capital industry in the US, compared to the highest marginal capital gains tax. It shows that venture capital investments increased sharply as the capital gains tax was cut in the late 1970s and early 1980s. When the tax rate was increased in the late 1980s, investments dropped. A cut in the tax rate in the mid-1990s led to a new increase in funds available for investment.

**Chart Eight: US venture capital investment and CGT rates**



Note: The bar chart shows annual commitments to the venture capital industry in millions of constant US dollars. The line graph shows the highest marginal capital gains tax rate effective in that year.

Source: Gompers and Lerner (1998).

### Stimulating innovation through tax reform

There are at least two distinct reasons why tax cuts for entrepreneurship can be economically efficient.

First, the most fundamental principle in the theory of optimal taxation is that the more sensitive an economic activity is to tax, the lower the taxes should be. As the economic behaviour of

entrepreneurs reacts more sensitively to taxes than most other groups in the economy, a tax increase on entrepreneurs is likely to have a disproportionately negative impact on economic activity.<sup>21</sup>

Second, and perhaps more importantly, is the effect of “innovation spillover”, or “positive externalities”. When innovators successfully create a new product or technology, they privately capture only a fraction of the social value created. The entrepreneurs of Silicon Valley, who largely created the digital revolution, have earned tens of billions of dollar of private wealth. However by dramatically raising global productivity, tens of *trillions* of dollar of wealth have been created for society.

These entrepreneurs created social value through innovation, new products for consumers, jobs for employees and wealth for financiers and stockowners. Of the total value created, the entrepreneur generally receives a fairly small share: While exact calculations must be treated with caution, Yale economist Professor William Nordhaus has estimated that on average only 2% of the social value of innovation is captured by innovators.<sup>22</sup>

In theory, therefore, entrepreneurs should be taxed less than economic actors who create less positive social externalities, (such as passive investors). The most targeted way of doing this is to reduce the taxes on capital gains from long-term holdings in start-ups (one of the main taxes faced by venture capitalists and entrepreneurs).

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<sup>21</sup> See Chetty et al. (2011) and Henrekson and Sanandaji (2012) for a review of evidence.

<sup>22</sup> Nordhaus (2004).

Capital gains taxes are paid when the value of investments grow. In this way, they have a particularly high impact on entrepreneurial companies. Yet the revenue they raise is relatively insignificant (less than 0.5% of gross national product in both the US and the UK).<sup>23</sup> Capital gains taxes can therefore be defined as a high-impact, low yield tax.

Cutting capital gains taxes would therefore be a straightforward way to promote growth. It would make entrepreneurship a more appealing choice for potential entrepreneurs and would also increase the flow of funds into venture capital and the entrepreneurial sectors.<sup>24</sup> This would be particularly true for those countries with capital gains tax rates of 25% or higher (such as Denmark, France, Sweden, Ireland, the UK, Norway, Spain, Canada and Germany).

### **Ending entrepreneurial flight**

High tax rates therefore reduce the probability that SuperEntrepreneurs will emerge in an economy. But they also influence the probability that SuperEntrepreneurs will emigrate, either before or after they become rich. In this way the public sector loses revenue that would have been paid had they stayed in their home country – and may also lose at least some of the benefit from that entrepreneur remaining in his home country (such as philanthropy or public service).

As the possibility of “flight” applies to all billionaires, not only entrepreneurs, the following data is based on the country of

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<sup>23</sup> Gompers and Lerner (2001).

<sup>24</sup> Reducing capital gains tax rates would have to be accompanied by efforts to limit “income shifting” (a process whereby the tax system incentivises individuals to engage in tax evasion).

birth of each billionaire, using the same method used to determine the source of wealth above, and combines this information together with data on their current residence.

Slightly more than 10% of billionaires reside in a country other than that of their birth. About three-quarters of those who have migrated have gone from a higher tax to a country with a lower capital gains tax rate. One-third of all billionaires who have left their home country have moved to a handful of tax havens (such as Switzerland, Monaco, the Cayman Islands, Singapore, Hong Kong, Bermuda, Gibraltar, Bahamas, Costa Rica, Cyprus and Barbados). Controlling for geographic and cultural distance as well as per capita income, taxes in both the home and destination country influence the likelihood that the rich relocate.<sup>25</sup>

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<sup>25</sup> See Sanandaji (2013). This might underestimate the effect of migration, particularly in high tax countries. For example, a Swedish journal has listed the richest Swedes (defined as wealth of over 1 billion Swedish kronor or about \$130 million). 35% of this group have moved to a lower tax country.

## 7. THE RIGHT REGULATIONS

Every nation regulates business. A certain amount of regulation is necessary in a modern economy in order to ensure that companies pay taxes, minority owners are protected, hazardous products are traded safely, employees are not taken advantage of, consumers are not deceived and the environment is protected.

