

What has value in the digital and network economy?

From scarcity to short-lived innovation and to the lack of safe assets

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The concept of economic value has a long history in economic and philosophical thought and has puzzled economists since the beginning of the discipline. In recent years, however, the ability to determine the real value of assets has become even more difficult. The bubble in asset prices in the pre-2008 period and the collapse thereafter, the large volatility and nervousness in the markets, the fact that most indices of stocks, commodities and other assets are correlated, the large swings in the price of gold, dollar and real estate in the last thirty five years, are examples of an inability of the markets to value properly. Moreover for an increasing number of assets the values are maintained for a short period of time and decrease rapidly afterwards.

Although one could give a series of reasonable explanations for each of the above mentioned cases, the fact that they coincide, indicates that something bigger is at work, something probably related to the dynamics of value formation. People and markets in the 21st century seem to have changed drastically the way of how and why they value things. Nowadays there is lack of safe assets to an extent that has never been the case in the past. The purpose of this paper is to show that a large part of the changes in value formation can be attributed to the digital and network economy (DNE for short). In this new economy the relative importance of innovation in the creation of value has increased drastically at the expense of scarcity and labour. However, the value that can be acquired through innovation lasts only for a limited period of time.

The reduced ability to discover the real value of assets and to make forecasts about its future fluctuations has significant social, economic and policy implications. The way that people value things and implicitly the theory of value was always in the core of all socio-economic and philosophical schools of thought. The digital economy has brought about structural changes that have not been conceptualized properly yet.

We start our discussion with the way that the DNE affects our ability to discover the real value of assets. This can be attributed to a series of factors, such as:

a) New pattern of production: Economies of scale

For a large number of industries the advances in information technology have radically changed the patterns of production. The relative importance of labour has declined while for an increasing number of industries the cost of production of the archetype, - i.e. the initial product, - is very high but subsequently the marginal cost falls rapidly reaching almost zero at massive production levels. The cases of software, pharmaceutical and chemical industries are indicative examples. Similar “economies of scale” characteristics are exhibited by an increasing number of other industries, especially those that produce goods operating with microchips, or need high R&D expenses for the design of the initial product, or require significant investments for the acquisition of their production base.

Firms that enjoy economies of scale usually exhibit natural monopoly characteristics, dominate the market and make monopolistic profits. At this point however it is important to note that according to the theory and empirical evidence, the level of such profits made by new technology leading firms are usually lower than those made by traditional monopolies. Empirical findings show that new technologies have led to a consolidation of companies, but at least so far, there have been few companies that succeeded to retain their “monopo-

ly” power for long. The maintenance of market shares in a fast-growing and changing market has proved a difficult task, even for companies which at some time managed to dominate. Indicative cases are the processors Wordstar, Wordperfect and Lotus that dominated at the late 1980s and the early 1990s but have all but disappeared today.

The observation that the profits of new technology leading companies are lower than those of traditional monopolies does not contradict the basic argument. The value of each product unit, as it is depicted in its price, is determined more by the utility that it provides to the consumers and the ability of the firm to exercise its monopoly power than the scarcity of the specific product or the cost of its production.

b) Economies of scale derived from the demand side: the case of network products

An even greater difficulty to determine the real value of assets is observed for new technology products that operate within electronic networks (operating systems, word processors, electronic mails, etc.) The demand for these products is mainly determined by the number of products already sold. As long as no one is interested in buying a network product, its price is essentially zero. An “entry price policy”, of selling the product below its cost, is usually followed by the firms in order to promote a new network product in the market. If this policy succeeds and a number of customers are locked into the product (lock-in effect) due to high cost of removal, a virtuous circle of increasing demand starts. However, after a certain level of sales, new sales can be made only to consumers to which the specific product offers limited utility (e.g. smart phones to elderly or very young people). Under such falling demand conditions the producing company has to lower the price in order to continue its sales.

c) Quick depreciation of the production base and new technology assets

It is well known that ICT products and goods that encompass technological knowledge decrease in value over time more quickly than other goods. Technological knowledge is accumulated through R&D and innovation efforts but it depreciates and becomes obsolete over time. The speed of depreciation is difficult to be estimated and consequently it is difficult for economic agents to form trustworthy valuations. For the depreciation of such products the notion of use and age are of less importance in comparison with a series of changes in external circumstances, or the development of new technology or the level of diffusion itself (economies of scale derived from the demand side).

d) Teleworking and the diminishing importance of the actual location

Real estate investments were for many decades an appealing choice for a large part of the middle class. Real estate prices were more stable than investment in other assets and forecasts about the future value of such investments were based on a number of reliable factors. A flat close to a business area, with a good transport infrastructure, safety, good climate and good view was regarded a good investment for a large part of middle class population. Furthermore, at a business level, location was a key to successful operations and overall growth of a company and location played an important role for achieving external economies of scaleⁱⁱ. If a location could deliver benefits to a company such as competitive unit costs, revenue opportunities, acceptable rate of return on investment and access to qualified labour, one could easily anticipate that this location could be developed commercially.

