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I. INTRODUCTION

The internet has changed our lives in several aspects; in fact, without fear of exaggeration, those changes can be described as revolutionary. One of the things we have started to get used to from the internet is the ubiquitous provision of free services. We can search information for free, we can receive and send messages for free, we can talk with distant relatives for free, we can play games and watch movies for free, and so on.

It is easy to get used to getting things for free. It is also easy to forget that this is something we humans have never enjoyed in our history. We are used to having to pay a price for everything we need, a dear price just to survive for most of our history. The preponderance of free services constitutes a good indicator of the revolution the internet presents in the minds of many people.

So, is there in the end “such a thing as a free lunch”? The economist Milton Friedman (awarded the Nobel Prize in 1976) famously titled one of his books *There’s No Such Thing as a Free Lunch*. Has the internet changed the way economic laws work or has this phrase just been refined to the current “If you’re not paying for something, it is because you’re the product”?

II. BACK TO BASICS: INTERCHANGE IN ECONOMIC THEORY

Individuals have needs. In order to satisfy those needs, they require resources, whose specific nature depends on the concrete need to be covered. Resources can only be obtained from the surrounding world, through investment in effort and time.

Fortunately, in the early stages of our history, someone discovered that resources could also be obtained by interchange with other individuals. Talking about revolutionary changes, this discovery led to the possibility of specialized work and vast increases of productivity and wealth for all humanity.

Our focus is on the analysis of these transactions. As already stated, individuals may obtain resources to satisfy their needs by interchange with other individuals. A voluntary interchange will only happen if both individuals think that they are going to profit from it (not necessarily in monetary terms, it may be in psychic terms).² In other words, a voluntary interchange happens when the marginal utility of the received good is higher than that of the given good, for both individuals. The received good satisfies a need of higher rank in the hierarchy of each individual than that satisfied by the given good.

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² See M.N. ROTHBARD, *MAN, ECONOMY, AND STATE*, Ch. 3 (1962).

When an interchange happens, a price appears. The price may be defined as the ratio of exchange between two commodities, expressed as the number of units of one of the commodities. Prices are historical phenomena that only appear when an interchange is consummated.

There are three more concepts related to an interchange. The revenue is the utility provided by the goods received in exchange of the given good. The cost of the transaction is the utility renounced because of the interchange; that is, the utility that could have been obtained if the given good would have been allotted to the next need in the ranking of preferences. The profit is the difference between both magnitudes and, as can be seen, is subjective and not quantifiable.

Economic theory goes on to explain how prices are formed.³ The main point to retain here is that the concept of interchange is general for any kind of good, and that prices can be expressed in any of the commodities interchanged. So, if two rabbits are exchanged for a sack of flour, it can be said both that the price of a rabbit is/has been half sack of flour and that the price of a sack of flour is/has been two rabbits.

Of course, direct interchange as described above has considerable limitations; it is difficult to match the preferences of two individuals, both in terms of desired goods and desired quantities. These limitations may be overcome by the use of a generally accepted good as a means of interchange. This good is known as money and gives rise to what is usually called indirect exchange. Individuals may so exchange their products for money, and later exchange the money for the good they require, which is certainly more effective than looking for someone who is interested in the product and ready to give in exchange the required good.

The use of money is another revolutionary change, and one that has also allowed the creation of vast quantities of wealth for societies. For our purpose, the main thing to note is that most economic transactions currently have money as one of the interchanged commodities. Because of that, we have grown used to express prices in monetary units. So, we say that the price of a rabbit is 10 Euros, but it is very strange to hear that the price of 1 Euro is 1/10 of a rabbit.

However, monetary transactions are just a subset of economic transactions, those in which money is used. But they are by no means the only type of interchanges, as already discussed. The fact that there is no money involved in the transaction does not mean that the transaction is free for any of the involved parties, as the above example of interchange of two rabbits for a sack of flour shows.

