Centrally Planned Innovation: A SWOT Analysis of Russia's Silicon Valley

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Chapter 1: Introduction and Theory

Russia has long been dependent on its abundant natural resources (oil, gas, and timber) as the main source of domestic revenue. In 2010, President Dmitri Medvedev and Prime Minister Vladimir Putin took the initiative to move away from natural resource dependency and to begin investing in high-tech.[1] It aims to evolve its technological sector from one that purchases innovation to one that produces it. In order to do this, the Russian government has begun to pour money into the region of Skolkovo, a suburb of Moscow. Medvedev and Putin have had multiple meetings with the top players in the technology field, including Cisco, HP, Nokia, Dell, and Microsoft.[2] In 2010 Cisco agreed to invest $1 Billion in Russian technology innovations over the next decade.[3] In 2012 Microsoft awarded a $100,000 grant to a Russian anti-piracy startup.[4] Despite Microsoft and Cisco's initiative, other companies and states are still hesitant to invest in Skolkovo due to corruption, intellectual property rights abuse, poor national infrastructure, and concern over returns on investments into the region.[5]

In order to evaluate the potential success of the Skolkovo initiative, I use a framework known as a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis. This framework allows me to objectively look at and qualitatively to measure different elements of the Skolkovo environment and to compare it with other global technology parks, in particular those it will be competing with in the global commercial market.

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[1] "Russia's "Silicon Valley" will be Located in Skolkovo." *RusData - BizEkon News.* March 19, 2010. Date Accessed: 03/12/2012.
[2] "Russia to engage Cisco, Nokia in high-tech research Skolkovo project." *RIA Novosti.* May 20, 2010. Date Accessed: 03/12/2012.
[3] "Cisco to Invest $1 Billion in Russian Innovations over the Next Decade." *The Russian Business Monitor (Russia).* June 25, 2010. Date Accessed: 03/12/2012
[4] Razumovskaya, Olga. "Skolkovo, Microsoft Invest in First Startup." *The Moscow Times*. The Moscow Times, 05 Mar. 2011. <http://www.themoscowtimes.com/business/article/skolkovo-microsoft-invest-in-first-startup/432104.html>.
[5] "No Reports on Modernization." Defense and Security *(Russia).* February 29, 2012. Date Accessed: 03/12/2012.

The results from the SWOT analysis will be of use to those interested in the agency of non-state institutional actors. Using the SWOT framework, I explore whether Skolkovo possesses the necessary structures and institutions needed to evolve Russia from an information communication technology (ICT) purchasing state to a state that develops ICTs. Once the necessary structures are created, I posit that Skolkovo will have the capacity to be a competitive global tech-hub. Unfortunately, my initial prediction regarding the potential success of Skolkovo and the greater Russian goal of moving into a technology producing country is one of trepidation due to the intermediate steps required to create that capacity. Though Russia has consistently produced some of the best and most creative technological minds in the world, most end up working abroad due to Russia's lack of creative freedom, low wages, lack of attention to intellectual property rights, and high levels of government interference. I use Silicon Valley literature and literature pertinent to Berlin-Adlershof, a comparable technology park in East Germany, as a control for what structures and institutions are both beneficial and necessary in fostering the type of innovative eco-system that Russia strives to develop.

I draw theoretical models from two dissimilar fields of literature: International relations' neorealism and studies of high-tech clusters. Viewing Skolkovo's chances of success through a deconstructed neorealist lens was inspired by Deborah Avant, Martha Finnemore, and Susan Sell's edited volume "Who Governs the Globe". Avant et al. assert that neorealism does a disservice by focusing only on state agency, writing "Even among structural theories, there is no obvious reason why the only structure of interest should be one created by a distribution of power among states".[6] Concurring, I consider the elements and structures examined in the SWOT analysis to be agents of power and change.

[6] *Who Governs the Globe?* 2010. eds. Deborah D. Avant, Martha Finnemore and Susan K. Sell. Cambridge, UK; New York: Cambridge University Press. p. 367

I place my research within this framework for two reasons. First, focusing on the (abstract) agent or agency which creates the networks and institutions of Skolkovo exposes areas that are flourishing and areas that are vulnerable. Concentrating on a dynamic, non-state agency allows for my research to be more operational than traditional neorealist theories typically allow.

Second, neorealism heavily leverages micro-economic structural concepts, particularly comparing the behavior of firms in a market with states in the international system. Firms, like states, are anarchic by nature but are bound by regulatory laws. Their goal is to survive and often to circumvent laws to achieve that goal. This is especially true in Russia, which is infamous for its high levels of corruption.

Understandably, much work has been done looking at the tech-anomaly that is Silicon Valley and many countries have tried to recreate its success. There are a number of copy-cat Silicon Valleys in the world (Israel's "Silicon Wadi" in Tel Aviv, India's "Silicon Plateau" in Bangalore, China's Zhongguancun). However, none of these technology parks have developed in the unique economic and cultural post-Soviet space that Skolkovo must grow and survive in. To this end, I examine former East-Germany's Berlin-Adlershof's technology park and point to lessons that Skolkovo can learn from its experience.

High-tech cluster literature often points to the unique eco-system of the Silicon Valley as a catalyst for its achievement. This includes close proximity to research universities and patent offices, a government that is willing to invest in projects and then remain hands-off, a normative acceptance of start-ups, a relative acceptance of failure, and a thriving culture that extends outside of the innovation labs. Zhongguancun in China, for example, has a successful science park, but lacks an engaging cultural neighborhood that encourages

scientists to stay in the region past their initial work.[7] Young scientists have so little to do outside of their job that most move away to find a better community. On the other hand Germany's Berlin-Adlershof, which is located a few miles away from the heart of Berlin, has had a relatively quick return on investment (ROI) since its re-opening in 1991. Skolkovo undoubtedly will face many of the same problems that other high-tech clusters continue to deal with but hopefully will be able to learn from successful regions.

This thesis explores the potential investment risks or roadblocks for companies which want either to finance the Skolkovo initiative or to consider creating a start-up in the region. First, it explores the internal strengths that the Skolkovo region has and compares it with the Silicon Valley. Second, it looks at the internal weaknesses of Skolkovo. Third, it presents opportunities for the region, highlighting potential commercialization opportunities. Fourth, this essay stresses external threats to the success of Skolkovo by concentrating on existing competitive high-tech clusters. Additionally, I present a case-study of former East-Germany's technology park Berlin-Adlershof. This technology park has many elements in common with Skolkovo in that it was developed in a post-Soviet space, has had to overcome communist culture and blend with Western ideas, and was envisioned and implemented by the government. This essay closes with a SWOT summary and a broad recommendation for companies or people considering investing in the Skolkovo project. As the Skolkovo project is relatively new at the time of writing, primary data sources are from global Russian and English language media (including taped press-conferences by the Skolkovo Foundation), grants and reports from both non-profit and for-profit businesses regarding business in Russia, academic literature about high-

[7] Tan, J. "Growth of Industry Clusters and Innovation: Lessons from Beijing Zhongguancun Science Park." *Journal of Business Venturing*. 21.6 (2006): 827-850.

tech clusters around the world, and academic articles investigating the historical use of technology in Russia.

Chapter Two:

The Road to Skolkovo: Russian Tech-Hub Development in the Post-Soviet Space

In his 2009 official essay to the Russian public, Russian President Dmitri Medvedev rhetorically asked: "should a primitive economy based on raw materials and endemic corruption accompany [Russia] into the [new decade]?"[8] He explained throughout the rest of the essay that the only way for Russia to move forward economically was to move away from natural resources as Russia's primary mode of economic wealth and to move towards one of technological innovation. Medvedev identified five strategic vectors for the economic modernization of Russia: new fuels for domestic and international markets; nuclear technology; information technology, including supercomputers and e-government data bases; space and satellite infrastructure; and medical equipment production. [9] It was from this essay and Medvedev's subsequent annual address to the Federal Assembly that the idea for Skolkovo originated. Of course, Medvedev is not able to create Skolkovo alone. In this section, I look at how Skolkovo came into existence by chronicling who the major agents of creation were, what they are looking to accomplish in regards to Skolkovo, why the Skolkovo location was chosen, what the Skolkovo time-frame for completion is, and perhaps most controversially, how Skolkovo is being funded.

Though spearheaded by Medvedev, the not-for-profit Skolkovo Foundation runs and operationalizes the Skolkovo Innovation Center. The head of the Skolkovo Foundation is Russian oligarch Viktor Vekselberg who was appointed into the role by Medvedev on March 23, 2010.[10] Perhaps best known outside of Russia for his vast collection of Faberge, billionaire

[8] Medvedev, Dmitri. Rossiya, vperëd! Stat'ya Dmitriya Medvedev [Russia, Go! A speech by Dmitri Medvedev]. Moscow, 2009 [cited March 15 2012]. Available from http://kremlin.ru/transcripts/5413
[9] Ibid.
[10] Viktor Feliksovich Veksel'berg: Biograficheskaya Spravka [CV of Viktor Vekselberg]. in RIA Novosti. Moscow, 2012 [cited April 10, 2012]. Available from http://ria.ru/spravka/20120313/593130553.html.

