THE ROSE OF THE WINDS

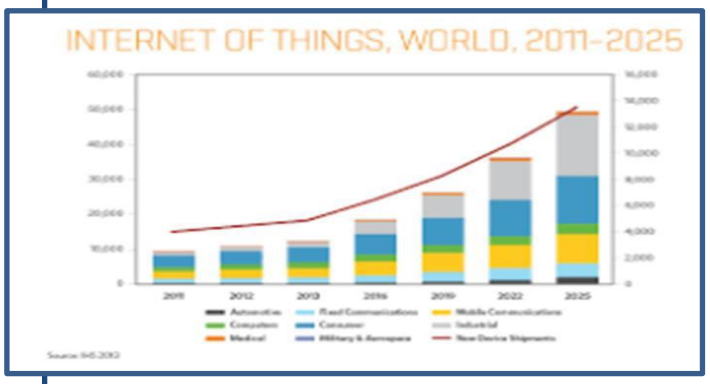
10 APRIL 2017

Zero marginal cost

A long intercontinental journey often gives one the opportunity, during the endless hours between one flight and the next, to focus on some interesting reading. The Fourth International Conference of the Azimut Group held in Sydney on March 29th, which brought together over 300 colleagues from 16 countries where we have offices, gave me an opportunity to learn more about the theory of zero marginal cost developed by Jeremy Rifkin, a brilliant thinker who is a consultant to the European Union and various world leaders. Rifkin maintains that a new economic system is emerging on the world stage. The emergence of the Internet "of Things", based on the connection between people and objects, will have the effect of increasing productivity to the point where the marginal cost of many goods and services will almost be zero, making the one and the other virtually free, abundant and no more subject to market forces. Technological innovation increases productivity and thus allows the seller to produce a quantity of goods at a more advantageous cost per unit. The increase in supply of cheaper goods then generates its own demand and, in doing so, forces competitors to come up with other technologies to increase productivity and sell their products even more cheaply. Cheaper prices mean greater disposable income for consumers, a situation that triggers a new round of competition among sellers. Imagine a scenario where the operating logic of the capitalist system leads to "extreme productivity" or "maximising the general welfare", an outcome in which the intensity of competition imposes increasingly effective technologies, improved productivity to the optimal point where each additional unit placed on the market has a marginal cost that is "almost zero", in which the actual production cost of each additional unit, net of fixed costs, is virtually zero, thus making the product almost free. If this happens, the profit, the lifeblood of capitalism, would disappear.

The phenomenon of "almost zero" marginal cost has already made quite a stir in the world of publishing, communication and entertainment, because it made an increasingly significant amount of information available free of charge to billions of people. Today, more than a third of humanity generates its own information through relatively cheap mobile phones and computers and shares it in the form of video, audio or text in an interconnected and collaborative world, all at almost zero marginal cost. And now this revolution is also beginning to be felt in other business sectors, like energy from renewable sources, 3D printing in manufacturing, or higher education online. Scattered throughout the world there are already millions of "prosumers", consumers producing for their own needs, and, according to Rifkin, within the next two or three decades they will be connected to large global networks, will produce and share green energy, materials and services, and will study online in virtual classrooms

at a marginal cost that is almost zero, projecting the economy into an era of almost free goods and services.



Big Data

Billions of sensors have already been linked to natural resources, production lines, electric and logistics networks, recycling flows and placed in homes, offices, shops, vehicles and even human beings. Thanks to these, a huge mass of data can be fed into the nervous system of a global "internet of things". The possibility of connecting to the network and tapping into all this "big data", taking advantage of the analysis and their algorithms to improve efficiency, will dramatically increase productivity and reduce almost to zero marginal costs of production and sharing of a wide range of goods and services.

The Internet is so evident in our everyday life that I was not particularly surprised to find futuristic solutions in some catalogues of furniture products presented at the recent Salone del Mobile in Milan. An innovative company has proposed an intelligent office, where the desk is able to recognise and welcome those who use it, and the chair automatically adjusts to the weight and the sitting position of anyone. On each table the illumination changes depending on who uses it, and a system feeds the various desk equipment into the network and makes it possible to organise meetings and video conferences without anyone moving. We have entered the age of technology that aims to think like humans, able to replicate the actions that need to be performed perfectly throughout the production cycle. Machines will not replace humans for a long time yet (let's hope) but they will work side by side with them with increasing intensity.

