The UK financial mathematics M.Sc.

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University	home/EU (k£)	non-EU(k£)	P	M.Sc. Course name
Warwick	31	31	E	F.M.
Oxford	27.5	31.1	N[1]	M.F. (part time)
Imperial	27	27	Y	M. & F.
Oxford	24.9	24.9	N	M. Comp. F.
City	23	23	V	F.M.
LSE	23	23	N	F.M.
LSE	23	23	N	Risk & Stoch.
King's	22.7	22.7	N	F.M.
Manchester	21.4	21.4	E	Q. F.: F. Eng.
Reading	19.8	19.8	N	F. Eng.
UCL	19.6	21.7	N	F. M.
Birkbeck	19	20	N	F. Eng.
Edinburgh/Heriot–Watt	19	22	E	F. M.
Brunel	17.5	17.5	V	F. M.
York	17.4	22.2	N	F. Eng.
York	16.5	21	N	F. M.
Queen Mary	15.5	18	N	M. F.
Birmingham	15.5	15.5	N	M. F.
Liverpool	15.4	15.4	N	F. M.
Exeter	11.9	19.5	N	F. M.
Manchester	10.7	18.4	V	M. F.
Leeds	9	19	N	F. M.
Leicester	8.5	16	E	F. M. & Comp.
Glasgow	8.3	17.2	N	F. Mod.
Strathcylde	7	13	N	Q. F.
Loughborough	6.3	13.8	N	M. F.
Birmingham	6	13.7	N	F. Eng.
Sheffield	6	15.4	N	Stat. with F. M.
Nottingham	6	13.7	N	Num. Teqs for F.
Swansea	5	12.5	N	M. & Com. F.

University	Fee (k£) home/EU	Fee (k£) non-EU	M.Sc. Course name
Aberdeen	3.4	12.6	Math.
Bath	6	18.6	Math. Sci.
Bath	6	18.6	Modern Appl. Math.
Bath	6	18.6	Math. Biol.
Birkbeck	4 (19) [4.5]	7.4 (20) [2.70]	Math.
Birmingham	5.9 (15.5) [2.63]	13.7 (15.5) [1.13]	Math. Model./MORSE
Bristol	8	17.5	Math. Sci.
Cambridge (univ. + coll.)	10.7	23.2	Part III of the Math. Tripos
Dundee	3.8	13	Math. Biol.
Durham	5.7	14	Math. Sci.
Edinburgh	9.3 (19) [2.04]	17.4 (22) [1.26]	OR
Exeter	7.5 (11.9) [1.59]	17.5 (19.5) [1.11]	Adv. Math.
Glasgow	5.4 (8.3) [1.54]	17.3 (17.3) [1]	Math./Appl. Math.
Heriot–Watt	5.9 (19) [3.22]	13 (22) [1.69]	Math.
Heriot–Watt	5.9 (19) [3.22]	13 (22) [1.69]	Appl. Math. Sci.
Heriot–Watt	5.9 (19) [3.22]	13 (22) [1.69]	Comp. Math.
Imperial	8.3 (27) [3.25]	23 (27) [1.17]	Pure Math./Appl. Math.
King's	8.3 (22.7) [2.73]	16.5 (22.7) [1.37]	Math.
Leeds	5.1 (9) [1.76]	13.3 (19) [1.43]	Math.
Leicester	8.5 (8.5) [1]	16 (16) [1]	Math. Model. Biol.
Leicester	8.5 (8.5) [1]	16 (16) [1]	Appl. Comp. Num. Model.
Liverpool	5.3 (15.4) [2.90]	12.2 (15.4) [1.26]	Math. Sci.
Loughborough	6.3 (6.3) [1]	13.8 (13.8) [1]	Indust. Math. Model.
LSE	11.6 (23) [1.98]	17.9 (23) [1.28]	Appl. Math.
Manchester	8.4 (10.7, 21.4) [1.27, 2.55]	14 (18.4, 21.4) [1.31, 1.53]	Appl. Math.
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Nottingham	6 (6) [1]	13.7 (13.7) [1]	Pure Math.
Oxford	5.6 (24.9, 27.5) [4.45, 4.91]	15.3 (24.9, 31.1) [1.62, 2.03]	Math. Model. Sci. Comp.
Queen Mary	6.3 (15.5) [2.46]	13.5 (18) [1.33]	Math.
Sheffield	6 (6) [1]	15.4 (15.4) [1]	Math.
Southampton	7.3	15	OR
Surrey	6.3	16.3	Math.
Sussex	5.5	13	Math.
UCL	8.5 (19.6) [2.30]	16.8 (21.7) [1.29]	Math. Model.
Warwick	7 (31) [4.42]	15.9 (31) [1.94]	Math.
York	6.2 (17.4, 16.5) [2.80, 2.66]	14.3 (22.2, 21) [1.55, 1.47]	Adv. Math. Biol.

