

Finance and Mathematics: A Lack of Debate*

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Over the last fifteen years I have seen many of the people around me, some very talented people, turn to financial jobs. They set out to study mathematics, had no interest in finance, but ended up working for the banks. For many, the turning point was around the time they were finishing their graduate studies and were facing the realities of the job market.

The financial industry is extracting much talent from society in the form of mathematicians who could be using their talent elsewhere. Given the harm the financial industry has inflicted on society, it can be argued that this talent is being misused. In Paul Krugman's words [K],

“But the fact is that we've been devoting far too large a share of our wealth, far too much of the nation's talent, to the business of devising and peddling complex financial schemes – schemes that have a tendency to blow up the economy. Ending this state of affairs will hurt the financial industry. So?”

In his *Intelligencer* piece ‘Mathematics and Finance: An Ethical Malaise’, Marc Rogalski [R] reminds us that the financial industry is part of the mechanism in the “class struggle for the division of surplus value” designed to increase profits of stockholders at the expense of the working class. The lesson of the recent financial crisis, that society needs protection from financial institutions, is not new. Today one tends to ask only about more regulations, but Rogalski asks us to bear in mind that the bankers' constant striving for huge profits puts them in conflict with the interests of society. Regulations

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can slow down their attack, but will not remove its threat. The fundamental problem can not be addressed by “dealing with a few bad apples.”

The current financial crisis has brought this state of affairs to the consciousness of the general public. Now is a time to ask questions.

If we are led to challenge a field of our science, financial mathematics, to examine the ethical implications of its work, there is nothing novel about that. During the Cold War, Operations Research was sometimes criticized; during WWII, some blamed physicists who worked on the Manhattan Project. Pure mathematicians are often spared these ethical challenges, as they are typically cushioned from reality by several layers of abstraction.

Rogalski argues that the dedication of the financial industry to enriching a small minority may make it dubious for public funds to be used to train its professionals: “But must the nation pay for that? must universities and research institutions pay for this partisan activity and steer students toward it?”

I would like to examine in particular the role mathematics departments play. I will not deal with the financial industry, or with the academic research and teaching motivated by it, but only about how graduate students starting with quite other motives are diverted toward financial jobs.

The phenomenon is widespread. I do not know figures for the profession as a whole, but I checked the current job status of the 76 mathematics PhDs at the University of Toronto between 2002 and 2009. Out of 18 who are known to be working in the private sector, 14 are in the financial industry. Of these 18, only 4 specialized in financial mathematics as students. Therefore, of the 14 non-financially educated graduate students who went into non-academic jobs, 10 (71%) went into financial ones. (And some of those who went into academic jobs may subsequently be squeezed out of them and swell this percentage.) It is my impression that the situation in many other research universities is similar: a high percentage of math PhDs getting non-academic jobs end up at the banks.

Self-Interest of Departments. In the past thirty years, many universities have defined themselves more as production lines for business [W].

Insofar as mathematics departments accept this redefinition, they may see their goal as maintaining a large flow of graduate students, for this yields a supply of cheap instructors, an easy justification for maintaining the departments and faculty, and an influx of (government) funds. This value system does not lead them to ask questions about what happens to their students afterward.

Insiders and Outsiders. Like most groups of people with shared interests, mathematics departments have somewhat of a cult mentality: caring mostly for ‘insiders’, academic mathematicians, and little about ‘outsiders’, non-academic mathematicians. The insiders regard the outsiders as contributing relatively little to significant mathematics, and hence of little interest.

The insiders take it for granted that mathematics is a worthy pursuit. The tacit inference is that the more mathematicians there are the better it is for mathematics and for society. Insiders tend to think of what they do as ‘important’, ‘beautiful’, ‘innovative’ – but also as ‘beneficial’, or at least ‘harmless’. While insiders include most of the decision- and policy-makers in the mathematical community, they pay little attention to outsiders and their impact on society.

This mentality works for a systematic blindness toward the phenomenon I am trying to discuss here. Those students who turn to financial or other applied work have made themselves, to some senior mathematicians’ eyes, invisible.

