

The Price of the Planet

By Nicolas Bouleau

Financial markets set the prices of things, which influence our relation to the environment. Nicolas Bouleau examines the environmental governance of these markets and invites us to shift our priorities away from economic logics, toward a concern for nature, and for the long term.

In a market economy, almost by definition, it is the price of things that most determines the behavior of economic actors. Anything that pertains to the long term, therefore—whether it be the rate at which fossil fuels are depleted, or the extent to which the world’s flora and fauna are being preserved—will also be determined by prices. And to the extent that, nowadays, these prices are overwhelmingly set by the world’s financial markets, it is these markets that now constitute the principal system governing humanity’s relation to the environment. It is this peculiar mode of environmental governance that I wish to examine in this article.

There is no need here to rehearse well-established facts about the deterioration of life conditions on Earth. After all, whether with regard to climate change, pollution, waste, deforestation, or the collapsing populations of insects, birds, fish, and other animals, the trends we are currently witnessing were already anticipated in 1972 by the Club of Rome and in 1992 at the Earth Summit in Rio. At the time, though, these were understood as so many threatening possibilities that could be avoided if only people were somehow made aware of them. Unfortunately, it is now clear that competing interests have gotten in the way of this presumed wisdom, and we must have serious reservations about the merits of a dominant economic model in which households, companies, and states are forced to privilege their short-term profit over the larger context and the long term.

As is well known, today’s neoliberal model of the market economy was shaped by policies of deregulation under Margaret Thatcher, in the United Kingdom, and Ronald

Reagan, in the United States, as well as by related policy shifts on the part of the World Bank and the International Monetary Fund. But these policy shifts themselves came on the heels of important technical changes in the functioning of financial markets, namely, that they had become capable of managing uncertainty by giving a price to futures contracts in which there was an element of chance. I have in mind the now infamous derivative markets that first developed across the world's financial markets in the 1970s and 1980s and were based on earlier work by academic economists.

Without going into too much detail, let us lay out the basic features of these markets, starting with the fact that they are speculative arenas in which people can buy or sell goods whenever they want and in the amount they want (more or less). These are markets that quote prices instantaneously and on a continuous basis for all kinds of economic entities—for stocks, currencies, mortgages, and bonds, for fossil fuels, metals, and agricultural commodities (grain, cotton, wool, etc.), and for the myriad derivative contracts that are based on these underlying assets.

Another feature of these markets is that participants are able to manage their risk exposure by relying on the highly mathematical theory of arbitrage, which claims that a “perfect” market is one in which no riskless profit is possible. Remarkably, to the extent that today's financial markets increasingly do approximate these ideal markets, such a reliance on the theory of arbitrage is arguably justified—especially as financial professionals use ever more sophisticated computer technologies and statistical techniques in their speculative pursuits.

Ultimately, between their mathematical basis, on the one hand, and the enormous volume of transactions they represent, on the other, financial markets have acquired a power that is at once secular and quasi-religious, as their prices now serve as reference points for all other markets, which means they effectively coordinate almost all economic exchanges.

But we must beware of simplistic analyses. In particular, the mere fact that markets seem increasingly to conform with the mathematical theory of arbitrage does not mean that this theory accurately or precisely captures the fluctuation of prices. Prices can go up, they can go down, or they can remain the same, all the while agreeing with the mathematical theory, for the simple reason that this theory does not say everything. In particular, it says nothing about trends or tendencies in the market. If anything, the theory suggests that trends are not visible on financial markets. For if they were, individuals would immediately seize upon the resulting opportunities for a riskless profit and prices would instantly adjust accordingly—thereby causing any trace of a trend to disappear just as quickly. All that prices can express, then, are the opinions of market participants: their opinions about possible futures, or about the worries and risks that lie ahead. And when it comes to the question of risk, more uncertainty translates into greater volatility and, therefore, into higher prices for derivative contracts.

The truth is that financial markets are exceedingly and increasingly volatile. And this volatility is no mere epiphenomenon; it is, rather, the unavoidable consequence of how markets are structured. There is volatility at every time scale, whether one's time horizon is a mere 10th of a second, a day, three months, or five years. In fact, the only thing that really follows from the mathematical theory of arbitrage is that prices on financial markets will fluctuate: there will be volatility, enough so that trends will not be objectively discernible.

Volatility as a Structural Flaw of Financial Markets

But what does this all mean for the significance of price changes, or for the so-called “price signal” that Friedrich Hayek claimed made the liberal economic system so superior to a planned economy? In principle, according to Hayek, prices in a market system convey crucial information about the relative scarcity of resources. The rub is that today's markets actually erase the price signal, and erase it all the more when the uncertainty is great (since the latter situation increases price volatility).

This is what we see in the case of nonrenewable resources such as minerals and fossil fuels. Financial markets, let us not forget, mediate nearly all our economic exchanges and they determine the investment and production strategies of economic actors. And, contrary to the beliefs of many who would place their trust in the current system, the information these markets produce is shrouded in a kind of “smoke,” such that the potential scarcity of resources is not visible on financial markets—or insufficiently so for companies and governments to take it into account in their medium- to long-term strategies.

Let me explain: as a nonrenewable resource is depleted, its disappearance necessarily induces a period of great price instability. As I have already intimated, the price trajectory for such a resource cannot be one of steady and indefinite increase, since such a trajectory would provide arbitrage opportunities that are by definition impossible. Indeed, if it were possible to take advantage today of tomorrow's price increase for a given commodity, its price would instantly go up even more.

