

“An unprecedented increase”

A short inquiry into causes why in one of the richest university settings of the world everybody is unhappy

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FORMAS

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A SWEDISH RESEARCH COUNCIL FOR SUSTAINABLE DEVELOPMENT

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**A short inquiry into causes why in one of the richest
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Foreword

In 2018, the Swedish government initiated a comprehensive review of the steering of resource allocation to Swedish state Higher Education Institutions (HEIs), including suggestions on a new framework of governance and funding to develop strong and responsible HEIs. As part of this investigation, the roles of the governmental research funding organisations were also discussed. The investigation, known by its acronym STRUT, was delivered to the Swedish government in February 2019.

Adding to the discussion on different governmental funding streams, Formas commissioned a conceptual (theoretical) analysis to investigate the pros and cons of direct research funding to universities versus distribution through research funding organisations. As an independent analyst, Dr. Michael Stampfer agreed to undertake the commission and the report “Pros and Cons of Distribution Streams of Governmental Funding for Research” was published in March 2019. As an addition to this comprehensive analysis, Formas then asked Dr. Stampfer for a report focusing on the Swedish system for research.

I would like to thank Dr. Michael Stampfer for an impressive work, digesting both international as well as national analyses on the Swedish system. I also would like to thank Dr. Pauline Mattsson for collaborating with Dr. Stampfer, translating the content of the Swedish analyses and adding valuable input, and Katarina Nordqvist, Senior Analyst at Formas, who has been instrumental in the commissioning of the report.

The issues raised here are complex but with this report I hope that Formas can inspire to an evidence-based discussion on the Swedish system for research, to achieve high-quality research for a better and sustainable world.

Ingrid Petersson
Director general, Formas

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1 Short summary

Parts of the Swedish university sector and its academic communities feel under pressure, as many signals, rules and incentives appear to shove the system into short-termism instead of long-term strategies, and into a feeling of being driven instead of actively building portfolios. This has led to a discussion about the causes of discontent, and among a few other things, Third Party Funding (TPF) has been identified as a main determining factor: According to a recent government report called STRUT, there is a need to regain more balance through higher Direct Appropriations and eventually lower TPF shares or even budgets. STRUT has made alternative proposals here: Further growth of Direct Appropriations only or re-direction from TPF sources. University representatives deplore limited room for manoeuvre and a general feeling of poverty, at least when it comes to planning, organising and financing longer-term, strategic priorities.

For non-Swedish observers this discussion is puzzling at first glance as the Swedish Higher Education sector is one of the best-endowed university systems in the world: GDP is very high and so are the government outlays and appropriations for research. These public funds in Sweden traditionally go to universities as there is no large institute sector in place. University funding of all kinds has been growing massively over the last ten years, at least when it comes to research, while student numbers have grown only marginally. The last three *research and innovation bills* in 2008, 2012 and 2016 have foreseen increases in Direct Appropriations and for public foundations and agencies which offer grants coming with full cost coverage. In parallel also the semi-public foundations and namely the private non-profit sector (but not industry) have been able to strongly augment their funding.

Although the Swedish government has traditionally asked universities for societal relevant and ‘third mission’ activities, a portion of the additional means came under the heading of boosting excellence and top-class research. Parts of the university sector however have perceived this additional input rather as a limitation regarding strategic scope than as an incentive to foster breakthrough research.

Again this is not easy to understand for external observers and there are not too many of them: Swedish research policy analysis is mainly a business of Swedish actors, and actors with an academic background play the most important roles. In two rare events, the OECD analysed the Swedish research and innovation system in 2012 and the additional research budgets in 2016. The results were by and large not been taken up by the Swedish discussion. The relevant findings of the two reviews can be broadly summarized as follows: Sweden is not a world leader in translating high inputs into world-class research results. The scientific outputs and impacts have been rated very good but definitely not outstanding, given the very high input and the visible gap between Sweden and other small countries like Switzerland, Denmark or the Netherlands. For university performance, the 2012 review asked whether Sweden could do better and the answer was yes. The 2016 review found little evidence of performance increases which might have materialised given the strong budget increases.

The two OECD reviews see room for improvement regarding strategic leadership of universities and building critical mass, as well as in the way how Swedish universities present themselves as internationally attractive employers for top class researchers. Both recruitment and career models as well as labour law requirements seem to favour incumbents and in-house careers which also might lead to specific collective mind-sets of academic communities.

Finally the OECD sees room for improvement also with the funding system, where many actors send many – often similar – financial, thematic and structural signals to the universities. The universities could not take up properly all of these signals in order to transform them into strategic action: In part this has to do with the nature of universities, where the individual academics and epistemic communities exert large influence on research content and funding applications. To a certain part this was due to lacking university strategies and proper mechanisms to plan research portfolios. Some of the TPF mechanisms and properties also received critical remarks and recommendations for improvement.

The 2016 review found an overall gap between the global ambitions of Sweden as a research and innovation nation and the rather local concerns and ambitions in its HE and research policies.

The present analysis was written on request of FORMAS and offers a wrap-up both of the two OECD reviews and of the authors' *Pros and Cons* review¹. The latter was written to provide an international comparison about the advantages and disadvantages of different forms of university research funding. Based on the questions raised by the OECD the present analysis tries to see what Swedish sources do say about the three questions: (i) *Strategic leeway of universities*, (ii) *recruiting and career issues* and (iii) *properties of the funding landscape*.

Its title “*An unprecedented increase*”² owes to the huge financial growth of university research funding in the last ten years. The outcomes and impacts however make no side completely happy. What are the underlying reasons? Is the relationship between Direct Appropriations and Third Party Funding the main explanatory factor or do we find other such factors along critical points raised by the OECD? The present analysis takes a look also on Swedish sources and tries to find some evidence. This evidence points to some more structural issues both in the university system *and* the funding system. The universities, being strongly shaped by entitlements and a researcher population of incumbents, face difficulties to manage strategic portfolios and to build internationally attractive recruitment and career structures. Temporal funding is often translated into permanent staff growth leading to an appetite for more temporal *and* permanent funding. The funders, in large numbers, confront the universities with a plethora of signals and requirements while showing a tendency to offer many similar products on a safe middle ground. In addition, no strong arbiter does exist in the Swedish research system.

All sides face difficulties to reform: The universities' capacity to change might be strongly shaped by traditional entitlements and procedures. The number of TPF sources might be just too high. The state as well faces limitations as a change agent: Ministries and other coordinating bodies are traditionally small. The reforms of the university system are a long, step-wise journey, as reforms are *de facto* very difficult to implement (and come with a *de jure* contradiction between competition incentives and labour law entitlements). Reforms of the TPF system face *de jure* challenges, as neither the semi-public nor the private foundations can be influenced by the state.

Probably these are some of the reasons why the Swedish discussion currently focusses on the amount of TPF shares, although changing that alone might neither lead to the path to excellence nor to the path to relevance ... nor to happiness as well.

¹ <https://formas.se/en/start-page/analyses-and-results/reports/2019-05-13-pros-and-cons-of-distribution-streams-of-governmental-funding-for-research.html>

² The quote is from the Swedish 2017 RIO report (Hallonsten and Slavcheva, 2018, p. 13).

2 Task of this working paper

Context

This working paper is a follow up to “Pros and Cons of distribution streams of governmental funding for research” (Stampfer, 2019), an analysis written by the author and commissioned by FORMAS, a Swedish Research Council for Sustainable Development in 2019.

It tries to draw some conclusions on Sweden in the light of the current discussion around the so-called STRUT report (SOU, 2019). This government investigation calls for considerable changes in the way how universities shall be funded. Main recommendations inter alia include one common stream of direct government funding (Direct Appropriations) for research *and* teaching, an increase in factual university autonomy (“trust-based management”), opportunities for the smaller and younger universities to develop in a better way; and last but not least a re-allocation of research funding streams: The STRUT review comes forward with a number of arguments to shift resources away from the well-developed Swedish Third Party Funding (TPF) landscape in favour of higher Direct Appropriations. This demand goes in line with other studies recently issued by representatives of the Swedish academic community, based on claims that a higher share of Direct Appropriations would entail gains in efficiency and effectiveness as well as higher outputs and impacts as well as more room for autonomous priority setting. The *Pros and Cons*’ review was a direct consequence of the STRUT process (but not its report itself as it was basically written before STRUT was issued) and it was meant to get a common knowledge based for the Swedish research actor set.

The task of this paper is to help broaden the discussion base in Sweden in the wake of the STRUT report. As a discussion paper, it shall provide some sources and inform FORMAS, its fellow funding organisations and other interested parties about a few issues which have yet been less central in the ongoing discussion.

Structure of this analysis

First we go back to the two extensive OECD reviews on the Swedish innovation system (OECD 2012; OECD, 2016; and a few other sources). These reviews represent a rare species for Sweden: They are comprehensive (system view) *and* external (international organisation *and* experts). Both have covered the university landscape and the funding system in an encompassing way, including the three main topics of this working paper: *Strategic leeway of universities, recruiting and career issues and properties of the funding landscape*. The OECD reviews have – on the basis of many sources and interviews – come forward with a whole score of insights and recommendations. The latter have been tested in large community stakeholder workshops and found broad acceptance. More or less, that was also the end of the adoption process. Therefore, it might be worth revisiting them in the light of the STRUT report; this is being done in *chapter 3*.

Next follows a short recapitulation of the *Pros and Cons* analysis for FORMAS (Stampfer, 2019), which had tried to find evidence in the international academic and evaluation literature which funding instruments for university research show which effects in different contexts. It was commissioned and written as a broad literature review without specific conclusions for Sweden. Here we first have a look on which studies put Sweden in comparison with other countries and how the Swedish system to fund university research performs relative to other systems. Next, we try to draw some conclusions for Sweden from studies and analyses covering one or more countries (but not Sweden). Finally, we

go into a few more categorical arguments, again along the three main topics *strategic leeway of universities*, *recruiting and career issues* and *properties of the funding landscape*. The “Pros and Cons” analysis is being discussed in *chapter 4*.

The next three *chapters 5-7* in more detail deal with the three issues that might contribute to understand things also beyond the ‘*university – TPF rift*’: This includes the question why Swedish university research has an input-output problem and why Swedish universities are being inhabited by many unhappy residents complaining about their relative poverty ... in one of the best-financed university systems in the world: Sweden is very rich and it spends more on universities, namely university research in relation to its GDP than most other rich countries. All three issues have been present in the Swedish discussion. In all three points we will have a look at some of the existing, mainly Swedish sources.

The first issue is the *strategic leeway of university management*. Here the background is the nature of universities as “incomplete” expert organisations strongly driven by the individual academics and by epistemic communities. The strong bottom up principle makes it difficult to actively manage a thematic portfolio. Different countries have different models in place, strongly influenced by cultural and legal trajectories. In the rich Swedish system, the general feeling of poverty within academia might be linked to forms of steering and distribution models, with university leadership facing certain limitations. This will be discussed in *chapter 5*, albeit without too much detail, as there are only few studies around.

The second issue covers the question *how universities recruit and provide career tracks* for academic positions. These questions have gained prominence in the light of the increasing competition for top talent and high performers as well as growing internationalisation of research and the prominence of university rankings. Sweden appears to have a mixed record, with many in-house careers and still various, partly opaque career tracks and with layers of different career modes. The consequences in principle are clear: Quality first comes through the selection of people. The stronger a faculty, the better are the outputs and impacts. Further, the stronger a faculty, the higher are the standards for applicants, new entrants and researchers still on the junior levels of the career track: Through this mechanism, high quality standards in a rich system have the chance to become permanent properties. Without any doubt, recruitment and career systems affect the quality, efficiency, effectiveness and impact of university research strongly. *Chapter 6* will look for evidence in Sweden.

The third issue points to the *funding system*. Contrary to a number of also well-endowed comparator countries, Swedish university researchers can draw from a very rich landscape of funding organisations, their boards often dominated by Swedish university researchers. Each of the three sub-sectors is inhabited by a number of funding sources: Public RFOs, semi-public foundations and private philanthropic foundations. Most of them have grown considerably in the last years. Most have instruments in their portfolio that are very similar to those of a number of their main competitors *and* cooperation partners, i.e. the other Swedish funding organisations. *Chapter 7* will – again with not many sources available – make a few selected comments whether this landscape affects quality and governance of university research, and if yes, how.

