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University autonomy: Improving educational output

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Evidence-based policy making

University autonomy: Improving educational output

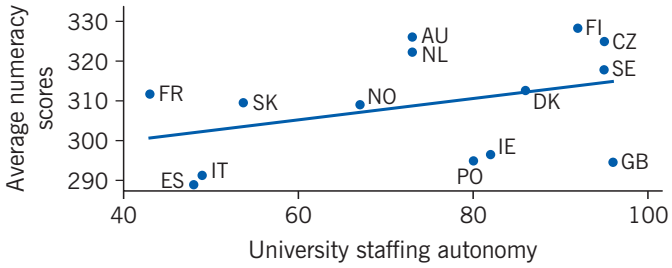
Universities deliver more competent graduates and higher quality research if they are more autonomous and well-funded

Keywords: university autonomy, university funding, university education, university research, labor productivity

ELEVATOR PITCH

University autonomy and funding is an important aspect in university-level education due to its impact on graduates' competencies, and on the quality and quantity of research produced. Political factors influence the amount of autonomy allotted to public universities in specific countries. There is sufficient evidence to suggest that an increase in autonomy for universities would provide better educational outcomes and have a direct impact on labor market productivity. However, the debate on autonomy has been overshadowed by discussions on tuition fees and student aid in political circles.

Graduate numeracy raises with university staffing autonomy, 2010



Notes: Average numeracy scores (scale 0–400) of graduates (ISCED 5–6) 25–34 years old. Numeracy is the ability to reason and to apply numerical concepts.

Source: Graduate numeracy: PIAAC data. Online at: http://www.oecd.org/site/piaac/; university staffing autonomy: EUA data [1].

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KEY FINDINGS

Pros

- Increased university autonomy contributes to graduates' competencies and university research output.
- Funding and student aid have a significant impact on graduates' competencies and university research output.
- The competencies of graduates and university research output are closely and positively related to labor productivity.
- Employer satisfaction with university graduates appears to be closely related to the quality of university research.

Cons

- University autonomy is limited in many countries, primarily due to political opposition.
- It is difficult to determine an accurate and agreeable measure of university autonomy.
- Comparing the level of autonomy across different systems is difficult.

AUTHOR'S MAIN MESSAGE

University autonomy, specifically in reference to academic approach, staffing, internal decision-making, and financial practices, in combination with proper funding, is likely to enable universities to produce graduates with better competencies and to enhance both the quality and quantity of research output. In turn, improved graduate competencies and university research output contribute to labor productivity and economic innovation. Increasing autonomy for universities should be a high priority for policymakers.

MOTIVATION

Increasing evidence suggests that universities will be better suited to pursue the goals of adding value to the "talent" or "competencies" of their graduates as well as improving their research output if given more autonomy and sufficient funding by public policymakers [2], [3]. The economic benefits of a university education are increasingly being recognized, while advanced competencies are needed for non-routine work in order to facilitate innovation and economic growth [4].

Countries differ substantially in how they deliver tertiary education, in terms of the autonomy of universities and the level of funding provided per student. Limitations set by government on how to organize internal decision-making, internal resource allocation, staffing, and the academic approach decide the structure of universities. Governments also affect individuals' decisions regarding university education, for example, by limiting admissions to certain degree courses. Potential students may be discouraged from pursuing university studies by high admission fees or—to the contrary—encouraged by student loans and grants. More university autonomy, better funding per student (in relation to GDP), and better opportunities for students to obtain financial support appear to make universities better equipped to enhance graduate competencies and university research output.

University policies, like most educational policies, are generally considered to be based on country-specific "political" viewpoints. However, evidence on the impact of policy on graduate competencies and innovation could improve government reform proposals and parliamentary policies.

DISCUSSION OF PROS AND CONS

Government policy: Autonomy and funding

Public policies play an important role in enhancing the research outputs and quality of university education. Two sets of public policies can be distinguished: financial instruments and legal instruments, which determine the delivery of university education, and are mostly captured by the term "autonomy."

Particularly in Europe, where universities are largely publicly funded (75%), the notion of university autonomy has been heavily debated in public policy. Various reforms have been enacted that aim at increasing the autonomy of universities, for example by enabling universities to manage their own finances. Greater autonomy is supposed to improve the delivery of university education, i.e. to add more value to graduates' competencies. Autonomy means that university staff are empowered to utilize their professional talents and experience in realizing the best learning and research outcomes. In order to avoid abuse of autonomy for self-centered purposes, a university is always considered within the context of accountability for its outcomes.

