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Rethinking Higher Education Financing: Comparative Evidence on Equity, Capacity, and Social Value

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ABSTRACT

Higher education finance is often debated through statutory tuition, although this indicator does not capture system capacity or the burden students actually experience. This article examines European higher education financing by distinguishing between statutory price, cost benchmark, and effective student burden. The study uses a comparative cross-sectional design based on linked public datasets: Eurydice fee and support indicators for 39 systems, EUROSTUDENT 8 indicators on student expenses and financial difficulty, and OECD, Eurostat, UNESCO, and World Bank data on expenditure, national income, and funding mix. The analysis combines regime mapping, Spearman rank correlations, parsimonious ordinary least squares models with HC3 robust standard errors, and robustness checks. The results show that GDP per capita is weakly associated with statutory tuition but more clearly associated with expenditure per tertiary student. Statutory fees also provide a weak guide to severe student financial strain, whereas weighted effective burden better captures the share of students exposed to payment and the resources available to absorb it. Lithuania illustrates the policy relevance of this distinction: low statutory fee indicators coexist with modest per-student expenditure and non-trivial effective burden. The article concludes that policy debate should move from headline tuition comparisons toward a three-part assessment of price, capacity, and burden.

1. Introduction

Tuition schedules have high political visibility, but they are a weak measure of the real price of higher education. Classic cost-sharing research already showed that tuition, family contribution, tax support, and student aid interact within broader financing settlements [1-3]. A system may report zero or low statutory fees and still expose students to costs through living expenses, selective fee incidence, weak grants, or family transfers. Another system may charge visible fees but compensate students through grants, income-contingent loans, or stronger public support. Later work on loans, fee rationales, and student-support systems confirms that nominal tuition is therefore not the price students experience; it is only one component of a wider financing architecture [4-6].

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This distinction has become more important as European higher education has moved from elite participation to mass and high-participation systems [7, 8]. Expansion has widened access, but it has also increased fiscal pressure and made the distribution of cost more politically sensitive [9-11]. Within the European Higher Education Area, the social dimension developed across the early Bologna declarations [12-14], later ministerial communiques [15-17], and the Bucharest, Yerevan, and Paris commitments on access and participation [18-20]. The Rome Communique and the social-dimension guidelines then linked finance more explicitly to participation, progression, and completion [21, 22]. The 2024 Tirana Communique and recent European monitoring reports continue to frame finance as part of participation, progression, and equity rather than as a simple entry-price question [23-25].

This article addresses the problem that public debate treats statutory tuition, institutional cost, and student burden as if they were the same object. They are not. The statutory price is the price signal provided by the system. The cost benchmark is the amount spent per tertiary student. The effective burden is what students actually pay after accounting for fee incidence, student income, and public support. When we combine these different concepts, we get a misleading comparison between countries and can generate policy conclusions that appear socially protective while leaving their institutional capacity underfinanced.

Lithuania provides a useful case because the official fee signal appears modest, yet the system must still confront questions of per-student expenditure, student support, household exposure, and demographic decline. EU policy documents on higher education modernization, the European Education Area, and university strategy make these questions directly relevant for smaller European systems [26-28]. The European strategic cooperation framework adds the same concern from the perspective of long-term education governance [29]. The Lithuanian case is therefore not used as an isolated national description. It is used as a lens through which the article asks whether low nominal price should be interpreted as affordability, or whether resource intensity and effective burden give a more credible picture of higher education finance.

The article combines three datasets, the Eurydice fee and support regulations, the OECD and World Bank spending and macroeconomic indicators, and the EUROSTUDENT evidence on students' spending, resources and financial difficulties. It gives four contributions. To begin with, it distinguishes the statutory price, cost benchmark, and actual burden on students. Secondly, it looks at European finance regimes, rather than ranking countries by fees. Third, it checks if national incomes are best linked to expenditure per student rates rather than statutory tuitions. In Lithuania, thing shows how low visible fees can coexist with modest system investment and non-trivial student exposure.

The article is structured around three questions. Are national income levels associated with observable tuition fees or the deeper resource capacity of the higher education system? Are average tuition fees a credible proxy for a normative study price, as described in national policy debates? Which more effectively explicates accessibility: nominal fees or the combined structure of fee incidence, support reach, private funding, and student financial stress? The conceptual framework will be developed in the next chapter and the hypotheses that will be tested in empirical analysis will be stated.

1.1 Literature Review and Conceptual Framework

The classic case for public subsidy in higher education rests on mixed private and social returns. Human capital theory treats tertiary education as productive investment, but the distribution of benefits across individuals, employers, and society complicates the question of who should pay [30, 31]. Distributional and welfare-state perspectives add that education finance is never only an efficiency question; it also shapes social reproduction and the public allocation of risk [32-34]. The

cost-sharing tradition argues that mass expansion makes exclusive tax financing increasingly difficult, yet cost-sharing is not a single policy instrument. It can take the form of upfront tuition, deferred charges, loans, tax expenditures, family transfers, or differentiated public subsidy.

A further conceptual problem concerns what exactly counts as the price of higher education. Tuition is the most visible component, but it is not the only mechanism through which states distribute resources. Public systems also decide how much to spend per student, whether funding differs by field, whether institutions are financed by enrolment or outcomes, and whether support is directed to institutions, households, or students. Comparative and European finance studies show that these allocation mechanisms convert formal access either into genuine study capacity or into under-resourced participation [35-37]. Deferred and income-contingent charging arrangements further illustrate why the timing and institutional design of payment matter as much as the headline charge [38-40].

This distinction could be thought of as a tension between volume and intensity. An institutionally limited system seeks to preserve and/or optimally allocate the volume of places. A system that is intensity-oriented asks whether each place could be financed at an intensity that would support the quality of teaching, student services, infrastructure and academic capacity. When fiscal capacity is strong enough, the two goals are compatible. As comparative studies on global higher education expansion and cost-sharing accessibility also suggest, they may diverge under demographic decline or fiscal forces. [41, 42].

It is useful to analyze regimes because of the way countries distribute financial responsibility across the state, households, students and institutions. In some systems, the state remains the primary risk-taker. In some cases, families or students are carrying a greater share of the adjustment, even as public rhetoric remains focused on universal opportunity. When different distributions of insecurity that are associated with similar participation rates coexist, and similar fee levels belong to different political settlements. [43, 44].

