FIRMS AND ACADEMIA: A BAD MARRIAGE?

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Latin American universities must concentrate on improving their quality, otherwise they will not be a solution to the lack of innovation. They will become a bigger part of the problem.

There is a widely shared agreement about the role that universities play on innovation. In general terms, it is believed that building a good triad of firms, government and academia, is a necessary condition for innovation. What if we take a different stance, and claim that in Latin America it might not even always be advisable?

The effect of putting firms and academia together is expected to be dual. It would swiftly diffuse basic and applied research to firms and products, and it would have companies steer research in the direction of relevant, practical market problems. Governments facilitate the process mostly with financial or fiscal incentives

It's true that some of the most potent innovation corridors in the world have been built around universities. Silicon Valley, the latest, had its origins in Stanford. Boston's tech innovation ecosystem evolved around MIT and Harvard. The Smithsonian's Lemelson Center for the Study of Invention and Innovation has documented many other cases, like the Medical Alley in Minneapolis in the 50s, formed alongside the University of Minnesota.

An optimistic view of the power of the triad induced many Latin American university presidents to look for places to copy from. Stanford has a favorite model. In the 1940s, Frederick Terman, the MIT Engineer behind the university's fantastic success, specialized the institution in a few specific areas[i] to compete with East Coast educational powerhouses, and to attract military grants and corporate clients.

He developed a bold approach to link with the corporate community. "Terman encouraged his faculty to consult for local firms, arranged for local industrial researchers to teach specialized courses on campus, and set up an Honors Cooperative program so that corporate employees could earn their degrees while working full time."[ii]

Some universities like Mexican Instituto Tecnológico de Monterrey, which had its origins in private grants, have moved successfully in that direction. Mexico, like other Latin American countries, also passed a law that allowed public university professors to receive royalties from the commercialization of their inventions, or stipends from consultancy. However, with exceptions, linking academia and firms has proven to be a failure in the region.

The problem has several facets. One is that large firms do not trust universities. If they have a serious problem, they would probably – and correctly – hire McKinsey or BCG to take advantage of their deep industry knowledge and their global view. The same goes when they face a relevant operational challenge. Companies would probably be right to buy a SAP, SalesForce or Alfa Laval solution, instead of a university-developed software or machine.

To make things worse for local universities, even when strictly academic knowledge is required, nothing stops large firms from hiring Wharton or MIT. In fact, regulation might play against locals. "I've heard from Brazilian multinationals, that there is a problem with regulation. There are so many regulations in local universities, that they go abroad," the Director of a major Brazilian MBA program said.

That leaves local institutions with a smaller market of SME's that cannot pay the more expensive brands. That is not necessarily bad, but it perpetuates the situation in which complex, more interesting problems, are left to high capacity, international players to solve.

On the other hand, professors at any school worthy of its license are required to enter a tough competition to publish on indexed journals. This, in many cases, has forced research to lose the practical relevance local companies seek, former Vice Rector of Colombian Universidad de Los Andes, Javier Serrano, said. Oftentimes local datasets are not available, or locally relevant topics are not interesting to major journal editors and, consequently, do not get explored.

Should bridging those diverging interests be a national goal? In general, the answer is no. Having good firms, and good universities is always a requisite for growth, but joint R&D efforts are desirable only under special circumstances.

Quality education: How good is good enough

Universities must, first and foremost, concentrate on building their quality, and academic prestige. The best schools in the region have recognized this objective. It calls for constant dedication of minds and other resources, since most institutions lag too far behind by world standards.

Universidade de São Paulo, the best Latin American university on the Times Higher Education World's university ranking, was classified in a group that holds the spots 250 to 300. Universidade Estadual de Campinas, the second best ranked, is somewhere between 400 and 500. The remaining 63 follow.

There tends to be some controversy about the criteria used on the rankings, but it is clearly an unneccesary discussion when the gap is so wide. The Times Higher Education considers indicators like teaching, research, citations, industry income and international outlook, that might give a good idea of relative institutional strength. Performance on each of those categories is depicted on the graph below. If LAC institutions are to move up on the clasification, they must improve on all of them, but more on research and citations, like USP and Unicamp have. This implies, in line with Serrano's comment, that researchers should have a greater incentive to look at problems that mainstream peers consider relevant, and less on local CEO concerns.

Latin American universities: distant followers

Scores – groups of the top 1,000 universities in the world

Source: The Times Higher Education 2018, Latin Trade

The U.S. News ranking is gentler with Latin American institutions. There are seven among the top 400 in the world. Universidade de São Paulo ranks 153. Distant followers Universidad Católica de Chile, 315; Universidade Federal do Rio de Janeiro, 338; Universidad de Buenos Aires, 341; Universidad Estadual de Campinas, 344; Mexico's Unam, 374; and Colombian Universidad de los Andes, 385.

