

# Funding of IITs/Universities

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How much funds are needed to run a higher education Institution – IIT, NIT, University?

# Rank the Institutes in terms of Annual Budgets



## IITs

Rank	Name
	IIT BHU
	IIT Bombay
	IIT Guwahati
	IIT Kanpur
	IIT Madras
	IIT Roorkee

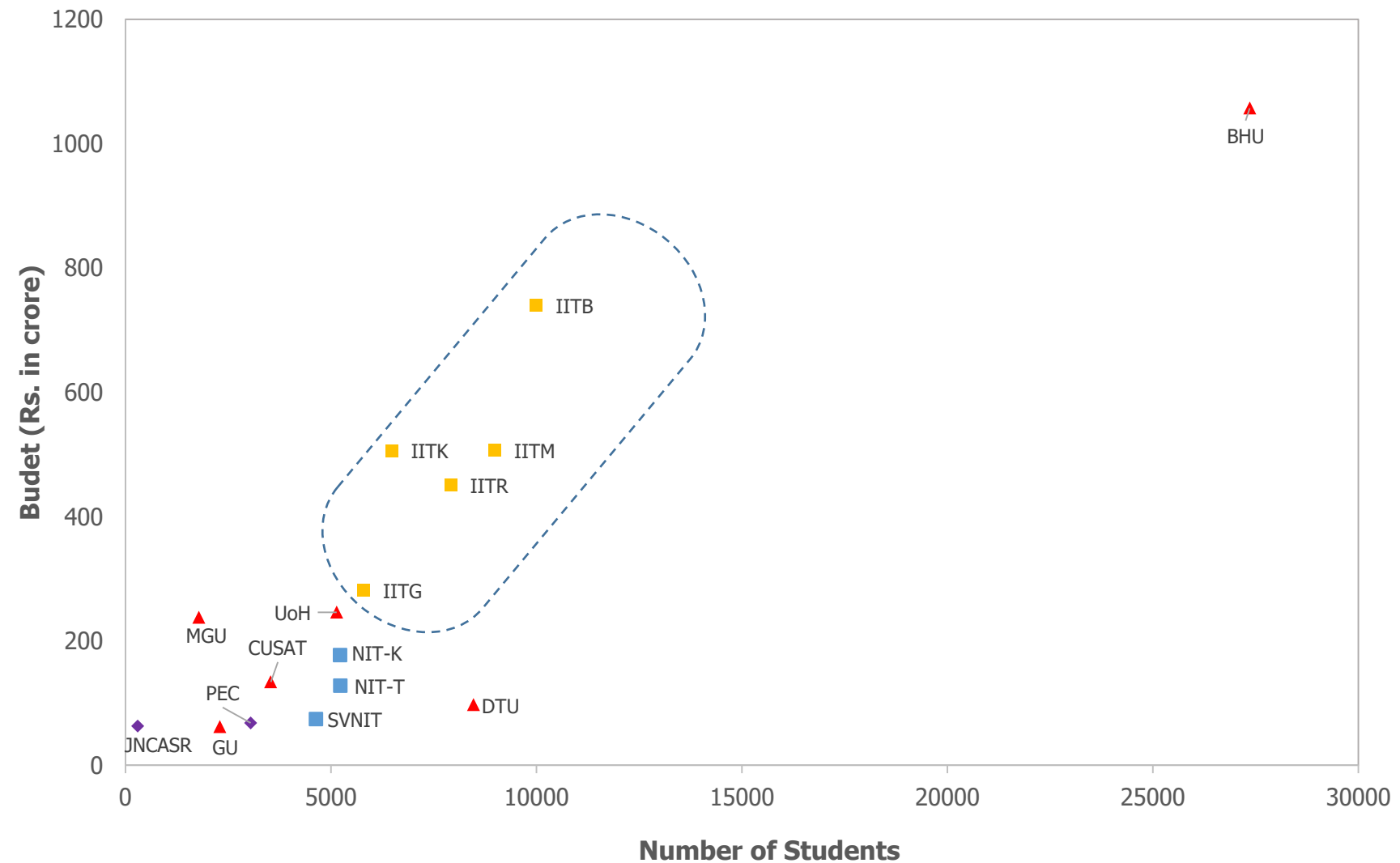
## NITs / Engg. Colleges

Rank	Name
	NIT Suratkhal
	NIT Trichy
	NIT Surat
	Gandhigram Rural Institute
	Punjab Engineering College
	PSG Institute of Management, Coimbatore
	JNCASR, Bangalore

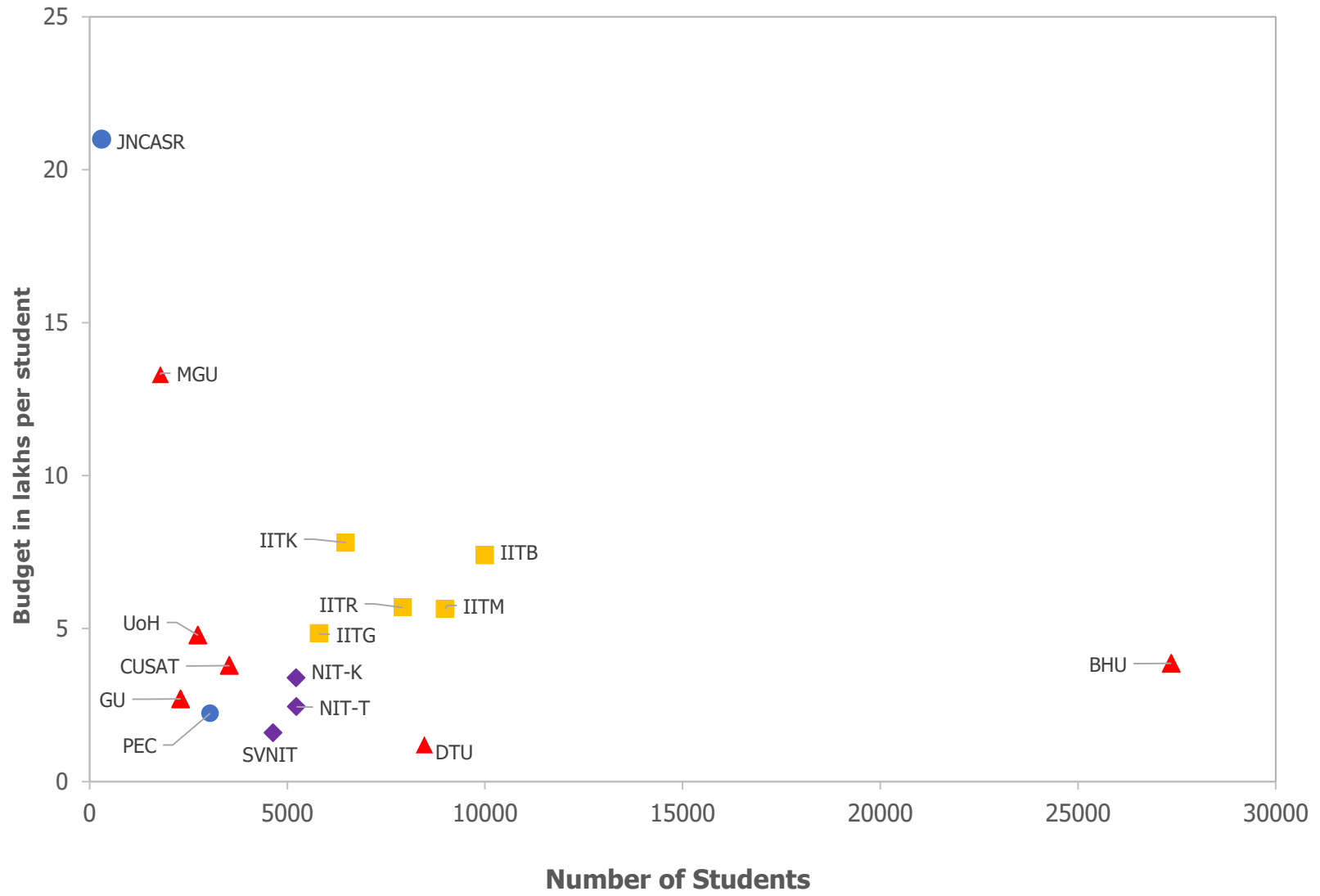
## University

Rank	Name
	Banaras Hindu University
	Bharathidasan University
	Cochin University of Science and Technology (CUSAT)
	Delhi Technical University (DTU)
	Goa University
	University of Hyderabad
	Jammu University
	Mahatma Gandhi University

# Annual Funding of select universities



# Annual funding per student of select universities





What are the factors that affect the level of funding required?



- Number of students
- Number of faculty
- Residential/Non-residential
- Cost of Living
- Number of staff
- Nature of courses- Research and teaching infrastructure requirement
- Built up Space – Airconditioned/ Non Air conditioned
- Growth- New Buildings, New facilities



What are the possible sources of funding?



- Central Government
- State Government
- Local Government / Authority
- Fees
- Donations Licensing/Equity/IP
- Interest Competitive Grants/Projects
- Industry R&D/ Consulting
- CSR Funds



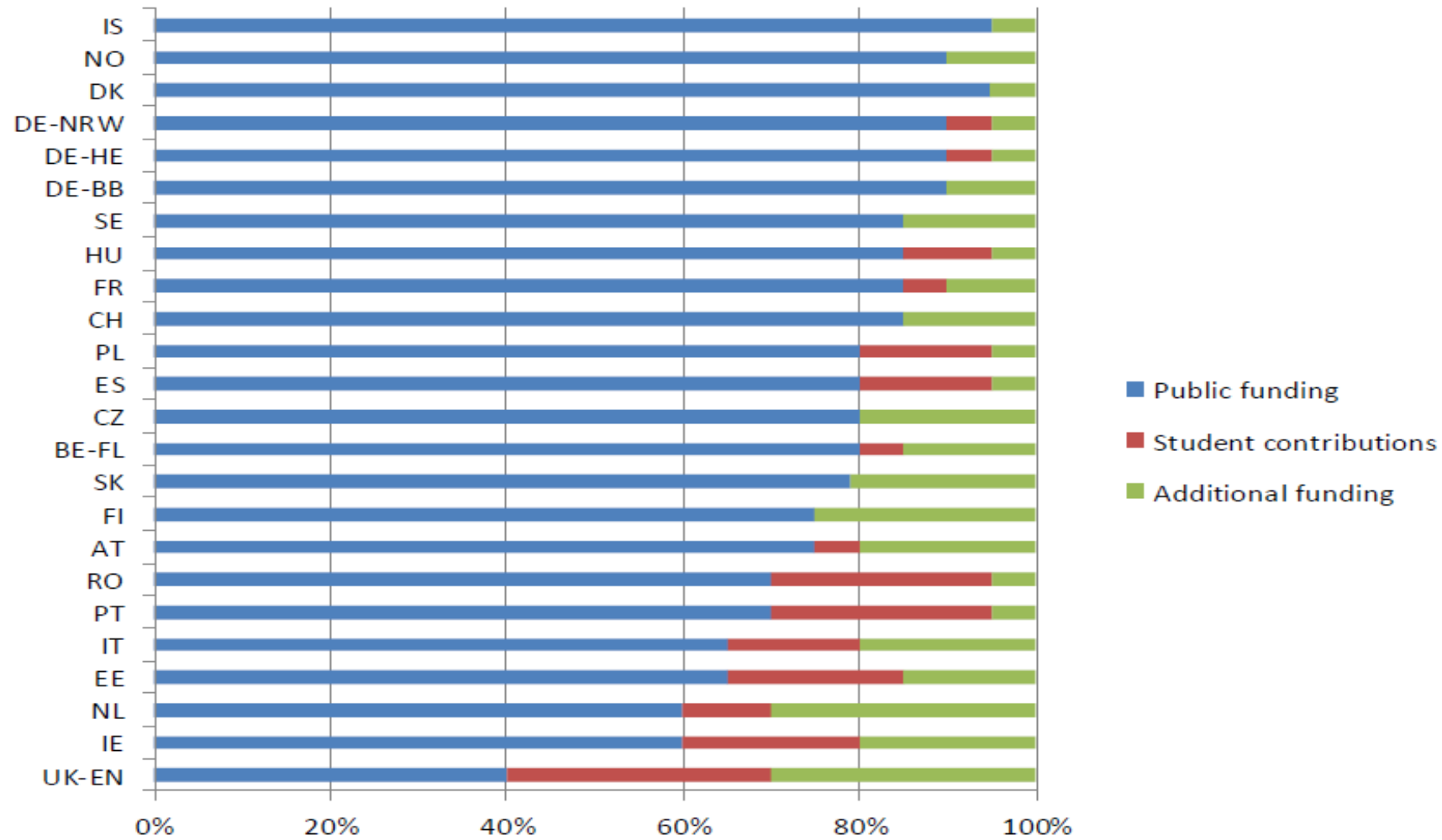
- Rent Collection
- Value Addition



Should the public pay for higher education?

