THE CONTRIBUTION OF RESEARCH-INTENSIVE UNIVERSITIES TO THE FUTURE OF PROGRESS

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1. Introduction

For many centuries, universities focused on discovering new knowledge "without being subject to any clear quality criteria" (van der Zwaan 2017, p. 91). In pre-war Europe, the idea that universities might contribute to progress in a more general sense of the term was not prevalent. There were even fears of "over-education" should access to higher education be extended beyond national elites (Valero and Van Reenen 2018, Goldin and Katz, 2008). Nowadays, it is undisputed that universities make decisive contributions to progress – be it in terms of research, education, general societal development or by boosting economic growth. Recent data show correlations between the number of universities in a country and future growth of GDP per capita (Valero and Van Reenen 2018). As economic, ecological and social challenges increase, so does public interest in immediate and measurable output of universities. More and more, academia is expected to focus on impact which generates direct benefit for society. Already today, the idea that academic research should serve a purpose is influencing research funding. With the ongoing Covid-19 pandemic and the economic and social crises that are likely to follow, such trends will intensify. Institutions of higher education have indeed a great capability and also a duty to offer solutions to pressing global problems. Curiosity-driven research and diversity with regard to research topics nurture creativity and innovative spirit – abilities that are indispensable in an ever faster changing world. The authors therefore believe that solely challenge-driven research – however important it may be – does not represent the most significant contribution of research-intensive universities.

This paper discusses how research-intensive universities contribute to progress today and which framework conditions must be met for universities to successfully contribute to the future of progress.

2. Universities' contribution to progress

"The concept of progress is in fact defined as a motion toward a goal" (Potter 1962, p. 1). This expression reveals the issue of the current discourse on progress. The term "directional research", as occasionally used by the European Commission, suggests a vector pointing forward - with the term "forward" being intrinsically linked to the notion of progress. More problematic is the fact that the term "directional" is associated to the notion of "serving a purpose", thus deemphasizing serendipity and value free basic research. Interestingly, we would not argue alike when looking at art. What progress can be identified when contemporary art is compared to Roman art? Are Roman pieces of art "better" than today's sculptures or paintings? It is argued here that the same is true for progress in research. Undoubtedly, research has made tremendous progress over the past 100 years, in the sense that new methods have been developed and new discoveries been made, such as, for example, in vaccine development or by expanding the standard model in physics, just to name two examples. But this does not mean that science itself is better today than it was 100 years ago. To judge the quality of science by its results alone does not do it justice – there are many more criteria that should be considered as well (e.g. methodological aspects, ethical standards, etc.). Increasingly, science is also measured by how successfully it operates at science-policy interfaces. And quite rightly so: Without strong science-policy interfaces, many recent key achievements would not have been translated into useful policies, such as the 2 degree Celsius climate goal or the United Nations Sustainable Development Goals. It is widely accepted that the agreement on the 2º C climate goal represents a significant progress. Hence, governments must increasingly interact with science, namely for three reasons: We need science to make sense of the world around us, to guide us, and also to find new solutions to the challenges of our time (v.d. Leyen 2021). Thanks to science, we live better, longer, freer, and happier. The reason for this is that we argue with reason, science, humanism and progress (Pinker, 2018). Accordingly, the future of progress represents a whole series of currents that fight tendencies limiting humanity, such as authoritarianism, ideologism, and fatalism. The notion of the future of progress is used here in a context of the necessity to foster value-free, basic research, contributing to the continuous evolution of the world towards a better place within new and emerging boundaries of global trends. The future of progress

encourages an agenda of scientifically informed criticism, allowing the notion of progress to be decoupled from its traditional meaning of purely economic growth by including degrowth theories (c.f. political ecology, environmental justice, etc.) and other alternatives to be valued as progress, too.