Terminology

The main concepts are used as in the “*Pros and Cons*” analysis (Stampfer, 2019) and will not be repeated here except two core terms:

- *Direct Appropriations* means all kinds of block grants, formula-based funding, namely Performance Based Research Funding Systems, PRFS) and other basic HE funding including public appropriations steered through *Performance Agreements* (PAs). “Direct Appropriations” is the term used in the Formas request for this analysis. Note that there are alternative terms being used in the literature also. The term *Block grants* stands for a completely unconditional funding stream, delivered by the state to the universities, either for research or research and education.
 - Note that the OECD reviews use the term GUF which stands for *General University Funds*. Here it is synonymous with *Direct Appropriations*, although GUF in literature can have also a more focused meaning.
- *Third Party Funding* (TPF) stands for all kinds of projects, programmes, centres and initiatives provided by *Research Funding Organisations* (RFOs), funding councils, public funding *agencies* and other public actors. These TPF activities range from purely bottom up funding to various kinds of top down elements of a thematic, mission-oriented or structural nature. The term TPF is being used as in this analysis there is no need here to further classify this funding into second- and third-stream *public* money (but see e.g. Koier et al., 2016). For the analysis these include all main external sources for research except industry and philanthropic funding.

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3 Learning from external studies about Sweden

3.1 Introduction

Sweden has a well-developed evaluation culture, leading to a reflected and iterative form of policy-making. Most of these evaluations are being done by Swedish analysts³ and they focus in scope on individual policy instruments, as most of the evaluations are commissioned by the various funding organisations. There are exceptions to this rule: Regarding *scope* we find a number of government enquiries like STRUT (SOU, 2019) or long-term impact assessments on funding in core areas (Arnold et al., 2008a; Arnold et al., 2008b). Regarding the *external* view a number of evaluations have been employing international experts, but more as peers for scientific and technological assessment than for an external system view.

In the 2010s however, two comprehensive OECD reviews have analysed the Swedish innovation system. The first one (OECD, 2012) was a study on the overall system performance and had been commissioned by the Swedish Ministry of Enterprise. The second one (OECD, 2016) was in most respects a follow-up exercise to deepen the first review along a number of substantial policy actions, like increasing Direct Appropriations and the introduction of various policy instruments like the Strategic Research Areas (SFO), the Strategic Innovation Areas (SIO) or the Challenge Driven Innovation programme (CDI / UDI).

Two such reviews therefore have been produced within four years. They include quite strong statements, which were not excessively discussed in Sweden. This also means that their findings were never directly contested. Both reviews together were based on hundreds of sources and interviews with more than 150 people.

If the OECD reviews had come to blatant misinterpretations, this might have stirred some protest. It did not. On the contrary, large stakeholder workshops (specifically the one at the end of the 2016 review, using interactive smartphone-based opinion polls) strongly endorsed the findings.

In addition, the RIO Country Report (Hallonsten and Slavcheva, 2018) will be presented as another source of analysis. It combines a Swedish and an international viewpoint for a recurring update on the Swedish research and innovation system.

3.2 The 2012 OECD Innovation Review

General description

The main recommendation of the 2012 review was to foster critical mass, excellence and relevance in public sector. The Swedish performance was rated high but not outstanding, also in the light of the then highest HERD/GDP ratio across the OECD area (ibid., p. 125; a position which has slightly changed since then). This was specifically true for the HE sector: After a period of financial stagnation in the 2000s, Swedish universities have seen substantial budget growth from 2008 onwards, with direct state funding (of all kinds) being the fastest-growing HE revenue stream for

³ This also includes a number of studies by actors like the international consultancy Technopolis, which has a Swedish arm and intimate knowledge about the Swedish system for nearly thirty years.

research in that period, with a HERD/GDP increase from 0.75% to 0.90% in the period 2007-2010 (*ibid.*, pp. 34 and 175 ff.; however, note that GDP did not grow excessively at that time). The introduction of indicator-based funding into Swedish HE Direct Appropriations was met with some scepticism by the OECD due to the caps coming with it, and the high TPF share did not raise great concern then. High TPF shares have been a longer term property in Sweden.

The scientific outputs and impacts (and other indicators like university rankings or early ERC success) have been rated very good but definitely not outstanding, given the very high input and the visible gap between Sweden and other small countries like Switzerland, Denmark or the Netherlands (*ibid.*, p. 136 f.). The review also pointed to the comparatively low growth rate of scientific publications in the 2000s (*ibid.*, p. 178; however, this went along with stagnating budgets until 2008). Regarding citation scores, nearly all comparator countries have developed better than Sweden over a twenty-year period, some in a significant way. The review asked whether Sweden could do better and the answer was yes. For these reasons, the review mainly addressed the universities, the specific Swedish cost structures as well as properties of the funding system.

The smaller universities were described as important links to local economic and societal needs, a role they could (and still can) play only with difficulties, given the relatively low share of (research) funding these actors obtain both from Direct Appropriations and TPF. Contrary to this the ten main (and older) universities have traditionally received quite generous budget allocations. In this light, the larger universities however might have performed better, also in technology transfer and science-industry collaboration (*ibid.*, p. 34).

For universities, the main recommendations of the 2012 review included the following:

- Help make the universities become more proactive players in the Swedish innovation system. A prominent pathway should be the build-up of better visible critical mass and a stronger differentiation and specialisation of universities.
- A further recommendation regards research assessments and stronger accountability, again in the light of generous research funding mechanisms for universities.
- Finally, Swedish universities should introduce more active and more internationally-minded recruitment procedures.

Box 1: 2012 SWOT analysis⁴

The SWOT analysis (OECD 2012, p. 20) lists the following points for the Swedish HE system and HE research:

Strengths are “*a strong human resource base*”; “*a strong science base with high inputs, strong actors (notably research universities) and very good output in terms of the number and quality of scientific publications*”; “*participation in international academic and industrial networks ...*”; “*high quality of institutions ...*”.

Opportunities include “*increased contribution of the strong core of academic research institutions to social and economic development*”; “*development of larger and more prominent centres of excellence at the top universities*”; “*development of regional knowledge hubs involving the smaller universities ...*”; “*further internationalisation of research, including through attraction of foreign researchers and students ...*”.

Weaknesses point to the following issues: “*university centres of competence/excellence are relatively small which can reduce their impact*”; “*insufficient links between traditional universities and SMEs*”; “*large number of medium-sized funding agencies engaged in similar funding activities*”.

Threats are “*failure to maintain existing advantages (e.g. in clinical research)*”; “*failure to make full use of the country’s rich knowledge base and loss of innovative edge in the face of global competition*”; “*increasingly fierce competition for top international talents ...*”; “*overemphasis on consensus building when decisions need to be taken rapidly*”.

Strategic leeway of universities and their management

The 2012 OECD did not come forward with overly strong statements on the way how universities are being managed in Sweden. However, the review found a strong role of individual professors and termed universities as rather decentralised organisations. This factor can be seen also in combination with the rich TPF landscape: A lot of TPF money coming in (without always covering the full cost of research) and drawing from the Direct Appropriations.

Further, “... *governance of universities seems to come from research departments, from many strong individuals and from a chorus of outside (funding and social) organisations, with impacts on recruitment, careers and the development of new fields. This stands in contrast to the strengthening of the formal powers of leadership since 1993 and the enlarged political and industry representation on university boards ...*” (ibid., p. 185). The study “Fostering breakthrough research” (Öquist and Benner, 2012) was issued practically at the same time when the review went into press. Therefore, the latter could use this source only superficially, albeit the arguments and findings were very similar.

Recruiting and careers

When it comes to internationalisation of the scientific landscape, the review identified high levels of co-publication and co-operation, but found less evidence for active international recruitment, as compared to countries like Switzerland: “*It would be worth studying the aggressive international recruitment strategies of some top European universities (and the internal structures they offer as host organisations) in order to strengthen Sweden’s position in the international competition for talent.*” (ibid., p. 27). In the same vein, Swedish universities should be more open to foreign students and researchers.

⁴ The 2016 OECD review did not repeat the SWOT analysis.

The 2012 OECD review was concerned with the low level of “star researcher recruitment” at Swedish universities (ibid., p. 177, based on Karlsson and Persson, 2012): Among the comparator group of six strong European countries Sweden scored specifically bad; the size of the “elite author community” being small. The review (ibid., p. 183) summarized that a “... *contributing factor could be the relative ‘endogamy’ of the faculty in Sweden’s universities and the comparatively weak renewal of the scientific elite. A part of the responsibility might lie with university leadership which might not fully use their influence in guaranteeing active, international and high-class recruitments across the board.*” (ibid., p. 186).

Third party funding; councils, agencies and foundations

The 2012 OECD review quite extensively described the very rich Swedish TPF system, consisting of each a number of public RFOs, semi-public foundations and private philanthropic organisations. The OECD found that their number, their overlapping remits and their voice in policy making were quite unique for smaller countries (ibid., pp. 225 ff. and 254 ff.). Most of the actors had (and still has) a governance structure with strong academic influence; the propensity to act as change agents was rated low for a number of these TPF sources (ibid., p. 230). The review was puzzled by the numerous interactions between the funding sources (ibid., p. 236), the small size of many interventions, the slow uptake of (Lund-declaration-style) “missions” and “grand challenges” and by the perception of a play-safe attitude. As a consequence, the review stated that “... *the relatively fragmented research funding system – some 20 mid-sized funding organisations with mid-sized instruments – tends to fund good quality but ‘safe’ research ...*” (ibid., p. 34).

The review found strong clustering around similar instruments remarkable, especially in the case of competence centres and Centres of Excellence (CoE). The various funding organisations have been funding “... *a fleet of similar mid-sized centres ... at each of the top universities. They provide for very good working conditions and exposure but they may lack the critical mass ...*” (ibid., p. 34). This plethora of centres and centre programmes was analysed in more detail in the report, discussing inter alia the question whether such programmes lead to a bottom up priority-setting, with the downsides of limited size, fixed-term duration and difficulties of universities to build long-term portfolios. The review called for a systemic evaluation of such instruments beyond individual funding organisations (ibid., pp. 254 ff.).

3.3 The 2016 OECD Innovation Review

General description

The 2016 review again emphasised the dominant role of universities for knowledge creation in Sweden and the constantly high HERD / GDP ratio of 0.9%. Due to very strong growth Denmark was now leading among OECD countries, but Sweden still ranked second. The review stated a comparatively high level of autonomy of universities in international comparison. It further analysed the HEI sector and its different properties, including the two-tier (but not binary) system of universities. Sweden has less HEIs per million inhabitants than in other small countries.

The very high share of TPF is a constant property of Swedish HE research funding. As a general trend, shifts from Direct Appropriations to TPF can be observed in many countries, but in Sweden it is quite different: TPF shares have *always* been high. In the last ten years, Direct Appropriations for research *and* TPF did increase in parallel in an unprecedented way, the latter albeit with a faster growth rate.

However, there are two factors not to be forgotten: (i) A preceding stagnation in the 2000s and (ii) a much stronger growth of research budgets in comparison to the budget lines for teaching (see also UKÄ, 2019). From 2008 to 2015, research income grew by 32% (Direct Appropriations and TPF, both with comparable growth rates) while the education stream only grew by 4% (OECD, 2016, p. 66)⁵.

For research, the increase in Direct Appropriations had been massive, which was also stated by the OECD: The 2008 Research and Innovation Bill provided SEK 1.5 billion for *lasting* stepwise increase and the following 2012 Research and Innovation Bill *another* SEK 1.2 billion in the same way. The universities profited from the budget growth along historical distribution patterns, i.e. the bulk went to the ten larger universities. No serious re-distribution took place, in spite of the – therefore quite questionable – indicator-based funding model, introduced in 2008 with 10% and increased to 20% in 2012. The review was very critical on this indicator-based funding due to any observable re-allocation effects between universities, i.e. a steering measure that does not steer (*ibid.*, p. 63).

The Research and Innovation Bills had tried to trigger some strategic orientation in the HE research field: In 2008 the intention was to strengthen individual (and already strong) research profiles of universities through SFO and other instruments. This did not happen and apparently there was a mismatch between goals and instruments. In 2012 the next Bill wanted to strengthen the top segment in the light of the disappointing academic performance. Here the match between goals and instruments appears to have been better, albeit without considerable immediate results. However, strengthening top class research is a long-term endeavour (OECD, 2016, p. 63). The 2016 Bill shifted the overall goals more towards societal impact but continued with a number of long-standing policy initiatives and distribution patterns. It waits to be seen whether this has been a good match.

Before we go into the specific topics, it has to be stated that the 2016 Review had a much more critical view on the university research base as well as on the policy measures to improve it. Neither the increase of Direct Appropriations nor the SFO⁶ initiative is being seen as specifically impactful, “... *there is little evidence of resulting performance increases.*” (*ibid.*, p. 15) This statement is important for our task as it does not blame only one side for the slow growth of impacts in the light of massive input growth.

