

A note about contracts

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I recently received some requests for information, from students in Donetsk and from professors in Poitiers : they have contacts with some companies and they want to know about legal issues for contracts.

## 1. Invoices

First of all, if you work for a company, you cannot expect to be paid if you do not send a bill (also called "invoice"). Legally, a company cannot pay for any expense which is not related to a bill. We cannot take money out of our pockets, say "you did some nice work", and give it to you.

An invoice says "I did this amount of work, please pay this amount of money". The question is : who signs the invoice ? What is its legal status ?

Typically, an invoice is made as the result of a contract : a contract describes the work to be done and the amount of money to be paid. A contract may be very simple : just a sheet of paper, and there is no compulsory form for contracts. However, in some cases, you may send an invoice without any contract (typically, for instance, if you give a talk). Of course, the amount of money has to be decided before, in this case. Reimbursements (for instance travel expenses) do not require a bill : just the tickets themselves.

So, there is a very simple and clear conclusion : if you do not see how to send a bill, do not work, because you will never get paid !

## 2. Types of contracts

Any legal institution can write a contract with a company, and at the end issue a bill. This can be for instance : the University itself, a non-profit organization, and individuals if they declared themselves as "independent workers". This is typically the case for doctors, lawyers, and so on.

A professor at the University may act as a consultant ("independent worker") for a company, provided he made the correct inscriptions, which depend on the country. In France, he should also obtain the permission of the University (which he usually gets very easily). In any case, he should declare the amount of money he receives to the tax system at the end of the year.

For a student, it is also possible to be part time employee of some company, if he wants to provide some work for this company.

These solutions are satisfactory for individuals, perhaps two people at most. If you are a whole group, they cannot be considered.

If you act through the University, or some non-profit organization, you should know that, in general, you cannot get money for yourself, from the work you have done. You can get various advantages : buying equipment (the University may buy a computer for you), or travel expenses, or any kind of professional reimbursement.

Here again, there is a simple conclusion : you can never get money for yourself, unless you receive a salary or you act as an independent worker. So, ask yourself this question: what is the use of the money I want to receive ? Is it a complement of salary, in order to make my professional life easier (typically, buying equipment, traveling to conferences, and so on), or is it for primary needs ?

### **3. Preliminary work**

Mathematicians have a strong tendency to concentrate upon the technical aspects of any problem : they turn it into a nice mathematical problem, which they try to solve, and they come back to the company (who started the problem) only at the end. This approach is totally wrong, for two reasons : first, it ignores the legal aspects I described above, and second because the client is not at all, in general, interested by a nice solution to its problem : it wants only useable progresses, which is totally different.

Sometimes, a partial progress, which is obvious for a mathematician, will be of great use for the company, whereas a complete solution does not fit at all, because of some constraints which were not seen.

So, because of many cultural differences, the possibility for mathematicians to work directly for a company is very slim. Therefore, I strongly recommend to start by a preliminary "exploration contract", which will take perhaps one week to two months. This preliminary contract will allow both parties to see what they can do together, collect data, and, mostly, agree upon specific issues. You may very well agree that this phase may require for instance 10 days of work, within a 2 months period.

My point of view is that, for this preliminary phase, the legal structures of the University should be used. Each University has a bureau in charge of external contracts ; they know how to write them, they know the cost, and so on. The company will be extremely happy not to be bothered by any legal aspect : at the end of the work, they receive an invoice from the University, that's all. Also, most companies like to have contracts with Universities : this is an opening towards research. Sometimes also, these invoices from Universities are partly tax deductible by the company (there is such a system in France, called "crédit d'impôt recherche").

If this preliminary phase works well, then you can think of creating a specific structure for this collaboration.

You should also know that, depending on the country, the mathematical community will sometimes oppose this collaboration with companies. The reproaches usually made are :

- to students : they should concentrate upon their diplomas ;
- to professors : they should concentrate upon their research.

These reproaches are of course irrelevant : answering the questions raised by a company is of course the best way to discover "real life mathematics", which is useful both for students and for teachers. But they are strongly part of the mathematical community's general beliefs. This is another reason why you should ask the University's support : most other disciplines do not have these oppositions at all.

I insist that, if you want to develop any collaboration with a company, you must take into account these two things : 1) legal aspects ; 2) the users' needs. If your intention is just to solve a mathematical problem, and write a paper for publication, you should not start a formal collaboration with a company, because it will produce nothing.