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POLICIES PROMOTING INNOVATION, ENTREPRENEURSHIP AND FIRM GROWTH IN KNOWLEDGE-INTENSIVE INDUSTRIES*

Before I start my presentation I will tell you a little about our Institute, usually named IFN.

A month ago we turned seventy five and it was started as a way for industry to communicate with the research community. Industrial leaders can't just come to the politicians, saying «this is how the world should be run». You need to base your line of argument on objective knowledge, research documenting the importance of entrepreneurship of firms, of industrial companies for the growth and increase of welfare. So, this is why this institute was created.

People who work there build their academic careers and many of them afterwards become university professors. In the lifetime of the institute about two hundred and sixty people have worked there during some part of their career. One of them became Governor of the Central Bank, some became undersecretaries of the government, famous journalists, and most of them became professors at universities. Normally, you stay with us for about ten years and then after that you continue to the university, start teaching courses and classes, and continue your research. Mostly in the areas where they began their career when at IFN.

* The text of the paper is compiled on the basis of the verbatim transcript of the author's oral speech. The author's presentation is given at the end of the paper.

Today we have more than twenty five PhDs, six PhD students and more than twenty professors working part time for us. Thus, more than fifty researchers work together with us.

What we do is best termed as applied economics and it is about the business sector, but it is not management or business administration. Everybody is a trained economist and this is how we work. It is very broad, we have five programs – from the effects of globalization in particular on big firms and big industry, to entrepreneurship, innovation, and the effects of cultural norms.

Today I will try to give you an idea about how you should design policies in your country in order to, first of all, be innovative.

Countries do not become rich through innovation; you don't even become rich by having the best researchers. You become a wealthy country by applying your research in highly efficient companies, companies that produce goods and services that have high value for consumers and other companies as intermediate products.

And also if you have a good product it is very important that you make a large company out of it. We (Sweden) have not always succeeded in this respect. We have had, for example, two automobile companies. One of them was SAAB, which first became an American and then a Chinese company. They made very nice cars, but if you make only one hundred and fifty thousand cars a year you will not prosper. The costs for development, design and marketing are fixed and largely independent of the sales volume. So if you sell no more than one hundred and fifty thousand units you become uncompetitive. In the 1970s BMW and the Swedish automobile companies were of a similar size, but over time BMW became five times larger, and hence able to spread the fixed costs on a much greater volume.

This story sends an important message: Having great ideas and being innovative is not sufficient. You also have to be entrepreneurial and to be able to build large companies that actually produce all these products efficiently and a top-notch marketing organization that manage to sell the products in large volumes across the globe. So, how do you do that?

Generally, you can say that the U.S. has been more successful in these respects than European countries; a disproportionate share of the new large firms are American. Thus, it is not a coincidence that Microsoft, Google and Apple are American companies, whereas few of the new leading high-tech companies originate in Europe.

The ones emanating from Europe, such as Ericsson and Siemens, they tend to be old companies that had a very strong position even in the inter-war period. They managed to retain and strengthen that position. You don't see that many European companies that have grown from nothing into world domination and that were established in the last three decades.

Here you Russians can learn from the divergent European and American experiences. Russia should develop your own equivalents to Microsoft and Google, and have them conquer the world markets in the future. So how can you make that come about?

It is about policy, policies and what politicians can do. Politicians can do a lot: They can create the environment – the ecology – in which entrepreneurs and other agents interact.

And what you see now, and what have had in our own country is a lot of romanticizing about small companies. We repeatedly hear politicians assert that we need many more people being entrepreneurs, meaning self-employed. But what we really need is that the truly talented persons create viable high-growth firms, firms that create lots of jobs. These high-quality firms can then offer good employment opportunities for the rest of us.

You need small firms also, but you cannot have a policy saying let's maximize the number of self-employed persons in your country. That would just be romanticizing about self-employment. Thus, very often you have politicians who use the word «entrepreneur» when they mean somebody who runs his or her own business. Perhaps a taxi driver who uses his own car, a hair dresser who doesn't have any employees, or a small street shop vendor where you can buy your newspaper in the morning.

You need to be able to single out the really good entrepreneurs, those who want to grow but who cannot do this alone. They need other complementary competencies, other agents helping them.

