

Academic Entrepreneurship in Ukraine

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Date of submission: 30 November 2015

This report has been financed by the Friedrich Naumann Foundation for Freedom.

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Executive Summary

Academic Entrepreneurship is a way of transferring knowledge and technology from science and higher education to the private business sector; thus, it contributes to the innovativeness and competitiveness of the economy, especially to small and medium-sized enterprises (SME). That is why many countries are considering support of Academic Entrepreneurship a part of their SME policy strategies. At the same time, Academic Entrepreneurship has been neglected for high-level policy discussion in Ukraine.

To draw more attention to this matter, we have initiated a fact-finding research dedicated to Academic Entrepreneurship in Ukraine. An international team of experts interviewed government officials, managers of some of Ukraine's leading universities and science parks, top researchers of the National Academy of Science, Ukrainian venture capital firms and several non-governmental organizations, all of which are committed to promoting Academic Entrepreneurship. Based on our research and on international best practice, we derived a number of recommendations that could facilitate Academic Entrepreneurship in Ukraine. Those steps we are suggesting, can be put into practice by individual people as well as institutions. They do not require substantial additional resources or major changes in the state regulation, which makes them easy to implement. In order to develop Academic Entrepreneurship in Ukraine, we recommend the following steps:

- Join all available resources (human, organizational, financial) of existing science parks and entrepreneurship departments in order to make the support processes more efficient.
- Create a clear vision, define an ambitious mission and create a brand that is able to actuate commitment, excitement and help identification.
- Win international partners that are famous for their Academic Entrepreneurship eco-systems.
- Create light-house success spinoffs. A few success stories will spark the development of an entrepreneurial culture in the science and the higher education sector.
- Teaching entrepreneurial skills should be the 'hot pot' for Ukrainian universities.
- Unlock scientific knowledge from institutions, which are not able to transfer patents into life.

All these steps can boost the development of a support eco-system for Academic Entrepreneurship. Concentrating all efforts on those activities means to commit less effort to side-show activities, which would lead astray from the path to success, such as: The discussion about shifting the responsibility of intellectual property rights from one state institution to another, which is quite a time-consuming activity. Science parks trying to acquire shares of academic spinoffs hamper growth and access to finance. Improving state regulation and state policy towards Academic Entrepreneurship is important, but spending too much time on discussing and evaluating state policy prevents researchers from being real entrepreneurs.

There is enough room for individual, self-responsible action, and the science and the higher education sector can start immediately to implement international best practice and inspire policy makers with success stories.

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1 Why Academic Entrepreneurship in Ukraine?

Why is this topic important for Ukraine? It does not appear on political agendas; neither does it appear commonly on public discussions. Is it just a side-issue, a nice-to-have for the time after other major problems have been solved?

Let us have a look at some of Ukraine's major problems: The technology standards of the private economic sector are, on average, far behind the international state-of-the-art. This is especially the case for the sector of small and medium-sized enterprises (SME). Further, the SME sector is little innovative compared to its international peers. Even worse, Ukraine suffers significantly from Brain-Drain, i.e. skilled and talented people are leaving the country.

Now, let us have a brief look on Ukraine's science and technology resources: 277 higher education institutions, 1.5 m students, about 75,000 lecturers with scientific degrees and about 54,000 professors and associated professors, 999 research institutions¹, a National Academy of Sciences of Ukraine with 178 research institutes and 19 thousand employed researchers, several other national academies; decades of tradition of internationally acknowledged research etc.

However, startup companies of graduates and spinoff enterprises from the science sector do not contribute much to solve the economic problems mentioned above.

Let us glance at the international experience, at how Academic Entrepreneurship contributed to solve similar economic problems:

- Science and technology-based startups are an important channel for technology transfer between science and the SME sector in both directions.
- The majority of graduates who start businesses usually stays in the region near to their university, i.e. does not emigrate from neither the country nor the region. In other words, Academic Entrepreneurship helps to stop the Brain-Drain.
- Regions with high Academic Entrepreneurship activity attract young professionals and high potentials not only for startups but for all kinds of industry, i.e. Academic Entrepreneurship contributes to Brain-Gain.
- The exchange of knowledge and skilled people between the SME sector, higher education sector and public scientific research institutes contributes to the development of high-tech clusters and innovative milieus.

Box 1 presents an example that illustrates the positive effects of Academic Entrepreneurship.

If we put this together: the significant potential, the promising gains and the little current activity, then the question should be: Why has Academic Entrepreneurship received so little attention in Ukraine until now?

¹ Crimea and part of Donetsk and Lugansk regions are not included; in 2014, there were 1,143 research institutions in Ukraine.

The Friedrich Naumann Foundation for Freedom and the authors step up to strike a blow for Academic Entrepreneurship in Ukraine and this publication is a first step. So, why is now a good time to put that topic on the agenda?

Box 1: Academic Entrepreneurship has driven Berlin to become Europe's digital center

Although Berlin is the capital of Germany, the Berlin region is not considered to be a particularly economically strong one. The GDP per capita of Berlin is 10% lower than the German average; the unemployment rate is the highest in Germany. Berlin has few of Germany's key industrial facilities: there is no heavy industry, little machinery industry, no significant financial industry, almost no automotive etc. Conventional economic data would not propose that Berlin has the fertile ground for becoming a European industrial center.

In the 90s, some of Berlin's higher education institutions have started in the 90s with Academic Entrepreneurship activities such as entrepreneurship teaching courses, a business plan competition and an entrepreneurship lab. This created the foundation for the development of a support eco-system for Academic Entrepreneurship.

The support eco-systems today consists of entrepreneurship support departments at the universities and higher education institutions that cooperate closely with the technology transfer offices, chambers of commerce and trade, private sector consultants and coaches, business angels, Venture Capital Funds, state-owned incubators, private-sector incubators and so-called Accelerators, civil society institutions as well as budget support from the federal government and access to federal state grants for academic startups.

