

How to Make an Innovation Policy Effective?

Background Notes Prepared for a Discussion at the Presidential Palace

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Introduction

Let me start with the reminder that VCs has *military* origins. The first VC limited partnership in the US was formed in 1958 (Draper, Gaither and Anderson). Soon after, the *Small Business Investment Companies*, a federally guaranteed risk capital pool was set up. The year 1958 was not accidental.

The US was in political panic after Russia sent the Sputnik to the skies. That year also saw the rushed passing of the National *Defense* Education Act – throwing large sums of money to universities shaping them into what they became these days (inadvertently bringing about the decline in university education both in the US and elsewhere in the world where the US high education strategy was emulated since – but I shall touch upon this problem only marginally on this occasion).

Briefly: the development of VC in the US was very much linked to military urgency. The US being the country that I characterize as among the few in the world that has lived with the principle of “*everything allowed – unless explicitly prohibited*,” the competition between the two aforementioned early funds soon led to the flourishing of a variety of financial institutions and instruments: IPOs, leveraged buy-outs etc. These institutions and instruments overcame fundamental problems at the time in US capital markets: illiquidity; accountability, the conflict between owners and managers in those years’ conglomerates, gradually solving the eternal problem of “who guards the guardians” etc. Capital markets in the US deepened and became what I would call “democratized”: it is this feature that to these days attracts ambitious entrepreneurs to the US from around the world.

Israel is now known in VC circles as the “start-up nation.” But its venture capital industry was born only 30 years ago, in 1985, with the creation of Athena Venture Partners (Until then Jews from around the world gave money to Israel, but hardly invested there). This company was founded – no accident - by Major-General Dan Tolkowsky, a past Chief of Staff of the Israel Air Force; Gideon Tolkowsky and Frederick Adler, among the pioneers of the US venture capital industry, the latter pushing the idea of listing Israeli companies on Nasdaq. The government there, as in the US, took the initiative in 1993 of offering tax incentives to foreign venture-capital investments in Israel, among others matching any investment with funds from the government (“Yozma” – which means “initiative”). Israel’s annual venture-capital outlays rose nearly 60-fold, from \$58 million to \$3.3 billion, between 1991 and 2000, the number of companies launched using Israeli venture funds rose from 100 to 800, and revenues from the new technology industries rose from \$1.6 billion to \$12.5 billion. By 1999, Israel ranked second only to the United States in invested private-equity capital as a share of GDP, and on a number of statistical measures it was first leading the world in the share of its growth attributable to high-tech ventures: 70 percent and fraction spent on of R&D. The country has the highest number of start-ups per person.

I shall discuss lessons I inferred from these two probably best known experiences of countries starting with no VC to speak of and becoming extremely successful financing successful start-ups, and growing companies: some lessons apply, some do not.

Adversity is a great teacher – military in particular - easy life isn't. Both countries perceived themselves in peril. What they did and how they did it shed light, I believe, on key, not always visible ingredients of bringing lasting success to countries to have an entrepreneurial, innovative culture and for which, among others, a competitive angel and VC industries are keys – them being an integral part of deepening, democratized capital market.

Lessons of Experience

While both in the US and Israel the government has played significant roles in the birth of the VC industry, its success was also due to the fact that very quickly both in the US and Israel the governments did *not put obstacles* in place for competing new funds to emerge, or come in from abroad.

Competition in this industry is critical: If you are entrepreneur with what you believe a great idea, and you already have your start up, you still have to persuade people to bet on you and your team in order to grow. Not everyone may be convinced, and not to the same extent. If you have only one source of capital to turn too – say a government fund - you may be easily rejected, and that would be the end of it. No access to credit – no company. I can give two very easy examples, one from Montreal.