Differential	$0 - 10\%$	$10 - 20\%$	$20 - 50\%$	$50 - 100\%$	$> 100\%$
Home-EU	Leicester Loughborough Nottingham Sheffield		Glasgow Manchester	Exeter Leeds LSE	Birkbeck Birmingham Heriot–Watt Imperial King's Liverpool Manchester Queen Mary UCL Warwick York
Overseas	Glasgow Leicester Loughborough Nottingham Sheffield	Birmingham Exeter Imperial	Edinburgh King's Leeds Liverpool LSE Manchester Queen Mary UCL York	Heriot-Watt Oxford Warwick York	Birkbeck Oxford

Pricing discrepancy

- There is a clear pricing discrepancy between M.Sc. FM and other "nearerst neighbour" M.Sc. programmes (e.g. M.Sc. Stat./M.Sc. Math./etc.) within the same departments.
- Home/EU students are largely subject to the same fees as OS students
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Value for Money

- Specialism and vocational training: Specialist for whom? Do quants/analysts really need this type of training? How many make it as the type of quants that do? Do lecturers and M.Sc. supervisors know the inside world of the quantitative financial service industry?
- Employability: Most M.Sc. FM graduates go into the quantitative financial services industry (self-selection?). But most people working in the quantitative financial services industry don't have an M.Sc. FM. Is it really a shoo-in?
- Intellectual depth and relevance: FM is a fantastic theory of its age that matters. Intellectually it is influential and stimulating on many different levels. But then are so many scientific theories that we teach at PG level.
- Opportunity and connectivity: Industry presence? How many students end up in a placement? Outside of London?
- World-class university: Then why offer a degree in the same department, from which one is equally eligible to work in the quantitative financial services industry at a third of the price? OS student fees already benchmarked higher for all degrees, for decades.
- International competition: European universities are free. US universities are unthinkably expensive by comparison.
- Industrial vendors charge this much: Industrial vendors are not universities and the bigger picture for them is not the bigger picture for us. One has to be careful about comparing vocational courses with academic courses. Is that who we are?

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The bottom line

Who cares, the students keep coming. The market has spoken!

Value for Money

"Why are fees for financial mathematics postgraduate taught courses so high in **relative** terms?"

"Because universities can get away with it"

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The elephant in the room

Most UK universities report that the overwhelming majority of their M.Sc. FM students are self-funded Chinese.

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Would any other public service industry tolerate or be tolerated for such an approach to its pricing policy?

"What is wrong with following market demand?"

or

"What kind of educational capitalism do you believe in?"

Precedent

Should we worry about a bubble effect?

- M.Sc. Statistics:
  - Course content used in industry, unquestionably vocational training
  - A qualification that is a minimal requirement, or preferential for many jobs, leading to well paid employment
  - Academia has strong connectivity with industrial partners
  - $\Rightarrow$ treble the fees?
- B.Sc./M.Math. Mathematics:
  - Highly prized by a very wide spectrum of UK employers.
  - some degree programmes report e.g. that 95% of graduates move directly onto employment or further study
  - Further removal of 9K fee cap $\Rightarrow$ double the fees relative to e.g. an UG degree in French Literature?

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- Over commercialisation of education: Marketing for masters programmes in financial mathematics often confuses what is needed by an elite core of quantitative analysts in larger banks and consultancies (who typically look far beyond the training that a UK M.Sc. in financial mathematics has to offer) with other softer quantitative roles in banking (for which a whole array of other quantitative undergraduate and postgraduate qualifications are equally relevant).
- Predatory education: If the principle of appealing to demand to justify the setting of exceptionally high fees becomes a more common practice, would the system not attract the uncomfortable prospect of external regulation?
- Teaching with a false authority: Some students from the M.Sc. FM are returning to developing and less regulated economies where it is unclear to what extent a qualification of this kind, marketed and sold to students the way that it is, is being put to use and by whom.

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Conclusion

- This is not an issue of "Marxist lefty education" vs "Capitalistic education". The latter has been present the UK system for decades. If anything it is about responsible "commercial education".
- FM is an important and valid intellectual discipline, **and it should be taught at university**. Using MSc FMs as cash cows without due care for the bigger consequences may well be doing the field, as well as doing the future of UK education system, a disservice.
- Twenty years ago, when the profession of the quantitative analyst was still relatively young, the M.Sc. MF meant something completely different to what it does today. The role that universities can play in, and the meaning of **high-level vocational training** for this profession has accordingly changed. **Fees and course content should reflect this fact appropriately.**
- Normalising the fees on the MSc FM will not reduce the number of international students and it will not mean that the MSc suddenly stops bringing money in. The majority of Non-EU participants that most MSc programmes report will still be paying a higher fee in line with the blanket university business model. Normalising fees will, however, prevent UK/EU students being potentially priced out.

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