The Review prominently states in the executive summary: “*The increase in block funding of universities has not succeeded in breaking the long-standing, circular link between institutional and ‘third party’ funding which has been detrimental to consolidating research excellence. An evaluation of the SFO has concluded that universities with overt strategies benefited most from the scheme, but that relatively few universities possess such strategies.*” (*ibid.*, p. 15). With “circular link” again both sides are addressed: This is not a one-way effect of SFO as a hybrid instrument on the university budgets and strategies, but might be influenced by university strategies themselves.

In the main chapter on ‘*Strengthening Swedish university research*’ the review found long-term traits and causes for the current problems, reaching back to the post-war era: Since then some lock-ins were constituted by the interplay between dominant universities (and academic communities) on the one hand and TPF sources dominated by the same academic communities (*ibid.*, p. 58), leading to non-strategic and small interventions.

⁵ This is also interesting when taking into account the massive lobbying power of the Swedish academic community: For quite a long period everybody seems to have been interested much more in research than teaching.

⁶ Most of the SFO funding seems to have been counted as Direct Appropriations, but see also UKÄ, 2019, p. 55.

The *hybrid* SFO initiative was seen as a kind of litmus test both for the abilities of the state and the universities: Can the state induce strong priorities through big initiatives? In this sense, SFOs were introduced to encourage *bigger risks* and *bolder ideas* at universities. The answer of the review is: *not really*, or better, *not fully*, and 20 SFOs with 43 research environments might have been too much. Can the universities step into virtuous circles by combining internal strategies and incentives from outside? Here the answer is: even less. Only few can do this, including more specialised universities, and those only to a limited extent, due to: “... *weak leadership and strategic capabilities in many universities; lack of clarity concerning career paths and inability to manage academic staff based on organisational strategies and performance.*” (ibid., S. 16).

The Direct Appropriations on the other hand are a difficult issue as well: Strong increases since 2008 have not been followed until now by strong increases in outputs and impacts.

Strategic leeway of universities and their management

The 2016 OECD Review (ibid., pp. 59 f.) describes a number of steps over the last decades which in principle should have contributed to higher strategic abilities, including stronger boards with a majority of external members, appointed rectors and increased incentives for planning. Over the 2000s the universities struggled to come forward with meaningful strategies, so “... *external funding remained the main driver of changes in university specialisation.*” (ibid., p. 60). Unfortunately, neither the TPF sources nor the universities could play their role in this context: The Research Funding Organisations (RFOs, i.e. foundations and agencies) were then mostly unable, perhaps in some cases also unwilling to act as change agents (ibid., p. 61) and the universities did not capitalise on the bigger TPF programmes: The various centre programmes have been used massively by the universities but not as a lever to create new structures or lasting forms of critical mass: “... *few of the research centres ... have turned into permanent structures ...*” (ibid., p. 60).

The OECD still sees strategic deficiencies on all levels, government, funders and universities. For the latter, “... *deeply ingrained – and laudable – concepts of academic freedom and autonomy for universities and individual researchers, when combined with weak internal governance structures, have tended to prevent universities from making strategic choices and investments.*” (ibid., p. 17). Both the 2012 and the 2016 Reviews state that in the triangle (i) university leadership – (ii) TPF and other external signals – (iii) departments and individual academics, the leadership is by far the weakest part. Priorities do come from below and outside; and due to the nature of both sources, these priorities are often fragmented.

When it comes to strategies, again the SFO evaluation showed that universities with clear, overt strategies profited most from this instrument. There are however not many such universities in Sweden.

Recruiting and careers

The 2016 OECD review states that overall budget growth from 2007 onwards has resulted in growth in staff numbers. Senior lecturers and professor positions have increased strongly. In addition, 2.000 new career development positions with fixed-term contracts have been created. Overall the pipeline has become bigger but also leakier, and with a slower flow (ibid., p. 66), and the career patterns were not rated as overly clear and transparent.

The universities did not use the additional Direct Appropriations and other parts of the massive financial inflow for greater freedom and ‘open’ lines of inquiry, according to the OECD review.

Instead, “... *the funds were often used to hire new recruits whose salaries partly depended on their raising additional ‘tied’ funds from TPF sources.*” (ibid., p. 25).

A substantial number of fixed term but also permanent university staff is (co-)financed by TPF money. The latter not only causes a problem *for* universities due to the inherent insecurity, but might be also caused *by* the universities, as the growth of TPF funding has led to more such recruitments according to the OECD. On the other hand, the increase in Direct Appropriations has not been used to fix this problem by funding permanent staff through this money stream.

Therefore, more TPF leads to a de-facto uncontrolled inflow of (subsequently) permanent staff, and more money means less leeway for universities and also permanent staff might feel poor in a comparatively abundant setting: “*Hence, each increase in GUF triggers increased demand for TPF, and GUF increases perpetuate – rather than mitigate – the perceived problem of over-dependence on TPF. ... SFOs ... provides a further example of this mechanism in operation.*” Also, with this initiative there was a lock-in; the fresh money again went into permanent positions, i.e. academics then hunting for TPF to survive as active researchers (ibid., pp. 71 and 77). Further, the Review criticised a tendency for in-house careers and a high level of “has made PhD here” staff and a comparatively low degree of mobility.

Third party funding; councils, agencies and foundations

The 2016 OECD review does not follow the arguments of many academic stakeholders who claim that more Direct Appropriations automatically lead to better outputs and impacts: The range of successful science nations ranges from Denmark and Switzerland with high Direct Appropriations to the UK and the U.S. which follow a different model with high rates of TPF and (in the case of the UK) a very competitive system also for the Direct Appropriations. This variety “... *makes it risky to attribute scientific success or failure to this ratio, especially as no wider body of statistical evidence exists to back up such a claim.*” (ibid., p. 67).

According to the review there is (i) a large number of TPF sources with rather increasing organisational variety (e.g. the appearance of the ERC or of newer private foundations), (ii) long-term stability in the relation between TPF and Direct Appropriation shares and (iii) a policy lock-in due to the legal nature of the wage-owner foundations and the increasing share of private foundations: A large chunk of TPF just cannot be influenced by the state (ibid., p. 69). (iv) A number of the state-governed RFOs have been traditionally under the de-facto control of Swedish academics⁷.

The large number of TPF sources might lead to a multitude of signals, with too many interferences and a lot of similar programmes and interventions. Due to the large number of organisations, there is fragmentation and many of their signals are just too small (ibid., p. 71). As a consequence, it becomes more difficult for universities to build strategies upon these many thematic or structural TPF signals ... or without too much listening to the songs of the many sirens. The review states: “... *there are also reasons to consider the rationalisation of funding organisations, together with realignment of missions and governance structures.*” (ibid., p. 17).

In the final stakeholder workshop the OECD review team came forward with the issue whether there is a preference in Sweden to discuss and design funding instruments first, before fixing other problems. This would imply a lower preference *from all sides* for the discussion of structural

⁷ Note that this is the case in many countries but remarkable in a situation where academics turn against „their“ funding organisations.

weaknesses within the Swedish HE research system; and where it should position itself on a global scale.

Concluding remark

Perhaps one of the most interesting claims of the 2016 OECD review is the long-term nature of the issues now discussed in Sweden. The shares between Direct Appropriations and TPF sources have not been changing too much between 1997 and 2013 (ibid., p. 69) and career tracks are still a construction site.

The review found an overall gap between the global ambitions of Sweden as a research and innovation nation and the rather local concerns and ambitions in its HE and research policies.

3.4 The EU RIO Report

The RIO report for Sweden (see Hallonsten and Slavcheva, 2018) is a recurrent, concise monitoring tool of the EU Commission on Member States' research and innovation policies. It can be described as a mix of national and external views, as one author comes from the respective country and a second one from the EU Joint Research Centre. Basically it is a correspondent system for each EU Member State, reporting along a number of pre-structured questions. These reports build on published studies and statistics, and not on own empirical work.

For the university research sector, the report observes a shift towards more TPF over a longer period; as well as “... *an ambitious reform agenda for the academic system, aiming at promoting university collaboration with other sectors ... and to strengthen the competitiveness of Swedish research ...*” (ibid., p. 6) as a shared belief across the whole political spectrum. This agenda “... *has turned universities away from their previous decentralised, traditional and rather rigid organisational structures ... although this transformation is far from completed and the universities bear strong traces of old organisational ideals.*” (ibid., p. 6). With the 2016 Research and Innovation Bill the report sees a shift in guiding ideas, away from the goals of excellence and specialisation, and towards more interaction with society.

Further, the report observes that “... *the dramatic increase of governmental funding for R&D in the years 2007-2014 was rather evenly distributed over the universities, the research councils and other funding agencies.*” (ibid., p. 7, see also p. 13); counting a 50% increase of both Direct Appropriations and TFP budgets in eight years. These mechanisms and distribution patterns have survived well given the strategic re-orientations in the 2016 Bill, “... *with significant path dependence*” (ibid. p. 7).

Sustaining the high quality of the public research base is listed as one of the three top challenges for Sweden. Here the report states a long-term stagnation or even deterioration in key educational and research output indicators. Like many other studies, the RIO report points to the “*slow but steady decline*” of Swedish top publication impact share, while nearly all comparator countries are doing better. The report states that various, but limited reform steps and investigations have been taken to increase university autonomy, with yet unclear results (ibid., pp. 13 f.).

4 Learning from the analysis of HE Research Funding

This short chapter takes up a few strands from the *Pros and Cons* review (Stampfer, 2019) written for FORMAS in the light of the STRUT debate. The full arguments can be then found in the review. The question here is how some of the sources and findings relate to the current Swedish situation.

Some general arguments of the *Pros and Cons* review

This section takes up some general findings from the *Pros and Cons* review and tries to draw some conclusions for Sweden. Note that in this section we draw from studies not explicitly dealing with the Swedish situations. For details see Stampfer, 2019.

Complexity; only few causal relations: The review shows that complexity exists on many levels. Each national system is different and those differences have increased with seemingly mainstreaming exercises like New Public Management or TPF growth (ibid., pp. 19 ff.). Universities are a specific kind of organisations (see below). The outer worlds and academic research interact in various forms (ibid., pp. 25 ff.). Difficulties abound when measuring impacts of Direct Appropriations (ibid., pp. 44 ff. and 71 ff.) as well as those of various TPF interventions (ibid., pp. 56 ff., 61 ff. and 71 ff.). When TPF sources fund academic-based or collaborative research aiming at societal or economic impacts, a lot of intervening factors do occur until the impact materialises, and attribution is often extremely difficult (ibid., pp. 64 ff.). Tracing causalities and interactions between instruments can be very demanding as nearly all research (and overall innovation) systems employ large numbers of policy interventions. E.g., when a CoE programme and indicator-based Direct Appropriations are being introduced at the same time, then which measure is exactly responsible for which kind of impact growth? (ibid., pp. 47 f., 67 ff. and 71 ff.). These are just a few examples. Simple statistical regressions – while often helpful in clarifying the picture – cannot catch the complex situation alone.

- ➔ What might we see in **Sweden** in this respect? In Sweden, this kind of complexity might be even higher than in other countries, due to the strong role of universities in the system and the large number of funding organisations.

Special nature of universities: Universities are no entities like others but termed by organisation sociologists and science studies scholars as *loose or incomplete* organisations. They are inhabited by experts for whom their global epistemic community is as important as their own faculty. Leadership cannot exert management control comparable to that in other organisations (ibid., pp. 16 ff.).

- ➔ What might we see in **Sweden** in this respect? In Sweden we might find specific difficulties stemming from a mixed system: Venerable traditions meet with explicit management approaches in a HE landscape, which is characterised by long-ongoing but not overly bold reforms.

(No) level-playing field (ibid., pp. 94 ff.): One striking point is the imbalance of the discussion, in Sweden perhaps stronger than in other countries. TPF sources – at least the public ones – are standing in the floodlight. They have to be explicit about all their assumptions, goals, criteria, selection mechanisms etc. as well as the outputs and impacts of the funding granted. This is necessary and leads to (i) constant learning and (ii) the emergence of many critical properties and also downsides. Some instruments just do not work too well in certain settings, and not all TPF measures can prove that

they lead to substantial outputs and impacts. On the other hand, universities sometimes tend to shy away from the transparency imperative, in some cases even with good arguments. Universities as traditional, “incomplete” expert organisations can be ridden with opaque decision-making procedures when it comes to recruitment and career promotion, thematic priority setting and internal financial allocations. The centrifugal forces are just very strong. On such a basis it is difficult to compare outputs and impacts of TPF funded activities with those coming from Direct Appropriations.