By now you probably all heard of *Cirque de Soleil*, the company that re-invented the circus, got rid of tired animal acts, and turned circus into a high-tech extravagant entertainment, and its founder, Mr. Guy Laliberte, into a billionaire. Mr. Laliberte started out as fire-spitting street entertainer, who first secured organizing a small local festival. But then he managed to persuade VCs of his dream – and you probably know or can easily find out the rest: He not only had successful shows running around the world, many in Las Vegas, but Montreal became a hub for training circus acrobats from around the world.

Now imagine this entrepreneur showing up at a government start-up or VC fund office: Can you blame the government employee rejecting his few million dollar application for transforming circuses according to his vision? (I do not know about Poland, but politics on the North American continent and Western Europe have become circus enough: politicians may not want competition). Seriously: It is very easy to talk about "think outside the box" and other such platitudes, common in business schools, but let us be honest: How many VCs or government employees with rights to allocate funds would make a bet on this entrepreneur? This simple example illustrates, I believe, why you need a competing angel (these days crowdfunding included) and VC sector: Unless Mr. Laliberte had access to a competitive VC sector his dream might have stayed a dream forever, a mere hallucination.

Or here is another example, from the fibre optics industry. David Huber, an engineer working for General Instruments at the time, invented a component needed in this industry. For years he tried to promote fibre optics within his company but without success. In the end, an angel investor gave him a few hundred thousand dollars. He left his job at General Instruments and soon he established a company called Ciena. After few rounds of financing by VCs, when Ciena had its IPO, Huber`s stake alone was valued at \$200 million. Without such access to angels (who are relatively well to do people, ready to bet parts of their savings on start-ups) and competing VCs – it is possible that Mr. Huber would have stayed a good engineer forever.

So establishing conditions for competitive angel and VC sector is crucial, and this involves not only a relatively stable currency (Israel stabilized its own only in the late 1980s; and VCs started to thrive from then on), but a critical mass of accredited investors, stable rules of the game insuring the meaning of "collateral," rights of minority shareholders and so forth – all needed to deepen and democratize access to capital. This appears to me especially important for countries such as Poland making the transition from a centralized past and starting with relatively little accumulating savings (so angel investors may be

scarce). I shall come back to the issue of whether or not Poland or other countries can replicate *the speed* at which a successful VC sector and start-ups develop even if it set conditions in place to deepen and democratize access to credit: some features might be, others - such as attracting massive brain powers, as the US, Israel or Hong Kong and Singapore experienced - might not be.

As noted first, military considerations and institutions played significant roles in the development of VCs in both countries – which brings me to the links between business and *education*. The latter refers, as I shall explain below, not to the formal, statistical sense of diplomas etc, but something far more fundamental.

Disciplined Education

A characteristic feature of many – perhaps most – of the successful Israeli companies is that their founders served together in the Israeli Army, the 8200 – a unit of the Intelligence Corps – responsible for collecting signal intelligence (SIGINT) and code decryption – being one example. Nice, Comverse, Stylit, Outbrain founders all come from this unit.

A recent book, *Israel's Edge*, documents the organization of another army unit, Talpiot, created about 30 years ago and done in collaboration among the Israeli Air Force, the Israeli Defense Forces' (IDF) Administration for Development of Weapons and Technology Industry and run under the auspices of the Hebrew University. The soldiers sign up for 10 years, not the customary three years men serve in the army, and their long preparation for top positions combine study of advanced sciences and math with training with soldiers from every branch of the IDF. It is by now public information where many of the graduates of this program ended up and what companies they ended up creating around the world.

The obligatory three years army experience and the above ten year voluntary ones for what I like to call "vital few," solve some of the main problems that at present both Western Europe and Eastern Europe, Poland too is facing, and to increasing extent North America too. After all, the biggest problem for start-ups and later when founders of start-up look to VC funds for additional funding and grow is finding the team to work with.