2.1 Benefits of value-free research

As mentioned above, it is believed that curiosity-driven, value-free research is of specific importance when promoting the future of progress and innovation in general. According to Benneworth and Cunha, "(…) the reality of innovation is not a series of smooth loops, but an unpredictable trajectory of experiments, failures, choices and dead-ends (…)" (Benneworth and Cunha, 2015, p. 11). In short, innovation is rarely a targeted process. Numerous scientific breakthroughs that would later prove decisive for scientific or societal progress came about rather by chance – take, for example, the discovery of penicillin. Therefore, the authors believe that one of the most promising ways in which universities can promote progress and a positive evolution of the world is to promote freedom. That is to say, promote free inquiry, create free spaces for researchers to conduct basic, value-free research, and finally foster freedom in academic teaching, too. This last point seems particularly important: In a rapidly changing world and with many countries entering the Fourth Industrial Revolution brought about by technological change it becomes increasingly difficult to assess today which kinds of knowledge and abilities will be needed tomorrow. Hence, universities should be all the more concerned to remain independent and flexible in their research and funding strategies as well as in scientist' skills. Many companies are currently launching their own apprenticeship programs so they can "mold" young people to meet their demands. The best examples are Apple University and Singularity University. Research universities, however, should offer courses of studies independent of global or regional trends prone to change. They cannot afford to put their main focus on specific topics that are being considered "fashionable" at the moment, as the hype might be over again soon (M. Schaepman in Furger and Hossli 2021). Likewise, there might be fields of knowledge that receive little public attention at the moment, but could become more important in the future. In the following, an example of the authors' home institution is cited: Since 2013, the University of Zurich (UZH) has been operating a center of research on Asian and Oriental studies. The institute brings together Indian,

Chinese and Japanese Studies, Islamic Studies and Gender Studies, all of which are small subjects at UZH with modest student numbers. Recently, however, we have noticed a growing interest, especially in Japanese studies. A development that is, amongst other things, attributed by the authors to the increasing importance of Asian countries in a global context.

When discussing the contribution of universities to the future of progress and the role of value-free research, it is also pointed out that of "the myriad ways in which universities contribute to changing the world" (Benneworth et al. 2019), only a small part is directly measurable (e.g. transfer of knowledge and technology into marketable products, number of spin-off companies, generation of economic activity). Apart from that, universities also play an indirect "developmental role" (Gunasekara 2006, p. 730) for example by providing unbiased analysis or capacity building through academic teaching and by providing access to qualified information via free lectures, panel discussions or museums. Last but not least, the concept of academic freedom itself might promote positive societal development as well. According to Bérubé (2007) and Giroux (2007), universities are fundamental for maintaining democratic societies, as they foster democratic ideals such as free inquiry. Similarly, Tierney and Lechuga assert that "academic freedom has been assumed to be not simply a useful idea for those who work within the academy but for society" (Tierney and Lechuga 2010, p. 130).

2.2 The role of directional (targeted) research

However, it is precisely the independence of universities – and hence, the freedom of research – that is under threat. Mainly because of the increasing pressure universities are exposed to, requiring them to translate research investments directly into benefits. There are several reasons for the growing demand for targeted research. First of all, there seems to be "a growing sense of being at a tipping point, a time of transformation" (European University Association 2021, p. 4) that is driven by global mega trends affecting all levels of societies worldwide: Accelerating technological change and digitalization, rapid evolution of knowledge societies, transformations of the world of work, ongoing processes of globalization and urbanization, emerging markets, ageing societies as well as multiple economic, political and environmental pressures (cf. Mc Kinsey Global Institute 2015, Davey, Meerman et

al. 2018, European Commission 2020, European University Association 2021). Exactly how these trends are affecting research universities will be discussed in more detail later.

Against the backdrop of global challenges, society's expectations towards universities to fulfill their “third mission” (Etzkowitz and Leydesdorff 2000, p. 3, van den Akker and Spaapen 2017, p. 7) have increased in recent years. More and more, policies are shifting towards the “delivery” (Alexander and Manolchev 2020, p. 1143) of scholarship and research for societal impact. The point, however, which is made here is not that targeted research should be rejected in principle. Universities have always been embedded in local societies and interacted with them in various ways. Also, societal interests can provide impetus for research projects that advance science and support progress. At UZH, the need to contain the pandemic and the spread of the Coronavirus have given rise to a large number of new research projects, many of which have already produced significant results. Thus, what is criticized is not directional research per se, but rather the shift from university autonomy towards a culture of efficiency and performance (cf. Alexander and Manolchev 2020, Ball 2003) that goes along with the promotion of directional research. This shift is supported not only by the previously mentioned external trends, but also by a range of internal trends shaping the landscapes of higher education.