Vekselberg made his fortune in Russian metal and oil. He graduated magna cum laude from the Moscow Transportation Engineering Institute and completed post-graduate studies in the Computing Centre of the Russian Academy of Sciences. Vekselberg's role as the head of the Skolkovo Foundation is to aid in the Development Fund for the Development Center and the commercialization of new technologies at Skolkovo.[11] A primary reason for Vekselberg's appointment was his strong connections in the international business world and his history of business success in emerging markets.[12]

Since his appointment, Vekselberg has been extremely active in evangelizing the message and mission of Skolkovo. In a 2011 interview, Vekselberg stated that the main goal for Skolkovo is to develop and utilize Russia's latent pool of talent to help commercialize Russian technology: "What we're trying to do is to set up a center that will help scientists to transfer ideas to real business. We're trying to create the eco-system for transfer… our goal is to create an environment for startups." [13] The Skolkovo Foundation's Vice President, Dmitry Kolosov further explained during an interview in Silicon Valley in March 2012 by saying: "The big goal of Skolkovo is to basically turn around the Russian business environment from being solely focused on oil and gas and mining industry and make it more innovative and make it a bit more technological. It's very important because it is the most widely spoken about non-oil and gas project in Russia; we have no reason to fail. We took the Silicon Valley as a role model for Skolkovo. .. [Skolkovo] is a place where you can realize ambitions in Russia. [We need to] show the rest of the professionals that Skolkovo is palace where you can realize your dreams and

[11] Tul'skii, Mikhail. 2011. Innograd "Skolkovo" prevratilsya v obekt ozhestochennoĭ lobbist skoĭ bor'by [Innograd "Skolkovo" to become the object of a fierce lobbying fight]. *Novye Izvestiia*, April 28, 2011, 2011, sec Ekonomika
[12] Gabu, Alexander. Tarasenko, Pavel. Medvedev. itogi: Silikonovaya sloboda [Medvedev results: Silicon settlement]. *Kommersant - Vlast'*, March 26, 2012, sec Main.
[13] Interview with ITMN TV, January 20, 2011

opportunities." [14] [15] In numerous interviews it is made clear that the leaders of Skolkovo are not setting out to create a Silicon Valley copy-cat. The Skolkovo Foundation's Chief Investment Officer, Alexander Lupachev, stressed in 2012: "We know that we can't copy-cat the Silicon Valley, because no one-person built it, but we can learn from its success stories and its mistakes."[16]

At the time of writing, the Skolkovo Foundation consists of fourteen board-members, including Vekselberg.[17] They represent international companies in primarily IT, nanotechnology, and energy. The boards' role is to oversee the development of the Skolkovo Innovation Center, to spread awareness about the initiative, and to assist in securing financing.

The long-term goal of the Skolkovo project is to create a Russian innovation ecosystem in order to globalize Russian businesses and to localize international companies' vis-à-vis research and development groups and high-tech manufacturing. It also aims to develop and retrain Russian high-tech specialists as well as to attract foreign talent from abroad.[18] Initially Skolkovo's business model is a private-public partnership, with the understanding that the public sector's influence will decrease dramatically over time. The Skolkovo Foundation's Chief Operating Officer, Steven Geiger, said in a 2012 interview that:

[14] Kolosov holds a law degree from Moscow State University and previously worked at Tyumen Oil Company and acted as Executive Secretary of the Board of Directors of TNK-BP.
[15] Interview with the Skolkovo Foundation in the Silicon Valley, March 28, 2012
[16] Interview with the Skolkovo Foundation in the Silicon Valley, March 28, 2012
[17] Esko Aho- Executive Vice President of *Nokia Corporation*; Vagit Alekperov-President of the *Lukoil Oil Company*; Anatoly Alexandrov-Rector of the *Bauman Moscow State Technical University*; Craig Barrett-Co-chairman of the S*kolkovo Foundation Council*; Martin Bouygues- Co-chairman of the *French industrial group Bouygues*; Alexander Galitsky- Managing partner of "*Almaz Capital Partners*" company; Mikhail Kovalchuk- President of the Russian Scientific Centre "*Kurchatov Institute*"; Peter Löscher- President and Chief Executive Officer of *Siemens AG*; Vladimir Rashevsky- Chairman and Chief Executive Officer of the *Siberian Coal Energy Company (SUEK)*; Eric E. Schmidt- Chairman and Chief Executive Officer of the *Google Inc.*; Ratan Tata- Chairman of *Tata Sons*; John T. Chambers-Chairman and Chief Executive Officer of the *Cisco Systems, Inc.*; Anatoly Chubais- CEO of the *Russian Corporation of Nanotechnologies (RUSNANO).*
[18] Ponomarev, Ilya. 2010. *What is Skolkovo? Russian initiatives to support national innovation ecosystem. presentation by Ilya Ponomarev, Chairman High-tech Development Subcommittee, State Duma; Advisor for Commercialization. Skolkovo Foundation November 30, 2010.* Moscow.

> "Our goal is NOT to copy and duplicate the Silicon Valley…our goal is to look at what the fundamental drivers of success are [in the Silicon Valley] and other innovation centers and how can we tailor that to the Russian situation and increase our chances of success. We have very clear targets, very clear milestones; we'll know that when we've hit those we've been successful. [We will know we have been successful] when the university's up and running and world-class students and professors are doing world-class research and are filing for patents and doing licensing. [In regards to venture capitalists, we know we have been successful] when the startups IPO or are acquired by Siemens, or GE or IBM."[19]

Skolkovo is, at its heart, a large research facility that is divided into five sectors of research focus: space, IT, energy, bio-tech, and nuclear development. Each sector is run independently of the others and is responsible for its own fiscal and research success.[20] On site, there will be offices, research labs, and small-scale manufacturing. Medvedev has made it clear that Skolkovo will not turn into a manufacturing city akin to Russia's Magnitogorsk or China's Shenzhen, where hundreds of thousands of workers are employed at the Longhua Science & Technology Park.[21]

On site there will be generous administrative support for both scientists and businesses, including intellectual property rights support, customs, prototyping centers, and financial services. In order to accommodate the thousands of people expected to live in Skolkovo proper, there will be K-12 schools (themselves intended to be innovative, technology intensive sites that will promote deeper learning through more intense technology use), cafes, theaters, and medical centers.[22]

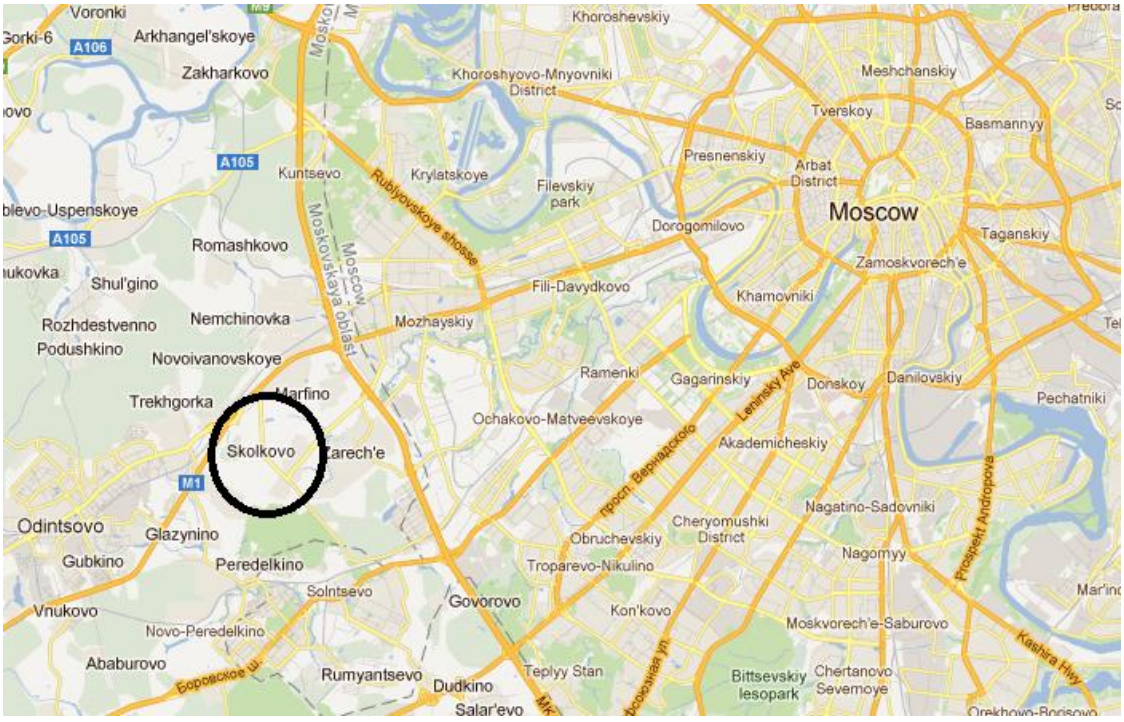
Academically, there is a non-diploma-granting academic program called Open University where students can attend workshops and lectures put on by renowned academics and

[19] Interview with the Skolkovo Foundation, March 28, 2012
[20] Ponmarev, Illya. 2010. *What is Skolkovo?*
[21] Dean, Jason, Sue Feng, and Christopher Lawton. 2007. "The Forbidden City of Terry Gou". *Wall Street Journal - Eastern Edition.* 250 (35).
[22] Ponomarev, Ilya. 2010

international business leaders. Additionally, the Skolkovo Foundation has paired with America's MIT in creating a joint MA/PhD program called SkTech. The mission of SkTech will be to "educate coming generations of technology entrepreneurs, advance scientific knowledge, and foster technological innovation to address critical issues facing Russia and the world. SkTech will enroll its first full inaugural class in 2014, and when scaled to planned capacity, will have 1,200 masters and doctoral students, 300 postdoctoral scholars and 200 faculty."[23] This partnership with MIT is a direct effort to develop Russian scientists in country and to attract foreign talent to Russia.

Physically, Skolkovo is located on 500 hectares of government donated land roughly 18 miles (30 kilometers) away from the center of Moscow. The location was chosen due to its close proximity to Moscow and the availability of the land. (See: Map 1)

Map 1: Map of Distance between Moscow and Skolkovo (circled)



[23] Skolkovo foundation and MIT to collaborate on developing the Skolkovo institute of science and technology: Graduate research university part of new innovation center outside Moscow. in MIT [database online]. Cambridge, Massachusetts, 2012 [cited April 23, 2012]. Available from http://web.mit.edu/sktech/news-events/pr1.html.

Additionally, it is next to Peredelkino, a writers' and artists' colony and the former home of Boris Pasternak, the famed Russian poet and novelist. This location gives it automatic cache and status for Russian intellectuals and intelligentsia. There are plans to develop both bus and train lines between Moscow and Skolkovo, as well as to improve already existing roads. Companies, residents, and employees at Skolkovo companies are automatically allowed special tax and visa exemptions. Especially unique to this project is that companies do not have to reside within the physical vicinity of Skolkovo to receive these special accommodations; indeed, if a company registers and is approved by the Board to become a partner or investor, then extraterritorial rules are put into effect.[24]

The public time-frame for building Skolkovo began in 2010 with the identification of Skolkovo for the location for the techno-park. From 2010-2011 was the City Program Development, which was the conception, master planning, and management and procurement strategy phase. 2011-2012 focused on designing the innovative green-buildings and systems, while construction is planned for 2012-2014.[25]

[See Appendix A for publicized computer renderings of Skolkovo]

[24] Sitnikov, Alexei. 2010. *Things you want to know about Skolkovo innovation center.* Moscow: Skolkovo Foundation, 2010 USRBC Annual Meeting.
[25] Skolkovo Management Report January - November 2011. in Skolkovo Foundation [database online]. 2012 [cited 2/12/2012]. Available from http://www.sk.ru/PlanAndPrograms.aspx.

