

FINRISK RESEARCHERS SERIES:

The Reductionist - Interview with Ernst Fehr

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FINRISK: What is risk?

Ernst Fehr: To me risk means emotional arousal. When I conceive a situation as risky, I am emotionally aroused. A particular example is the publishing process. When I believe that I have written a good paper, I submit it to a good journal. However, there is a high probability, typically higher than 90 percent, of rejection. This is risk to me. It accompanies me throughout the production of a paper.

How do you manage risk?

Whenever I face risk, I try to take measures to reduce it. Let's continue the example above. The biggest risk I'm exposed to as a scientist is the potential rejection of a good paper by a good journal. I manage this risk by trying to anticipate every possible objection. I always try to write a paper in such a way that the reader has no opportunity of even thinking of an objection. This is risk management from the perspective of a scientist. Those people who publish successfully have mastered the management of this risk.

How did you become an economist?

At some stage in my youth I started to read about developing countries. As a young idealistic person, I cared about their problems a lot. At one point in time, I came across some literature that suggested that economics was rather important for the problems of developing countries. It became clear to me that one can only understand these problems by seeing through the economic forces at work, that is, by understanding the political economy of the issues. This grabbed me. Two years before taking my A levels I knew already that I would study economics. Actually, I wanted to study both economics and theology. But then, it didn't work out with theology.

Are there any people whose teaching, work or thoughts have had a lasting effect on your research?

During my university studies it was Professor Winfried Vogt, now at the University of Regensburg. He was a student of Professor Schneider, one of the most important economists during the first two decades after World War II in Germany. *Economics used to be rather conservative, and so were economics professors. This was not the case for us as students, who participated in demonstrations, teach-ins, sit-ins, you name it.*

Vogt convinced me to study traditional economic theory, to take it seriously. He always said that one needs to understand something in order to criticize it. And one has to be better than those who are criticized. So I started to study neoclassical economics. This has paid off, I would say today. I wanted to criticize neoclassical economics, but on the way I also discovered its good sides. *Now I can take whatever I like of neoclassical economics, and discard whatever I dislike.*

A major part of economics, and financial economics in particular, builds on

the Walrasian model. The two main tenets of the Walrasian model are self-interested and exogenous preferences, and complete and costless contracting. This allows economists to neatly separate subject (agents) and object (the economy agents perform in). The resulting models follow a rather mechanistic approach. What is your take on the Walrasian model?

It is true that financial economics has widely adopted the behavioral assumptions of the Walrasian model. Take asset pricing and the assumption of no arbitrage as an example. The behavior of the individual agents is a black box called “no arbitrage”, that is, individual behavior is of no interest. Then some fancy mathematics is applied and out comes a nice result. However, something fundamental is ignored here, which is part of the Walrasian tradition, namely that we need a micro foundation of individual behavior.

I do believe that there are two lasting merits of the Walrasian model, micro foundation of individual behavior and the quest for consistency and closing the model. The model is closed by taking the economy as a whole into account. What is wrong, in my opinion, are the details of the micro foundation. Behavior is based on a simple optimization problem assuming price-taking behavior. Today we know that there are many different types of behavior which cannot be captured by the Walrasian model.

A big open question to me is how we can build models that both take our new insights about individual behavior into account and have a degree of overall consistency similar to the Walrasian model.

A general equilibrium model like the Walrasian model is static. Should we not take the process of agents' interactions into account?

This is a deep question. It seems to me that it is infinitely more difficult to build such dynamic models. Otherwise, people would have done it already. The brightest people in the field have failed at building such models. You probably need some type of mathematics that is extremely difficult to handle.

But then, theory is not necessarily about proving theorems. You can use simulations or build ad hoc models like in physics. Isn't it the case that economists often want to be more mathematical than mathematicians and thus artificially constrain themselves?

There is one reason why economists are the way they are. In physics you can actually pin down important parameters of your model by observing them in nature. This means that physicists can significantly reduce the degrees of freedom of their simulations because they have the relevant empirical knowledge. And this is precisely the reason why simulations have a bad reputation in economics. Typically, there are too many degrees of freedom in simulations, and people have the impression that you can prove almost everything with a simulation.

We have to ask ourselves what we have to do for our colleagues to accept simulations as a valid tool in economics. In my opinion, we have to do exactly the same as experimental economists did some time ago. At some stage, they agreed on what determines a good experiment so that they can differentiate good and bad experiments. We would need to do something similar for simulations.

In my opinion it would be a big step forward if economists made simulations part of their toolkit. But, as I said, we would have to agree on what makes a good simulation.

One way to connect simulations with reality would be the use of experiments.