First, what we mean by «entrepreneur» is somebody who can really see and perceive opportunities, and also is willing to grow. It would not have been sufficient for Bill Gates to have his great idea, and say to himself that it would be okay to build the largest company in Seattle, instead of trying to conquer the global market. If he had been thinking like that Microsoft would not have existed today. Instead some competitor who came up with a similar product would have captured the market. Nobody would have liked to have any Microsoft products, because the company was too small for the network effects to materialize.

It is very often the case that somebody has a fantastic idea and tell himself «I don't want to have more than thirty employees, it is enough for me», it is an intensive knowledge idea, with the potential of penetrating the global market. But if you want to survive you have to grow, because if you don't grow some other competitor will introduce a product that more or less fulfills the same need and people will start buying that product instead and your firm will atrophy and die.

When people think of successful entrepreneurs in Europe the ideal they have in mind tends to be a person who starts a company at a young age and still owns the entire company at age eighty-five, and at that point the person would be among the richest person in the country, and then the company is inherited in its entirety by his children, preferably by the eldest son. But there is no way you can build a high-tech company in this way today. You need to start a company and then you need to have types of agents coming in, helping you build this company.

You need first entrepreneurs at the beginning starting these companies, taking them to a certain level, and then after that you need to make the company more structured. You need industrial competence, which requires the recruitment of someone who has had a previous career in large companies. Thus having learnt how a company should be structured in order to be efficient.

You need to establish high-quality management practices within your firm, thus you need industrialists. Moreover, you need skilled labor. Unless your father is extremely rich, it is very likely that you need outside financing, you need external owners coming in. And of course, it is a high risk venture.

Nobody knew Microsoft would become a giant. Probably, many other competitors at the time tried to achieve what Microsoft achieved, and almost all of them failed. But some people, who had stock in Microsoft, became very wealthy. And since it works like that you can't go to the bank and borrow money. You can borrow money when you are a company with a positive cash flow. It is not until then that there is evidence that there is little risk that you fail. Before that the founder has to rely on equity financing from outside investors.

But venture capitalists and business angels demand ownership in order to be able to share in the upside, should the firm succeed. This means that you have to give up part of your ownership. You can't say: give me your money but I still own 100% of this company because what they want is upside. And they got a share of the company that they hope will be valued highly in the future.

If this company evolves well it is going to become a company with dispersed ownership listed on a stock exchange. You need to have vital, vibrant stock market. And this you might say is about really small companies that don't need to have a stock exchange today. Because if there is a stock exchange then you and the venture capitalist will know that ten years from now the company may be large enough to be listed on the stock exchange, and then there'll be agents on the market running pension funds and so on. And then the company will have a high value.

A dynamic and entrepreneurial economy thus requires a secondary market. Even if I do not use the secondary market until fifteen years have elapsed since the founding of my firm, it is very important for my decision to start a company. That is what you see in some countries like Israel for instance. People have start-ups; the companies become listed in New York rather than in Tel Aviv. So, the stock markets are dependent on the U.S. stock market and work very nicely, with the companies having very high value.

Then of course, you need to have skillful workers. If it is in a highly tech intensive industry you will need smart, well trained people located locally who can build your firm together with you. And in many cases you have to give them ownership stakes as well.

You also need competent customers, because you will never make the company and its products better than they are asking for. And if customers are not demanding, it is very unlikely that you will produce products of really high quality. That is why it is often in areas where people demand a lot from the companies from which they make purchases, that it is more likely that there will be more skilled companies that will conquer the global market.

You won't get any better than your customers ask for – this is true everywhere. If you live in a neighborhood where people are very much aware of what they can demand from their doctor, when you go to the doctor it is much more likely that you have a good doctor than if you live in an area where people don't know what to expect from the doctor. It is only in the former case that the doctor needs to be on his toes.

If you are a policy maker you have to think about how do good ideas bring innovation into my country, and how they become large firms. You have to make policy so that all those various agents, all of them, have favorable incentives for developing the company together.

Let's say you have a fantastic research center, but you have really bad taxation for entrepreneurs and you don't have a secondary market for ownership, i.e., you don't have a well-functioning stock market. Then your research is unlikely to be commercialized. Or if you have very innovative researchers coming up with ideas that can be marketed but you can't build companies in your own country what will they do?