Is Higher Education a Public Good?

# Higher Education Funding in Europe

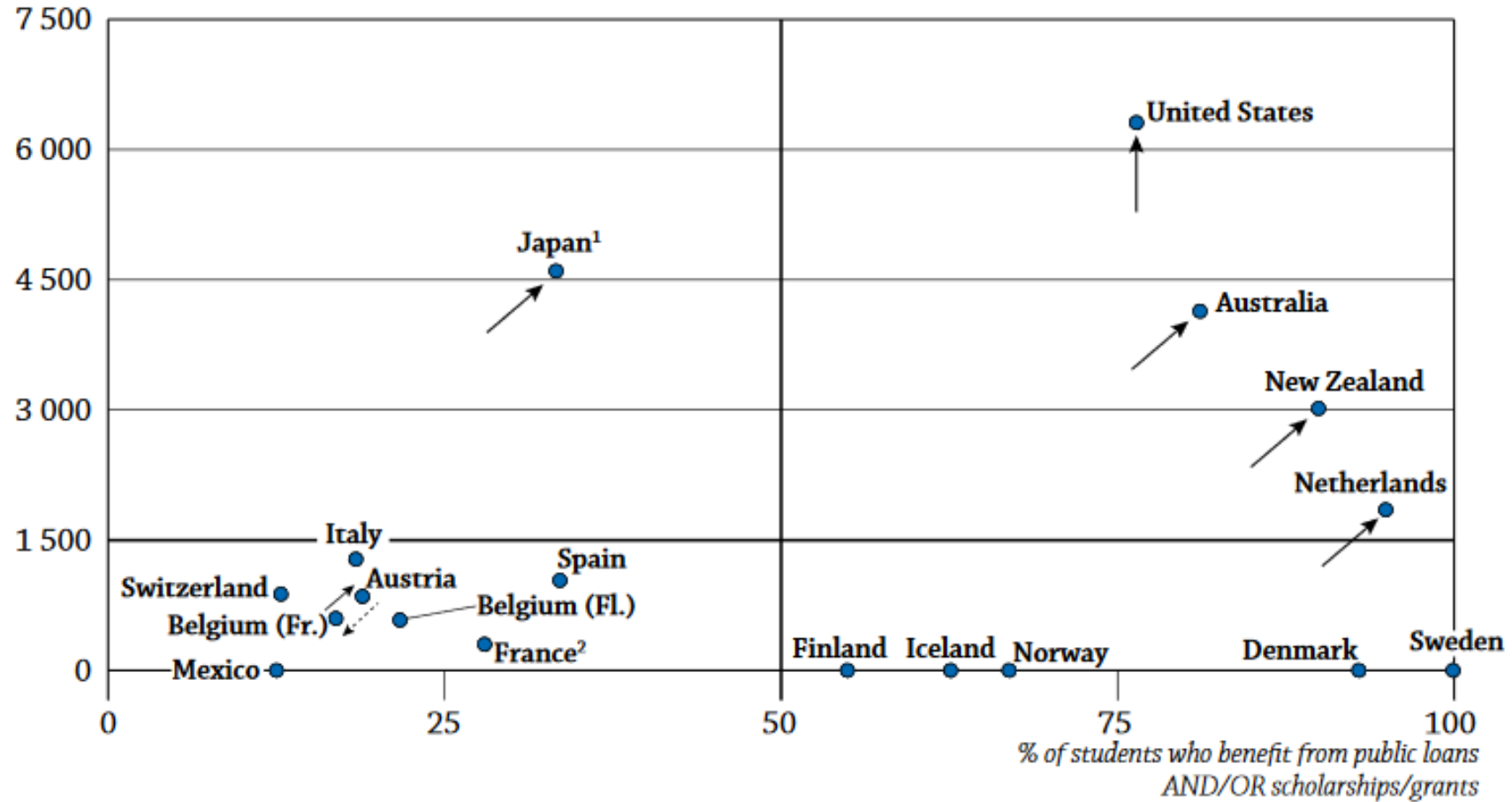


Estermann, T & Kulik Anna (2017)

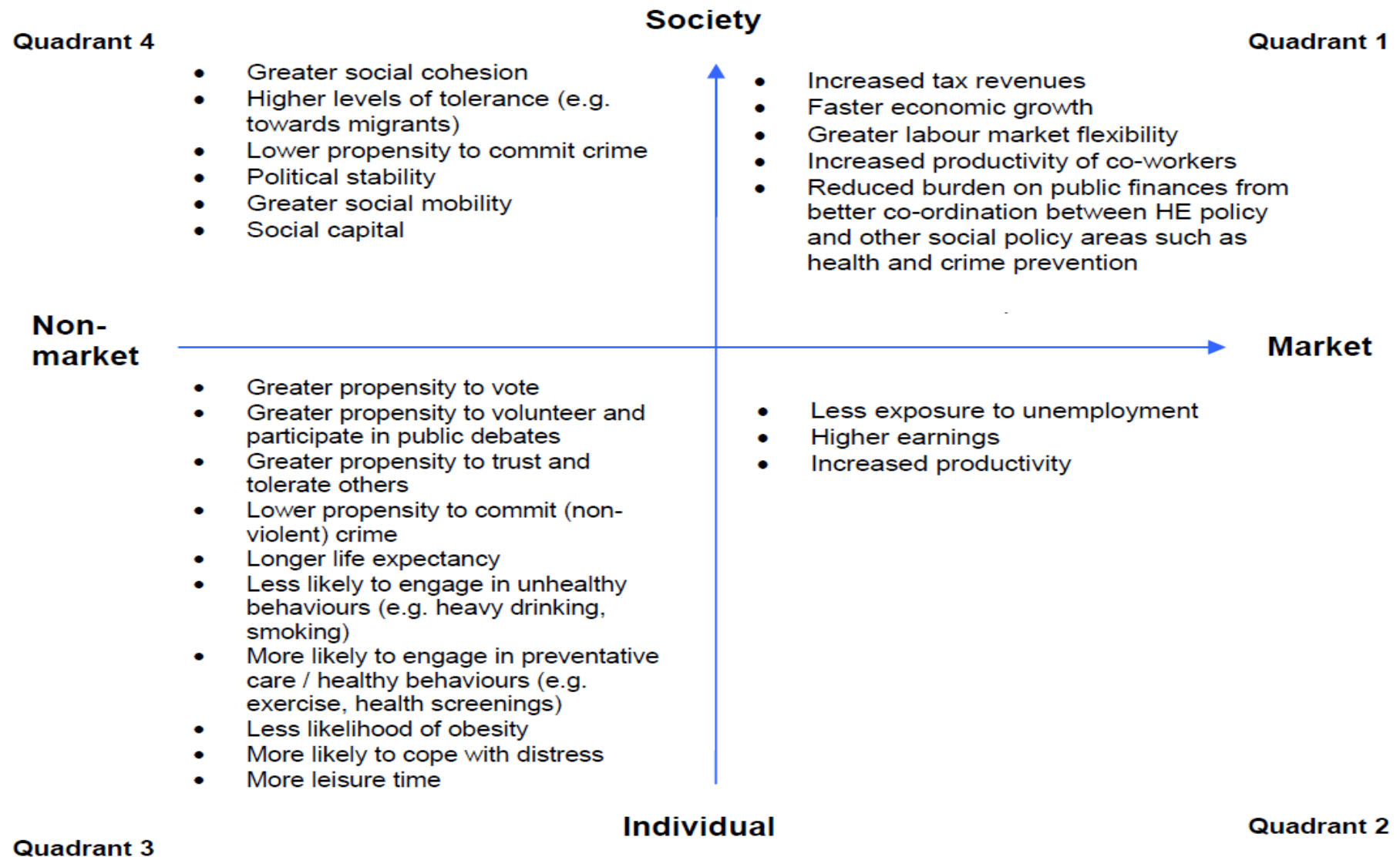
# Average tuition fees



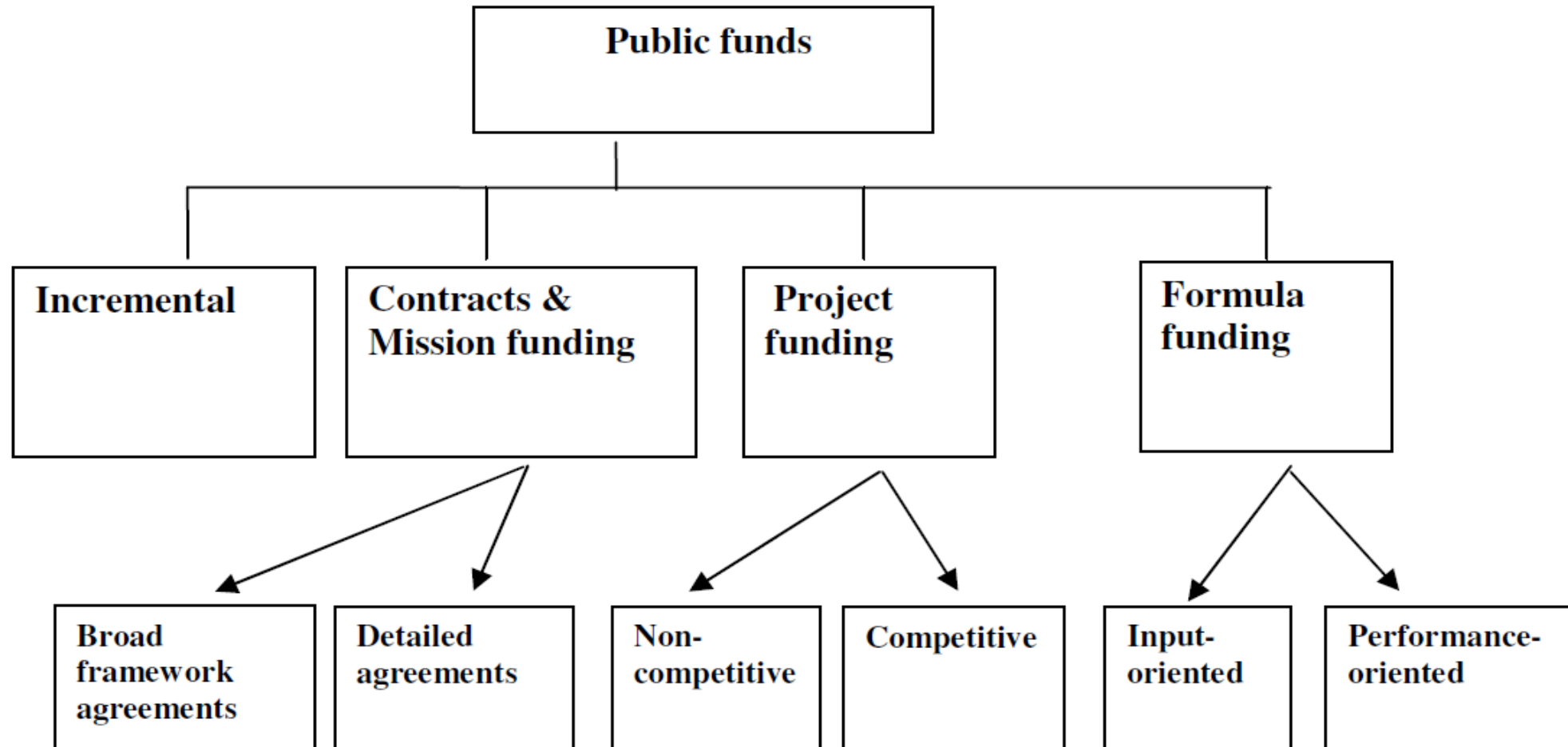
Average tuition fees charged  
by public institutions in USD