According to the literature on student responses to price, tuition alone is not the relevant unit. The costs students consider include fees, living costs, grants available, avoiding debt, having to work part-time and so on. Classic price-response and aid studies show that demand is sensitive to costs and subsidies, but that the effect depends on family background, aid design, and the institutional setting. [45-47]. Work on rising tuition and prospective institutional choice adds that students may respond differently when costs are visible, deferred, or uncertain [48, 49]. Evidence from grant reforms and tuition-policy changes similarly shows that fee and aid instruments operate differently across countries and student groups [50-52]. Additional studies from Ireland and England reach related conclusions about abolition, aid, and participation effects [53, 54]. More recent European evidence reinforces the same point: tuition and loan reforms can affect enrolment and attainment, but their effects depend on support architecture and student resources [55, 56]. The newest European evidence on tuition fees and the replacement of grants by loans again shows that policy design, not price alone, shapes educational outcomes [57, 58].

Accessibility should likewise be understood more broadly than initial entry. A system may be open at the point of admission and still reproduce inequality through dropout risk, work intensity, differentiated exposure to financial stress, or the unequal capacity to absorb indirect costs. Need-based grants and financial incentives can support persistence and completion when they are legible and sufficiently targeted [59-61]. Related evidence on performance incentives clarifies that support design can also affect motivation and achievement [62]. Debt-related studies add that students do not respond only to net present value; they also respond to fear, symbolism, and family resources [63, 64]. Later work on student loans and symbolic violence shows that deferred payment can still shape participation through perceived risk and social meaning [65, 66]. The stratification literature

therefore remains relevant because inequality can persist even under expanded participation [67, 68]. The social-dimension agenda in European higher education increasingly frames finance as part of participation, progression, and completion rather than as a simple entry-price issue.

Recent studies also extend the methodological vocabulary available for education-finance analysis. Petkovski and Vranić show how predictive modelling can use education-related variables to explain digital participation, while Tešić demonstrates the relevance of machine learning and multi-criteria reasoning for educational prediction [69, 70]. Bouraima et al. prioritise strategies for sustainable higher education development through a FULLEX MCDM approach, and Subotić et al. link educational factors to entrepreneurial potential and economic development [71, 72]. Entrepreneurial-university and digital entrepreneurship studies likewise show that higher education capacity questions increasingly intersect with research commercialisation, digital learning, and skills development [73, 74]. These studies do not replace classic finance theory, but they support the reviewer-relevant point that current education research increasingly combines policy questions with analytical, comparative, and decision-support methods.

The framework put in this article is built on these observations. Statutory price refers to the officially prescribed yearly fee for study. Cost benchmark shows the average public expenditure on tertiary students. It is indicative of the resources committed to the system. Effective burden refers to the economic burden actually experienced once fee incidence, the student income and support are filtered through student resources. Expectations are not that richer countries charge more or less. Rather, richer systems are likely to maintain higher per-student investments.

This framework is especially relevant for Lithuania as it is not only low nominal signals that obscure harder questions on funding intensity. A high number of publicly funded places may demonstrate a commitment to access, but that does not necessarily demonstrate a sufficient investment in students once in the system. The narrowness of grants, thin student services or weak institutional funding per student may still leave students exposed to indirect cost pressures across formal public access.

The article consequently, it considers these characteristics of financing structure and accessibility to be regime-level properties. The structure is captured through fee incidence, grants and loans, tax reliefs, family allowances and private funding shares. We capture accessibility through indicators closer to the student experience: fee-payer share, fee-income ratio, receipt of public support very serious financial difficulties and the social gradient in those difficulties. This approach directly ties the theory to the empirical parts of the paper, rather than allowing the empirical analysis to degenerate into a narrow comparison of headline fee values.

1.2 Research Questions and Hypotheses

The hypotheses are intentionally modest because the data are cross-sectional and the country samples are small. They are used to discipline the empirical comparison rather than to claim causal identification.

H1a: GDP per capita in PPP terms is positively associated with government expenditure per tertiary student. H1b: GDP per capita in PPP terms is not systematically associated with the most common statutory tuition fee.

H2: The most common statutory tuition fee is a weak predictor of very serious student financial difficulties once countries are compared at the system level.

H3: Weighted effective burden, defined by fee level, fee incidence, and student income, is more informative than statutory tuition alone for assessing student-facing financial exposure.

H4: European financing regimes are better differentiated by combinations of fee incidence, support instruments, and household exposure than by statutory fee level alone.

2. Methodology

2.1 Data Architecture and Measures

The empirical design uses three linked but not fully identical data layers. This nested design is preferable to forcing all sources into one thin common sample. The first layer maps statutory fees and support architecture across European systems using Eurydice open data for 2022/2023 and 2023/2024 [75, 76]. The second layer captures student expenses, resources, and perceived financial difficulties using EUROSTUDENT 8 country data for 2021-2024 [77, 78]. The third layer benchmarks resource commitment and funding mix using OECD comparative indicators [79-81], OECD Data Explorer series [82, 83], Eurostat finance and enrolment indicators [84-86], UNESCO statistical documentation [87], and World Bank macro and education indicators [88-90]. Additional World Bank enrolment and attainment indicators provide context for system scale and educational structure [91, 92].

The three-layer structure reflects the three substantial themes of the article. A macro layer reflects and the potential for national income. The system architecture which transforms the average statutory tuition into a price signal in Eurydice. The ‘student layer’ refers to the overall architecture and accessibility of higher education systems. It speaks to how students experience fees, support, and financial stress in practice. Due to the architecture, the analysis remains conceptually clear, even if no single public dataset captures the three dimensions well. Table 1 provides a summary of the data architecture and the variables constructed for the analysis.

