Analyzing Structural Stratification in the Swedish Higher Education System: Data Contextualization With Policy-History Analysis

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20th century massification of higher education and research in academia is said to have produced structurally stratified higher education systems in many countries. Most manifestly, the research mission of universities appears to be divisive. Authors have claimed that the Swedish system, while formally unified, has developed into a binary state, and statistics seem to support this conclusion. This article makes use of a comprehensive statistical data source on Swedish higher education institutions to illustrate stratification, and uses literature on Swedish research policy history to contextualize the statistics. Highlighting the opportunities as well as constraints of the data, the article argues that there is great merit in combining statistics with a qualitative analysis when studying the structural characteristics of national higher education systems. Not least the article shows that it is an oversimplification to describe the Swedish system as binary; the stratification is more complex. On basis of the analysis, the article also argues that while global trends certainly influence national developments, higher education systems have country-specific features that may enrich the understanding of how systems evolve and therefore should be analyzed as part of a broader study of the increasingly globalized academic system.

Introduction

The global academic system is developing in the direction of increased stratification. A handful of elite institutions, continuously occupying the top places in global rankings, are let to symbolize excellence and prestige in research (and education), while the rest—the majority of all higher education institutions—rarely reach public notice. Authors have argued that the underlying reasons for this development is twentieth century *massification*, of both education and research, which has caused *stratification* of institutions, typically the development of *binary* or *two-tier* higher education systems, on global level as well as within national contexts (Geuna 1998, 1999; Clark, 1983, 2008; Hazelkorn, 2005).

This article focuses on the research mission of Swedish higher education institutions (HEIs) and analyzes structural stratification in what has been designed as a formally unified system. It uses a comprehensive quantitative data source[1] to illustrate the stratification, focusing entirely on research activities and showing the present-day situation. The article then explores the opportunities in analyzing these raw data and explaining the current situation for Swedish HEIs by the aid of policy analysis based on secondary literature. The contribution of the article is threefold. First, it presents robust quantitative material on the structural characteristics of a formally uniform but informally differentiated national system of HEIs from a rich and publicly available source, so far surprisingly unexploited for this purpose. Second, it contextualizes and interprets these data and thus presents a solidly validated macrolevel case study, going beyond the somewhat simplified claim that the Swedish system is *binary* and reaching other, more nuanced conclusions. Third, it highlights and discusses some opportunities and limitations of combining macrolevel quantitative figures on

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[1]The public so called *NU-database*, maintained and provided online by the Swedish National Agency for Higher Education (Högskoleverket, HSV), which collects the data annually directly from the HEIs and from secondary sources such as Statistics Sweden (http://www.hsv.se/statistik/statistikomhogskolan).

HEIs with historically oriented analysis of national research policy.

The article is structured as follows. First, we give a brief background orientation. Thereafter, we present statistical data along with some concise findings regarding current structural patterns[2] in the Swedish system of HEIs. Then we use a literature review of Swedish research and higher education policy history to contextualize the findings. The concluding section contains a discussion of the findings and some conclusions regarding the explanatory opportunities and limitations of the quantitative data, the qualitative policy analysis, and their combination.

Massification and Stratification Internationally and in Sweden

Academia has changed irreversibly in the past hundred years. Emerging from the turn of the 19th century with a newly obtained research mission to complement education, it has since undergone dramatic growth, usually referred to as *massification*, in both of its core missions. Massification is most discernible in the manifold growth in the number of professionals, students, and institutions in academia across most OECD countries (Scott, 1998; Geuna, 1998, p. 257; Clark, 2008, p. 414; Enders & De Boer, 2009, p. 163). The institutional and structural characteristics of academic systems have changed profoundly in response to these developments. Particularly noticeable is the opening of new universities and colleges and the relabeling of various professional schools to higher education institutions; henceforth referred to as *new HEIs* or *newcomers*. The process, initiated in the 1960s and 1970s is often said to have formed *higher education systems* across the European continent. These systems often became *binary* by default, by a continued concentration of research efforts in the group of (often older) elite institutions, and a stronger focus on education as well as limited research capacity among the newcomers (Kyvik, 2004, pp. 394–396; Hazelkorn & Moynihan, 2010, p. 77; Hazelkorn, 2005, pp. 30–31; Vaira, 2009, pp. 135–136; Geuna, 1998, pp. 255–265; Scott, 1995).

With time, however, policy ambitions to strengthen regional competitiveness and secure quality in education by research links created opportunities for the newcomers to grow some research capacity (Lepori & Kyvik 2010, p. 259; Bleiklie, 2005, p. 53; Hazelkorn, 2005, p. 41). Often based on grass root initiatives and collaborations with local/regional industry, these research activities have occasionally managed to become competitive and have established niches for themselves by strong connections to education, deep collaboration with industry, and a focus on application and social relevance (Hallonsten, 2012; Adams, 2000; Hazelkorn, 2005, p. 60). But the initial governmental allowances for research in newcomer institutions have seldom or never grown to match those of the older research universities, and recent policy emphasis on excellence and strategic prioritization has reinforced stratification and solidified binary structures (Hazelkorn, 2005, p. 138; Clancy & Dill, 2009, p. 9). In particular present day excellence initiative funding schemes and the growing importance of university ranking tables appear to strongly disfavor the newcomer institutions discursively but also in practical policy and funding priorities (Stensaker & Kehm, 2009; Hazelkorn, 2011).

The development of the Swedish higher education system diverges very little from the general (European) case. One hundred years ago, Sweden had two full-breadth research universities (Lund U and Uppsala U), two relatively new institutions that would soon grow into equals of these (Göteborg U and Stockholm U), two specialized engineering schools (Chalmers UT and Royal IT), one specialized medical school (Karolinska I), and one private university specialized in business and economics (the Stockholm School of Economics; Ljungberg, Johansson, & McKelvey, 2009, p. 131). Massification of Swedish higher education included a fivefold increase of the total number of enrolled students between 1960 and 1990 (Bauer, Askling, Marton, & Marton 1999, p. 48). It led to the founding of two new universities in the 1960s (Umeå U and Linköping U), the addition of no less than 11 nonuniversity institutions in the late 1970s (Ljungberg et al., 2009, p. 140; Bauer et al., 1999, p. 54), and seven more like them throughout the 1980s and 1990s. In 2009, over 30 universities and university colleges existed in Sweden; 29 of them are included in the analysis in this article.[3]

The Swedish higher education system is legally uniform, with few exceptions. Of the 29 HEIs studied here, 27 are organized as governmental agencies and two are formerly governmental but nowadays owned by private foundations (Chalmers UT and Jönköping UC). All are under supervision of the Swedish National Agency for Higher Education (Högskoleverket). What formally separates *universities* from *university colleges* (*högskolor*) is that universities have the right to grant doctorates in any research area of their choice, whereas university colleges must apply for this right in specific disciplines. In the following, we refer to those HEIs established before 1977 as *established universities*, eleven in total, and those established in and after 1977 or

[2]No time series are included in the statistics, for the following combined reasons: The study is designed to make use of statistics to illustrate the *present-day situation* and explore its historical reasons with the aid of a literature review. Furthermore, the data source contains comparable figures only from 2001 onwards, which is too short a time frame to draw any plausible conclusions regarding causalities between policy decisions and changes in macrodata.