III. NEW MARKETS, NEW TRANSACTIONS

With this in mind, let us turn back to the supposed zero-priced⁴ activities on the internet. Are they considered zero-priced because they actually constitute a gift from one party to the

³ See, for example, E. VON BÖHM-BAWERK, *THE POSITIVE THEORY OF CAPITAL*, (Translated into English by W. Smart, 1891).

⁴ In the rest of the paper, the term “zero-priced” is preferred to “free” to avoid ambiguities in a regulatory context. In this context, a free activity may be understood as an activity not subject to Government intervention.

other? Or is it because no money, but other assets, are interchanged? Is the lunch actually free or isn't it?

The paramount example of a “zero-priced” activity on the internet has always been the provision of searching services to users. This is how respectable giants such as Yahoo or Google started their activities. By now, it is clear that their business model is based on advertising; they get their revenues from people who want to advertise products or services to third parties.

Google offers us a zero-priced use of its search engine and other web applications, because that is how Google attracts our attention to its advertisements. The business model of Google roughly involves two types of transactions:

1. Google offers an audience of possible customers in exchange for money from the advertisers.
2. Google offers web services in exchange for the attention (requiring time) from the users.

As can be seen, none of these transactions is zero-priced for the involved parties. The only difference between them is that one involves money, the other does not. Both are economic transactions that are carried out in the respective markets.

The business model of search engines is quite well known and has been used (and is still in use) by free-to-air television and radios. A similar model is used by several digital media. In summary, they provide contents in exchange for our time and attention. They are not giving us their contents for free, but in exchange a commodity: time.

More complex are other business models proposed on the internet, because in some cases they have not yet proved their viability. It is the case of the business model of WhatsApp: they provide (nearly) zero-price instant messaging and (for some months now) voice calls between its customers. While some say that the subscription fee required per user (currently, U.S. \$0.99 per year) is enough to make the business profitable, there are others that think the business model could be explained in the value of the data they acquire when the customers send messages. These suspicions arise as a consequence of the high value put on WhatsApp by Facebook, which seems difficult to explain just taking into account the revenues from subscription fees. The same suspicions seem applicable for the recent launch of Windows 10, given at zero price to users of previous Microsoft operating systems.

Be it time or data, it is clear that users are exchanging some commodity for internet services, and in consequence that these services are not zero-priced. Of course, if a concrete individual does not value his time or his data, the services will appear as free for him, even if it is clear that the service provider would likely not provide the service if it were not paid for in this kind of commodity.

Recall that for a voluntary transaction to take place it is necessary that both parties value that which they receive more than what they give away. This is compatible with one of the parties not conferring any value to the given commodity, but that does not make the transaction less economic or costly.

Summing up, it seems that the internet has given birth to new business models based on non-monetary transactions. They rely on economic transactions in which time and possibly

personal data is exchanged for information services and contents. These interchanges are of the same nature as the more widespread monetary transactions, and cause concrete markets to exist— and these markets of course may be analyzed with the usual technics.

IV. TIME AS A RESOURCE

For the moment, we will focus on time, whose nature as a valuable limited resource is well established by millennia of human experience. Personal data, the other commodity that seems to be traded in zero-priced activities, requires a more detailed and complex analysis, which is beyond the scope of this article.

It is scarcely worthwhile to recall that time is limited. Each individual only has a certain time to live, and most part has to be dedicated to physiologic needs (at least, with the current state of the art). The available time after these basic needs is distributed among several activities, according to the preferences and requirements of the individual.

As every action attempted by individuals requires time, it is obvious that it is impossible for us to do every possible activity. Therefore, time constitutes another scarce resource to consider when taking decisions. Besides, time has one feature that most economic resources do not have: time is irreversible and cannot be “stored,” at least with the current state of technology. The time which is not used elapses, and can never be used.⁵

When an individual chooses Google to search for some information, or YouTube to watch a content, or Facebook to contact some friends, he is purposely allocating time to the activity. The internet service provider may use part of the allocated time to its own purposes, such as showing advertisements.

