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THE IMPERATIVE OF SUSTAINABILITY IN THE BUSINESS MODELS OF THE XXI[ST] CENTURY / Adriana Almășan

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Abstract: *Sustainability has become a mandatory requirement in the business models of this century, with the aim to reverse the recent trends in economy. In the era of disruptive economies, the optics of what constitutes added value has significantly shifted towards a more inclusive approach. The waste effect, the greed in conducting business, the ignorance of the impact of business development's impact over the environment, the use of certain technologies, despite the insufficient knowledge of how they work, and bureaucracy threaten the very existence of humanity. Yet, none of these perils are properly addressed from the legal perspective, nor are they prone to be mitigated in a blurred legislative system. The paper discusses the necessity of a broader understanding of sustainability, with a view to business models, as well as integrated legal solutions, at the level of European Union legislation.*

Key words: *Sustainability; Business Model; European Union; Disruptive Economies; Markets; Environment Protection; Unfair Trading Practices; New Technologies*

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1. INTRODUCTION

We are living in the era of disruptive technologies based on inventions that aim to "recycle" the existing relevant markets into new ones, changing the economy itself. These new technologies generate not only a significant impact on the economy sectors (in transportation,[1] communication[2] etc.), but they also impact social relations (social media being a by-product of digital technologies), art (NFT, the art created using blockchain technology), education (LUE, 2014, pp. 183-184) (the products developed by Open AI using bots for the assistance in various fields, including research), banking (digital banking or the so-called neobanks (AU, 2024)).

Entrepreneurs use innovation to shift consumption towards markets that develop new technological solutions. The added value of the products generated by the

[1] The online platforms and mobile applications of transportation services enabled prosumerism, the autonomous vehicles enabled new personal transportation services, such as shared car rides.
[2] Enhanced audio-video mobile communication technologies enabled mobile TV broadcasting and streaming, as well as online education services, including remote learning.

new technologies is based on the supply and demand mechanisms, with the intrinsic value remaining without support in a free economy.

We are also living in an economy of greed, where social and human values are merely used as a means to the end of gaining profit. Still, society is abundantly influenced by swift channels of communication that expose individuals and companies to a level of vulnerability to pressure that has never been observed in the history of mankind.

Temporary extraordinary circumstances, such as economic, sanitary, or political crises have added multiple challenges to the economic and social changes with permanent effect.

Worldwide, the efforts to achieve sustainability in the employment of new technologies have led to multidisciplinary research (Kristoufek, 2013) and effective actions on the part of leading companies worldwide (Microsoft, 2020). At the United Nations level, the endeavour is summarised in the United Nations Sustainable Development Goals (SDGs), a commitment plan aimed to harmonise the new technologies with humanity desiderates pertaining to the protection of our planet, as well as the creation and management of opportunities, and striking the balance of responsibility. The UN Secretary-General noticed in 2020 that the implications and potential of digital technology the SDG's are present in all the SDG's 17 goals and 169 targets (United Nations, 2019, p. 15).

1.1 The Fourth Industrial Wave

The fourth technological wave features new relevant markets and disruptive technologies enabling new definitions of the relevant markets. The new technologies, such as M2M (Machine-to-Machine communication), the IoT (Internet of Things) (Khalil, Malik, Hong, et al., 2023),[3] the shift from the digital era to metaverse and the great leaps in AI (Artificial Intelligence) and augmented social reality and others created new markets and laid a powerful emphasis on the potential competition.

The necessity to adapt to the new economic realities has been acknowledged by the new Commission Notice on the definition of the relevant market for the purposes of Union competition law, which is pending to replace the Notice published by the Commission in 1997. The draft document does not yet solve the definition problems arising from the new technologies that alter the configuration of the markets. For instance, the draft Notice acknowledges rather the difficulties of applying the SSNIP test (Small Significant Non-transitory Increase in Price) in situations such as for zero monetary price products and highly innovative industries.[4] The draft document also indicates as a solution the empirical application of the SSNIP test,[5] in an approach that has already been used in past practice by the European Commission.

In this context of economic development, considering the free evolution of markets, disruptors of the new economies do not entertain sustainability studies, nor are they required to perform such analysis. Also, there is no sustainability test for disruptive economies, with most of them operating successfully after they had already proven they could not sustain a competitive and environmentally friendly economy. The trial-and-error

[3] The applications of technologies enabling IoT include urbanistic development, as shown by Khalil, Malik, Hong, et al. (2023).
[4] Paragraph (32) of the draft Commission Notice on the definition of the relevant market for the purposes of Union competition law.
[5] Paragraph (33) of the draft Commission Notice on the definition of the relevant market for the purposes of Union competition law.

system is prone to generate, however, a severe impact on the real economy, without the undertakings assuming accountability.

Expanding business comes with a sustainability risk, such a peril varying according to the business model. Some business development is fuelled by greed, hence jeopardising the world economies. Regardless of the cause, whether it might be overrating a company or acquiring capital in excess, a large-scale expansion is prone to trigger economic bubbles, as it is fictitiously grounded.

Another source of sustainability risk comes from erratic company management. The wasteful management implies a considerable sustainability risk, even though public awareness increased pressure against all sorts of perks, such as the use of company jets, real estate facilities, and improper asset management. However, the radicalised public opinion, in the form of cancel culture, which worked with certain success, has yet to tackle this sort of inconsiderate and greedy behaviour. Additionally, the inequalities resulting from digital poverty increase the gap between the sustainability goals and the existing global inequalities (O'Sullivan, Clark, Marshall, et al., 2021).

