

CHAPTER 11

A Business Model for the 21st Century European University

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MOVING IN THE AMERICAN DIRECTION

“The world is moving in the American direction. More universities in more countries are charging students tuition fees,” says *The Economist* (2015). Of course, there is more to the American university model than merely tuition. Many of us have benefitted from the opportunities of great American research universities. Some of us have further implemented their spirit within a European university by instituting, for example, tenure track positions, professional deans, competition for funds, doctoral schools and a president devoted to fundraising.

However, the reported — and confirmed — crisis of student debt in the U.S. has shed doubts on the role model of the American university. Can we avoid throwing away the baby with the bathwater? We take up the challenge that we should continue to move towards the American model of research universities while maintaining our European values.

Universities are known for their resilience and stoic resistance to change. “Once I identified 85 institutions that had been in existence since 1520 and were still largely unchanged. Seventy of them were universities,” wrote U.C. Berkeley’s first chancellor, Clark Kerr (Kerr, 2001). Europe invented several university models, not just one (Sam & van der Sijde, 2014). The **Humboldtian** model unites research and teaching, where teaching of *new* knowledge is the fundamental mission, in total academic freedom, but with a

centralized governance. The **Napoleonic** model focuses on high-level vocational and technical training, or professional education, also within a centralized system. The **Anglo-Saxon** model emphasizes a “liberal education,” giving students the flexibility to develop personally, with institutional autonomy and self-governing institutions. Finally, there is the **(Anglo-)American** model. It has all the (somewhat contradictory) features of European models integrated by the U.S. (and later spread back to Europe). This model has far more students, a decentralized system of governance, autonomous institutions and an entrepreneurial model of higher education, whereby universities play a critical role in the economic development of their region or nation.

Implementing the American model is not easy. According to Swiss Nobel Prize winner Richard Ernst (Herbst, 2009), “[...] we follow a kind of hybrid system that is situated somewhere between the German institutional system (with few professors) and the U.S. American system with a high number of professors heading small teams but without workers on permanent contracts. [...] We try to combine the advantages of both systems but tend to ignore the fundamental incompatibility of the two systems. We think we have vanquished the German system, but we are still a long way from the American one. [...] There is no middle way.”

IS THE AMERICAN MODEL BROKEN?

In 2008, the net cost (tuition, room and board, subtracting financial aid) for one year in a four-year public university in the U.S. was equivalent to one quarter (25%) of the median family income (Zumeta *et al.*, 2012). Alarmingly, the net costs have increased by about one percentage point per year for the past decade. Net costs, in fact, might not be very different from those in many European countries; tuition costs, however, are. Tuition absorbs an ever-higher proportion of family income: for private four-year university courses, tuition was 16% of the median income in the 1970s and is 30% today. “Tuition hikes are addictive” (Bowen, 2013), but for universities, tuition revenue is the only readily available source of income to compensate for declining state appropriations. Accordingly, as a percentage of total educational revenue in public higher education, net tuition rose from 23% in 1986 to 43% in 2011 (Bowen, 2013).

As a result, the number of students (or parents) who borrow money for university education is steadily increasing, at a rate of roughly 7% per year (reaching close to 40 million borrowers in 2012). The amount borrowed increases at the same rate. Why bother to borrow for college? Because college still pays. The private return on investment of a college education is significant, both during and after economic downturns.

Despite these statistics, it's important to note that the looming student debt crisis is NOT due to the great research universities — even with their impressive levels of tuition.

In July 2012, the U.S. Senate Committee on Health, Education, Labor and Pensions published an 800-page report, (Collini, 2013) which was the culmination of a two-year investigation into “for-profit” higher education institutions. The senators found that many from the least advantaged sections of society are stuck with massive student debts after having enrolled in, and quickly withdrawn from, courses that were never suitable for them. (“Subprime degrees, like subprime mortgages, are sold to communities relatively unfamiliar with the product.”) (Collini, 2013). Indeed, a tsunami of substandard private universities hit the American market in the last decade. These for-profit schools are overwhelmingly dependent on revenue from tuition. One player, Laureate, already has more than 150 campuses in North America, Latin America, Europe and Asia and operates 15 medical schools and well-regarded hotel management schools in Switzerland and Spain (Wildavsky, 2012). The biggest player in this market is the University of Phoenix, with a claim of 600,000 students and annual revenue of more than \$4 billion in 2010 (Collini, 2013). The Senate investigation showed that 60% of these students dropped out within two years. Among those who completed their degrees, 21% defaulted on student loan payments within three years of finishing (Collini, 2013).