Table 1

Data architecture and constructed variables

Layer	Coverage and sources	Key variables	Analytical use
System-regime layer	Eurydice fee/support data, 39 countries	Fee required; most common annual fee; fee-payer share above €100; need-based grants; loan availability; tax relief; family allowance	Maps statutory price and support architecture; used for cluster analysis and regime classification
Student-affordability layer	EUROSTUDENT 8 with Eurydice and GDP overlap, 25 countries (19–24 in specific tests)	Fee-payer share; mean fee paid; mean monthly income; public-support coverage; support amount; very serious financial difficulties; parental-education splits	Constructs fee burden ratio, weighted effective burden, support intensity, and equity gap
Resource benchmark layer	OECD finance indicators + World Bank macro data + Eurydice fee benchmark, 11 countries	Government expenditure per tertiary student (PPP); private funding share; GDP per capita (PPP); statutory fee benchmark	Tests how national income relates to the cost benchmark / normative study price proxy and funding mix

Note: The three-layer design avoids forcing all public sources into a single reduced common sample. The cost benchmark is treated as the closest cross-national proxy to a normative study price. The student-affordability layer uses ratios and shares rather than raw monetary levels because EUROSTUDENT country files report monetary amounts in national currencies.

The Eurydice layer contains system descriptors for 39 countries with enough information on public or government-dependent institutions. The focus is on the home, full-time, first-cycle students wherever the underlying indicators permit. The analysis extracts six types of variables from this layer: whether fees are charged; what is the most common statutory annual fee or charge; what are the share of students paying fees above EUR 100; availability and typical amount of a need-based grant; availability of a loan and how many students use it to borrow; compensation measures to families

such as tax relief on fees or family allowances. These variables are used for regime mapping and for the regulated-price concept.

Through the Eurydice indicator, we operationalize average tuition fees for the most common annual statutory fee in the harmonized student category. Allowing transparency and clear definition, this variable is suitable for cross-national comparison. While taking it into account, it should be interpreted carefully. The analysis is not exhaustive in capturing all within-country differentiation by study mode, institutional segment or status category. It is especially limited, though, in systems where some students occupy state-funded places, while others pay directly under a common legal framework. The article, therefore, treats the fee prescribed by the statute as a deliberately incomplete measure of price, albeit an important one.

The EUROSTUDENT layer contains country indicators for 25 systems. The analysis doesn't directly compare raw fee or income levels across countries since the monetary items in the country files are expressed in national currencies. Rather, it manufactures unit-free proportions and shares. The main inputs include the share of students paying fees to higher education institutions; mean fee amount paid; mean monthly income; share receiving public support; mean amount of support among supported fee payers and share reporting very serious financial difficulties. To keep things simple, the article also looks at parental education disaggregation, comparing students whose parents have no tertiary education to students whose parents have tertiary education.

The OECD-World Bank benchmark layer is for the cost benchmark and funding structure. The key indicator is government spending on tertiary education students, adjusted for purchasing power parity (PPP). This relates to how much money comes from individuals as opposed to the state and the overall strength of the economy. After being harmonized with the pertinent fee and macroeconomic variables, the benchmark sample comprises 11 countries. The macro indicators are generally anchored in 2022 because that year maximizes the overlap across the various public sources, but also remains close to the academic year fee data.

The cost benchmark has a different function. Government expenditure per tertiary student expressed in PPP terms is used here as the closest comparative analogue to a normative study price on account of its approximation to the resource intensity with which the system is able to organize teaching, supervision, digital infrastructure, facilities and academic support. When the policy question pertains to the strength of a system, conceptually, this is more informative than tuition. A fee that is low may be politically salient, but it does not reveal whether the institution teaching that student is robustly financed, thinly financed, or in between. This distinction is important for discussions in Lithuania because the debate is often framed around the question of publicly funded places rather than whether the expenditure deemed necessary for each place.

This also explains why the number of publicly funded places is not used as the central cross-national benchmark. Cross-nationally comparable place counts are difficult to harmonise, but the more important reason is conceptual. A broad distribution of supported places can coexist with low funding intensity. In such a configuration, public subsidy is present, but its unit value may be insufficient to sustain quality or to reduce household burden meaningfully. Per-student expenditure is therefore the more informative comparative indicator when the aim is to evaluate whether a system is strong, not merely whether it is generous in formal coverage. In other words, the analysis privileges depth of support over the simple breadth of nominal entitlement.

$$\text{Weighted effective burden}_i = (\text{mean fee paid}_i / \text{mean monthly income}_i) \times (\text{fee} - \text{payer share}_i / 100) \quad (1)$$

$$\text{Support intensity}_i = \text{mean public support among supported fee payers}_i / \text{mean fee paid}_i \quad (2)$$

$$\text{Equity gap}_i = \text{very serious financial difficulties}_i, \text{noHE} - \text{very serious financial difficulties}_i, \text{terHE} \quad (3)$$

Three derived variables structure the analysis. Effective burden is measured in two related ways. The fee burden ratio equals mean fee paid divided by mean monthly income. The weighted effective burden in Eq. (1) multiplies that ratio by the share of students who actually pay fees; this measure is preferable when fees apply to only part of the student body. The support-intensity ratio in Eq. (2) compares support received by supported fee payers with the mean fee paid. The equity gap in Eq. (3) captures the difference in very serious financial difficulties between students without tertiary-educated parents and those with tertiary-educated parents. For Lithuania, a further caution is essential: the recorded EUR 50 value is the dataset's most common annual statutory fee for the selected category, not a complete estimate of the annual tuition burden across all fee-liable study places.

The article's accessibility concept is likewise multi-dimensional. Structure is captured through regime characteristics such as fee incidence, grants, loans, tax relief, family allowances, and private funding shares. Accessibility is captured through indicators closer to the student experience: the share paying fees, the mean fee-income ratio, support receipt, very serious financial difficulties, and the social gradient in those difficulties by parental education. This combination allows the analysis to answer a question that fee comparisons alone cannot answer: whether a system that appears affordable at the statutory level is also affordable in practice.

2.2 Analytical Strategy, Hypothesis Testing, and Robustness Checks

Due to the small number of samples and skewness of several variables, the analysis prefers robust and transparent tools to complex modeling. Spearman rank correlations are employed to assess bivariate associations due to their robustness against outliers and non-normal distributions. To estimate system-level regressions, the article performs a series of parsimonious cross-sectional OLS models with heteroskedasticity-consistent (HC3) robust standard errors: $\ln(\text{cost benchmark})$ on $\ln(\text{GDP per capita})$, private funding share on $\ln(\text{cost benchmark})$, and $\ln(\text{statutory fee} + 1)$ on $\ln(\text{GDP per capita})$. The models are used to test H1a and H1b and to vault the connection between resource intensity and private funding.

