

## GOVERNMENT - ACADEMY DIFFERENT APPROACHES TO TECHNOLOGY TRANSFER

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The paper will present the conflict between the natural preference of Technology Transfer Organization (TTO)'s regarding commercialization for the licensing option and the government preference for Spin-Offs. The conflict regarding preference for one of the two main Technology Transfer options: the first, the licensing or selling of the technology and the right to use it to existing commercial entities; the second the spinning –off of firms, in which new firms are formed, to which the technology is transferred. It will further suggest that the less than expected results, are due to the conflict.

The recent prevalence of TTOs and TT support tools, (e.g. professional training, hand-books, seminars, associations etc.) are evidence of the effort to affect technology transfer from the Academy to the Industry (Fontana, Geuna and Matt, 2006). The Academy or Research Organization are organizations dedicated towards the creation of knowledge and in most cases (e.g. universities) also teaching. However, another function is the transfer of the knowledge created from these organizations to society, and in most cases that would mean the industry. For that purpose, the Academy employs internal units (the exact legal entity is depended upon the national legal system) specializing in the transfer of that knowledge – Technology Transfer. The two main avenues for Technology Transfer (TT) are Spin-Offs which is the creation of new (start-up) companies owning the technology created by the Academy (these start-ups by nature are small and therefore are included in the sector of Small and Medium enterprises – SMEs), and Licensing - in which the technology is transferred by licensing to existing companies which make use of it in their products and services. In recent years, the EU Commission (EU 2009; EU-IPR, 2010; EU-SME. 2010; FP7, 2010), has been advocating such transfer and has been promoting the transfer not only of technology but also of expertise and research capabilities (e.g. FP7 IAPP), and at the same time has put a lot of emphasis on the applicability of research results (EU, 2003; EU, 2009; EU-IPR, 2010; EU-SME, 2010). It seems however, from various reports (EU, 2006) and from the emphasis on strategies like, venture capital (EU, 2011a; EU, 2011b), that the main policy of the government is that of encouraging start-ups or spin-offs from Academia.

That policy is understandable from a governmental point of view, start-ups promise the immediate job creation that can be directly linked in an obvious way to the effort of Technology Transfer. It is therefore both, direct and measurable. In this aspect, licensing while it increases the employment of the firm by receiving the technology but presents some obvious difficulties regarding the casualty of the employment and the Technology Transfer. Licensing also makes it more difficult to measure the additional investment resulting from the process than a start-up, where all investment can be directly linked to the TT.

Therefore, for governments, interested in a measurable, direct and obviously linked to their efforts economic growth, start-up formation is a preferable solution. Additionally, SMEs make the economy more robust. The SME are faster, more resilient, require smaller markets to survive and even when they fail they discharge a smaller number of employment seekers than large firms. Building mechanisms for the easy creation of SMEs is, therefore, an economic necessity for an economy competing in international markets. Furthermore, there are additional side benefits to the Spin-Off support policy.

The evident side benefit is the formation of a service sector, the venture capital sector, which is by offering an alternative venue for investment, makes the entire financial sector more robust. That sector can attract international investment from large multinationals, creates jobs, and as a byline for its activity helps circulate the funds in the market.

For most countries where there is an increasing number of PhD holders, not in academic track, the development of the start-up sector offers another side benefit, as an outlet for the surplus of PhD holders, without burdening the academic sector. From SMEs it would spill over to the other firms in the industry.

The direct benefit as well as the side benefits explains the government preference for Spin-Off support policy. Therefore, when looking to promote that activity and deciding to help the research organizations in the process – by forming the TTOs, financing them and offering other support measures, that preference was naturally made obvious to the TTOs. However, several questions arise, as what is best for the source of the knowledge, the universities and research organizations (Luukkonen, 1998; Luukkonen, 2000)? Do they have the same preference (Laursen, and Salter, 2004)?

A research organization would have an obligation, even if only implied, to transfer its knowledge in a way that would best benefit society. Most research organizations are

supported by either official public funding, such as government budgets, or by other "public" funds, such as donations. These create an obligation to act in the public's best interest. To make sure, for example, that knowledge created by them is used to benefit the society. If they discover a drug candidate that can help cure cancer, then they should make it available to the pharmaceutical industry, so it can get it approved and then produce and sell it to the people who need it. If the new knowledge is a new communication algorithm that requires less energy and can, therefore, save energy, reduce radiation, it should be transferred to the relevant industry to improve the lives of the users.

Based on that understanding, as well as being interested in the economic benefits to be derived, the universities in most cases embraced the TTO formation. However, after consideration of the process involved it would seem that the licensing track is more attractive. When forming a start-up, there are risks involved that have nothing to do with the technology, as there are issues of managerial mistakes, not enough VC funding available and any number of reasons start-ups fail (EU, 2011a; EU, 2011), plus it takes time for that start-up to crank up the marketing and sales infrastructure that will allow to maximize economic returns. Of course the start-up may not grow up to return the high yield expected after all the works. There are heavy investments to be repaid etc. which make that Spin-Off a riskier and in the short term a less economically viable choice.

At the same time licensing to existing companies may create revenue almost immediately, depending on the licensing agreement and sector, there may be interim payments during development, and registration of the products to the TTO / research organization, which cannot be expected from a start-up. Further to that, once the product is ready for sale, the licensee would have a fully developed production and marketing infra-structure in place to capitalize on the investment. It would, therefore, seem faster and less risky for the TTO to opt for the licensing choice when available.

Along this route, a very relevant question may come up, as what happens when the two, the government preference and the TTO preference clash? That would depend in many cases on the funds available for the TTO, the nature of its knowledge and similar factors. The TTO would prefer to license but would spin-off when there is little choice, or when there are funds available for that almost exclusively. That is the case when the government concentrate efforts on the creation of financial tools for start-ups in preference to other options. Since that would make the TTO generate less income, and would make the economic independence of the TTO more difficult to attain, it would certainly take more time to reach this stage, it will make the

TTO seem less profitable and reduce that attractiveness of the TT process as an academic endeavor.

At the end an alternative is presented. The alternative suggests supporting the natural tendency of the TTO and allowing for excess activity to "Spill-Over" to the Spin-Off activity. That alternative is based on the assumption that strong TTOs encourage all venues of Technology Transfer, and have the power to sustain even less lucrative venues, or long term activities. By creating support mechanisms for the licensing activity or for the TT process in general, and allowing the TTO to select the best venue, new TTOs would be able to show economic results that would boost their activity and the transfer of knowledge to the industry. Additionally since not all knowledge can be effectively licensed, the TTOs will pursue the venue of Spin-Offs when appropriate, and in time will also create new start-ups. In that way more knowledge would be transferred and new firms would be created, with all the side benefits mentioned above. All that while the TTOs will be stronger and the TT process will have a more attractive image for the Academy in general.

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