But not every nation regulates business in the same way: indeed, there is a vast variation in the nature and force of regulations. This includes the legal requirements that need to be met before a business can open its doors, the amount of time required to fulfil regulations as well as the financial cost of the various fees that may be required. As Professor Andrei Shleifer and his co-authors noted in a 2001 World Bank Study, *The Regulation of Entry*:

*“To meet government requirements for starting to operate a business in Mozambique, an entrepreneur must complete 19 procedures taking at least 149 business days and pay US\$256 in fees. To do the same, an entrepreneur in Italy needs to follow 16 different procedures, pay US\$3,946 in fees, and wait at least 62 business days to acquire the*

*necessary permits. In contrast, an entrepreneur in Canada can finish the process in two days by paying US\$280 in fees and completing only two procedures. The minimum official time for a new firm varies from two business days in Australia and Canada to 152 in Madagascar, with a world average of 47 business days. The official cost of following necessary procedures for a simple firm is as low as 0.5% of per capita GDP in the United States and as high as 460% of per capita GDP in the Dominican Republic. The worldwide average is 47% of annual per capita GDP.”*

Differences in regulations are not only large between advanced and third world countries, but also within the advanced economies. In Canada, for example, a new business needs on average two days to start, and costs the equivalent of 2% of per capita GDP. Sweden is about average in terms of regulations on start-ups among OECD members. There, a new business needs 13 days and costs on average 8% of per capita GDP to set up. In contrast, in France, it takes an average of 53 days to set up a new company and costs 36% of per capita GDP, while in Italy it takes on average 62 days, at a cost equivalent to 45% of per capita GDP.

The study also found that more corrupt countries tend to have more regulations; and more heavily regulated countries have a larger informal sector. Moreover, more regulated countries do not have higher quality goods, more competition, better consumer health or any less pollution.

It should be noted that the study only measures the material cost, and the cost in terms of time, to deal with regulation. But business owners must also deal with the psychological cost.

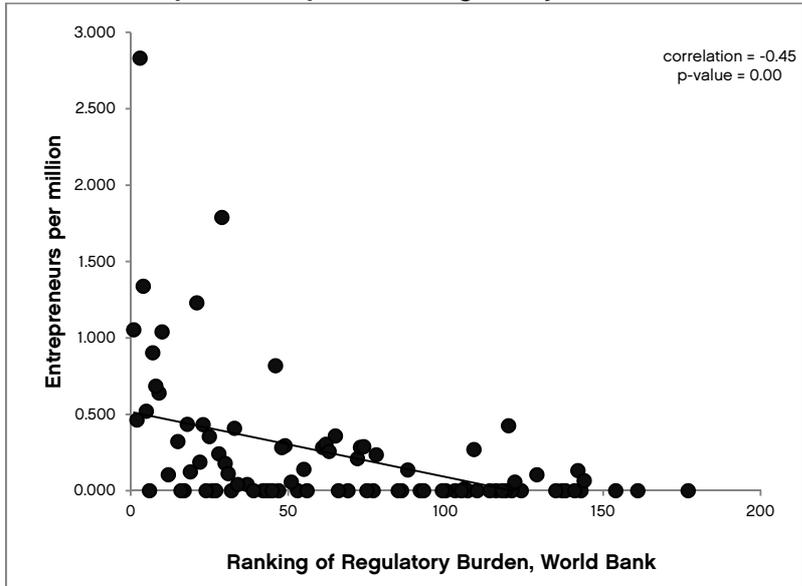
After all, is it worth starting up a business if you have to worry about red tape all the time? Entrepreneurs tend to be unusually creative individuals, passionate about their innovation. They are rarely interested in form-filling and dealing with bureaucracy.

Chart Nine compares the level of SuperEntrepreneurship with the World Bank's "ease of doing business" index which covers all countries. A robustness check, with a smaller set of 28 developed countries, is shown in Chart Ten. The results indicate that countries with a heavy regulatory burden have fewer entrepreneurs per capita. Table One then measures the effect of regulations, while taking differences in per capita income and tax rates into account. Even when controlling for the latter, more regulations are associated with fewer SuperEntrepreneurs.

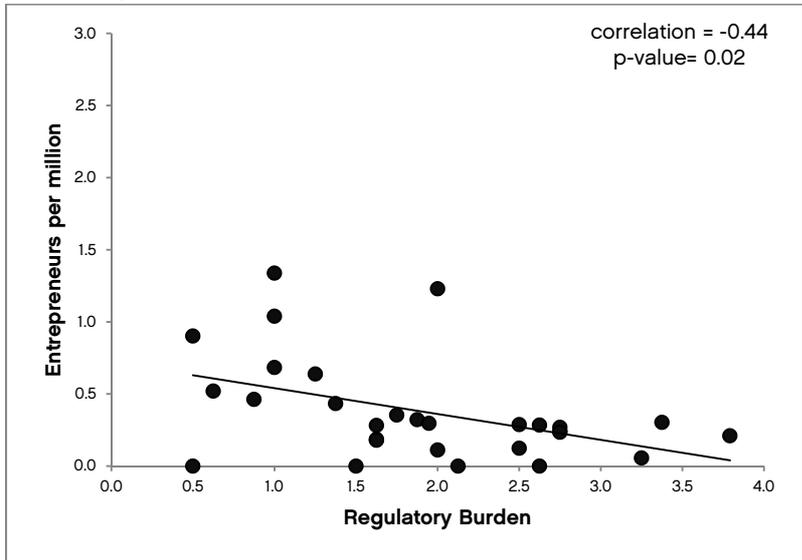
The strong negative correlation between entrepreneurship and regulations suggests that a heavier regulatory burden inhibits the emergence of SuperEntrepreneurs. But this correlation does not of course prove causation. Even so, the empirical evidence is supported by strong theoretical reasons why regulations reduce the number of new entrants to the market and limit small business growth. In contrast, it is hard to imagine why making it costlier and more time-consuming to start a company should encourage more start-ups.

Reducing the regulatory burden, which appears to promote growth, comes at limited cost to national Exchequers – a significant advantage when many Western countries are facing significant budget deficits. And as has been seen, countries where it is easier and cheaper to start up new companies, such as Canada and Australia, do not have more dangerous products or less competition compared to more heavily regulated countries such as France and Italy.