The regime analysis tests H4 by mapping financing systems through hierarchical clustering with a Gower-style mixed-variable distance. The distance matrix combines fee level, fee incidence, grants, loans, tax relief, and family support. Four clusters are retained because they are substantively interpretable and stable enough for comparative discussion. The student-affordability layer tests H2 and H3 by comparing statutory fees, weighted effective burden, and reported severe financial difficulty. All results are interpreted as associative and descriptive, not causal.

Three mechanisms facilitate the incorporation of robustness analysis. First, HC3-adjusted regressions are reported with rank correlations. Furthermore, logarithmic transformations are undertaken where monetary indicators are skewed. The discussion assigns more importance to trends seen repeatedly across each of the statutory-fee layer, the cost-benchmark layer, and the student-burden layer. The importance of this design for the $n = 11$ cost-benchmark sample is critical. The small sample size does limit statistical power but does not prevent careful consideration of whether the evidence is consistent with evidence for or against the hypotheses.

3. Results

3.1 Mapping Higher-Education Financing Regimes

Cluster analysis shows that European higher education finance cannot be captured by a simple high-fee/low-fee axis. The Eurydice variables (Table 2) opened up four regime families. Systems with

statutory fees set around zero or very low fees incidence. Systems with low fees charge low typical fees, but a larger share of students pays such fees. They more often supplement direct public provision with tax-based or family-based compensation. In mixed-fee systems that have family support, Lithuania located, statutory fees are quite low but payment incidence is relatively high as are family allowances or tax-supported payment. High-incidence broad-fee regimes charge fees that are higher than the median, but which create payment obligations for a large proportion of students.

Table 2

Financing regime profiles based on Eurydice indicators

Regime	n	Median statutory fee (€)	Mean fee incidence (%)	Need-based grants	Loans	Tax relief	Family allowance
Universal low-fee	8	0.00	7.5	0.500	0.750	0.375	0.125
Partial-incidence low-fee	8	74.50	51.3	1.000	0.625	1.000	0.625
Family-supported mixed-fee	7	100.00	70.3	1.000	0.571	1.000	0.714
Broad-fee high-incidence	16	451.46	76.8	0.875	0.562	0.312	0.375

Note: Need-based grants, loans, tax relief, and family allowance are reported as the proportion of systems within each cluster where the instrument is available. Median fee and mean fee incidence are based on the Eurydice country files used for the cluster model.

The profiles provide insights in two ways. First, grant availability is widespread across almost all clusters; what varies more sharply is fee incidence and the family-public balance of compensation. Two collections can share a median fee, but differ on support logic. The regime language is more informative than a simple ranking. Even if a country looks inexpensive legally, organized financing might be around the household's responsibility. Conversely, if a country is visible cost-wise, risk might be socialized better once grants or loans are taken.

The classical public-provision model is like the universal low-fee cluster comprising Denmark, Estonia, Finland, Greece, Sweden, Türkiye, Cyprus and Montenegro. Fees are only incidence at an average of 7.5 per cent and the median statutory fee is an incidence of zero. The broad-fee high incidence system, in contrast, has a statutory median fee of EUR 451, and a fee incidence mean of greater than 76 per cent. The low-fee partially incidence cluster is located in the middle range and the charges are low if formally stated but where payments are high and instruments that are fiscal and familial are widely used. The mixed-fee cluster comprised Lithuania, Czechia, Germany, France, Portugal, Slovenia, and the German-speaking Community of Belgium, all of which have a median statutory fee of EUR 100. Furthermore, just above 70 per cent represents the mean fee incidence.

We must not consider these clusters as fixed models. They are regimes of analysis and not categories confined by the Constitution. Regardless of whether they choose market- or government-based solutions to financing and provision, nearly all countries are subsidising higher education, but they differ on where they locate the margin of adjustment. Some entities mainly absorb pressure via public budgets, other via households, students, support systems, whereas many other via hybrid of the three.

Seen through the article's three-part framework, the cluster results tell us something more specific than the existence of four financing regimes. They show that the overall structure of higher education systems varies not simply by price but by the way price, compensation, and responsibility

are combined. Universal low-fee systems are accessible partly because fee incidence is minimal and public support is strong. Family-supported mixed-fee systems are different: the headline fee may remain moderate, yet the system relies more heavily on household mediation. The broad-fee high-incidence systems, finally, normalise direct payment but often sit within more explicit compensatory architectures. Accessibility is therefore structured less by the nominal fee alone than by the configuration in which that fee is embedded.

3.2 Economic Development and Financing Structure

H1b was examined by comparing GDP per capita PPP with the most common statutory fee. If tuition were a simple function of national wealth, richer countries should systematically charge more. They do not. Figure 1 shows a weak association between GDP per capita PPP and the most common statutory fee in the European overlap sample, and the rank correlation is effectively negligible ($\rho = 0.134$, $p = 0.585$, $n = 19$; Table 3). The corresponding log-linear regression is likewise insignificant: $\ln(\text{GDP per capita})$ does not explain $\ln(\text{statutory fee} + 1)$ once small-sample uncertainty is acknowledged (Table 4). The figure should therefore be read as evidence against a simple income-to-tuition relationship, not as a causal model of fee policy.

Table 3

Bivariate associations

Association	n	ρ	p
GDP per capita PPP vs statutory fee (European overlap sample)	19	0.134	0.585
GDP per capita PPP vs fee-payer share (European overlap sample)	24	0.136	0.527
Statutory fee vs very serious financial difficulties	19	-0.270	0.264
Weighted effective burden vs statutory fee	18	0.810	<0.001
Fee burden ratio vs parental-education inequality gap	23	0.362	0.090
GDP per capita PPP vs cost benchmark (OECD-CEE sample)	11	0.582	0.060
Cost benchmark vs private funding share (OECD-CEE sample)	10	-0.624	0.054

Table 4

HC3-robust OLS models

Model	Dependent variable	Main predictor	n	Coef.	Robust SE	p	R ²
M1	$\ln(\text{cost benchmark})$	$\ln(\text{GDP per capita PPP})$	11	1.510	0.565	0.007	0.373
M2	Private funding share	$\ln(\text{cost benchmark})$	10	-16.687	6.872	0.015	0.255
M3	$\ln(\text{statutory fee} + 1)$	$\ln(\text{GDP per capita PPP})$	19	2.318	3.101	0.455	0.046

Note. All models are cross-sectional and associative. The dependent variables are transformed where indicated in the table. Robust standard errors are HC3 to reduce small-sample sensitivity.