Depending on the subjective value of time for the individual with regard to his goals, he may be ready to “waste” some of this time auditioning the proposed advertisements, or not. For example, if Google is especially effective in searching results for the intended purpose, the user may be more willing to spend time with the advertisements. This partly explains the dynamics of innovation in this field; quicker and more accurate results are the propelling force for search engines.

If one has a couple of hours to spare for entertainment, some providers may be ready to provide content in exchange for some time attending advertisements. Others try to exchange the content for money, assuming that the individual values his time high enough to prefer avoiding the advertisements.⁶ Once again, the value that each individual assigns to his available time is the key to explaining the different business models.

Once established the value that time has for zero-price internet services, it can be expected that, if there is freedom of entry, a fierce competition appears for time. Do not forget that time cannot be stored nor its production increased, so its value can only increase as a result of possible alternative activities. How is this competition manifested?

⁵ For a more detailed analysis of the economic features of time, see M. J. Rizzo, *Time in Economics*, THE ELGAR COMPANION TO AUSTRIAN ECONOMICS, 111-117 (P.J. Boettke, ed. 1994).

⁶ Of course, other features may have more relevance for the value of content and the ability to exchange it for money: quality, novelty, uniqueness of the event... In any case, time will be required to consume the content.

As time increases its value, internet providers are able and obliged to “pay” more for this time. They pay for our time with more services, as is easy to assess when analyzing the evolution of successful enterprises as Google or Facebook.

Google, for example, has incorporated to its original zero-price search service, a plethora of zero-priced web services (e-mail, maps, hosting, cloud, videos, pictures...), together with software for PCs (Chrome), a mobile operative system (Android), and apps. And the trend goes on, as the already quoted example of Microsoft with Windows 10 shows.

In any case, the above examples are just empirical evidence of the theoretical analysis exposed: time is a scarce resource and has a different value for each individual. In consequence, time may be (and in fact is) used as medium of exchange with which to pay apparently zero-priced services.

V. CONCLUSION

Internet free markets have posed some challenges to competition and regulatory authorities. Some authorities have wondered if this zero price could be a case of predation, but fortunately for the users the idea has not progressed, at least for the moment. Others consider that a free market, being free, may not pose competition problems, as is the case of the European Commission in the acquisition of WhatsApp by Facebook.

The authorities’ main problem has normally been how to measure the market in the absence of a price for the service. Academics have proposed to tackle the issue by means of the theory of “two-sided markets,”⁷ in which zero prices in one side of the market may be rational (and not predatory) and explained by the revenues obtained in the other side of the market.

This paper shows that these problems have their roots in the narrowing of the concept of economic interchange: most authorities and economists seem to consider that a transaction is economic only if money is exchanged. They confuse economic transactions with monetary transactions.

Plenty of the new business models that are flourishing on the internet are based on economic transactions that are not monetary, but are not free (zero-priced) either. It has been shown that payment can be made with time and with personal data.

So, if these markets need to be analyzed for competitive or regulatory purposes, the unit of measure should be coherent with the kind of transactions going on in those markets. If time (or data) is the money in those markets, then it just seems logical to use it for competitive assessment, for example, in the application of the SSNIP⁸ test (and thus the scope of the relevant market), and in the calculation of market shares.

It has also a clear impact in merger regulation thresholds. As these thresholds are defined in terms of currency, they ignore the amount of revenues in time and data that the involved firms may have. Because of that, a redefinition of these metrics seems in order.

⁷ See J.C. Roche & J. Tirole, *Platform Competition in Two-Sided Markets*, (1) J. EUR. ECON. ASSOC. 990–1029 (2003).

⁸ Small but Significant Non-transitory Increase in Price.

Of course, none of these processes seem easy, and plenty of obstacles lie ahead. But citizens deserve the same effectiveness of competition policy, regardless of whether they pay with money, with their time, or with their data.