- ➔ What might we see in **Sweden** in this respect? In the current Swedish discussion, the advocates of higher Direct Appropriations do not appear to overly deal with this argument. For their own business they mainly ask for “trust-based management”. Such an argument comes with two considerable downsides: (i) The two main funding sources cannot be compared on a level-playing field, as the own remit partly remains in the shadow (➔ chapters 5 and 6, see e.g. ‘rigged’ job openings), while TPF is has to fulfil all kinds of transparency requirements⁸. (ii) The claim for “trust-based management” might effectively block discussions about influential factors like career models, internal allocation mechanisms and strategic capabilities. This might result in more money being spent along old patterns, leading to the same problems but on a higher spending level (see also OECD, 2016).

Ubiquitous academics: What universities get and how they are perceived by the outer world is also co-shaped by academics and their representatives. They often form the majority in RFO and agency boards (Stampfer, 2019, p. 54), sit in government advisory councils and can exert formidable lobbying power. They are the peers that form the first part of the term peer review (ibid., pp. 56 ff.), a term that has a quite negative connotation in the STRUT report. Academics write government reviews. Every university professor is by definition an expert in all kinds of higher education and research policy issues.

- ➔ What might we see in **Sweden** in this respect? It is safe to state that these phenomena are strong in Sweden in all respects, with the small ministries, the many research councils and the strong role of universities. Therefore any “us” against “them” attitude cannot be supported by the findings and sources of the *Pros and Cons* review. Neither does the rhetoric of the “*poor normal academic*” versus the “*sinister academic gatekeeper elite*” lead to anywhere (even if an elite might exist) and would not be understandable for a Swedish taxpayer who at the end finances the whole system.

Money matters, but not fully explains differences in outputs and impacts: The strong science performers (measured against publication impact) often have a high HERD / GDP ratio, although there are quite some differences in input even in the group of small successful European countries. With Denmark and Switzerland, the correlation between high input and high impact is strong, lesser the case of the Netherlands (ibid., p. 32). Large successful countries like the U.S. or the UK have much smaller inputs. However, input *growth* strongly correlates with impact *growth*.

- ➔ What might we see in **Sweden** in this respect? It is however not surprising that Sweden has experienced an ongoing discussion about input-impact relations, as the latter should be higher for Swedish science, given the substantial inputs (see e.g. Öquist and Benner, 2012 or OECD, 2016).

⁸ This is true for universities everywhere, even those in countries with full-cost accounting.

Strategic leeway of universities and their management

The *Pros and Cons* review (ibid., pp. 16 ff.) sketches some patterns derived from the academic HE literature: (i) Significant strategic leeway for university management is internationally rather an exception than the rule, due to the nature of universities. (ii) Some countries like the U.S. have systems in place that allow for such leeway but do not allow for a blueprint: European universities neither have large endowments nor strong presidents plus board structures. Many U.S. universities are private organisations and there is no federal Direct Appropriation mechanism for research in place. A number of other cultural and financial differences also exist. (iii) In Europe a number of highly visible positive outliers do exist, e.g. the well-endowed and well governed Swiss ETHs. Below these there is a broad continuum of mixed (bottom-up / top-down) governed universities across Europe. (iv) Such strategic capabilities are not necessarily tied to a certain form of Direct Appropriations or a certain mix of the former and TPF sources. It appears to be more a matter of cultural factors, see the way the Danish universities were reformed and how they developed over the last 10-15 years. Another explanatory factor could be found in the interplay between comprehensive evaluation systems and clear strategic functions within the universities, see the Dutch universities with a comprehensive Research Evaluation System (RES, structured evaluations, but de-coupled from immediate budget decisions) and strong deans exerting strategic tasks (ibid., pp. 77 f. and 80 ff.).

Strategic leeway means (i) the existence of a strategy on top or faculty level, (ii) strong internal decision-making mechanisms, (iii) the aim to strategically approach, win and match certain TPF sources and (iv) also the existence of sufficient amounts of Direct Appropriations for the execution of this strategy. Examples from the *Pros and Cons* review show that this is quite possible to do. In Swiss universities considerable internal funds do exist for recruitment as well as for the preparation of research projects and strategic initiatives. A few places like the EPF Lausanne have reinvented themselves as a top place in the last twenty years along clear recruiting and thematic strategies. In the Netherlands, a number of universities actively manage different funding streams through strong strategies (Koier et al., 2016). The German *Exzellenzinitiative* has improved the abilities to strategize and build critical mass in a number of universities, albeit on a less comprehensive and convincing level than originally intended (Stampfer, 2019, pp. 79 f.).

➔ The **Swedish** situation will be discussed in *chapter 5*. The *Pros and Cons* review shows that many countries have a university landscape with limited strategic capabilities on the top organisational level, and Sweden is one of them. The review further shows that such strategic capabilities apparently do pay off. Finally, hybrid instruments like the SFO initiative do not substitute for strategic capabilities and they do not *per se* transform universities into strategic actors.

Recruiting and careers

Recruiting and career mechanisms enter the *Pros and Cons* review in three ways: On the one hand it introduces these mechanisms as a potential explanation for trajectories and differences in *systems* performance. On the other hand, the review analyses TPF *programmes* that include explicit career incentives or criteria. Finally, it takes a short look on the interaction between *Direct Appropriations* and careers.

Systems: Across the review it serves as a potential explanatory factor for differences in performance within and among systems. We can draw a certain link between active top-class recruitment and outputs as well as impacts, and we can do this also for clear career paths; on the level of organisations as well when comparing national systems (ibid., pp. 16 ff.; 36 f.; pp. 91 ff.). The *Pros and Cons* review

did not go into detail here as this was out of the scope of the study. However, in the conclusions chapter (ibid., pp. 91 ff.) three high performing countries Switzerland, Netherlands and UK are being presented. They have quite ambitious recruiting and career systems in place and they have been very attractive for foreign top-class researchers. In many other respects they differ, at least the UK from the two continental countries.

Programmes: Various forms of TPF have interactions with career paths and also recruitment patterns. Some TPF programmes funding *people* include the provision of a career track position by the home institution as a prerequisite for funding while others do not. The ERC foresees the portability of its grants and increases the negotiation power of its (often young) holders, if they are ready also to move to another country: The portability helps in obtaining tenure positions (ibid., pp. 82 f.). In some countries like the Netherlands, large excellence grants for younger researchers have become a kind of preferred pathway for career tracks, while having no such grants means that a straight academic career becomes much more difficult (ibid., p. 99). In some countries including Sweden, excellence programmes have become standard in a number of RFOs, and isomorphism and strong Matthew effects might be the case (Hallonsten and Hugander, 2014). Overall the large person-centred grants appear to have a lot of advantages for pushing universities and HE systems towards more modern career models like tenure track. One caveat should not be forgotten: The *Pros and Cons* review also discusses cases of such programmes that cannot always prove that those chosen are “better” than those who were nearly funded but were under the funding threshold (ibid., pp. 57 f.; Klaus and del Alamo, 2019; Neufeld, 2015). Apart from these large person-centred grants (ibid., pp. 62 ff.), the *Pros and Cons* review also deals with career-related issue of individual, PI-centred bottom up projects which allow for step-wise research work but can endanger evolving careers due to their short-term character (ibid., pp. 61 f. and p. 99). CoEs on the other hand can form safe spaces for career development as they run for a long period and allow for various interactions (ibid., pp. 67 ff.).

Direct Appropriations: Here the link is very strong (and can in reality also be very weak). Most permanent positions are funded out of Direct Appropriations and the rather recent financial autonomy of universities in many countries comes together with their traditional right to choose who is recruited, promoted and becoming a professor.

- ➔ The **Swedish** situation will be discussed in *chapter 6*. The *Pros and Cons* review contains some evidence that strong (international, active, top-level) recruiting mechanisms and clear career systems might be one of the variables that contribute to the explanation of successful universities and HE systems.

Third party funding; councils, agencies and foundations

Again, most countries have different settings that have grown along specific trajectories in the last 70-120 years (ibid., pp. 51 ff.). What we find is a broad range:

- no real TPF in place, e.g. Italy (although the ministry hands out some funding)
- one overarching TPF source, e.g. Norway (plus a small innovation agency)
- a similarly dominant actor but for university-based / fundamental research only, e.g. Switzerland (plus a small innovation agency)
- a binary structure with a dominant RFO and a dominant innovation agency, plus other actors, e.g. Finland, the Czech Republic or Austria, in a more differentiated form also the Netherlands

- a similar system but with a ministry and strong regional actors as funders instead of the innovation agency, e.g. Germany
- a hybrid system with organisations that are often funders and performers at the same time, and too difficult to describe in one line, e.g. France
- a system that has remodelled its funding along EU Framework patterns, e.g. Poland that has copied the ERC as a result of a non-performance shock
- a differentiated system with RFOs (now under a strong common roof), sector ministries, smaller innovation agencies and very strong private foundations, among others, e.g. the UK
- a broad landscape in a superpower, with RFOs, agencies, private foundations and dominating sector ministries, e.g. the U.S.
- a broad landscape in a small country, with a number of differentiated public RFOs and potent private funding sources, e.g. Denmark
- a very broad system with a multitude of TPF sources, e.g. Sweden

These are already eleven settings and we could continue with even more variety. Overall, there is no strong correlation between TPF structures and the scientific success of a nation. Neither can we draw overly strong conclusions from the distribution between Direct Appropriations, TPF and other sources. Sweden has a very high TPF share but so has the U.S. and also the UK. There are also different findings for the efficiency and effectiveness of national systems regarding high or low TPF shares in university research funding. Some comparative studies like Aghion et al. (2010) see rich TPF sources as a contribution to strong scientific outputs and impacts, while others like Sandström and van den Besselaar (2018) cannot identify such a correlation. In their model-based approach, growth in input correlates with growth in impact, and less competition-driven funding affects the system in a *positive* way. Although the results should be interpreted with some caution (see the variety above), the authors have their point. Neither Denmark, nor the Netherlands, nor Switzerland have an excessively competitive funding system in place and in all these countries, the share of Direct Appropriations for research is high. These are the immediate comparator countries for Sweden and they all perform very successfully.

A common denominator across countries is the shift within public funding: We see an increasing TPF share over time across many countries, while the ratio *public* to *private* sources has remained rather stable (ibid., p. 35, see also Janger et al., 2019; OECD, 2018; Paradeise et al., 2009; Lepori et al., 2007). Overhead payments again differ across countries: While Austrian universities can only to a small degree count on them (the Austrian Science Fund FWF does not offer any overheads), Sweden has a relatively generous system in place; but see → *chapter 7*.

The *Pros and Cons* review presents the growing portfolio of TPF instruments as another common denominator (ibid., p. 36). However, it might matter whether this large portfolio comes from a small or from a significant number of RFOs, agencies and foundations, at least in small countries. The various forms of funding programmes (ibid., pp. 61 ff.) are present in most countries.

Finally, the *Pros and Cons* review states that different funding streams have different functionalities: Direct Appropriations shall support long-term and structural change, while TPF shall support targeted and more immediate change. Both instruments, Direct Appropriations and TPF, should be measured against these goals. There are however examples for TPF programmes aiming at structural change (like Societal Challenges in the EU Framework Programmes) as well as examples for short-termism and conservatism in the Direct Appropriations. This might open an avenue for a different form of discussion about funding streams and their effectiveness and impacts.

- ➔ The **Swedish** situation will be discussed in ➔ *chapter 7*. The *Pros and Cons* review emphasizes the different structural properties across countries that make comparative studies and success models quite difficult to do. Swedish universities can draw from rich Direct Appropriations for research and from very rich TPF sources.

5 Strategic leeway of and within universities

Swedish universities as strategic actors?

A current discussion in Swedish research policy is revolving around the funding mix. A number of actors claim that the share of TPF is too high, therefore reducing the leeway for universities and their leadership to set own priorities, manage their budgets and improve quality policies. According to these actors, unfavourable TPF properties include insufficient full-cost coverage, short-termism, on-off financial frameworks for people and labs, various external thematic and structural signals and high cost of (sometimes unreliable) TPF application and selection procedures. So the argument goes to partly “relieve” universities from TPF signals to unleash productivity, increase strategic actorship and to foster excellence.

This idea is tempting but perhaps does not cover the whole picture, as it mixes properties of TPF funding with properties of university governance and academic culture:

- True, TPF often needs university co-funding from the Direct Appropriations. From the Netherlands (Koier et al., 2016) however, we know that research portfolios can be managed strategically and that it makes a big difference for faculties if TPF inflow is being managed along such research strategies.
- True, many external funders come with perhaps too many ideas and great plans (and sometimes without appropriate financial means). Nevertheless, a weak university leadership will not become stronger in the absence of external impulses. In a clean world of Direct Appropriations only, weak and often also strong university leaders are in the hands of their academic populace and the internal power-brokers. There are strong internal incentives for equal distribution and for distribution biased by influential actors. At least we know this too well from history.
- True, excellence stems from strong academic groups. Within universities, external funding sources are one influencing factor (but not a decisive one according to the critics of TPF mechanisms). There might be stronger factors, like long-term internal support for strong groups and promising ideas, further active, competitive and international recruiting procedures and clear merit-based career tracks. So, if TPF is not the most important variable, then we also have to look for other explanatory factors when analysing the Swedish situation.