1.2 Added Value in Economy

The rule of thumb is that the economy must create value capable of satisfying the needs of individuals and companies on the planet. The free market basic principles enable only products and services in demand to be offered, the products and services not having an economic use naturally remaining outside the market.

But beauty is in the eye of the beholder, as the old proverb says. The on-line economies generated all sorts of nonmaterial creations. Not surprisingly, the cost of production for most of these immaterial goods is not neglectable, such being the case, in a couple of examples, of NFTs[6] - crypto art as a form of art produced by using blockchain technology - and cryptocurrencies – financial commodities having fluctuant value generated in an immutable digital ledger that records transactions between agents interacting in a peer-to-peer network - that consume significant quantities of electric energy for being generated. It is therefore difficult to strike a balance between the cost of production and the human need that the products aim to fulfil.

These are business models that feature economic value with no real presence and are as speculative as the financial instruments directly linked to the financial crises, the economic crisis in 2008 being triggered by the speculative transactions and abuse of derivatives. The capital in digital markets became speculated and manipulated by investment banking to the extent that the economy in this century is like a casino fuelled by a giant debt bubble and computer-driven derivatives.

1.3 Welcome to the Economy of Greed

The investment either seeks long-term, moderate profitability in safer conditions, or short-term, high-risk, higher profits. The investors' choice between greed and security in setting their motivation has never been under legal censorship. Preventing erratic, greedy behaviour is a difficult task, incompatible with the principles of the free market.

However, so is attempting to remedy and sanction the manipulation prowess and taking measures to hinder the natural lure so many people have for greediness. For

[6] The value of digital art includes the costs sustained with production, but also the creative value inherent to any artistic endeavour. The sustainability challenges add to the ethical and technical ones, as the conveying of health risks. See, for a detailed analysis, Calvo (2024).

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instance, the victims of Ponzi schemes are never compensated, a tax on gullibility being self-implied. As consumer preferences welcome this type of <opportunities>, apparently there seems to be a crime without victims, as they gather no sympathy. This is not true. The economy is a victim, as people and companies that were not even indirectly involved in such schemes become the ultimate victim, as the bubble breaks.

Greed in the economy embraces so many other forms (Dignam, 2008). For instance, hostile takeovers imply a waste effect, in addition to harming the relevant market, especially in the case of the so-called "garage sales" of assets, when the acquired company discontinues the production of goods or the supply of services. Sold assets are not likely to generate the same added value as they did when aggregated in the goodwill of the former company.

In addition, innovation – the largest source of added value in an economy – does not contribute to market competitiveness. Often, big businesses keep startups out of the markets, preventing competition on the markets either by way of a buyout or by disrupting their supply or distribution channels.

However, predatory behaviour in the markets appears to be condoned. For instance, the EC Merger Regulation enables the European Commission the prerogative of control over the economic concentrations provided that the operation has a community dimension transposed in structural conditions.[7] Should the concentration operation concern undertakings of sizes that do not meet the thresholds provided in the EC Merger Regulation, competition law only takes interest in predatory behaviour falling under the conditions of abuse of dominant position in the relevant market. The legal systems, including the competition legislation at the European Union level, are still far from granting protection for an <offer that cannot be refused>.

1.4 Transient Challenges

In addition to the challenges pertaining to the way the markets based on new technologies function, challenges that imply an irreversible impact, there are some other trials for the legislation designed to regulate the economy.

Among the tests having a non-permanent effect, the most relevant are the recent crises and emergencies generated by the COVID-19 pandemic and economic crises, the most relevant being the supply shortages in production (cooling fans supply shortages led to chain production delays in 2022, microchip shortages led to action on the part of European Parliament creating a plan to overcome semiconductor shortage)[8] and transportation (for instance, the obstruction of Suez Canal for six days in March 2021 led to multiple negative consequences, including 9 bn USD per day, that being 12% of the global trade, according to Lloyds).[9] Also, the energy crisis triggered by the armed conflict in Ukraine, and the related economic sanctions applied to the aggressor caught the attention of authorities worldwide.

Consequently, the relevant markets had a specific dynamicity and shifted to fit the new political, social, and economic circumstances. For instance, the pandemic increased the tendency of hoarding in consumers, enabling scalping from the traders who profited from slight market fluctuations. In another example, the pandemic also

[7] Art. 1, Council Regulation (EC) No 139/2004 of 20 January 2004 on the control of concentrations between undertakings.
[8] Proposal for a Regulation of the European Parliament and of the Council establishing a framework of measures for strengthening Europe's semiconductor ecosystem (Chips Act).
[9] Lloyd's List (2021).

stimulated single-use products, as well as sanitary protection products (such as face masks and gloves) that generated additional waste.

The crises and emergencies negatively affect consumer behaviour, making it difficult to predict whether the tendency is reversible or not, when the cause ends (Crane, 2020, p. 54; De Moncuit, 2020, p. 58).

To this end, consumer environmental awareness is essential. The negligent, unaware consumer, who does not act diligently, may easily establish behavioural patterns leading to increased consumption and waste.[10]

Also, as the business models generally do not aim to increase customers' consciousness/mindfulness, the entire responsibility for purchasing behaviours lies with the customer. The legislation does not prevent any excess or abuse in the consumption of goods or services. In case transient causes embed permanent shifts in consumer behaviour, there is no legal correction mechanism in place to prevent them.