Chapter 3: Strengths

A SWOT analysis is a marketing and investing technique used to evaluate a company's competitive advantage. [26] Because the Skolkovo Foundation is aiming to act as an overarching leader of technological innovation in Russia, a SWOT analysis is particularly useful to understanding why companies (both foreign and indigenous) are investing in the region. In order for Skolkovo to gain legitimacy, its success depends on initial foreign high-tech investment. [27]

The literature analyzing the success of Silicon Valley is quite consistent regarding the types of environmental elements which facilitated its rise to global prominence.[28] The most salient elements that need to be in place for a tech-hub to develop are: Initial state financing; a close relationship between local industry and major research institutions; a variety of topics being researched at once; globally diverse talent pool; and a desirable community for people to live in. This chapter argues that Skolkovo has all of these elements either in place or is consciously working towards incorporating them into their business model.

3.1: Initial State Financing

Described in the Washington Post as "the blogging, tweeting, iPad-carrying president", Dmitri Medvedev has long been known for his love of technology. [29] It was therefore unsurprising when, in 2010, he announced the need for a Russian technology hub. In a speech to

[26] Awe, Susan C. *The Entrepreneur's Information Sourcebook: Charting the Path to Small Business Success.* Westport, Conn: Libraries Unlimited, 2006. P 193
[27] "Skolkovo Foundation January -November 2011 Management Report."
[28] O'Mara, Margaret P. *Cities of Knowledge: Cold War Science and the Search for the Next Silicon Valley*. Princeton, N.J: Princeton University Press, 2005. P 226-234; Kenney, Martin. *Understanding Silicon Valley: The Anatomy of an Entrepreneurial Region.* Stanford, Calif: Stanford University Press, 2000. ; Cooke, Philip, and Dafnah Schwartz. *Creative Regions: Technology, Culture and Knowledge Entrepreneurship*. London: Routledge, 2007.
[29] Lally, Kathy. "Medvedev, IPad in Hand, Tries to Stress High-tech at News Conference. *"Washington Post* 05/19/2011 Suburban ed., sec. A: A11. Print.

the members of the academic advisory board of the Skolkovo Development Fund, Medvedev said:

> The Skolkovo project is not simply a random one and I hope it will represent a special partnership between the Russian government, business and science. I think that today its purpose is obvious to all: we do not want to belabor the point. On the other hand, in Russia it is normal that such initiatives still generally receive a so-called blessing from above. And in our country often signals carry further if they are made by the government. Actually, this is not ideal, but I hope that someday such a high-tech center could be established without such extensive government involvement. Nevertheless, today it is clearly needed and that is why I am involved. Perhaps such involvement really is necessary today. [30]

Though Skolkovo has not publicized direct Russian military investment the state is still playing a large role in both its development and initial financing. As stated by President Medvedev above, Skolkovo (or any Russian high-tech center) has its best chance of success if it is endorsed by the government. Besides being a way to invest money into the future of the country, this endorsement is an extremely public vote of confidence for the country to become more than a producer of natural resources. Using Silicon Valley criteria, we see that Skolkovo meets the government investment condition is a key to fostering a technology-hub.

It has become part of Silicon Valley's mythology that it was built almost exclusively due to its pro-entrepreneurial culture, when in fact an extremely large part of its success is due to initial federal investment. The government influenced development through both university research grants at (primarily) Stanford, and by investing heavily in regional military development.[31] Stuart Leslie, in his chapter "The Biggest 'Angel' of Them All: The Military and the Making of Silicon Valley", notes "Silicon Valley's largest single employer has been Lockheed Missiles and Space (now Lockheed-Martin), with a peak of 28,000 workers at its

[30] Text of "Opening remarks at meeting with members of academic advisory board of the Skolkovo Development Fund" published in English by Russian presidential website on 22 October 2010 President of the Russian Federation website, Moscow, in English 22 Oct 10/BBC Monitoring/(c) BBC
[31] O'Mara. *Cities of Knowledge*, p97

Sunnyvale production facilities and its Palo Alto R&D laboratory."[32] Perhaps equally as important as direct governmental investment is the social signaling to established East Coast firms, such as General Electric and Zenith, to set up laboratories and research centers in the area. Later, foreign firms would follow suit and come to Silicon Valley in order both to establish a presence and invest in startups.[33]

Skolkovo has seen that this is a successful investment model and is taking direct steps to leverage the good ideas and implement them with a Russian culture twist. The broad idea of Skolkovo has been attributed to President Medvedev, which has enabled numerous favorable laws to pass with little opposition.[34] Currently, there are both tax incentives for companies which choose to set up shop in Skolkovo and relaxed visa regulations to encourage foreign scientists to permanently relocate. Further, President Medvedev signed a Federal Law on September 21, 2010 entitled "On the Skolkovo Innovation Center", which "regulates the relations connected to the implementation of the measures aimed at creating and operating the Skolkovo Innovation Center, as well as life support systems on its territory."[35] Had this been a private citizen or foreign company initiative, it is doubtful that so much would have been accomplished in such a relatively short time.

3.2: Research Diversity and Close Ties Between Local Industry and Major R&D Institutions

The relationship between higher-education, research and development (R&D) spaces and technology development cannot be overstressed. A major factor for the success of the Silicon Valley and a majority of its larger commercial companies is that they recognized the value of

[32] Leslie, Stuart W. "The Biggest 'Angel' of Them All: The Military and the Making of Silicon Valley." *Understanding Silicon Valley: The Anatomy of an Entrepreneurial Region,* p49
[33] Ibid.
[34] "History of Skolkovo." *Skolkovo*. 2011. Web. 10 Feb. 2012. <http://www.sk.ru/Model/AboutFund/History.aspx>.
[35] Ibid.

partnering with the best and the brightest that would be keen to use their products and eventually to develop it further by either building on those products or by becoming employees. Stanford University is a prime example of a research institute that benefited greatly from being located in the Silicon Valley. It also drove much activity and acted as an industry magnet. Not only were federal technology research grants given to Stanford faculty and centers, for-profit companies were also creating their own R&D facilities in which a variety of new products were being formed and eventually sold on the markets. IBM, for example, created a research laboratory in the Silicon Valley in the 1950s meant to tap scientists who were unwilling to move to the East Coast.[36] Technology companies strategically donated (and continue to donate) money and products to research institutes in order to gain early product loyalty.[37] Stanford was proactive about fostering relationships with the technology industry and encouraged their students to work in the commercial R&D facilities.

Skolkovo is using this proven strategy in its own technology park. They are partnering with a number of research institutes in both the near (Moscow State University) and abroad (MIT) to gain access to the brightest minds. [38] The Skolkovo Foundation is taking the need for close ties to research institutes so seriously, in fact, that they have created a number of higher-education systems to be located in Skolkovo: The Skolkovo Institute of Technology, Open University Skolkovo (a non-degree granting program), and a partnership with the for-profit

[36] Von Burg, Urs. "Institutions and Economics." *Understanding Silicon Valley: The Anatomy of an Entrepreneurial Region*. By Martin Kenney. p235

[37] Foremski, Tom. "Thought Leaders: Dan'l Lewin - Microsoft Seeks Closer Ties to Silicon Valley and Startups around the World" *Silicon Valley Watcher - At the Intersection of Technology and Media*. 08/16/2007. Web. 02/7/2012. <http://www.siliconvalleywatcher.com/mt/archives/2007/08/microsoft_wants.php>.

[38] "MIT and Skolkovo Foundation Announce Collaboration - MIT News Office." *MIT - Massachusetts Institute of Technology*. Massachusetts Institute of Technology, 06/11/2011. Web. 02/1/2012. <http://web.mit.edu/newsoffice/2011/skolkovo-mit-announcement-0618.html>.

Skolkovo School of Management (an exclusive MBA program whose motto is "helping successful people become more successful"). [39] [40]

Further, Skolkovo is diversifying their R&D portfolio by having 5 specific research "clusters" areas with which they hope to gain a commercial advantage: information technology, bio-medicine, energy, space, and nuclear development.[41] This puts them in an advantageous position for government assistance, foreign investment, scholarly research and commercial investment. The hope is that this will allow them to become a "catch-all" for scientists globally: if a researcher is interested in both space travel and energy efficiency, it would behoove them to move to Skolkovo where both sectors will be active and thriving.

3.3: Global Minds - Local Real Estate

Many of the best minds in the Silicon Valley are non-American. In 2011, non-profit Silicon Valley Foundation reported that "one-third of [their] residents are immigrants, nearly half of [their] workforce is foreign-born and close to two-thirds of those under the age of 18 are children of immigrants."[42] This international workforce has the added benefit of allowing products to become more appealing across cultures, an especially important factor for an increasingly diverse United States.

The Skolkovo Foundation and the Russian Government know that they need to tap the international community for both innovation purposes as well as to show their commitment to being a globally relevant tech-hub (foreign companies will be more willing to participate if it means jobs for their citizens). To this end, the Skolkovo Foundation has a dedicated staff to assist with employment documents and issues with the Federal Migration Service. Equally

[39] "History of Skolkovo." *Skolkovo*. 2011. Web. 10 Feb. 2012. <http://www.sk.ru/Model/AboutFund/History.aspx>.
[40] "Skolkovo: Mission." *Skolkovo*. Skolkovo School of Management. Web. 02/02/2012. <http://www.skolkovo.ru/public/ru/about/>
[41] Ibid.
[42] "Immigrant Integration". *The Silicon Valley Community Foundation*. Silicon Valley Community Foundation. Web. 02/12/2012. <http://www.siliconvalleycf.org/content/immigrant-integration>

important is that "Foreign citizens employed by the Skolkovo project and their families are not subject to quotas thanks to the Federal Law 'On the Innovation Center Skolkovo'; Family members of highly skilled foreign specialists involved in the project automatically receive permission to work in Russia."[43]

Logistically, working in a foreign country can be tricky to navigate: this is especially true in a country like Russia where red tape is often avoided by who you know and how much money you can pay. Skolkovo is moving in the right direction in easing the immigration process for its workers and their families. This lack of red tape makes living in Skolkovo more desirable, which is a necessary requirement for retaining talent in the region.