H1a was examined by comparing GDP per capita PPP with the cost benchmark. The relationship between wealth and the cost benchmark is stronger than the relationship between wealth and tuition. In the OECD-CEE benchmark sample, GDP per capita is positively associated with government expenditure per tertiary student ($\rho = 0.582$, $p = 0.060$, $n = 11$). In the HC3 regression, the elasticity is large and statistically meaningful: a 1 per cent increase in GDP per capita is associated with an estimated 1.51 per cent increase in the cost benchmark ($p = 0.007$; $R^2 = 0.373$). Figure 2 visualises

this pattern: countries with higher income capacity are more likely to sustain higher per-student expenditure, even though they do not necessarily charge higher statutory fees.

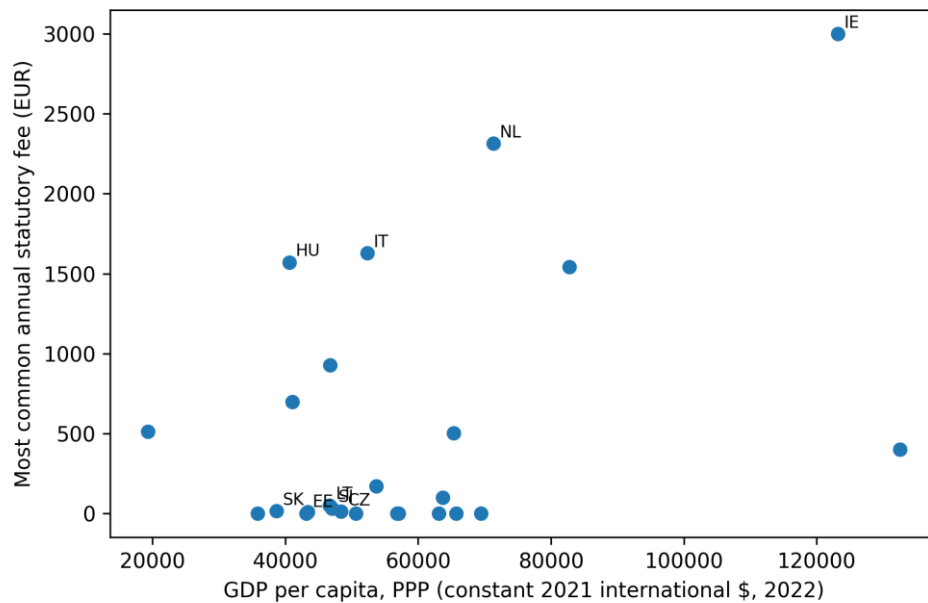


Fig. 1. National income and statutory first-cycle fees

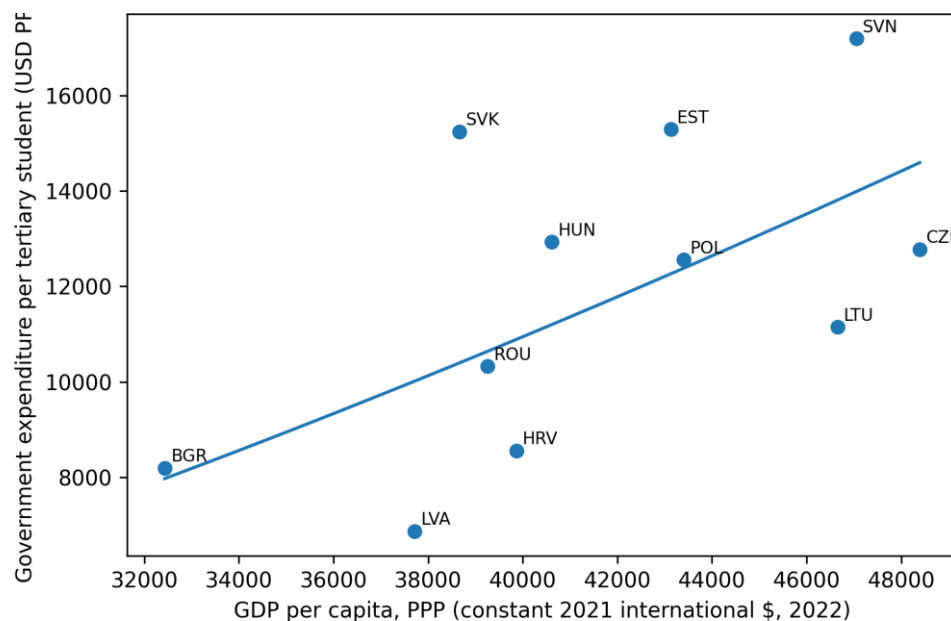


Fig. 2. National income and the tertiary cost benchmark

Note. OECD–CEE benchmark sample. The x-axis reports GDP per capita in PPP terms for 2022; the y-axis reports government expenditure per tertiary student in USD PPP.

Figure 3 adds a second result. Systems with a higher cost benchmark tend to rely less on private funding at the tertiary level. The rank correlation between government expenditure per student and the private funding share is negative ($\rho = -0.624$, $p = 0.054$, $n = 10$), and the corresponding regression coefficient on $\ln(\text{cost benchmark})$ is -16.687 ($p = 0.015$). The implication is not that public and private resources are perfect substitutes; rather, richer and more generous systems appear able to maintain

higher investment without proportionally shifting the financing burden toward households or other private actors.