2. BUSINESS MODELS IN THE XXI CENTURY

Business models are diversified, as they adjust to the types of technologies they employ. The fast-changing markets are prompted by technologies in the making (Lavin, Gilligan-Lee, Visnjic, et al., 2022).

The e-commerce is conducted increasingly in marketplaces, with this type of platform attracting most of the clients. Only the most dedicated customers elect to shop on the producer's website shopping page. This trend greatly enhanced the market power of the marketplace owners, now seen as gatekeepers in the position to influence the customers' behaviour, including by self-favouritism. Despite this conduct being prohibited by the competition regulations pertaining to abuse of dominant position (Said, Somasuntharam, Yaakub, et al., 2023), the practice is still a source of abundant jurisprudence both in the United States of America, where the legislation is applied in the spirit of economic effectiveness,[11] and in the European Union.[12]

Undertakings operating on demand build their business model on prosumer-based activities in the market, developing direct interaction between supply and demand, hence the operators on the market not being compelled to create legal vehicles to register to the system.

Some of the operators in the markets of on-demand services are conducting their business using the peer-to-peer system, generating a sort of two-sided marketplace, the offer, and the request for services being hosted by the online application.

The subscription-based business model is the most traditional one. Nonetheless, the services provided online are readily available worldwide and they force the operation to comply not only with legal requirements in the home country but also in the countries of the consumers.

Seeking fast expansion, some online services have replaced the trial-based business model with the free-premium model. This type of business model offers a base-level service, in principle, unsatisfactory for most users as well as an upgrade to a paid level full service.

This business model is compatible with peer-to-peer operations.

[10] This effect also being a consequence of the market for lemons theory explained behaviour, as explained in 4.2 below.
[11] U.S. v Google LLC, Case A:20, 2020, U.S. v Microsoft Corp., Civil Action No 98-1232, 1998.
[12] EC, Case AT.39740, Google Search (Shopping), 27.6.2016.

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The ad-supported models of businesses host advertisements on the platform they operate. As the revenue is controllable, this type of business model raises moderate competition concerns, in terms of business valuation. Nonetheless, the distortion effect is significantly enhanced by the interplay between hosting of ads on platforms and placement of ads on social media. Due to the swift communication used by the advertisement models, this business model gained unpredicted importance, to the extent such online platforms are highly competitive in the news and media markets. The importance of social media has reached a peak, where influencers are deemed as an important factor in marketing in most of the markets, especially in Fast Moving Consumer Goods (FMCG).

The most difficult to assess and complex business models are the hidden revenue generation of business. They exploit social media's impact in the world and gain market power by collecting data from their clients who subscribe for free. The sustainability and competition problems raised by this model of business cannot be accurately assessed.

The open-source business model is based on the contribution of the users, even though the model does not eliminate the use of human resources and other operational costs that may be significant. This business model triggers similar concerns from the perspective of development and competition as the ones in the hidden revenue model.

2.1 AI Based Business Sustainability

In addition to the general requirement of digital consumption's sustainability, considering that Internet access has reached 60% of the global population, with the average user spending over 40% of their waking life on the Internet (Istrate, Tulus, Grass, et al., 2024), the digital usage that employs AI entails distinct consideration.

The most unpredictable business model is the AI-based one. As the research has not yet reached the stage of complete comprehension of how the Artificial Intelligence works and its applications are in ongoing development, the world economy still encounters high risks from the usage of AI-powered products and services. The liability system resulting from the activities led by the AI is yet to be determined (Vial, 2022, p. 70).

AI technologies enhance the development of multi-robot systems, enabling hosting of blockchains by the robots with the assistance of smart contracts as well as the synchronised data storage capabilities (Dorigo, Pacheco, Reina et al., 2024). The implementation of smart contracts worldwide is closely linked to the national legal systems, and the discussion about generating a global regulation for the contract in the form of this technology is impractical.

AI technologies enable bot-assisted services in various customer care areas, including health services, e-commerce, education, communications, multimedia etc. Many multinational companies have already embedded such services on their digital platforms, in an endeavour to automatise the most repetitive activities and replace human operators.

The AI race is hyped by the leading high-tech companies to the maximum, without anybody knowing where it would lead humanity. The viral sheer enthusiasm shared by the hi-tech business environment in the capability of AI has already led to distortions. The epitome in this regard might be the chatbots used in online sales platforms, deemed to eliminate human assistance and, hence, a considerable cost, but futile for the purpose of adequate customer assistance, most of them being designed poorly in the form of a several entries question and answer online window.

Most of the services that are AI-assisted continuously provide anecdotal errors (Walters and Wilder, 2023) ("hallucinations") as, in fact, AI is merely a collection of information, analysed and synthetised, acting similarly to an oracle. Computer scientists advise caution in using the AI-powered tools in research (Castelvecchi, 2016). Eventually, where there is no natural intelligence, artificial intelligence cannot be generated.

2.2 Digital Currency Sustainability

Digital currencies do not represent alternatives to fiat currencies, as the exchange fluctuations to the USD and the extended market behaviour as a commodity led to the failure to meet the basic requirements for such an analogy (Baldwin, 2018).[13] Even the most popular cryptocurrencies failed to prove sustainability, despite several great vantage points in their favour, including security, transparency, autonomy, and accessibility.