They will put them in the window so to speak and then they will sell the idea to entrepreneurs in America, for instance, who will buy the idea and the researcher will be wealthy, but no additional wealth is created in your own country because the company based on the innovation is not built in your country.

So, you have to have a policy package that is good for everyone involved; a package that harmonizes the incentives of all parties.

Unfortunately, politicians tend to single out one category and say that they do a hundred percent for that category, and that will do the trick, that will really make us wealthy. But it is much better to make ten percent improvements for ten different types of categories than to make it one hundred percent better for one type of agent and then do nothing for the others.

If you are going to develop your companies you need to involve a spectrum of key competencies. You need a manager and probably innovators creating the company and you have to incentivize them to work for you. And those guys, if they are really good, already have a nice career, a great job at a top university, in the leading industrial firm in your country, and you would like them to come to work with you instead.

You have the need to expand with these venture capitalists coming in to finance your company and, perhaps, you are not the person who can take the company to the next level, it may be time to sell, or you may stay on for a bit longer, but many things can happen then. At that phase you might become a listed company and you should have public offering or the company can be sold to some other company. Just like Google today, when they buy some start-up and integrate it into their own company. All these things might happen and whatever happens that would be most suitable for the firm. But in order to make whatever is most suitable, you have to incentivize people.

In order to lure key persons away from their current positions you need to compensate them for giving up their current pension fund contract, and perhaps, as well as the stock for the founders. Because people have given up some promising careers in some other place, they are likely to want some equity stake as well – when the value of your work is capitalized you would like to have your fair share have part of it. It is unlikely that you will transfer to this company unless you firmly believe that there is a fair chance that it will actually evolve into something fantastic. Otherwise, you would hardly be willing to spend some five to ten years trying to achieve this.

And here of course, the tax system becomes crucial.

When you think of taxation many people are inclined to say that the corporate tax rate in Sweden is 22 percent, and in the USA and in Germany it 35 percent, and they believe that this is a good indicator where the tax system is most favorable for building high-growth firms.

Some may remark that the capital gains tax rate is also important. But one cannot just look at tax rates; one also needs to consider the fine details in the tax system. As the saying goes: The Devil is in the details!

Here I am going to talk mostly about stock options to give you the feel for how it works.

If you are an entrepreneur and create a company and somebody comes in as a partner and you are building this company together. Then, of course, the large gains emanate from your entrepreneurship, not from the initial financial investment, because you are the entrepreneurial person who can combine all the different functions and all the resources in a very smart way. But from the perspective of the tax system, the income that results is defined either as labor income or capital income. There is no item «taxation of income from entrepreneurship» in the tax code. So, becomes important how the income is categorized.

And if you get dividend from the company, how is that taxed? If you sell off the company, how is it taxed?

For instance, in many countries dividends from the company are highly taxed, while if you are the founder of the company and sell it off after ten years, the tax rate is zero. If you have such a system people will very likely sell out to somebody.

One very important and really great challenge today for almost every western country (I am not knowledgeable about Russia in this respect), is our aging societies and how people should get by at an old age. The strategy is to create funded pension system were you save in financial instruments while you work, then they are gradually solved off during old and the idea is that we should then live nicely from the proceeds.

The pension savings are administered and invested by pension fund managers, and there are these very, very large funds. In Sweden, the largest pension fund has some sixty billion Euros. But we also need pension savings to be channeled to startups that may need fifty thousand Euros. This is very difficult to achieve. The challenge in many Western countries is that we have created enormous systems harboring pension funds savings that have become so large they cannot handle such small amounts of money. An early-stage entrepreneur is likely to need a small amount of money from an outside investor who acquires a minority ownership stake to get started. But the guy running the pension fund would say – Oh, I cannot handle such small amounts, unless you need one to ten million Euros I cannot help you. It is too expensive for us to handle smaller amounts than one million, and we would prefer if nobody asked for amounts below ten million Euros. The tax system also tends to subsidize pension savings, but in order to protect the individual saver, only a few funds are allowed, of course, they then become extremely large. Some countries handle this problem better than others, but generally a major dilemma has been created in all western countries.