Career consultancy QS ranks thirteen regional institutions among the top 400. However, it's worth mentioning that 40 percent of their final score is given by expert-judged academic reputation. When only academic credentials are considered, citations per faculty indicator for instance, these universities are sent back to a sad academic barren land. Only two institutions make the top 500 cut: Universidade Estadual de Campinas (414) and Universidade de São Paulo (459). The rest vanish.

Latin American universities ranked among the world's 400 best

Source: The Higher Education, U.S. News, QS, Latin Trade

It's unfortunate, but probably fair to conclude, that most universities are still not delivering on their basic social mandate of offering their students the best possible education. This is measured with the rod that places unquestioned world leaders like Oxford, Cambridge or MIT at the top of the list.

Hence, they must focus on quality. Find ways to attract top-rated faculty, versed on research topics that are interesting material for the best journals, while improving their teaching effectiveness.

It does not have to be take 20 years. Loans and training to get professors admitted at the top 10 universities, or setting up matching services to have them co-author papers with professors at better

ranked institutions, would be in the employing school's best interest, a quick multiplier of quality, and a booster for the probability of alumni being later admitted to top schools.

Monetary rewards for publications and academic research are a strong incentive for basic and applied research. It might sound like a tired idea, but Russia, for instance, recently included a provision on its innovation policy to grant financial incentives to researchers who are published in the best indexed journals. This becomes like the pecuniary reward some governments give to Olympic medalists.

Chinese universities have done a fantastic job at closing the quality research gap in a decade. Now they have better labs, doing better research. Their formula has a wide mix of interesting strategies, ranging from international cooperation, to clever investment, to training teachers and opening international doors for their students, and their classrooms to international faculty.

The Shanghai Institutes for Biological Sciences co-ventured with French Institut Pasteur, and collaborated with German Max Planck Society in two of its eight institutes. These institutes recruit faculty from China and abroad, and grant scholarships to students who want to work in overseas collaborator labs for a year or two[iii].

The Chinese Academy of Science's Institute of Biophysics acquired a bleeding-edge technology microscope, developed powerful microscopy techniques, and gave ample access to the microscope itself. The strategy facilitated the hiring of top researchers. At times, advanced instruments are obtained sharing budgets of several universities.

Hiring and global recruitment are also a piece of the successful action. The Department of Immunology at Tianjin Medical University has already awarded 119 honorary and visiting professorships to foreign scholars. The result of this and other efforts, is that Chinese students can interact with leading visiting scientists from the world, and in many instances, students can also be candidates for research scholarships abroad.

Good university governance is important to improve research, and it is key to attract talent. Successful industry sponsored postdoc packages in China offer good pay packages, and emphasize independence just in the same level.

The best applied research

Does a basic and applied research thrust induce innovation? Not always, but a move towards quality education pulled by quality research would amount to a revolution in Latin America.

It's widely known that firms complain about the pertinence of the skills students acquire in formal training programs. They mostly have a feeling of practical pessimism about the solution of this issue. At the same time, absence of well-paid jobs for graduates increased middle-class disenchantment with tertiary education. This nasty conjunction might, in the end, shape a shared negative skepticism about the usefulness of education, let alone world-class quality education.

It would be a quantum leap to convince societies that the way out of underdevelopment is in part increasing educational quality. "Enough" is not a word that should exist when referring to education. It's easier to build stronger, more innovative societies upon well-educated citizens.

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Managers should also adhere to the cause, for a different reason. They would be dead wrong to believe that quality education does not have a short-run impact on business.

As we have said, there is abundant evidence that universities can greatly foster corporate innovation by training managers, and by exposing board members, family firm owners, and CEOs, to global trends and best managerial and performance-tracking practices.

Developing strong managerial skills, strategic vision and impeccable results-based execution, could be the single most important tool to foster innovation in companies, big and small in Latin America.

The natural channel to educate top management is no other than the traditional research-and-teach universities. There is no need for many big new developments. If they lack deep global or industry knowledge, local universities can always partner with international schools to reskill CEOs and Board members.

Mexican investment promotion agency ProMexico has an example, with a twist: it does not involve local universities. In 2017 it started a program to train board members to lead global companies. The program is run in partnership with the Southern Methodist University. Results are immediate. ProMexico will soon offer their alumni's expertise to a group U.S. firms that want to take Latin American market knowledge to their boardrooms. It's easy to think about the benefits that this kind of programs can bring to the quality of management of local firms.

Put differently, building better CEOs should be a major endeavor in every country. The relevance of formal management training can never be overstated. Management research and teaching should be raised to the rank of the most needed sciences in the region. As a society, we should make sure that those who we entrust the handling of our assets – and the mixing the factors of production- do it well.