Nonetheless, in digital communities, especially during the recent COVID-19 pandemic, these exchange means revealed tremendous possibilities, despite the lack of consistency to enable predictions of stability (Mattsson, Criscione and Takes, 2023).[14]

The digital markets imply other sustainability risks. The most important ones pertain to cryptocurrency, generated by using electric energy. Comparing the cost of production of crypto coins and fiat coins, the result is that cryptocurrency is not a gain in sustainability as its mining consumes huge quantities of electric energy. Furthermore, virtual currency that is not generated on the blockchain may be more efficient, and therefore safer for the environment. Without attempting in any way to tackle the comparison between the two types of currency from an exhaustive perspective, the outcome is that there is a sustainability challenge stemming from the growing cryptocurrency markets.

Also, by having no correspondent and guarantee in actual goods, this type of currency represents false value, and not added value in an economy that is prone to generate bubbles and disturb the economy (LI, 2023).

Cryptocurrency has already proved a certain value in enabling payments that cannot be performed by using fiat coins, however, this is not a category of achievements that ensure sustainability. The legislation still needs to decipher the technical means to apply legislation to some technology-based businesses, such as taxation and securitisation of commercial operations using this type of collateral.

2.3 Prosumerism

There are some aspects of the new technologies-based markets that still shine a beacon of hope on the sustainability requirement of the business models. Prosumerism, as an efficient business model, is the epitome regarding the relationship-transforming nature of some of the new technologies and the substantial change in legal status of the law subjects. Featuring prosumers, as individuals or entities, that can consume and produce simultaneously, prosumerism encompasses numerous applications.

[13] The author took bitcoin as reference, analysing its alternative soaring and plummeting describes this cryptocurrency as a cautionary tale in the development of new financial markets.
[14] The authors analysed the Sarafu users in Kenya during the COVID-19 outbreak, reaching the conclusion that the model could not be compared to empirical account balances.

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In one of the most relevant economy applications, the energy sector (Jacobs, 2016; Jakimowicz, 2022; Korotko, Rosin and Ahmadiahangar, 2019), prosumerism pertains to future smart grids, which help to integrate distributed energy resources (DER) into existing electric power systems (EPS). Other applications include communication services, such as transmedia audio-visual production (Lastra, 2016; Park, Cho and Choi, 2017), personal transportation services, hospitality services etc. The challenges in striking a balance between enhancing the application of prosumerism in the energy sector and enabling sustainability are difficult to regulate, in the effort to reach the climate neutrality goal in 2050. As the prosumer energy market is expanding, this represents the focus in regulation at the European Union level.[15]

Blockchain technology, which is based on the prosumer connection on dedicated platforms (Pop et al., 2020) is also subject to sustainability risks. Sustainability discusses risks beyond the basic carbon footprint, the concept that has multiple implications derived from the preservation of the planet and maintaining the carbon footprint low. A recent study explains that the current emissions from mining devices supporting NFTs transactions are expected to have an extinguishing effect on the lives of people sometime in the future. For instance, in the United States, it is expected that the average lifetime carbon emissions of 3.5 persons - 4434 metric tonnes or 4,434,000 kgCO2 – will lead to the death of one person between 2020 and 2100 who would not otherwise have died. Death rates from blockchain transactions can then be estimated based on Bressler's calculations, considering the estimated emissions caused by a blockchain network and dividing the number of transactions to calculate an estimated emissions transaction cost (Truby, Jon, Dahdal and Ibrahim, 2022).

One of the most relevant applications of prosumerism is e-commerce (Weitzenboeck, 2015). The personalised production of goods involves the customer in the design of the product, simultaneously tailoring the product to their own needs. This triggers certain sustainability advantages and disadvantages. On the one hand, this prolongs the usual use of the product, the emotional attachment to fit products being one of the main reasons. Also, the more fitted to the needs of the customer, the more likely it is to score high in efficiency. On the other hand, the tailored products are less likely to be resold to other customers, and the ones that do not meet expectations would become waste.

The technologies transfer to the customer some of the service and peer-to-peer platforms increase economic efficiency. The economic efficiency is further increased by the assessment and feedback systems that enable control over the quality of the product or the service, by using the reception by the public. The platforms that host such services, such as Yelp, TripAdvisor, as well as social media used in marketing, such as influencers' channels, function in concurrence with the service-providing platforms, adapting in real time to their positioning in the market. This model is both applicable for undertakings but also for prosumers, the peers registered in the platform to perform the services directly in contact with their clients.

Some business models, such as airbnb.com, thrived due to its enabling prosumerism and challenging the competitors, hence inducing significant shifts in the market. Such was the case of its competitor Booking.com, who was forced to reshape its business model, welcoming private hosts to register in the platform, due to the massive change in social perception that enabled the transfer of customers. For this reason, booking.com added, for instance, environmental sustainability information

[15] Commission Recommendation of 14 March 2023 on Energy Storage – Underpinning a decarbonised and secure EU energy system 2023/C 103/01.

among the platform's search criteria, for the convenience of the customers who are now more sensitive to environmental protection, than they were in the past.

As these technologies are based on a significant boost in creativeness, the prosumer-oriented ecosystems being driven by innovation (Seran and Izvercian, 2014), it becomes difficult to predict their future development to apply adequate corrective legislative measures to the inequalities resulting from the asymmetric power between the platform operators and prosumers, as well as to achieve the goal of sustainable operational governance.

Currently, the status of the prosumers represents a legislative concern from the perspective of establishing and protecting essential rights,[16] especially in the context of the increased role of robots in the operation of digital markets (Nevejans, 2017).