The founders must *trust* one the other. They must know how one complements one the other: Who has *leadership skills*? Who is the *techie "nerd"*? Who has *organizational, managerial skills*? *Negotiating skills*? Who is *better dealing with stress*? Who is *the better listener*? Unfortunately, the present fad is to discuss "education" and "innovation" as some kind of homogenized "human capital," or "R&D," both measured by statistics and aggregates such as degrees, patents, what government may call "research spending" etc., which then lead to recommendation for spending more on universities, business schools, R&D and so forth. None of these may be good indicators of entrepreneurship and innovations. Different institutions may be needed to identify and develop these traits, religious and military among them, depending on the country.

Let start with "trust": How do you find other young people to trust, and trust enough to found a company with him or her? Contracts are never good enough substitute: Think marriage. You may sign a pre-nuptial, but that is hardly a complete contract.

Where do you meet these young people and get well acquainted with them? A network of family and friends you grow up trusting is a beginning. If you practice a certain religion and show up regularly in Church – that is another institution whose members may trust one the other more than outsiders. Poland may have an advantage in this regard since: as I understand the Church has greater influence here than in Western European or other eastern European countries, and Poland is a rather homogenous

country. Universities, business schools in particular may be a distant substitute to generate trust in a secular society: some universities may, others not so much.

Courses in ethics are now common at Western universities, in business schools in particular, but my personal observation is that they are rather useless. If one is not ethical by adolescence, learning for observing parents at home – I doubt one will ever be. People may become law obedient citizens – but that is not the same thing as having a sense of honor, duty all the things that generate trust, a specific spirit and culture.

Can institutions substitute for military service – like a one year obligatory National Service – for all 18s old, male and female – do the trick? It could help: it would also create a sense of *obligation*, and not just a narcissistic youth asking for “rights.” (It could also solve a problem, mitigating to some extent another problem: of inequality. After all, where do young people from the “wrong side” of the track meet those on the right side, and learn to trust one the other?). And people from very different backgrounds would have to deal one with the other, solve problems together, compromise, become more tolerant and understanding.

Courses in leadership are common in every business school too. They may be marginally useful, to let those already having such trait learn from cases, listening to visiting successful entrepreneurs and top management about their experiences – dealing with failures in particular. As I noted before: Adversity is the great teacher. Again, it is not easy to detect leadership skills by just sitting in lectures. If the university did a good selection of students – then it may be easier to detect such a trait. It appears to me that the huge emphasis on taking part in team sports in US high schools, colleges is a kind of substitute for demonstrating such skills, and also how you get along with team members. Some skills relevant for future VC can then be discovered: it is not accidental that during interviews much emphasis is made as you advance in the selection process on finding out traits that just being a straight A student do not reveal.

I do not believe that most professors in business schools at present, the way academia is organized - matter much in this respect: if these professors never solved any business problem in their lives – they never financed companies, did not manage, market, advertise only wrote dissertations and papers about these topics, it is unlikely that they could teach much about leadership. They, like business students should probably be sent to be apprentices before start lecturing, never mind if they have PhDs from highly regarded institutions. Business, finance, management is mainly art, execution - little science.

But even if the professors are bright and experienced, if universities gave up on selection and admit mediocre students, these professors cannot do much: The students will stay mediocre. And the contrary: If the students are bright and have leadership traits, these traits will stay – never mind if the professors and lecturers are mediocre. So selection of students is crucial: see the drastic ones used for the Talpiot or other units in the Israeli army. That is how good networks are established.

During the last few years people around the world became aware of this void and they have been experimenting with a variety of institutions to bring young people wishing to become entrepreneurs together, and seeking capital. Originally a social network to match start-ups and investors, Angellist is now a “funding exchange.” Last time I checked, they put up some \$250 mm on 1,000 start-ups out of 85.000 listed on the site – so a bit more than 1%.

In fact, boundaries between angels and VCs have been blurring someone with the bad performance of VC for the last decade or so in the US (in Canada the returns have been miserable for decades).