[3]Kalmar UC and Växjö U merged in 2010 and formed the *Linnaeus University*, and because of this institutional merger, there are no figures for Kalmar UC and Växjö U for 2010. In this article, we use the figures on Kalmar UC and Växjö U, since Linnaeus University is an all too new institutional entity to use in the analysis and draw conclusions from. The little more than 20 very small public and private institutions providing higher education (as well as conducting some research) in specialized areas such as arts and pedagogy are excluded here and throughout the rest of the article, as is Stockholm School of Economics, which has university rights (see below) but is private, comparably very small, and specialized in one research area.

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TABLE 1. The institutional structure of the Swedish higher education system.

Established universities	Full-breadth universities	Governmental	Gothenburg U, Linköping U, Lund U, Stockholm U, Umeå U, Uppsala U
	Specialized institutions with university status	Governmental	Karolinska I, Luleå UT, Royal IT, SLU
		Private	Chalmers UT
New HEIs	New universities (i.e. with formal university status)	Governmental	Karlstad U, Mitt U, Linné U, Örebro U
	University colleges with "research area"	Governmental	Blekinge IT, Malmö UC, Mälardalen UC
		Private	Jönköping UC
	University colleges	Governmental	Borås UC, Dalarna UC, Gotland UC, Gävle UC, Halmstad UC, Kristianstad UC, Skövde UC, Södertörn UC, Väst UC
Other, specialized, institutions		Governmental	*(8 institutions)*
		Private	*(14 institutions)*

made independent by the 1977 legislation (see below) as *newcomers*.[4] This basic separation suggests that the Swedish higher education system is binary, and authors have claimed that this is indeed the case (Kyvik, 2004; Ljungberg et al., 2009). However, as mentioned in the introduction, it is part of the purpose of this article to go beyond this claim and seek more nuanced interpretations, with the aid of historical policy analysis.

The institutional and legal structure of the Swedish higher education system is outlined in Table 1. The names used are our abbreviations. Tables with an alphabetical list of the abbreviations with full official names in Swedish and English as well as basic information and all figures used throughout the article, are found in the appendix.

Quantitative Data

In this section, we present basic data from the NU-database on the 29 HEIs in Sweden and their *research volume*, *research intensity* (overall and divided on broad research areas), and *ability to attract external funding*. To achieve a balance with respect to time variables, all figures used are calculated averages of the past 5 years (2006–2010), except figures for Kalmar UC and Växjö U, which are averages of 2006–2009 (see footnote 2). A detailed table containing all data used to generate the figures is found in the appendix.

Research efforts in the Swedish higher education system account for approximately a fifth of the total research and development (R&D) expenditure in Sweden,[5] and over two thirds of this academic research effort is funded through the governmental budget, either in permanent, first-stream funding or through competitive schemes such as research council funding programs (Vetenskapsrådet, 2008, p. 12). The institutional block grant funding for research, that is, first-stream, permanent research funding to the HEIs, accounts *on average* for approximately 45% of the income for research in the higher education system, compared with an average of approximately 80%–90% in the late 1970s (Vetenskapsrådet, 2008, p. 15; Engwall & Nybom, 2007, p. 40). Hence, in Sweden, just as in most Organisation for Economic Co-operation and Development (OECD) countries, the research financing system for the academic sector has gradually shifted emphasis from governmental first-stream funding to competitive schemes, ensuring an increase of funding sources for academic research and that long-term funding has been gradually eroded (Engwall & Nybom, 2007; Marton, 2009; Elzinga, 1993; Granberg & Jacobsson, 2006).

Figures 1 and 2 clearly show a major gap between the group of established universities and the group of new HEIs in terms of *research volume* (with the specialized Luleå UT as an exception and intermediary). The newcomer with largest research volume, Örebro U, despite formally being a full-breadth university (see the section Policy-History Analysis), has less than a fourth of the research resources of Linköping U, which (with the exception of Luleå UT) is the established university with the smallest research volume. The gap is slightly less pronounced in the distribution of governmental block grants, but still evident.

Turning to *research intensity*, whereby is meant the importance and weight of the research activities in a HEI in relation to the other major mission of HEIs, education, Figure 3 shows that while there is not as wide an inequality gap, the categories are still intact, and there is a clear threshold level (intriguingly enough, it lies at 50%) in the statistics. Figure 4 combines number of students per professor with number of employees with a PhD degree, two measures that show the (relative) importance of research activities in the institutions. A low number of students per professor is taken as a suggestion that each professor has relatively more time to spend on research activities. The gap is as clear as in the figures on research volume: Research is a core activity in the established universities, whereas in comparison, it is at best an auxiliary or peripheral activity in the new HEIs.

Figure 5, showing number of research areas, deviates somewhat from the previous pattern of two distinct groups of institutions (color coding is used to make the figure

[4]With exception for the agricultural university SLU, which counts as an established university, having university rights, despite being formally created in 1977.

[5]In total, R&D expenditure in Sweden amounts to around 3%–4% of GDP (Vetenskapsrådet, 2008, p. 9).

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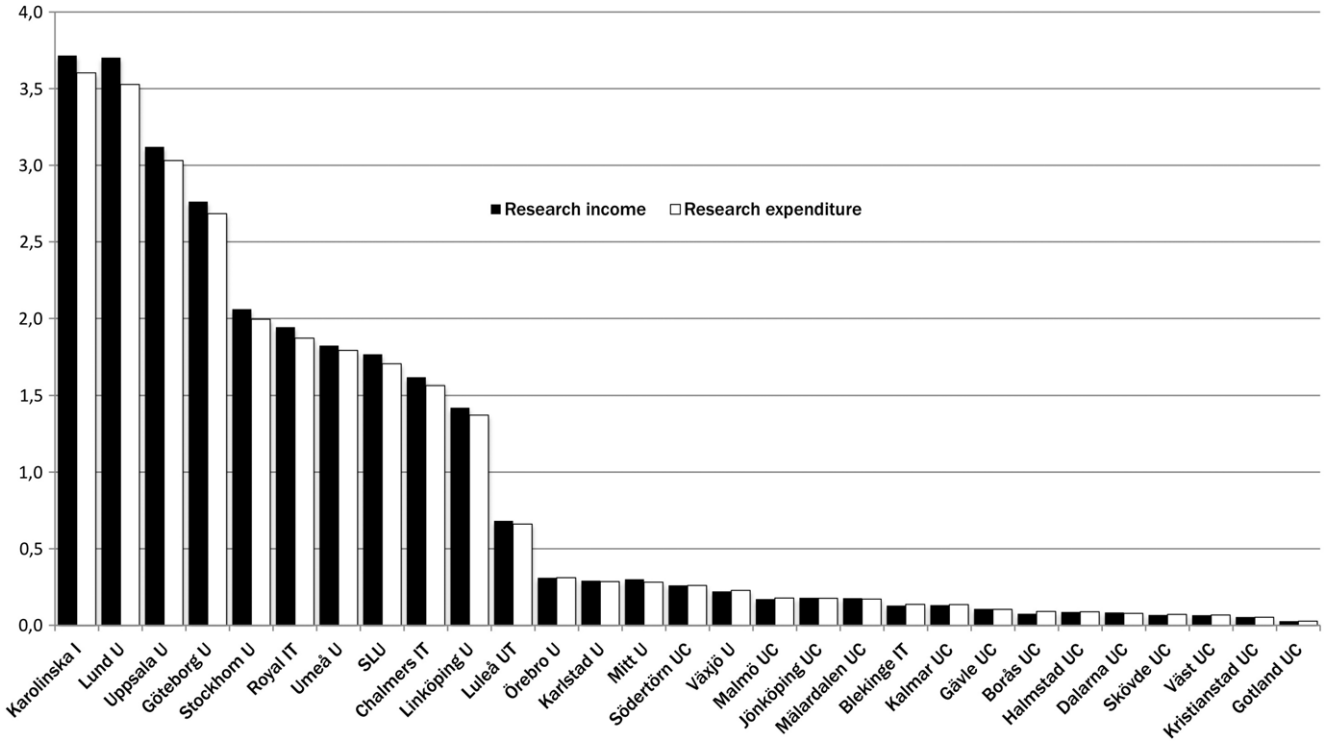