By the end of the 90s and in 2000, many other German university regions had also started with Academic Entrepreneurship activities. However, Berlin became the most popular region for Academic Entrepreneurship in the software industry. In 2009, Berlin was still an insider's tip, hidden behind such cities like Hamburg, Munich, Frankfurt and Cologne. Only three years later in 2012, Berlin received EUR 133 m venture capital investment in IT startups, which was more than 50% of the sum for entire Germany. Venture Capital is only one component of the support eco-systems, but it is a good measurement for the maturity and attractiveness of a startup region.

The growth accelerated. Over the first half of 2015, Berlin has received EUR 1.4 bn of venture capital investment in IT startups, which is 10 times as much as the amount received over the entire year 2012, overtaking even London and thus all other IT startup regions of Europe.

Berlin became a magnet for software engineers and related professionals from all over the world. As a result, the incumbent IT industry followed the startups and moved to Berlin, too. By 2015, many global IT companies possess research centers or production facilities in Berlin. Regarding the software industry, Berlin experienced a massive Brain-Gain, which was led by the academic startup scene. Taking together the high number of startups, the high number of software professionals, the high number of international software companies and the high capital investments: Berlin is the digital center of Europe.

2 Why now?

Because the window of opportunity is now open but will not remain open indefinitely.

In order to assess the situation of Academic Entrepreneurship in Ukraine, we undertook a fact-finding research. We spoke to government officials, to the officials of some of Ukraine's leading universities and science parks, interviewed top researchers of the National Academy of Sciences of Ukraine, visited Ukrainian venture capital firms and several non-governmental organizations, that are committed to promote Academic Entrepreneurship in Ukraine, and to many other people.

In a positive manner, we were surprised by the enthusiasm and commitment shown by all the people we have met. We really felt their passion for the topic. People kept saying, 'we are willing and ready to do something about it and we have already started'. At the moment, this enthusiasm is the most important resource the Ukraine has. This passion and enthusiasm is the crucial essence providing the solid ground for further efforts. You need to trigger this fire before it burns out.

Further, there are already some 'plantlets', some academic entrepreneurs and startups that have established recently. Box 2 highlights some of them. These first-mover startups could lead the development of a fertile eco-system, which creates the basis for an emerging Academic Entrepreneurship cluster. It is important to gain momentum of those first initiatives. Those plantlets must not wither.

Furthermore, there are already some attempts of developing a support infrastructure. Kyiv's leading universities, the Kyiv Polytechnic Institute and the National University Taras Shevchenko have founded science parks and they are willing to devote financial resources, institutional capacity and personnel to the support of academic startups. Most importantly, the science parks have the political support of the universities' rectors. Both universities try to establish a network of supporters from private sector and the civil society. There are several such examples of other higher education institutions in Ukraine.

We do not provide either a complete description or a full assessment of the Academic Entrepreneurship situation in Ukraine in this publication. We have focused our research on activities in or related to the capital Kyiv. We have chosen Kyiv for practical reasons in order to get some insights into challenges, problems and advances. Our findings are not meant to be representative for the entire country. Moreover, it would be contra productive to focus on how far Ukraine is behind other countries like Germany, Great Britain, and Belgium etc. with respect to the Academic Entrepreneurship development. Instead, we want to stress that Ukraine's first steps towards Academic Entrepreneurship in their unique environment give rise to optimism - if continued appropriately.

It is now important to set the right course for this movement. It is exactly now the time to make use of international experience, avoid known mistakes and apply best practice knowledge. This publication aims at contributing to the latter by providing some recommendations, based on profound knowledge and experience about Academic Entrepreneurship in Germany and Western Europe.

Box 2: Academic Entrepreneurship 'plantlets' in Ukraine

Academic Entrepreneurship 'plantlets' in Ukraine	
	<p>Melta Ltd.</p> <p>Melta is a spinoff from the National Academy of Science of Ukraine. It uses an invention of the G. V. Kurdyumov Institute for Metal Physics of the NAS of Ukraine: a special technology that can change the characteristics of alloy metal. The alloys have special amorphous and nanocrystalline structures. It can be used for increasing the energy efficiency of heating systems as well as of electric transformers.</p>
	<p>SOVA</p> <p>SOVA is portable water purification system. It is a spinoff-project from the Kyiv Polytechnic Institute. The project has received some pre-seed financing for developing a business case.</p>
	<p>iHUB</p> <p>iHUB is a network of co-working spaces and incubators for IT-startups in Kyiv and other Ukrainian cities. iHub is supported by international donors.</p>

3 What are we talking about? Conception and misconceptions of Academic Entrepreneurship

Quite a few of the people we have met regard Academic Entrepreneurship as a state-organized, state-regulated and state-financed process that aims at commercializing scientific research results by means of establishing spinoff companies. This conception is problematic for the situation of Ukraine, because if you follow such a concept of Academic Entrepreneurship, you are faced with major problems.

First, if you think the process should be state-regulated and state-organized, you will need to develop an effective state regulation regarding a framework for Academic Entrepreneurship; regarding intellectual property rights, you will need to develop the appropriate organizational structure (duties, responsibilities and accountabilities) beforehand; you will need to build institutional capacities of science institutes and higher

education institutions beforehand. Also, you must provide sufficient resources. Currently, those framework prerequisites are missing.

Accordingly, the people, who favor such a concept of Academic Entrepreneurship regard the State of Ukraine as the most important bottleneck for developing Academic Entrepreneurship. The following sentence was a more than common response: 'The regulation provides no mechanism for us to do xyz ...'. In essence, many of the committed people, many of the ready-for-action supporters and many of the want-to-be entrepreneurs are hold up by waiting for some change in state regulation and finance. This is the current situation: Ready and waiting. However, 'tempus fugit'. Above, we have sketched-out that there are indeed some plantlets of promising startups in Ukraine, but those will wither if the supporting eco-system is not going to develop soon.

The second big problem is that such an approach mainly focuses on financial incentives, it stresses the commercial returns. This leads to unrealistic expectations and will cause disappointment. Positive effects of promoting Academic Entrepreneurship emerge on a national level and in the long-term. Direct returns on an individual level can at most be rarely observed. The expectation of personal gains can therefore hardly mobilize personal commitment and civil society resources - but we come back on this later.