We do not know too much about the strategic capabilities of Swedish universities. Bottom-up culture is traditionally very strong and they can be described as rather decentralised organisations.

The RIO Report (Hallonsten and Slavcheva, 2018, p. 13) describes a long-ongoing and never comprehensively managed change process: *“This general resource increase was paralleled by a reform agenda on the side of the governance and organisation of universities. The so called ‘Autonomy Reform’ of 2010 deregulated the academic sector and gave the universities greater mandate to (re)structure their organizations themselves ..., but it is difficult to yet fully assess the effects of this reform. Several public inquiries have been undertaken in the aftermath of the reform, including the academic career system, university governance and management, and academic entrepreneurship. Legislation and reform are pending.”*

This overall picture of long-term construction work and limited strategic abilities is being supported by the two OECD reviews (2012 and 2016), by the evaluation of the long-term Swedish performance in the EU Framework Programmes (Arnold et al., 2008) and by the more recent evaluation of the SFO initiative (Swedish Research Council et al., 2016).

The “Fostering breakthrough research” exercise (Öquist and Benner, 2012) claims that Sweden fails to focus on top-class science. To their view, the impact gap between Sweden and top comparator countries also stems from organisational deficiencies within universities: In-house control is underdeveloped and Direct Appropriations mostly follow external signals. Their main point however is that Swedish universities are run in a small-scale management attitude and not through visionary leadership for which neither leaders nor the academic communities have an appetite for.

The SOU “*Utvecklad ledning av universitet och högskolor*” inquiry (SOU, 2015:92) identifies a number of financial decision levels in Swedish universities. The big decisions are being taken either by the University Board or by the Vice Chancellor, different universities follow different approaches here. However, the Board has normally a strong role, while on the lower levels, deans and heads of departments do not have too much leeway for strategic decisions. According to the inquiry, history strongly matters in allocation decisions. Contrary to e.g. the Netherlands, the strategic role of the deans is seen as rather weak. All levels deplore that they cannot act in a strategic way ... Again: in one of the best-endowed university systems in the world.

The SUHF report (2016) states that the scope for management is limited in Swedish universities on various levels. According to the authors this is mainly due to the many signals coming from TPF sources (SUHF, 2016, p. 8). Therefore, long-term approaches and risk propensity suffer. In this respect, the Swedish situation would differ unfavourably from the settings in other successful countries. Such an analysis is definitely not wrong. However, two things appear to be missing: The authors do not take into account the wide variety of settings in Europe and globally, and they see the universities mostly as victims of a well-meaning but evil-doing outer world. The potentials and shortcomings of university strategy-making in Sweden are being discussed in much less detail.

This is a *deus ex machina* approach like in a Baroque Opera: *If only the outer world would change, our true strategic abilities would unfold and triumph. As all other actors cannot do it (as TPF and peer review does not work according to the authors), the current external incentive structures have to change towards more Direct Appropriations, and then finally a long-term, forward looking attitude will take place within the universities. ...* We see, some degree of caution is needed, *although*, true, the comparison to Denmark, Switzerland and the Netherlands makes sense and can lead to important learnings for Sweden.

One qualitative study (Fridholm and Melin, 2012) took a closer look and tried to identify where and how strategic leadership takes place at Swedish universities. The authors find some evidence for thematic priority-setting or cases of clustering around strategic new infrastructures, as well as examples for strategic planning for the Direct Appropriations on top level. Many ideas for strategic initiatives unsurprisingly start from bottom up and different universities have different abilities when it comes to transform this into strategic action and portfolio building. Strategic priorities are often funded through appropriations from several entities at different levels at the university. They are often also supported by external funding, for example when an external funder requests co-financing from the university.

According to Fridholm and Melin (2012) the strategic initiatives observed in the study can be categorized into five types of activities: (i) investments to create coherent career ladder for researchers, in particular young researchers, at central and lower levels; (ii) investing into research areas where the university is particularly strong, for example the establishment of (interdisciplinary) research centers, often in a multi-sourcing approach; (iii) investments in internationalisation, such as research exchanges, international recruitment, or support for EU applications; (iv) increasingly investments in infrastructure, increasingly a top level task as external funders have opted out from strategic infrastructure funding; and (v) investing in single services of strategic importance.

It is difficult to say how these strategic capabilities compare to those in other countries. First, few such studies do exist. Second, framework conditions differ strongly, e.g. with regard to large endowments and powerful presidents / boards in some U.S. universities or to management challenges coming along with the UK REF funding and evaluation model. However, the capabilities are definitely less developed than in the Netherlands (see Koier et al., 2016). Another country, Denmark, has seriously transformed its university system over the last ten to fifteen years. We have to ask whether this would have been possible as a top-down government activity only, without strategic actorship on the side of the universities.

It is less difficult to say that within Sweden, different universities have different strategic capabilities at hand. The SFO evaluation (Swedish Research Council et al., 2016) showed that this substantial extra funding has been used in a more transformative and sustainable way (only) by some actors: Specialised universities had clearer overall strategies at hand and therefore could use the SFO money better to further their original strategic goals. In addition, some less prominent fields in Swedish science became more visible and the SFO initiative acted as a change agent. However, as a whole the universities did not use SFO money as a strong change instrument and as an opportunity for focussing. Definitely, the SFO initiative can be blamed for having issued 20 strategic areas and 43 research environments in a small country like Sweden and also for not offering a real long-term perspective. On the other hand, most universities did not use the instrument for a strategic agenda: They just had no strategy as a blueprint (Swedish Research Council et al., 2016).

We might further ask whether universities are being driven into untenable cost structures lately? The answer is no and yes. No, as personnel cost as share of overall university cost has only moderately grown over the last ten years, from 60.4% to 63.1% (UKÄ, 2019). No, as there have been offers by the government to increase strategic action, like the SFO initiative. Yes and No, as the share between Direct Appropriations for research and TPF has changed over the last periods⁹, but not fundamentally. Yes, as the imbalance between teaching and research budgets has grown massively over the last periods. Yes, as the cost burden for running a world-class lab has become very high in many research fields, and cost for scientific infrastructure has surged as well.

A note on STRUT and strategy

The STRUT review (SOU, 2019) claims that strong and responsible universities need room for manoeuvre and solid core funding to develop as organisations and to provide good working conditions to fulfil its main tasks including research and teaching. Based on recent studies like Sandström and van den Besselaar (2018) or SUHF (2016) they also consider a hands-off, trust-based steering as more effective and efficient.

Table 1 lists a few core arguments brought forward by STRUT (left column) and provides short comments in the light of our task (right column).

⁹ ... with even more funders and a growing share of private non-profit funders paying for less or no overheads.

Table 1 STRUT claims commented

STRUT	Comments
University leadership on different levels cannot lead as they have to follow too many external signals.	<i>Many external signals affect all kinds of organisations. The issue might be also the signals from within, often triggered by outside signals. The nature of universities makes translation more difficult but not impossible. Low academic mobility (→ chapter 6) reduces the appetite for internal reform and quality policies: You know less about the world and you know your direct colleagues too well.</i>
External funding sources tie up various forms of co-financing that has to be taken from the direct sources/base funding.	<i>Direct Appropriations in Sweden are also high. High share of indirect cost is coming with many TPF sources. Is scarcity less a consequence of TPF than of leadership styles and sometimes missing strategies?</i>
The steering effect creates an incitement for universities to direct the base funding towards areas/disciplines where there is a higher possibility to receive external funding.	<i>The number of external funders in Sweden is extremely high and universities are confronted with many signals. "Tying up" however can in part be countered by strategies and active portfolio management.</i>
There is also a risk that the internal quality processes are not maintained and developed within the university but that instead these are out-sourced to external funding agencies/sources.	<i>Reminds of the "perpetrator-victim reversal" phenomenon. No-one hinders universities and communities to develop stricter quality systems. Functions of TPF for QS are indeed discussed internationally but not primarily as an outsourcing issue. 'Outsourcing' is therefore no valid argument. Real strong academic communities welcome internal and external quality systems and signals.</i>
On an individual and research group level a too high share of external funding can lead to opportunistic behaviour to adapt to fields and research questions that are of interest for the external funder, bad for renewal, for thematic variety and for intrinsic motivation.	<i>Opportunistic behaviour is in the DNA of academic business (which is fully o.k.): Academic careers and scientific research are full of uncertainties and need consistency as well as adaptability. De-motivation might rather come in with low success rates (→ issue of staff growth due to TPF). External funders might have good ideas for research questions and many TPF sources are not thematically pre-defined (and different TPF sources act differently).</i>
The balance between research and teaching cannot be kept up	<i>STRUT has a point here and changes are under way in Sweden. However, there was a long-term consensus in Sweden to increase funding for research (Direct Appropriations and TPF) and not for teaching.</i>
A high proportion of external funds makes it difficult for universities to work in a responsible and strategically way with questions e.g. related to gender equality and career development.	<i>Studies show that universities do not automatically behave in a responsible way when left on their own. Gender is a shared issue of TPF and HEIs and the historical record of academic communities and HEIs is dismal in that respect. Career development is at the core of academic freedom and tasks. To hold TPF responsible at least shows partial blindness on the ability and willingness of universities to strategically pursue their core academic tasks → chapter 6.</i>

In a nutshell: For the universities, the outer world is to be blamed. To some respect STRUT carries the hope that once left on their own, Swedish universities fix all their problems (and those of Swedish society) much better as they are liberated from too many signals from the outer world.

This might be in part wishful thinking for at least three reasons: (i) All kinds of organisations today have to cope with many signals from the outer world and the social contract between society and universities has become a long shopping-list, for good or bad. How should German university presidents act with such a worldview, as they have to cope with three times more industry-sponsored research than their Swedish colleagues? Should their Italian counterparts see themselves as the luckiest people in Europe, in the absence of meaningful signals from the outer world; and should Italy be seen as the international role model for academic careers? [*We could go on endlessly here*]. (ii) The record of the Swedish academic sector regarding strategic capabilities, recruitment and careers and quality policies is not that compelling. On what grounds shall Swedish research and HE policy build their trust that a removal of external pressures would lead to more structured and strategic actorship of universities? (iii) Attacking the public TPFs might distract from other issues that will not go away once TPF shares are lower. The main question is: Those who ask for trust-based management have to convince policy and taxpayers that they have earned trust.

This does not mean that everything is fine with the current situation. The TPF landscape is overly rich in international comparison and does not always act in a very strategic and bold way (→ chapter 7).

Further topics: A disclaimer

Note that there are also other topics currently being discussed in Sweden: E.g., one issue affects the ability of younger and smaller universities to do more research and to get it financed properly from Direct Appropriations and TPF. Another issue is a direct consequence of the large input growth in the last ten years, as the larger universities did not spend it all immediately and have been building up reserves. Both topics appear to have increased the heat of the discussions before and around STRUT, as younger and smaller universities do feel strong pressure and have been raising their voice.

We are aware of the discussions but did not include it into our analysis: The latter point could be seen as an issue but does not necessarily have to raise too much concern. The first point is leading to the big question of Swedish HE system stratification and is therefore outside the scope of this analysis.

6 Recruiting and career issues at Swedish universities

Are there clear, transparent and internationally competitive career paths in Sweden?

In an international comparison (Frolich et al., 2018), Sweden has a comparatively wide variety of career models and paths, both across and within HEIs. "... *individual institutions differ widely, not least in terms of individual employment contracts, sometimes even within individual departments at the same university. The working conditions and the share of teaching and research tasks depend rather more on funding than on the title of the position. The main career path goes from a career position to some type of recruitment position, then to a lectorate (associate professor), ending with a professor position. However, in practice there is a variety of pathways up the career ladder.*" (ibid., pp. 11 ff.).

If we would ask a product safety expert, she perhaps would say what we see here is not a ladder at all, at least not one she would certify as something which is safe to use. Such a verdict however would apply also to some other countries. However, there is a lot of progress towards more structured career systems in comparator countries.