Simulations and experimental economics complement each other. In fact, this is what physicists do. They know from experiments how certain objects behave. This way, they can assume certain rules of behavior for these objects in simulations, as those rules have been verified by experiments. Economists could do the same.

For many years you have been using experiments in your research. One could say that you have been connecting economics to reality. What were the most interesting findings, in your opinion?

My colleagues and I have been working in one particular area of experimental economics, social preferences. We have been looking at various aspects. One of them has been the question whether certain anomalies in individual behavior are important for economics. There are many deviations from the standard model but many of them are not important. My goal has always been to show in which situations certain anomalies in individual behavior do affect outcomes at the aggregate level, that is, when agents interact.

We made an important breakthrough in the nineties when we could show that social preferences can be highly relevant in competitive situations. Whenever we have a highly competitive market, like in a double auction, and contracts are incomplete, social preferences do matter a lot. A prime example is the labor market. Performance is usually not fixed in a contract, that is, a contract does not say how hard somebody has to work. Instead, the amount of work is determined during the production process. Thus, we have a moral hazard problem on the side of the agent. If the relationship is repeated, there is also moral hazard problem on the side of the principal. He might promise to pay a bonus but refuse to pay. This is a typical double moral hazard situation. We could show that in such situations markets work systematically differently than the standard model of perfect competition predicts. Theoretical results had pointed in this direction much earlier. But we could show it empirically. It is a long way from theory to precise empirical evidence. But we could show it.

*This year we published a paper entitled "Relational Contracts and the Nature of Market Interactions" in *Econometrica* where we show that markets with a double moral hazard problem work fundamentally different from perfect markets. This is an important insight.*

In another experiment, closely related to evolutionary biology, we could show that cooperative individuals tend to punish free riders. We call such behavior altruistic punishment. This has consequences for all sorts of cooperative situations. Let's take the labor market again. I believe that we cannot understand unions without assuming altruistic punishment. A union is a public good. The question is why an employee should participate in a strike if he can also benefit from the results of the strike without participating. It is the instinct to altruistically punish free riders that at the end makes most employees participate.

Altruistic punishment is equally important for all sorts of team compensation. If there is a team bonus that is shared among all team members, we have a free riding problem. Altruistic punishment is also important for the large global public good such as global warming. It is important for tax avoidance, and for the welfare state. This means that altruistic punishment is relevant at every level of society.

In the Walrasian model market prices are set such that all markets are cleared and resources are allocated efficiently. You are saying that there are markets where this is not the case.

Whenever there is a moral hazard problem, the market price frequently does not clear the market, that is, the market price does not converge to the competitive level. Instead, it stays above the competitive level. Demand and supply influence market prices much less than in a situation without a moral hazard problem. We could show this effect in experiments. We created a situation with excess supply of labor and then switched to excess demand for labor. Wages, the price for labor, did change but the change was an order of magnitude smaller than traditional theory predicts. It means that you have price rigidity in such markets. This is a rather important insight. We can have price rigidity in labor markets even though the market is free, that is, that are no unions. Price rigidity is a consequence of long-term relationships between agents, which help them manage their moral hazard problem. In such long-term relationships fairness is rather important. It is fairness that endogenously leads to rigidity of wages.

You recently claimed that the working of economies and societies cannot be understood without taking strong reciprocity into account. Can you give some examples?

You cannot understand the labor market without assuming the existence of strong reciprocity. But the same is true for goods markets. In labor markets you observe what we call nominal wage rigidity, that is, it is essentially impossible to cut nominal wages. It almost never happens, except if a company is on the brink of bankruptcy. According to traditional theory, wages have to decrease whenever labor becomes cheaper. Let's say that the supply of labor increases. Wages would have to fall. But in practice, they rarely do. This is a huge puzzle to economists that traditional theory cannot explain. Aspects of fairness seem to play an important role here. It seems that firms do not cut wages in certain situations because they do not want to harm employee morale. Another important topic is the welfare state. You cannot possibly understand the welfare state without strong reciprocity. In fact, it is based on some sort of reciprocity. Many people in our society are willing to support those members of our society who deserve help. The question is who deserves help. Most people would probably say that somebody deserves help if his poverty wasn't his fault. But this excludes those people who moonlight and at the same time receive unemployment benefits. If there are too many people who loot the welfare state in such a way, then the welfare state loses its legitimacy. An interesting insight we gained from laboratory experiments is that a person's decision to cooperate is conditional. It is conditioned on the expectation that other people cooperate as well. Take the welfare state again. I would not cheat

on the welfare state if I knew that the other members of society do not cheat, either. However, as soon as I expect the probability of others not adhering to the norm to be large, I change my behavior as I don't want to be the fool. We call this phenomenon conditional cooperation. We can show it in experiments. Actually, we conducted experiments where people had to work a bit in order to earn money. But we allowed for theft, that is, subjects could steal other subject's earnings. And, clearly, the more people expected to lose their money through theft, the more they would steal themselves.