FIG. 1. Annual total research income and expenditure, billion SEK.[6]

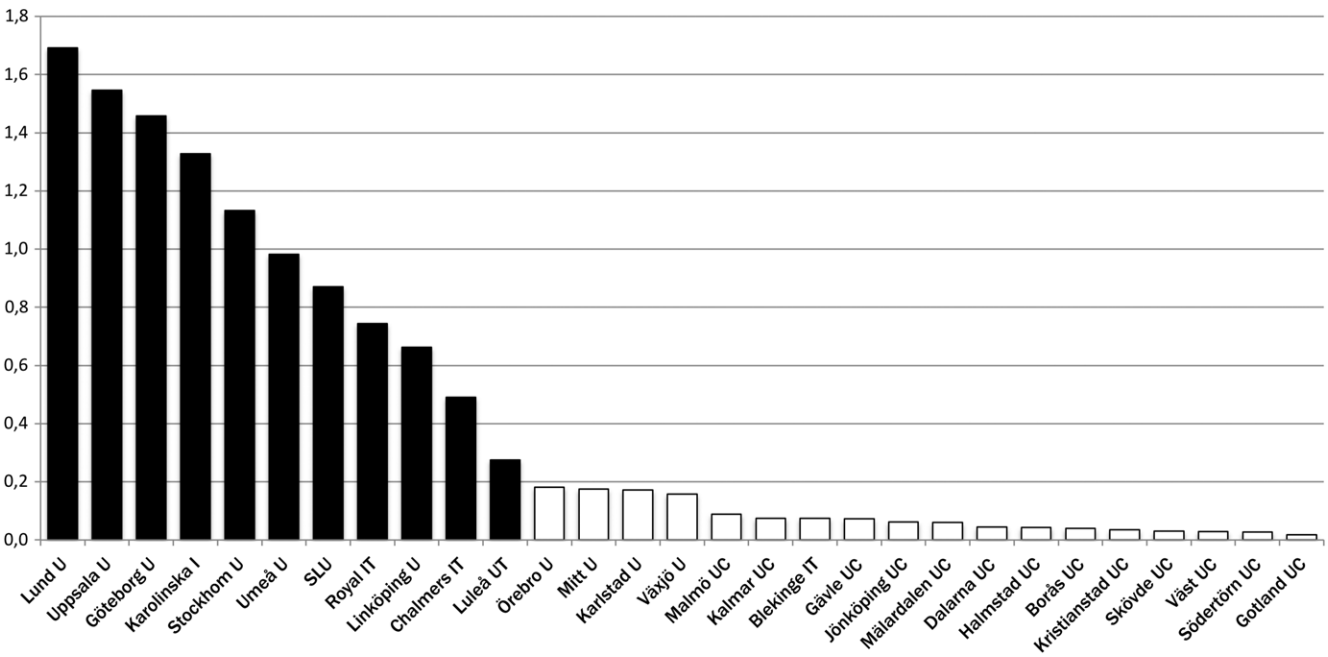

FIG. 2. Annual governmental block-grant funding for research, billion SEK, new HEIs (see table 1) in white.

clearer; established universities are in black and newcomers in white). Unsurprisingly, five of the old, full-range universities have the highest number of active research areas, while specialized institutions (both among the new HEIs and the established universities) have significantly lower numbers of active research areas. A striking fact is that the groups of institutions are not as distinctly separated—the

[6]The currency SEK translates approximately as follows: 100 SEK ≈ 10 € ≈ $15.

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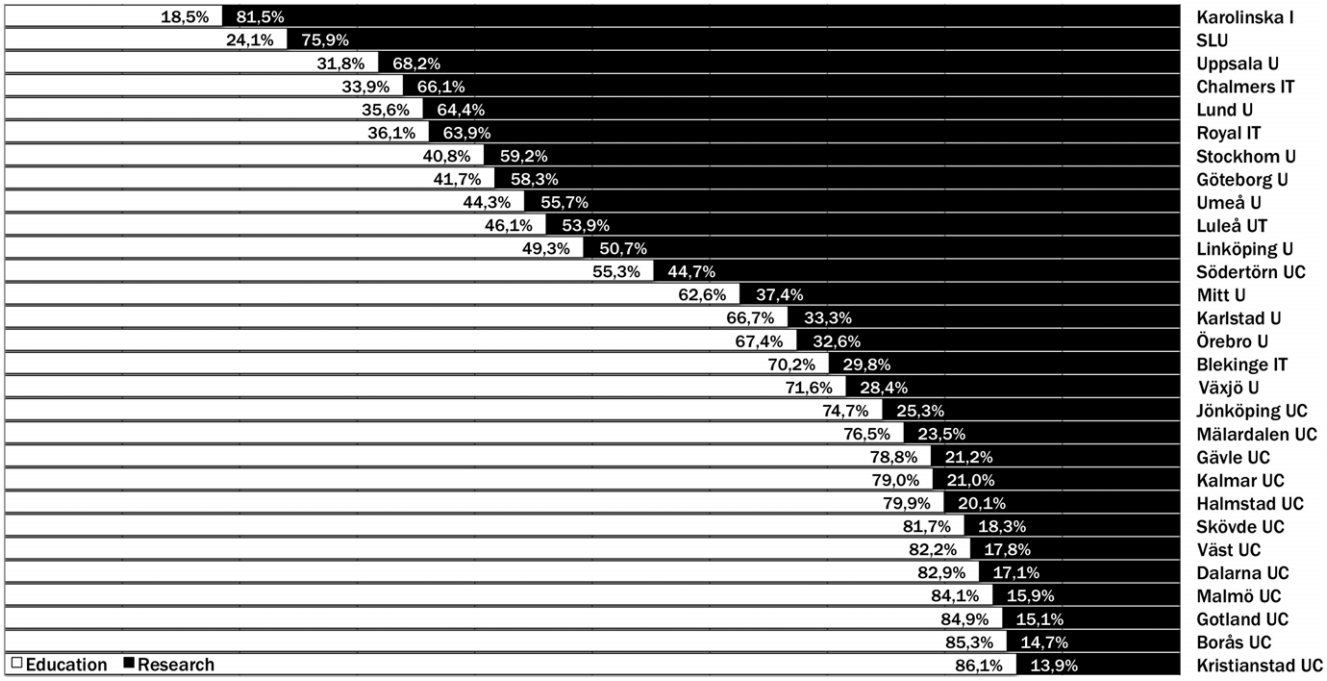

FIG. 3. Relation between research and education activities in overall annual expenditure.