A feeble bridge

What about the ties between university and firms? Consulting for SMEs, and incubating or spinning-off startups are always options for academics to take, but they should not distract universities from its academic excellence goal. These institutions must do well what they were created to do.

Left alone, accreditation-pressed universities will increase their production of basic and applied research. To lift financial constraints, universities could promote endowed chairs, Serrano suggests. This tool financially strengthens universities, but at the same time helps develop a research agenda for donor industries.

Solid universities may also convince governments to have and maintain sectorial funds in complex R&D cycle industries like mining, oil, energy, pharma, and agriculture.

Being an entrepreneurial university requires a different approach. Much like with professional athletes, training and running are not the same tasks, nor do they require the same skills.

Frederick Terman knew that to be close to entrepreneurs and to foster new companies, he needed entrepreneurs in his ranks. "Professor Dean A. Watkins was director of the electron devices laboratory and co-director of the Stanford Electronic Laboratories. Terman recognized qualities in Watkins that he knew would make him a good businessman," a study by Carolyn Tajnai reads. A research university, instead, needs academics.

This story is well known to HR managers, but it is so many times forgotten by university presidents. Good hiring is never about finding the best available person, but the best suited for the job. To tie in with corporations, a good researcher must be taught about the microeconomics of a specific industry, a thing she might not even be interested in or trained for.

It is nice to have university professors marketing their ideas, if they know how. If they do not, it probably is a social waste. In laggard institutions, as are most in Latin America, it seems best to keep professors closer to the blackboards and their computer screens, deepening their knowledge and improving the quality of education, aspects that are required to generate economic growth.

Ideas and rigorous training can make nations advance. Ask Chileans, if University of Chicago professor Arnold Harbeger did not have a larger impact on that country than all the companies accelerated by all universities combined.

Stanford: The Quality Secret

Hero selection is crucial for economic development. Stanford is always a good hero for universities to have, but rectors and policy makers trying to imitate its feats, may do well to remember that the university's ability to leap tall buildings in a single bound, requires more than a cape.

This university's success lies less on promoting startups than many think. In 2015-16, Stanford received $94 million in gross royalties from 779 technologies. That's a nice sign of its good institutional eye for spinning off successful startups.

But way more important than that, since the 1940's, its faculty and students have consistently proven that they have a highly effective method to analyze business environments, to identify opportunities, and grow corporations around their ideas and their research.

Proof to that is the list of companies that alumni have helped to create. There are old economy names like Gap, Nike, Dolby Laboratories and Charles Schwab; first settlers of Silicon Valley like Hewlett-Packard, Cisco and Sun Microsystems; and new-economy icons like Google, Netflix, Tesla and Instagram.

But it is a strong academic performance, the enabler that has attracted government grants since the 1920s, and that still today fuel research. Per Stanford's website, 6,000 externally sponsored projects drew $1.3 billion in federal funds during 2016-17 (13 times more than royalties).

Academic quality and resources, helped create a virtuous environment for further knowledge creation, attracting top talent. Stanford boasts having 19 living Nobel laureates, most of them in Economics, and 13 more who have passed away.

Building-up strength

Financial strategies must be clever in poor, resource constrained countries. Providing good education is costly. The annual cost per student at public Universidade Federal do Rio de Janeiro is estimated by daily Globo at $22,000.

The richest universities have enough financial strength to permanently improve quality. The 50 richest

universities in the world have endowments valued in August 2017 at $362.4 billion. That is equivalent to 7 percent of Latin America's GDP. Governments in the region spend each year an equivalent of 5.3 percent of GDP on all education levels, from early childhood to tertiary schooling.

The 50 richest universities charge undergraduate students annual tuitions on the range of $30,000 to $50,000. Top private universities in Latin America charge from $9,000 to $11,000 per year, between 20 and 30 percent of their developed counterparts, and in line with global income differences. GDP per capita in Latin America is 21 percent that of high-income countries.

It does not appear to be wise for Latin American universities to follow the same path of rich universities, with one-fifth of their resources. A mix of quality improvement, and heavier deployment of financing tools like securitization of student loans, insurance, contingent claims, may be formulas to consider. Some of them are timidly being used in the region.

The Woodrow Wilson Center and the Vidanta Foundation sponsor this series on innovation.

[i] "Academic prestige depends on high but narrow steeples of academic excellence; it is not possible to cover all the bases." From Tajnai, Carolyn E. (1985) "Fred Terman, The Father of Silicon Valley" Manager Stanford Computer Forum. Stanford University.

[ii] Molella, Arthur and Anna Karvellas (2015) "Places of Invention" Smithsonian Institution Scholarly Press. Washington D.C. p. 19.

[iii] Science Magazine (2015) "A Research Boom in China's Municipalities" http://www.sciencemag.org/features/2015/12/research-boom-chinas-municipalities