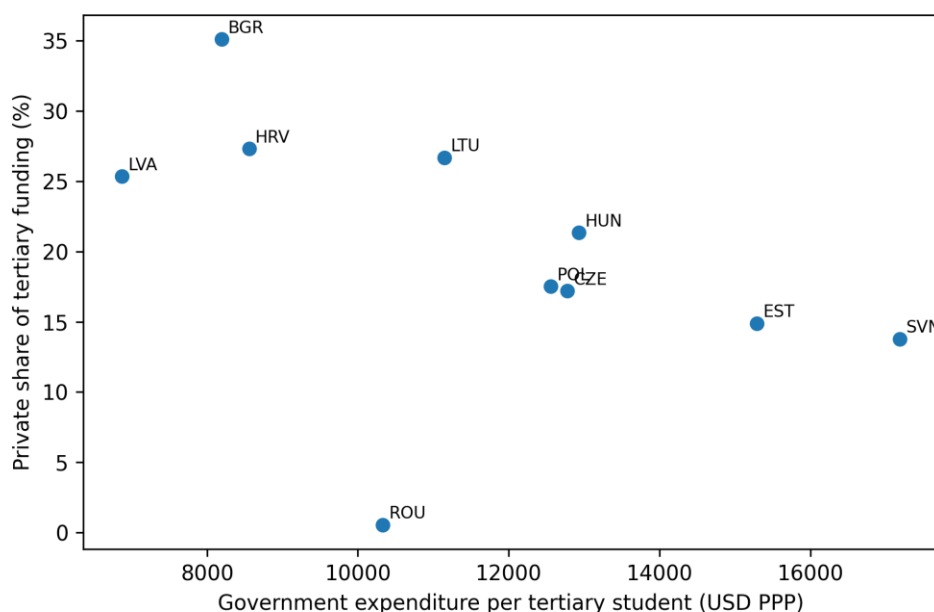


Fig. 3. The cost benchmark and private funding share

Note: OECD–CEE benchmark sample. The x-axis reports government expenditure per tertiary student in USD PPP; the y-axis reports the private share of tertiary funding.

Together, these findings support a structural reading: economic development matters primarily through fiscal capacity, while tuition remains politically and institutionally contingent. GDP is therefore not destiny for tuition policy; it is closer to a constraint on public investment.

H2 was examined by comparing statutory tuition with the share of students reporting very serious financial difficulties. The student layer shows why the distinction between formal price and experienced burden is not merely conceptual. Statutory fees are a weak guide to acute financial strain: the correlation between the most common statutory fee and very serious financial difficulties is negative but statistically insignificant ($\rho = -0.270$, $p = 0.264$, $n = 19$). Systems with low official fees are not automatically easy to navigate, and systems with visible fees are not automatically experienced as more punishing.

H3 was examined by constructing the weighted effective burden indicator. Once the mean fee paid is scaled by student income and by the share of students who actually pay fees, its link with the statutory fee becomes strong ($\rho = 0.810$, $p < 0.001$, $n = 18$; Figure 4). Figure 4 therefore shows that fee schedules still matter, but they matter through incidence and resource context rather than as stand-alone numbers. In effect, statutory price is filtered through the social technology of the system: who pays, who receives support, and how much income is available to absorb the charge.

This result also sharpens the interpretation of average tuition or normative study price in Lithuanian debates. If the relevant benchmark were statutory tuition alone, Lithuania could appear comfortably positioned because the recorded fee indicator is low. If the relevant benchmark is the cost benchmark, the picture becomes less reassuring. Lithuania then appears as a system with modest per-student expenditure relative to better-funded comparator cases. The policy inference is straightforward. A low nominal price does not compensate for limited funding intensity, and the more demanding question is not whether the formal fee looks socially acceptable, but whether expenditure per student is adequate for quality, support, and competitiveness.

3.3 From System Price to Student Burden

The student layer shows why the distinction between formal price and experienced burden is not merely conceptual. Statutory fees are a weak guide to acute financial strain: the correlation between the most common statutory fee and the share of students reporting very serious financial difficulties is negative but statistically insignificant ($\rho = -0.270$, $p = 0.264$, $n = 19$). Systems with low official fees are not automatically easy to navigate, and systems with visible fees are not automatically experienced as more punishing.

The weighted effective burden indicator behaves differently. Once the mean fee paid is scaled by student income and by the share of students who actually pay fees, its link with the statutory fee becomes strong ($\rho = 0.810$, $p < 0.001$, $n = 18$; Figure 4). This is intuitive: fee schedules still matter, but they matter through incidence and resource context, not as stand-alone numbers. In effect, the statutory schedule is filtered through the social technology of the system—who pays, who receives support, and how much income is available to absorb the charge.

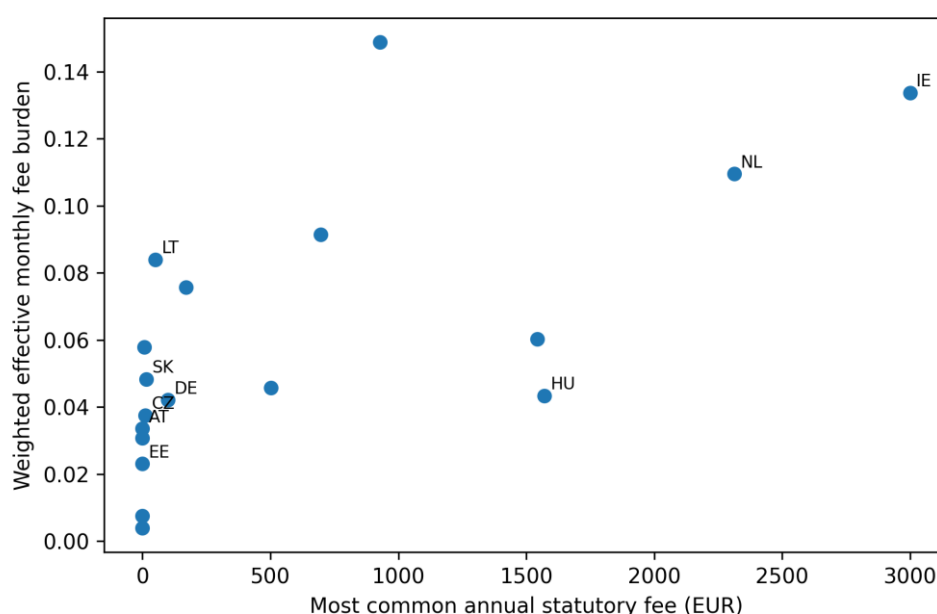


Fig. 4. Statutory fees and effective burden

Note: European overlap sample. Weighted effective burden = (mean fee paid / mean monthly income) $\times$ fee-payer share. This indicator captures both formal price and the share of students exposed to payment.