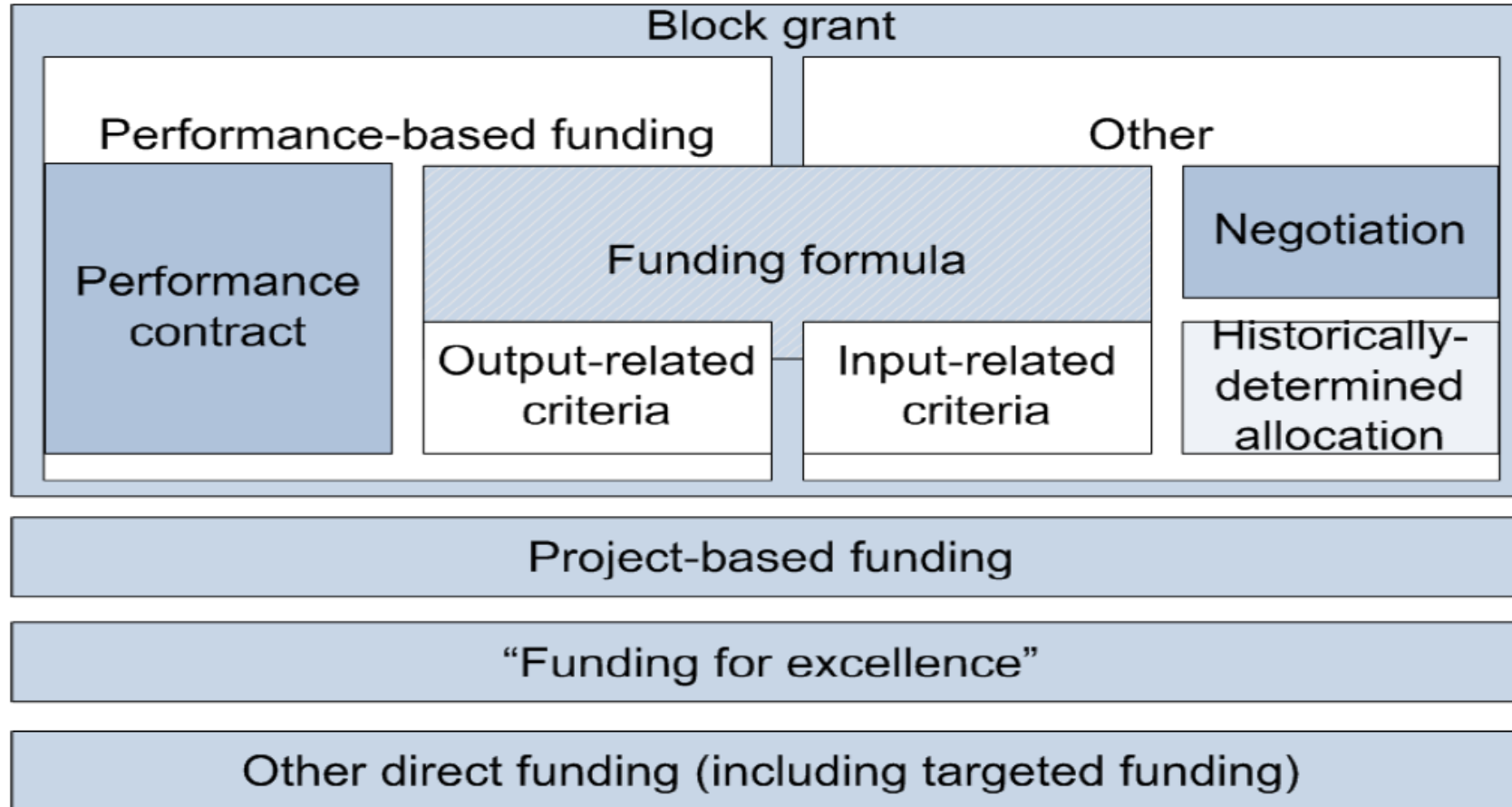
# Wider Benefits of Higher Education



Source: Brennan et al, 2013



Jongbloed, B. (2009)



Estermann, T & Kulik Anna (2017)

# Public Funding Models- Globally



Country	Block grant and HEI autonomy	Primarily student Nos driven	Weighted by discipline	Performance funding agreement	Research & Access funding within core	Allocation model includes student fees
Ireland	Yes	Yes	Yes	Yes	Yes	No
Australia	Yes	Yes	Yes	Yes	Research only	Yes
Norway	Yes	Not directly	Not directly	Yes	No, research within performance component	N/a
Netherlands	Yes	Yes, but by graduates	Yes	Yes	Yes	Yes
Wales	Yes	Yes	Yes	No	Yes	Yes
England	Yes	Yes	Yes	No	Yes	Yes
Scotland	Yes	Yes	Yes	Yes	Yes	N/a
Denmark	Yes	Yes, but credit	Yes	No	Yes, within weightings	N/a

HEA (2017)



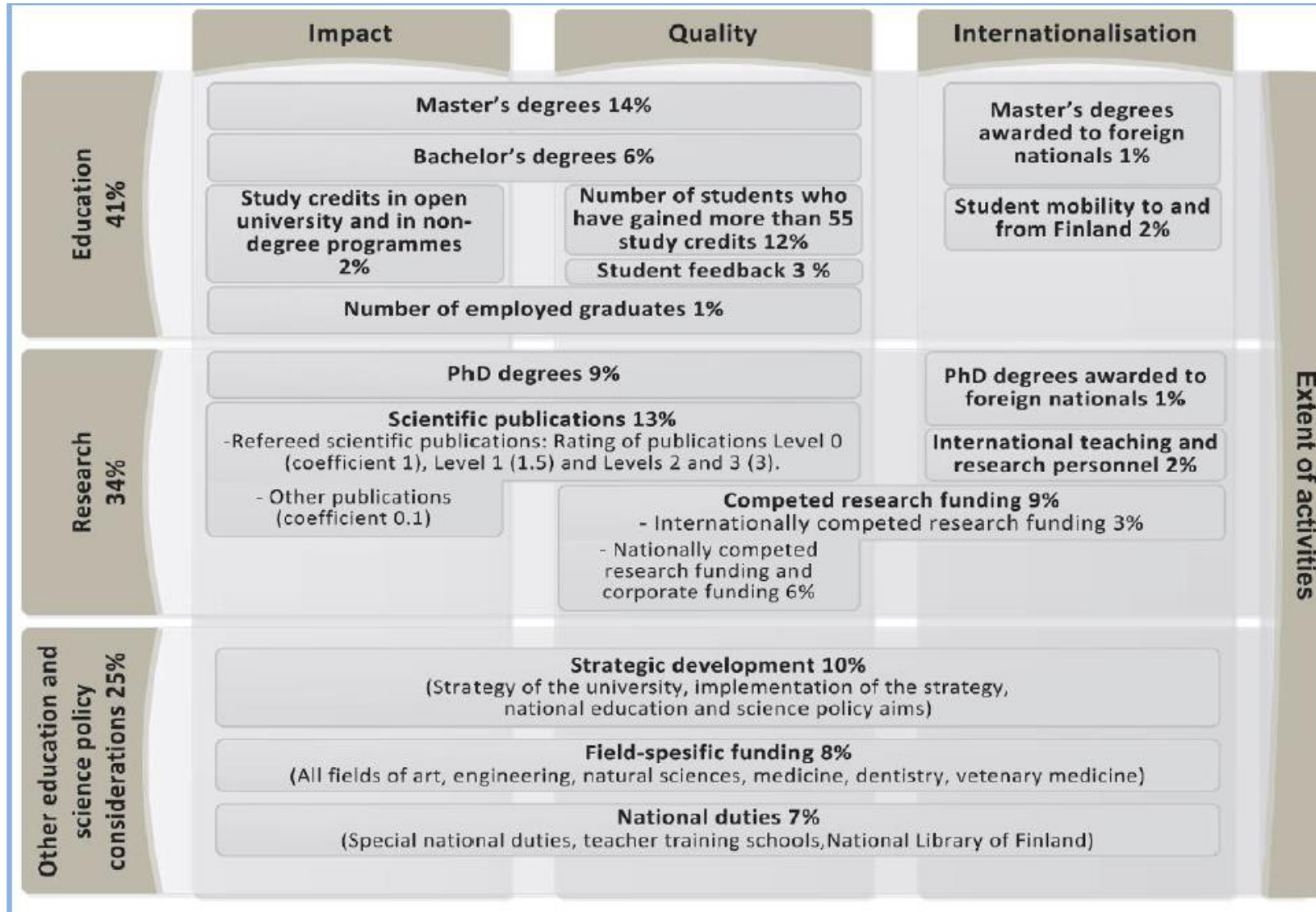
# Funding Formulae-Europe

	Input	Throughput	Output	Other
Teaching	BA/MA students; student/staff ratio	Students who took exam: BCTS attained; exam passed; year completed	BA/MA degrees obtained; degree completion in standard time of study	Graduate employment rate; added value of diploma; international students
Research	Doctoral students / candidates	Patent applications	Doctoral degrees/thesis completed; research evaluation; successful patent applications; external research funding obtained; scientific activities; research contracts obtained; publications/ citations; income from science and technology transfers; publishing researchers	
Other	Staff; floor space		External funding obtained; EU/international funding obtained (can be linked to teaching and research); rankings outcomes	International staff; diversity- related indicators; community outreach; review of strategic plans of universities; staff structure/quality

Estermann, T & Kulik Anna (2017)