A large draw of the Silicon Valley is its pleasing locale: fantastic weather, thirty minutes away from San Francisco, great schools and safe suburbs for families to live in. Researchers are inclined to stay and to keep developing because they like living in the area. Though on the surface, this may seem like an inconsequential aspect of a technology hub, a number of Silicon Valley copy-cats have failed because they lacked attractive environs. Beijing's Zhongguancun Science Park, for example, has low retention rates because scientists, frankly, find the area boring and would rather be in a more exciting location.[44] Skolkovo is located 18 miles (30 kilometers) from Moscow in the Odintsovskiy Rayon and, as noted above, has already laid the ground plans for busses and trains to travel regularly between the two cities. This encourages scientists and their families to enjoy their leisure time in one of the cultural capitals of the country.

If residents choose not to venture to Moscow during their off hours, their high-quality on site apartments will be located next to theaters, shopping centers, cafés and restaurants. There are

[43] "Innovator- Participant Benefits." *Skolkovo*. Skolkovo School of Management. 02/12/2012. <http://www.sk.ru/en/GetInvolved/Innovator/ParticipantsBenefits.aspx>.
[44] Tan, J. "Growth of Industry Clusters and Innovation: Lessons from Beijing Zhongguancun Science Park."

numerous world-class architects attached to the Skolkovo project who aim to create luxurious environs for people to live in.

Chapter 4: Weaknesses

The advantages of looking at a company's (or in this case, a region's) weaknesses are that one is able to objectively look at its drawbacks, how things can be improved, and how reliable business processes are. By looking at the big picture from either the end-user or customer's point of view, we are able to gain a better perspective on how things can be improved internally.[45]

I have identified four potential weaknesses in the Skolkovo initiative: Astronomically high import taxes for foreigners; presidential political regime change; Russia's infamous culture of corruption, and poor state infrastructure.[46]

4.1: Import Taxes for Foreign Workers

Skolkovo is invested in reversing its brain-drain and wants foreign talent to move to Moscow to invent, innovate, and work in its techno-park. Though Medvedev has waived some barriers for foreigners, such as easing visa requirements, import taxes for foreigners remain dramatically high.[47] The average import tax for a foreigner who is moving a household of belongings into Russia is €20,000 ($26,000 USD).[48] This cost is not typically covered by

[45] Awe, Susan C. *The Entrepreneur's Information Sourcebook: Charting the Path to Small Business Success.* p193
[46] "SWOT Analysis." Russia Commercial Banking Report (November 2010): 7-10. Business Source Complete,(accessed 03/13/2012).
[47] "Medvedev Signs Law Easing Visa Rules for Foreign Specialists." *RIA Novosti*. 12/27/2011. Web. 03/14/2012. <http://en.rian.ru/russia/20101227/161946168.html>.
[48] Bennett, Ivor. "Prime Time Runs Month-long Investigation into New Import Duties for Foreigners." *Russia Today*. Moscow, 08/19/2010. *RT.com*. Web. 03/13/2012. <http://www.youtube.com/watch?v=4FXOISi0Fro>.

Russian companies as part of the moving package, and when it is, the time-delay for retrieval or reimbursement can often be months.[49]

This entry barrier is not present in other tech-hubs. If Skolkovo wants to lure scientists away from other areas, such as Silicon Valley or Redmond, WA, it must become easier for foreign workers to relocate.

4.2: Presidential Regime Change

Current President Dmitri Medvedev has invested a large amount of political capital into promoting both Russia's move towards a knowledge-based economy and the success of Skolkovo. In 2011, Medvedev announced that he would not be running for reelection, but would instead step aside for his Prime Minister (and twice elected former Russian president) Vladimir Putin to run. Unsurprisingly, Putin's victory of another term was announced soon after the March 4, 2012 presidential election.[50] Putin has openly approved the Skolkovo initiative and has acknowledged numerous times that Russia must move away from being dependent on natural resources. [51] He has also launched a complementary agency entitled The Agency for Strategic Initiatives, which aims to encourage and solidify technology social networks across the country.[52] Unfortunately, many take Putin's support at face value and predict that he will not give as much air time to Skolkovo or modernization as Medvedev has done. Without continued vocal support from the government, many investors could be tempted to leave. I explore this external threat later when I look at the types of investments and contracts foreign tech companies have agreed to in Skolkovo.

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[49] Ibid.
[50] Herszenhorn, David M. "Putin Wins, but Opposition Keeps Pressing." *New York Times*. The New York Times, 03/04/2012. <http://www.nytimes.com/2012/03/05/world/europe/russia-votes-in-presidential-election.html>.
[51] "The Future According to Medvedev." Moscow News. 11/17/ 2011 Date Accessed: 03/14/2012
[52] Naumov, Igor. "Vladimir Putin's New Agency Will Complement Dmitry Medvedev's Skolkovo Plans." *The Telegraph*. Telegraph Media Group, 03/06/2011. Web. 04/14/2012 <http://www.telegraph.co.uk/sponsored/russianow/politics/8555406/Putin-agency-to-complement-Medvedevs-Skolkovo-plans.html>.

4.3 Culture of Corruption

Though it is beneficial that Skolkovo is being partially funded by the Russian government, this partnership leaves open more opportunity for corrupt business practices. The World Bank defines corruption as "the abuse of public power for private benefit", and the Russian government has been known to indulge heavily in such practices.[53] The Corruptions Perceptions Index is a global non-profit which "ranks countries and territories based on how corrupt their public sector is perceived to be. A country/territory's score indicates the perceived level of public sector corruption on a scale of 0 - 10, where 0 means that a country is perceived as highly corrupt and 10 means that a country is perceived as very clean."[54] The 2011 Corruptions Perceptions Index Report ranks Russia 143rd out of 182 countries with a score of 2.4.[55] Further, the area of Moscow has been reported of having the 3rd highest incidence of bribes by region in the country, exceeded only by Kursk and Rostov.[56] Neither of these numbers is comforting for foreigners interested in investing in the region. Corruption levels will have to decrease dramatically before smaller angel investors will begin to feel comfortable putting their seed money into Skolkovo projects. Though there are no restrictions on indigenous Russian companies investing, primarily only large international companies are putting their money into Skolkovo.

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[53] Vito,Tanzi, "Corruption Around the World: Causes, Consequences, Scope, and Cures," Staff Papers - International Monetary Fund 45, no. 4 (December 1998), pp. 559–594,

[54] "Bribe Payers Index." *Corruption Perceptions Index: Transparency International*. Corruption Perceptions Index, 2011. Web. 03/14/2012. <http://cpi.transparency.org/cpi2011/results/>.

[55] Ibid.

[56] Remington, Thomas F. 2011. *The Politics of Inequality in Russia*. Cambridge: Cambridge University Press. p163

4.4: Building Skolkovo

The official Skolkovo website has elaborate computer mock-ups of what the finished technology city will look like [See Appendix A]. According to an investor's press-release "Groundbreaking is scheduled for mid-2011 and the new city is to be completed in just three years."[57] This time frame, unfortunately, is not going to be met. At present, The Skolkovo Foundation and any on-site researchers are housed rented high-rises in downtown Moscow. According to sources, ground has not been broken for the building of the city to begin. Though winter weather is surely at fault for some delay, it is doubtful that the promised city will be built any time soon. This is surely a problem for scientists who are being asked to move to Skolkovo: if there are not any apartments or labs and the date is still vague of when they will be built, why should they relocate?

[57] Veser, Thomas. "Heading for Russia's Science City." *Siemens Publications*. Siemens, Spring 2011. Web. 03/14/2012.<http://www.siemens.com/innovation/pool/en/publikationen/publications_pof/pof_spring_2011/pof_0111_forschung_skolkovo_en.pdf>.

Chapter 5: Opportunity

Analyzing the favorable characteristics within the Russian marketplace can influence investors and also allow people who work there to identify their local economy. I have identified three opportunities for Skolkovo to succeed in the near future: distance education learning; a growing middle class with disposable income to purchase technology; and electronic government (e-government) and electronic education (e-education) software for both the Russian market and export market.

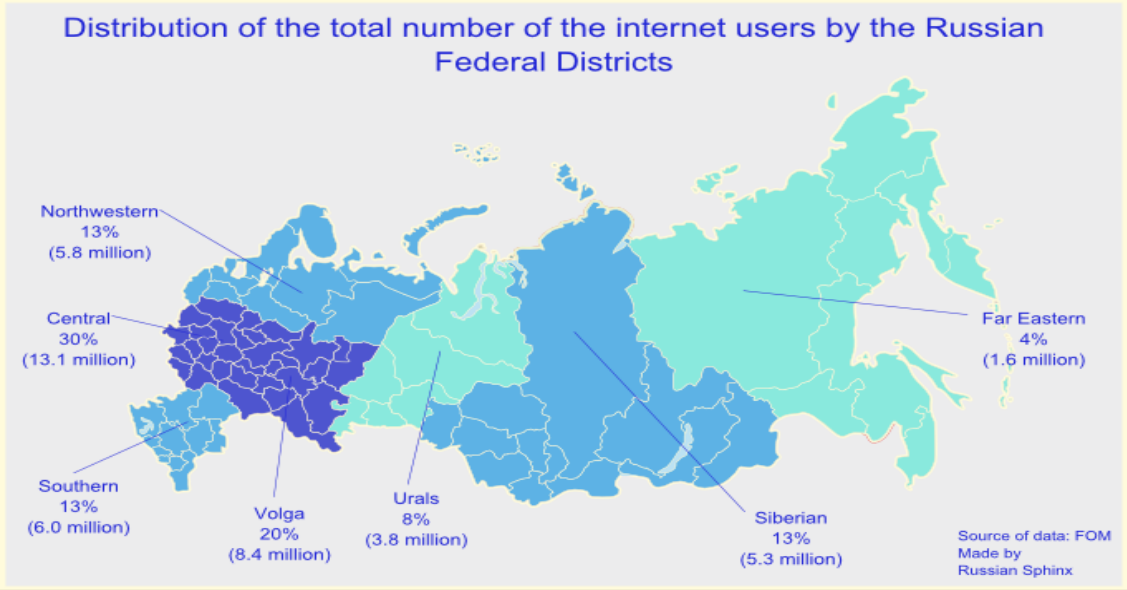
5.1: ICT Innovation through Distance Education

In 2008, eight prisoners in a Vologda maximum security prison graduated from a distance learning course titled "The Basics of Orthodox Faith".[58] In Kemerovo, a distance learning center was opened to provide remote education to disabled children.[59] In May 2011, pupils in the Verkhneuslonsky district of Tatarstan took their history lesson in a computer lab, taught by a teacher tens of kilometers away.[60] These examples of how distance education is being used in the Russian Federation shows how wide spread and multi-faceted this alternative form of education is becoming. More importantly, for Skolkovo, it demonstrates the variety of in-country markets that are eager to utilize different types of technology.