In contrast, most elite schools currently have policies whereby middle-income families do not have to pay *any* tuition fees. Bloomberg Business (Otani, 2015) analyses ten of them. For example, Stanford University announced at the end of March 2015 that, starting this fall, students whose families make less than \$125,000 a year will not pay any tuition fees. Previously, the school had set the bar at \$100,000. Students with a family income above \$65,000 a year still have to cover room and board. And Stanford is not alone in this. Brown University’s (tuition for 2015 is \$48,272) policy is that families making less than \$60,000 don’t pay tuition, room or board. Princeton, Cornell, Duke, Harvard, Yale and MIT all have similar policies.

TUITION IN EUROPE (NOT THE AMERICAN WAY)

European countries have three models of tuition and student aid in higher education systems (OECD, 2013). In Model 1, high tuition fees are combined with a well-developed student-support system; the Netherlands and the United Kingdom use this “American” model. The systems in these countries present potentially large financial obstacles to entry into university education, but they also offer substantial public support to students. The average entry rate for this group of countries is significantly above the OECD average

of 60%. In Model 2, there are no or low tuition fees alongside generous student support systems. This group is composed of the Nordic countries (Denmark, Finland, Iceland, Norway and Sweden). The average entry rate into a tertiary-type education for this group is also significantly above the OECD average. These high entry rates may also reflect the attractiveness of highly-developed student financial support systems, not just the absence of tuition. For instance, in these countries, more than 55% of students benefit from public grants, public loans or a combination of the two. In a third model — which includes all other European countries for which data is available — low tuition fees are combined with a less-developed student-support system. All of these countries charge moderate tuition fees. A fourth model — countries with high tuition fees but less-developed student support systems — is not present in Europe, but is typical in Asia.

Student numbers are growing faster than global GDP (*The Economist*, 2015). The global tertiary enrolment ratio increased from 14% to 32% in the last 20 years. The number of countries with a tertiary enrolment ratio of more than 50% went up from five to 54 in that period. As an example of this tertiary explosion, “in the decade to 2009, Chinese universities hired nearly 900,000 new full-time faculty members” (*The Economist*, 2015). The OECD estimates the number of international students to have grown from 2.1 million to 4.3 million in the past decade alone. This potential financial resource has not gone unnoticed by European universities. In some countries, such as the U.K., extra-European students already make up a near majority of international students, and these students can be targeted with higher tuitions fees (within E.U. regulations). In other countries, the topic is hotly debated, less for reasons of tuition and more regarding a broader discussion on migration and job permits. Nevertheless, for a few select countries and renowned universities, the financial stream from international students will become a valuable resource.

THE AMERICAN WAY: THE ENTREPRENEURIAL UNIVERSITY

What is new is that universities have become much more relevant to economic growth and social *bien-être* (see, for example, the “Knowledge for Growth” report of the European Union [2008]). Many academic scientists no longer believe in the necessity of an isolated “ivory tower” for scientific discovery. “This reflects a genuine sense that the process of scientific exploration has become a much more collaborative process, requiring input and stimulation from a wide variety of sources,” says former president of Harvard University Derek Bok (Bok, 2003).

There is indeed rapid growth in “money-making opportunities” for research universities provided by a technologically sophisticated, knowledge-based

economy. “Now that scientific discovery and continuing education are valued so highly,” writes Bok (2003), “pressures have arisen from every quarter to have universities make their services available to those who need them. State officials ask campuses to speed innovation, job creation and economic growth by cooperating more closely with industry. Businesses urge universities to do more to train their executives and collaborate scientifically in ways that will lead to valuable new products. Citizens everywhere look for courses of study that will help them qualify for better jobs and promising careers. These growing demands allow universities and their faculties to profit from academic work in more ways than ever before.”