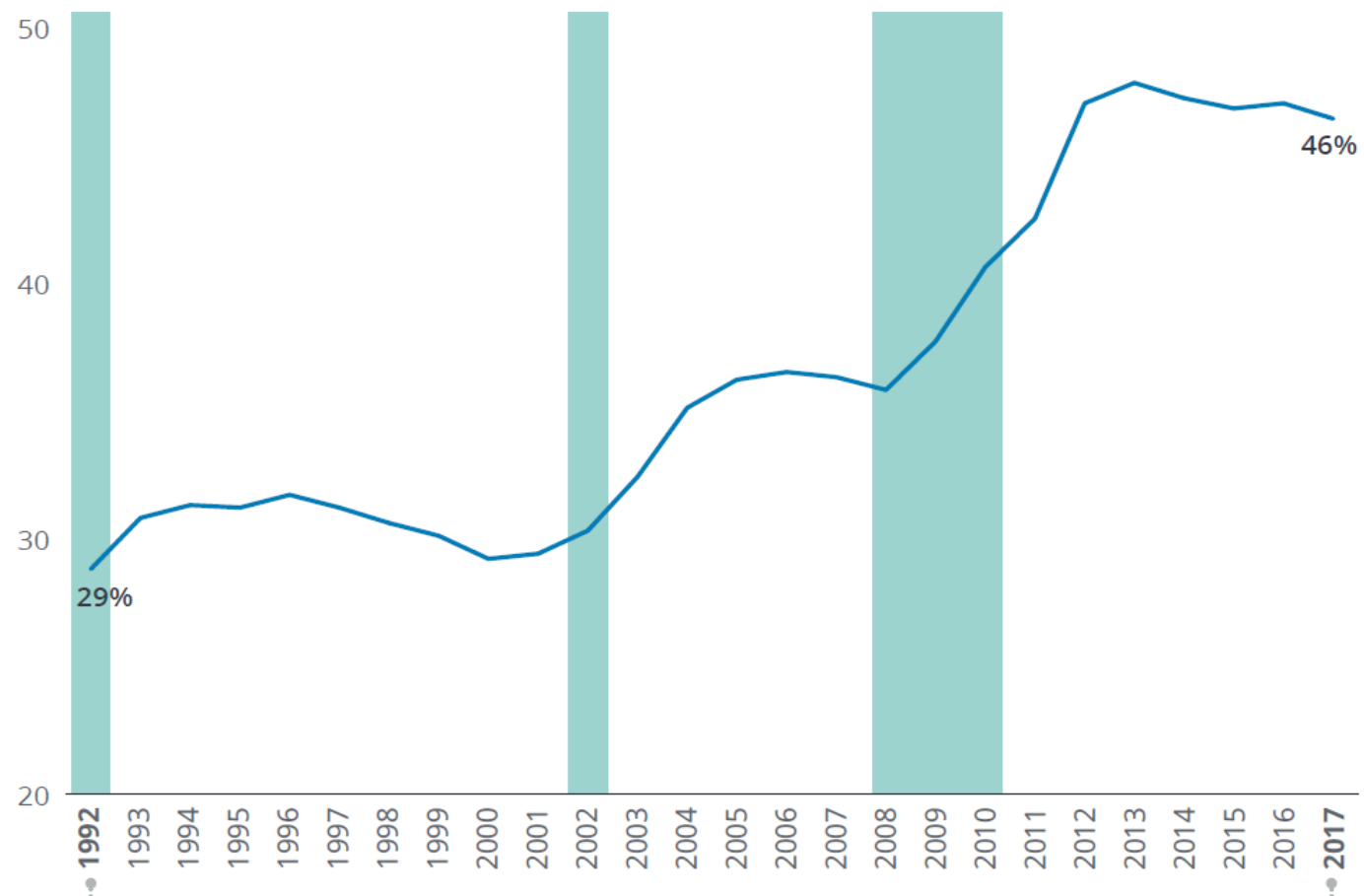


# Finland: Funding Formulae



Estermann, T & Kulik Anna (2017)

# US Higher Education- Share of Tuition

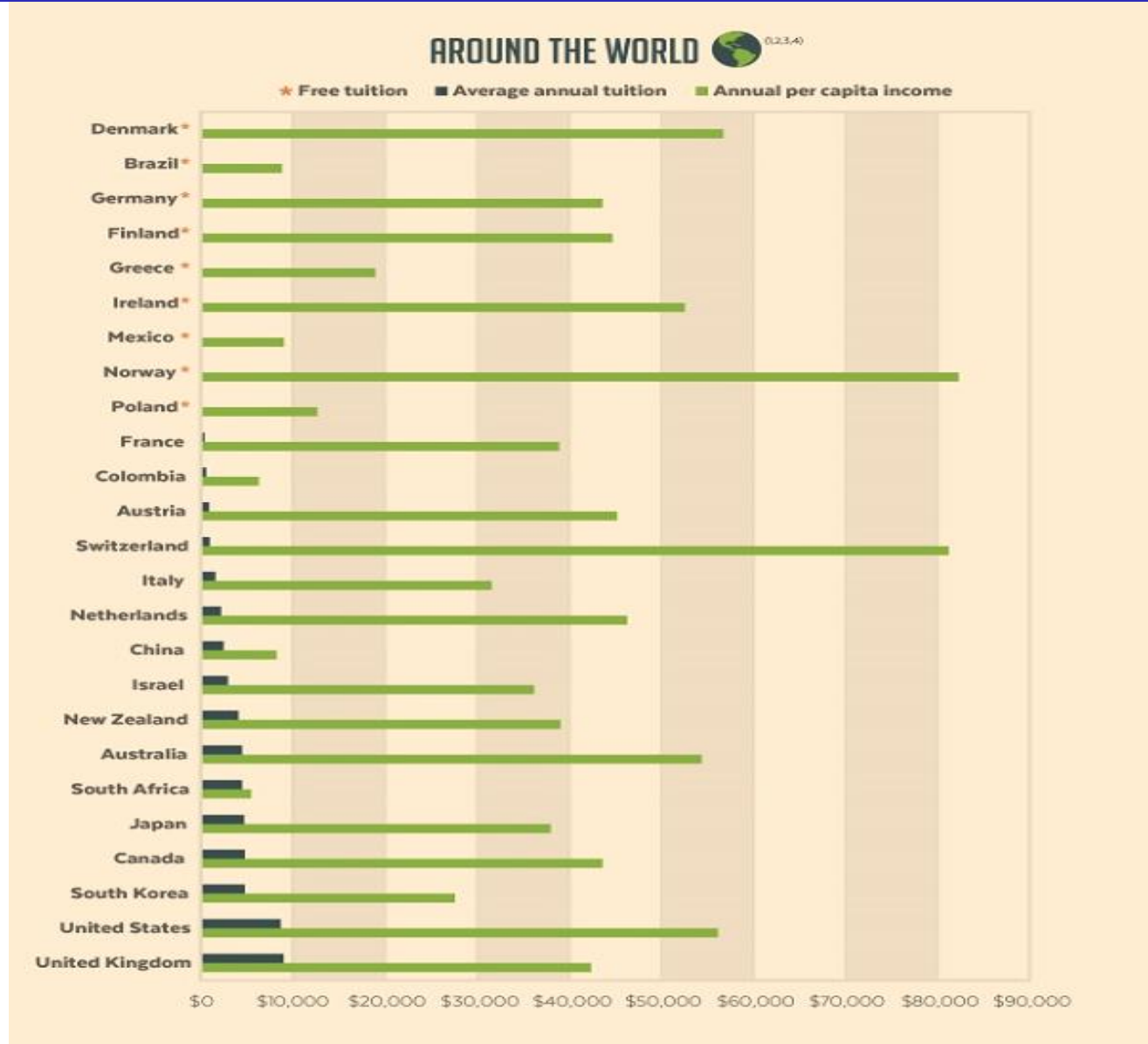


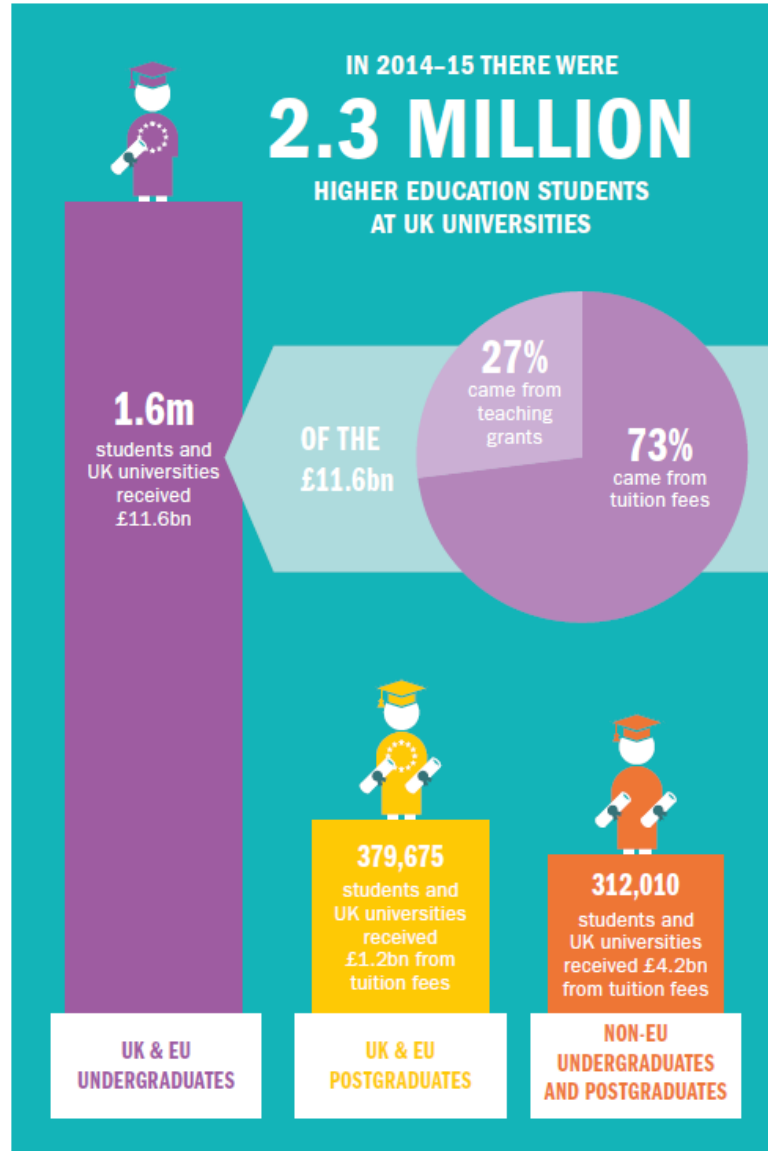
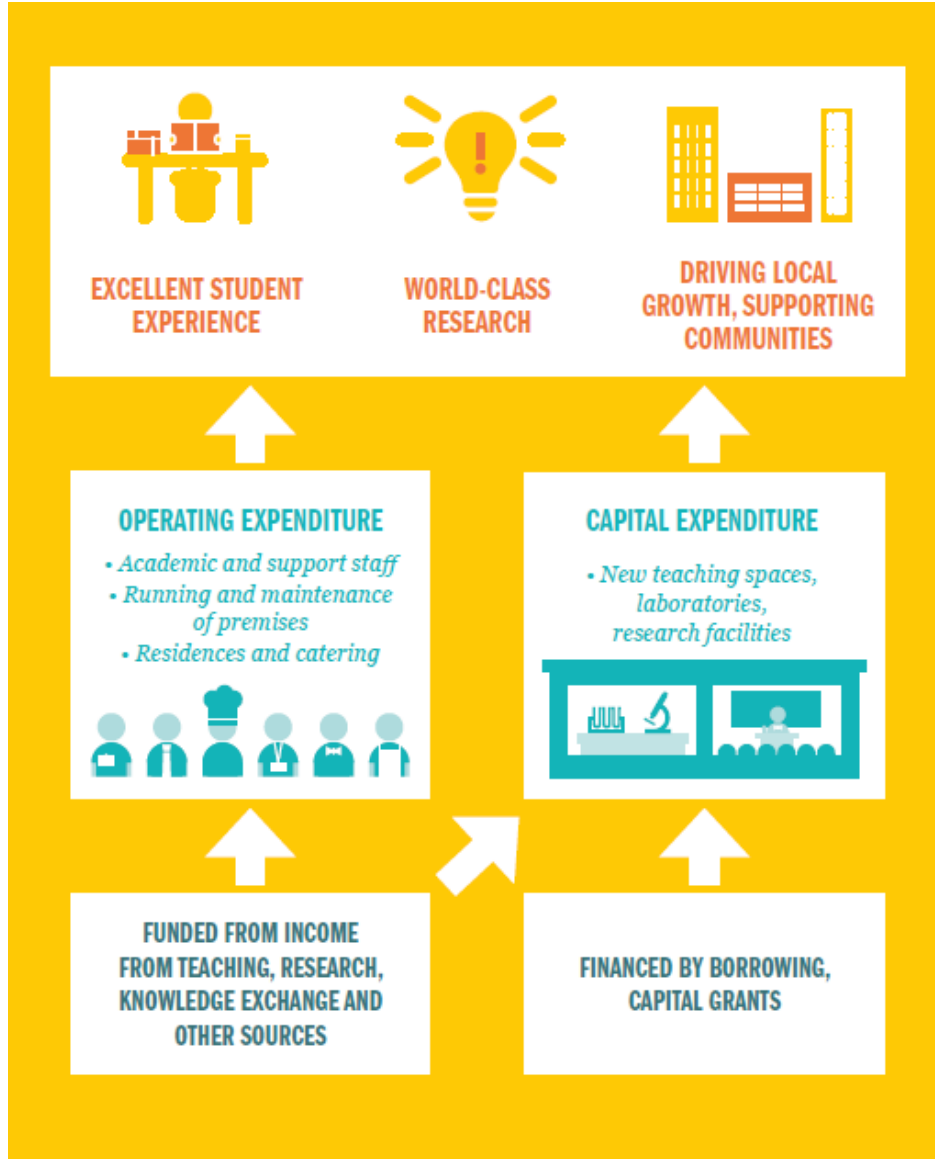
**A growing percentage of public higher education revenue is coming from tuition**