Historically, distance education was utilized in the USSR in order to reach the millions of people who lived in remote villages across the country. Distance education began to broaden its scope of student services in the early 2000s. Students who had participated in either correspondence or distance learning had typically been either associated with a university or

[58] V Vologde zaklyuchennye distantsionno izuchayut osnovy Pravoslaviya [In Vologde prisoners learn the basics of Orthodoxy remotely]. (2011). Retrieved 05/20/2011, from http://www.patriarchia.ru/db/text/497971.html
[59] V Kemerovo poyavit·sya tsentr distantsionnogo obucheniya detyeĭ-invalidov [In Kemerovo there will be a distance learning center for disabled children]. (2011). Retrieved 05/20/2011, from http://distance-learning.ru/db/el/E1AEA7AAECF33132C3257524003895CC/doc.html
[60] Chesnokov,Yevgeniĭ. (2011). V malokomplektnye sel'skie shkoly prikhodit distantsionnoe obuchenie [Distance Learning Arrives in Small Rural Schools]. Retrieved 05/20/2011, from http://www.dlearn.org/

were working adults who wanted to create more opportunities for themselves though extra degrees and certificates. Increased access to the internet has made services more accessible to disadvantaged groups such as children with special needs as well as people who live in hard-to-reach villages. See Map 2:



Map 2: Distribution of Russian Internet Users in 2010

Primary and secondary schools are also known to utilize e-learning to supplement weak programs, particularly foreign language departments. These are all local opportunities for Skolkovo start-ups which may be more inclined to produce a product or service that would have a ready market.

Although connectivity may not be high-speed in all areas of the country, Internet penetration is high and consistent with Russia's population distribution (See: Figure 1). The curve of distance education is likely to mimic the curve of internet penetration, though its overall usage will clearly fall below that of generalized internet use. (See: Figure 2). One of the most important effects of Internet access has been the growth of access to education for disabled

children. In July 2009, the Minister of Education released a statement announcing that 8.5 billion rubles from the 2009-2012 federal budget will be designated for in-house training of disabled children and for distance education. The 2009 budget allocated an initial one billion rubles and plans to assign 2.5 billion rubles over the course of the next three years.[61]

Rural schools are also benefiting from distance education. At a secondary school in a rural town in Tatarstan, students use computers, webcams and headsets to interact with their history professor who lives hundreds of kilometers away. The students used to have to be transported to the city center in order to receive some of their lessons but it was proving too costly to do so on a constant basis. A school in Perm experienced a similar problem when an English teacher refused to make the trek to the village Mahovlyane during the spring due to such severe road damage that transportation by jeep was required. The village schools have begun participating in distance learning so that the students are not left without a foreign language or vitally needed Internet studies.[62] Currently in Tatarstan there are eleven rural schools participating in distance education, reaching 136 students and 15 teachers.[63]

Foreign ideas and technologies are often viewed skeptically in Russian education; it may take a few years for the use of information communication technology (ICT) as integral parts of a new educational system to be seen in a positive light. ICT use may be more accepted, however, if it is indigenous technology. Russian history shows that distance education has played an important role in propelling the Russian people forward. Correspondence learning helped bring literacy rates in the Soviet Union to 99% and spread civic education to the masses.

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[61] *Ministry of Education and Science of the Russian Federation Press Releases.* 8.5 billion rubles will be assigned from the federal budget for in-house training for disabled children in 2009-2012. 2011 [retrieved 05/30/2011]. Available from http://eng.mon.gov.ru/press/release/4169,print/.

[62] Ivanov, Alexey. *In the Perm Territory, Distance Learning is used in Dozens of Schools*. 2011 [retrieved 05/25/2011]. Available from http://www.1tv.ru.

[63] Chesnokov, Yevgeniĭ. V malokomplektnye sel'skie shkoly prikhodit distantsionnoe obuchenie [Distance learning arrives in small rural schools]. 2011 [retrieved 05/20/2011]. Available from http://www.dlearn.org/.

Distance education in the 1990s introduced Russian university students to their counterparts across the world and allowed those who couldn't afford to study abroad the opportunity to earn advanced degrees. Today, the internet is bringing subjects and teachers to remote and underprivileged schools. Disabled children are able to use distance education to learn at their own pace and gain valuable skills that they have traditionally been excluded from. ICTs are contributing to the educating of a new generation who are entering a world foreign to their teachers; by participating in distance education Russian students today are working towards the future of their country. With the continued support of the government, distance education via ICTs has an excellent chance to move Russia towards the knowledge based economy that it strives to become.

5.2 Local Opportunities for Technology Application: The Russian Consumer

The Russian economy is continuing to recover from the 2008/2009 recession and as of this writing has not reached complete pre-crisis activity levels.[64] This is not to say that Russia's economy is in crisis: indeed, "the economy has averaged 7% growth in the decade following the 1998 Russian financial crisis, resulting in a doubling of real disposable incomes and the emergence of a middle class."[65] Additionally, President Medvedev stated in his April 24, 2012 speech to the Russian State Council that the unemployment rate in the first fiscal quarter of 2012 was around 6.5%, (equal to the pre-crisis level) and that Russia had "fully restored the pre-crisis level of production of goods and services". [66] [67] With an increase in both economic stability and

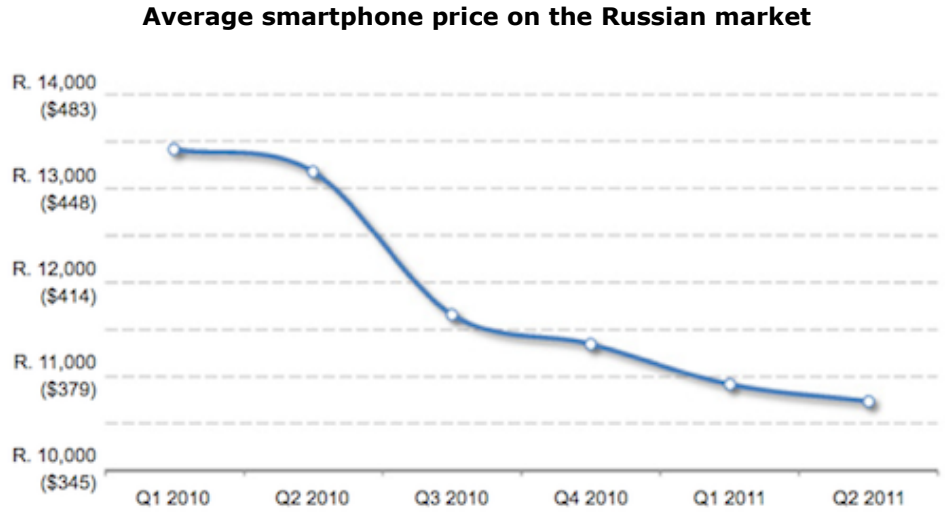
[64] OECD (2011), OECD Economic Surveys: Russian Federation 2011, OECD Publishing. doi: 10.1787/eco_surveys-rus-2011-en

[65] CIA: The World Fact Book: Russia. 2012 [retrieved 4/24/2012] Available from https://www.cia.gov/library/publications/the-world-factbook/geos/rs.html.

[66] This council included members of the government, regional leaders, the higher courts' presidents, the leader of the Presidential Executive Office, the speakers of both houses of Parliament, public figures and business leaders.

disposable income, Russians are becoming active purchasers of commercial-technology, specifically mobile phones, computers, and Russian software. The Russian middle-class provides a ready market for Skolkovo's IT products, especially ones that integrate the use of key investors such as Nokia, Microsoft, Ericcson (telecommunications and data support), IBM, Intel, and RIM (maker of BlackBerry mobile phones).

In 2010 Russia ranked #4 globally in total number of mobile cellular telephone users, with 238 million individual subscribers.[68] The smartphone market expanded an estimated 78% in 2011 alone, bringing in "an estimated 30.7 billion rubles, or $1.1 billion. Sales for the period reached 2.8 million devices – a figure confirmed by MTS, a leading mobile operator and retailer – up 118% from the same period in 2010."[69] One reason for the dramatic rise in cell phone purchases is due to the decrease in price (See Graph 1):

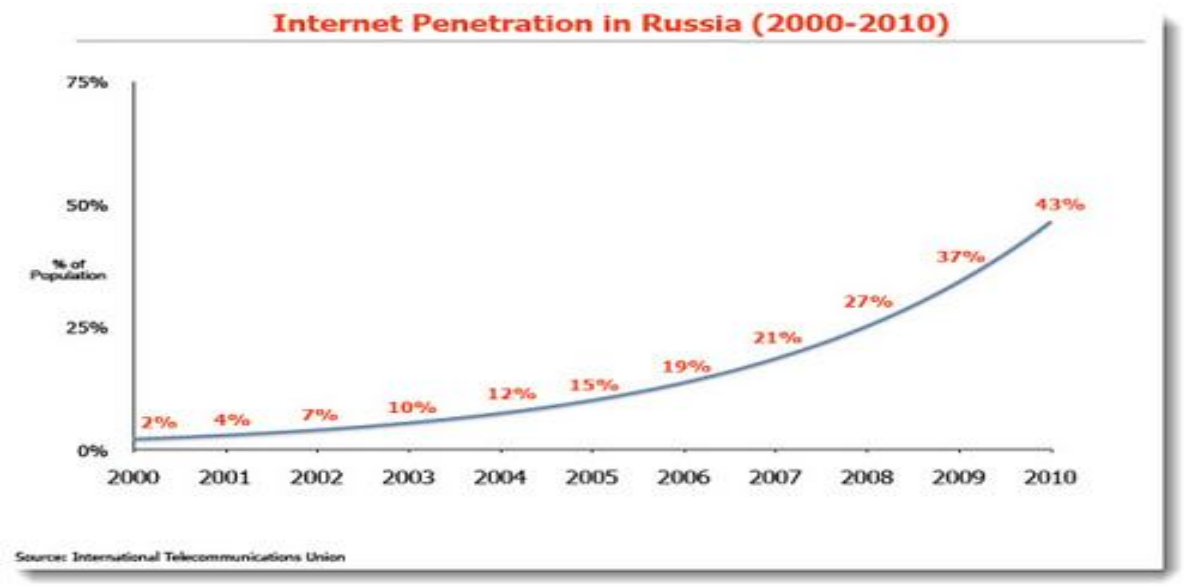


Graph 1- Source: Svyaznoy, July 2011

[67] Medvedev, Dmitri. *April 24, 2012 Speech to the Expanded Meeting of the State Council*. 2012,http://eng.kremlin.ru/transcripts/3697 (retrieved 4/27/2012).
[68] CIA: The World Fact Book: Russia. 2012 [retrieved 4/24/2012] It is worth noting that this is more than double the Russian population of 142 million, implying that the average Russian owns more than one phone.
[69] Maltseff, Sergey, Adrien Henni, and East-West Digital News. 2011. Russian Smartphone Market to Exceed $2 Billion in 2011, Samsung on the Rise. *East-West Digital News,* August 15, 2011.