**Chart 9: Entrepreneurship and the regulatory burden**



**Chart 10: Entrepreneurship and the regulatory burden, OECD-countries, 2008**



**Table One: Cross-Country regressions of entrepreneurship rates**

	(1)	(2)	(3)	(4)
Population	0.014** (0.000)	0.015** (0.000)	0.013** (0.000)	0.014** (0.000)
GDP per capita	0.037** (0.002)	0.039** (0.002)	0.024** (0.003)	0.027** (0.003)
Taxes		-0.027* (0.007)		-0.024** (0.007)
Regulations			-0.007** (0.001)	-0.007** (0.001)
Constant	0.159* (0.78)	0.750** (0.174)	0.893** (0.150)	1.393** (0.212)
<i>R</i> -squared	0.79	0.79	0.80	0.80
<i>No. of observations</i>	90	90	90	90

Note: Column (1) shows entrepreneurship rates regressed on population size and GDP per capita. Column (2) includes the above with the addition of taxes. Column (3) includes regulations but not taxes. Column (4) includes all variables.

This table reports coefficients from a Poisson Event Count Model where the dependent variable represents the number of people who become billionaire entrepreneurs in each country. Taxes refer to the standard statutory corporate income tax rate as measured by the World Bank. Regulations refer to the ease of doing business, again as measured by the World Bank. Two stars (\*\*) denote statistical significance at the 1% level and one star (\*) denotes statistical significance at the 5% level.

## **8. CHARITABLE INSTINCTS?**

In 2009, the two richest men in America organized a confidential dinner meeting of billionaires in New York City, hosted by David Rockefeller. Guests included George Soros, Michael Bloomberg, Ted Turner and Oprah Winfrey. The topic of discussion was philanthropy.

Each billionaire was asked to describe his philosophy of giving. CNN-founder Ted Turner told the story tale of how he had made a spur-of-the-moment decision to donate \$1 billion, most of his fortune, to the United Nations. During this dinner, Bill Gates and Warren Buffet started the biggest fundraising drive in history, initiating “The Giving Pledge”, a campaign encouraging billionaires to commit the majority of their wealth to philanthropic causes. So far around 113 billionaires have agreed to the pledge.

Billionaires are targeted because Gates and Buffet believe that only they have sufficient funds to make a dent into the world's major problems. The US was initially targeted in part because, with its stronger emphasis on giving back something to society by those fortunate enough to have acquired wealth, it has a stronger culture of donating.

Bill Gates has already donated close to \$30 billion dollars of his own wealth, a move which has cost him the title of the richest man in the world. Gates has further pledged to donate his remaining wealth of about \$60 billion (leaving his three children \$10 million each).

Omaha billionaire Warren Buffett has also pledged the great majority of his wealth to charity, leaving only a small endowment to his children. As he has said: "I want to give my kids just enough so that they would feel that they could do anything, but not so much that they would feel like doing nothing".

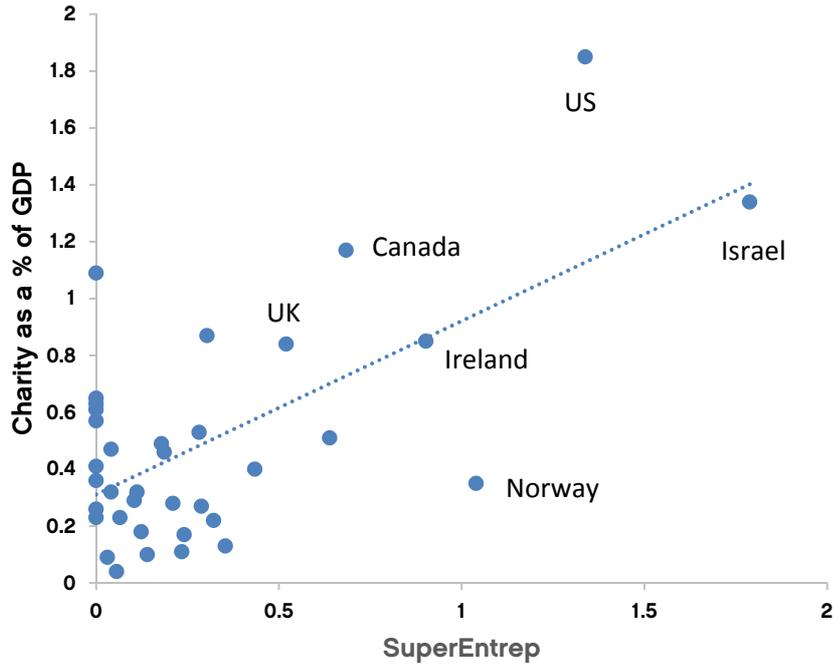
The Johns Hopkins Comparative Nonprofit Sector Project collates data on cross-country differences in charitable donations. In particular, its *Global Civil Society: Dimensions of the Nonprofit Sector* contains charitable donations as a share of GDP in 36 countries.<sup>26</sup> According to this source Americans donated 1.9% of GDP to charity, compared to 0.3% of GDP in continental Europe.

There is a very strong correlation between the per capita number of SuperEntrepreneurs and donations to charity as a share of GDP, with a statistically significant correlation coefficient of +0.64. This relationship holds also when controlling for per capita GDP and tax rates. Other than the US, countries with a high count of SuperEntrepreneurs and high charity as a share of GDP includes Israel (1.3% of GDP), Canada (1.2% of GDP) and the UK with 0.8% of GDP. Several British Superentrepreneurs have joined Gates and Buffets Giving Pledge to donate half their wealth to charity, including Michael Anthony and Richard Branson.