The inequality signal points in the same direction. The fee burden ratio has a positive, though only marginally significant, relationship with the parental-education gap in very serious financial difficulties ($\rho = 0.362$, $p = 0.090$, $n = 23$). The pattern should not be overinterpreted, but it is substantively suggestive. Where fees loom larger relative to student resources, students without tertiary-educated parents tend to exhibit a larger disadvantage in acute financial stress. This supports the interpretation that affordability is mediated by family resources, not only by formal fee levels.

Read against the three questions that motivate the article, the pattern is clear. National income levels matter most for system resource capacity, not for average statutory tuition. Average tuition becomes analytically meaningful only when filtered through fee incidence, support design, and student resources. Accessibility, finally, is not reducible to the fee schedule at all: it reflects the wider financing structure that determines who pays, who is protected, and who studies under stress. A financing system can appear egalitarian at the moment of admission yet reproduce disadvantage inside higher education through differentiated stress, work burdens, or insecurity.

The third research question concerns the overall structure and accessibility of higher education systems. The student-layer results suggest that accessibility depends on how nominal prices are translated into actual exposure. A system may keep statutory fees low yet require a significant share of students to pay something non-trivial relative to their income. Another may present a more visible formal fee but neutralise part of its effect through stronger aid or higher student resources. What matters, in other words, is not only the level of the fee but the social mechanism through which the fee is distributed, compensated, or absorbed.

For policy interpretation, accessibility should not be reduced to the number of publicly supported places or to low statutory fees. It requires evidence on fee incidence, support reach, and the real burden carried by students and families.

3.4 Robustness Analysis

The robustness analysis does not change the substantive interpretation of the results. First, the main bivariate findings are reported with Spearman rank correlations rather than Pearson correlations because the monetary indicators and fee variables are skewed. This reduces the influence of extreme statutory-fee cases and is appropriate for the small overlap samples.

Second, the regression models use logarithmic transformations for GDP per capita, expenditure per student, and statutory fees where appropriate. The transformed models support the same distinction observed in the rank correlations: GDP per capita is associated with the cost benchmark but not with statutory tuition. This pattern supports H1a and H1b, while also showing that the result is not simply an artefact of raw monetary scale.

Third, the student-affordability results remain conceptually consistent when the analysis moves from statutory tuition to weighted effective burden. Statutory fees do not explain severe financial difficulty well, but the burden indicator captures the combined effect of fee amount, payment incidence, and student resources. This supports H2 and H3 and strengthens the argument that affordability should be analysed as exposure rather than as nominal price.

Fourth, the cluster solution should be read as a robustness-oriented classification rather than as a definitive taxonomy. The four regimes are retained because they reflect recurring combinations of fee level, fee incidence, grants, loans, tax relief, and family support. With country-level data, exact cluster membership may shift when indicators are added or removed, but the main conclusion is stable: European systems are better understood as financing regimes than as a simple ranking from free to expensive.

These checks are necessarily limited by the $n = 11$ benchmark sample and by the fact that the layers do not contain identical countries. For that reason, the article does not claim causal identification. The robustness claim is more modest: the core distinction between statutory price, cost benchmark, and effective burden remains visible across alternative indicators and methods.

4. Discussion

4.1 Lithuania in Comparative Perspective

Lithuania provides a useful test case because its profile resists simple classification. In the merged student-regime dataset, Lithuania combines a recorded most common statutory fee of EUR 50 with a mean fee-payer share of 32.8 per cent and a weighted effective burden of 0.084. Around 33.1 per cent of students report receiving public support, while 8.3 per cent report very serious financial difficulties. The parental-education gap in severe financial difficulty is 2.68 percentage points. The more revealing system indicator is the cost benchmark: government expenditure per tertiary student is about USD PPP 11,151, below the OECD-CEE comparator median of USD PPP 12,558. Table 5 summarises this comparative position.

Table 5
Lithuania in comparative perspective

Case	GDP per capita PPP 2022	Most common statutory fee (€)	Weighted effective burden	Very serious financial difficulties (%)	Equity gap (pp)	Support recipient share (%)	Fee payer share (%)
Lithuania	46,651	50	0.084	8.301	2.677	33.105	32.798
Family-supported mixed-fee systems (median)	48,391	100	0.076	6.447	2.165	33.105	57.212
Universal low-fee systems (median)	60,078	0	0.007	6.401	2.565	76.195	1.455
Broad-fee high-incidence systems (median)	68,352	1,544	0.085	8.224	3.628	28.035	78.498

Note: Cluster medians are computed from the merged overlap sample used for the student-affordability analysis, not from the full Eurydice regime sample. Lithuania's EUR 50 value is the harmonised dataset's most common annual statutory fee and should not be interpreted as a comprehensive estimate of annual tuition across all fee-paying study places. In the OECD-CEE benchmark sample, Lithuania's government expenditure per tertiary student is USD PPP 11,151, below the sample median of USD PPP 12,558.

The EUR 50 value therefore requires methodological caution. In this article it denotes the Eurydice variable for the most common annual statutory fee for home, full-time, first-cycle study in public or government-dependent institutions. It should not be read as a complete estimate of annual tuition faced by all Lithuanian students. In the Lithuanian context, where the boundary between state-funded and student-paid places remains embedded in the legal architecture of higher education, the variable is useful for regime comparison but too narrow to stand in for actual price exposure [93].

At that point of the clarification being made, Lithuania illustrates a bigger structural problem. A system may appear to have a low nominal fee but is still only moderately financed at the system level and non-trivial in effective student burden. When compared to universal low-fee systems, the nominal fee in Lithuania looks low. However, its incidence is far higher and support reach narrower. On closer examination, Lithuania may look inexpensive on paper relative to broad-fee high-incidence systems, yet its weighted burden is near their median. A nominal price that is low does not guarantee low real burden and high public investment.

The issue concerning Lithuania's reform, then, is not whether the system can display a low statutory fee, but whether it can increase expenditure per student while maintaining sufficiently broad and socially credible access. Demographic contraction makes this issue sharper. Falling student numbers may prompt other responses besides proportional fiscal retrenchment. The same demographic trend can be considered a chance to increase funding intensity, enhance program quality and competitiveness, without necessarily shifting greater cost onto students and families.