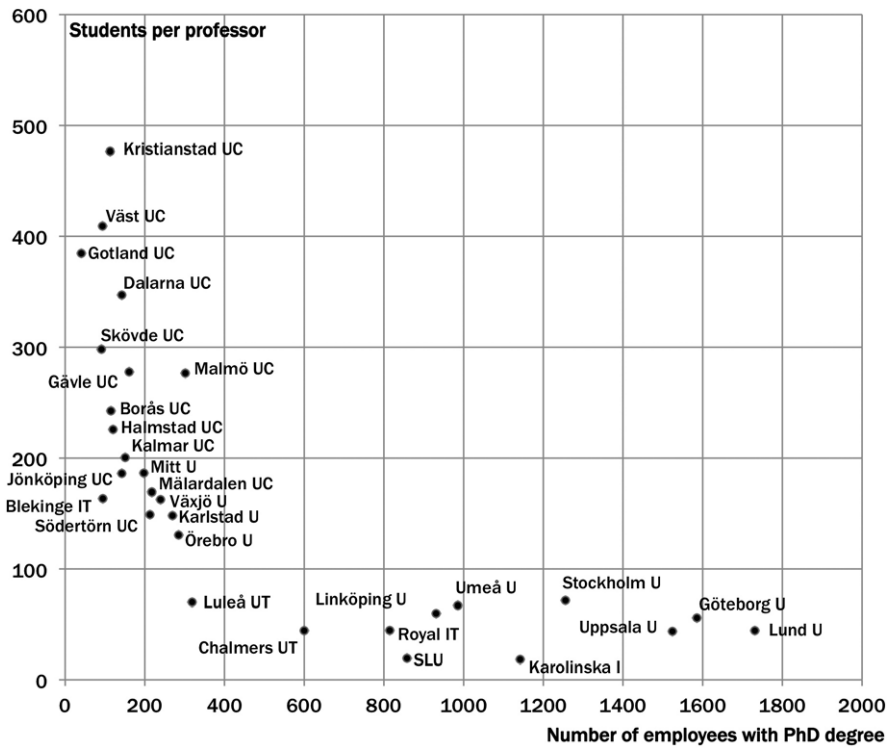

FIG. 4. Number of students per professor and number of employees with PhD degree.

new HEIs have a number of active research areas *comparable* with the established universities—which would suggest a *dilution* of research efforts in these institutions, given their significantly lower research funding. Figure 6 largely confirms this suspicion; on average, the research areas in the new HEIs institutions lack the funding of their counterparts in the established universities, which would suggest that they lack the critical mass to compete with them.

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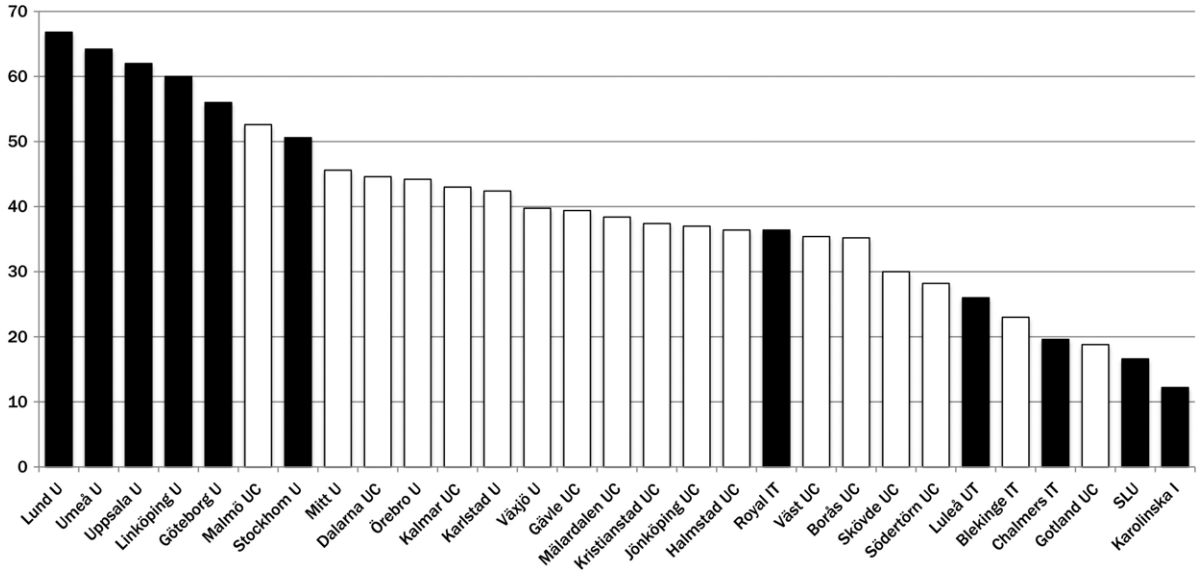

FIG. 5. Number of active research areas[7], new HEIs (see table 1) in white.