3. SUSTAINABILITY CHALLENGES IN THE CURRENT BUSINESS MODELS

Sustainability may be analysed from the triple perspective of ecologism, economic efficiency, and socio-cultural absorption of the business model.

The challenges in sustainability come from waste generation and management, production efficiency, and ensuring the perfect fit between the demand and offer on the markets. Some of the new technologies gain efficiency, failing however to create sustainable environment safety. In this context, pursuant to article 191 TFEU, EU legislation aims to strike a balance between the liberties inherent to the free market and the protection of competition and the environment. The scope of the EU environmental policy includes boosting the efficient use of resources, leading to a clean, circular economy, and reducing pollution.[17]

3.1 Waste in Food Industry

Among the sources of waste, fast food industry is one of the largest. The production of ready-to-eat meals in a short time for frugal consumption requires continuity in production and triggers the risk of wasting the food not consumed in due time.

Another source of waste is the self-service food industry. Extended from the economic buffet style serving in cafeterias and self-service establishments to luxury restaurants, the version <all you can eat> is the epitome of wasteful management of serving food.

The food in supermarkets is discarded at the expiration rather than being donated while still fit for consumption. The distribution by networks of food banks is a scarce phenomenon, therefore legislation should step in and set redirection of products towards distribution points, in a similar manner to the electric and electronic products manufacturers' obligations to recycle.

The waste effect in food purchase has been increased by nutrition habits (Shang, Li, Xu, et al., 2020; Yudkin, 1963), hoarding habits during the pandemic and the food distribution led to overeating and obesity, in some parts of the world, and starvation, in some others.

[16] The European Council has adopted in June 2023 a position on the Draft Directive Proposal of the Commission establishing the status of the digital platform workers and the use of Artificial Intelligence in the workplace.

[17] The European Green Deal, adopted by the European Commission in December 2019. The act sets the roadmap to address climate change and environmental degradation.

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Not lastly, the production of subpar goods, especially in the food industry, is a significant source of waste, with most of the unfit products being discarded.

The most efficient nutrition solutions do not reside in legislative measures, education being paramount in this regard. The new technologies (Papastratis, Konstantinidis, Daras, et al., 2024) also enable solutions to the waste tendency.

3.2 Packaging

Packaging became important especially in recent years, in the pandemic context, setting a trend of individual wrapping for categories of goods that did not have traditionally distinct packages. The most important source of excessive packaging is the e-commerce (Guo, Wu, Tan, et al., 2023), most of the products are sold in resistant and sometimes even unnecessary boxes, or plastic covers. The e-commerce business model has not yet resolved the challenge of sustainability, considering how delivery works. Packaging, delivery to the door, and client assistance make sales easier, however, they simultaneously increase the volume of sales and the quantity of waste, increasing the volume of non-recyclable garbage.

The legislative solutions applied in the EU are inadequate for solving the challenge. For instance, the mandatory tax for plastic containers (such as bags, whether biodegradable or not) limits only in a small proportion of the waste. In fact, the measure is aimed to merely increase the cost, not to urge restraint in the use of packaging.

3.3 Sustainable Agriculture

The planet functions synergically, therefore all the endeavours aiming to ensure sustainability should be applied in a harmonised endeavour. This is not, however, the reality. In stark contrast with support legislation at the European Union level for the development of sustainable agriculture, including by special funding,[18] the lack of concern for sustainability in rural development, especially in developing countries, adversely affects the climate in other parts of the planet.

The actions taken under the United Nations auspices, signatory countries to the Paris Agreement (to which the European Union is a signatory member) attempt to substantially reduce global greenhouse gas emissions to enable the long-term global average surface temperature, by committing to increase it by 1.5-2°C, at most, above pre-industrial levels.[19]

Sustainable agriculture is the practice consisting of a system of farming that allows conserving resources for future generations. This should be the aim of agricultural production designed to provide for an increasingly populated planet. However, sustainable agriculture is not mandatory worldwide, the legislation only prohibits the production of food that raises health concerns.

Even though healthy food enables the reduction of health services costs and increases the well-being of the population, no worldwide legislative measures are boosting the observance of sustainability principles.

One example is the slow development of Fair Trade, a concept aimed at protecting farmers in developing countries from the predatory behaviour of the large companies acting as the purchasers of their products. While this should be the

[18] EU funding of 95.5 bn euros budget for the 2021-2027, available by means of 7-year rural development programmes from the European Agricultural Fund for Rural Development (EAFRD) includes an injection of 8.1 bn euros deemed to aid farming, by addressing the challenges raised by the COVID-19 pandemic.
[19] The Paris Agreement, adopted by United Nations in 2015.

commercial and environmental standard, it remains organised merely at the level of associations[20] which practice it to enhance their public image, comparable to an act of philanthropy.

3.4 Sustainable Forest Management

Sustainable forestry is the practice of managing forests to meet the current needs and desires of society for forest resources while preserving the forests. Despite the growing population of the world, waste in forest management still occurs, with the present technologies being able to replace some of the lumber and cellulose used in production, but not in their entirety.

Even though the legislation in the European Union,[21] as well as Member States level is strict in preserving the forests, regulating conditions of timber production,[22] as the cornerstone of ecologism, the challenges in the enforcement of said laws are symptomatic of the inadequacy of the solutions. The challenges in the application of the legislation emphasise the importance of the implementing action plan, such as the European Green Deal,[23] according to which an estimated 3 bn trees should be planted in the EU Member States by 2030.