An entrepreneurial university, therefore, is not just one that actively seeks to innovate how it conducts business. It also undertakes “entrepreneurial activities with the objective of improving regional or national economic performance as well as the university’s financial advantage and that of its faculty” (Sam & van der Sijde, 2014).

FUNDING OF EUROPEAN UNIVERSITIES

In a nutshell: the more generous public funding of universities in Europe still does not reach the heights of the total (private + public) funding of tertiary education in the U.S. The average total expenditure for higher education within industrialized countries is 1.7% of GDP, while the U.S. invests a full 2.7% of their GDP into higher education (OECD, 2013). About two-thirds of the total expenditure in the U.S. is private (i.e. personal or family); in Europe, the private, personal and family contribution is only half that. When ranking countries by private expenditure on universities, the U.K. is surprisingly ahead of the United States, and Switzerland is dead last (alongside Luxembourg). The U.S. also dominates expenditure per student, standing a solid 20% over the expected expenditure on OECD’s wealthy countries’ regression curve. The dominance of U.S. universities in all rankings (especially at the top) is in keeping with this impressive investment.

For OECD countries there has been a slow erosion over time in the share of public funding at the tertiary level. This percentage decreased from 78% in 1995 to 69% in 2007 and, since then, has stabilized at around 70%. After the 2008 economic downturn, U.S. states reportedly slashed their tertiary education appropriations. However, nearly all European countries — though also in recession — maintained or increased their public spending on tertiary education (even Greece). Then later, in 2011, almost half of the 28 countries for which data was available ultimately did reduce their budgets for tertiary and adult education.

It’s time for European universities to wake up.

EUROPEAN UNIVERSITY FUNDING: 70% PUBLIC

Reliable comparative numbers for university funding in Europe are not easy to obtain. A 2011 report by the European Commission (De Dominicis *et al.*, 2011) based on 200 European research universities showed that the government continues to be the main funding source for European universities, at 70% of total funding. An investigation by the European Association of Universities with voluntary participation (Estermann & Pruvot, 2011) produced similar numbers, with 72.8% of university income attributable to national and regional funding.

Core Versus Competitive National Public Funding

This public support is further split into two main parts: national core funding and national competitive funding (typical of Research Councils and National Science Foundations). Thus, on average the 70% public national funding is further split into 57% for core funds and 13% for “national competitive funds.” When comparing different European practices regarding this split, no clear message emerges. Top universities are found with both high and low proportions of national competitive funds. A preliminary comparison between a few excellent universities shows considerable variation. National core funding makes up 74% of total national public funding at EPFL, and 78% at our sister university ETH. For our friendly competitors, national core funding is 63% (TU Delft) and 55% (TUM) of total national funding.

Core funding — the Swiss way

When the Swiss parliament adopted (at the beginning of this century) “core” funding for federal universities, this global budget was accompanied by a parliament-approved “performance mandate”. This budgeting mode was politically driven and “resonated well in a nation characterized by a traditionally strong governmental role in the steering of higher education” (Herbst, 2009). An intermediate body (the ETH Board) was installed between politics and academia, formally charged with controlling implementation. This intermediate body, very different from a “Board of Trustees,” is continuously under pressure to micro-manage the implementation of the performance mandate.

Zooming in on a real budget (EPFL)

In 2014, core funding from the federal government amounted to 64.3% of our total expenditure (of around 900 million CHF). A mere 15 years ago, this core funding was at 80%. This implies that, in 2014, 35.7% (or more than 300 million CHF) had to be obtained through competitive research funds,

private sponsoring, negotiations with regional governments and public-private partnerships. Internal income (notably student fees and interest from our endowment) makes up one-tenth (3%) of this effort.

The growth over the past 15 years of our budget is due, in good part, to our success in competitive research funding and sponsorships. Securing competitive research funds, both national and international, has contributed most to the growth of our budget. Sadly their often-insufficient overhead “punishes” a successful research university. Sponsoring was not even recognized as a source of funding before 2005; today it constitutes 12.9% of external funding.