The following definitions describe four different dimensions of autonomy:

- Academic autonomy (deciding on degree supply, curricula, and methods of teaching; deciding on areas, scope, aims, and methods of research);
- Financial autonomy (acquiring and allocating funding, deciding on tuition fees, accumulating surplus);

- Organizational autonomy (setting university structures and statutes, making contracts, electing decision-making bodies and persons);
- Staffing autonomy (responsibility for recruitment, salaries, and promotions) [1], [5].

Organizational autonomy and financial autonomy are often combined to form "managerial autonomy."

The illustration on page 1 shows the difference in university autonomy across several European countries by comparing staffing autonomy with a measure of graduate competency: numeracy (i.e. the ability to reason and to apply numerical concepts). The results are only partly in agreement with those from judgments by independent observers [5]. They reflect differences in the qualitative assessment and in the weighing of the subcategories for each of the four autonomy dimensions—differences that cannot easily be interpreted to reflect changes in university policy.

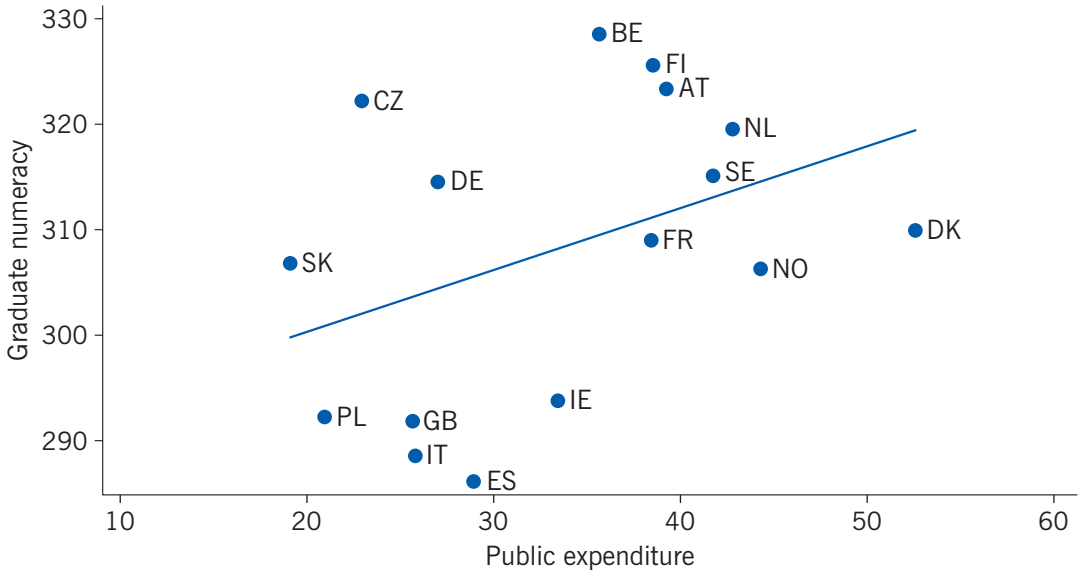
Regarding financial autonomy, the following policy variables are relevant for universities' performance [3]:

- Financial aid to university students as a percentage of total public expenditure on university education.
- Tuition fees, leading to private expenditures: private expenditure per university student as a percentage of GDP per capita.
- Public expenditure per student as a percentage of GDP per capita.
- Incentives inherent in public expenditure. Countries differ in the ways they fund public education: on the one hand are block grants, independent of any performance indicator, and on the other hand is very detailed performance-related funding (e.g. funding per degree awarded). Some countries (e.g. Denmark and the Netherlands) have recently reverted to "performance contracts" for universities, itemizing what universities should deliver and how they should do so in terms of, for example, student to teacher ratios and dropout prevention, while simultaneously sustaining overall autonomy (Figure 1 plots graduate numeracy against student funding for 16 European countries).

There is considerable variation in both the level of autonomy and the level of funding across Europe [3]. The countries with the highest levels of expenditure per student are not necessarily the ones with the greatest amount of university autonomy. The illustration on page 1 and Figure 1 both demonstrate that there is a relationship between graduate competencies and autonomy or funding for all universities in a selected European country, but that this relationship is weak and not necessarily causal.