3. Internal and external trends acting on universities

External trends that affect universities worldwide include global risks, which are predominantly environmental (biodiversity loss, climate change, etc.), technological (disrupting labor markets and changing lives, etc.), geopolitical (democracies under pressure, interstate conflicts, etc.) and societal (disparities, migration, etc.). The top 5 global risks in terms of likelihood and impact have changed from 2007 to 2020 from being economic dominated to environment dominated (Figure 1, WEF, Global Risk Report 2020).

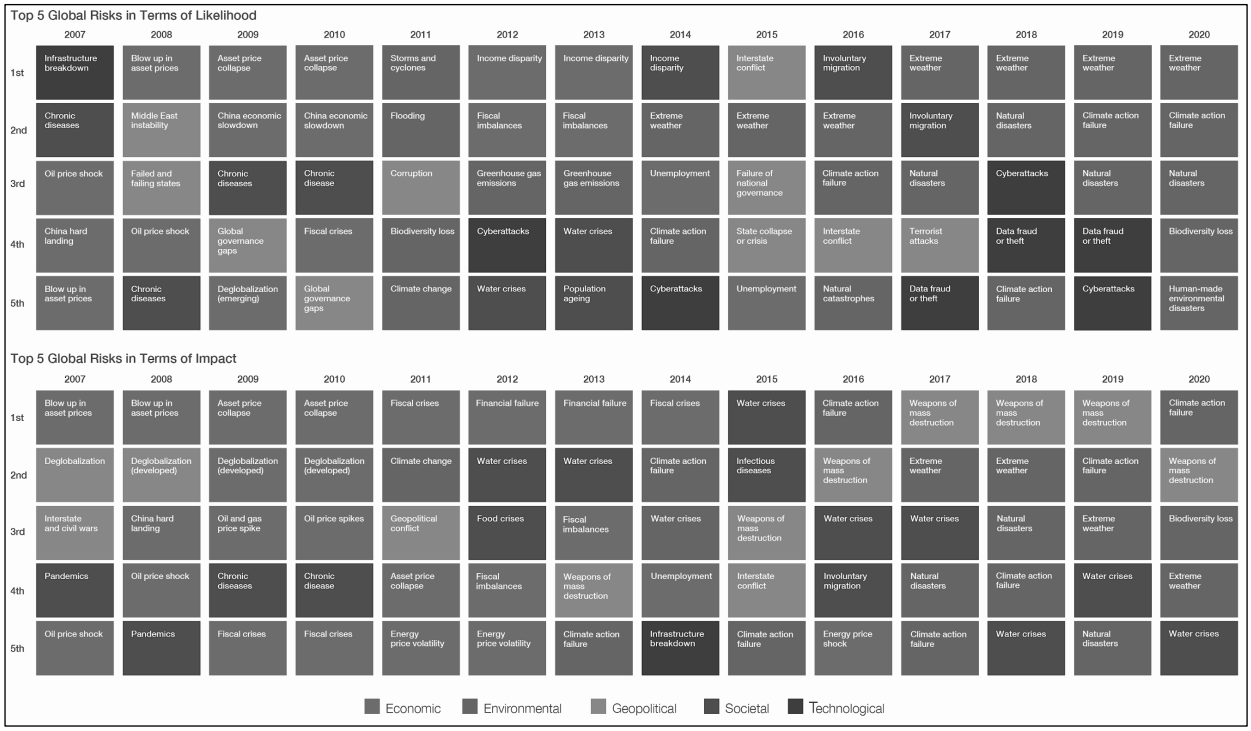

Figure 1

At the same time, the predominantly dual role of universities in higher education and research is itself increasingly developing to be a geopolitical factor, too.