The result is a volatility crisis: as prices begin to fluctuate wildly, investors begin to worry and this in turn only increases the volatility—until, finally, the risk becomes too great for both market participants and listing organizations, and the market unravels. When individual transactions end up modifying the price too much, an organized market is no longer possible.

In the face of such uncertainty, admittedly, market actors often have recourse to derivative products, which are effectively insurance policies against short- and medium-term risks, and which actors regularly use to shield themselves against price fluctuations. But the

thing is, one cannot run a company using insurance policies alone: one needs to have a vision, and one needs to make choices about which projects are worth pursuing.

Take the case of a farmer who is trying to decide on an investment strategy for the future of his farm: should he be planting new fruit trees, purchasing new equipment, increasing (or decreasing) his livestock, or investing in new buildings? Recall, now, that our hypothetical farmer gets his grain from wholesalers who themselves bought it at prices set on financial markets, and it becomes all too clear that excessive uncertainty surrounding the price of grain will leave him unable or unwilling to experiment with new strategies. The industrialist on whom Hayek based his own reasoning is likely to suffer from a similar paralysis.

More generally, the volatility of financial markets stands as an obstacle to negotiating any environmental agreement, as it creates disproportionate opportunities for those who are willing to exploit nonrenewable resources. Indeed, in the conflict pitting environmentalists against would-be followers of a purely “economic” logic, fluctuating costs tend to lead to the irreversible destruction of natural resources.

Imagine, if you will, a marshy terrain that happens to be both rich in biodiversity and the site of untapped fossil fuels. These are both scarce goods of a sort, but their prices do not follow the same trajectory. On the one hand, we have the wild and seemingly random fluctuations in the price of fossil fuels, as set by financial markets; on the other, we have the occasional adjustment in the value of “ecosystemic services,” as determined by experts. Sooner or later, the market value of the site’s untapped fossil fuels will be priced higher than its rich habitat, which will thus end up being destroyed.

In other words, the idea of putting a high “price tag” on the environment as a way of protecting it not only runs up against the reality of competing economic interests (as we can see in the case of pricing carbon emissions), but is rendered inoperative in the neoliberal context by the excessive volatility of financial markets.

Providing Information by Different Means

The social and environmental consequences of this phenomenology of financial markets are considerable. Economic actors may well be able to protect themselves from the risk of price fluctuations by using derivative products, but these contracts do little to help the ecological transition of a company. What is more, by virtue of their unavoidable volatility, financial markets only serve to conceal the scarcity of nonrenewable resources, from which it is imperative that we collectively move away.

The truth is, when economists in the 1950s first developed the derivative markets that serve as the basis for today's financial markets, it was roughly 20 years before the Club of Rome published its first report. And whatever uncertainties people may have had about the future during the postwar boom concerned neither the exhaustion of natural resources nor the disappearance of bees.

Might we then hope to reinforce the price signal, especially in the case of nonrenewable resources? The very idea would go against the principle of a free and competitive market. What I propose instead, therefore, is that we develop new institutions capable of giving us—as scientifically and reliably as possible—the information that markets are unable to provide. This, incidentally, is what the economist Robert Solow was already calling for in 1974.¹

Whether or not the scientist Dennis Meadows and his colleagues already foresaw the consequences of financial volatility when they wrote up their report for the Club of Rome in 1972, I do not know. But it was surely wise on their part (and on the part of those who updated the report in 2004) to couch their analysis in terms of surface, mass, and volume: in short, to use nonfinancial indicators that would thus not be susceptible to the fever of the market.

Indeed, in light of the various ways that finance has already failed us with regard to both the environment in particular and the long term in general, the only solution before us is to devise scientific knowledge and scientific indicators that are not financial; these alone would be capable of describing the current state of the planet and its evolution in ways that give both states and economic actors the information that markets cannot provide.

For this, we must put in place institutions that will monitor environmental trends, gather and disseminate information, and sound the alarm at every level of the decision-making process. Only thus can we escape the hegemonic rule of the market and combat those international organizations that insist on the primacy of the economic.

Such a scientific challenge goes beyond merely taking stock of the current situation; it is a matter of both grasping the present state of affairs and of expanding the ways we might discern trends and opportunities. It means acknowledging and scrutinizing the intuitive and subjective dimensions of our fears, transforming these into something like a disinterested worry.

Now more than ever, we cannot be content to pursue scientific knowledge for our own personal gain; rather, we must develop an intellectual and cognitive legacy that we can pass on to the later generations who will be fighting the environmental devastation. In short, it is a matter of changing people's reasoning and practices by shifting their priorities away from purely economic considerations and toward a concern for the commons, for nature, and for the long term.

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- BOULEAU Nicolas, *Financial Markets and Martingales*, Springer, 2004.
- BOULEAU Nicolas, "Limits to Growth and Stochastics", *Real World Economics* n° 60, 2012, 92-106.
- BOULEAU Nicolas, *Le mensonge de la finance, les mathématiques, le signal-prix et la planète*, L'Atelier, 2018.
- GERLACH S., RAMASWAMY S., SCATIGNA M., "150 Years of Financial Markets Volatility", *BIS Quarterly Review*, 2006.
- HAYEK F., "The Use of Knowledge in Society", *The American Economic Review*, XXXV (4), 1945, 519-530.
- MEADOWS DONELLA, RANDERS J., MEADOWS DENNIS, *Limits to Growth. The 30-Year Update*, London, Earthscan, 2004.
- - SOLOW R., "The Economics of Resources or the Resources of Economics" *The American Economic Review*, 64 (2), 1-14, 1974.