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<sup>26</sup> Salamon et al. (2004).

Chart 11: Entrepreneurship and philanthropy, OECD-countries, 2008



It may of course be that the strong correlation between charity and the number of SuperEntrepreneurs is not causal and reflects cultural differences, such as Anglo-Saxon countries donating more to charity and having more entrepreneurship.

To some extent, there may be an interplay between Anglo-Saxon capitalist culture and Anglo-Saxon prescription for charity, especially for the fortunate. Tocqueville has argued that protestant norms such as industry, frugality, charity and humility were important for US development.<sup>27</sup> The Calvinist Puritan

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<sup>27</sup> De Tocqueville (1966), reprint from original 1835 publication.

settlers brought with them strong norms of charity from England, which also influenced Canada and Australia. Interestingly, a similar norm towards expectations of charity from the wealthy exists in Jewish culture, which may in part account for the high rate of charity in Israel.

American capitalism also differs from other societies with its historical focus on both the creation of wealth and the reconstitution of wealth through philanthropy. The implicit social contract allows rich Americans to retain most of their wealth from taxation. In return, they voluntarily give much of it back to society, in projects of their choosing. The notion exists that wealth beyond a certain point should be invested back in society to expand opportunity for future generations. In this way John D. Rockefeller, the richest man in US history, gave back 95% of his wealth before he died.

Based on tax data, Fortune Magazine estimates that the 400 highest earning Americans donate \$15 billion to charity each year, or around 10% of their annual income.<sup>28</sup> Compared to other donors, wealthy Americans are more likely to donate to education and the arts but less likely to donate to religion.

The strong charitable tradition in the US has had several positive feed-back effects. As Zoltan Acs and Catherine Phillips have argued:<sup>29</sup> “much of the new wealth created historically has been given back to the community, to build up the great social institutions that have a positive feedback on future economic growth.” Thus, in his lifetime, Rockefeller alone established

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<sup>28</sup> Fortune Magazine and CNN Money (2010).

<sup>29</sup> Acs and Phillips (2002).

many important institutions, including the University of Chicago, Spelman College, The General Education Board, National Bureau of Economic Research, Brookings Institution and the Rockefeller Foundation. The University of Chicago is not the only great private research university created through individual philanthropy. The same is true for Stanford, MIT, Johns Hopkins, Carnegie-Mellon and Duke.

Equally, the practice of philanthropy creates legitimacy for capitalism among the public. Bill Gates, the richest man in the US, accumulated his wealth in part through sharp elbows. Yet his is one of the most popular people in the country. In one Pew poll, he was viewed favorably by 69% and unfavorably by only 15% of the public, the best numbers of any public person polled. Similarly, according to Gallup, Bill Gates is the most admired man in America who is not a current or former President.

## **9. WHY IS THE US SO ENTREPRENEURIAL?**

The Forbes data confirms that the US is far more entrepreneurial than Western Europe, regardless of which measure of entrepreneurship is used. The per capita number of SuperEntrepreneurs is 4.5 times higher in the US, the percentage of the largest firms started by entrepreneurs since World War II is 4.4 times higher, and venture capital investments as a percentage of GDP is 3.6 times higher. Why is this?

One explanation that has been put forward is that there is more US investment available for research and development. However, the US does not differ significantly in this regard from Europe, though a higher share of US research is funded privately. Another theory is that the US market is larger. But again in the aggregate there is no established link between either the per capita number of entrepreneurs or total GDP and the size of a country. Though there are economies of scale for countries, there are also dis-economies of scale. In today's integrated economy, Western Europe as a whole has roughly the same purchasing power as the US.

Two more plausible factors which might explain US entrepreneurialism are taxes and regulations. The US has lower

taxes and a more favourable regulatory climate for entrepreneurs than Western Europe. According to the latest data the OECD index of regulations in the average of Western European countries is about twice as burdensome as regulations in the US.

Charts 7, 8, 9 and 10 above showed how high tax rates and heavy regulations are negatively linked to entrepreneurship rates across developed countries. Using this model about two-thirds of the higher rate of entrepreneurship in the US compared to Western Europe can be explained by lower tax rates as a share of GDP and by less burdensome regulations on entrepreneurial firms. Another variable that is positively linked to entrepreneurship is per capita income, although it is not clear if higher per capita income causes higher rates of entrepreneurship, or if higher rates of entrepreneurship and a more favourable business climate in general increase per capita income.

Gross National Product per capita is about 40% higher in the US than the average of Western Europe. If these differences in the levels of wealth are added to the model and treated as an explanatory variable, taxes, regulations and wealth account for four-fifths of the entrepreneurship gap between the US and Western Europe. The remainder may be due to the famous entrepreneurial spirit of the Americans, although no reliable method exists to measure cultural differences between countries.

## 10. THE LIMITS OF GOVERNMENT ACTION

In 2000, the European Union signed up to the “Lisbon Strategy”. The aim was to make the EU “the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion” by 2010.

Innovation was a prominent part of the Lisbon Strategy: “The competitiveness and dynamism of businesses are directly dependent on a regulatory climate conducive to investment, innovation, and entrepreneurship.” The word entrepreneurship is invoked repeatedly.