3.5 Recycling

Recycling has developed into a distinct industry, generating products or components for various sectors, from packaging to electric and electronic products.[24] This economic activity is a sensible measure to increase economic efficiency while promoting ecology.

The European Union legislation emphasises the 'polluter-pays principle' the waste management resting with the original waste producer, which is responsible for this category of costs.[25]

Representing one of the main waste measures regulated at the EU level, in addition to prevention and preparing products for reuse, recycling is deemed as a better alternative to other solutions, such as recovery (whenever possible, such is the case of energy) and (even effective) disposal.

However, recycling does not get proper legislative incentives for the private sector to comply or enter the business. For example, the collection of waste, separated by categories, necessary to produce recycled materials, is not controlled by the recycling

[20] World Fair Trade Organisation is an NGO operating worldwide. For further details, please see https://wfto.com.

[21] Regulation (EU) 2023/1115 of the European Parliament and of the Council of 31 May 2023 on the making available on the Union market and the export from the Union of certain commodities and products associated with deforestation and forest degradation and repealing Regulation (EU) No 995/2010, Regulation (EU) 2018/841 of the European Parliament and of the Council of 30 May 2018 on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework, and amending Regulation (EU) No 525/2013 and Decision No 529/2013/EU.

[22] Regulation (EU) No 995/2010 of the European Parliament and of the Council of 20 October 2010 laying down the obligations of operators who place timber and timber products on the market.

[23] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Sustainable Europe Investment Plan European Green Deal Investment Plan.

[24] Directive 2012/19/EU on waste electrical and electronic equipment (WEEE), replacing the original WEEE directive (Directive 2002/96/EC).

[25] Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives.

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producers. The volume of supply is controlled by the market functioning, the interplay between demand and supply not being subject to control, in a free market, as well under the principle of free movement of goods.[26] However, notable efforts have been made in the EU legislation to enhance the cooperation between recycling and the production of EEE goods.[27]

In some other examples, the recycling (green) tax, prescribed by the national legislations according to the EU Energy Taxation Directive (ETD),[28] does not cover the process, nor the single-use plastics tax, a contribution to EU collected from the Member States since July 3rd, 2021, can reduce pollution, according to its scope. While the recycling of electronic and electric products exceeding the value of the tax and the recycling is mandatory for the producers, the legislation incentivises association with the scope of recycling and enables collusion between producers. These competition risks are confirmed by the case law of the competition authorities.[29]

4. CONSUMER BEHAVIOUR AND SUSTAINABILITY

Demand holds a great role in developing sustainability in the markets. Consumer behaviour has been integrated in market research and it has been developed into an entire field of research in behavioural economics (Thaler and Sunstein, p.7).[30] The research in this field seeks solutions that enable manipulation of the consumer choices for the benefit of the consumer. Listening to the consumer's needs and conduct in the market has an essential role with this end in mind.

4.1 Consumer Behaviour

In past business models, consumer behaviour was predicted by forecasts grounded on the *ex-post* analysis of the choices made by the consumers, whereas in current business models, consumer behaviour is manipulated.

Consumerism enabled the growth of markets and had favourable effects in the second half of the past century. In this century, this trend has greatly enhanced and led to waste and overconsumption.

4.2 Market for Lemons

There may be other circumstances added to the erratic consumer behaviour, such as the market for lemons effect (Bercea, 2015, p. 69). The undertakings compete in the markets to gain larger market shares, including by means of continuously lowering the prices of their products and the tariffs of their services. The direct result is a dramatic decrease in the quality of products and services, to match the prices or tariffs. The phenomenon also impacts the diversity of products and services by eliminating from the

[26] Provided in the articles 34 and 35 TFEU, according to which fiscal and non-fiscal barriers are prohibited in the trade at EU level.

[27] The stimuli include incentives for the recovery and reusage of the products, as is provided in the eco-design directive (Directive 2009/125/EC).

[28] Energy Taxation Directive (ETD) - Council Directive 2003/96/EC of 27 October 2003 restructuring the Community framework for the taxation of energy products and electricity is the European Union's framework for the taxation of energy products including electricity, motor, and most heating fuels.

[29] Romanian Competition Council, Decision no 8/2014, Decision no 10/2014 applying fines to undertakings, members of recycling associations for infringing art. 101(1) TFEU.

[30] The promoters of behavioural economics are the academics including professor Barry Schwartz and the Nobel prize laureates in economics from the University of Chicago, Daniel Kahneman, Richard Thaler, as well as law professor Cass Sunstein.

market the competitors that refuse or are not able to alter production to produce the same goods for cheaper costs. The markets become monopolistic, with the impact of offering <lemons> hindering competition.

The paradox of Akerlof's theory market for lemons consists in the negative effect of encouraging the practice of lower prices for the benefit of consumers, while getting an anticompetitive effect and adversely affecting the consumers.

Market for lemons is however encouraged by the consumers, seeking avidly or even obsessively the lowest price/tariff. Dedicated on-line platforms assist consumers in identifying the lower price, by comparing product prices and advertising the lowest price. Also, marketplaces favour the vendors offering the lower price, by not revealing essential information pertaining to the product characteristics, thereby leading to the false conclusion that the products are similar. In certain cases, the competition regulators act counterintuitively to accelerate the market for lemons effect. For instance, the Romanian Competition Council, which hosts on its website Monitorul Preturilor (Price Monitor[31]), a service that compares prices from several supermarkets, featuring the lowest price in the market for certain essential food products.