Internal trends affecting universities include expectations towards universities to provide answers to pressing questions more rapidly and in a more targeted fashion. Keywords often mentioned in this context are agility, directionality and translational research. The European Research Area (ERA) constitutes of a 14-point action plan (DG Research and Innovation 2020), that is based on excellence and competition as well as on talent driven and open research. Key to ERA are ideas such as “developing industrial technology roadmaps to maximize innovation in strategic areas” (Action 5), “strengthening excellence and maximizing the value of knowledge generation, circulation and use” (Action 6), as well as “developing guiding principles for creating value from knowledge” (Action 7), reconfirming the need of “directional research”. An emphasis on the need of independent, value-free fundamental research is not expressed anywhere. In other words, the majority of trends that can currently be observed indicate that universities are primarily requested to provide more value for the (predominantly) governmental investments. Both inside and outside universities, the focus of decision makers is on efficiency and efficacy. And since most universities nowadays face an underfunding challenge – as research grows much faster than financial support to universities – they need

to be as efficient as commercial market players. The third space, increasingly occupying professional roles in general management, specialist areas, or quasi-academic areas at universities (Gordon and Withchurch 2007), will have to overcome the prevailing simple dichotomy of administrative versus academic staff (Rhoades 1998). Skill-sets of future labor workers are composed of all relevant skills necessary to perform basic research (such as analytical thinking and innovation, active learning strategies, complex problem solving, creativity, originality and initiative, etc. (WEF 2020, p. 163)).

What is more, universities are nowadays required to provide synthesized findings that are understandable for a broad, non-academic public and written in a “marketable” form. In Switzerland, discussions about “optimized” science-policy interfaces have intensified recently in the context of the Coronavirus pandemic. In spring 2020, the Swiss government set up a scientific Covid-19 task force in order to support political decision-making processes, including lock down policy, by scientific evidence. The role of the scientific task force, however, repeatedly gave rise to debates. There were voices criticizing the cautionary tone of the taskforce, while the scientific experts themselves complained about not being listened to enough. The example of the task force is a good illustration of the conflicts that are likely to arise when "usability demands" are made on basic research. Tensions became particularly evident when the nearly real-time development of a vaccine against Covid-19 simultaneously gave rise to requirements for synthesis findings based on clinical trials of new vaccines to be made available in real-time, too.

4. New university models

In view of the many external and internal pressures affecting universities, several new university models of how to make universities fit for the future have been proposed recently.

In their “thoughtbook” on the future of universities, which was funded by the European Commission, Davey, Meerman et al. set out to create a vision for the university in 2040. They do so by giving the views of various academics, entrepreneurs and thought leaders in 40 individual articles. While not proposing a clear-cut university model, the majority of voices speaking in the “thoughtbook” place a strong focus on the need of universities to become more

engaged and entrepreneurial if they wish to thrive in an uncertain future. The authors agree in principle that universities will continue to play an important role as providers of "discipline-knowledge" (Davey, Meerman et al. 2018, p. 11), especially in light of the increasing importance of lifelong learning. But the way in which universities will perform this task will change significantly. According to van Damme (2018), for instance, universities should adapt their teaching by focusing more on skills that are relevant in the labor market. In the view of several authors, universities should also strive to adopt new learning and teaching methods to allow for more flexible, cooperative, interdisciplinary learning (cf. Dolderer 2018, Godsman 2018, Coley 2018), also by making use of new technologies in order to reach more students (Davey, Meerman et al. 2018). Another point which is highlighted by several contributors is the importance of co-creation of knowledge and value-co-creation between stakeholders from academia, business and society at large (cf. Bregenholt 2018, Plewa et al. 2018, Abruzzini 2018). As the editors put it, the authors collectively "envisage a close integration of university and business, founded in a clear understanding of the economic and social benefit such a collaboration can achieve". (Davey, Meerman et al. 2018, p. 15). To sum up, according to the "thoughtbook", universities that wish to play a significant role as drivers of positive change in the future must align with business innovation and transform into spaces where academics work in "symbiotic partnerships with industry, government and societal stakeholders" (Davey, Meerman et al. 2018, p. 6).