The intro paragraph on Sweden in Frolich et al. (2018, p. 11) ends with "*Lecturers may be given the opportunity to apply for promotion to a professor position independent of a vacancy, but this is no longer an unconditional right.*" A recent SULF report on academic recruitments bears the title '*A Play for the Gallery*' (translated from Swedish, reported in Myklebust, 2018). The study describes most recruitment processes as 'rigged', sometimes arranged in a way that the results might have been clear beforehand. The SULF study sample for a majority of cases reveals quick openings and selections, few candidates, opaque processes, well-hidden job advertisements. In nearly 75% of the cases an internal applicant got the position.

This leads to the question, how well does the Swedish system work? For this we take a look into a document coming from the heartland of Swedish academia. The study *Good and Clear Career Paths at Lund University* (Rönmar and Wickberg, 2018) describes the Swedish career system along an *easy in – difficult out* narrative, using this venerable university as an example. The authors are the law faculty dean and an officer from the office of the Vice Chancellor.

They state in the opening chapters: "*The excessive element of internal recruitment at Swedish higher education institutions – including at Lund University – and limited mobility ... is well known.*" (ibid., p. 4). This could not have been stated in clearer terms. Data from a Swedish Research Council study show overall high numbers of internal recruitment (Vetenskapsrådet, 2016, pp. 7 ff.).

Based on data by the Swedish Research Council from 2016, over 60% of the professors at the larger universities had been recruited internally, and more than 60% of the career development appointees had got their PhD at the same university (Rönmar and Wickberg, 2018, p. 23). This is coupled to another issue, nicely called 'in-lasning': "*Vacant posts that are based on external research funding, applied for and to be carried out by a specific named researcher, may be considered 'playing to the galleries' and may result in the loss of confidence in the recruitment process. ...*" (ibid., p. 26). For the Swedish system it would be "... *important to avoid automatic conversion into indefinite contracts ...*" and similar practices (ibid., pp. 27 f.).

If these kinds of recruiting procedures are the stepping stones into the majority of permanent positions, then Swedish universities might have a major issue here. In a similar vein, Frolich et al. (2018, p. 41) conclude: "*In the Swedish system there are mostly promotions, seldom competitions, for professorships.*" Only in a limited number of cases, full professors are being recruited from outside, also

due to problems to provide attractive starter packages (Vetenskapsrådet, 2019a). Whether Swedish universities can in larger numbers attract (rising) stars from abroad or practise opportunity hiring, is difficult to find out but we might safely assume that this is not yet current practice.

In a similar vein the recent SOU *Trygghet och attraktivitet – En forskarkarriär för framtiden* inquiry (SOU, 2016) comes to the conclusion that Sweden never had a coherent career structure. This has various negative effects for academic mobility, gender equality and the continued supply of young researchers.

Rönmar and Wickberg (2018) further state: “*There is a fundamental tension between the meritocratic system on the one hand, which is based on constitutional regulation, merit and expertise and vacancies advertised for open competition, and employment protection according to the Employment Protection Act on the other, which includes provisions on automatic conversion of fixed-term employment into indefinite employment after a certain period of time, the duty to provide alternative work and the priority for re-employment.*” (p. 7). As described in this study, Swedish HE employers have to comply with many Labour Law regulations and Labour Court decisions with a high level of protection for employees.

This is not unusual for continental European HE systems and creates tensions and problems also in other countries. However, the relatively easy way for academics to obtain a permanent position in their home institutions in combination with a high level of protection definitely is a challenge at least for those universities with a claim to be excellent.

These two factors might influence the research performance of Swedish universities at least as much as the structure of the funding system. For an external observer it may sound alarming; Swedish universities might have a selection and a quality problem at its entry doors. Why this? A university system with such closed loops (i) draws from a much more limited talent pool than other international competitors, (ii) with ‘in-lasning’ and similar practices it hires a lot of people already well known and not overly mobile and (iii) perhaps most important, the dominant culture is never seriously contested or broken. This might lead to an attitude that things have been always that way and that entitlement and not competition is the main motivating factor in such a university system.

The review from Lund inter alia recommends three things (for their own university but *pars pro toto* for the HE system): First, the university should work on mind sets and attitudes of academics and faculties as this is a primary problem, second, they should shift to career development positions and away from unstructured and easy ‘*has-been-here-so-will-be-here-indefinitely*’ routines. Third, the authors ask the TPF sources for help, based on dialogue with the universities: RFOs and foundations should “*promote investments in this area.*” (Rönmar and Wickberg, 2018, p. 30). The latter might be a very good idea, also to come into more constructive discussions again (see also Stampfer, 2019, pp. 82 f. with examples for TPF career funding coupled to career development positions stipulated by the universities).

What are main properties of the Swedish academic career and recruitment system?

What are the main issues in Sweden with regard to recruiting and career systems, again according to a cross-country comparison? For this point we return to Frolich et al. (2018) and other sources.

- Are there too many fixed-term positions in Swedish universities? This is not the case as neither base nor the growth rates are comparatively high in Sweden: In Austria, Finland, the Netherlands or UK the shares of temporary staff are much higher; and: “*The total share of fixed-term employment in Sweden has decreased slightly since 2012.*” (ibid., p. 131). The number of

permanent positions increased by 35% between 2008 and 2016. The number of fixed-term contract increased only by 10% during the same period (UKÄ, 2018).

- Are there too many rungs on the career ladder? Not really, compared to other countries (Frolich et al., 2018, p. 132). The question rather is whether it is a well-designed ladder leading to a well-defined endpoint.
- Does the share of different career levels in the overall academic staff tell us anything specific in an international comparison (ibid., pp., 120 ff.)? This is difficult to say as PhD student share in academic work staff is high due to the specific working conditions of Swedish PhD students. The most striking feature in international comparison is the comparatively still low share of PostDocs and other junior positions and the low numbers of career development positions. This is about to change as PhD positions become increasingly difficult to finance due to a number of reasons (comparatively expensive, considerable rights and entitlements, long duration, less stipends etc.)
- Does Sweden have a tenure track system? Yes and no, like in many comparator countries. Tenure-track-style instruments have been introduced but they still do not affect the majority of academic positions and careers. Different universities have opted for different approaches (ibid., p. 41, see also Vetenskapsrådet, 2019).
 - In their case study, Henningsson et al. (2017) describe that a kind of tenure track has been introduced recently in a number of Swedish universities. It is being designed in various ways, albeit within the main cornerstones of the U.S. tenure track model. In the Swedish cases portrayed, the main motives for tenure tracks are efforts to win research talent and other quality-oriented criteria, plus a balance between research and teaching. Academic freedom through tenure track does not appear to play a considerable role in Sweden (and in Swedish tenure track efforts). Job security comes in via national HE legislation and via the tradition of in-house careers.
 - Henningsson et al. (2017) further stress the large variation how such career models are being translated in different university settings. This variation is in part due to different international role models as specific universities compete within specific international peer groups.
 - Öquist and Benner (2012) see a close link between under-developed career paths and research excellence: There is no clear tenure or comparable full career track; and TPF inflow is necessary to co-fund many salaries of younger researchers with permanent positions. In addition, the authors see an issue in the small numbers of active recruitment of international top-class researchers.
 - The “*Trygghet och attraktivitet*” SOU inquiry states that only about a third of Swedish HEIs offer career development positions that give the holder the right to move up to higher rungs on the “ladder” after an individual evaluation. Further they observe that the number of such positions has been stagnating at a low level (around 1.000), despite the unprecedented growth in Direct Appropriations and overall HERD in the last ten years. The additional funds have been used for ‘in-lasing’ and other positions. While high TPF inflow might have pushed this to a certain degree, it is the universities and not the outer world that decide about career systems and forms of promotion. The main route to full professor in Sweden is not via career development positions, so tenure track still plays a rather marginal role (SOU, 2016).

- Is there clarity regarding a career system? No, see above, and “... *there is much variation in career systems and the use, content and existence of different positions and titles between the different institutions. At the same time, there is also much variation in working conditions between different individuals with the same positions at the same university.*” (Frolich et al., 2018, p. 37).
- The unclear career models even cut through many individuals: “*The content of their position and employment contract does not depend on the name of their position but how this position is financed. Many positions are results of pie-like funding arrangements, sometimes recorded to multiple funding sources.*” (ibid., p. 37). Other sources confirm this finding but also state that this is a recurrent but not a dominant phenomenon: Professors and holders of career positions are not or much less affected and the sums involved are rather limited (Vetenskapsrådet, 2017). Further this phenomenon can be observed also in other countries.
 - Doctoral students, PostDocs and researchers are often TPF-funded while teaching positions come from Direct Appropriations. Therefore researchers (or staff doing mostly research) are more confronted with fixed-term contracts and with the risk of termination if TPF dries up (Vetenskapsrådet, 2019a). On the other hand, the Direct Appropriations for teaching have not grown much over the last 20 years.
 - Better-structured career paths are existent in the natural and engineering sciences while other fields like health and medicine have less structured “ladders” in place (Vetenskapsrådet, 2017).
- Do Swedish universities regularly attract and recruit international top researchers? Not more than to a certain extent, as both recruitment procedures on departmental (and faculty) level as well as the absence of strategic funds for expensive recruitments from outside form two strong roadblocks (SOU, 2015, p. 40).
- This leads to the question whether there is a clear policy on national and HE level regarding the link between research and teaching? No, as Swedish HE policy has made two big turns in the last decades, first towards separation of the two main functions and more since 1997 towards unification again. However, “*the traditional division still presides.*” (Frolich et al., 2018, p. 40). This has apparently resulted in a multi-faceted landscape with many different incentives, approaches, career structures and positions, in all difficult to steer and to communicate to younger scientists as well as internationally. The best international talents might then get clear-cut offers and starter packages in other countries.

Properties continued: How mobile are Swedish academics?

This question strongly relates to the career system. If mobility is low then the picture of a largely self-sustaining system becomes more complete.

- Is the inner-Swedish academic mobility too low? The answer is yes, as the venerable ‘older’ research universities recruit more than 60% of its professors and 70% of the associated professors in-house and most of them have made their earlier career also within the same university¹⁰. The smaller universities (with more recent right to grant PhDs) have a higher rate of externally recruited academics but we might wonder whether this is an ambitious policy by these organisations or just a path without factual alternatives. Note that some fields

¹⁰ The problem is the absence of a truly competitive tenure track model with open calls for assistant profs.

like medical sciences have a disproportionally high rate of such in-house careers. Another remarkable fact is the high number of career development position holders that have also made their PhD in-house (SOU, 2016, pp. 273 ff.).

- Is the international mobility of Swedish researchers too low? The answer is mixed here. Regarding academic inward mobility Sweden does fare quite well on some career levels (ibid., pp. 126 f.), with a strong increase over the last ten years. Some universities have adopted international recruitment approaches (Fridholm and Melin, 2012). However, there is comparatively low outward mobility on most staff levels (see below table 2) which might be explainable in the light of the many in-house careers.

When it comes to internationalisation, Swedish universities and academics are active and well connected in many respects. Their international mobility however is less strong compared to their colleagues in important comparator countries (see table 2): On average 28% of Swedish researchers have worked three months or more in a country other than the one within which they received their PhD degree. While this is close to the EU average of 27,4%, the share of researchers in other comparable countries is considerably higher. For instance, almost half (48,1%) of Swiss researchers, and more than a third (38,4%) of Austrian researchers have worked abroad for three months or longer. Swedish researchers' comparative lack in mobility is especially pronounced with early-career postdocs, where only 30,9% of Swedish researchers compared to 37% (Denmark) and up to 52,1% (Netherlands) have worked abroad for three months or longer. However, the share of mobile researchers in Sweden remains comparatively stable across career stages while considerable differences between all career stages can be observed in the Netherlands.

Table 2: Share of researchers that have worked abroad for 3 months or more at least once in the last ten years of their post-PhD career, in % and by panel country

	Post-Doctoral or Equivalent	Established Researcher	Leading Researcher	All Career Stages
Total EU	30,2%	27,5%	25,5%	27,4%
Sweden	30,9%	28,6%	25,8%	28,0%
Denmark	37,0%	28,1%	29,4%	30,3%
Netherlands	52,1%	22,7%	37,0%	32,5%
Austria	49,1%	33,3%	35,0%	38,4%
Switzerland	51,6%	44,5%	47,8%	48,1%

Source: MORE 3 website: <https://www.more3.eu/>

This result¹¹ is also confirmed by Vetenskapsrådet (2015) and Vetenskapsrådet (2019b). In their mobility analysis VR states: “Sweden has a lower degree of mobility when compared to a selection of successful research countries. Weak career systems and shortcomings in the recruitment process appear to be some of the most important obstacles to mobility” (Vetenskapsrådet, 2015, p. 6). ... Oh wait, we had that one already.