If the trend continues, core funding will be below the 50% barrier by 2030, with consequent implications on the governance and autonomy of our university.

FINDING NEW INCOME STREAMS

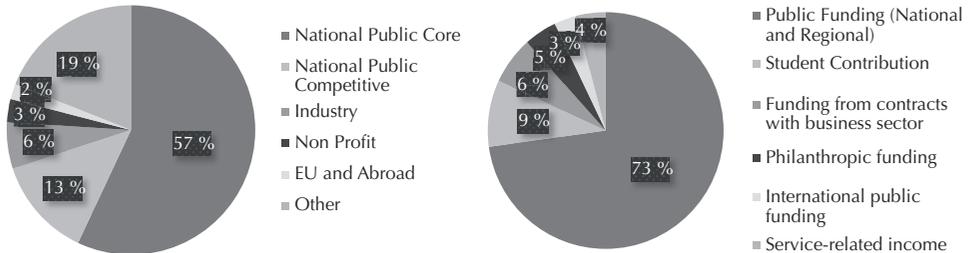
As said, on average, (continental) European universities still benefit from a solid and comfortable level of public (national) funding, at around 70% of total income. In the U.S., when it became increasingly apparent — in the 1990s — that the share of state support devoted to higher education was not likely to return to 1960s levels, universities aggressively sought other revenues, including higher tuition, increased private fundraising and more aggressive endowment investment strategies (Zumeta *et al.*, 2012).

As we saw above, with slowly declining public support, it may now be wake-up time in Europe. World-class universities (on this, the Russell Group [Russell Group, 2012] and the World Bank agree) do not depend solely on finances for their success. They need 1) a critical mass of talent which includes both faculty and students; 2) favourable governance that allows and encourages autonomy, strategic vision, innovation, efficient resource management and flexibility; and 3) sufficient resources to provide an extensive, comprehensive learning environment and a rich environment for advanced research. This paper concentrates on this last point.

As in the U.S., pressures on public budgets and threats of budget cuts drive the diversification of income, and risk mitigation is a powerful driver for the strategic pursuit of new funding sources. While a definitive and comprehensive view of the different “funding streams” for European universities is still out of reach, both the E.U. Commission and the European University Association have offered first glimpses into these income streams.

In the analysis by the E.U. Commission (Fig. 1, left) (De Dominicis *et al.*, 2011), industry sources represent approximately 6% of total income; 3% comes from the non-profit sector, and 2% are (international) European funds; 19% of these extra-incomes are classified as “other”, another indication that university accounting is far from standardized. In the analysis by the E.U.A.

Figure 1: Average distribution of different income streams for European universities. Left: E.U. Commission (JRC). Right: E.U.A.



(Fig. 1, right) (Estermann & Pruvot, 2011), 6.5% of total income comes from contracts with the business sector, 4.5% is from philanthropic funding and 3% from European funds. Altogether, philanthropic funding, collaboration with industry, non-national (European) funding and service-related services represent, on average, between 12% to 18% of the total income of European universities.

In the case of EPFL, total national funding (core and competitive) declined from a high of 91.1% of total income in 2000 to 85.2% of total income in 2014, reflecting an increased pressure on national finances. Had national funding remained stable, EPFL would receive 90 million CHF more than it received in 2014. These “missing millions” are covered by revenue from sponsoring, philanthropy and, especially for EPFL, a very successful drive for E.U. funds (after the creation of the E.R.C).

Below is a review of the principal “money-making” streams outside national funding and tuition, as detailed by the E.U.A (Estermann & Pruvot, 2011).

Philanthropy

Philanthropic sources are a potentially vital source of income for universities. Philanthropy is not nearly as well developed in Europe as it is in the U.S. In fact, a recent collection exercise by the E.U.A. showed that only half of the universities in the sample were able to provide reliable data on this income stream (De Dominicis *et al.*, 2011). Philanthropic sources today are typically 3%-4% of university income in Europe. The underdevelopment of philanthropy has cultural roots. For instance, alumni in continental Europe are reportedly reluctant to “pay twice,” i.e. to donate to the university after having paid for their education (Estermann & Pruvot, 2011). Also, there is no “culture of asking” from the side of most universities. There are furthermore structural insufficiencies; the capacity to attract philanthropic funding is related to the ability of the institution to found other legal entities (foundations) and build up reserves. Most importantly, philanthropy must

be identified as a priority by the university and especially by the university president.