One of the hottest higher education policy issues related to funding is the setting of tuition fees in relation to student aid. Very few European countries have allowed universities autonomy in setting tuition fees. If tuition fees exist, then the government sets them. Debates on this topic affect a range of important concerns, including equality of educational access. One major impact is not so widely acknowledged, though: debates about funding have drawn attention away from the discussion about increased university autonomy, subsequently reducing the likelihood of any significant reform on this topic.

Figure 1. Graduate competences and university funding, 2010



Source: Graduate numeracy, average score (scale 0–400) of graduates (ISCED 5–6) 25–34 years old: PIAAC data. Online at: http://www.oecd.org/site/piaac/; public expenditures (expenditure per student as a percentage of GDP per capita): data from Empower European Universities. Online at: http://www.empowereu.org

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Effects of autonomy and funding on university performance

Public higher education is supposed to serve academic education, public research, and social service. Funding policy and government "control" imposed through legislation (here captured as the degree of university autonomy inherent in government policy) represent the means of achieving public university goals.

The impact of autonomy on university performance has been analyzed for public research universities in the US [6]. Universities with a greater degree of autonomy were only found to perform better on endowment and gifts per student, but not on other quality variables such as faculty quality, undergraduate quality, or the levels of government grants per full-time equivalent staff member. "Those campuses which have the most freedom from constraints on their academic programs, and which are funded generously by the state, are most successful in raising funds from alumni" [6]. In this study, state support for universities (i.e. funding) significantly explained university performance (i.e. more funding resulted in better performance). However, reverse causality—whether better performance resulted in more funding—was not analyzed. Furthermore, the imprecise measurement of autonomy could explain why it did not appear to have an impact on university performance.

A subsequent study—conducted some 20 years later—concentrates on research output, measured by patenting and international university research rankings, according to the Shanghai-ranking, for the US and Europe [2]. The partial correlations between autonomy and university output are positive for both the EU and US [2]. Also, in the US, when a state university receives a positive funding shock (i.e. an influx of additional funding in the form of grants or endowments, for instance), then it produces more patents if it is more autonomous and faces more competition from private universities through merit-based competitions for federal funding [2].

More recently, the importance of funding was established for a top rank in the *Times Higher Education* ranking system [7]. Funding is the combined income received per student from

public and private sources. The rank is a quasi-indicator of university performance, both in the education and research domains. Another study shows the separate role of autonomy for 32 European countries: an additional unit of organizational autonomy is associated with a 13% higher likelihood of being ranked as a top 500 university (in proportion to the population of the country) [3].

For these 32 countries, several different university performance measures are used to establish the relative role of autonomy in educational performance [3]:

- Quantitative indicator: the number of enrolled students as a percentage of the population of corresponding age.
- Graduation rates.
- Graduate employment rates of 25 to 34-year-olds three years after graduation.
- Percentage of foreign students in the host country as a measurement of that country's attractiveness in university education.

University research performance for the 32 European countries has the following measurements [3]:

- Scientific publications within the 10% most-cited scientific publications worldwide as a percentage of total scientific publications of a country.
- The percentage of universities in the Academic Ranking of World Universities (ARWU), or Shanghai Ranking, proportionally to the population.
- The number of incoming Marie Curie Fellows and young European Research Council grant winners per million inhabitants.
- Private–public co-publications per million inhabitants.
- Patents.

These performance measures are often closely related to each other. In Europe, one generally finds that research performance is strongly correlated with GDP per capita, where the Netherlands, Sweden, and Switzerland are stronger in research than expected based on their GDP. However, this observation casts doubt on a relation with university autonomy, where the universities in the Netherlands and Sweden enjoy a lot of autonomy, while the Swiss universities (except for the two federal ones) do not.

It turns out that expenditure per student is the policy measure that is most significantly related to outcomes at the university level [3]. Higher public expenditures are related to a more attractive system for foreign students, a higher likelihood for graduates to find employment, and better research performance by universities. For example, a 1% increase in expenditure per student is associated with an increase of 0.65 percentage points in graduate employment rates within three years of graduation and a 29 percentage point increase in publications in the top 10% most-cited scientific journals [3].