The Lisbon strategy was not a success. As Sweden’s Prime Minister Fredrik Reinfeldt remarked in 2009: “it must be said that the Lisbon Agenda, with only a year remaining before it is to be evaluated, has been a failure.” If so, why did the ambitious goal fail to materialise?

Crucially, the Lisbon Strategy never defined whether the aim was more small and medium size businesses, or more entrepreneurship. The terms are used interchangeably, and it is implicitly assumed that the same set of policies promote both.

More importantly though the EU nations refused to acknowledge the importance economic policy plays for entrepreneurship and innovation.

No easy paths exist to promoting entrepreneurship. High taxes and a heavy regulatory burden are central to the weak business climate in the EU, but the political will to reform did not exist. A sizable rhetoric gap characterised the Lisbon Strategy in practice: on one hand it lauded entrepreneurship and innovation, but on the other hand it lead to neither lower taxes nor lower regulation.

The EU is not the only government to have failed to promote entrepreneurialism. For example, when Harvard Business School Professor Josh Lerner looked at the role of public policies in fostering entrepreneurship,<sup>30</sup> he found that these policies have generally failed.

For example, nothing on the scale of Silicon Valley has been created by any country through active government policy. While the economics of scale and the network effects of agglomeration in Silicon Valley have given companies based there an extremely important competitive advantage, it has not been possible for any other government to replicate this success.

Similarly, Lerner pointed out that many neighbouring countries have tried – and failed – to replicate the success of Dubai. The city of Dubai in the Arab Emirates has little oil, but is endowed by nature with a natural harbour. In the 1960s, Dubai massively developed its port and became a successful regional hub of

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<sup>30</sup> Lerner (2009).

trade and finance. Once neighbouring countries and cities witnessed this, many tried to repeat its success. But again the problem was that Dubai had a long head start. There was not room for several regional hubs, and Dubai's imitators were left with debt and little success.

Among OECD countries, there is no clear link between public investments in research and development and entrepreneurship. This does not alone prove that all such projects fail, but taken together with a lack of clear evidence in favour of public projects to promote entrepreneurship, it makes it improbable that this policy can succeed.

One reason may be the difference between invention and innovation: an innovation can involve turning a technical invention into a useful product, successfully bringing it to market and profitably producing it. Only then can consumers benefit from the invention, and only then is the product viable. The overwhelming majority of inventions do not become innovations. It is therefore possible for countries to have plenty of patents and inventions yet have few successful entrepreneurial companies.

Perhaps the most obvious example of this was the former Soviet bloc. Though less technologically advanced, the gap in inventions between the east and west was far smaller than the gap in innovation. The Soviet bloc did not benefit from the computer revolution, not because it lacked engineers and scientists, but because it lacked an entrepreneurial sector.

### **Promoting small business or promoting entrepreneurship?**

When politicians say they want to promote entrepreneurship, they typically are implicitly referring to innovative and growth oriented entrepreneurship as exemplified by Apple and Google,

rather than more plumbers and dentists. This focus is natural, since the goal of entrepreneurship policy is spurring technological progress and job creation.

However, as has been seen, policy makers often conflate self-employment with innovative entrepreneurship. For example, President Obama in his speeches on the subject regularly uses the terms entrepreneurship and self-employment interchangeably.<sup>31</sup> The unspoken assumption appears to be that the policies that promote innovative entrepreneurship and policies that promote self-employment and the formation of small and medium size enterprises are the same.

This would not be a problem if the same policies that promote self-employment were effective in promoting entrepreneurship. Yet it appears that many policies have the opposite effect on self-employment and innovative entrepreneurship. The question should be: “do we want to have more Googles and Wal-Marts or more plumbers and a larger number of independent retail stores?” The policies that promote the latter might reduce the former, and vice versa.

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<sup>31</sup> See for example Obama (2009).

## **11. WHICH INDUSTRIES ARE MOST SUITED TO ENTREPRENEURS?**

Opportunities for SuperEntrepreneurs exist in almost all industries – from health care and solar power to frozen chips, rubbish collection, energy drinks, fertilisers and GPS navigators. However, not all industries are equally open to entrepreneurship. The Forbes data show that the majority of the SuperEntrepreneurs gained their fortunes through ventures in IT, biotech, finance and retail. In general, industries with a high concentration of self-employment (such as construction) tend to have a lower representation of SuperEntrepreneurs. The same patterns can be discerned by studying the flows of venture capital. IT and biotech absorb far more than half of all US venture capital investments, and yet both industries have a low degree of self-employment.

Some industries are inherently more open to entrepreneurs and start-ups due to their fixed costs and capital requirements. On the one hand, a young enthusiast can code a search engine or computer game which is superior to existing products. Biotech also suits the entrepreneurial model as young researchers can develop innovations within relatively small companies with

investment from venture capital. On the other hand, it would be almost impossible for a young entrepreneur to compete with Boeing and Airbus, or Toyota and Volkswagen.

However, there are far fewer billionaires from the biotech world than from IT. In part this is due to the lower return on investment from even successful biotech firms, and the limited upward potential from each new drug. Successful biotech entrepreneurs become multi-millionaires, but rarely billionaires.

There are several SuperEntrepreneurs from the financial services industry, in part due to the industry being extremely well-paid. Another element is that finance depends heavily on individual skill and unique human capital. Finance billionaires are roughly equally divided between hedge funds, real estate and private equity. Many hedge fund billionaires did not build large complex firms, but simply founded firms through which they could leverage their own unique talent (and luck). Private equity billionaires however are more clearly involved with innovative entrepreneurship.