5. Policy Recommendations

First, Lithuania should treat expenditure per student as the core financing benchmark. The comparative evidence suggests that the cost benchmark is more informative than the most common

statutory fee when the policy question concerns quality, capacity, and competitiveness. A higher baseline of public expenditure per student would make the normative study price more realistic and would reduce the risk that broad access is maintained by spreading resources too thinly.

Second, public funding should be differentiated by field of study and educational cost. A uniform financing logic is unlikely to reflect the real cost differences between programmes with different infrastructure, staff, supervision, laboratory, or digital requirements. Differentiation should be transparent and rule-based so that institutional competition is not distorted by hidden asymmetries or inherited advantages.

Third, need-based support should be strengthened for students with fewer family resources, including first-generation students. The burden results show that affordability is not captured by statutory tuition alone. Support policy should therefore address effective exposure: who pays, how much they pay relative to income, and whether public support is sufficient to prevent study from becoming financially fragile.

Fourth, a carefully designed performance-sensitive component may be added to the funding model, but only if it is calibrated to progression, completion, and outcomes without rewarding exclusion. The aim should not be to maximise the number of nominally free places under unchanged funding intensity. The aim should be to combine fair access with adequate expenditure per student, stronger institutional capacity, and more neutral framework conditions across accredited institutions.

6. Limitations of the Model

The first limitation is sample size. The cost-benchmark layer contains only 11 countries after harmonisation, and several student-affordability tests use samples between 18 and 25 systems. This restricts statistical power and makes causal inference inappropriate. The results should therefore be read as disciplined comparative evidence rather than as definitive econometric proof.

The second limitation concerns data alignment. Eurydice, EUROSTUDENT, OECD, Eurostat, and World Bank indicators do not always cover identical years, country groups, or student categories. The article deals with this problem by using a nested data architecture and by reporting sample sizes for each test, but some mismatch remains unavoidable in public cross-national data.

The third limitation concerns within-country heterogeneity. Country averages cannot fully capture differences by field, institution, study mode, residence status, or the boundary between state-funded and fee-paying places. This is particularly important for Lithuania, where the harmonised EUR 50 statutory value is useful for comparison but not sufficient to describe all student-facing tuition exposure.

The fourth limitation is that the regime classification is descriptive. Cluster analysis helps reveal financing families, but it does not prove that regime membership causes student burden or financial difficulty. The classification should therefore be used as a policy-mapping tool, not as a causal typology.

These limitations narrow the claims of the article, but they do not undermine its central insight. If even a cautious descriptive design shows that statutory tuition, cost benchmark, and effective burden behave differently, then fee-centred policy debate is analytically underpowered. Future research should test the framework with panel data and student-level micro-data.

7. Conclusions

This article sought to rectify a common shortcut in higher education finance, which is to treat nominal tuition or other charges as the price of study. The shortcut that leads to a conclusion is misleading. Statutory fees, expenditure per student and effective student burden behave as different

empirical objects across the European samples used here. A low/ high fee signal does not, on its own, indicate that a system is financed appropriately, socially protective, or affordable in practice.

The first contribution is conceptual. Statutory price, cost benchmark, and effective burden are three different concepts that should not be confused. This distinction allows one to pose more sophisticated questions regarding finance. A statutory price is an explicit price signal. The cost benchmark is the resource intensity of the system. The effective burden, once fee incidence, income and public support are taken into account, captures what students really pay.

Another contribution is empirical in nature. The results lend support to H1a and H1b: GDP per capita is more strongly related to government spending per tertiary student than to statutory tuition. Much more than visible fee policy, national income seems to determine system resource capacity. The findings further lend cautious support to H2 and H3. Statutory tuition does not provide a reliable representation of significant financial hardship, however, weighted effective burden is a better measure of student-facing exposure.

The third contribution is classificatory. The article shows that European higher education finance is better understood through regimes than through a simple ranking from free to expensive. Fee incidence, grants, loans, tax relief, family allowances, and private funding shares jointly structure accessibility. This supports H4 and shows why countries with similar fee levels may generate different student experiences.

The fourth contribution is policy-oriented. Lithuania illustrates how a low recorded statutory fee can coexist with modest per-student expenditure and non-trivial effective burden. The Lithuanian case therefore shifts the reform question away from headline fees alone. The more important question is whether the system can raise expenditure per student, strengthen student support, and maintain credible access without spreading public resources too thinly.

The policy implication is direct. A forward-looking financing model should combine higher public expenditure per student, field-differentiated funding, stronger need-based support, and a carefully calibrated performance component tied to progression, completion, and outcomes. Under demographic decline, this model would treat falling student numbers not only as a fiscal risk but also as an opportunity to improve funding intensity and institutional capacity.

The impact of the study lies in providing a more usable language for policy comparison. Instead of asking whether a country is cheap or expensive, policymakers should ask whether the financing regime delivers adequate resources, protects vulnerable students, and distributes responsibility transparently. In this sense, the article offers both an analytical correction and a practical diagnostic tool for smaller European systems facing pressure to balance equity, capacity, and competitiveness.

Future research should extend the framework with panel data and student-level micro-data. Such work could test how changes in fees, grants, loans, and expenditure per student affect application, persistence, work intensity, completion, and inequality over time. Until then, the central conclusion is already clear: higher education finance is understood poorly when tuition is mistaken for the system itself.

Author Contributions

Conceptualization, G.S. and M.R.U.; methodology, G.S. and M.R.U.; formal analysis, G.S. and M.R.U.; investigation, G.S. and M.R.U.; data curation, G.S. and M.R.U.; writing—original draft preparation, G.S. and M.R.U.; writing—review and editing, G.S. and M.R.U.; visualization, G.S. and M.R.U. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Declaration of Generative AI and AI-Assisted Technologies in the Manuscript Preparation Process

During the preparation of this work, the authors used AI-assisted tools, namely Chatgpt Pro 5.5 and DeepL Translation Tool, to support language editing, manuscript formatting, and readability enhancement. These tools were not used to generate scientific content, analyses, or conclusions. After using these tools, the authors reviewed and edited the content as needed and take full responsibility for the final manuscript. No generative AI tools were used to create or modify the study figures or artwork.

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