

The French quant connection

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Brendan Maton explores the pre-eminence of engineering in French elite education and the extent of its success in application in asset management

At a glance

- Engineering is the most prestigious subject in France's Grandes Ecoles, elite institutions of higher education.
- Finance is the most popular destination for such elite graduates.
- So far, French finance specialists have had more of an impact on investment banking than asset management.
- Ambition and marketing skills are important for the broader success of French quants.

Education in France is supposed to be meritocratic. And the very best of the half-a-million or so 17 and 18-year-olds taking the baccalauréat at the end of secondary school every year should eventually find their way into one of the Grandes Ecoles, of which there are just under 300. Created singularly over the centuries by sovereigns, emperors, political and academic leaders, their purpose is to offer the highest practical education to solve the most pressing problems of the times (the first were set up under Charles IX (1550-1574) to study the sea).

Their intake is based on merit, although meritocracy, in France as elsewhere, remains an ideal that is not always realised. Some students get better help cramming ('la prépa' can take three years); some lycées are better recognised by the Grandes Ecoles than others. Either way, the selectiveness involved, especially for the highest-ranking institutions, means that meritocracy ends with the qualification process. The Ecole Centrale Paris, for example, selects 330 students each year from 10,000 applicants.

Literature can be studied at a few Grandes Ecoles but the subject is low-ranking. Languages are not much higher – they are subsidiary to disciplines that are considered more important. Law fares much better. But the most prestigious subject is engineering.

Constructing the First Republic (1792-1804) was the founding cause for Napoleon's Grandes Ecoles and that spirit has not changed. Only engineers can devise bridges, mines and roads. The same is true of twentieth-century inventions – aeroplanes, rockets and nuclear reactors.

French companies are proficient at making all these things. At the Grandes Ecoles, natural sciences, then social sciences, follow engineering.

“The way the French choose their elite is via mathematics and science, not languages or literature. The top positions in industry go to engineers,” says Ulrich Koall, managing director of Quoniam Asset Management, a German quantitative firm. Koall knows the system well, as his wife is French and his children were educated at lycées.



The École normale supérieure in Paris

Not every one in the budding French elite needs to be highly numerate, although the Grandes Ecoles have similar thresholds to MBA courses for maths. But the notion of a history or modern languages graduate taking a top job ahead of a science graduate – or worse still, taking responsibility for a position that requires maths or science training – is unnatural to the French system. It is a difference to other national cultures that can cause friction, not least in the world of investment management.

While the spirit of engineering remains predominant, France does not need as many engineers as before. World-class companies such as Areva, Alcatel, Airbus and Total are well served by graduates from the Grandes Ecoles and universities. They design sophisticated and technical constructions all over the globe. The Bolloré Group is building a railway through five African

countries from Togo to Côte d'Ivoire. Technip has co-created the largest floating liquefied natural gas facility in the world.

The most popular destination for graduates of the elite schools is now finance. Of all LinkedIn members who studied at Ecole Nationale des Ponts et Chaussées (the National School of Bridges and Roads), one of the oldest and most prestigious, 14% work in finance.

Among this group are co-CIO at Natixis Global Asset Management, Emmanuel Bourdeix and Pierre Séquier, head of Exane Asset Management.

From the Ecole Centrale Paris, whose alumni include Vincent Denoiseux, head of quant strategy in the passive team at Deutsche Wealth Asset Management and Fabrice 'Fabulous' Tourre, former Goldman Sachs bond trader, the figure is 9%. At neither establishment is any other sector – including public service, IT or engineering – as popular.

So when international investors hear the phrase financial engineering, it may sound like a gimmick. But once the esteem of the mother discipline in French education is understood the phrase is absolutely not superficial marketing. The applied mathematics of engineering has been adapted with increasing gusto by the Grandes Ecoles to the world of finance, most specifically to the structuring and pricing of exotic derivatives.

The pre-eminent course for this specialism is taught at Paris VI by Professor Nicole El Karoui. There is now an eponymous El Karoui course and she has been the subject of several newspaper articles. While these articles have only appeared in the last 10 years, El Karoui has been teaching these kinds of courses since the 1980s. Why has it taken so long for her fame, and the attendant respect for French financial engineers, to spread? The answer is because initially it was only the investment banks that had need for her super-qualified derivatives graduates (It is interesting to note that El Karoui herself spent less than a year working for a bank).

Specifically, it was Société Générale in Paris that drew on the pool of graduates to create and structure synthetic products. Dr Julian Robertson, associate professor in political science at City University of Singapore, makes the point that in the field of equity derivatives, SocGen, and later, BNP, were not emulating the traditional leaders in investment banking – Goldman Sachs, Morgan Stanley and JP Morgan.

In a 2014 paper on the rise of the French financial elite, he writes: “The spread of equity derivatives to global markets is a story centred on French banks expanding their derivatives footprint and then French financial elites migrating to global banks. Equity derivative activity is one aspect of financial globalisation that has been concentrated outside of the American market... The value of European over-the-counter equity derivatives has been double that of the United States in nearly every year since 1998, and closer to triple in select years, such as 2000–03 and 2007–08, based on data from BIS [Bank for International Settlements].”

So while El Karoui's graduates were concentrated in Paris, the wider world did not take notice, even if SocGen and BNP are substantial banks. One of the best foreign commentators on the country, John Ardagh, writing as late as 2000, could claim that “the brilliant graduate [in the UK] who might aim for the BBC or the City is more likely, in France, to go into public service or industry.”