The institutional void was also filled by so called Accelerators, such as TechStars, that see sees themselves as substitute for B-schools. Dave McClure, founder of 500 Startups has been quoted saying that “I’d rather get \$100K and be a case study, rather than pay \$100K and read case studies.” Apparently there are now 2,000 accelerators around the world, Y Combinator being probably the best

known (having nurtured Dropbox and Airbnb). The company has been doing what most B-schools no longer do, be very tough on selection: of some 2,600 it selects 74 to attend a 3 month course. Y Combinator pays the participants – and gives up 7% of their start-ups equity. Techstars is a bit different, a matchmaking company between youngsters and mentors, with participants also taking formal courses in taxes, payrolls. Some business school profs suggest that all these new institutions help you with a start-up, but the B-Schools curriculum will help you for 20 years (John Eckhardt at Wisconsin-Madison). I doubt that's true: More like self serving, a bit like politicians building monuments, stadiums or spending initiatives that may bring rewards in twenty or more years. By then they are long out of office and cannot be held accountable. With twenty years of experience with start-up and making it grow, the middle age once entrepreneur learned all about business.

What these accelerators achieve is selection of "vital few," building up networks and also matching them with potential sources of capital. Once they are properly mentored, they can lead good teams – even if the members of the team they hire to make their start-up grow are just "very good" and not quite among the "vital few." Apple without the late Steve Jobs went almost bankrupt, the stock dropping to \$2. It was not the case that Apple did not have very good engineers: But the "Job"-less management saw itself in the business of competing with Dell, not i-phones and solving the problem of the music industry at the time. Or think sports: a Wayne Gretzky or a Michael Jordan have raised the performance of decent sport teams.

True, the saying is that the cemeteries are full of people who were eventually replaced. And indeed, if you look at developed stock markets, you can see that when suddenly a founder or CEO dies, the stock at times hardly moves. This is the case of a CEO and his Board putting a good succession plan in place. But if no good succession exists, stocks plummet. Financing Prima Donnas can be dangerous, especially if VCs or shareholders do not insist on having the proper Boards.

The VC's responsibility for a good board and being aware of personal characteristics of founders is one of their key roles. In my experience, one of the warning signs as partner in an angel group and in some financial institutions was when we looked how founders reacted to questions about allocating stocks and stock options. If, say, a founder insisted on very high percentage for himself, and relatively little for his team – red flags popped in our minds. It is dangerous to finance one-man shows, even if excels. Did the founder's insistence mean that his team wasn't that good? Or he is an egomaniac? Obviously, if the person in question had a patent to his name, the story was different: But then as VC you come up with a contractual solution and *separate* compensation for royalties from the rest of his compensation for managing the growth of the start up. So no general theories apply when you encounter founders who want to grow.

An essential patent – that's great and gives barriers to entry, and it makes it easier to finance a start-up or a growing company owning the patent. But just having patents to your name – may not mean much these days. Let me explain, because in a number of recent debates I have realized that people are neither aware of the origins of the 20-year patent protection, nor how the entire patent statistics are not quite signifying these days what often politicians and think tanks say they imply future growth.

Here is why: Whether you manage a small or big business, one of the toughest problems to solve is compensation: How do you compensate R&D personal? Based on what? After all whether in pharmaceutical or energy or high tech, you really do not know if the ideas the scientists are working on will eventually have any commercial application, and if so when. So the R&D department is a cost – paid because the company buys in effect "rights to appreciation." This right acquires value once the company registers a patent and it either turns into a successful commercial good or service or it turns into cash by either selling the rights, or if it sues another company preventing using what the company believes is its patented idea and wins – into cash. Other than that, R&D spending is a cost.

I'll make a detour on patent laws, because their origins are a good illustration how we live unthinkingly at times we received ideas, which may do more harm than good these days. This detour may be particularly relevant to larger companies: how to organize production internally and how to set up better compensation schemes. Surprisingly, the origin of patent laws in the 14th century is actually related to a

present day policy of attracting entrepreneurs to a country, and the present 20 year protection for patents having nothing, absolutely nothing to do with any evidence of economic rational. At close inspection, the 20 years is an arbitrary number.