### **Higher education and SuperEntrepreneurship**

Overall, the self-employed in the US do not differ much from the general population in terms of education and cognitive ability, while the self-employed in Europe tend to be less educated than average. But this result should not be interpreted as showing that formal education and intelligence are not important for entrepreneurship.

In fact, SuperEntrepreneurs tend to be well educated and appear to be exceptionally bright. Even including the many college dropouts, only 16% of US billionaire entrepreneurs lack a college degree, compared to 53% of the self-employed and 54% of salaried workers. It is noteworthy that while only 13% of

US workers and 14% of the self-employed have advanced degrees (such as an MA, MBA or JD), half of US SuperEntrepreneurs have such degrees.

Most impressive of all is that SuperEntrepreneurs in the US are five times more likely to hold a PhD degree as the general population. A widely disproportionate number attended Ivy-league and other elite universities.<sup>32</sup> While these 14 elite institutions represent less than 1% of total US undergraduate enrolment, 33% of SuperEntrepreneurs have degrees from these universities. Another 2% are dropouts from this small set of schools.

Many of the billionaire entrepreneurs in the Forbes sample tend to be from older generations, when obtaining a PhD or other advanced degrees was much less common than today. What results do we get by looking at entrepreneurs in recent generations? Economists Bengtsson and Hsu investigated a representative sample of entrepreneurs in firms that in recent years received venture capital funding.<sup>33</sup> The results are striking. Approximately 25% of founders of firms that received venture capital had a PhD, and another 14% an MBA. The authors also estimated that 26% of founders of entrepreneurial firms had an undergraduate or graduate degree from Ivy League or elite universities. In both our sample of SuperEntrepreneurs and this sample of VC-funded firms, Harvard and Stanford did well.

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<sup>32</sup> Defined as Harvard, Stanford, Yale, Princeton, MIT, Caltech, University of Chicago, Columbia, Northwestern, Duke, University of Pennsylvania, Brown, Cornell and Dartmouth. The list is chosen based on undergraduate and graduate ranking as estimated by US News 2011.

<sup>33</sup> Bengtsson and Hsu (2010).

These results should not be surprising. Entrepreneurship is a knowledge-intensive activity. Innovation, creativity, leadership, and building new organisations all demand intellectual dexterity. Historians of Silicon Valley emphasise the importance of Stanford University for the development of the microprocessor industry. Similarly Route 128 in Boston, the second most important entrepreneurial cluster in the US, is strongly tied to MIT and Harvard.

One component of the myth that entrepreneurs do not need education or specialist training is based on the relatively large number of college dropouts. However, people drop out of college for two opposite reasons. The largest category fails because they are not skilled enough to acquire the degree. A smaller category drop out or because they feel that a degree from college is not worth their time. Harvard dropouts Bill Gates and Mark Zuckerberg, co-founders of Microsoft and Facebook respectively, clearly belong to the second category.

The countries that have the highest rates of entrepreneurship, such as the US, Canada and Israel all have a highly educated population and superb universities. However there are several countries that have highly educated population yet under-perform, such as France and Belgium, or for long periods of time even Britain. It appears that education, like hard work, is necessary for entrepreneurship, but not enough if other components are lacking.

## **Academia and SuperEntrepreneurship**

If a disproportionate number of SuperEntrepreneurs hold PhDs, then what about their professors?

In high-tech clusters, it is no longer rare for academics to become entrepreneurs. However, few go on to become SuperEntrepreneurs. Perhaps the career choice of academics makes them less likely to become entrepreneurs: becoming an academic requires years of specialization, most of which has no value whatsoever for running a company. Since successful entrepreneurship also requires specialization, it becomes impractical for most people to pursue both careers, and a choice has to be made. Moreover, the choice to become a tenured academic strongly hints of a disposition for risk-avoidance.

This leaves doctoral students as one of the groups best fitted for knowledge-intensive entrepreneurship. They have access to the research frontier, often helping move it themselves. Since doctoral students are by definition bright, they are at an advantage in having many of the attributes required for entrepreneurship. A minority of doctoral students also have the practical, social and managerial skills required for running firms. An even tinier minority combine all these qualities with ambition and the willingness to take risk, making them natural entrepreneurs.

## 12. SEVEN CHARACTERISTICS

The most important attributes of SuperEntrepreneurs are also the hardest to quantify: their personality traits. These include creativity, work ethic, ambition, optimism, self-confidence, leadership qualities, adaptiveness, drive to achieve, tolerance of ambiguity, resilience, tolerance of stress, decisiveness, ability to deal with failure, a high energy level and good social skills.

But there are other characteristics which will increase the chances of joining the Forbes list. First, they must not only be brilliant – but they must also be able to scale up their genius. If they rely too much on their own work, rather than employing others under their creative leadership, they might become an expert in designing and producing glasses. But they will not go on to create the world's largest eyewear retailer. If they take out patents on their own inventions, they might achieve success, but never on the scale of Thomas Edison. And if they raise quail and chicken with their own hands, how then will they become the next Liu brother?

Gaining a fortune by working for someone else is also unusual, although in finance one at least has a slim chance of becoming a self-made, employee billionaire (for example, in 1987 bond

market innovator Michael Milken made \$550 million in salary and bonuses while an employee for Drexel Burnham Lambert, which corresponds to \$750 million before tax in 2010). But this is a rarity. In the Forbes list, there are many self-made billionaires in the finance sector, but virtually all founded and retain a sizable ownership stake in their hedge funds, venture capital or private equity firms.