4.3 Vendors Influencing Consumption

One significant criterion in decision-making is information, the vendors being legally obliged to provide it. As the means of communication and technologies enabling the conveyance of information diversify, distortions become a recurring occurrence due to data misinformation and translation bots (Editorial Nature, 2024).

Undertakings contribute to challenges to sustainability by manipulating the choices available to the consumer, with the scope to increase consumption and waste. Such choices vary greatly from companies offering one product choice (as is the case for Aldi which offers one product of each kind/category) to tens of products (another large operator of supermarkets, Walmart, exposing the consumers to the largest possible range of goods), with both business models being successful. However, the wider the choice selection, the more difficult it is for consumers to decide which product fits best their needs. To enable this task, most of the online marketplaces provide search engines featuring selection filters, according to various criteria.

The linked sales represent another important source for overconsumption. Although they increase consumption and have adverse effects on the principle of a sustainable economy, they are only prohibited by competition law as abuse of dominant position[32], if they meet the conditions, including holding a dominant position, conditions difficult to be met in most of the relevant markets, due to the dynamicity of economy and the relatively high market share thresholds. This condition significantly narrows the application of sanctions and lowers the dissuasive effect on illicit behaviour.

Cognitive traps (Dobelli, 2013) also prevent consumers from making wise choices, however consumer awareness is of interest to the legislator only if distorted by the trader. In fact, the consumer is protected by the specific legislation only for the manifest abuse of the traders.

[31] See https://monitorulpreturilor.info.

[32] According to art. 102(d) TFEU, it constitutes abuse of dominant position making the conclusion of contracts subject to acceptance by the other parties of supplementary obligations which, by their nature or according to commercial usage, have no connection with the subject of such contracts.

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4.4 Artificial Intelligence and Consumer Behaviour

Algorithms "pick-up" consumers' preferences, enabling the process of identifying the most suitable product for the customer's needs. However, the next step used by the traders in tailoring their offers is profiling the customers. For this scope, the AI collects and analyses personal data to establish the customer's profile. The new technologies enable the employment of complex information to design targeted ads, whereas companies on some occasions fund online misinformation, algorithmically distributing advertising across the web (Ahmad, Sen, Eesley, et al., 2024).

The targeted ads cross the threshold and, instead of assisting the consumer to pursue more suitable purchasing choices, they enable waste and erratic consumer behaviour by enticing buying products or services that the consumer initially did not desire. Still, the AI-based business models ignore the threats to the environment and incite overconsumption (Stuart, Gunderson and Petersen, 2020), most likely accentuating the trend in the foreseeable future.

4.5 Solutions to Excess Consumption

The non-legislative solutions to avert consumerism as a behaviour pattern include the <all-in-one> products. The development of such goods could be a market solution to excessive consumption. For instance, from cellular phones to smartphones, the market has changed so that one product would replace a phone, a miniature TV set and radio, a high-performance camera, an e-reader, and a small computer. In this sense, consumer education on social and economic responsibility is far more effective than legislation imposing obligations for the producers and indirectly influencing consumer behaviour.

Not only multi-use products, but also conversion of products could be a solution to recycling, which is less cost efficient and difficult to enforce by legal provisions. The legislation at the European Union level emphasises the importance of reusing products, by mandating the repair of certain categories of products enabling the prolongment of their use.[33]

A sector that has been heavily impacted by the consumers' waste habit trends is the fast fashion sector. The fashion in garment products (clothing and footwear) encourages the seasonal change of wardrobe, while the fashion industry renders it affordable for customers (Drew and Yehounme, 2017). Fast fashion is forecasted to triple the resource consumption by 2050, by reference to 2000, currently amounting to 5% of the global carbon emissions (considering the transportation carbon footprint) (Editorial Nature, 2018). As 60% of the garments are disposed of by incineration within a year of their production (Remy, Speelman and Swartz, 2016) and the increasing number of customers of fast fashion worldwide, the trends are likely to maintain.

The market for lemons phenomenon also leads to waste and disregard for environmental preservation. The epitome of the adverse effect of lowering the prices and the quality of products is the so called <fast fashion> industry, a concept invented by companies such as SheIn, a producer of clothing products, which places on the market thousands of new products every day, at very low prices. The predatory behaviour of this company enabled its leadership in the market.

[33] Commission Implementing Decision (EU) 2021/19 of 18 December 2020 laying down a common methodology and a format for reporting on reuse in accordance with Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives.

5. LEGISLATIVE SUPPORT IN SHAPING THE BUSINESS MODELS

As ecologic, economic, and socio-cultural sustainability represent prerequisites of desirable business models, to achieve this goal, complex and coordinated measures are to be adopted.

The legislative actions at the EU level aim to prevent and mitigate pollution, and enable workable competition in the relevant markets while protecting the customers' legitimate interests. However, the legislation has yet to resolve the issues arising from the employment of new technologies, such as the ones based on Artificial Intelligence, with these technologies remaining difficult to control.

5.1 Regulation and Application

The law is powerless without appropriate application. Therefore, there are two categories of challenges attached to legislation: both the legislators, on the one hand, and the European Commission and the national regulatory authorities, on the other hand, have a duty to ensure that technology may not harm humanity and to guarantee the sustainability of the markets.