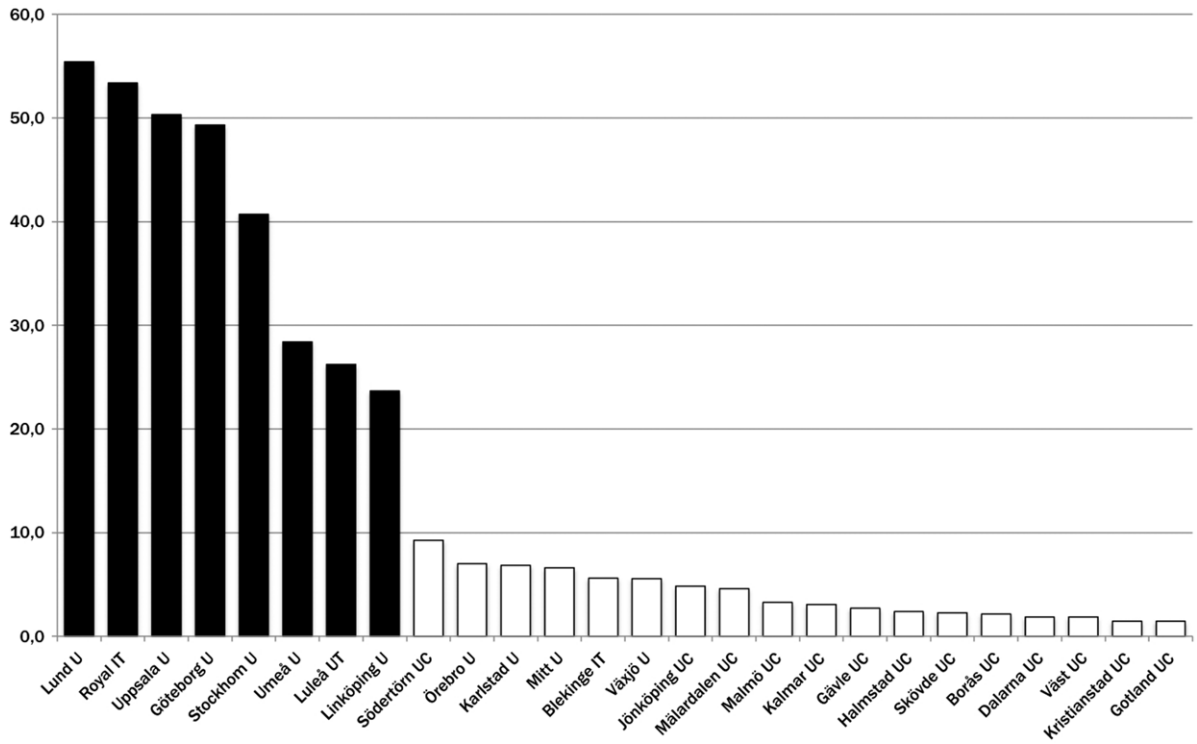

FIG. 6. Annual funding per research area, MSEK[8], new HEIs (see table 1) in white.

[7]These are the *research areas* reported by the HEIs to the National Agency for Higher Education (and used in the NU-database) in accordance with the definition used in Swedish official statistics and defined by *Statistics Sweden* (the national statistics agency). A complete list is found at http://www.hsv.se/download/18.328ff76512e968468bc80003053/NationellaAmnen2010.xlsx

[8]Three HEIs have been excluded for reasons of clarity; these represent extreme figures due to their specialization and still relatively large research volume: Karolinska I (approx. 300 MSEK), SLU (approx. 100 million SEK), and Chalmers IT (approx. 82 million SEK). Interestingly, despite being specialized institutions, neither Royal IT nor Luleå UT show similarly deviating figures, but place themselves on par with full-breadth universities.

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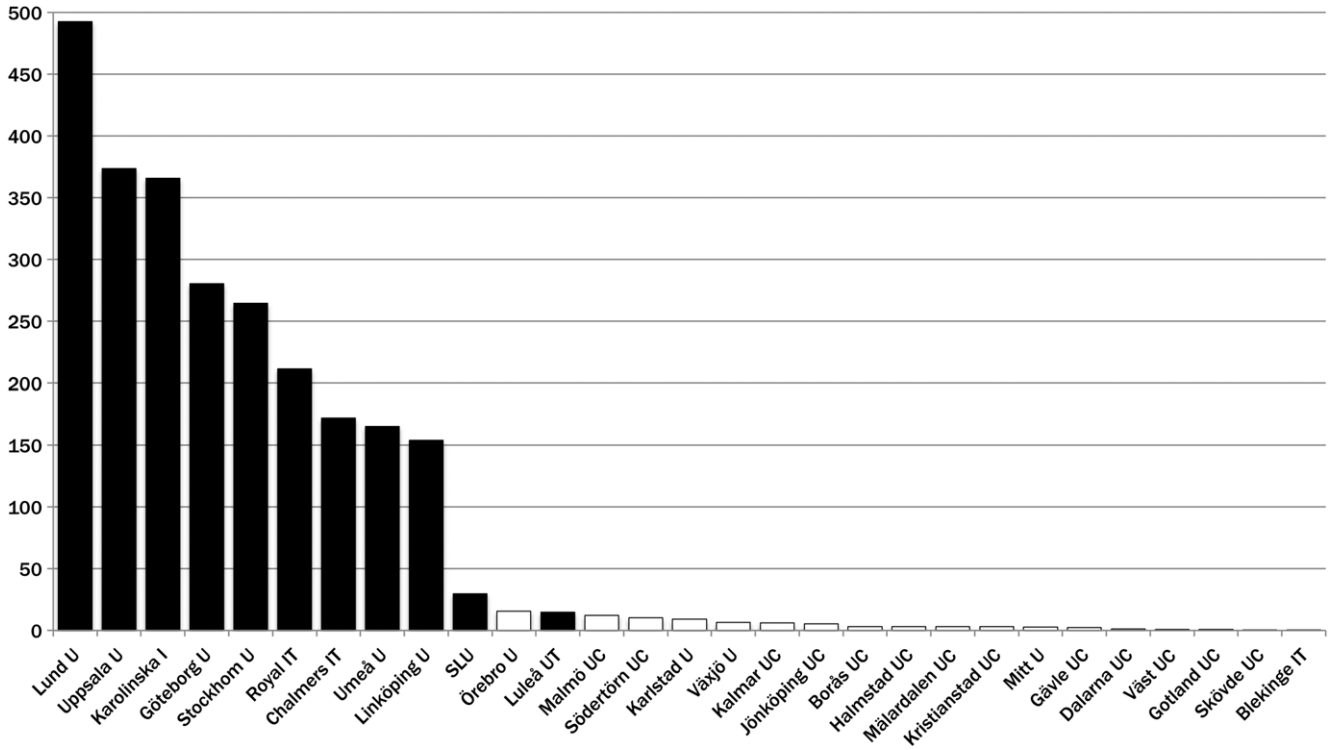

FIG. 7. Annual funding from the Swedish Research Council, total, MSEK, new HEIs (see table 1) in white.

Figure 7 shows a rough measure of the ability of the HEIs to attract external funding, chosen because it represents the most prestigious and competitive source of funding, namely, project grants from the Swedish Research Council.[9] Missing in explicit terms in Figure 7 is an exact total ratio; this is calculated to *29:1*, that is, almost 30 times as much Research Council funding money goes to the established universities as to the newcomers. Excluding the border cases SLU and Luleå UT, the gap is obvious: No new HEI comes closer than a tenth of the sum of Swedish Research Council grants in any of the established universities.

The figures and numbers presented in this section have served to show, unequivocally, that the category of newcomer HEIs in Sweden have (a) significantly smaller *research volumes*, (b) less relative *research intensity* (compared with education), (c) a clear lack of *critical mass* in research, and (d) a considerable *inability to attract prestigious external funding*, than do the established universities.

Policy-History Analysis

In this section, we use literature on research and higher education policy developments in Sweden in the past three to four decades to contextualize the data presented above.

In line with the ambitions of the social democratic government to broaden social and geographical student recruitment, the 1977 university reform sought to further massification of higher education by the creation of no less than 11 new HEIs (Government bill 1975:9). Effectively *regionalizing* higher education, the 1977 reform also created a legally uniform and leveled higher education system with centralized authority—the "University of Sweden" (Elzinga, 1993, p. 191)—and there was no formal distinction between different institutions and their missions. But the established universities retained their status as full-breadth research universities also strong in education, whereas the newcomers were supposed to take the role of local or regional providers of reproduced knowledge, serving their regions with skilled labor. Research funding consequently remained concentrated to the established universities, and the little auxiliary resources for research activities given the new HEIs to improve the quality of education by research links, were controlled by the faculties in the established universities, who were the only institutional units in the system withformal right to discretionary funds for research. In this sense, perhaps the Swedish higher education system was in practice made binary already by the 1977 legislation (Ruin, 1985, p. 120; Kyvik, 2004, p. 401).