A few people have joined a rapidly growing company at a senior level an early stage and amassed a significant fortune. Meg Whitman for example became President and Chief Executive Officer of eBay in 1998 when the company only had 30 employees. Twelve years later, thanks to her stock share and bonus she had become the fourth wealthiest woman in California, with a net worth of \$1.3 billion in 2010.

This illustrates that there is a small chance that an individual can become a self-made billionaire by working for someone else as an “intrapreneur”, someone who creates drastic change within the organisation. In that case, they must make sure that they have ownership of at least some part of the company.

One surprising finding is that immigrants are not over-represented as Super-Entrepreneurs: 13% of the US population are foreign-born, while only 11% of its billionaire entrepreneurs are foreign-born. Billionaire entrepreneur immigrants have played an important role in places such as Silicon Valley, starting firms such as Google and eBay. But they do not dominate the rankings.

Going through the stories of over 1,000 SuperEntrepreneurs, seven lessons about entrepreneurial success emerge:

1. Entrepreneurship is hard, risky and tough. There is a good chance that you will fail in your attempts to create the next Google.
2. Entrepreneurship is often knowledge intensive. It is no coincidence that Larry Page and Sergey Brin, whose academic research explored the mathematical properties of the internet, were the ones that founded Google.
3. Entrepreneurship is a numbers game. If you only start one company, and pursue a single business idea, you are much more likely to fail than your neighbour, who tries a number of different ideas over a long period of their life.
4. Entrepreneurship is increasingly specialised, and supported by an infrastructure. If you have a great idea, and can attract the aid of venture capital, you will be much more likely to succeed.
5. Entrepreneurship is more common in certain industries than in others. You can potentially become a billionaire pursuing almost any business idea, but are much more likely to succeed if you do so in a rapidly growing (and novel) field – as biotechnology and IT have been during the past decades.
6. Entrepreneurship typically requires industry experience. Steve Jobs worked at Atari before founding Apple. Microsoft co-founder Paul Allen worked as a programmer for Honeywell.
7. Entrepreneurship requires scaling up. Edison gained over 1,000 US patents not merely through his own work, but by creating the first industrial research laboratory.

### 13. CONCLUSIONS

The historic conflation of self-employment with entrepreneurship may lead to poor policy development.

For example, it has been found that high tax rates do not lower and may even increase self-employment.<sup>34</sup> But this should not be interpreted as relevant to the question of how tax policy affects entrepreneurship. Equally, the empirical finding that the self-employed do not earn more than the employed,<sup>35</sup> does not imply that entrepreneurship has no economic premium. Neither does it imply that the higher rate of self-employment among immigrants entails that immigrants are more likely to create high-growth firms.

The self-employed are numerous and do not differ much in terms of education from the general population. This has led to the conclusion that advanced skills are not central for entrepreneurship, and that policies that make it less appealing

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<sup>34</sup> See, for example, Bruce and Schuetze (2004).

<sup>35</sup> See, for example, Hamilton (2000).

for high quality individuals to become entrepreneurs are unproblematic, since the economy contains millions of nascent start-ups. Yet the individuals who combine the skill, specialised knowledge and managerial ability to build large new companies are rare. They tend to already have secure well-paying jobs in existing firms that must be given up if they are to seek to become entrepreneurs, an attempt which in most cases fails, with no return for time, effort and capital invested. Policies that take away the rewards for the rare cases of success deter entrepreneurship.

If self-employment and innovative SuperEntrepreneurship are two distinct economic activities, explained by different forces and associated with different outcomes, then policy makers should therefore use a definition of entrepreneurship which is based on innovation. This would correspond better with what policy makers appear to want for their countries: technological progress and economic growth to the benefit of all citizens.

## **AFTERWORD: THE WORLD'S UP AND COMING SUPERENTREPRENEURS**

This report shows that there are large differences between countries in terms of the number of high impact entrepreneurs. Countries with lower taxes and a lighter regulatory burden have more Superentrepreneurs per capita. But where will the world's new Superentrepreneurs come from?

It takes time to build a billion dollar fortune, even for the likes of Steve Jobs and Bill Gates. Many of those who have amassed such wealth have done so by launching innovative firms during the 1970s, 1980s and 1990s. During these times market economy was just beginning to spread to many new parts of the world. There are many examples of innovative entrepreneurs in for example the former socialist republics in Eastern and Central Europe, who are on the trajectory of becoming the future self-made billionaires of the world. In an upcoming paper, we will focus more on innovative entrepreneurship in the new market economies of the world.

Most Superentrepreneurs in modern market economies have amassed their wealth by launching successful firms based on developing new products and services that revolutionise entire

industries. These individuals have gathered their billion dollar fortune whilst creating even greater value for society at large. In other societies, the relation between wealth creation for the individual and society at large is not as clear. Many of the self-made rich of countries such as Russia are more crony capitalists than innovators.

Today, many ex-Soviet, African and Latin American countries are struggling to lay the ground work for encouraging creative rather than destructive entrepreneurship. Support for growth friendly policies can increase if entrepreneurs succeed whilst at the same time benefiting society at large. The interplay between high impact entrepreneurship and economic policies can thus go both ways.

Most interesting are countries that have appeared stuck in a vicious cycle of mistrust, poor policies and little entrepreneurship, and yet have managed to lift themselves to a better trajectory. Surprisingly this seems to be happening in more countries than many realise. How have they done it, and what can others learn?