A Detour on Patents

Patent controversies continue to roil the business world. In March 2013, a federal judge in the US slashed by nearly half the \$1.05 billion in damages awarded Apple last year in its patent-infringement suit against Samsung. On April 1, India's Supreme Court denied Novartis AG's request, after a seven-year legal battle, to gain patent protection for an updated version of its blockbuster leukemia drug Gleevec. And on April 15, the U.S. Supreme Court heard arguments in *Association for Molecular Pathology v. Myriad Genetics*, challenging Myriad's claim to patent a naturally occurring gene.

Meanwhile, Amazon founder Jeff Bezos has suggested that patents for Web software expire after three to five years. Pharmaceutical companies, however, insist that it is vital for patents to remain protected for 20 years in their industry.

Can a more flexible system be devised to provide different duration of patents for various industries, without having detrimental impacts on innovations? Is there a way to mitigate conflicts between companies and countries? What ideas should even receive patent protection?

Such controversies aren't new. America's Founding Fathers anticipated fights over the control of ideas. Thomas Jefferson and Benjamin Franklin were generally opposed to awarding even limited monopolies to inventors. James Madison and Alexander Hamilton were in favor—though Madison wanted to reward inventors with money rather than monopoly powers.

The first U.S. patent law, in 1790, protected inventions for 14 years—a purely arbitrary period dating to 14th-century England. It derives from the Crown's willingness at the time to attract – yes, migration of skilled people is not a new phenomenon – entrepreneurs from the continent. As apprenticeship lasted 7 years, the Crown decided to offer monopoly powers to the entrepreneur until he trades two generations of local apprentices.

Congress extended patent protection to 21 years in 1836. In 1861, the Senate wanted to return to a 14-year patent life; the House of Representatives wanted to stand pat. The result was a compromise, 17 years, which lasted until 1999, when 20 years became the standard world-wide (the assumption being that it takes about three years of administrative hurdle to register the patent).

Yet Switzerland didn't have a patent law until 1887, and its legislation in that year covered only inventions that could be represented by a model, leaving all other processes unprotected.

This system didn't harm the Swiss. On the contrary, it was one of the main reasons for the great success of the country's chemical and aluminum industries. French and German companies, whose production processes were considered too close to the ones that were patented in their home countries under stricter patent laws, moved to Switzerland.

Even so, French and German economic growth rates don't seem to have been affected by the departure of entrepreneurs who founded the Swiss companies. If these men had stayed in their home countries, they would have stayed simple employees, rather than become founders of companies—contributing far less to those countries' growth (recall Huber's case noted above). There was no VC industry at the time, and access to credit was limited.

Today, there is a belief that the 20-year life granted to patents in all industries fosters more patents, and that the number of patents granted implies much about a country's ability to innovate or create wealth. Not really. As the University of Western Australia's Tim Mazzarol correctly observed, "*many companies today seem to be inventing patents rather than patenting innovations.*"

This happens as companies compensate their R&D personnel more for their number of publications and patent applications than for collaborating with the rest of the company finding commercial solutions for problems. The consequences are more patent wars and the expenditure of large sums to buy patents trying to prevent such wars, but not necessarily resulting in more commercialization of patents.

Google buys Motorola_Mobility patents for \$5.5 billion; Apple, Microsoft, Sony and RIM buy Nortel's, defeating Google's bid. Costly lawsuits drag on for years: Apple's with Microsoft, 1985 to 1997, or recently Apple and Samsung fighting across continents.

Who benefits and who pays for Samsung holding around 31,524 "patent families," Microsoft 8,887 and Apple 1,941 in the mobile computing and telecommunications fields? Not consumers, who pay the monopoly prices. Even the companies themselves must spend heavily out of their profits to get and then protect patents.