Thus, we suggest another perspective of Academic Entrepreneurship that is based on different attitudes, different perspectives and has proved to be helpful in many countries such as Germany. Academic Entrepreneurship is ...

1. a measure for developing personal talent and for a self-determined personal life and career,
2. an international movement of people, who aims at using science and technology for the progress of mankind and for protecting our environment,
3. a measure of freedom and autonomy in research and education,
4. a measure of contributing to the country and its society,
5. a measure for fair and justice competition of all ideas and attempts that are aimed at making the country and the world in a better place,
6. starting a business in order to bring ideas to live and to fulfil visions.

This may sound pathetic to some readers. Nevertheless, it is the real drive motivating students, graduates and young scientists all over the world to found a company; and this is a description of the motives of many professors to spend their leisure time and parts of their salary supporting such founders. It is the reasoning why special foundations donate money. And it explains why some political parties are more keen on promoting Academic Entrepreneurship than others are.

That approach has two advantages. Firstly, it focuses on the self-responsibility not only of the to-become entrepreneurs but of all players involved in the support and development of Academic Entrepreneurship. Accordingly, the guiding question for all actions is 'What can we do today by ourselves?' instead of 'What external conditions need to be changed by someone else?'

Secondly, it is not based on financial incentives. This helps to adjust individual expectations. It is common knowledge of nowadays that only a fraction of science and technology-based startups survives the first five years, of which only a fraction will earn significant yields. However, any (financial) failure of a startup can still be a win with respect to the personal development of the founders, with respect to the development of the supporting eco-system and with respect to the learning of the society. Economic theory calls such an approach: utilizing externalities that emerge from knowledge-spillover effects.

When it comes to technical terms, usually three forms of Academic Entrepreneurship are distinguished:

- Academic spinoffs are new corporations that base their business on direct science and technology transfer from state research institutes or higher education institutions.
- Academic startups are new corporations founded by students, graduates or scientists that use knowledge or research results from state research institutes or higher education institutions.
- Academic entrepreneurs mean students, graduates and scientists that become entrepreneurs in fields of business that require an academic background.

The last group is usually the biggest group, the first group is the smallest in Western countries such as Germany, Great Britain and the USA. Although the three forms may appear different on first sight, they are similar regarding the underlying spirit and motivation, and they flourish in the same eco-system. They basically differ with respect to the intensity of science and technology transfer.

The spirit of this publication has been inspired by the second approach that considers Academic Entrepreneurship as an attitude and passion rather than a mechanism. Consequently, we focus our recommendations on actions that:

- 1) are within the circle of influence of individual people and institutions,
- 2) do not require substantial additional resources,
- 3) do not require a major change in state regulation.

4 Steps you can take right now

4.1 Join forces

Ukraine has got the people, knowledge, resources and passion it needs to make a huge progress in developing a fertile Academic Entrepreneurship eco-system – but institutions and people must join forces.

There are several science parks, business incubators and similar institutions in some of the Ukrainian higher education and state research institutions, but none of them has sufficient resources and sufficient capacity. Consequently, the track records are modest. By no means, we want to criticize the work that people did. Quite the opposite, we could not praise enough what has been achieved considering the circumstances.

However, for some serious progress in Academic Entrepreneurship promotion, all of the existing science parks and incubators are too small and none of the teams running those institutions combines sufficient competency and experience to walk alone.

We strongly recommend joining the forces, at least in the beginning of the development. Let us take the City of Kyiv as example: bundling all existing resources, all personnel currently working in this field and all current supporters would be just enough to endow one single incubator or science park. However, as for a start, one single science park for the entire City of Kyiv would be sufficient for all Kyiv universities, all higher education institutions in Kyiv and all the Kyiv based institutes of the National Academy of Sciences.

That recommendation may sound radical on first sight; but it is based on successful experience from Germany. Let us provide some benchmark numbers in order to assess the proposal in economic terms: An academic startup in Germany is currently eligible for up to EUR 150,000 of state grants plus up to EUR 20,000 of direct non-financial support subsidies plus up to EUR 400,000 of state-backed venture capital.² Obviously, not all startups receive such a big amount. There is a Germany-wide pyramid-style tender system, but each year a two-digit number of startups manages to receive amounts near the maximum. German universities and research institutes have sufficient facilities and personnel for entrepreneurship education, entrepreneurial talent screening, technology scouting, economic patent assessment, supporting startups with their application for subsidy tenders etc. It is because of that comfortable endowment with resources why many German universities can afford to run their own science park or incubator. However, that is the situation right now. 15 years back, the picture was completely different. 15 years before, most German universities had collaborated with other universities and higher education schools in order to initiate Academic Entrepreneurship development. They created networks and the state research institutions joined those networks. The Academic Entrepreneurship networks shared their scarce resources and joined their forces.

² <http://www.exist.de/EN/programme/EXITS-Business-Startup-Grant/content.html>,
<http://www.foerderdatenbank.de>

Accordingly, almost no university or institute was able to list its own success stories, all startup and spinoff successes were common results of partnerships. However, politicians, funds and foundations began to acknowledge the importance of Academic Entrepreneurship and to appreciate the proof of concept. In other words, they saw that it really works and they became willing to devote substantial amounts of resources.

As a matter of fact, when the financial endowments for the Academic Entrepreneurship support doubled, tripled or in some cases even 10-folded, many networks died, once each of the partners have had acquired enough resources to walk alone. At the same time, the effectiveness of the Academic Entrepreneurship activities decreased. This is intuitive because the network cooperation had created more synergies than just cost effectiveness. Knowledge exchange, specialization, expert pooling and increased international visibility are non-financial advantages of network cooperation that had been lost with the network's dissolution.

Box 3 describes an example of a region in Germany that faced a situation in 2003 comparable with the Kyiv region today.

Box 3: Case Study of a German Academic Entrepreneurship network

'Land Brandenburg' is a federal state of Germany and has eight state universities and higher education institutions accounting for 50,000 students altogether. Regarding the economic situation, the region is one of the weakest in Germany. The GDP per capita is 30% below the German average; the unemployment rate is one of the highest in Germany. The state government, which is financing the higher education institutions (according to the German system), has not provided any additional resources for Academic Entrepreneurship until the end of the 1990s. Accordingly, there have been only few Academic Entrepreneurship activities.