Net tuition as a percent of public higher education total education revenue, US FY1992-2017

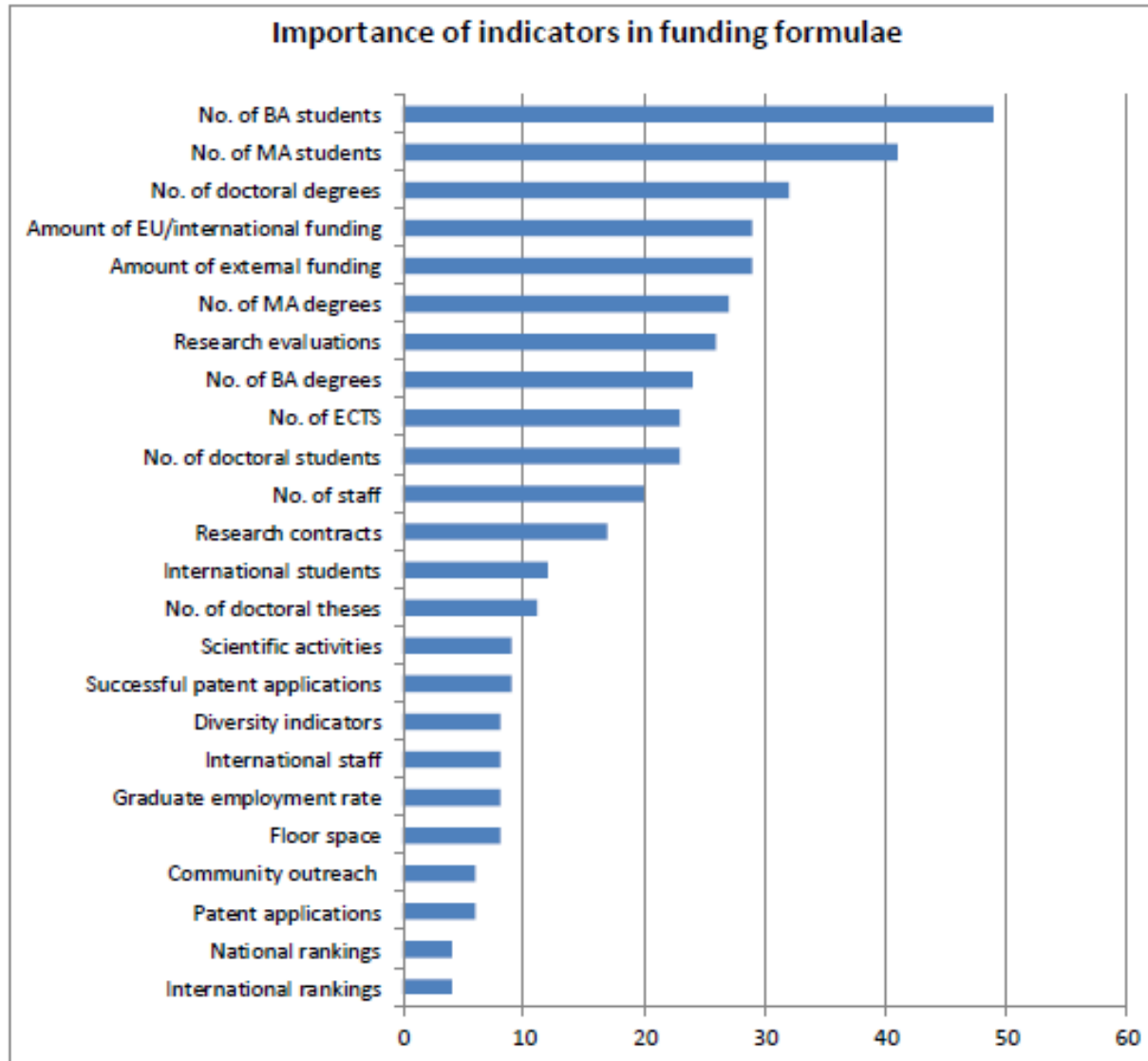
Deloitte (2018)

# Tuition and per capita income

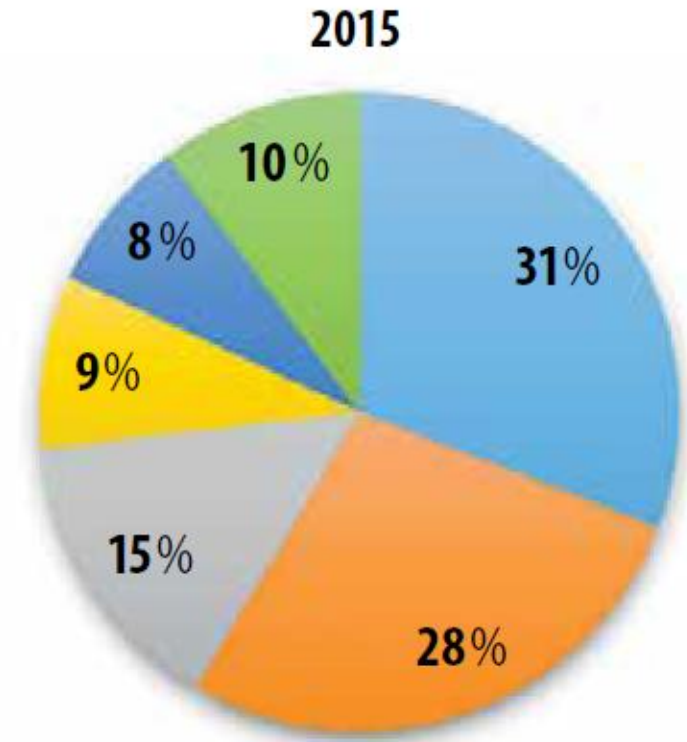
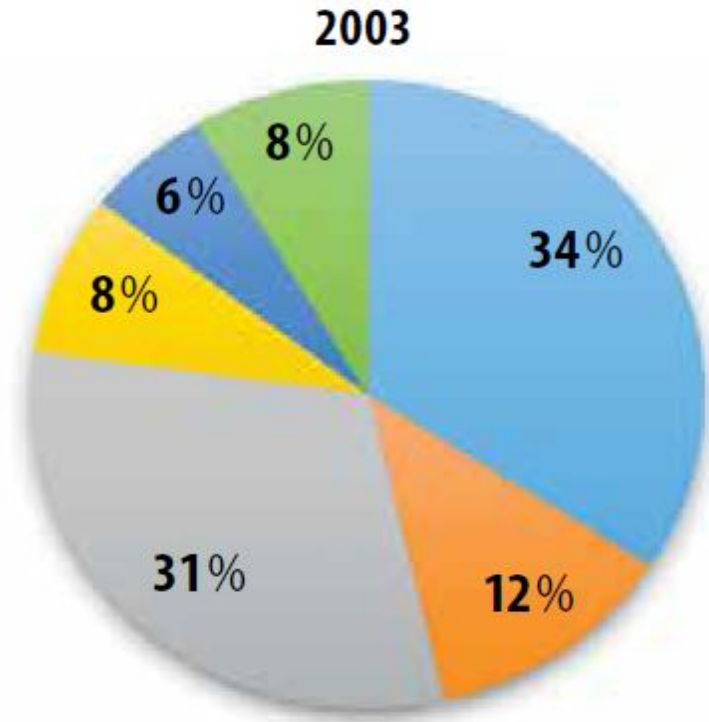




Universities UK. (2016)



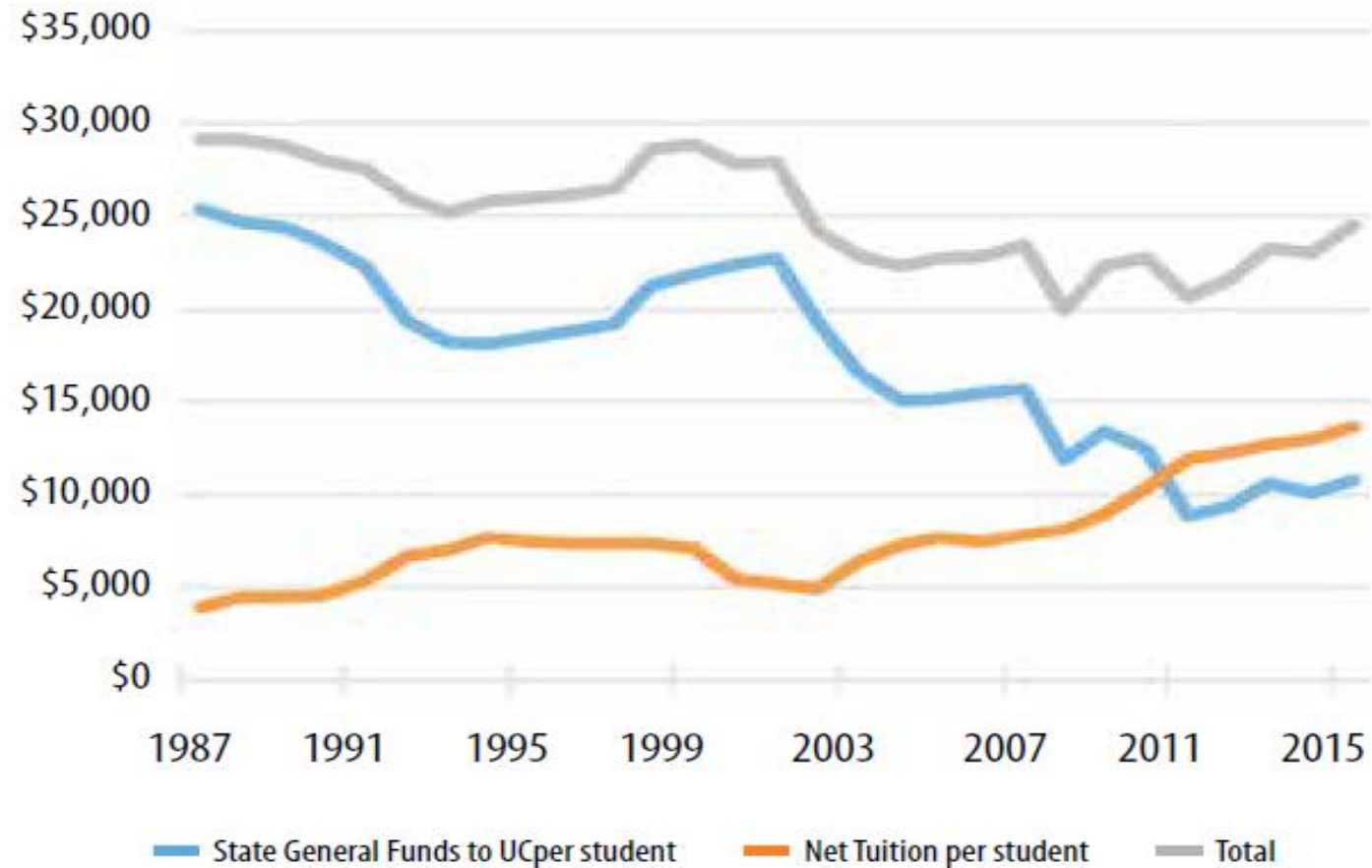
Estermann, T & Kulik Anna (2017)



- Grants and contracts
- State educational appropriations
- Auxiliary enterprises
- Student tuition and fees
- Other
- Private gifts

Douglass and Bleemer (2018)