Russian mobile operators do not subsidize handset devices. This means that when a Russian goes to purchase a phone, they do not sign a contract in exchange for a cheaper device, as is common practice in America. Current market trends show that Russians in larger cities are willing to pay more for devices than even their wealthier European counterparts, and that a majority of Russians are unable to purchase smartphones but do in fact want them.[70] This presents two commercial opportunities for Skolkovo's IT cluster and its investors: software development for smartphones and subsidization plans for mobile devices.

Unsurprisingly, internet use has also been increasing in Russia. The OECD reports that [in regards to] the use of information technology, "Russia has made rapid advances in recent years, with spectacular growth in internet connections and mobile phone use."[71] In 2011, Russia ranked 10th globally with 13,758,000 internet hosts.[72]



Graph 2 Source: International Telecommunications Union

[70] Ibid.
[71] OECD (2011), OECD Economic Surveys: Russian Federation 2011, OECD Publishing. doi: 10.1787/eco_surveys-rus-2011-en
[72] CIA: The World Fact Book: Russia. 2012 [retrieved 4/24/2012]

On the surface, this number indicates that only 1 out of 10 citizens have access to the internet; however the data does not take into consideration smartphone ISP connections or multiple people using a single access point. A more accurate representation of internet use in Russia was reported by The Public Opinion Foundation, who wrote that in "2010, there were approximately 57 million monthly regular Internet users aged 12 and older in Russia, or 46% of the corresponding population. 8 out of 10 inhabitants, or 86% of the population aged 12 and older, had at least one mobile telephone or mobile device. Nearly 1 out of every 5 Russians aged 12 and older had used the Internet from a mobile device in the last month."[73] This high level of internet access provides ample market opportunity for Russian tech companies who are interested in software development, creating a web-presence, or for e-commerce opportunities. This is especially relevant given the market trends of Russians preferring to use indigenous software and websites.[74]

There are opportunities for Skolkovo investors in places where they do not have to reinvent the wheel; truly, scientists and business people can improve upon processes and ideas already in use in other countries. American venture capitalist Esther Dyson, who has been investing in Russian technology companies since the 1990s, points to e-commerce as one of the biggest opportunities for Russia.[75] Due to its very nature of being online, transactions become more transparent and virtual paper-trails are created to help curb corruption.

5.3 E-government and E-education Software: Local Use and Export Opportunities

[73] The Public Opinion Foundation. 2011. *Mobile Internet in Russia.* The Public Opinion Foundation and East-West Digital News, 1. This data was based on a poll conducted from 19 November to 6 December, 2010 with a sample size of 6,474 respondents ages 12+.
[74] Peterson, D. J. 2005. *Russia and the Information Revolution*. Santa Monica, CA: RAND Corp. p74
[75] East-West Digital News. US business angel Ester Dyson: "Online services can reduce the costs of being honest" . in *CJSC East-West Digital Consulting* [database online]. 2012 [retrieved 03/09/2012]. Available from http://www.ewdn.com/2012/03/09/us-business-angel-esther-dyson-online-services-can-reduce-the-costs-of-being-honest/

The Skolkovo project is, at heart, a government proposed and (partially) funded initiative. Many people in Russia have expressed frustration about their government funding a public-private project where there is such high potential for "skimming off the top". Two opportunities for the Russian government to encourage both success for Skolkovo as well as benefits for Russian citizens as a whole is to invest innovation capital in both e-government and e-education programs. Were these programs to succeed, they would give more legitimacy to the Medvedev's statements about Skolkovo being an asset to Russia as a whole.

"E-government" is broadly defined as being an electronic way for citizens and businesses to communicate directly with their government. This communication happens digitally and can include anything from an official city website with contact information for local officials, to a site where you can pay parking tickets online. The purpose of e-government is tri-fold: to improve communication between officials and citizens; to streamline government processes; and to encourage government transparency by making information available to all citizens and groups. In a June 2010 joint statement with President Barack Obama, President Medvedev committed to creating a "more open and accountable government using ICTs" as a way to increase Russian government transparency and accountability.[76] This government interest is a large opportunity for Skolkovo's IT startups that would be able to create products that would benefit their country directly. Aside from promoting civic engagement, indigenous e-government solutions create jobs from the top-down, further helping local economies.

E-education works hand in hand with distance learning and ICT use. Examples of e-education include using computers and the internet for school projects and research; using email and class webpages to communicate with parents and students; and basic universal computer

[76] "*Promotion of Information Communication Technologies (ICT) for Civic Engagement*" 2011. USAID foreign assistance for programs overseas. Charles S. Pope. Vol. RFA-118-11-000006. Moscow, Russia: USAID.

literacy. In a 2003 publication, the World Bank reported that: "It is the view of the World Bank (and consistent with international experience) that the provision of access to education through ICT is the way in which the risk of [wealthy schools consistently outperforming disenfranchised schools] will be minimized. However, in Russia, to date, lack of equipment, of production of quality electronic learning materials, and of the delivery of such materials is hindering this possibility."[77] As discussed above, ICT use in Russian schools is an opportunity to develop both indigenous products and to contribute directly to the education of the Russian populace. What should also be considered is the export opportunities that arise with the creation of strong ICT/e-educational products. The opportunity to export ICT/e-education products was identified in 2003 by the Putin backed federal program *E-Russia*, which aimed "to create conditions for building an effective well-balanced economy focused on domestic consumption and export of information technologies and services."[78] With Putin returning to power in May 2012, he will likely still be in support of his old programs; it would behoove Skolkovo participants to play to Putin's technology interests to gain both financial and political support.

[77] Froumin, Isack, Mary Canning, and Kirill Vasiliev. 2003. *Russian Federation E-learning Policy to Transform Russian Schools*. World Bank, 25893-RU.
[78] Ibid.

Chapter 6: Threats

Awe writes that "obstacles or conditions that prevent your company from achieving its objectives are threats."[79] I have identified three external threats to Skolkovo's success: Other Silicon Valley copy-cats, near-abroad techno-park competition, and fickle investors. The objectives of Skolkovo are to have the five sectors that they are focusing on developing (energy, bio-medical, IT, nuclear, space) become alternative sources of income for Russia so that the country can move away from depending on natural resources for their main export goods and services. In 2010, Russia was second in the world of exporting oil (5.01 million barrels/day) and first in exporting natural gas (199.9 billion cubic meters). Their biggest imports include petroleum and petroleum products, natural gas, metals, wood and wood products, chemicals, and a wide variety of civilian and military manufactures.[80] In order to become commercially viable in each of their five technology sectors, Skolkovo will have to differentiate itself in an already highly competitive niche global market.

6.1: Global Silicon Valley Copy-Cats

Silicon Valley is synonymous with technology, innovation, and financial prosperity. It is therefore wholly unsurprising that other countries have tried to replicate its success before Medvedev's announcement in 2010. In creating a Silicon Valley "copy-cat", Skolkovo will be contending with India's Silicon Plateau, Ireland's Silicon Bog, The Philippians' Silicon Gulf, and Israel's Silicon Wadi.[81] Additional competition includes high-tech areas such as Singapore,

[79] Awe, Susan C. *The Entrepreneur's Information Sourcebook: Charting the Path to Small Business Success.* p194
[80] Central Intelligence Agency. *The World Factbook: Russia*. Langley, VA, 2012 [retrieved 4/24/2012] Available from https://www.cia.gov/library/publications/the-world-factbook/geos/rs.html.
[81] Bresnahan, Timothy F., and Alfonso Gambardella . 2004. *Building High-Tech Clusters: Silicon Valley and Beyond.* Cambridge; New York: Cambridge University Press.

Hong Kong, Taiwan. I identify India and Israel as being key countries whose technology hubs pose industry threats to Skolkovo.

India's high-tech capital, Bangalore, is located in the southern part of the country and is home to some 7 million people.[82] Bangalore's technology park specializes in software, IT services, and nanotechnology; fields in which Skolkovo wants to develop. Arora et al. point to the rapid and "dramatic growth of IT in the advanced industrial nations [having] two important features that were of great importance for follower countries: the decoupling of hardware from software, and the pronounced human capital intensity of software."[83] Because Bangalore developed relatively soon after the technology boom in the Silicon Valley (1993), they were able to capitalize early on the increased need for software workers. Unlike Skolkovo, Bangalore's technology sector has not made innovation a priority; rather, much of the software –related work is "non-innovative and involves activities such as offshore development and testing, "localization," and on-line technical support.[84] India's technology sector is comfortable leveraging already defined markets and has been successful as a result. Unlike both Skolkovo and the Silicon Valley, Bangalore has specialized almost exclusively on a select range of technologies, allowing India's IT sector to quickly flourish. (See Table 1)

[82] Central Intelligence Agency. The World Factbook: India. Langley, VA, 2012 [cited 5/5/2012]. Available from https://www.cia.gov/library/publications/the-world-factbook/geos/in.html
[83] Arora, Ashish, Alfonso Gambardella, and Salvatore Torrisi. 2004. In the Footsteps of the Silicon Valley?: Indian and Irish Software in the International Division of Labor. In *Building High-Tech Clusters: Silicon Valley and Beyond.* Timothy F. Bresnahan, Alfonso Gambardella, Cambridge; New York: Cambridge University Press. p78
[84] Ibid.