In the late 1980s, the new HEIs had a "breakthrough" of sorts both in education and research (Benner, 2008,

[9]The council awards project grants on annual basis in all areas of research, and the competition is generally very high, which makes council grants viewed as especially prestigious.

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p. 113). Student numbers grew dramatically, and central education plans and *regional boards* for education were abolished, which increased the new HEIs' influence over their own educational planning (Högskoleverket, 1998, p. 17). Calls for greater institutional independence and self-governance were heard from both outside and inside the sector (Government Bill 1989/90:90, p. 201). With the governmental research bill of 1990, funding for research activities in the newcomers was substantially increased, but the money continued to be channeled through the established universities, who thus kept their influence over the development of research at the newcomer HEIs (Benner, 2008, p. 113).

This changed in 1993, when a center-right government launched a major university reform in order to decentralize decision making (in particular in the area of financial management of the HEIs), increase institutional autonomy, and create new management and steering procedures (Bauer et al., 1999, p. 254). Generally, the reform altered the governance of the higher education system and the influence of the state, making regulation and economic incentives the prime governance tool and introducing market-like models for allocation of resources (Engwall & Nybom, 2007). This reform and two additional policy decisions in 1994 increased the autonomy of the new HEIs significantly: A strategic research funding organization with the mission to build up research capacity at new HEIs in collaboration with Swedish enterprise was formed,[10] and the new HEIs were given the right to appoint their own professors. Also, de facto doctoral training programs were set up at many new HEIs, built on collaborations with established universities who formally granted the degrees. This was but one of several attempts at the new HEIs to compete for resources and recognition in the system by establishing research activities (Benner, 2008, p. 121). Such attempts have been observed in many national higher education systems, and this has been conceptualized as *academic drift* in Europe and as *mission creep* in the in the United States—smaller education-dominated institutions seek to replicate and emulate ranking research centers and established academic institutions, out of ambition and sheer envy (Geuna, 1998, p. 259; Dill & Soo, 2004, p. 61–62; Kyvik & Lepori, 2010, p. 10–11; Kyvik, 2004, p. 406).

The 1993 and 1994 reforms can be interpreted as first steps in creating an *institutional career path* for the new HEIs, that is, enabling them to make incremental quality improvements and organizational moves towards possible status as full-scale research institutions and "university" designation. In 1996 and 1997, the social democratic government established permanent institutional block grants to the new HEIs and, perhaps most important, gave them the formal opportunity to apply for the rights to award doctoral degrees in a certain *research area* (four defined research areas existed: natural sciences, technical sciences, medicine, and humanities/social sciences; Government bill 1996/97:5). The institutional career path was completed with the opportunity for university colleges to apply for university status, which would increase direct governmental funding and give full freedom to establish new fields for doctoral training within any research area. The remarkable institutional mobility created by these reforms was matched by institutional career moves on behalf of several of the new HEIs: In 1999, three university colleges were turned into universities (Karlstad U, Växjö U, Örebro U), and three were granted so called *research areas*.[11] In 2005, Mid Sweden University College was turned into a university. Of the four new universities, only one, Karlstad, had passed the quality assessment done on appointment by the National Agency for Higher Education. The government's decision was apparently based on other priorities (Sjölund, 2002, pp. 174–178; Högskoleverket, 2005, p. 17).

The institutional career path has had practical limitations. Over a decade after having become universities by name, Karlstad U, Växjö U, and Örebro U still have research volumes far smaller than the established universities, and rather on par with the other newcomers. This is largely because the institutional career path was insufficiently connected to the funding system—although some block grant funding for research came with the university title and the award of so-called research areas, it was minuscule compared to what was generally regarded as necessary to build up research activities on a broader scale. The funding stream was kept at a minimum and despite the relative upswing in research activities among the new HEIs in the 1990s, many of them remained essentially educational institutions. Those with research activities of some distinction are still, in relative terms, far from the volume and critical mass of the established institutions (Benner, 2008, pp. 115–116, 167).

In 2004, the government's policy for the new HEIs changed dramatically. The research system was, quite suddenly, considered too (geographically) broad and decentralized, the number of institutions too many, the research environments too small and uncompetitive, and thus the risk significant that resources were being inefficiently utilized (Government bill 2004/05:80). The solution became consolidation and profiling, which could be seen partly as a (belated) reaction to the 1993 reform and the emergence of an overly decentralized system. After 2004, consequently, no new research areas or university titles have been awarded to newcomers and so the institutional career path has been effectively closed. Furthermore, the series of new governmental excellence-driven and strategic funding schemes from 2004 and on have come out in favor of the established

[10]The *Knowledge Foundation*, in Swedish *Stiftelsen för Kunskap och Kompetensutveckling, KK-stiftelsen*. The foundation has clearly had a role in the efforts of some of the new HEIs to develop their own research activities (Holmberg, 2012).

[11]Kalmar UC, natural sciences; Blekinge IT, technical sciences; Malmö UC, medicine. The coming years, two more research areas were awarded: Mälardalen UC, technical sciences, 2001; Jönköping UC, humanities/social sciences, 2004 (Högskoleverket, 2005, p. 17).

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universities. According to Benner, Stensaker, and Unemar-Öst (2010), the design of these programs did not match the research profiles of the new HEIs—they required a volume and breadth of research activities that few or none of these institutions could build or uphold.

In 2008, the career path for new HEIs was also formally closed, as the possibility to apply for research area was replaced by the possibility to apply for the right to grant doctorates in distinct subject fields. Unlike research areas, however, this right comes with no additional funding (Government bill 2008/09:50). A new procedure for first-stream funding, focused on academic excellence (publications, citations and ability to attract external funding) and used to distribute a share of 5% of the total annual governmental first-stream funding for research, was launched in 2008 (Government bill 2008/09:50), and will most likely work in favor of the established universities, at the expense of the new HEIs (Sandström & Sandström 2009, p. 246).

Policy decisions in the decades since the peak of massification of higher education in Sweden have, as this section has shown, worked to both the advantage and disadvantage of the new HEIs. Although these institutions have doubtlessly gained autonomy and received some resources to build up research capacity, they are stuck in a lower stratum or second tier of the system. Some have taken steps on the institutional career path and become universities by name, and several have managed to develop comparably competitive research niches (Benner, 2008, pp. 166–167; Holmberg, 2012). But the role and function of the new HEIs as research institutions are unclear due to the ambiguity of the governmental policies of the last two decades (Benner et al., 2010, p. 8). History also suggests that (quasi-)market mechanisms—e.g., the relative growth of competitive funding schemes and heightened institutional competition (also internationally)—have had a certain influence on the development.