In the beginning of the 2000s, all state universities and state higher education institutions of 'Land Brandenburg' joined and established a Brandenburg Center for Academic Entrepreneurship.

In 2003, the Center managed to receive some funds from a federal policy program as well as from a foundation. The center used the funds to finance employees whose duties included entrepreneurship education and the support of academic spinoff projects with advice and coaching. However, there was not enough money to finance a complete support infrastructure for each of the universities. Therefore, they joined and created a virtual network science park, which means that all universities and higher education institutions cooperated; they exchanged information, best practice, teaching material and the employees teamed together for supporting nascent entrepreneurs and spinoff projects. Above all, they established a shared pool of supporters from the private sector and the civil society (experts, consultants, venture capital partnerships etc.).

The network created several success stories. State politicians heard its voice; it acquired more funds, and it created several famous spinoffs. In 2009, the Potsdam University, one of the network's members, was ranked No. 1 of all German universities with respect to Academic Entrepreneurship. In other words, within less than a decade the Academic

Entrepreneurship support infrastructure of this university rose from the last to the top. It then employed more than 30 people and continued to produce more than 30 spinoffs per year.³

One of the most famous spinoffs from the Potsdam University is 'signavio'. It is a software company with a unique product. It was founded in 2009. Today it employs more than 80 people in Germany and California.

However, the Academic Entrepreneurship support network fell to pieces step-by-step. Coordination problems, personal problems, competition thinking, envy and many other issues made the cooperation less and less efficient. The staff of the Brandenburg Center for Academic Entrepreneurship was reduced from 17 to 2. Each of the former network partners today tries to run its own science park; some perform better than others do.

While Brandenburg started to neglect its Academic Entrepreneurship network potential, the neighbor state Berlin repeated the success story of a joint university network. 'B!gründet'⁴ is the Academic Entrepreneurship support network of the universities and higher education institutions of Berlin and is now one of the most successful in Germany and even worldwide.

For Kyiv, we recommend a single science park that acts as a catalyst and growth core. It should focus on the following tasks:

- Incubating services for the small number of current spinoff projects
- Expert pooling
- Coordinating knowledge exchange
- Linking all existing supporters and mentors from the private sector, from politics and from civil society to one single shared support network

Above all, it is necessary to connect the students and researchers of different institutions with each other. Currently, the higher education institutions in Kyiv are quite specialized, which means that none of the schools cover all of the competencies needed to create a successful startup. Therefore, we recommend connecting the students that study natural science with those that study economics, design, communication, engineering, management, software engineering etc. Students learn entrepreneurial thinking by understanding different perspectives, appreciating different competencies, broadening their horizons and training their social skills. Furthermore, such a diversity of competencies and perspectives provides fertile ground for new ideas and business models. A single science park could coordinate the student networking.

Recommendation 1: Join all available resources (human, organizational, financial), reduce the number of science parks and similar institutions and facilitate networking beyond institutions.

³ <http://www.potsdam-transfer.de>

⁴ <http://www.begruendet-berlin.de>

Box 4: Case Study of a Academic Entrepreneurship Support Eco-system

The following highlights some components of an Academic Entrepreneurship support eco-system. The compilation was inspired by the eco-system of the Berlin greater region.

<i>Partner</i>	<i>Contribution</i>
Faculty of Business and Economics	Provides entrepreneurial and business courses for other faculties
Career Centers of universities*	Provide soft skill trainings for nascent entrepreneurs
Faculties of universities*	Integrate entrepreneurial and business courses and soft skill trainings into all curricula
Technology scouts	Review research results of research professors and research departments for commercial potential
Talent scouts	Match scientist and want-to-be-entrepreneurs, initiate entrepreneurial team building
Technology Transfer Offices	Provide advice with IP strategies
University* deputy president	Develops entrepreneurial culture and attitude of entire university*
Departments of entrepreneurship support at universities*	Supports nascent entrepreneurs with advice, helps to find the appropriate entrepreneurship policy program
State government	Provides funds and entrepreneurship policy programs: access to finance, non-financial support programs such as coaching and consulting, access to premises, state-owned incubators
Federal government	Provides grants for academic startups and spinoffs
Federal government and industry partners	PPP Venture Capital Funds
Private sector incubators and Accelerators	Support startups with funds, advice, networks and premises, rely on a big base of nascent entrepreneurs from universities, act as additional pull-mechanism to motivate even more graduates to start a business
Private Venture Capital Funds	Invest in startups for commercial purposes, rely on a big base of nascent entrepreneurs from

	<p>universities, act as additional pull-mechanism to motivate even more graduates to start a business</p>
Professional services	<p>Advice in legal issues, tax issues, design, websites etc. for academic startups and entrepreneurs, Professional service providers can be academic entrepreneurs themselves, trends reinforce each-other</p>
Chambers of Commerce	<p>Provide basic advice in legal issues free of charge, Provide networking services</p>
Employment Agency	<p>Provides information about entrepreneurial career opportunities as opposed to employment</p>
Commercial banks	<p>Have special startup departments, offer special conditions for bank accounts for startups</p>
Co-working spaces	<p>Lease micro-premises (e.g. one single office desk for one day) to startups on a commercial basis Act as networking hubs where nascent entrepreneurs and startups meet and exchange information and knowledge</p>
Industry Associations	<p>Carry out business plan competition in cooperation with universities</p>
Foundations of Civil Society	<p>Provide entrepreneurship education and grants for nascent entrepreneurs that have inferior access to state programs, e.g. social entrepreneurs</p>
Network coordination office	<p>Supports coordination and knowledge-exchange of all eco-system partners</p>
<p><i>* The term university shall include here all higher education institutions.</i></p>	

4.2 Create a vision, define a mission and create a brand

After a successful decision towards joined efforts and cooperation, it is important to formulate a vision. What is the long-term aim of the Academic Entrepreneurship activities? What will the science and technology landscape look like in 20 years, what role will Kyiv play in that landscape and what is Academic Entrepreneurship supposed to contribute to that picture?⁵

Further, define a missionary statement that explains the motivation and passion behind all efforts towards Academic Entrepreneurship. The mission statement should include the values and virtues of people engaged in this field.