The stories of the Bill Gates and Steve Jobs in the world are, although fascinating, relatively well-known. That of the new market economies – and which government policies can best foster the growth of Superentrepreneurialism – still waits to be told.

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## APPENDIX 1: METHODOLOGY

Information was first gathered on all individuals who appeared in Forbes Magazine's annual ranking of the world's billionaires at least once between 1996 and 2010. Forbes describes its methodology as follows:

*“More than 50 reporters in 13 countries worked on compiling our 25th annual World's Billionaires rankings. Throughout the year our reporters meet with the list candidates and their handlers and interview employees, rivals, attorneys and securities analysts. We keep track of their moves: the deals they negotiate, the land they're selling, the paintings they're buying, the causes they give to. To estimate the net worth of billionaires' we value individuals' assets, including stakes in public and private companies, real estate, yachts, art and cash – and account for debt.*

*Not that we pretend to know what is listed on everyone's private balance sheet, though some folks do provide that information. We do attempt to*

*vet these numbers with all billionaires. Some cooperate, others don't.*

*Privately held companies are valued by coupling estimates of revenues or profits with prevailing price-to-revenues or price-to-earnings ratios for similar public companies.”*

It was then necessary to establish whether or not each of these individuals is a self-made entrepreneur. Forbes itself provides a brief description about the source of wealth of each billionaire. In many cases, individuals with inherited wealth, or non-entrepreneurial billionaires were easily removed from the sample. This excluded entertainers, writers, investment bankers and corporate executives.

Judgements then had to be made on whether entrepreneurs are self-made. Occasionally those defined as self-made had received some assets from family firms, but then grew fabulously rich. Here the classification by Forbes was followed in determining the source of wealth. For example, Rupert Murdoch who inherited a small firm is designated as an entrepreneur because he is classified by Forbes as “self-made”, whereas Donald Trump is not included as an entrepreneur because he inherited significant wealth and is classified by Forbes as “inherited and growing”. Thus the criterion used was to classify the individual as an entrepreneur if they did not start rich and if they earned their wealth by growing an initially small firm, even where the firm was not strictly founded by the billionaire.

If the description by Forbes magazine was not sufficient to determine entrepreneurial status, online sources were consulted. With a handful of exceptions (primarily for East and

South Asian billionaires), these steps were sufficient to determine the source of wealth for most of the 1,723 billionaires, leaving 996 self-made entrepreneurial billionaires. Out of the 1,723 billionaires, we were unable to find enough information on 29 individuals, who were excluded.

Forbes also reports the country of citizenship and the country of residence for each individual. This information was supplemented with data on their country of birth, using the same sources as above. When no information on country of birth could be located it was assumed the individual's country of birth is the same as their citizenship.

The second entrepreneurship variable used data from Forbes' list of the "World's 2000 Largest Public Companies". We then computed the fraction of these companies that were started by entrepreneurs, following a multiple step process.

- We first gathered data by consulting the company's home-page on when and how each company was founded. If the company was founded after 1945 by one or several identifiable individuals, we classified it as entrepreneurial. Since the comparison aims at measuring the level of the current and not the historical entrepreneurial level of economies, companies founded before 1945 were coded as non-entrepreneurial, even if founded by individuals.
- A surprisingly large percentage of the companies were in fact not entrepreneurial, but instead arose through mergers of non-entrepreneurial companies, were founded by the state, came about through privatization of state assets or were spin-offs from existing public companies. If a company had been created through a merger, we determined if one or more of the main merging companies were themselves

founded by entrepreneurs after 1945, in which case the company was coded as entrepreneurial. If the webpage did not contain sufficient information to determine the status of each company, online sources were consulted.

- With the exception of a small number of mostly East Asian companies, this allowed us to identify the percentage of entrepreneurial companies in each country.

Our third measure of entrepreneurship uses data from Bosma and Levie (2010). They provide estimates of venture capital investments in 2008 as a share of GDP for 31 advanced countries.

Since valuing privately held assets is inherently challenging, Forbes refers to its estimates as "highly educated guesses". As a check, the estimates are reviewed by a panel of business experts. External evaluations indicate that the list is surprisingly accurate. McCubbin (1994) found that the wealth estimated by Forbes strongly corresponded to estate tax returns of decedents.

The "Survey of Consumer Finances" (SCF) relies in part on tax returns to identify the wealthy Americans. As a testament to the comprehensiveness of the Forbes list, the SCF only tends to find a small number of individuals with assets above the threshold that Forbes missed (Kopczuk et al. 2004). Rankings of billionaires by other magazines such as Bloomberg and the Chinese Hurun Report similarly tend to reach similar findings. The 2012 Forbes global list included 1,426 billionaires while Hurun independently identified 1,453 billionaires, mostly the same individuals.

## **APPENDIX 2: THE 6% NON-ENTREPRENEURS**

About 6% of self-made billionaires in the sample did not become rich by founding and/or developing a new venture. A few of the billionaires are entertainers, such as J.K Rowling, writer of the Harry Potter books. (Entertainers who build business empires are defined as entrepreneurs, including Oprah Winfrey, Steven Spielberg and George Lucas). Four financial sector CEOs and a handful of finance sector workers have become rich through compensation packages. An additional two of the 24 individuals had started working at growing firms and in time became major owners. One works as a highly successful lawyer. The rest have strong links to entrepreneurship. One was an investment banker who brokered major deals involving entrepreneurial firms. Two are initial investors in entrepreneurial firms. The remaining six are managers brought in at early stages of fast growing entrepreneurial firms such as Microsoft, E-bay, Cisco and Google.



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