But the elite of the Grandes Ecoles were going into banking, just into the quant departments, rather than visible executive management roles. Once the French quants started to be lured to London and thence New York, they began to be noticed – sometimes for the worst of reasons. Three of the biggest derivatives blow-ups this century had French traders at their heart: Fabrice Tourre at Goldman Sachs; Jérôme Kerviel at SocGen and Bruno Iksil, also known as The London Whale, at JPMorgan.

The role of the French here has to be kept in perspective. Robertson's calculations show that within London-based investment banks, 57% of equity derivative quants and 44% of equity derivative traders are French-trained. It would come as more of a surprise if there were no French connection in any derivative fiasco.

Exotic equity derivatives are one thing but they are not standard fare for most pension funds. France's maths elite may supply half the talent for investment banks' equity derivatives teams in the City but this is just one vein of one arm of finance. What are the consequences for the much larger field of equity asset management?

The short answer is that the adaptation of engineering assuredness to finance has had some impact in asset management but not revolutionised the sector yet.

Noël Amenc, director of ERI Scientific Beta, the commercial spin-off of EDHEC Business School, says the reason for French asset managers' recent focus on quantitative equity strategies is because it is a natural way for them to compete using mathematical prowess in tough markets.

“France does not have a deep pension sector. As a people, we prefer fixed income to equities because we are risk-averse. Then there is not a deep pot of equities to manage and there is no culture of equity stockpicking in France.”

Stockpicking, with all the attendant research, is expensive and Amenc observes that the Americans have a long history of doing it well. “But smart beta is cheap.”

So here he sees an entry-point for the French.

Amenc's thesis works for his own organisations, EDHEC and ERI Scientific Beta. It also fits young houses such as TOBAM, Ossiam, La Française Global Investment Solutions and even fledgling Fundvisory. The biggest house it can discernibly be applied to is Lyxor Asset Management, subsidiary of SocGen and heavy producer of derivatives-based investment products.

With these organisations, it is clear to see how the diffusion of talent from the newer finance courses of the Grandes Ecoles – often, but not always, via investment banks – has boosted local asset management. Sofiene Haj-Taieb, CIO and co-founder of La Française Investment Solutions, spent 16 years at SocGen, beginning in equity derivatives. Bruno Poulin, president of smart beta ETF specialist, Ossiam, spent 12 years at SocGen as a managing director. Arnaud Llinas, head of indexing at Lyxor, was head of listed and synthetic equity trading at SocGen.



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Nicholas Gonzalez

Where the ‘quant diffusion’ could make a seismic difference is with the titans of French asset management. But they are so big and varied, it would take a bold leader to commit them entirely to quant specialisms. Amundi is committed to exchange-traded funds (ETFs), has CPRAM for thematic and a stake in TOBAM. BNPP has THEAM. Natixis has Seeyond. But these sit alongside so many domestic and overseas subsidiaries, including stockpickers, that the character of the overall firm only ever changes gradually.

Regarding expansion abroad, French asset management quants have not been lured to foreign firms as fast as to London’s investment banks. On a global scale, the most striking trend is for highly numerate Chinese graduates, not the French, to take executive positions in quant asset management in other countries (see Chinese stand out in smart beta world).

And so, competitors are respectful but not overly worried by French quants. “Can they take their science and maths skills towards an excellence in smart beta and quant? I have serious doubts,” says Koall. “They are up against great houses and mathematicians elsewhere.”

Nicolas Gonzalez, formerly a research analyst at the European Central Bank (ECB) and European equity quant portfolio manager at SSGA, acknowledges the criticism. “When I went to the ECB after engineering school, I was not yet ready for real-job application. Theoretically, I was 10 years ahead of colleagues and could teach them things. But countries like the UK give you hands-on experience sooner. When I was at State Street, the Paris half of the team took three times longer than the London half to reach a decision. We like to think things through thoroughly.”

So to win in asset management, the French will need more than just brilliant maths. Listening to the likes of Amenc, Poulin, Vincent Chailley of H2O Asset Management, and above all Yves Choueifat of TOBAM, one is struck by their ambition and great marketing skills as much as their mathematical prowess.

And their most lucrative marketplace might be where big data meets retail finance – robo-advisory. Gonzalez and his partner, Romain Deguest, an El Karoui alumnus and probability whizz-kid – are already supplying major houses with robo tools that take care not only of the obvious, such as risk and asset allocation models, but also exploit customers’ online behaviour. The tools require statistical modelling for market research, financial know-how for the investment recommendations and computer programming to capture and interpret the online decision-making patterns – all meat and drink to the French quants.

Chinese stand out in smart beta world

In quantitative finance, it is not the French but those educated in mainland China who deserve greater recognition.

In a search of papers on Social Sciences Research Network (SSRN), the recognised online repository for academic papers, including finance, IPE analysed the nationality of authors of papers captured by the phrase smart beta.

The answers reveal that 26% were from the US while 12% came from France. But narrowly ahead of the French was China, with 13%. The Netherlands had 9%, while 5% represented Italy.

More significant than the percentages were the positions and employers of the nationalities. Almost all the French authors worked for French organisations. But several of the Chinese were in executive posts at major asset managers abroad. They include Ed Qian, PanAgora’s CIO of multi-asset; FeiFei Li, head of investment management at Research Affiliates; Pu Zhang and Yu Meng, both portfolio managers at CalPERS; and Xiao Lu, head of quant research at BNPP Investment Partners in Paris.