Vision and mission statement have the function to integrate all players. They form the common ground. People shall identify themselves with the mission and vision. Mission and vision can also attract more supporters.

In order to perform this function, the mission as well as vision statement need to address emotions and beliefs. They must actuate commitment, excitement and help identification.

A good brand supports the communication of the mission and vision. A good brand is a message that spreads easily and unambiguously. It must be unique and stand out from other brands. 'Silicon Valley' is such a brand. Everyone in the world knows what it is and what it stands for.

Box 5: Examples for mission statements

Stanford University

'[...] Stanford offers the kind of education needed for leadership in a rapidly changing world. Its seven schools ... offer a breadth of highly regarded degree programs that allow students the freedom to explore their intellectual and personal passions.

From Nobel Prize winners to undergraduates, all members of the Stanford community are engaged in creating new knowledge, and Stanford brings an innovative, entrepreneurial spirit to this work of discovery. Stanford people take on audacious problems, bring imaginative new approaches to solving them, and work collaboratively to advance knowledge and make meaningful contributions to our world. [...]'⁶

Massachusetts Institute of Technology

'[...] The mission of MIT is to advance knowledge and educate students in science, technology and other areas of scholarship that will best serve the nation and the world in

⁵ Apparently, the KYIV 2025 Development Strategy neglects the role of Kyiv's research and higher education institutions for entrepreneurship and innovation. (http://kievcity.gov.ua/upload/a/kyiv_strategy_eng.zip).

⁶ <http://www.stanford.edu>

the 21st century.

MIT is a place of extraordinary interactions. It's a setting where people and ideas come together in new ways—illuminating mysteries, making sparks fly, and fostering intellectual breakthroughs. [...] ⁷

Berlin

[...] Berlin is a city that is constantly changing and always reinventing itself. This means, first and foremost, that Berlin is a city of opportunities! The city encourages people from all over the world to come here, get happy, pursue their goals, face their major challenges, advance their careers and live out their dreams.

Berlin is the place to be for sciences with a vital network between science and business and its potential for talents as well as startups. A special focus of the image lies on the topic of "technology transfer and innovation support". Berlin has a lot of potential here connecting innovative companies with existing companies.

Here in Berlin, change is a fundamental part of our way of life. Creative and talented professionals from all over the globe gather in the German capital; this is where they come to make contacts and transform new ideas into successful projects. Hardly any other location in the world has so much creative dynamism and drive. As the capital of startups, culture and lifestyle trends, Berlin is also a hotspot for tourists and a highly sought-after relocation site for innovative companies. [...] ⁸

Recommendation 2: Create a clear vision, define an ambitious mission and create a brand, which are able to actuate commitment, excitement and help identification.

4.3 Win international partners

We were astonished, that only few of the international universities, which are famous for their Academic Entrepreneurship eco-systems, were referenced as networking partners in any of the presentations, which we have seen during our visits.

We are not talking about spending travel budgets and using knowledge exchange as an excuse for traveling abroad, but we are talking about real intense partnerships. As an example for explaining what is meant by the term deep partnerships: Berlin's universities have partnerships with universities in Israel, and one result of the cooperation is a new special German federal regulation that provides access to German grants for graduates from Israel when planning an academic startup. The amount of subsidies is up to EUR 150,000 per team, and it is just for the planning and preparation period. ⁹ However, German entrepreneurial universities seem to play no role for Ukraine's universities.

⁷ <http://www.web.mit.edu>

⁸ <Http://www.be.berlin.de>

⁹ <http://www.existstartupgermany.com>

We have neither heard about partnerships with the MIT, which is the most cited role model for Academic Entrepreneurship in the world, nor about partnerships between British and Ukrainian universities, although British universities have been the first in Europe that dealt with Academic Entrepreneurship; they possess a treasure of experience and best practice.

Academic Entrepreneurship is a global movement. If you want to do some serious progress in this field, you need the support of experienced international partners.

International partners provide best practice, short-cut the learning curve and transfer reputation.

Solo actions or national actions will not lead any university or any country far ahead. Academic Entrepreneurship has nothing to do with patriotism or tradition. Most importantly to state: Academic Entrepreneurship is not a competition between institutions or countries, but it is a global community of practice.

One of the overdue steps, by the way, for Ukraine is to join the Global Entrepreneurship Monitor community¹⁰.

Recommendation 3: Cooperate intensively with universities that are internationally renowned for their experience and competency in Academic Entrepreneurship.

4.4 Create light-house success startup projects

Light-house success projects serve as a proof of concept. Politicians need to see that the Academic Entrepreneurship support activities work. Presenting results, i.e. spinoff companies, is more convincing than any argument or academic study.

Once politicians can see the results of Academic Entrepreneurship, they will start thinking more pragmatically about reforming the regulatory framework. Right now, the public discussion is rather theoretical, like 'we would have had more spinoffs if we had a better regulatory framework'. It would be much more convincing to say: 'Look! We got the successful spinoffs A, B and C despite the current unfavorable regulatory framework. Imagine what we could do with a more efficient regulation.'

The same goes for acquiring funds from international or domestic donors. A showcase tells more than a bunch of explanations.

Above all, light-house success stories are one of the best means for positively changing the attitude of students and professor colleagues towards Academic Entrepreneurship. Successful academic entrepreneurs are likely to be seen as role models, other students will want to follow the example. More and more professors will appreciate the importance of entrepreneurship for the faculty and the entire institution. The entire climate will become more supportive. The university or institute will experience an emerging entrepreneurial culture.

A light-house spinoff must have professional characteristics in order to create such positive impact: It should be a private-sector company, that has transparent ownership and

¹⁰ <http://www.gemconsortium.org>

governance, it should be easy to find and to access and it should report its balance-sheets and profit-loss-accounts.