These factors seem to have shifted in the digital era. Working patterns are changing and the relative importance of location is diminishing. There is a considerable ongoing interest in teleworking, since advances in technology make such practices ever more cost effective. There is also a growing number of companies that operate virtually. Furthermore, environmental and lifestyle concerns as well as the possibility for a better work-life balance have influenced individual attitudes. Under these circumstances nobody can easily forecast

what will be the value of a shop in the center of a town, or of an office in a business center or of an apartment in a nice city, ten years from now.

e) Product and price differentiation

Differentiation and development of goods and services adjusted to customer needs is highly facilitated by new technology. Furthermore enhanced possibilities for collecting data about consumer behaviour allow companies to sell “tailor made” products and services adjusted to the special needs of each customer. As long as this adjustment is made at low cost, firms can follow a pricing policy with monopolistic characteristicsⁱⁱⁱ and receive the surplus from the consumer. Although empirical evidence does not fully support this argument and in practice competition in selling new technology goods over the internet has increased dramatically in recent years, it is a matter of investigation whether the “increased competition” effect is stronger than the “tailor made” one. Once again consumers are in doubt about the fair price of the goods and the difficulty of proper valuation increases.

f) Intellectual property protection

Without the effective protection of intellectual rights a lot of the existing goods would never have been produced. The intellectual property legislation has traditionally maintained a balance between the protection of creators' rights and the public good in fair access to and use of such goods. The maintenance of this balance is however difficult in the digital era because of a) the radical changes in the way in which we access and use information, b) the unlimited possibilities of transmitting and using all these protected materials in digital form over interactive networks, c) the enhanced possibilities to develop new programmes, services and even products with small modifications in software and d) the necessity to facilitate technological progress. The legal system responds to the new technological developments but since technologies and markets evolve increasingly rapidly, the response cannot be effective. No matter how quick and continuous legal adjustments can be, they lag behind reality. In such an environment, where internet works, among others, as “the world's biggest copy machine”, intellectual property rights are not effectively protected and the “fair” value of the assets is difficult to be assessed.

From scarcity to innovation

The above mentioned factors clearly indicate that in the digital and network era an increasing number of sectors exhibit natural monopoly characteristics and the “invisible” hand of the market seems increasingly detached from the real economy. A high and increasing number of goods are produced under economies of scale conditions and equilibrium is only partially achieved through competition.

In this new economy, the valuation of commodities has changed significantly. In the classical economy, goods' attributes and scarcity were the basic determinants of their value while the relative importance of knowledge was mainly determined by its contribution to the production and development process. In the new economy, though, underlying value tends to be intangible. For a growing number of goods their value is determined mainly by the ideas and knowledge that they incorporate. The ability to innovate is the key source for value and wealth creation. However, even if one succeeds to launch an innovative good, the benefits will not last for a long period of time. Sooner or later and irrespectively of the copyright laws, competitors will enter the market. The prospect of acquiring monopoly power for a limited period of time is actually what mainly motivates the business sector to undertake risks.

The change in the determinants of value formation associated with the enhanced difficulty to discover the real value of assets and to forecast their future value has significant social, economic and policy implications:

First, the effects of the new technology associated with the macroeconomic imbalances that have mainly been

generated in the pre-2008 period, resulted in a lack of safe assets. A large and increasing percentage of the world population finds enhanced difficulties in finding credible saving assets that can serve as a bridge of purchasing power from the present to the future. Apart from some people, consisting mainly of professionals in specific disciplines, rich families and businessmen, who are knowledgeable and see the crisis as an opportunity, the majority of the population feels insecure and has a sense that are entering an uncharted territory. Insecurity by itself accentuates problems and the experience of recent years shows that the lack of safe assets triggers financial crises.

Secondly, the conclusion that new technologies have significant effects on how markets work, raises questions about the kind of regulations that governments have to enact in order for markets to function effectively. Moreover the fact that new technology cuts across national boundaries, indicates the necessity of new forms of international co-operation and governance.

Thirdly, the fact that existing socio-economic theories have been developed prior to the digital revolution means that they are unable to provide sufficient answers about the efficient management and diffusion of new technology, the way that the value produced has to be allocated, as well as the way that new technology can improve the well-being of the world population. Reality shows that there is need for extensive research on these issues which may lead to new theories.

i A natural monopoly is a company that experiences increasing returns to scale over the relevant range of output and relatively high fixed costs.

ii External economies of scale happen outside the control of a company and encompass positive externalities that reduce the firm's costs. External economies may also result from the clustering of similar businesses in a specific location e.g. software businesses in Silicon Valley or investment banks in the City of London.

iii Under these circumstances firms can follow a pricing policy that the percentage difference in the price for the tailor made product is higher than the marginal cost for producing it. Under these circumstances firms can follow a pricing policy that the percentage difference in the price for the tailor made product is higher than the marginal cost for producing it.