# UC Fund share time trend

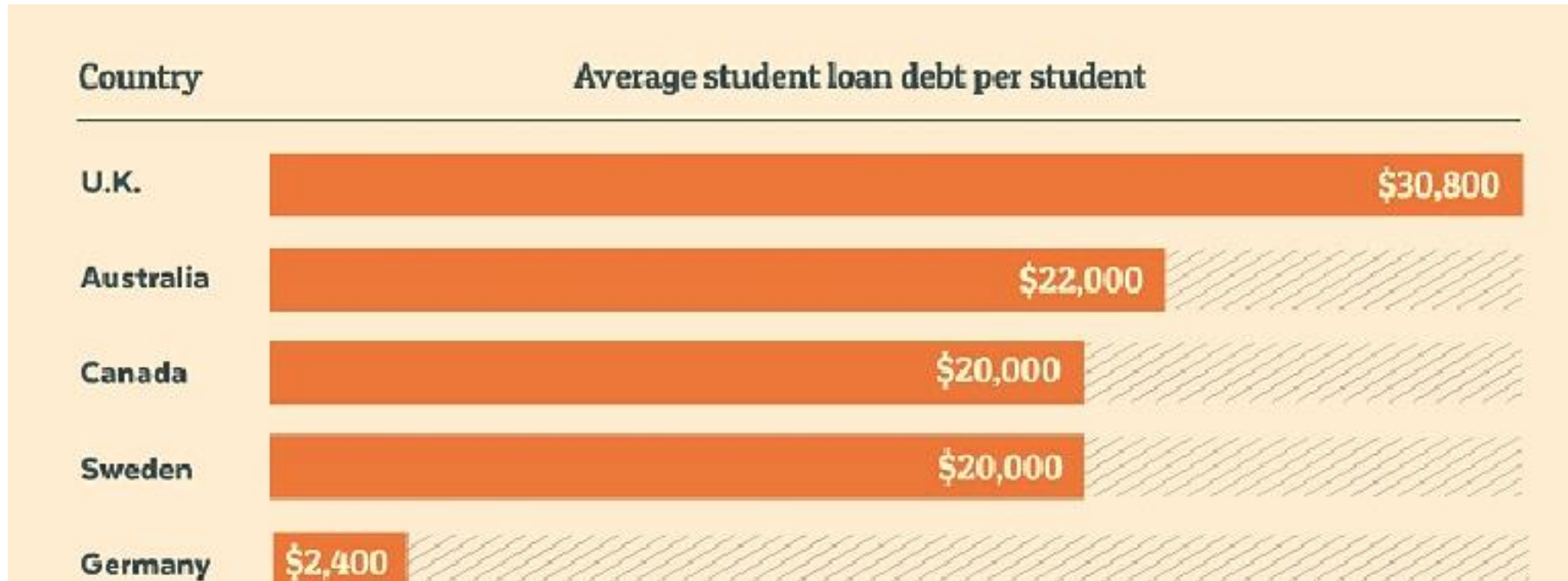


Douglass and Bleemer (2018)



Student debt exceeds **\$1 trillion** in the US  
yet 29% of all students who take out loans drop out  
of school, with 9% of loans currently in default

# Average Student Loan Debt



<https://www.cnbc.com/2017/10/13/cost-of-college-tuition-around-the-world.html>

# Aggregate Govt. Funding Estimates

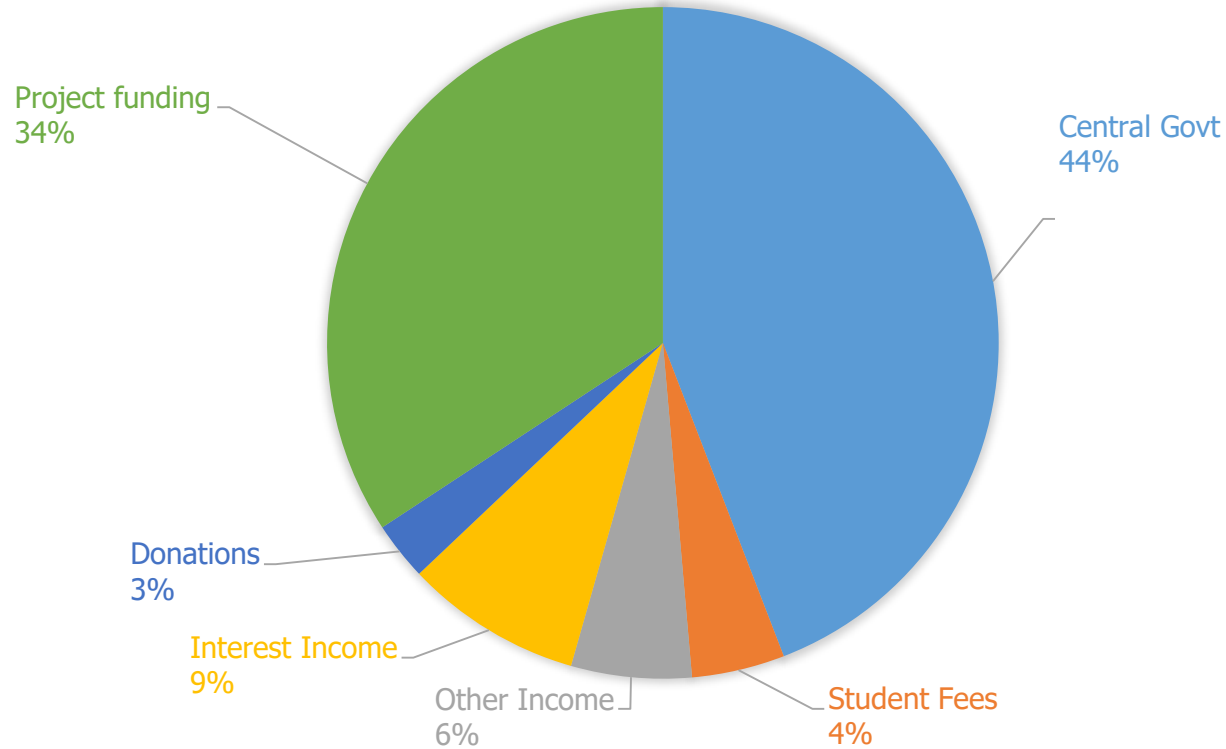


**Projected funding requirement for various educational institutions**

Institution	Number	Total amount (Rs. Cr)	2018-19	2019-20	2020-21	2021-22
New IITs	6	10000	2000	3000	4000	1000
Old IITs renewal of old infrastructure	9	9000	3000	4000	2000	0
2nd Gen IITs	8	6000	2500	2500	1000	0
IoE	10	10000	1000	3000	4000	2000
NITs new	1	1300	500	500	300	0
NITs 2 <sup>nd</sup> Gen	10	6000	2000	3000	1000	0
NITs 1 <sup>st</sup> Gen	20	4000	1000	1500	1500	0
Central Univs (new)	10	10000	1000	3000	4000	2000
Central Univs (old) renewal	25	10000	2000	3000	4000	1000
IISERs	5	5000	1500	2500	1000	0
IIMs new	6	4500	1500	2000	1000	0
IIIT (PPP)	20	3000	500	1500	1000	0
IIITs Govt	4	2000	500	1000	500	0
Languages institutes	5	1000	200	500	300	0
Other institutions CFIs	10	1700	500	500	700	0
SPAs	23	5500	1000	1500	2500	500
School Education		1000	250	250	250	250
Health Infrastructure	20	6000	1000	2000	2000	1000
Research promotion		4000	500	1000	1000	1500
<b>Total</b>		<b>100000</b>	<b>22200</b>	<b>36000</b>	<b>32300</b>	<b>9500</b>

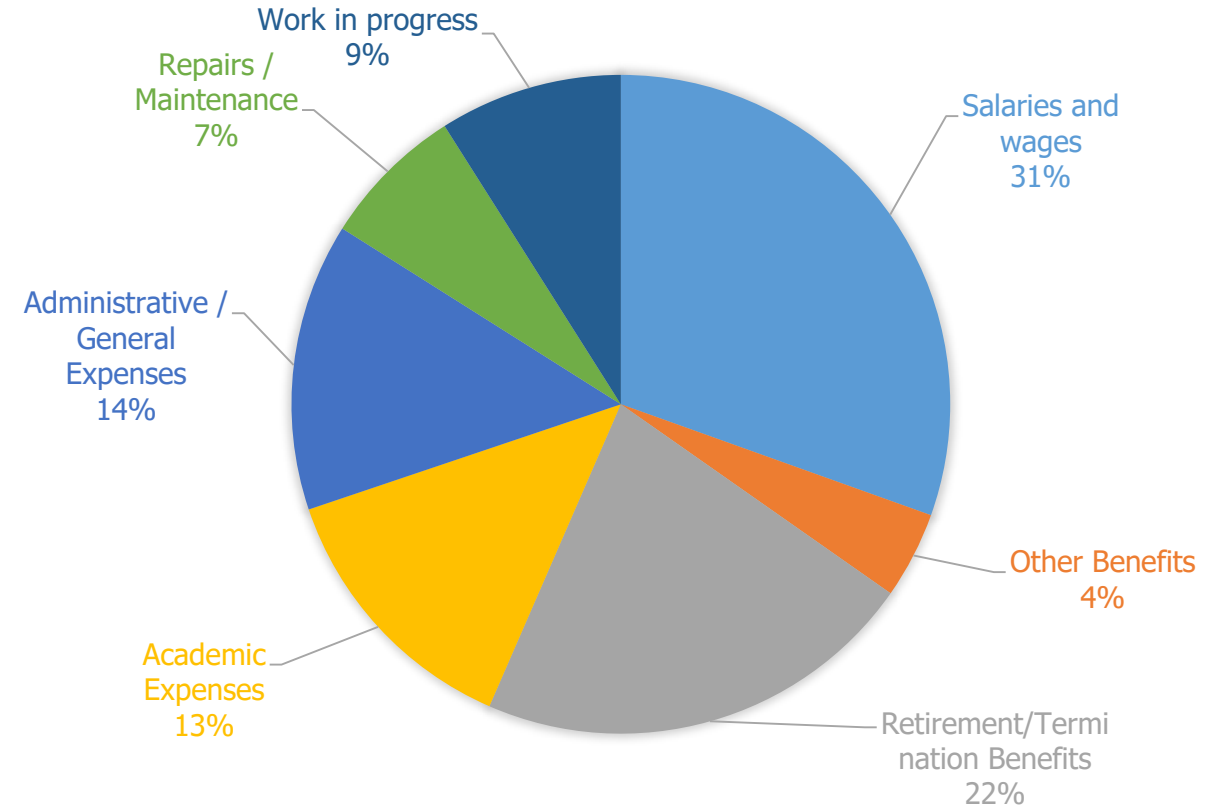
Source: PIB 2018  
HEFA and RISE

## Major Funding (2016-17)



Total: Rs. 1140 Crores

## Major Expenditure (2016-17)



Total: Rs. 713 Crores



How much overheads should we charge?

How do we justify overheads?



# Overhead Rates (US universities)

<b>Average of All Schools</b>	<b>0.482</b>
<b>Average for Private Universities</b>	<b>0.544</b>
<b>Average for Public Universities</b>	<b>0.465</b>
<b>Northern Kentucky was the lowest at</b>	<b>0.298</b>
<b>City University of New York Highest at</b>	<b>0.690</b>

Source: Sale and Sale, Indirect Cost Rate Variation for University Research: An Empirical Investigation of Overhead Rate Determinants ,

Indirect costs:

depreciation; maintenance; library costs; interest on debt; general administrative expenses; departmental administrative expenses; sponsored projects administration; and student administration expenses.