We have not found any project that is close to fulfilling those conditions. We started our research with a list of more than 20 projects, which were selected by the representatives of several support organizations from both the state and civil society. It was very difficult to find the projects in the internet; we could only find a fraction of the list. It was almost impossible to identify the companies behind those projects and to discover the ownership structure and governance. Those we managed to find, could not report significant turnover, not to mention profit. We were left with the impression that the institutions exaggerated about their spinoff outcome. The credibility of institutions could be harmed by such exaggerations.

Recommendation 4: Create real and transparent success stories and resist from make-up stories.

4.5 Teaching, teaching, teaching

Universities and higher research institutions can contribute a lot more to Academic Entrepreneurship than they do today without any change in regulation or any additional resources. That is because Ukraine's universities and higher research institutions have the autonomy to change curricula and to denominate professors and lecturers. It is within their circle of influence to teach entrepreneurial courses like business planning in all faculties across all courses of studies.

They would only need to convince the university management and colleague professors. For instance, it means for instance to convince the physics professors to short-cut the existing curriculum in order to create space for new courses like business modelling, intellectual property strategies and so forth. It means even for the economics faculty and the management faculty to give up on some of the theoretical courses and to offer instead more modules for developing social skills like empathy. Convincing the university staff and science community is the most difficult task of all, according to international experience from several countries. However, it is certainly the first step. If colleagues do not support the idea of Academic Entrepreneurship, why expect politicians or others to support it? It takes time to change the attitude towards entrepreneurship, but you can start today with the change process. And you can concentrate on your core competency: Teaching.

Recommendation 5: Integrate entrepreneurship education in all faculties and courses of study in all universities and higher research institutions.

Box 6: Examples for entrepreneurship teaching courses in higher education

Examples for entrepreneurship teaching courses in higher education

The Potsdam University served already as an example in Box 3. The university has 20,000 students in approx. 50 bachelor programs and 50 master programs. The university offers 117 different entrepreneurship courses for all students of all bachelor and master courses. The catalogue of entrepreneurial teaching modules contains even some special modules for postgraduates. Most importantly, the majority of modules is integrated into the curricula, which means that students get formal credit points and marks. The following list highlights just a few of them.

- Business planning
- Design Thinking
- Management for natural science students
- Economics for students of non-economic studies
- Negotiation techniques
- Presentation skills training
- Business simulation game
- Entrepreneurial Summer School
- Social competencies for entrepreneurs
- IPR strategies and management
- Entrepreneurial team management
- Project management
- Entrepreneurial marketing
- Entrepreneurial finance
- Introduction to entrepreneurial legal issues
- 'Working as a freelancer'
- Entrepreneurial Assessment Center

This list, although taken from Potsdam University, represents common best practice in Germany.

4.6 Unlock scientific knowledge

In Ukraine, researchers often aim at patenting their inventions and research results because the number of patents is an important indicator for assessing researchers' productivity. Patents as well as all other intellectual property belong to the institution that employs the researchers. Actually, the legislation of Ukraine does not precisely state who owns the rights to intellectual property created under the endowment of public funds. Due to this insecurity regarding the structure of ownership rights of intellectual property, there is lack of incentives for the alleged owner to commercialize such intellectual property.¹¹

¹¹ Tsibulov P (2012): "The Distribution of Property Rights to Intellectual Property Created Using the Money the State", Theoretical and practical aspects of the economy and Intellectual Property, 2012 Issue 1, Volume 2.

However, even if intellectual property was regulated unambiguously, we would be faced with the fact that the state-owned or state-financed research institutions of Ukraine have neither sufficient capacity nor sufficient resources to commercialize the patents.

Therefore, the scientific knowledge is locked in like in a treasury. However, the intellectual property right protects it, but it cannot be used because there are only few licensing contracts. This is an unused potential.

Apparently, a misconception of the idea of patents is one of the underlying problems. In general, patents are for companies. The function of a patent is protecting a business from competition. A patent is an intellectual property that helps a company to generate monopolistic profits that compensate for high risks and high investments. Neither are the state-financed research institutions businesses nor do they have competitors (in Ukraine). It makes only little sense for science institutions to hold patents. Patents create no scientific credits either. The currency of scientists is publications. The saying goes: 'publish or perish', not 'patent or perish'. It is quite the opposite, since publishing and patenting are mutually exclusive.

We recommend to unlock the scientific knowledge, i.e. the patents, as soon as possible, even if it means to license the patents for free to startups (each patent exclusively for one company - obviously). There should be some conditions, most importantly the condition that the startups must really use the patents for production, for further development or for selling to the market etc. A company must not hold a patent without utilizing it as this would lock in the knowledge again.

In that way, the state would not generate any income from licensing. However, the state currently does not generate significant income from licensing either.

On the other hand, it would be a great chance to transfer knowledge and technology to the economy and to create business opportunities for startups.

Recommendation 6: Those institutions, which have not been able to commercialize their patents, should sell or license their patents to academic startups free of charge.

5 Steps that lead astray

5.1 IPR management at universities

This chapter highlights some issues which lead astray from the direct path to an effective Academic Entrepreneurship eco-system in Ukraine. The following explains briefly, why the approaches, although sounding somehow plausible in theory, are unlikely to work.

The first issue concerns the responsibility of managing intellectual property rights (IPR). According to the current draft laws, that responsibility is going to be shifted to the universities.¹² The expectation, that this change will have any significant positive impact on the Academic Entrepreneurship activity in Ukraine, will likely be disappointed.

The hope behind such an institutional change is nourished by the experience from the Bayh-Dole-Act in the USA. Before 1980, the state-financed research in USA did not result in many new products. At the national level, the USA held thousands of patents, but only a fraction of the patents was used for commercial production. After the Bayh-Dole Act was passed in 1980, the commercialization of state-financed research increased and so did the number of academic spinoffs in the USA. Part of the Bayh-Dole-Act was the right of universities to hold the intellectual property of state financed research.