Moral Ambiguity. In his ‘Response to Rogalski’, Ivar Ekeland [E] says, “If bets go sour, mathematicians cannot help, but governments can”. What is the logic here? That if our students willingly go to work for institutions known for looting the public, it is of no ethical concern if governments have not yet got around to regulating these institutions? It may be that regulation could make banks into a more benign force, but is Ekeland saying that students and their advisers must passively wait for this to be done?

A person who goes to work for the banks may be desperate for a job and

have no other choice, or he or she may even dream of getting rich¹. Many people working for the banks surely feel no moral issue. To me, these jobs are morally unjustifiable.

In her famous analysis of the banality of evil [A], Hannah Arendt observed that Adolf Eichmann was incapable of thinking about the moral consequences of his actions: nothing of the sort ever occurred to him. He was morally blind – seeing his operation of the concentration camps only in logistical terms. We hold him responsible for his crimes, but the system in which he operated had its role. A large organization – like a government or a corporation – is conducive to this sort of moral blindness. Of course banks are corporations par excellence, and it is easy for mathematicians there to see no need to justify their work for the bank, because they work in a moral vacuum.

Government regulation may try to contain the damage from financial institutions. But individuals also carry a responsibility, both towards themselves and others. Even when outside forces seem overwhelming, individuals have a choice: the extent to which they choose to participate. This applies to everyone, not just mathematicians: to what extent do psychologists care to be part of a system of torture? to what extent do citizens stand by while the environment is being destroyed? and to what extent do mathematicians care to play along with a destructive financial industry?

Having said that, I must add that it is not fair to put the burden only on individuals when the system has trapped them. Here is where mathematics departments are failing us: they are complicit in setting the trap, by training students in research areas where nobody is hiring, leaving them without room for maneuver when they come to job-hunting. In effect departments are handing over many of their students to the banks.

Lack of Discourse. Discourse about the role of mathematics in society is

¹An example of being exploited while making a good salary: A friend who considers himself lucky to have one of these financial jobs is currently making \$80,000 a year. Calculated at 40 hours a week this comes to about \$35/hr. He actually works 60-70 hours a week and is effectively not allowed to charge overtime, which brings his hourly rate to about \$20/hr. His billing rate – the rate the bank proposes to charge the client – is calculated at around \$450/hr. The billing rate for more senior people at his bank is even more exorbitant at over \$1000/hr.

not part of the general consciousness and is not encouraged by departments. On the other hand, the business-as-usual attitude of mathematics departments in moving students through the system, not asking questions about what happens to them, not encouraging them to think about the implications of what they do, and deferring moral responsibility to other echelons, in effect sanctions the status quo.

Departments should consider it part of their function to prepare students for non-academic life, to encourage students to think about their role in society. It should be a department's duty to inform students about the current trends, to encourage discussion, to stimulate them perhaps to imagine new possibilities.

An Example of Challenging the Status Quo. In 'Beyond the Disciplines: Art without Borders' Suzi Gablik [G] writes about graphic designers trying to put their skills to more worthwhile and ethical use:

"Recently I read in *The Structurist*, a magazine published in Canada, that graphic designers have risen up against sterile corporate modernism and consumer capitalism, and are looking for other ways of practicing their craft beyond that of designing brand-name logos and promoting obsolescence. According to Kalle Lasn, founder and editor of the Canadian journal *Adbusters*, graphic designers want to put design skills to more worthwhile and ethical use than product marketing. Instead of trying to become the next big 'it' in the design world, these renegade designers joined up with the anti-globalization movement, wrote a manifesto 'First Things First', published in *Adbusters* in 1999), and declared their intention to do something more interesting than just speed up the consumer purchasing cycle."

Here is an example to put us to shame! Mathematicians are much better organized than artists or designers. They are not just individuals: they have professional societies, are part of a university system where most work in math departments. It should be easier for us than for graphic designers to think and act to put our skills to better use. It should not be up to the victimized young people only: the departments should wake up and do their share.

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