In a similar direction points the "Blueprint for Universities of the Future" proposed by a Knowledge Alliance Project also supported by the European Commission. The report provides recommendations "on how to solve the educational challenges around Industry 4.0" (Universities of the Future 2019, p. 3). According to the authors, Industry 4.0 will mainly require "transferable skills" (Universities of the Future, p. 8) that can be applied in changing settings and across disciplinary borders. To ensure that employees can keep their skills up-to date in a constantly changing world, the "Blueprint" sees it as one of the main roles of universities in the future to provide educational programs that ensure a skilled workforce. In order to make sure that education is aligned to the needs of industry and society, universities should act as "platforms" or "bridge builders" (Universities of the Future 2019, p. 12) that foster the relations between higher education, industry and the public sector. The authors

emphasize that “developing closer collaboration between Institutions of Higher Education and industry is for mutual benefit” (Universities of the Future 2019, p. 12).

Cooperation between academic and non-academic partners plays an important role also in the vision of universities without walls, which was proposed very recently by the European University Association (EUA) in 2021. The paper aims at providing European universities with a model of how they should aspire to develop during the next decade. Looking to the future, the authors envision “universities without walls” (European University Association 2021, p. 5) assuming a leading role within society, both as drivers of societal change and as centers of research, where knowledge is built, developed and shared within national or international networks. Again, the function of universities as bridge builders and co-creators of knowledge is highlighted. However, the role of universities without walls is not that of institutions reduced to “knowledge providers” delivering specific services. Rather, they retain the traditional core missions of universities (teaching, research, innovation and contributions to culture) but strengthen their transformative capacities by becoming more open and engaged. By open universities, the authors understand institutions that are connected with partners from inside and outside academia as well as accessible to students and staff from diverse backgrounds. This includes for instance providing a physical campus, but also a virtual one. The term engaged universities describes institutions that put their skills and knowledge into the service of society, in particular by tackling global challenges such as sustainability, social cohesion and the promotion of diversity. But targeted research is not presented as the only way to fulfill this mission. Rather, the authors emphasize that value-free research will be of essential importance for universities in the future: “(…) curiosity-driven research will be a precondition for knowledge-based solutions, it will also be fully recognized as an end itself. Universities will provide space for lateral thinkers who test and develop new ideas that are not yet acknowledged (…)” (European University Association 2021, p. 8).

In order to turn their vision of universities without walls into reality, the authors identify three decisive factors: enabling frameworks, in particular the protection of university autonomy, adequate (more) investments and strong leadership. Additionally, three more priorities are mentioned, which must be considered for a successful implementation of the universities without walls model. According to the authors, their vision requires a reform of academic

careers (more flexible, less precarious, new evaluation practices), more interdisciplinary approaches and finally more measures on the part of universities to promote social engagement.

5. Conclusions

While excellent universities are both responding to changes in trends and actively contributing to trend setting, their resilience is dependent on the amount of basic research performed. Research-intensive universities contribute to progress by shaping the future of research, teaching, innovation and culture. A strongly diversified portfolio of research activities, substantial research-intensive and moderate directional research, constitutes the best strategy to build resilience and reinsurance for future trends. The future of progress is strongly dependent on diverse, interdisciplinary and basic research activities of universities.

Key framework conditions for sustainable university models are:

a) sufficiently high fraction of available basic research funding for interdisciplinary topics,
b) skill set of teachers and students aiming at new academic and economic labor market requirements (such as empathy, emotional intelligence, etc.)
c) creative, original and critical thinking for innovative approaches and ideas, as well as
d) leadership and social influence to establish a culture of openness, sharing attitude, and resilience.

It is up to the universities to take up those challenges and ensure with their strategy, that their research strategies are not outpaced by an accelerated (external) change of trends, regionally, nationally and globally.

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