I will now try to explain to you why stock options, correctly designed, can be so useful and value-enhancing.

When most people think of stock options, they tend to think of the CEO of General Electric or some other large public firm, and that he has stock options that will pay exorbitantly when they are exercised at a point in time when the stock market is booming. And most people find this illegitimate.

But this is not what one should really use stock options for. I realize I am the founder of the company, for instance, and I realize that I require the competence and effort of a particular person to help me build my company. But that person already has a really great job at GASPROM or GE, and it is high risk to work for me instead and give up the secure and well-paid position. One way to lure the person over to my own firm is to offer an ownership stake: I promise to give you ten percent of the company, if you work for me for seven years from now, and you don't have to pay anything. The only thing I demand from you is that you put in enormous effort and I will pay you a reasonable salary but not that high, because we don't have a positive cash flow yet. And then in the future if you put in all this effort, you will own ten percent of the company and if we have succeeded and reached our expected targets, you will become a very wealthy person.

In the USA they made changes in their system so that pension funds were allowed to invest in venture capital firms (who specialize in early-stage investments) and also in taxation of stock options and capital gains taxation. These changes, instituted around 1980, paved the way for pension fund money to be channeled to the startup sector. Without these changes there would have been no Silicon Valley as we know it.

Before 1980 today's Silicon Valley could not exist, because the tax system was such, pensions fund and saving rules were such that there was no way that these startup activities could come about. Because if you give stock options to somebody then there may be a ten percent chance that they will become highly valuable. But there may be a ninety percent chance that they'll be worth nothing. And then it is really important that if they become highly valuable, which is unlikely in the same way that it is unlikely that somebody who starts a firm will become exceptionally successful, that in that case you are not highly taxed. Because if you are highly taxed ex post on something that is unlikely ex ante, and that requires sustained effort and risk-taking, the expected rate of return becomes very low. Therefore, the sharp decrease of tax rates on stock options in the United States in the early 1980s made such a difference to the startup sector. Without it, leading IT companies such as Microsoft, Apple and Google, and the giants in biotech such as Genentech, most likely would not have existed. Instead the industrial leaders would perhaps have been Japanese or Korean.

My colleague Tino Sanandaji and I have analyzed the tax rates on stock options and the size of venture capital industry. We have done this in a standardized way for twelve countries and what you can see is that if you tax stock options very highly you get a very small venture capital sector, and little activity in the knowledge intensive sectors that rely heavily on venture capital and startups in order to thrive.

And there is one saline problem in our own country, Sweden: we are very innovative but we do not see as much growth as we would expect in the entrepreneurial companies, because gains on stock options are treated as though they were regular labor income and therefore such gains are taxed very highly. As a result, stock options cannot be used as incentive devices in early stage ventures.

Let me now conclude by spending a couple of minutes on the labor market.

In the USA, the number of jobs grew by two percent per year for decades, but how did this happen? Well, every year, six percent of all jobs consisted of jobs in new firms, i.e., jobs that by definition did not exist in the previous year. Twelve percent of all jobs in a certain year were created by existing firms through expansion. Thus eighteen percent of all jobs did not exist the year before. Still, the number of jobs only increased by two percent. This is because six percent of all jobs were lost when other firms closed down, and then ten percent of all jobs were lost because some firms contracted employment. So, in order to increase employment by two percent, eighteen percent new jobs have to be created. Or to be more concrete, in an economy having one million jobs and where one hundred and eighty thousand new jobs are created each year, but one hundred and sixty thousand jobs disappear in the end you only get a net increase of twenty thousand jobs.

So, in the USA, in order to create those two percent jobs, you need a total churning of thirty four percent. And we always believed that Sweden was very different, but turns out that the pattern is similar. The sum of job creation and destruction through entry, expansion, exit and contraction is almost as large as in the United States.

This all means that if you want to build a great business it has to be reasonably easy not only to start companies, but for existing companies to expand, and for a country to prosper many companies need to try because a large share of the new companies will fail. Thus, one needs a favorable environment for entrepreneurship, but also good incentives for people to change employers. It must be reasonably easy to recruit people. Those you would like to recruit already have jobs elsewhere. And here, of course, tenure rights become important. For instance, if pension rights and healthcare benefits are very much tied to your current employer, and if you change your employer you will lose your healthcare benefits or you will lose pension benefits, you are unlikely to change jobs.