The situation in Ukraine today is similar to that in the USA before 1980 with respect to the locked-in patents. However, when considering adapting best practice solutions from other countries, it is important to review the conditions. And the specific conditions in the USA differ tremendously from those in Ukraine. The universities in the USA possess long-time experience (some of them more than 200 years) with self-governance and financial autonomy. Most importantly, they are used to act entrepreneurial because they compete in the fundraising market. The universities in the USA have capacities to manage and market intellectual property because they understand market mechanism, are skilled in marketing and negotiation and possess economic and business competencies. In contrast, Ukraine's universities and higher education institutions possess very low financial autonomy; they have not even been allowed to use normal bank accounts for their financial operations until recently. Above all, the institutions have not enough experience, not enough capacity and no resources for dealing with all the tasks related to manage and commercialize intellectual property.

Recommendation 7: The problem of locked-in patents is important, but it is unlikely to be solved by shifting the IPR to the universities. It would be better to allocate the IPR to companies.

¹² Recommendations of the Parliament Hearings on "Science and Technology (S&T) Development in Ukraine" held on 2 July 2014.

5.2 University or research institute as a share-holder

The idea of a university, research institution or a science park holding shares of its spinoff companies, is widespread in Ukraine. The objectives of such a concept include the expectation of cash returns. This concept is misleading and will probably disappoint expectations in Ukraine.

Admittedly, there are some rare examples of such public-private-partnerships that work. However, that is the exception rather than the normal case. It is found in very special ecosystems and unique circumstances.

Again, analogously to the reasoning in the previous chapter, the conditions of the US universities and the US innovation system are completely different from the conditions in Ukraine. Let alone the autonomy, capacity, resources and experience of US universities compared to those of Ukraine.

There is another, more practical reason why such a concept is unlikely to work. In order to explain that, it is important to understand the market for investments in science and technology-based startups.

Firstly, this specific niche investment market is a global market and the worldwide sum of financial capital that flows into that field is too small to be fragmented locally. Either you compete with startups in California, London, Berlin, Singapore for investments, or you do not compete at all.

Secondly, there is a minimum to the efficient size for the investments in science and technology-based startups. The investments are only efficient if they exceed several million Euros. The reason for this is the high amount of fixed transaction costs for assessment, due diligence, negotiations and legal issues. For small investments, the transactions costs are too high in relation to expected profits. Therefore, all the smaller investment rounds at earlier stages in the development cycle of the startup are just a preparation in expectation for the first 'real' investment. Early stage investors and so-called Business Angels usually speculate for the so-called exit, which means selling their stakes to a 'real' investor with margin. For attracting the first 'real' investment round, you need to address global venture capital funds, because the private equity market in Ukraine is in relation to international benchmarks underdeveloped.¹³

Thirdly, it is important to understand the decision making of global investors. Three basic types of risks compose the investors' financial risk:

- Technology risks
- Market risks
- Team risks

The investment decision process is mainly about trying to assess these risks in relation to expected returns. Investments in science and technology-based startups by its nature entail the highest uncertainty of all investments. The success or failure of a science and

¹³ The Deal Book of Ukraine. Venture investment in the Ukrainian industry. 2015. http://uadn.net/files/ua_dealbook.pdf

technology-based startup is almost unpredictable, no matter how good the preparation and the business plan is. Therefore, investors will not accept any risks additional to the basic risks. Having a university or a science parks among the shareholders, forms an additional risk, because such institutions have specific interests, slow and bureaucratic processes and are obliged to legal constraints. This is particular the case for Ukrainian institutions, not to mention the risks of corruption. It is unlikely that any 'real' global investor would accept such additional risk. In other words, it is unlikely that any 'real' global investor would accept a science park as a shareholder. Global investors are only interested in companies

- a) whose shares belong only to the management team (and other financial investors) and
- b) that possess all intellectual property rights.

Therefore, a university or a science park that holds shares of its spinoffs is likely to harm the access to Venture Capital and thus to hinder the growth of the startup.

Recommendation 8: Draw a clear line between the private enterprises and the public sector institutions like science parks and universities.

5.3 Expectation of individual rewards

The primary role of the university is to prepare its graduates and scientists for the life outside the education system; the secondary role is to assure that all inventions find their way into society. Spinning off science and technology-based startups is a measure of transferring knowledge and technology into the society; thus, the science system should spare no efforts to support that transfer and release the startups from any requests. Give the entrepreneurs all they need.

It is unrealistic to expect individual returns or merits on personal level or on institutional level for others than the entrepreneurs themselves. We do not claim that such expectations exist, but we say it is important to sweep away such thoughts. The benefits of Academic Entrepreneurship are for the society. All people involved in supporting students and scientist with entrepreneurial ambitions should base their actions on the premise that they will never receive anything in return.

Recommendation 9: Regard the support of Academic Entrepreneurship as a not-for-profit undertaking, where the entrepreneurs receive all the fame and money.

5.4 Tax privileges

Tax privileges and tax incentive schemes play a big role in the public discussion.¹⁴

To shortcut the reasoning here: Tax privileges will have no positive impact but will cause a lot of political discussion, create envy, attract tax avoidance schemes etc. Let us recall Chapter 3 that explained what Academic Entrepreneurship is about: it is a measure of developing talents, supporting a self-determined way of living and of contributing to society. It is the opposite of short-term oriented rent-seeking and opportunity exploiting. Short-term tax privileges are extrinsic incentives that destroy intrinsic motivation. Not only will it harm the development of an Academic Entrepreneurship eco-system, but it will also put all the enthusiastic and selfless people in line with lobby pressure groups.

Recommendation 10: Tax privileges are not appropriate for fostering Academic Entrepreneurship.

5.5 Waiting for the state regulation to change soon

We met quite a few people waiting for the state to regulate something and we have seen exaggerated expectations towards the change that is supposed to come with any new regulation.

This attitude breaks out precious energy. As we have seen in the past for decades, expectations towards the government and authorities to reform the regulative environment in Ukraine have often been disappointed. As this holds for all kinds of regulations in Ukraine, why should it be different in the field of Academic Entrepreneurship? Moreover, there may be not only a lack of the political will for reforms, but also exist a lack of the institutional capacity: The impact assessment of science and technology regulation is almost impossible and requires itself entrepreneurial skills, if not fortune-teller skills. Any state regulation and state investment in this field is subjected to a high risk of failure and thus requires a lot of courage.