<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.495.8287&rep=rep1&type=pdf>

# Comparison of University Overhead rates



A COMPARISON OF INDIRECT COST (OVERHEAD) RATES UNIVERSITIES CHARGE VARIOUS SPONSORS  
FISCAL YEAR 2014

#	RECIPIENT	ON-CAMPUS RESEARCH	ON-CAMPUS OTHER SPONSORED ACTIVITY	OFF-CAMPUS VARIOUS PROGRAMS	LOCAL GOVERNMENT
1	HARVARD UNIVERSITY	69.0%	34.0%	26.0%	
2	STANFORD UNIVERSITY	60.5%	61.6%	30.4%	
3	JOHNS HOPKINS	62.0%	36.0%	21.0%	
4	UC BERKELEY	56.5%	40.0%	26.0%	
5	UC SAN DIEGO	55.0%	43.0%	26.0%	
6	UNIVERSITY OF CHICAGO	58.0%	33.0%	26.0%	
7	OREGON STATE UNIVERSITY	46.0%	33.8%	26.0%	
8	UNIVERSITY OF WASHINGTON	54.5%	33.8%	26.0%	
9	FLORIDA STATE UNIVERSITY	51.3%	51.8%	26.0%	26% TDC
10	UNIVERSITY OF BALTIMORE	55.0%	50.0%	20.0%	15% MTDC
11	UNIVERSITY OF MICHIGAN	55.5%	30.0%	26.0%	
12	UNIVERSITY OF MASSACHUSETTS - AMHERTS	59.0%	34.0%	26.0%	26% MTDC
	AVERAGE	56.9%	40.1%	25.5%	

## Attachment 1 - Comparison of University Overhead Rates

[sccgov.ig2.com/Citizens/FileOpen.aspx?Type=4&ID=128441](http://sccgov.ig2.com/Citizens/FileOpen.aspx?Type=4&ID=128441)



How much flexibility do we have in expenditure?

How much flexibility do we have in funding?

How do we distribute funding internally?

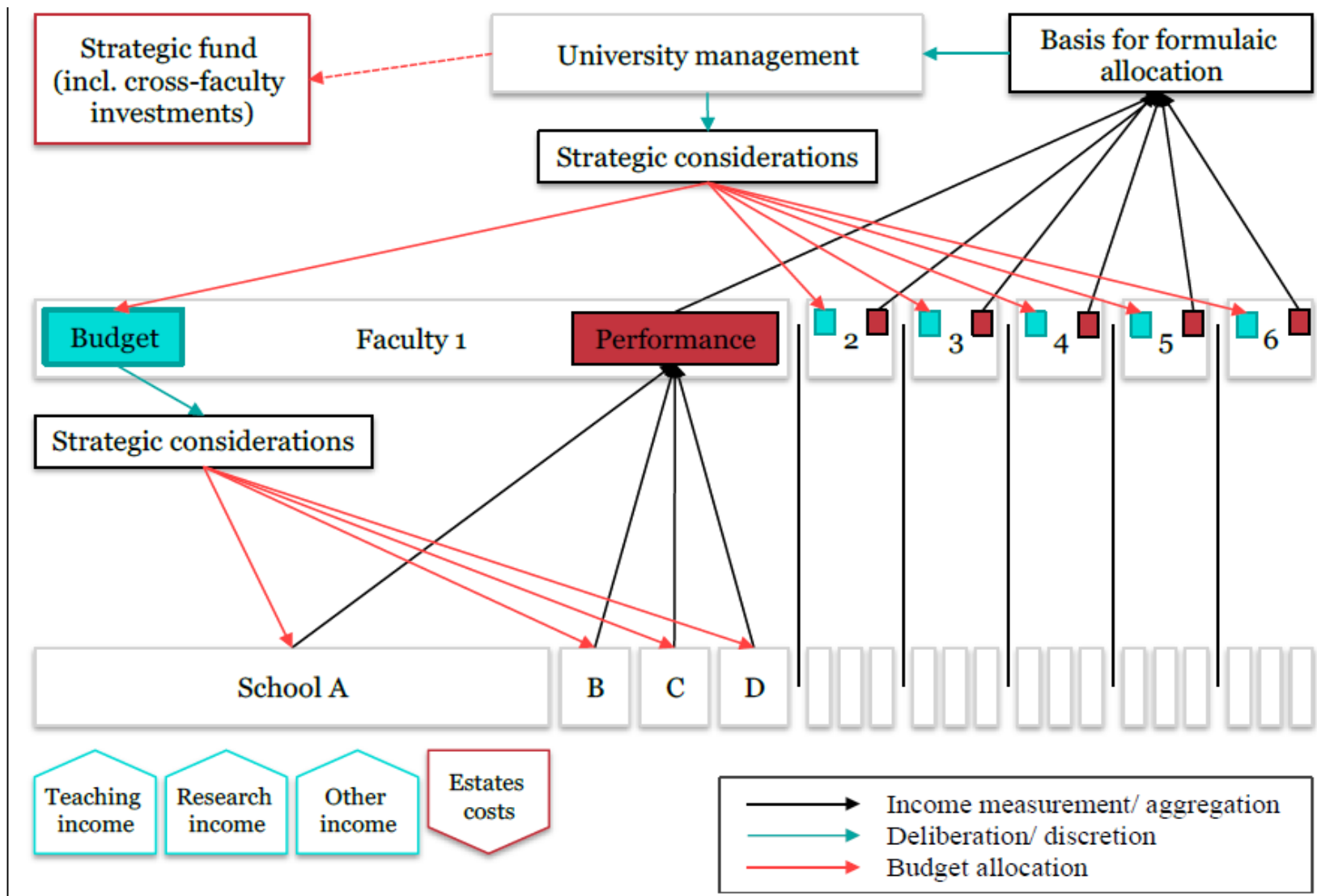
Is it ad-hoc? Historical?

How do we fund new groups? Academic units?



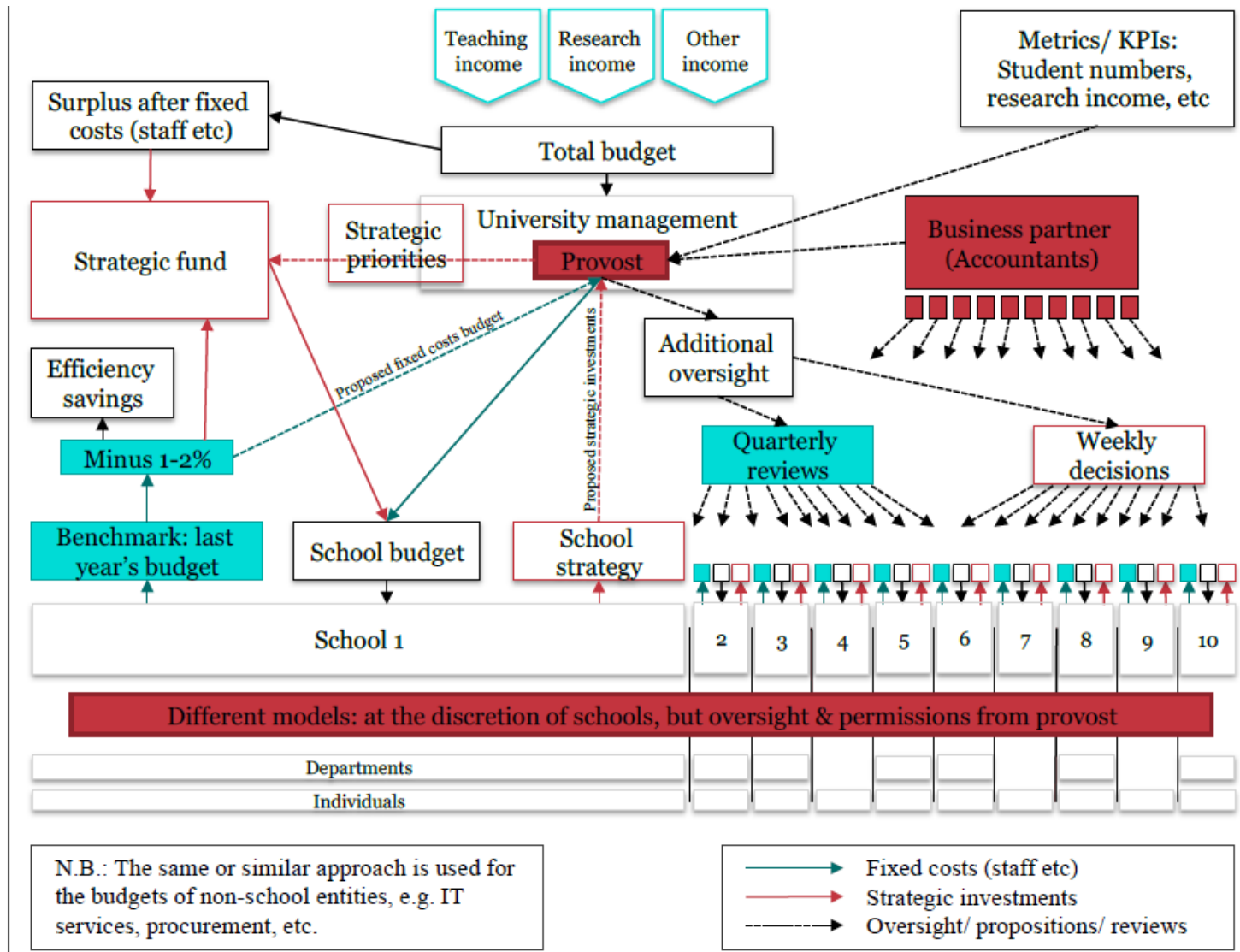
- Should we take loans?
- How should we manage our investments?
- Should we approach HEFA?
- Are there innovative but risky options?
- Should we use the endowment?

# Fund Allocation- University of Bristol



Universities UK. (2016)

# Fund Allocation- Loughborough University



Universities UK. (2016)



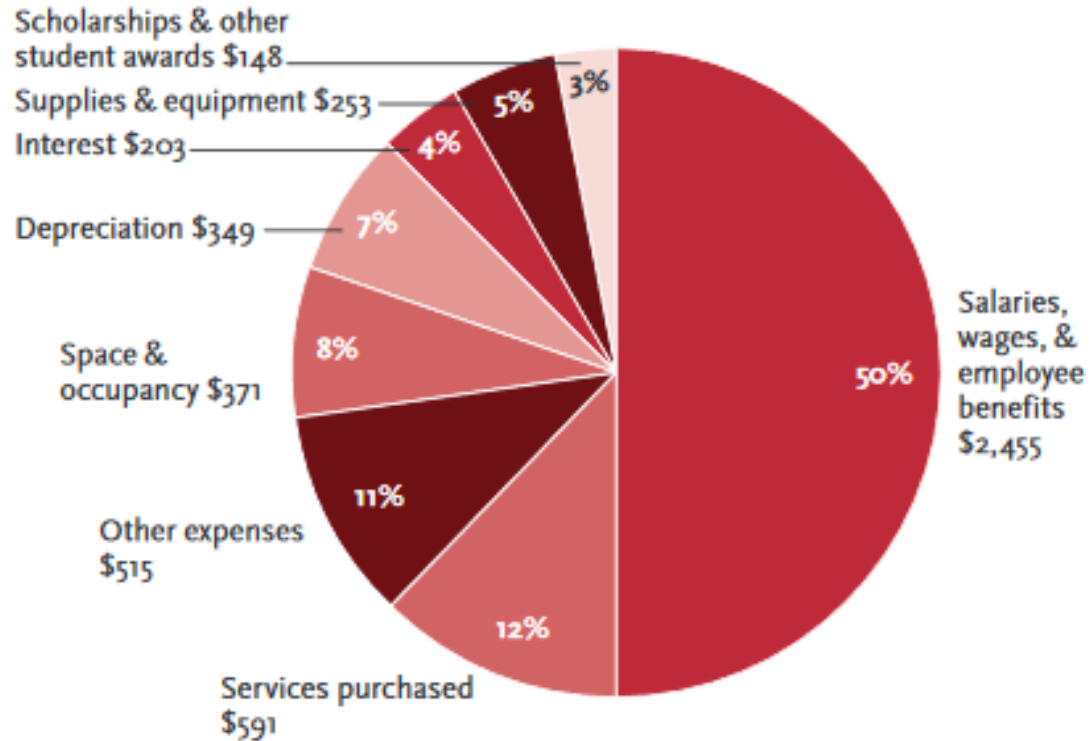
# Endowments of Richest universities

School name	End of fiscal year 2017 endowment
Harvard University	\$37,096,474,000
Yale University	\$27,216,639,000
Stanford University	\$24,784,943,000
Princeton University	\$23,353,200,000
MIT	\$14,832,483,000
Univ of Penn	\$12,213,207,000
Texas A&M Univ	\$10,808,501,077
Univ of Michigan Ann Arbor	\$10,777,563,000
Columbia University	\$9,996,596,000
Univ of Notre Dame	\$9,684,936,000