My message is the following: in order to prosper a country really needs high-growth firms, they are very important. They are not created by means of visionary political speeches or government support programs.

Instead, the way to obtain such firms is to create an ecology, an institutional setup that will make it beneficial for entrepreneurs and other complimentary agents to create those companies. By harmonizing incentives, these agents will jointly translate a potentially valuable innovation into an entrepreneurial firm that could grow into a large incumbent firm, perhaps even into the global industry leader. In this short presentation I have tried to convey this main message and also tried to explain the key components of the tax system and labor laws that can make this come about. There are of course also other components that also matter. But that is beyond this presentation.

So, these were my final words. Thank you for listening.

Some suggestions for further reading

1. *Henrekson, Magnus och Dan Johansson* (2009), «Competencies and Institutions Fostering High-growth Firms». Foundations and Trends in Entrepreneurship 5(1), 1 –80.

2. *Henrekson, Magnus och Mikael Stenkula* (2010), «Entrepreneurship and Public Policy». Chapter 21, pp. 595–637 in Zoltan J. Acs and David B. Audretsch, eds.,Handbook of Entrepreneurship Research: An Interdisciplinary Survey and Introduction. New York: Springer.

3. *Henrekson, Magnus och Tino Sanandaji* (2014), «Small Business Activity Does not Measure Entrepreneurship». Proceedings of the National Academy of Sciences of the United States of America (PNAS) 111(5), 1760–765.

Policies promoting innovation, entrepreneurship and firm growth in knowledge-intensive industries

Magnus Henrekson

Presentation at the Internat'l Conference **Strategic priorities in the economic development of Russia and the European countries**

St Petersburg, April 3, 2014

RESEARCH INSTITUTE OF INDUSTRIAL ECONOMICS

What is IFN (the Research Institute of Industrial Economics)?

- Founded in 1939; 25 researchers with a Ph D, 5 doctoral students, some 20 affiliated researchers
- Funds from same sources as university scholars
- Applied economics; business sector perspective in five broad programs:
  - Globalization and corporate restructuring
  - Economics of entrepreneurship
  - Economics of the service sector
  - Economics of electricity markets
  - Economics of Institutions and culture
- www.ifn.se

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Motivation and purpose

- Gazelles/HGFs found to contribute disproportionally to growth and job creation
  - Clearly the case in the U.S.
  - But generally less true in Europe
- What institutional conditions most likely to be conducive to HGFs?
  - Talented entrepreneurs supply effort
  - Incentives to expand if potential
  - Harmonization of diverse competencies and agents
- Identify key agents
- Institutions: I focus on taxes and labor markets

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Entrepreneurs most important

- Ability and willingess of individuals on their own and within organizations to
  - Perceive and create new economic opportunities
  - Introduce their ideas in the market, in the face of uncertainty and other obstacles, by making decisions on location, form and the use of resources and institutions.
  - Compete with others for a share of that market.
- Entrepreneurship $\neq$ self-employment

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Entrepreneurs need a competence structure (esp. if knowledge-intensive)

- Innovators (Innovation ≠ invention)
- Industrialists
- Skilled labor
- Venture capitalists
  - Business angels
  - VC funds
- Agents on the secondary (exit) market
- Competent customers