The 20-year patent life does benefit consultants and lawyers, and does not necessarily bring about more innovations and growth. It brings about an increase in government administration and expansion of the courts. This results in a misallocation of talents and capital that could be mitigated or even avoided either if the life of patents weren't so long, or if patent protection varied depending on industry.

What would happen if the life of patents in some industries, such as software, were shortened, as Mr. Bezos has suggested? Companies and governments would be far more likely to cooperate than fight. There would be less piracy around the world. With regulatory and legal reform, there would be less litigation. Money spent on lawyers and lengthy trials today would instead be spent on innovations. This might inconvenience lawyers, accountants and consultants. But it would be a win-win-win for consumers, producers and investors. Meanwhile, the facts suggest that there is no particular reason to promote the production of patents. What should be done is have policies and strategies within companies to speed up *the commercialization of patents* – a completely different story. The origins of the years patents have been protected also bring up the issue of migration of qualified people, as this obviously impacts the speed at which a country may grow.

Back to Business Education

Now back to education: Sixty-three percent of employers said that recent college graduates don't have the skills they need to succeed, the Association of American Colleges and Universities found in 2010. A separate survey showed that 25 percent of employers say that entry-level writing skills are deficient. What else went wrong?

I noted before that requiring young people to serve in the military or some national service educates people to be disciplined. It is also a fact that military threats expose young people to solve problems on the ground as higher ranking officers are not always on the spot, at times there is no time to contact the latter before making tough decisions. This has a number of effects: it develops quickly a sense of *accountability, team work, responsibility for team members*. Also, since regular soldier must find solutions, there is a constant, at times informal, back and forth between the regular soldiers and the higher ranks. Accelerators may be nice, but I do not believe they solve the particular problem of facilitating fluidity of information.

The kind of lack of formal hierarchy helps later in civilian life, when employees on the floor can more easily contact the top management – much easier than in countries lacking such experience. It probably helps that people continue to serve in the army until they are in their forties (about a month every year). A civilian in high position may have been a regular in the army and an officer may be a technician or engineer reporting in civilian life to a person who was a regular soldier under his command. Such situations allow greater fluidity of information and lead to less respect toward any “authority,” no matter what field you are in: science, business, technology and academia. *The company or institution is less likely to be trapped by dogma – by which I mean act or do research drawing on other people’s thinking.* Whether or not this trait can be taught and sharpened artificially when you do not perceive external threats, or when a country is endowed with natural resources - and you are not educated from early age that your performance is a matter of survival, as a person, for the family, for the tribe or the nation – I am not sure. Having a culture with a sense of purpose is not something that is easy to create and sustain.

The so called often cited “economic miracles,” Hong-Kong, Singapore, Israel, Germany, and the US are all somewhat unique. The first three benefited from large influx of immigrants, and established laws, regulations to serve as basis for a commercial society. They also had no choice: all three lack natural resources, and had to rely on trade. Germany’s miracle after WWII also happened when then finance minister, Ludwig Erhard first drastically lowered tax rates, stabilized the currency and then, until 1961, West Germany accepted some 12 million skilled immigrants from Eastern European countries.

In the US, Chinese and Indian engineers were at the helm of 24% of the technology companies started in Silicon Valley between 1980 and 1998. In a 2007 update of that study, the researchers found that in over 25% of the high-tech and engineering companies started between 1995 and 2005, at least one key founder was foreign-born. What’s more, in 2005 these immigrant-founded companies produced \$52 billion in sales and employed 450,000 people. In 2006, immigrants were responsible for 24.2% of the international patent applications filed in the U.S. in 2006 (with Chinese entrepreneurs accounting for the most, followed by Indians, Canadians, and British,, though immigrants from China and India constitute less than 1% of the U.S).

I do not believe that the aforementioned “miracles” can be replicated in other countries. The survival frame of mind, or frames of mind constrained by “lack of natural resources,” nor migrants’ self selection and their networks, cannot quite be replicated. These exceptions disprove rules but they suggest what countries wishing to catch up can do, what type of institutions they should come up with substituting for military, for better selection and so forth.