The current state regulation might not be very effective with respect to fostering Academic Entrepreneurship, but it is definitely no showstopper. There is enough room for action.

Recommendation 11: The dialogue with the Parliament and state authorities for discussing, evaluating and improving state regulation and state policy towards Academic Entrepreneurship is important, but players should limit their effort here and channel more energy to those action fields that are within their circle of influence.

¹⁴ Recommendations of the Parliament Hearings on “Science and Technology (S&T) Development in Ukraine” held on 2 July 2014.

5.6 Waiting for any additional external funding

The same applies to the waiting for external funding. It is unrealistic to expect that the Ukrainian state is going to provide significant funding in the short-term. Besides, we are talking about using state money to support private enterprises, in other words social costs and privatized profits. Chapter 1 explains that the overall welfare for the society is positive in the long-run. However, Academic Entrepreneurship policy competes for subsidies with other policies such as industrial policy, export promotion policy, cluster policy etc. All of the other competing policies have also good arguments that they produce high economic welfare and that the state funding will pay-off and potentiate. The authors, of-course, are convinced that expenditures for Academic Entrepreneurship is the best alternative, but we do not represent the main stream.

Any additional external funds are a nice to have but waiting for it would thwart the recent positive development.

Recommendation 12: Actions aiming at acquiring external funding for measures to promote Academic Entrepreneurship are important, but players should limit their effort here and focus more on reallocating existing resources within their autonomy.

6 Instead of an outlook

... we would like to make a proposal:

Link all institutions and people mentioned in this publication together into one network. The resulting network will include:

- Talented and motivated Ukrainian researchers who aim at bringing their inventions to market
- Ambitious young Ukrainian academic entrepreneurs
- Committed und passionate supporters
- Experts for intellectual property rights in Ukraine
- Business consultants
- Experienced policy advisers and policy networkers
- Private sector entrepreneurs
- Ukrainian investors
- Access to international investors
- Access to international experience in Academic Entrepreneurship
- Access to international best practice
- Access to a global community
- Access to funding from Ukrainian foundations and international foundations and donors
- Access to state funds
- Facilities and equipment
- Access to PR and media platforms

If all of them agree to cooperate and everyone makes a small contribution, it should be sufficient for creating a couple of successful spinoffs.

Epilog

This publication is the second of a series concerning the topic 'SME as an Engine for Economic Growth – Towards A Modern SME Policy'.

The series is a joint undertaking of the Friedrich Naumann Foundation for Freedom and Berlin Economics.

The motivation and contribution of the Friedrich Naumann Foundation for Freedom is based on the FNF 2014-2016 project objective for Ukraine “to identify the major SME needs in Ukraine and propose appropriately targeted measures to improve the SME framework, thus expanding liberal policy approaches, identifying obstacles and initiating learning processes and social change to facilitate economic activity”. The objective is to support the policy reform processes with realistic and specific recommendations for improving the framework for SME development in the short term and promoting competition within the Ukrainian economy in the long run. This should be achieved through personal consultations with relevant decision-makers, national experts, representatives of civil society (business associations) and international organizations, as well as by collecting comprehensive and reliable data.

Berlin Economics is a company that has advised the Ukrainian Government and other public authorities such as the National Bank of Ukraine on a wide range of economic policy issues and on financial sector development for many years. Its analytical work is presented and discussed during regular meetings with high-level decision makers.

Certain aspects of SME development policies have already been addressed by the Friedrich Naumann Foundation for Freedom and Berlin Economics in the past.

Whilst last year's joint publication sketched out the principles of a comprehensive and holistic SME development policy, the current joint work sheds light on a specific part of SME development that has been almost neglected in Ukraine so far. Consequently, the paper addresses not only policy makers of Ukraine, but it also aims at providing specific recommendations for the committed people in science and higher education of Ukraine.

The main authors of the paper possess long-term experience in the field. Dr. Alexander Knuth wrote his PhD thesis about Academic Entrepreneurship and he has managed a support program for academic startups at Potsdam University, one of Germany's leading entrepreneurial universities. Dr. Olha Krasovska contributed to the discussion with her experience and knowledge gained from 13 years work at the National Academy of Sciences of Ukraine and two-year experience at the State Fund for Fundamental Research of Ukraine, that is the only one state fund in Ukraine providing grants for Ukrainian researches on the competitive base.

Both authors are themselves passionate about Academic Entrepreneurship as well as the editors and all people who contributed to this publication.

Acknowledgements

The authors would like to express their gratitude to Miriam Kosmehl and Ricardo Giucci for commenting and editing the paper. We would also like to express our gratitude to the following institutions and people for providing us with information, insights, feedback and fruitful discussions.

Business-Incubator «Youth Business Center» of Kyiv National University of Technologies and Design

Roman Kozhushko

CRDF Global

Natalya Artiukhovska
Eugenia Severyanina

Foundation for Scientific and Technological Development of Ukraine n.a. academician V.S. Mihalevich

Olga Rudenko

Kyiv National Economic University Vadym Hetman

Larisa Antonuik
Olena Tsyrukun

National Academy of Sciences of Ukraine

Vitaliy Bevz
Orest Ivasishin
Yuriy Kapitsa
Ievgeniia Kochelab
Oleksandr Semyrga

NDI Foundation

Olga Krupskaya

Science Park 'Kyivska Polytechnika'

Volodymyr Gnat
Yaroslav Kologryvov
Oleksandr Zgurovsky

CIPE Center for International Private Enterprise, Center for Public Expertise

Nataliya Balandina
Liubomyr Chorniy

Detonate Ventures, UAngel

Nataliia Berezovska
Regina Makhotina

iHub

Bogdan Ianatiev
Dimitri Podoliev

Ministry of Education and Science of Ukraine

Dar`ya Chayka
Viktor Shovkalyuk

National Technical University of Ukraine 'Kyiv Polytechnic Institute'

Sergey I. Sidorenko
Olga Vakhrina

Science Park of Kyiv National Economic University Vadym Hetman

Andriy Matviychuk

Science Park Kyiv Taras Shevchenko University

Vitalii Cherniuk

Sikorsky Challenge Ventures Fund

Oleg Lyhovyd