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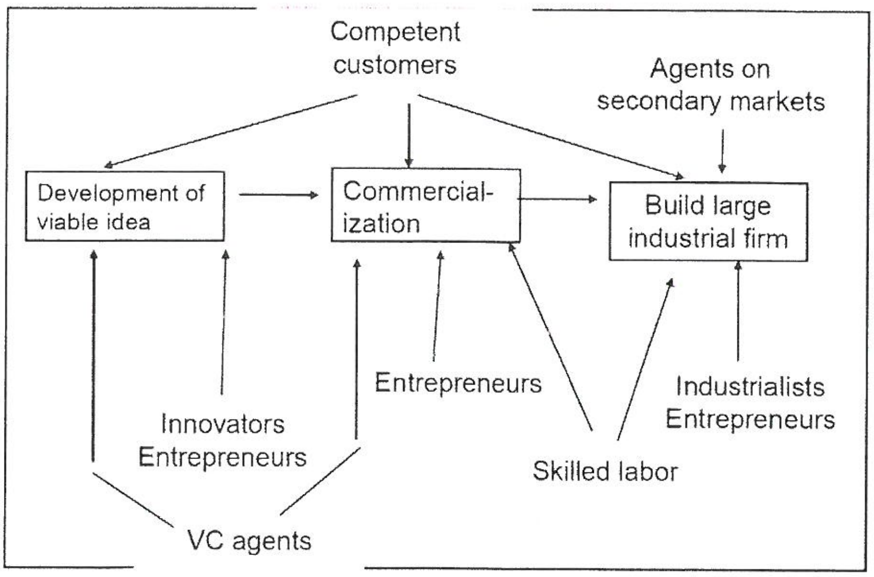
Interacting agents of change



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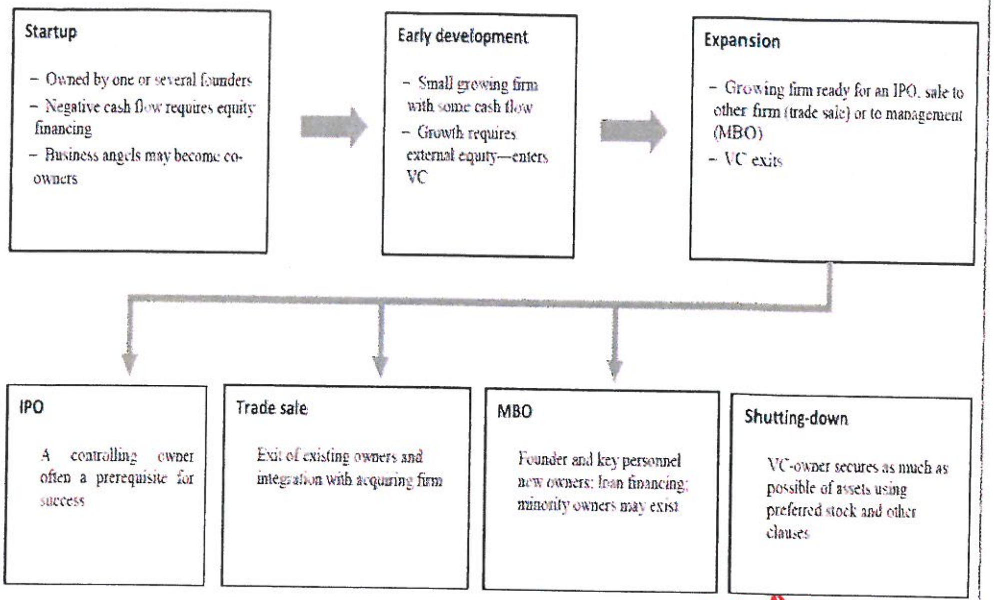
Phases in the Evolution of a Firm



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The tax code

- Key rates and schedules insufficient to characterize the tax code
- Tax code does not acknowledge these categories (income from e-ship etc)
- Key agents interact in complex ways; details in the tax system likely to be of great importance

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Corporate taxation

- Statutory rate
- Two-tier taxation benefiting debt financing?
- Accounting measures to lower effective taxation

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Different taxes and their effects

Cannot cover all details

Taxation of current capital income

- Dividends
- Interest income

Capital gains taxation

- Differences across assets
- Differences based on holding period

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Taxation of return on savings

- Differences across instruments
- Preferential treatment of pension savings
  - Where can these funds be channeled?