Autonomy has a statistically significant impact on research output (through managerial autonomy) and on education output (through policy autonomy). Accordingly, one additional unit of policy autonomy relates to a 3.60 percentage point increase in the number of students from non-traditional backgrounds. Furthermore, financial aid to students positively contributes to attracting international students and international researchers (Marie Curie Fellows) [3].

Better funding and a higher level of managerial autonomy are associated with an increase in research performance. However, while policy autonomy relates to an increase in graduation and graduate employment, it is not significantly associated with research attractiveness and productivity [3]. A plausible interpretation is that policy autonomy allows the academic staff to design their own courses and tailor them to the needs of their students to facilitate learning and the acquisition of skills relevant to the labor market.

Unfortunately, no studies have yet linked graduate competencies as an output to university policy in the form of autonomy and funding, even though data are available on graduate competencies from the OECD project International Assessment of Adult Competencies (PIAAC). The data from PIAAC reflect graduate competencies in the labor market, measuring literacy, numeracy, and "problem solving in a technological environment" (IT skills). These metrics are the result of graduates' innate abilities prior to entering education, the higher education process, as well as competencies developed while at work.

Note that in all the studies mentioned, education and research performance is set against autonomy and funding, as if policy is independent from both university performance and cultural factors. As such, reverse causality or unobserved heterogeneity may require further consideration.

The relevance of university policy for economic growth

University policy, relating to legislative autonomy and public funding, affects economic growth due to its impact on university output in education and research. This relationship between (university) education, research, and labor productivity is complex, especially when considering technology's influence on investment in physical capital. It is well established that technological progress does not occur in a vacuum, but is rather the result of breakthroughs in human or physical capital combined with higher productivity levels [4]. In turn, changes in productivity levels are likely to be the result of, amongst others, the involvement of well-trained workers in the production process along with advancements from public and private research and development.

In the past four decades, the supply of skilled workers increased rapidly in OECD countries, yet demand still outpaced supply, leading to an increase in the wage premiums for well-trained workers. This is the race between technology and education. Education, while trying to educate workers to operate new technologies, pushes technology further to break new ground [8].

Human capital has traditionally been approximated by workers' years of education, without accounting for potential differences in quality. This changed with the introduction of internationally comparable assessments of cognitive skills. Scores on international tests like the Programme for International Student Assessment (PISA; as an indicator of the quality of human capital) turned out to matter more for subsequent economic growth than did years of school attainment [9]. The impact of such scores on growth remains statistically substantial, even when accounting for potential "reverse causality": achievement might differ because of previously achieved economic growth.

In turn, these scores are well connected with government policy in funding and school autonomy. These policy factors have been found to have a substantial impact on skill development in some 50 countries, and affected economic growth for the period 1960–2000. This remains the case when correcting for reverse causation; that is, countries

Figure 2. Employers' satisfaction and research productivity, 2014

Note: Number of publications in top journals as measured by citations per country, compared to overall employer satisfaction with university graduates.

Source: Empower European Universities. Online at: http://www.empowereu.org

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that perform better might be more inclined to use "better policies" [9]. At the same time, the existence of reverse causality is a warning about the independence of and control over public policies: at first glance they appear to be the result of particular political processes, while from a distance they seem to move more or less systematically and organically as a result of economic development [10].

Labor productivity is related to an increase in research performance in 32 European countries [3]. However, indicators related to the quantitative educational output of universities (like the relative enrolment of students or graduation) show a different relation with labor productivity [3]. University systems with the largest enrolment relative to the age group 18–24 do *not* enjoy the highest levels of labor productivity. In fact, a 1% higher university enrolment rate relates to a *decrease* of €0.33 of GDP per capita produced per hour and 0.49 percentage points lower labor productivity [3]. At the same time, the quality of the education system (reflected through employment/graduation) is positively related to labor productivity and, although to a lesser extent than research, to the country's economic innovation [3]. Research quality and scientific appeal, international attractiveness, and graduation/employability are positively associated with a country's labor productivity [3].

Figure 2 depicts a very interesting correlation between "employers' satisfaction with graduates" (an education-output measure) and research performance in European countries. Accordingly, employer satisfaction generally increases in conjunction with research productivity, though outliers do exist (e.g. Lithuania). This could be explained as the success of the Humboltian concept of a university where strong research and education come together, the qualities of the graduates are enhanced (as perceived by employers).