Endowment

Nowhere is the chasm greater between U.S. and E.U. universities than in endowments. In 2014 (NABUCO, 2015) data gathered from 832 U.S. colleges and universities show that these institutions' endowments (totalling **\$516 billion** in assets) returned an average of 15.5% for the 2014 fiscal year. On average, annual endowment funds accounted for 9.2% of institutions' total operating budgets. Not only the yearly returns (15%) but also the size of the endowments is impressive.

This mode of fundraising was pioneered in Europe by the University of Cambridge, which raised an impressive £1.2 billion. If philanthropic endowments are to play a bigger role in the future of European universities, a workforce dedicated to operating them will have to exist. Again, the U.K. is leading in Europe (see the Pearce Report, [HEFCE, 2012]). At EPFL, we have likewise set up a Development Office for this purpose.

Charities

Philanthropic funding of research projects and chairs is on the rise. In Europe, these sources now supply, on average, 6.5% of competitive research funding: 3%-4% in most European countries and almost 10% in the United Kingdom (Aebischer, 2012). At EPFL, private sponsorship has tripled, from 3% to 9% of research income over the past 10 years, funding numerous new chairs primarily tenure-track assistant professors. Full-fledged research centres are also made possible through this funding source, as for our Wyss Center for Bio- and Neuro-engineering in Geneva, financed by a single donor.

We have elsewhere (Aebischer, 2012) drawn attention to the risk of philanthropic funding if charities refuse to cover a university's overhead costs. This leads to institutions with many privately funded projects being punished, in a sense, for their success. Universities may drain resources from education to meet the higher costs of research infrastructure. Private bodies should not hijack university resources. They should contribute a fair share to the expenses of a sustained research enterprise. To make it easier for them to do so, universities should better identify the full cost of research activities and share that information. Because most charities operate internationally, these overheads should be aligned worldwide.

Collaboration with Industry

Despite a lot of hoopla regarding the threat of commodification to universities, industrial funding makes up a mere 6%, on average, of the total income

of European universities. Interestingly, while corporate support has grown, it still makes up less than 10% of all university research — even in the U.S. (Bok, 2003).

In today's knowledge society, a better connection between universities and industry is profitable for both universities and society. This happens through stronger networking arrangements, collaborative funding of research programs, better exploitation of ideas, professional management of intellectual property and investment in “spin-off” and “start-up” companies (David & Metcalfe, 2007). Technology is a “mixed” good, containing both private and public elements. This “mixed good” model (Baycan & Stough, 2013) holds great potential to better serve society through a knowledge transfer system that encourages interactions between universities and industry. Thus, the “public good” model is not dying. We are witnessing a gradual convergence between academic and commercial culture toward “open science” and “open innovation.”

From the perspective of universities, engaging in knowledge commercialization activities is more than a money-making scheme. It also gives access to jobs for students and Ph.D.s, adds inspiration for researchers and leads to new ideas (PriceWaterhouseCooper, 2007, cited in Baycan & Stough, 2013).

Tech-transfer and revenue from patents

Science lore has it that the two U.S. Nobelists who invented DNA sequencing (Herbert Boyer and Stanley Cohen) patented their work, thereby making Stanford and UCSF rich(er), while the two European Nobelists who discovered monoclonal antibody-producing hybridoma cells (Cesar Milstein and Georg Kohler) did not.

In fact, European countries were quick to adopt legislation akin to the U.S. Bayh-Dole Act, and, as in the U.S., a financial windfall from patents does not (or rarely) occur. EPFL, like many other universities, is increasingly successful with patenting and licensing; however, financial returns are unconnected. The fact that these discoveries have led to the creation of numerous start-ups (250 to date) is far more precious and valuable for society, and the regional impact, in direct and indirect employment, is substantial. Interestingly, the higher economic impact of the United Kingdom's entrepreneurial universities is also explained by entrepreneurial spin-offs, rather than revenue from patents (Russell Group, 2012).