¹¹ ... which might be influenced by cultural factors and perhaps also by the Welfare State

Limited mobility – both within and beyond Sweden – seems to be difficult to change. TPF cannot be seen as a remedy here as most of the grants do fund research work in Sweden (and are needed for researchers to obtain and sustain a position ... in Sweden). A large proportion of researchers funded by the Swedish Research Council are employed at the same universities as the one where they took their PhD and therefore as a rule were recruited internally (Vetenskapsrådet, 2017). In this context Sweden might take note of a long-term programme from a country traditionally (but not anymore) ridden by endemic academic careers. The Erwin Schrodinger Fellowships¹² of the Austrian Science Fund have been sending scores of PostDocs and other junior researchers abroad for a longer period. Many did return and made their academic career with success. As the Schrodinger Programme now runs for many decades, it had with low cost a huge impact on internationalisation, mind-sets and as a consequence on structural properties of the Austrian university system. The effects on research quality are indirect but significant.

Do Swedish universities use TPF money / budget growth to create more (permanent) positions?

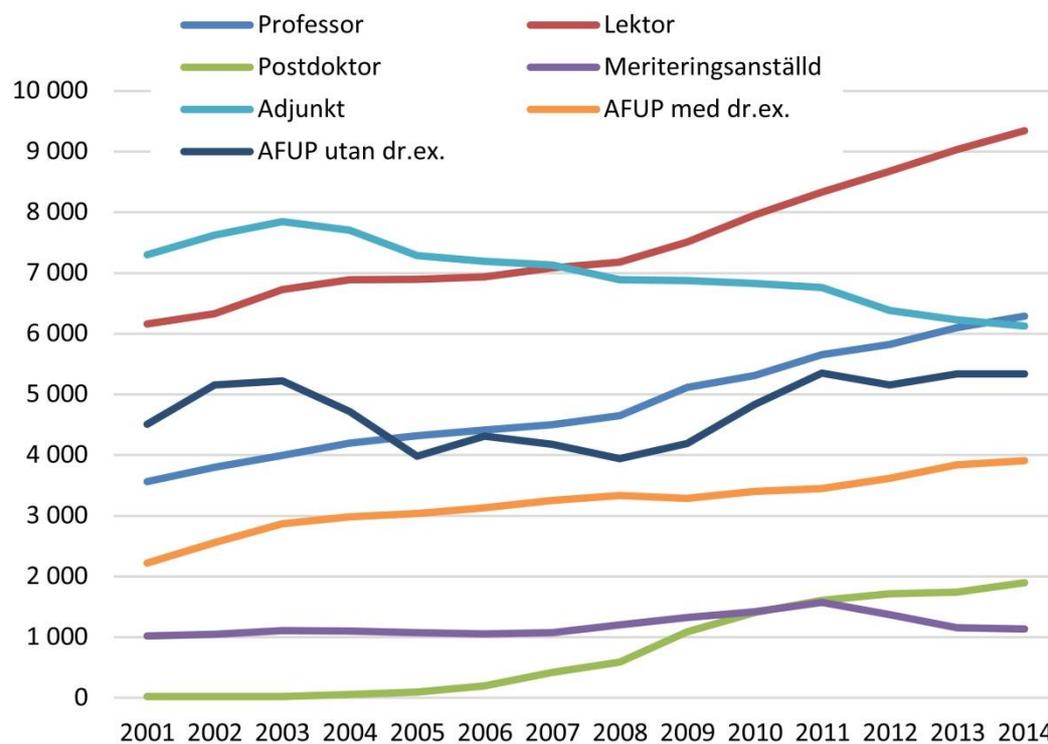
The Lund Career Path study also emphasizes the growth in positions and the different growth rates in different positions at Swedish HE institutions. According to this source (Rönmar and Wickberg, 2018, p. 23), “... (I)n 2001-2014, there was a drastic increase in the number of professors (77 per cent) and senior lecturers (52 per cent) respectively. The category of research and teaching staff with a doctorate also grew by 76% and the number of postdoctoral fellows increased tenfold in the short period from 2006 to 2014, albeit from a small starting base. Other categories like associate senior lecturers and research fellows showed much less growth.

These numbers come from the 2016 inquiry. Figure 1 (from SOU, 2016) shows the following numbers for academic staff growth in the period 2001-2014: (i) A sharp increase in the number of professors (77%, with an extra upswing from 2008 onwards) and lecturers (52%, again with an extra upswing from 2008 onwards); (ii) a sharp increase in the number of other research and teaching staff with a PhD (76%); (iii) a ten-fold increase in PostDoc positions but from a near-zero level before 2006 to approx. 2.000 staff in 2014; (iv) little increase in the number of research assistants and assistant lecturers since 2001 (11%); (v) a small increase, 18%, in the category of other teaching and research staff with a PhD degree (over 5.000 in 2014). The proportion of women increased in all categories, except for postdoctoral fellows where the proportion of women decreased slightly.

Note that the number of permanent positions increased by 35% between 2008 and 2016. The number of fixed-term contract increased by 10% during the same period (UKÄ, 2018). Such a first look seems to confirm at least in part what the OECD reviews have taken note of: A lot of the additional research money has gone into the creation of new permanent positions which then need to be sustained by more TPF and Direct Appropriations (with one caveat: the numbers of young PostDocs with temporary contracts have also grown substantially). Note that this is not necessarily a bad thing, but it does not fit to well into the narrative of the poor Swedish universities having no options. This growth can also not be linked to massive growth in student numbers as there is no massive growth in student numbers.

¹² <https://www.fwf.ac.at/en/research-funding/fwf-programmes/schrodinger-programme/>, see also a recent evaluation: https://www.fwf.ac.at/fileadmin/files/Dokumente/Ueber_den_FWF/Publikationen/FWF-relevante_Publikationen/fraunhofer-isi_schrodinger-impact-evaluation.pdf

Figure 1: Growth in different categories of university staff 2001–2014, headcount



Source: SOU, 2016

For the future, Rönmar and Wickberg (2018, p. 27, based on SOU, 2016) propose to offer more associate senior lecturer positions. They argue that universities can combine attractive offers with international recruitment, much easier than on the full professor level. Such offers then can be supported by TPF programmes (incl. ERC) or private foundations that want to support such recruitments through larger grants and universities in turn offer a career position. From an outside view such a proposal makes sense and has been also successfully delivered in other countries like Germany¹³ or Austria. A large number of such competitively selected assistant professor / associate senior lecturer positions are also one (but not the only) step into a form of tenure track digestible for a continental European HE system.

Such a move appears to be of high priority in Sweden. The current harsh attacks against TPF providers in part have a point in their criticism. However, they come from representatives of universities that are not always able and willing to set up internationally competitive recruitment and career systems and some of them might see only the shortcomings on the other side.

¹³ TU Munich as one prominent example: <https://www.tum.de/nc/en/about-tum/news/press-releases/details/35248/>

7 Notes on the TPF landscape in Sweden

Intro: Some things were quite clear before the current Swedish discussion

The STRUT inquiry (SOU, 2019) sees an imbalance between the Direct Appropriations and TPF. A number of preceding studies and inquiries did argue in the same direction (SUHF, 2016; SOU, 2015; see also Sandström and Heyman 2016). According to the 2015 “*Utvecklad ledning av universitet och högskolor*” SOU inquiry, the current allocation of Direct Appropriations and external grants, combined with the requirements for joint funding, would limit the universities' opportunities to make strategic decisions and define internal priorities. The shares of Direct Appropriations were too small in relation to the funds allocated by research funding agencies. This imbalance would then benefit applied research at the expense of basic research (SOU, 2015, p. 105). Many non-governmental funders would not contribute with the entire indirect costs, which would lead to a demand for co-funding (SOU, 2015, p. 108). The SOU inquiry argues for less pressure on universities through more Direct Appropriations and more pressure on TPF sources to reduce other, state-induced co-funding requirements.

The RIO report (Hallonsten and Slavcheva, 2018, p. 8) contrasts this with data: “*This means that the dramatic increase in governmental funding for R&D in the years 2007-2014 was rather evenly distributed over the universities, the research councils, and the other funding agencies. ... Moreover, with the period of 2007-2014 seeing the largest increases of governmental spending on R&D in a long time, with allocations to universities and public research-funding agencies increasing nearly 50% in this seven-year period.*” To be fair, the TPF growth has been faster than growth in Direct Appropriations.

The government had wanted to flood universities with different financial streams, including a strong increase in Direct Appropriations, and it had delivered: “*... The 2008 and 2012 research bills put this rhetorics into practice by launching an unprecedented increase of the GBAORD¹⁴, focused on a general increase in institutional block-grant funding to the universities and the Strategic Research Area programme ... and a general resource increase across the board that raised the level of the annual governmental outlay on R&D with 50% over seven years.*” (ibid., p. 13).

The UKÄ university funding report (UKÄ, 2019) shows the growth paths of both Direct Appropriations and TPF: Between 2007 and 2017, Direct Appropriations grew from SEK 14.4 to 18.2 billion, while the public funders' budgets showed comparatively stronger growth, from SEK 7.2 to 10.8 billion (UKÄ, 2019, pp. 45 f.).

This diagnosis is corroborated by the 2017 EUA Public Funding Observatory (Bennetot Pruvot, Estermann and Kupriyanova, 2017, p. 10; see also student data for Sweden in UKÄ, 2019). Across European countries, Sweden has a strong increase in overall HE funding but the number of students has not increased significantly. Currently Sweden has perhaps even the ‘best’ development in student – budget ratio across Europe, from the university pursers' view.

So, the unhappiness cannot be caused by money streams alone.

¹⁴ In Sweden, GBAORD (Government Budget Allocations and Outlays for R&D) is de-facto all going to universities as there is no large state research sector like in Germany, France, the U.S. or many other countries. As a consequence, Swedish academics do not have to share the considerable public appropriations for research with other actors. For a historical overview, see OECD, 2016.

TPF in Sweden: Many sources and some trends towards a safe middle ground

The large number of external funding sources and their manifold signals confront universities with a complex outer world that automatically becomes part of their inner world through various priorities, through academics writing applications and the inflow of TPF streams with different degrees of overhead cost. This setting has been described in detail by both OECD reviews (→ chapter 3) as well as by studies written in preparation for the STRUT review (SUHF, 2016, pp. 7 f.). This point is relevant as we do not know of any other small country with such a rich population of funders. Table 3 shows the different sources and their growth over the last 10 years

Table 3: UKÄ, External sources for Swedish university research and their growth patterns

	2007	2017	Förändring 2007–2017	
			Mkr	Procent
Forskningsråd	3 631	6 421	2 790	77 %
Vetenskapsrådet	2 717	4 966	2 248	83 %
Formas	589	950	361	61 %
Forte	325	506	181	56 %
Statliga myndigheter	2 366	2 571	205	9 %
Vinnova	605	901	296	49 %
Sida/SAREC	384	187	-197	-51 %
Rymdstyrelsen	57	82	25	44 %
Övriga statliga myndigheter (inkl. Energimyndigheten)	1 321	1 401	80	6 %
Statliga universitet och högskolor	309	520	211	69 %
Stiftelser och andra organisationer utan vinstsyfte i Sverige	2 616	4 715	2 099	80 %
Wallenbergstiftelser	442	1 484	1 042	236 %
Cancerfonden	330	384	54	16 %
Stiftelsen Riksbankens jubileumsfond	156	298	142	91 %
Stiftelser förvaltade av lärosäte	273	294	20	7 %
Övriga organisationer utan vinstsyfte i Sverige	1 415	2 256	840	59 %
Offentliga forskningsstiftelser	1 056	1 310	253	24 %
SSF	525	631	106	20 %
KK-stiftelsen	158	338	179	113 %
Östersjöstiftelsen	199	168	-30	-15 %
Mistra	125	132	7	5 %
Övriga offentliga forskningsstiftelser	48	41	-8	-16 %
EU	1 297	1 804	507	39 %
EU:s ramprogram exkl. ERC	1 101	1 197	97	9 %
Europeiska forskningsrådet (ERC)		339	339	
EU, ej ramprogram	197	267	70	36 %
Medel från övriga utlandet	458	776	318	69 %
Kommuner och landsting	300	650	351	117 %
Företag i Sverige	499	771	271	54 %
Övrigt	-98	3	101	
Totala bidragsintäkter	12 435	19 540	7 105	57 %

Source: UKÄ, 2019, p. 66

In detail, we see the overall strong growth of external research funding by 57%, compared to 26% growth of Direct Appropriations for research (UKÄ, 2019, p. 48, but see also different counting with a smaller gap, *ibid.*, p. 70). The Swedish Research Council (+ 83%) and the private Wallenberg foundations (+ 236%, mainly KAW) are two large sources with specifically dynamic growth patterns.