Taking the impact of autonomy and funding on university performance together with the impact of university performance on labor productivity shows the overwhelming importance of the organization and funding of university systems for economic growth. It is a no-regret

strategy to engage in university reform toward more autonomy for universities (embedded in the proper quality assurance system) in combination with proper funding.

LIMITATIONS AND GAPS

Metrics for the qualitative aspects of government policy that determine the delivery of education are still being developed. Different measurements do not always match and time series are mostly absent. This may lead to an underestimation of the impact of institutional governance of higher education on performance and thus labor productivity. The OECD Assessment of Higher Education Learning Outcomes (AHELO) project is likely to contribute to more comparable international measurements. However, this project has stalled because of resistance from both US and UK universities.

Moreover, detailed data on graduate competencies are only recently available for 23 regions and countries. They have not been fully analyzed in the context of educational institutional structure or funding.

When conducting any analysis, it is important to exclude the bias that results from reverse causality: policy design may appear to be independent of certain outcomes, while it may in fact be the result of the country or region's development. Furthermore, educational participation may be driven indirectly by innovation while at the same time contributing to innovation in the future. The cultural differences between countries are another source of bias.

Most empirical evidence is derived for well-developed countries close to the "production frontier," but this topic is also relevant for developing countries. There are only a few exceptions (notably South Korea, Singapore, and Taiwan) where less developed countries quickly escaped the "middle income trap," i.e. the difficulty of making the transition from a low or middle technology based economy toward a high technology economy.

SUMMARY AND POLICY ADVICE

Change toward more autonomy

Governments find it hard to release public universities from the controls imposed on these organizations. Parliaments prefer to hold ministers of education directly accountable for the performance of universities rather than relying on external quality control. It is thus not easy to find parliamentary majorities willing to support the introduction of autonomy legislation while maintaining accountability. University administrators are often also reluctant to embrace more autonomy, as it implies more responsibility. There is therefore no constituency that is served in the short term by changes toward more university autonomy.

This situation is exacerbated by the "democratization" of universities that occurred in the 1970s. University legislation in Western Europe was altered, granting students and staff substantial decision-making power about university appointments and resource allocation. This decreased university administrators' flexibility to maximize their institution's educational and research output. Reversing that process is met with substantial opposition from within universities. Political parties who do not want to alienate this constituency are likely to be against university reform.

Nonetheless, many Western European countries have adopted university autonomy as an important point of departure for enhancing universities' effectiveness, modeled after the

Anglo-Saxon example (e.g. the Netherlands, Denmark, and Sweden). Yet, none of these changes went without substantial political strife. In France, the vocal majority of university administrators were among the opposition. In Germany, many autonomy discussions took place but without much impact. Sometimes the pendulum actually swung in the direction of less autonomy (like in North Rhineland Westphalia). The recent economic crisis has also hindered the reform movement toward more autonomy.

The lessons of past successful changes toward more autonomy should be recognized:

- University reform toward more autonomy needs to be discussed broadly in society based on its relative (de)merits, before legislation can take place.
- More autonomy is especially needed for research universities. Differentiation in autonomy for the different parts of the university system should be envisaged.

University autonomy is likely to strengthen universities' ability to improve graduates' competencies and research output, provided that an effective quality control system is in place. University autonomy and the efforts made through investments in higher education are—through the education and research contributions of universities to society—important means to promote (sustainable) economic growth.

Governments should know how important autonomy is: managerial autonomy is important for research attractiveness and research productivity, whereas policy autonomy translates into relatively high educational performance. Governments should carefully reflect about whether the present level of autonomy in their universities, as well as public support per student, is effectively improving their graduates' competencies and the quality and quantity of their research output.

Yet, it seems that governments are uncertain whether universities are able to effectively use the autonomy with which they are entrusted (e.g. for societal purposes), even if there are strict quality control systems in place. In fact, several European countries have restricted autonomy in the recent past.

A major piece of policy advice is not to focus on quantity, namely participation in higher education and spending on research, but rather on the quality of education and research. Quality is likely to be enhanced by both more autonomy and better funding.

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Competing interests

The IZA World of Labor project is committed to the *IZA Guiding Principles of Research Integrity*. The author declares that he has observed these principles.

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