Taxation of stock options

- Capital or labor income?
- Instrumental for the distribution of created equity value across agents depending on their importance
- US changes (1979–1981) in tax law and rules for investment of pension funds paved the way for Silicon Valley as we know it

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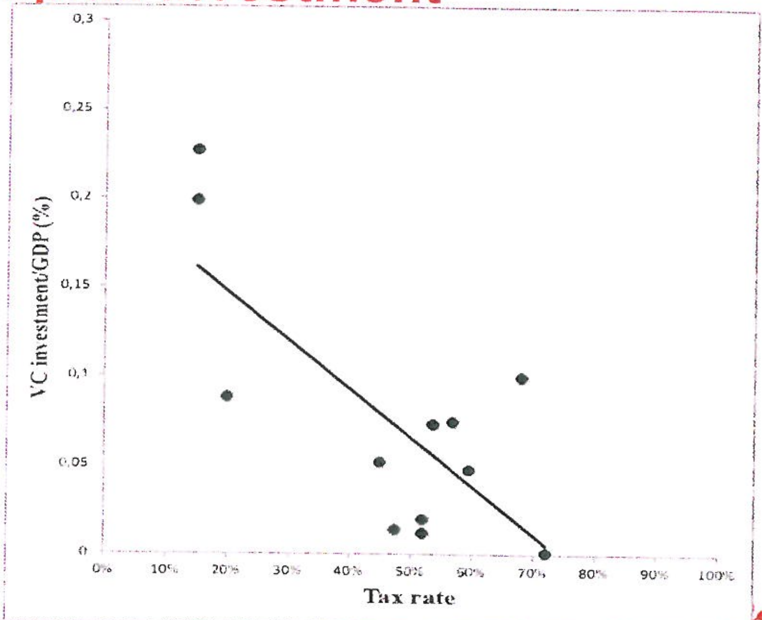
Stock option taxation and venture capital investment



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Labor market institutions

- Enormous churning (every 6th job disappears every year in the US; almost as high in Sweden)
- Wage-setting arrangements
  - degree of centralization and formalization
  - miminum wage laws
  - wage compression "deprofessionalizes" service sector
- Labor security mandates weigh more heavily on smaller and younger firms and on those with high business risk (HGFs)
- Labor security mandates hamper the reallocation of workers, jobs and capital

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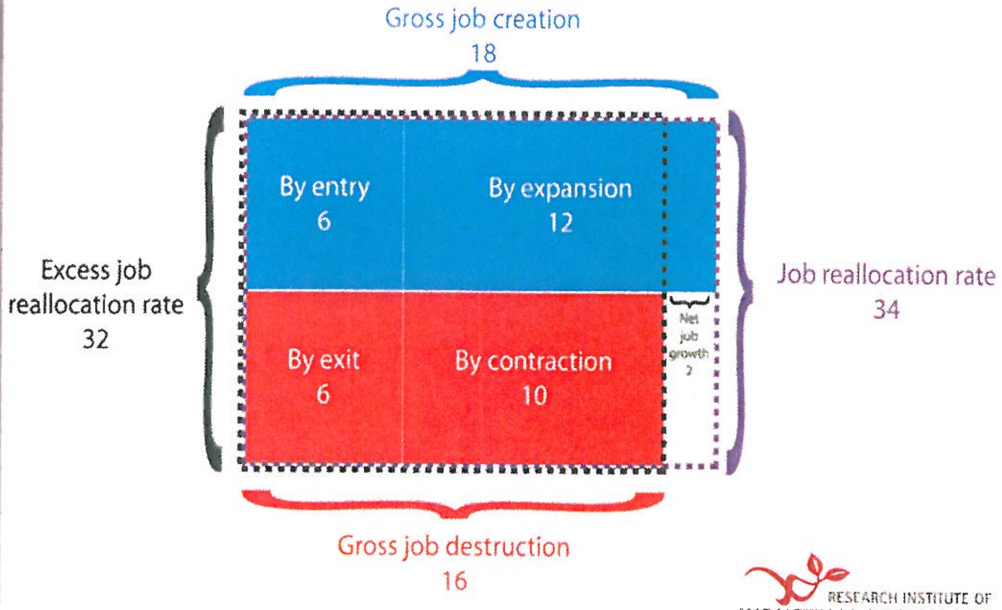
U.S. job creation and destruction, annual average, 1977–2005 (%)



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Conclusions

- HGFs/Gazelles key to growth and job creation
- Many complementary competencies and agents in complex interaction to take firm from small to large
- Impossible to pick winners *ex ante*
- Key institutions to harmonize incentives
  - The tax system: have to get the details right!
  - Labor market regulations and wage-setting institutions; do not tie entitlements to long-term tenure
  - Savings systems and social insurance as facilitators
  - Product market regulations enabling entrepreneurial process and product innovation

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