One underlying paradox of the Swedish TPF system must be explained in this context:

- One the one hand variety abounds: 15-20 medium to major sources all come forward with different signals, programmes, initiatives, cost regulations and thematic or structural ambitions. By definition, variation is nearly endless. The numerous private foundations often pick certain fields and won't pay for (full) indirect cost. The again numerous semi-public (ex-wage owner) foundations are independent and do follow their own strategies and either go into well-defined niches (as KKS or SSF have been doing traditionally) or they show less of a profile. The many thematic agencies follow their thematic missions. The four major public research funders all have a place in the system, from change agency (VINNOVA and increasingly FORMAS) to providing bottom-up money – with no or less strings attached – in the case of the Swedish Research Council.
- On the other hand, there is a movement towards the safe middle ground and towards “attractive” forms of funding. The 2016 SUHF report (*ibid.*, pp. 8 f.) correctly complains the lack of coordination of the Swedish funding organisations and their actions, even more in the absence of a strong government body doing this. Three examples might illustrate this:
 - First, there has been a long-term tendency in Sweden to fund centres (see the 2012 OECD review), which is useful (compare Langfeldt et al., 2015) but might be challenging when five such programmes do (or did) exist in parallel, each of them funding many such fixed-term centres. This might have led to a multitude of thematic and structural signals towards the universities which then could not digest it due to this multitude but also due to limited strategic capabilities of universities (OECD, 2012, p. 254 ff., see also → chapter 5).
 - Second, programmes to support younger (future) star researchers have abounded with initiatives from different funding sources. This leads to interesting forms of Matthew effects (Hallonsten and Hugander, 2014) but still not to a situation where Swedish researchers make their careers only because of getting such a large grant. Compare the different situation in the Netherlands, with large grants as de-facto prerequisites for careers (Scholten et al., 2018).
 - Third, KAW as a strong private actor has drawn back from infrastructure funding and reallocated funds towards the support of projects and people. Overall, infrastructure funding has become more a task to be funded by the universities through Direct Appropriations and by the Swedish Research Council at a national level.

The paradox might have turned into a dilemma for Swedish universities: they receive many signals, all well-intentioned, all a little different, often on a small frequency band. Collecting, hunting and harvesting are being done mostly on the lower levels.

This dilemma is accentuated by the way EU sources have been used traditionally by Swedish universities. The EU FPs come forward with tremendously ambitious goals. At the end of the day the main use for Swedish universities is another convenient form of money, namely for such communities that stand less in the focus of Swedish funding initiatives (Arnold et al., 2008). This

might be hard to believe on first sight, given the comprehensive research funding landscape. In part it might find an explanation by the tendency of Swedish RFOs to cluster around towards certain instruments and policy interventions, i.e. the safe middle ground. (Another part of the explanation might come with the nature of collaborative FP funding). The third part of the explanation relates to strategy and is described in → chapter 5. Larger EU initiatives do not seem to have led to structural changes at universities. Neither has the ERC strongly impacted on career systems and strategies nor has Sweden been an early adopter of larger societal challenges on the national level.

People, pies and additional cost: What are Swedish universities doing with TPF money?

All these issues are also deeply linked to the ability of universities to profit from TPF through strategic action. Putting the Swedish (Fridholm and Melin, 2012) and the Dutch (Koier et al., 2016) HE strategies side by side, the situation becomes clearer: In the Netherlands most universities have a strategic approach towards research portfolios and how to use TPF sources on the level of faculties, while in Sweden there are many useful activities but less of a strategy. The *Pros and Cons* review (Stampfer, 2019) and → chapter 5 in this paper provide more information. As an illustration, just compare the titles of the main analytical studies: The Dutch analysis is called *spinning plates* and portrays the deans as the ever-attentive experienced full-time jugglers, trained by strong competition and a national Research Evaluation System. The Swedish analysis is titled *Med glädje, men inte med lättbet* (Gladly / with pleasure but it is not that easy). Well, perhaps it is that easy to explain the Swedish situation and where the problems also might be situated.

For Sweden we might repeat a finding from the international comparative report by Frolich et al. (2018, p. 37): “*The content of their position and employment contract does not depend on the name of their position but how this position is financed. Many positions are results of pie-like funding arrangements, sometimes recorded to multiple funding sources.*” But who bears the responsibility for this situation? True, the many funding organisations are flooding the universities with flour, butter, sugar and apples. The pies however are being produced and baked in the university kitchen. Applications come from universities and the decisions how to spend the money are also being taken within universities. Many of these pie-style-financed researchers then obtain permanent positions. This is one example why a reform of the TPF system alone would perhaps lead nowhere, without significant change within the universities: E.g., in the case of a TPF reduction, the many researchers would perhaps write even more applications in a fiercer fight for a smaller number of grants.

Two more reasons might *in part* also serve as an explanation for the constantly high level of TPF: PhD students, one of the core cost categories in many TPF sources, are more expensive than in other countries. RFO grants often come with substantial (i.e. full) indirect cost coverage¹⁵, at least those from public sector research councils and agencies. Not all comparator countries have such a system.

The latter point is specifically important. A substantial part of TPF enters Swedish universities on a full cost base (direct project cost plus indirect cost calculated on a full cost base; VR, FORMAS, FORTE, VINNOVA). Another significant fraction of TPF comes with some indirect cost covered, like the EU FPs or a number of the semi-private or private foundations. Some foundations however

¹⁵ For FORMAS: <https://formas.se/en/start-page/applying-for-funding/how-it-works/projects-that-qualify-for-funding.html>.

For the Swedish Research Council (VR general terms and conditions, Point 3.1): “Funds for research or research-supporting activities at universities and higher education institutions or other approved administrating organisations shall include direct and indirect costs in the same proportions as calculated for the research or research-supporting activity as a whole.” <https://www.vr.se/download/18.43d20bbb1693bb2490d2be/1552568358499/General%20terms%20and%20conditions%20for%20grants%202019.pdf>

do not provide for overheads. This last part is certainly challenging for Swedish university leaders on different levels. In all, more than half of the large TPF share appears to come with full cost, another quarter or even more with some overhead payments.

A study (Vetenskapsrådet, 2019a) takes a look on the departmental level. It identifies a difficult overall situation when many TPF sources come in, have to be managed and some have a draining effect on Direct Allocations. This study also shows that cost transparency in the Swedish model also leads to high cost for *all kinds* of activities. Each research project has to ‘pay’ for its relative share of the universities indirect cost, but only a part of the many externally funded projects comes with full cost coverage. This gap has to be filled with Direct Appropriations for research and in such a way a real draining effect can take place. This funding model is a challenge and obviously not one invented by the TPF sources alone.

However, seen from various European countries the Swedish situation cannot be described as too uncomfortable. Nearly all funding lines by the Austrian Science Fund (FWF) come *without* any overheads. This is true for some other funders, only a few agencies like FFG (the Austrian VINNOVA counterpart) include some indirect costs in their funding. The situation in the Netherlands is similar. In Germany, funding by the Deutsche Forschungsgemeinschaft (DFG) now comes with 22% indirect cost¹⁶. Similarly, the Swiss National Science Foundation (SNF) funding is matched with 20% overheads¹⁷. Public TPF in the UK comes as 80% of the full economic cost. Many large philanthropic foundations in other countries do not pay for indirect cost at all but KAW in Sweden to a certain extent does, giving at least 15%. The Dutch situation (Koier et al., 2016) shows, that active portfolio management and serious strategies do allow universities to deal with such a complex TPF without being totally drained. True, the share of Direct Appropriations is much higher in the Netherlands (and in Austria and Switzerland as well) and the cost model is not the same.¹⁸ For further reading, see also the EUA comparison on cost models across Europe (EUA, 2018).

A few concluding notes on TPF

Finally we come back to the 2014 study by Hallonsten and Hugander: Similar to the 2012 OECD innovation review, they find that Swedish funding organisations due to their large number tend to provide for inadvertent funding agglomeration and with their instruments show a tendency to flock in the safe middle ground, with ‘*future leaders programmes*’ (as the OECD diagnosed for the many similar centre programmes): The authors describe a “... *striking uniformity in aims and purposes of the funding programs under study, and this we have explained by the use of the concept of institutional isomorphism ... Especially the two mechanisms of normative pressure and mimesis are typically at work when non-mainstream actors seek to establish legitimacy; mimesis most typically also as a response to environmental insecurity ... Several domestic Swedish funding bodies are not only experiencing this uncertainty but also already situated in an incoherent and pluralist system, and will thus ... look at role model organisations as well as attempt to more generally adhere to dominating discursive themes to find clues on how to increase their legitimacy.* (Hallonsten and Hugander, 2014, p. 257).

The one difficult TPF signal to Swedish universities is therefore a salvo of *similar* funding opportunities from a broad array of RFOs and other funders. It might be difficult for universities to

¹⁶ <https://www.bmbf.de/de/dfg-programmpauschale-513.html>

¹⁷ http://www.snf.ch/SiteCollectionDocuments/ueb_overhead_reglement_d.pdf

¹⁸ For indirect cost see also Janger et al. (2019), p. 176 with a DFG – FWF – SNF – NWO – RCUK comparison

build strategies with so many open doors; it might be also difficult to have a constant planning dialogue with so many funding sources.

The other difficulty for universities consists of the salvos of many *different* funding opportunities, again from a broad array of funding organisations. If each of the 15 main Swedish funders had only five different funding lines, plus if we assume around 20 from the EU, this would add up to 95 different channels and opportunities. If it were ten per funder, the sum would be already 170. We did not count, but it should not be too difficult to do. Just as a benchmark: In much smaller Norway, the single council RCN in 2016 had a three-digit number of programmes: “... *it reduced the number of funding programmes or schemes from 229 to 178 over the 2000s ... In recent years, the number fell even further, to nearly 130 individual initiatives, including about 30 larger programmes.*” (OECD, 2017, p. 193). To be repeated: Only in one council.

So, life is difficult for Swedish university leaders, not only because of strategic issues in their own realm but also when it comes to the large number of external signals.

These signals cannot be bundled too well in Sweden: University leadership and universities as a whole appear to have room for improvement in strategizing. On the other hand, more than 15 different funding sources of all kinds do not and cannot confront the universities with a clear overall portfolio and negotiation spaces are difficult to design and operationalise. The various funding sources often collaborate but at the same time they compete: The public actors for budgets and all actors for attention, success and legitimacy. The ministry is no help at all: A handful of people just cannot steer such a complex system.

TPF variety therefore seems to contribute to the challenges for university management and performance. The aim of this study was to show that TPF properties are not the only challenge around; and perhaps it is not even the most important one. There are several factors shaping the current Swedish university and research system. All sides should be aware about the complexity of the system; and it might be fruitful to set goals and designs instruments that as an ensemble work towards the fulfilment of these goals.

8 References

8.1 Literature

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8.2 List of abbreviations

CDI	Challenge driven innovation (a.k.a. UDI)
CoE	Center of Excellence
DFG	German Research Foundation
ERC	European Research Council
ETH	Swiss Federal Technical University
EU	European Union
FP	Framework Programme
FFG	Austrian Research Promotion Agency
FORMAS	Swedish Research Council for Sustainable Development
FWF	Austrian Science Fund
GBAORD	Government Budget Allocations and Outlays for R&D
GERD	Gross Domestic Expenditure on Research and Development
GUF	General University Funds
HE / HEI	Higher Education / Higher Education Institution
HERD	Higher Education Expenditures for Research and Development
KKS	The Knowledge Foundation
NWO	Dutch Research Council
OECD	Organisation for Economic Co-operation and Development
PA	Performance Agreement
PRFS	Performance-Based Research Funding System
PRO	Public Research Organisation
RCN	The Research Council of Norway
RCUK	Research Councils UK
REF	Research Evaluation Framework
RES	Research Evaluation System
RFC	Research Funding Council
RFO	Research Funding Organisation
SIO	Strategic Innovation Areas (a.k.a. SIA)
SFO	Strategic Research Areas (a.k.a. SRA)
SNF / SNSF	Swiss National Science Foundation
SOU	Swedish Government Official Reports
SSF	Swedish Foundation for Strategic Research
SULF	Swedish Association of Doctoral Candidates
TPF	Third Party Funding
UKÄ	Swedish Higher Education Authority
VINNOVA	The Swedish Governmental Agency for Innovation Systems
VR	Swedish Research Council

About Formas

Formas is a government research council for sustainable development. We fund research and innovation, develop strategies, perform analyses and conduct evaluations. Our areas of activity include the environment, agricultural sciences and spatial planning. We conduct specific environmental analyses that aim to make it easier for Sweden to achieve our environmental goals. We also communicate research and research results.