Silent Revolution

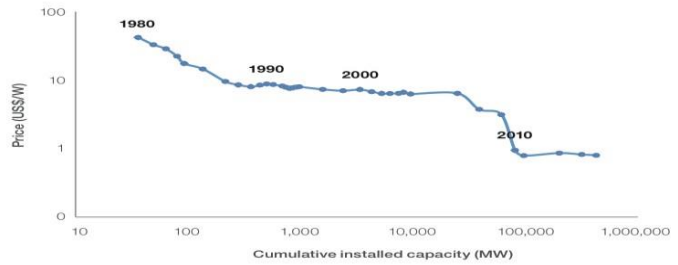
According to a survey of the Economist Intelligence Unit, the rapid collapse in technology costs and the recent development of free spaces, like in mobile communication or cloud computing, is rapidly drawing the Internet of Things into the centre of the global economy. The central message of this survey shows that the majority of business leaders believes that the productivity gains offered to the entire value chain by the Internet of Things will be so convincing that it will supplant the traditional way of doing business. The pressure to increase efficiency and productivity and reduce marginal costs will be uncontrollable, and businesses that are slow to upgrade and that do not remain on the cutting edge by exploiting the new potential of productivity will be outclassed by the competition. The evolution of the Internet of Things will probably follow

a trajectory very similar to that of the "world wide web", which, from the beginning of 1990, resulted in a steep reduction in costs, in this case the cost of production and the sending of information.

Energy for all

Twenty-five years ago it was hard to believe that within a quarter of a century for its communications a third of humanity would rely on large global networks of hundreds of millions of people, through which they can exchange audio, video, text, and that all the world's knowledge would be accessible from a mobile phone. It was also unimaginable that every person could share a new idea, present a product or convey a thought to a billion people at once and that the cost of such an operation would be close to zero. Probably the same will occur in the energy field. Already several million pioneers have turned their homes and their businesses into micro power plants capable of collecting renewable energy on site. Like the computer industry, the renewable energy sector has initially had to contend with very high capital outlays. But the evolution of technology will, within a relatively few years, heat our homes, run our appliances and our cars, and power manufacturing plants with a significant reduction in costs comparable to what happened to mobile phones or computers. The "Global Risks Report 2017" of the World Economic Forum in Davos shows that the collapse in prices of photovoltaic panel cells, wind power or storage capacity of batteries is leading to a "Fourth Industrial Revolution", considerably reducing a large-scale energy system now replaced by self-produced energy.

Figure 3.3.1: The Falling Price of Photo-Voltaic Modules



Source: Bloomberg New Energy Finance.
Note: Prices are in constant 2015 US$.

The last worker

Already in 1930 John Maynard Keynes theorised: "We are being afflicted with a new disease of which some readers may not yet have heard the name, but of which they will hear a great deal in the years to come – namely, technological unemployment. This means unemployment due to our discovery of means of economising the use of labour outrunning the pace at which we can find new uses for labour". Keynes believed, with a vision that was somewhat fantastical, that machines would produce an abundance of goods and services almost free of charge, freeing humanity from the burden of work and frantic pecuniary interests to allow greater focus on the "arts of life". Economists that came after Keynes have long realised that the most efficient economy is one in which consumers pay only the marginal cost of the goods and services they buy. But if consumers pay only the marginal cost and this cost continues to approach zero, businesses would not be able to guarantee

a profitable return on their investments. To avert such an eventuality, market leaders will try to take control of their markets, to acquire a monopoly position so that they can set prices greater than the marginal cost of their products. This explains the growing dominance of big companies like Google, Microsoft, Apple or Amazon: the more they take commercially dominant positions, the more they are rewarded by the market.
Again from this year's World Economic Forum in Davos, a study predicts that by 2020 seven million jobs will disappear from the global market and two million new jobs will be created, with a net loss of five million, and all this because of the "fourth industrial revolution." A crucial aspect is the speed with which these changes are taking place. The affected labour force must be trained again to acquire the skills needed to carry out new professions, while current skills are not necessarily those required by companies in the more or less distant future. The problem lies in the speed of adaptation of people and institutions, which is often slower than technological progress. This is also a consequence of the fact that they often do not know the skills required in the future because they do not even know what the jobs of the future will be. For some professions there will be a bitter battle between companies to find personnel, while in other areas there will be an excess of people willing to do a type of job that is increasingly less necessary. It won't be just the workers in the manufacturing sector and in service automation undergoing this "silent revolution". The advances made in artificial intelligence can be applied to a wide range of professional areas. For example, eDiscovery is a type of software that can sift through millions of legal documents, seeking behaviour patterns, lines of thought, concepts, at a rate and with an analytical accuracy that is unachievable even by the most prepared jurists. This process will fuel the creation of new multidisciplinary professional figures like Data Scientists. The challenge will again be related to education. The more schooling required to perform complex work tasks, the lower the risk that they can be contracted out to intelligent machines. But automation will make it more interesting to search for professionals able to dialogue with and ask questions of the robots. But in the future who will pay the workers replaced by machines? Bill Gates made a lot of news when he proposed taxing profits generated by robots. In the European Parliament this idea was struck down, while initial drafts of regulations on robots are being drawn up, from the earliest indications hypothesising their treatment as legal persons with a citizen's income, the responsibility for cars without drivers. Should we start reconsidering Isaac Asimov's sci-fi laws of robotics? Maybe so. We should probably closely read some of his works to find out who will be the last worker.

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