Discussion and Conclusions

Legally and formally, the Swedish higher education system is uniform, and there is no codified division of labor between the institutions of research and education activities (n. b. the established universities are also very strong in education). The only exception is the university/nonuniversity separation that gives 15 institutions certain formal rights that the other 14 do not enjoy. However, the quantitative data show that there is far-reaching de facto or *hidden* structural stratification in the Swedish academic system.

One simple interpretation, at first sight supported by our material, is that the system is binary. The measures of *research volume*, illustrated by Figures 1 and 4, suggest this, as does history, since the two groups of HEIs are separated (with one exception) by the year 1977. This interpretation of the Swedish academic research system as binary is also supported by previous analyses (Bauer, 2000; Kyvik, 2004; Ljungberg et al., 2009). A closer look at the quantitative data presented doe however, shows a slightly more complex reality. The specialized institutions (e.g., Chalmers IT, Karolinska I, Luleå UT) naturally deviate from the strict polarization and the distinct categorization. The new universities (Karlstad U, Mitt U, Växjö U, Örebro U) have significantly larger research volumes than the other new HEIs, although not even close to the established universities in whose company they formally belong. Thus, the quantitative data can be interpreted in different ways and the attempts to illustrate structural stratification of the Swedish higher education system by these data are somewhat ambiguous: Is there a *two-tier* or *three-tier* or perhaps *several-tier* system? And how distinct is the separation between the groups?

In previous analyses, the reasons for stratification of the Swedish system have received little attention, and the difference between formal and informal divisions between groups of HEIs in the system has been largely neglected. Our historical analysis provides a clue by showing that a de facto division of labor has characterized the system since 1977, which is mirrored in policy developments through the decades. One conclusion from the policy analysis is that if a binary system existed in the 1980s, later developments have enabled some mobility in this system that has, over time, created several tiers and thus in one sense loosened the harsh binary structure. The dynamics of the system since the beginning of the 1990s is mainly explained by changes in governmental policy, but also that the new HEIs had their own external research funding foundation which is probably unique in an international context (Kyvik & Lepori, 2010; Hazelkorn, 2005). The changes created opportunities for some of the HEIs to establish themselves as research institutions, while others remained mainly educational institutions, all depending on the different abilities of these HEIs to compete for the increasing relative amount of external funding in the system.

However, the 1990s governmental policy shifts did not induce any sweeping changes in the Swedish higher education system since the policies were not in place long enough to have real effect. The window of opportunity for the new HEIs only lasted for approximately ten years, from the higher education reform in 1993 to the closing of the institutional career path in 2004. Since 2004, policy has rather increased or reinforced (existing) stratification. The macro-view, illustrated by our quantitative data, fails both to show such developments or provide any clues as to the reasons. Qualitatively oriented policy-history analysis is clearly needed here for interpretation, to draw proper conclusions beyond what we judge to be a rather oversimplified identification of a binary system.

By the combination of two data sources, we have provided an example of how to achieve an enriched understanding of *stratification* in national higher education systems, suggested by numerous studies but seldom either substantiated by robust data or historically explained. Many studies

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of national higher education systems, especially "comparative higher education," use global trends as explanations for national similarities (Marginson & Rhoades, 2002) and much literature focuses on national policies following macrotrends and structures (Clark, 1996). This article demonstrates the benefits of using complementary methods—quantitative data and qualitative policy analysis—in understanding this development. We conclude that there is great merit in analyzing structural stratification in higher education systems as context-specific by combining comprehensive macrolevel quantitative data and research policy analysis, and by integrating higher education studies with research policy studies (which is relatively infrequent).

The approach certainly also has some weaknesses that limit the study, for example, the lack of a comparative element and the inadequacies associated with analyzing higher education institutions and their capacities in research without accounting for differences within institutions, e.g., between different disciplines (López-Illescas, de Moya-Anegón, & Moed, 2011). Both are consequences of the basic premises for this study, not least the nature and scope of the empirical material. The database used is restricted to Sweden and keeps to the macrolevel figures on funding and broad research areas. On the other hand, the availability of the database has provided us with a golden opportunity to analyze data that are often used rather unadvisedly to indicate relative quality or strength among HEIs within national contexts or internationally. Our contribution is an important first step towards deeper knowledge of the apparently global phenomenon of institutional stratification of academic research systems.

Thus, we argue that this type of analysis can contribute to an understanding of the development of national higher education systems in a globalized world by examining local variations and patterns. The combination of methods used in this study offers a way to examine the inter-relationship of national government policy, market-like models for allocation of resources, and the agency of HEIs in a specific context. The quantitative data provide interesting and important problem areas that need to be solved by qualitative analysis. Clearly, there are reasons to moderate the perception of deliberate government policy as the lone determinant of the fate of systems as well as individual institutions. When analyzing a complex system evolving over time one should rather underline the unintended consequences of policymaking.

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TABLE A1. Basic facts on the HEIs.

Abbreviation	Official name in Swedish	Official name in English	Location	Founded	Type[a]
Blekinge IT	Blekinge Tekniska Högskola	Blekinge Institute of Technology	Karlshamn, Karlskrona	1989	UC with research area, gov
Borås UC	Högskolan i Borås	University of Borås	Borås	1977	UC, gov
Chalmers IT	Chalmers Tekniska Högskola	Chalmers University of Technology	Göteborg	1829	Full university equivalent, priv
Dalarna UC	Högskolan Dalarna	Dalarna University	Borlänge, Falun	1977	UC, gov
Gotland UC	Högskolan på Gotland	Gotland University	Visby	1998	UC, gov
Gävle UC	Högskolan i Gävle	University of Gävle	Gävle	1977	UC, gov
Göteborg U	Göteborgs Universitet	University of Gothenburg	Göteborg	1891	Full university, gov
Halmstad UC	Högskolan i Halmstad	Halmstad University	Halmstad	1983	UC, gov
Jönköping UC	Högskolan i Jönköping	Jönköping University	Jönköping	1977	UC with research area, priv
Kalmar UC	*Högskolan i Kalmar*	*University of Kalmar*	*Kalmar*	*1977*	*UC with research area, gov*
Karlstad U	Karlstads Universitet	Karlstad University	Karlstad	1977	New university, gov
Karolinska I	Karolinska Institutet	Karolinska Institute	Stockholm	1810	Full university equivalent, gov
Kristianstad UC	Högskolan Kristianstad	Kristianstad University	Kristianstad	1977	UC, gov
Linköping U	Linköpings Universitet	Linköping University	Linköping	1970	Full university, gov
Linné U	Linnéuniversitetet	Linnaeus University	Kalmar, Växjö	2010	New university
Luleå UT	Luleå Tekniska Universitet	Luleå University of Technology	Luleå	1971	Full university equivalent, gov
Lund U	Lunds Universitet	Lund University	Lund	1666	Full university, gov
Malmö UC	Malmö Högskola	Malmö University	Malmö	1998	UC with research area, gov