Year	Exports (in $ million)	Employment	Total Revenues (in $ million)
1993-4	330	90,000	557.9
1994-5	485	118,000	825.8
1995-6	734	140,000	1,249.40
1996-7	1,085	160,000	1,765.80
1997-8	1,800	180,000	2,700
1998-9	2,650	250,000	3,900
1999-2000(est.)	3,900	NA	5,600
2000-1 (est.)	6,300	NA	8,600

Table 1: The Growth of the Software and Computer Services Industry in India. Source: NASSCOMl Aurora et al. 2004

Current 2012 projections estimate that Indian software product exports will reach USD 1.5 billion, primarily driven by mobility and cloud applications.[85] These numbers are threatening to Skolkovo as it intends to focus heavily cloud development. Venture capitalists may be hesitant to invest in a both redundant and infantile tech sector when a both established and cost-effective option is already available.

Where India is focused almost solely on software related services (development, testing, customer service), Israel has honed their research and development (R&D) sector. R&D is an area that Skolkovo wants to develop across all five of their clusters: biomedical, space, nuclear, IT, and energy. Israel has a wealth of human capital trained in all of these sectors. Statistical measures report a high level of general education and more importantly, an extremely high number of scientists: In 2006-2207 Israel had 140 scientists and technicians per 10,000

[85] NASSCOM. *Indian IT-BPO: Trends & insights: Software products.* NASSCOM.com [database online]. 2012. Available from http://www.nasscom.org/software-products (retrieved 5/5/2012).

employees, 135 engineers per 10,000 employees, and was ranked first in availability of scientists and engineers.[86] This strong force of scientists and engineers has helped Israel gain an absolute advantage in R&D by being able to deliver higher-quality products with the same (or less) resources than other R&D tech-hubs.[87] Israel's R&D is heavily financed by venture capitalists which are the same group that Skolkovo is trying to leverage financial support from. At the time of writing, Skolkovo has primarily corporate support for R&D development. If corporate support pulls out due to political pressure, there will be precious little capital left to sustain the research. Though Russia has a very large percentage of tertiary education graduates from the STEM fields, because most universities do not perform R&D, the number of graduates capable of innovation activity is quite low.[88]

6.2: "Near-abroad" Techno-park Competition

In addition to foreign techno-parks, Skolkovo will have to compete with Russian innovation centers that are either in existence or in development. In May 2010, eight regions of Russia chartered the Association of Innovative Regions of Russia (AIRR) in order to create complementary conditions for inter-region socio-economic development; carry out joint projects funded by either federal money or investors; to organize an interregional database to assist in innovative projects and products.[89] These regions include Kaluga, Mordovia, Tatarstan, Perm, Tomsk, Novosibirsk, Krasnoyarsk, and Irkutsk. As shown in Table 2 below, the eight regions are in locations that have access to notable medical and science research-universities

[86] Office of the Chief Scientist, Israel Ministry of Industry and Trade. 2007. *The Intellectual Capital of the State of Israel: 60 years of Achievement.* Jerusalem: The Office of the Chief Scientist, Israel.
[87] de Fontenay, Catherine, and Erran Carmel. 2004. Israel's Silicon Wadi: The Forces Behind Cluster Formation. In *Building High-Tech Clusters: Silicon Valley and Beyond.* eds. Timothy F. Bresnahan, Alfonso Gambardella. Cambridge: Cambridge University Press. p 48
[88] ITB Infoservice. 2011. *Russland – Modernisierung durch Innovation und Forschung [Russia - Modernization through Innovation and Research].* Berlin: Kooperation International- An Initiative of the German Federal Ministry of Education and Research, 5. 2011.
[89] ITB Infoservice. 2011. *Russland – Modernisierung durch Innovation und Forschung [Russia - Modernization through Innovation and Research].* 2011

(Novosibirsk, Irkutsk, and Krasnoyarsk), nuclear research (Kaluga), military-technology developers (Perm), petrochemical industries (Tatarstan), fiber-optics specialists (Mordovia) and nanotechnology experts (Tomsk).

Map 3: Locations of the Association of Innovative Regions of Russia in proximity to Skolkovo

Region	Specialization	Skolkovo Competition
Kaluga	Nuclear	Nuclear
Mordovia	Fiber-optics	IT
Tatarstan	Nanotechnology	All
Perm	Software	IT
Tomsk	Laser technology; biomedical	IT; Biomedical
Novosibirsk	Nanotechnology, nuclear, biomedical, IT	All
Krasnoyarsk	Aerospace, IT, biophysics, petroleum engineering	All
Irkutsk	Energy, geo-chemical	Energy

Table 2: Existing Russian technology parks and their specializations

Not only do each of these regions already specialize in at least one of Skolkovo's five research clusters, but they have also secured federal financing and support from the Administration of the President of Russia, the Ministries of Economic Development and of Education and Science, ROSNANO, the Russian Venture Company, the Academy of National Economy, and the Academy of External Trade.[90] All things being equal, scientists may be more inclined to join an established institute to complete their research instead of taking a risk on Skolkovo.

6.3: Fickle Investors

The opportunities at Skolkovo depend heavily on the types of vested companies. The board members have made it clear that they will allow entrance into Skolkovo as long as it agrees with both the goals and size of the core business of a particular vendor. Thus, the threshold for companies entering into Skolkovo can be quite high.[91] Large, well-known investors have been readily accepted. Figure 2 shows the type of collaboration of the primary investors as of December 2011. As shown, about three-fourths of the companies invested have made soft commitments to Skolkovo, where the remaining fourth have made investment agreements based on numeric metrics being met. This indicates that most companies are hesitant to invest heavily in quantitatively measurable ways. Even more telling are sources which say that companies may also leave if there is even a hint that incoming president Putin will not give Skolkovo as much political support as Medvedev. (See Appendix B)

[90] Ibid.
[91] Ustimenko, Igor. 2011. *Analysis: Could Skolkovo be the Russian 'Silicon Valley'?* Gartner, Inc., G00210715.

Chapter 7: Case study of Berlin-Adlershof Technology Park

In order to appreciate the post-Soviet innovative space that Skolkovo occupies, it is useful to compare it to the development path of other technology parks that arose under similar economic and social conditions. Germany's Berlin-Adlershof techno-park is a government funded technology center located in the former GDR. There are a number of commonalities between the two parks: both are government funded, both take a milieu approach to networks, and both hope that other tech clusters will build up around the parks to help bring commercial business to the area.[92] This brief case-study examines how Berlin-Adlershof developed from an East German research hub to a thriving technology park by embracing both private and public financing and encouraging a start-up culture in its R&D centers.

7.1 Past and Present Berlin-Adlershof

The Berlin-Adlershof technology park is located in the southwestern part of the Adlershof borough. One of its most enduring legacies is the intentionality with which it applied proximity-oriented use of spatial economic policy, here defined as an economic policy used to "encourage the development of sectorial clusters following a commodity chain."[93] Before the collapse of communism in the early '90s, the Adlershof-Berlin location had a long history of being oriented towards modern technology use. Prior to WWII, Adlershof was home to the first airport for engine-powered flights in Germany and was consistent in its pursuit of scientifically based aviation research that utilized wind tunnels and large testing facilities. Post WWII and under the GDR, Adlershof became home to the *German Academy of Sciences* and honed its

[92] Elmar Kulke defines the *milieu approach* as: "policy [that brings] together research components, such as universities or research institutes, and support the resulting spin-off businesses. Kulke, Elmar. "The Technology Park Berlin-Adlershof as an Example of Spatial Proximity in Regional Economic Policy." *Zeitschrift Für Wirtschaftsgeographie* 52.4 (2008): 193-208. Print.
[93] Ibid.

research interests towards natural sciences: by 1989 it was home to fifteen natural science institutes that specialized in physics and chemistry and employed approximately 5,400 people.[94] After reunification, the technologically oriented enterprises were state financed and Humboldt University's natural sciences institutes were relocated to Berlin-Adlershof. This was the beginning of the intentional application of proximity-oriented spatial economic policy: Berlin-Adlershof moved research clusters closer in proximity so as to encourage the exchange of tacit-knowledge and innovative thinking.

Today, Berlin-Adlershof is one of the most successful technology parks in Germany. As of April 2012, it is home to 429 companies, eleven non-university research institutes and six scientific institutes of the Humboldt University in Berlin. The university and R&D facilities focus on photonics and optics, microsystems and materials, IT and media, biotechnology and environment, and photovoltaics.[95] Approximately 15,000 people are employed in Berlin-Adlershof and 8,000 students study at its universities. In close proximity to the technology park are Media City and Trade and Service City, home to an additional combined 475 companies, 7,150 employees, and €752.2 million in revenue ($981.5 million USD).[96] Though not as world renowned as the Silicon Valley, Berlin-Adlershof can still be considered a technology-park success story.

[94] Ibid.
[95] Photovoltaics is a method of generating electric power via solar radiation. Its most common commercial use is through solar panels.
[96] *Adlershof in Zahlen: Was ist Adlershof*? [Adlershof in Numbers: What is Adlershof?] in Adlershof Online [database]. Available from http://www.adlershof.de/newsview/article/adlershof-in-zahlen-1/ (accessed 5/5/2012).

7.2: Lessons for Skolkovo

There are a number of economic and social lessons that Skolkovo can take away from the Berlin-Adlershof technology park experience: Encourage policy that brings together research components and supports the resulting spin-off businesses, utilize public-private companies appropriately, and create a goal of tiered economic success where the first tier is having positive direct and in-direct impacts on the local economy, including Moscow proper.

The importance of a spatial concentration of innovative agents (including universities, R&D facilities, and for-profit companies) cannot be overstated. High-tech cluster literature repeatedly points to close proximity to research facilities as one the most important components for technology park success.[97] One of the reasons for Berlin-Adlershof's success is that as a techno-park, it specifically aimed at bringing together R&D components *and* supported the resulting spin-off businesses. Skolkovo is already developing this type of environment by working together with top global universities (Moscow State University, MIT), and international companies that are investing in on-site research facilities (Nokia, Cisco, Siemens). By creating a welcoming surrounding environment for innovative thinking, Skolkovo will be able to leverage on not only the sense of community they will have built, but will also be able to generate human capital by training and developing its researchers in line with select business interests, thus generating regional revenue.