<https://www.usnews.com/education/best-colleges/the-short-list-college/articles/10-universities-with-the-biggest-endowments>

## FISCAL YEAR 2017 OPERATING EXPENSES

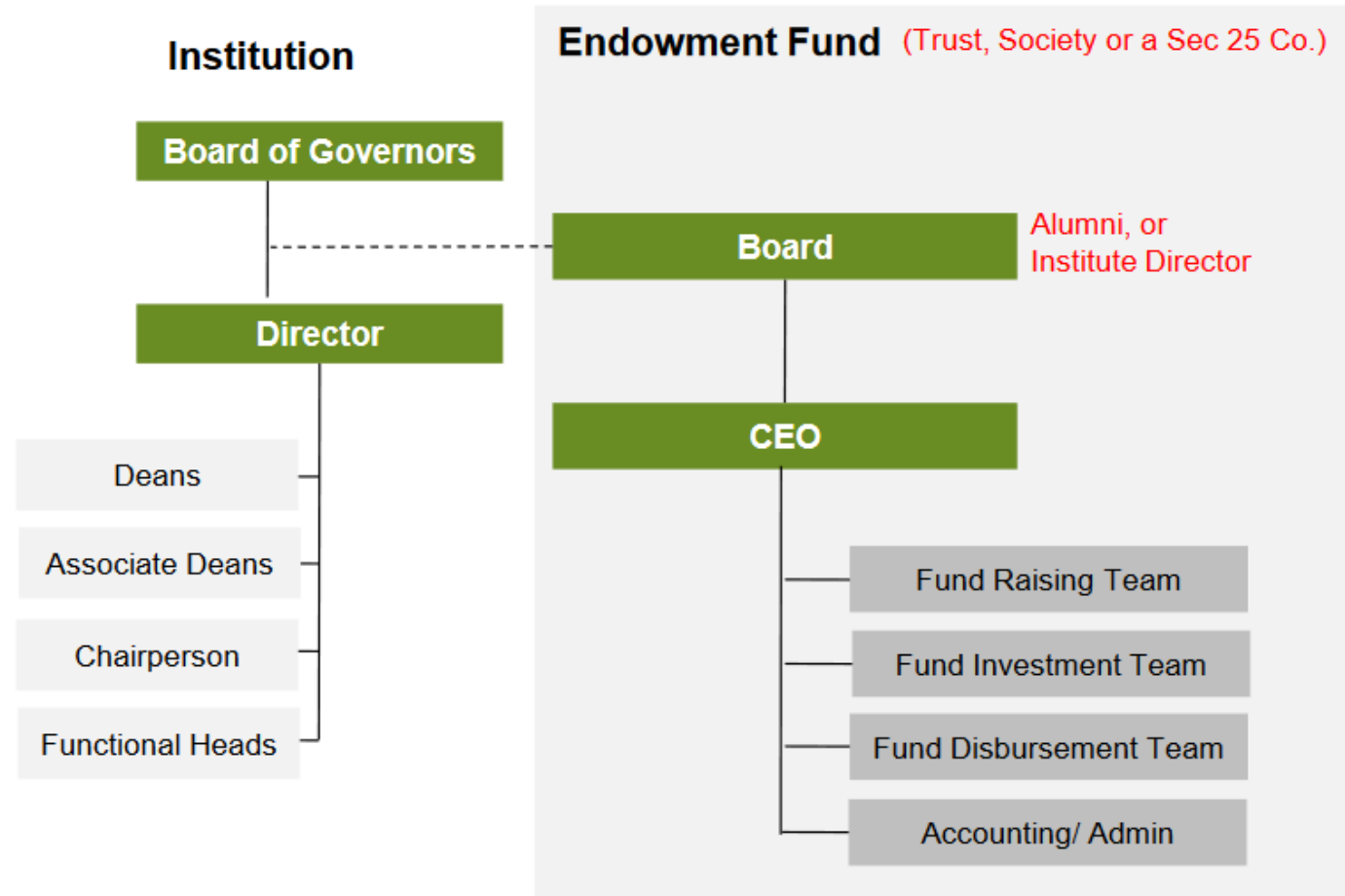
*In millions of dollars*



**TOTAL OPERATING EXPENSES \$4,885**

[https://finance.harvard.edu/files/fad/files/final\\_harvard\\_university\\_financial\\_report\\_2017.pdf](https://finance.harvard.edu/files/fad/files/final_harvard_university_financial_report_2017.pdf)

# Managing Endowment



[http://eduvisors.com/dwnld\\_assets/PDF/Eduvisors\\_Monograph\\_-\\_Endowment\\_Funds\\_-\\_August\\_20112.pdf](http://eduvisors.com/dwnld_assets/PDF/Eduvisors_Monograph_-_Endowment_Funds_-_August_20112.pdf)



- Legacy Systems
- ERP
- Lock in

What metrics should we use to compare our systems?

Are online integrated systems necessarily better?

Should we tailormake and develop our own systems? Or purchase state of the art software?



- Due Diligence – Processes , GFR, Internal Audit, External Audit
- CAG
- Transparency
- Turnaround time
- Accountability
- Actual Value to the Institute



- Leverage Funds
- Bridge Funds
- Seed Grants
- RIFC
- Student Conference Funding
- Department Development Fund
- Research Development Fund
- Student International Competition Funding



- Management Education- Global MBA
- Engineering Education- Global Specialised courses
- Research Academy

What should be the metrics for assessing the viability ?

Fund flows, Student flows, Value additions

Short Term and Long term strategies



- What policies should we have for IP?
- Mechanisms for Revenue Sharing?
- Incentives for Inventors?
- Start-ups - liberal policy?
- How do we manage our patent portfolio?
- How do we deal with IP protection? Litigation?
- What policies should we have for our research park?



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- **Energy and Environment (28):** Detection method for pollutants (PAH), Energy efficient heat exchangers, Fuel cell stacks, Method for contaminated site remediation, Solar energy based devices, Solar photovoltaics, etc.
- **Health care (22):** Antiproliferators of cervical cancer, Apparatus for orthopedic surgery, Circuit design for bio-medical devices, Drug delivery systems, Membrane separation techniques, Prosthetic devices, Treatment for pulmonary diseases, etc.
- **ICT (23):** Device for enhanced memory storage, E-education on miniature video devices, Improved RF communication devices, Microwave communication systems, Wireless sensor networks, etc.
- **Manufacturing (35):** Laser assisted material processing, Micro Sensors, Novel polymers for various applications, Synthesis of biocompatible chemicals, Textile manufacturing processes, etc.
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For enquiries please email us at [licensing@iitb.ac.in](mailto:licensing@iitb.ac.in) or contact Dean R&D office, IIT Bombay, Powai, Mumbai - 400 076



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Advt. in Times of India of IIT Bombay Technologies for Licensing

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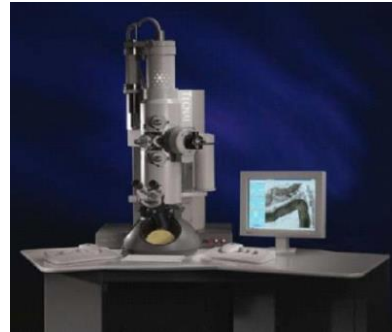
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**Microcompounder and mini injection moulding**



**Cryo TEM**



**Scanning Probe Microscope**



**Central Surface Analytical Facility (ESCA)**



**Liquid N<sub>2</sub> plant**



**Confocal Microscope**



**Ellipsometer**



**Dielectric Broadband Spectrometer**



**Physical Property Measurement System**



**Nanoindenter**



- Should we identify a few key areas?
- What should be the process for such identification?
- Inclusion/ Exclusion?
- Decision by an individual/ group?
- Enthusing? Demotivating?
- Bottom Up? Top Down?

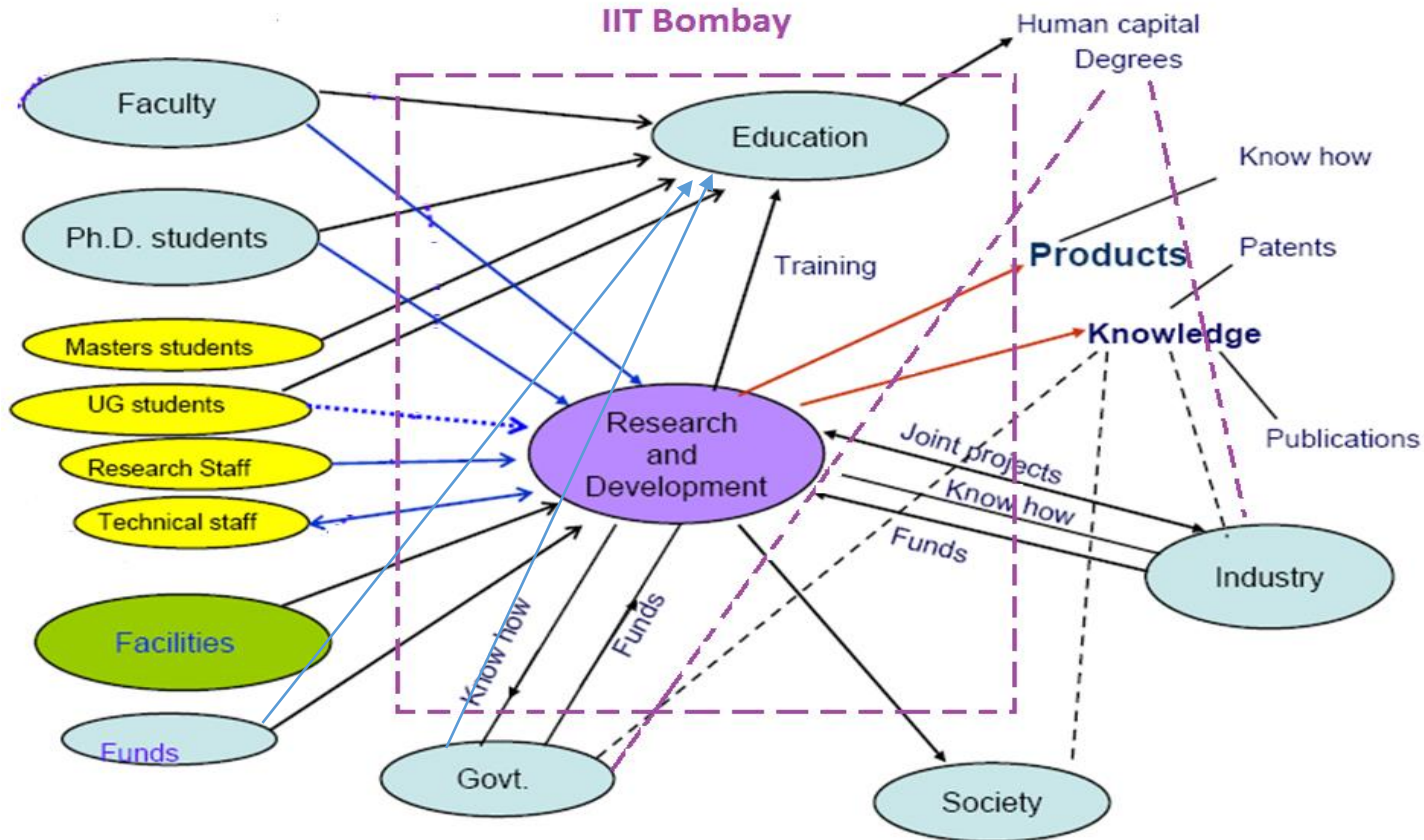


- Delegation – Clearly defined financial powers
- Flexibility
- Spirit of the rule
- Discipline – Adhering to rules
- Systems and Processes
- Clearcut roles and responsibilities
- Feedback Mechanisms
- Firefighting – short term versus planned



- Create a process for a strategic plan
- Get broad stakeholder involvement
- Announce publicise plan and goals
- Integrate strategic plan with annual budgets and decision making
- Allocate funding and responsibilities for action items
- Review progress and make mid-course corrections

# Schematic of interaction between IIT Bombay and Society



Thank you



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