Conclusions

Let me conclude by a suggestion: namely: *not* to emulate the present higher education models in the US or Western European countries.

The numbers of students enrolled appears high, what may be less well known that six years after starting their studies, only about 60 percent of white males graduate, whereas among African Americans males only about 35 percent. In Quebec the dropout rates from high schools are in the 40 plus percent, both, I believe reflecting the mistaken idea that keeping youth in high schools and universities is a good idea. It appears that it would be far better if these youth were instead directed toward apprenticeships and not to vague studies that bore them to death. Even those who now take 4 years college courses could finish their formal studies in three years – spend one year in internships or National Service.

US recent data suggests what not to do: Various studies have shown that increased spending on educational institutions in recent years has not led to measurable improvements in learning. Using data from the 2010 Digest of Education Statistics, Eric Hanushek of Stanford University analyzed student enrollment and teacher and staffing levels at K-12 U.S. public schools between 1980 and 2008. He found

that staff and teachers grew roughly twice as fast as students over this period. Yet while school staff increased 52 percent and student enrollment by 21 percent, students showed no additional learning in Hanushek's achievement tests.

Universities show similar trends of increased administration personnel and costs without greater learning, as documented in Richard Arum and Josipa Roksa's recent book *Academically Adrift: Limited Learning on College Campuses*. Among others, they note that gains in critical thinking, complex reasoning, and writing skills have either been "exceedingly small or nonexistent for a larger proportion of students," with 36 percent of them experiencing no significant improvement in learning whatsoever over their four years of "learning." So should Poland or other countries replicate the present US education system, its business schools in particular? It does not appear to be the case.

In the most recent research, US millennials scored lower than 15 of the 22 participating countries, in numeracy ranked last and surprisingly in computer literacy too. However, the gap between the top 90th and 10th percentile was bigger than the gap in 14 of the 22 countries. Numeracy levels among high school and higher declined since 2003.

In contrast, Israeli undergraduates' stellar performance suggests that completing undergrad studies in three years does not mean less education. It is true that Israeli youngsters arrive at the university two to three years older and are more mature than Western counterparts because of two years service in the army for women and three years for men. But this implies that young Americans should gain discipline and experience, not that they should stay longer in schools.

The Swiss and Israeli school systems provide insights what may be done. After primary education (grade eight), students are sorted according to their abilities, and some go to high schools (with streams in science, math, and the humanities), while others go to trade or vocational schools that collaborate with related businesses. This dual system does not close the doors for late bloomers: If some youngsters change their minds and want to become engineers and go to universities, they can pass a few exams later and apply. Adolescents whose talents and interests are not in general studies are not forced to prolong their schooling – that has been a recipe for decline in educational standards the last few decades, and has created larger, more expensive school administrations.

True, statistical studies until few years ago show that people in Western countries who stay longer in schools or go to universities secure higher incomes. The erroneous inference has been that education is the path to greater income and social mobility. But these studies were done during a period that coincided with the expansion of government bureaucracies, which employed graduates knowing little but jargon. Until the late 1980s, the resulting compounding costs were covered, in part, by the flow of capital and talent to U.S. shores from much of the rest of the world, as there were only a dozen countries open to leverage one's talents. That world is gone with the wind, though many of its ideas remain – as can be seen in the US political debates the last few years.

Perhaps Poland can learn from the Western mistakes, forget about undergrad business schools altogether, and leapfrog toward the Accelerator models and other institutions that can better prepare youngsters for entrepreneurial futures. It should be clear though that I only discussed here the talent part of the equation. Although I hinted about the necessity of deepening, democratized capital markets as being necessary, that crucial part of the equations, how to achieve it is an entirely different topic. The fact that very few countries managed to have vibrant capital markets should suggest that it is no simple matter: Fortunately in this visit of mine to Poland I will have the opportunity to present them elsewhere, complementing the comments in this presentation.