Attracting Companies

Another important consequence of industry collaboration is that it attracts existing companies to campus to build sustainable partnerships. The U.K., in particular, has been highly successful with attracting commercial investment

in research and development (R&D) from overseas (Stromquist, 2007). Inviting bigger companies — especially international ones — to campus has been an ongoing and, thus far, successful strategy at EPFL. While direct financial benefits for the university are modest, over the long term the economic impact on the region and jobs for graduates pays off handsomely through a renewed interest of government and parliament for universities. World-class universities are able to form high-tech innovation clusters of knowledge-intensive activity. R&D companies and venture-backed companies tend to settle near top universities, and research-intensive universities are one of the main driving forces behind the development of high-tech clusters (Russell Group, 2012).

Service-related income

Revenue generating services comprise the management of conference facilities, catering and accommodation (including student residences). In Europe, some universities do generate revenue from these services, but in general institutions seek to cover running and lifecycle costs of these services. In other words, making a profit is not the primary aim. This is the case at EPFL, where student residences, hotels and a conference centre were built by the university in a public-private partnership (rent-to-own scheme), without government aid or investment — a first in Switzerland.

International Public (EU) Funding

This income stream makes up, on average, less than 2% of the total revenue of European universities. However, some schools that are firmly integrated into the European Research Area, such as EPFL, score very highly in European research funding. We recommend the vigorous and sustainable development of ERC-type funding, which gives a unique and competitive playing field for all universities. Coverage of total cost is a point of contention, since insufficient coverage of indirect costs punishes successful universities.

In addition to such a funding scheme that favours the best universities, networks of universities could be sustained through a healthy use of structural funds (as with, for example, the Teaming partnerships in Horizon 2020).

ERC-grant successes delineate European hot-spots for leading universities. Paris, London, Munich, Cambridge, Oxford, Zurich, Barcelona, Amsterdam, Lausanne and Madrid comprise the top ten (European Research Council, 2015).

Extension Schools and MOOCs

At a previous conference, we pledged the rebirth of world-class European universities through MOOCs (Aebischer & Escher, 2013): “If we play our

strengths right and engage the IT revolution cleverly, European world-class universities will once again be among the best.” Two years later we now know that, unlike the perspective of American universities, we do not have to think of MOOCs primarily as a cost-saving teaching technology. MOOCs per se seem irrelevant in a discussion about diversification of income streams. However, we also know that most of our MOOC students already have university degrees and are using MOOCs for professional development; they also wish to be certified (see e.g. Escher *et al.*, 2014). This creates an opportunity for a new financial stream. How important that stream will become remains to be seen.

Reduce Costs?

We have focused our discussion on additional financial income for European universities and have said nothing about reducing costs and improving productivity. As long as our customers — i.e. students — are not a decisive financial resource, raising completion rates and lowering time-to-degree, while highly commendable, will not bear significant financial impacts. Generally, efficiency is not a helpful guide in discussing the financial set-up of great universities. As one president of Harvard used to say: “To encourage real creativity, you need to have a good deal of slack” (Bok, 2003). Interestingly, our cursory analysis of some great universities in Europe shows that the cost per student at a great university is around \$80,000 per year (and roughly \$100,000 at Harvard), regardless of the underlying financial streams or conditions. Thus, we know the cost of necessary “slack”.

CONCLUSION ON DIVERSIFICATION

World-class universities require adequate investments for teaching and research from a broad range of sources (Russell Group, 2012), and research-intensive universities draw on a complex mix of public and private income sources. All these funding streams — endowments, charitable income, business partnerships, expansion of international activities, income from international (extra-European) students — offer crucial funding opportunities. However, ultimately our great universities owe their success and financial stability to public support. Moreover, public support will remain high given the societal relevance of universities, as politicians and the public understand that the knowledge economy requires top-flight research and world-class universities.

Cities that are lucky enough to host great European universities will increasingly be inclined to contribute to these lively campuses and the substantial economic impact they produce.

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