Throughout its history, Berlin-Adlershof has accepted public financing in order to complete its research. The state has seen continuous ROI from the technology park, both

[97] Kulke, E. 2008; Innovation processes of Dutch firms. In 2007. *Creative Regions: Technology, Culture and Knowledge Entrepreneurship*. eds. Philip Cooke, Dafnah Schwartz. London; New York: Routledge. p 68; Wallsten, Scott. 2004. Public Venture Capital and Science Parks. In *Building High-tech Clusters: Silicon Valley and Beyond*., eds. Timothy F. Bresnahan, Alfonso Gambardella , 229. Cambridge; New York: Cambridge University Press. p 231

monetarily and in high employment numbers for its residents. Like Skolkovo, Berlin-Adlershof established a public-private company, WISTA (Wissenschafts und Wirtschaftsstandort Adlershof, or Science and Business Location Adlershof) in order to organize the development of the park. WISTA is responsible for the parks PR and marketing, the construction, lease, and operation of the innovation centers, and the management of office rental space.[98] *They are not in charge of what is developed nor does WISTA micromanage the scientists' research goals.* This is an especially important take-away for the Russian technology park and its public-private board. The Russian government has a history of mandating innovation; in order to succeed they must step-away from the innovation portion of Skolkovo and operate purely as a management board.

Finally, Skolkovo should work towards local success before aiming to become a global-technology hub. Specifically, there are cultural norms (i.e. poor work-ethics held over from the Soviet era, high levels of corruption, lack of business transparency) that need to be addressed at the local level before expanding globally. Berlin-Adlershof was able to overcome Soviet cultural hold-overs by investing in long-term programs that maintained the momentum of development.[99] For Skolkovo, this could include investing in companies which maintain fiscal transparency and actively abstain from corruption. During its formative years, Berlin-Adlershof created a program which "promoted more independence for young researchers" allowing for start-up like conditions to develop.[100] As Skolkovo is already planning to foster such an environment, they should encourage small companies to adhere to transparent business practices and anti-

[98] Ibid.
[99] Koenig, Robert. 1997. Slow Rebuilding of Germany's East. *Science* 275 (5305): 1408.
[100] Koenig, Robert. 2001. Humboldt Hits the Comeback Trail. *Science* 291 (5505): 891.

corruption laws. This would allow these behaviors to develop organically and become Skolkovo norms.

By initially focusing on economic success for the local Skolkovo and Moscow regions, Skolkovo will be able to measure the true impact of its projects. Berlin-Adlershof has made a tremendous impact on the lives of not only the people it employees, but also residents in the Berlin city-center. It is estimated that "for every employed person in the development area, another employed person in Berlin is dependent upon the former."[101] In Table 3 below we are able to see the impact of the Berlin-Adlershof technology park on employment in Berlin.

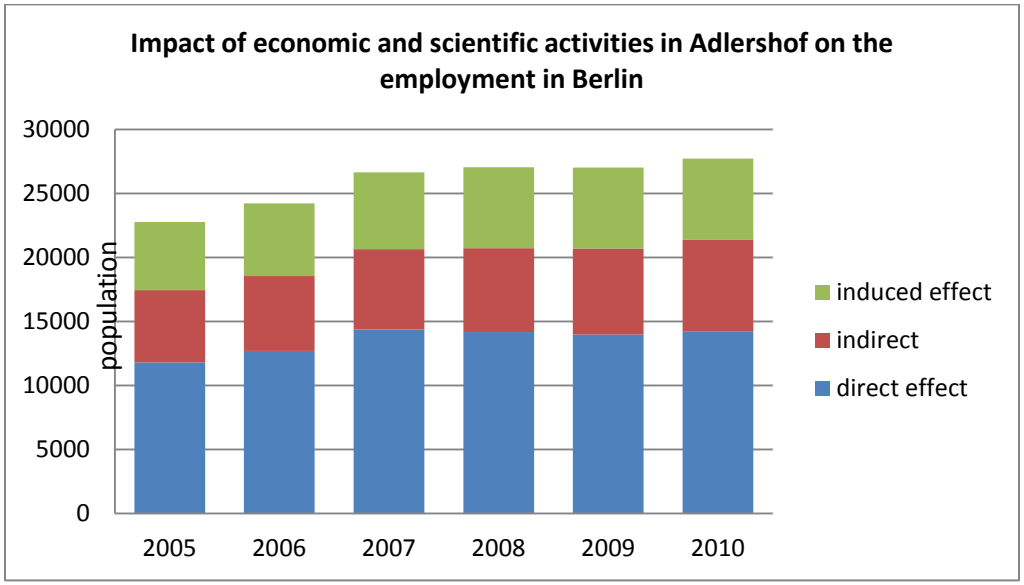


Table 3 Source: DIW Study Adlershof

Were Skolkovo to concentrate primarily on conquering their local market, they would be better equipped in tracking their progress as well as gain much needed local support by increasing employment opportunities.

[101] WISTA. 2010. *The Economic Significance of Adlershof: Impact on added value, employment and tax revenues in Berlin.* Berlin, Germany: WISTA-Management GMBH.

Chapter 8: Concluding Thoughts

Strengths	**W**eaknesses
o State financing o Local educational institutes o Diversity of research topics o Global talent o Good location	o Poor state infrastructure o Astronomical import taxes o Political regime change o Poor business practices
Opportunities	**T**hreats
o Ready in-country market o Distance education, e-education, e-government o Growing middle class with disposable income for consumer electronics and e-commerce	o Global techno-parks o Russian techno-parks o Fickle foreign investors

Table 4: Skolkovo SWOT Summary

The goal of this investigation was to gain a better understanding of the possibility of success of a modern, centrally planned Russian city. At this stage in the development of Skolkovo, a quantitative estimation of its probability of success is nearly intractable. For this reason I took a common approach to evaluating business prospects from a venture point of view and combined it with historical and contemporary comparisons to existing technology parks. My research leads me to conclude that Skolkovo's chance of reaching its goals is quite good. It is my final opinion that those looking to invest in Skolkovo, with either time or money, would be making a prudent decision, and would find themselves at the forefront of Russia's burgeoning tech-industry.

Appendix A: Computer Renderings of Skolkovo provided by Skolkovo Foundation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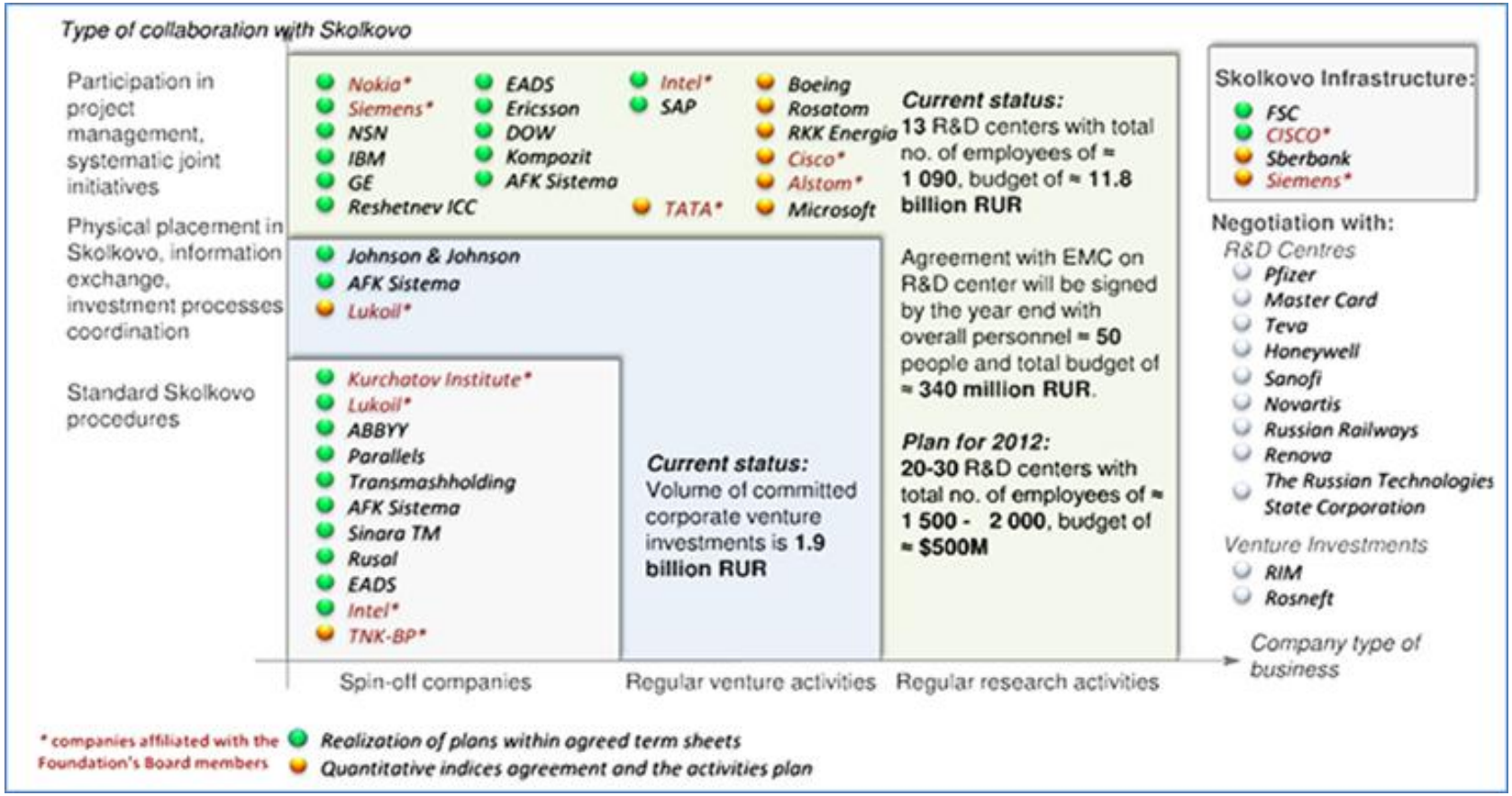
Appendix B: Type of Investor Collaboration with Skolkovo



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