This, however, means that there are non-linearities in behavior. As soon as my expectation drops below a certain threshold I switch my behavior.

That's right. Usually, there are multiple equilibria. A society can be trapped in a "corruption" equilibrium. People are corrupt above average because everyone expects that the others are corrupt as well. A society can also be in a "low corruption" equilibrium when everyone expects that others are not corrupt and therefore does not accept bribes. You have such phenomena as soon as you have social preferences, that is, when people are willing to meet their social obligations as long as others do the same.

Actions are based on expectations. This means that if I want to change people's behavior I have to change their expectations. Let's go back to the welfare state. In certain countries more and more people seem to expect that others cheat on the welfare state. Isn't this the beginning of the end of the welfare state?

This is exactly where politics comes in. One of the most important jobs of politicians is to manage people's beliefs. Germany is a good example. More and more people are cheating on the welfare state. The government is now reforming the institutions of the welfare state such as unemployment benefits. You can look at this as some form of belief management. It is equally important in organizations.

Often, particularly in business life, self-regarding, egoistic behavior is proclaimed. People are told that they have to behave like Homo economicus in order to be successful. Your research, however, casts doubt on Homo economicus as a role model. What kind of advice would you give to the young aspiring manager?

In my opinion, egoistic behavior doesn't pay off. This is partly related to the fact that there is an enormous amount of disciplining in repeated interactions.

Intelligent people understand that of course.

What's interesting is that the disciplining device is not a contract but the long-term relationship. Another disciplining device is reputation.

You can continue this thought. Bob Franks assumed that you can actually tell whether somebody is an egoist or not. Somebody might have red ears whenever he is cheating. Thus, he will avoid cheating. If you are an employer and you need somebody trustworthy, the best that can happen to you is to employ somebody who gets red ears. He will never cheat on you. Obviously, this is just a metaphor. However, if Bob Franks' assumption is correct, that is, if you can tell whether somebody is intrinsically honest or just for egoistic motives, then the person who

is intrinsically honest has a competitive advantage. He might do better. This means that it might pay off to be intrinsically honest.

A lot of people say that the academic subject economics has little to do with real-world economics. You have been moving economic research forward tremendously by making it more realistic. What are the major milestones on the road ahead?

The main goal is to build tractable models of individual behavior that are relevant for economics. We have made progress in this direction but not enough.

To me there are three effects of first-order importance. These are fairness and reciprocity, extreme short-term impatience – what we call hyperbolic discounting –, and loss aversion. These three areas of Behavioral Economics are here to stay. It is now on us to build appropriate models.

Another aspect that is important to me is the verification of these phenomena with field data. We could verify a lot with experimental data. However, only few things have been verified with field data. *Loss aversion is an exception. It was shown that in the real estate market people rarely sell houses below their purchase price. This is called nominal loss aversion. According to the standard model it is completely irrational.*

A third aspect that I find extremely exciting is neuroeconomics. Its aim is to investigate the neural and biological foundations of social behavior. It is actually a new discipline at the intersection of neuroscience, biology, economics and psychology. I expect tremendous insights from it. My colleagues and I have been working intensively on this field using methods from genetics and neuroscience.

Will there ever be a Grand Unified Theory of Economics?

Some economists believe that it exists already. But these are metaphysical ideas brought to economics by mathematicians and physicists.

It is more or less an empirical question whether we will ever have a Grand Unifying Theory. It is not something that you can postulate a priori. Maybe people behave differently in different environments such as in the family or markets. Hayek claimed this, and so does Vernon Smith. Maybe there are common characteristics in the behavior in these different environments, and maybe there are differences. If there are differences in fundamental parameters of behavior across different behavioral domains, then what can the Grand Unifying Theory be?

Anyway, if there ever will be such a theory, I expect it to be based on neurobiology. Our brain is a very complex network. Understanding this network will be key to any such theory. So, if we want to get closer to a Grand Unifying Theory it will have to be via neurobiology, and certainly not via physics.

This is a rather reductionistic approach.

We humans are radical reductionists. And this will never stop – a drive which is actually scientifically interesting in itself. We want to know which emotion drives strong reciprocity. Which neural activities are behind this emotion? Which molecular processes are behind the neural activities? And then we want to know the relevant processes at the atomic level. It never stops. Our quest for knowledge is only limited by the availability of appropriate technology.