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Mitt U	Mittuniversitetet	Mid Sweden University	Härnösand, Sundsvall, Östersund	1993	New university, gov
Mälardalen UC	Mälardalens Högskola	Mälardalen University	Eskilstuna, Västerås	1977	UC with research area, gov
Royal IT	Kungliga Tekniska Högskolan	Royal Institute of Technology	Stockholm	1826	Full university equivalent, gov
Skövde UC	Högskolan i Skövde	University of Skövde	Skövde	1977	UC, gov
SLU	Sveriges Lantbruksuniversitet	Swedish University of Agricultural Sciences	Alnarp, Skara, Uppsala, Umeå	1977	Full university equivalent, gov
Stockholm U	Stockholms Universitet	Stockholm University	Stockholm	1904	Full university, gov
Södertörn UC	Södertörns Högskola	Södertörn University	Huddinge	1995	UC, gov
Umeå U	Umeå Universitet	Umeå University	Umeå	1965	Full university, gov
Uppsala U	Uppsala Universitet	Uppsala University	Uppsala	1477	Full university, gov
Väst UC	Högskolan Väst	University West	Trollhättan	1990	UC, gov
Växjö U	*Växjö Universitet*	*Växjö University*	*Växjö*	*1977*	*New university*
Örebro U	Örebro Universitet	Örebro University	Örebro	1977	New university

Note.
[a]Type refers to the taxonomy developed in table 1.

TABLE A2. Basic figures on economy, annual averages 2006–2010 (kSEK).

	Education income	Research income	Education expenditure	Research expenditure	Governmental block grant research funding	Funding from the Swedish Research Council
Blekinge IT	303,461	129,030	303,461	137,127	74,456	138
Borås UC	438,143	75,498	438,143	90,510	39,781	3,270
Chalmers IT	830,105	1616,342	830,105	1564,762	490,648	171,992
Dalarna UC	407,649	83,808	407,649	78,009	44,070	1,314
Gotland UC	153,011	27,154	153,011	26,753	17,837	833
Gävle UC	399,211	107,122	399,211	103,967	72,337	2,536
Göteborg U	1,977,342	2,762,037	1,977,342	2,683,942	1,458,071	280,412
Halmstad UC	347,458	87,164	347,458	88,270	43,056	3,256
Jönköping UC	530,655	179,606	530,655	176,329	61,313	5,290
Kalmar UC	496,425	131,939	496,425	135,704	74,702	5,989
Karlstad U	582,340	291,128	582,340	285,704	171,942	9,008
Karolinska I	846,095	3,715,712	846,095	3,603,187	1,328,063	365,799
Kristianstad UC	335,932	54,152	335,932	52,682	35,172	3,066
Linköping U	1,379,463	1,420,117	1,379,463	1,372,023	662,627	153,996
Luleå UT	582,840	681,842	582,840	661,026	275,159	14,800
Lund U	2,048,672	370,224	2,048,672	3,527,681	1,691,970	492,596
Malmö UC	905,918	171,231	905,918	177,701	88,510	12,040
Mitt U	502,372	300,425	502,372	281,613	174,609	2,891
Mälardalen UC	577,191	176,860	577,191	171,177	59,903	3,206
Royal IT	1,098,904	1,942,854	1,098,904	1,871,069	744,044	211,436
Skövde UC	301,081	67,501	301,081	71,286	30,547	218
SLU	559,838	1,766,183	559,837	1,704,152	870,759	29,710
Stockhom U	1,420,040	2,060,045	1,420,040	1,994,276	1,132,762	264,545
Södertörn UC	322,298	260,985	322,298	259,996	27,051	10,341
Umeå U	1,447,105	1,823,054	1,447,105	1,791,357	982,268	165,180
Uppsala U	1,456,364	3,119,931	1,456,364	3,030,877	1,546,451	373,605
Väst UC	303,758	65,729	303,758	67,466	29,399	984
Växjö U	558,656	221,461	558,656	227,808	157,848	6,520
Örebro U	641,347	309,824	641,347	310,785	182,048	15,770

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TABLE A3. Basic figures on students and personnel, annual average 2006–2010.

	Students and personnel					Research areas		
	Students	Professors	Researchers	PhDs	Students per professor	Number of research areas	Funding per research area (kSEK)	PhDs per research area
Blekinge IT	5,068,4	31,0	241,6	94,5	163,5	23	5,610,0	4,1
Borås UC	7,324,8	30,2	352	114,8	242,5	35,2	2,144,8	3,3
Chalmers IT	8,866,2	200,2	1,007,2	600,0	44,3	19,6	82,466,4	30,6
Dalarna UC	8,608,7	24,8	388,8	142,3	347,1	44,6	1,879,1	3,2
Gotland UC	3,998,7	10,4	112,6	40,5	384,5	18,8	1,444,4	2,2
Gävle UC	8,324,3	30,0	411	160,8	277,5	39,4	2,718,8	4,1
Göteborg U	28,926,6	518,8	2,678,2	1,585,5	55,8	56	49,322,1	28,3
Halmstad UC	6,586,9	29,2	303,6	120,0	225,6	36,4	2,394,6	3,3
Jönköping UC	9,713,7	52,2	397,4	142,3	186,1	37	4,854,2	3,8
Kalmar UC	7,168,5	35,8	411,75	150,8	200,5	43	3,068,3	3,5
Karlstad U	9,892,2	66,8	661,2	269,5	148,1	42,4	6,866,2	6,4
Karolinska I	6,498,5	356,8	1,856,2	1,141,8	18,2	12,2	304,566,6	93,6
Kristianstad UC	6,959,9	14,6	312,8	112,8	476,7	37,4	1,447,9	3,0
Linköping U	18,549,9	309,6	1579	931,0	59,9	60	23,668,6	15,5
Luleå UT	8,293,2	118,8	619,6	318,8	69,8	26	26,224,7	12,3
Lund U	28,565,1	644,4	2,579,6	1,730,8	44,3	66,8	55,423,1	25,9
Malmö UC	13,322,8	48,2	760,6	301,8	276,4	52,6	3,255,3	5,7
Mitt U	11,335,4	60,8	492,8	197,5	186,4	45,6	6,588,3	4,3
Mälardalen UC	8,999,4	53,2	522	217,5	169,2	38,4	4,605,7	5,7
Royal IT	14,017,2	314,8	1,449,4	814,5	44,5	36,4	53,375,1	22,4
Skövde UC	5,305,7	17,8	290,8	91,3	298,1	30	2,250,0	3,0
SLU	4,283,3	223,6	1,397,2	858,0	19,2	16,6	106,396,6	51,7
Stockhom U	30,238,6	423,6	2,347,8	1,255,5	71,4	50,6	40,712,4	24,8
Södertörn UC	6,966,2	46,8	363,6	212,8	148,9	28,2	9,254,8	7,5
Umeå U	19,522,9	291,2	1,855	985,5	67	64,2	28,396,5	15,4
Uppsala U	23,367,0	534,4	2,425,8	1,524,0	43,7	62	50,321,5	24,6
Väst UC	5,894,3	14,4	296,4	93,8	409,3	35,4	1,856,8	2,6
Växjö U	9,785,9	60,2	552,5	239,3	162,6	39,75	5,571,3	6,0
Örebro U	10,148,1	77,8	574	284,8	130,4	44,2	7,009,6	6,4

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