The first tier of challenges pertains to the legislative process. The examples above indicate that the concern focuses at the EU level on the legislation that imposes certain obligations to the undertakings operating in the relevant markets which are challenged from the perspective of sustainability. Although this process is democratic, transparent, and subject to verification by preliminary feasibility and impact studies, there is still the risk that the legislation is inadequate for real life, with respect to new technologies. For instance, it is difficult to strike a balance between the benefits of using drones, especially from the economic perspective, and the jeopardies ensued from their circulation, especially from the public safety perspective. The advantages and the risks render difficult the regulation of the use of autonomous drones.[34]

The second-tier of challenges is arises from the application process. Most of the technologies produce immaterial products and services, with some being recorded in independent ledgers that cannot be controlled by the state to verify the observance of laws (Pałka, 2017, p. 205). The difficulties in the application of the law prevent the deterrent effect sought by the law when prescribing certain conduct. Even though important steps have been taken to regulate the use of AI in administration.[35] The standard of conduct in using AI in services availed to the population by the public administration (Bignami, 2022) should be matched by the private services, in order to achieve consistency and ethical behaviour towards the population.

On the one hand, there is difficulty in drafting legislation effectively, on the other hand, there is also difficulty in properly implementing it. To the two categories of challenges, a third tier of challenges is added to the judicial process. The power of justice lies in its enforcement capabilities. The legislative, administrative, and judiciary bodies lack the technological knowledge to ensure the proper understanding of digital businesses. The problem is endemic, as, for instance, how the technology works is at the

[34] The base legislation includes the Commission Delegated Regulation (EU) 2019/945 of 12 March 2019 on unmanned aircraft systems and on third-country operators of unmanned aircraft systems, and the Commission Implementing Regulation (EU) 2019/947 of 24 May 2019 on the rules and procedures for the operation of unmanned aircraft.

[35] Such being the case of AI in Government Act passed by the US Congress in 2020, which established an AI Center of Excellence, that is a program in General services Administration.

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core of the case, and the opinion of one or several legal experts would not be a specific, individual matter, hence transferring to the expert the power of judging the case.

Also, at the rate the technology is developed, it is unlikely that the law and its application will keep up the pace. For instance, when the pandemic started, in early 2020, emergency legislative measures had been taken at the member states and EU level, to contain the surge of contamination, and many undertakings had been adversely affected, consequently, by such measures.

The State aid measures granted by the Commission, having as grounds the State aid Temporary Framework adopted on 19th March 2020,[36] enabled Member States broad flexibility foreseen under State aid rules to support the economy in the context of the coronavirus outbreak.

The Commission issued 408 decisions for State aid measures, approving 497 national measures notified by 27 Member States and the United Kingdom, amounting in 2020 to 332 State aid decisions adopted under the Temporary Framework, and 76 State aid decisions adopted directly under the Treaty, and 16 Decisions adopted by the Commission Banking State aid cases, availing approximately 3.08 bn euros to distressed undertakings, as results from the Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions (European Commission, 2021).

In the context of the severe health threat to which the EU population has been exposed, and considering that many undertakings were in distress or even on the verge of exiting the market due to the restrictions, the Commission's prompt reaction should be analysed in the context and welcomed, as it certainly prevented the possibility that more undertakings exited the markets (Derenne, 2020, p. 63). However, considering that the State aid measures were granted within a short timeframe and in urgent conditions, and, most of all, that the economy has suffered radical changes, the relief might not have been adequate support during the pandemic restrictions.

The pandemic permanently changed certain market trends and conditions. Especially, the many adjustments of the services markets had permanent effects (for instance, the airlines changed their business model during the circulation restrictions and never reverted some of the deviations in their service supply, after the restrictions were lifted).

5.2 Climate Protection Legislation

The legislation aimed to map the transition to climate neutrality in the European Union is set in place,[37] however, climate protection does not occur in a bubble at the level of one small continent, but in the worldwide context, the harmonious blend of adequate measures in urban and rural areas leading to integrative results (Kaklauskas, Abraham, Kaklauskiene, et al., 2023).

Aiming to stimulate the use of renewable energy, decrease carbon emissions, and antipollution, legal measures often imply restrictions without offering viable alternatives. For instance, the Commission sets calendars[38] for the undertakings in the

[36] Communication from the Commission Temporary Framework for State aid measures to support the economy in the current COVID-19 outbreak 2020/C 91 I/01.

[37] Proposal for a Regulation of the European Parliament and of the Council establishing the framework for achieving climate neutrality and amending Regulation (EU) 2018/1999 (European Climate Law).

[38] Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No

relevant markets to implement efficiency standards in heating, ventilation, and air conditioning systems (HVAC) that are based on technologies not yet invented. The high level of emissions requires this to be addressed instantly, even though the economic activities that are not energy efficient are deemed to meet the basic needs of the consumers. Among the consequences of such requirements, an increase in competition and innovation may be noticed.

In another example, the <rush> for electric vehicles replacing the more polluting ones has not yet considered long-term impact on the environment, such as the discharge and the recycling of their batteries. In achieving climate neutrality goals, a shift from the use of fossil fuels in vehicles to electromobility is one of the prerequisites, incremental steps being taken in enabling sustainability by means of legislation.[39] From another perspective, the autonomy of electric vehicles has significantly improved, compared with the initial commercial models available on the market, however, the battery charging infrastructure is not yet developed in all the Member States to the level that the purchase of such vehicles would be desirable for all customers.

Pursuing the creation of pollution-free urban areas, some cities adopted legislation to create green zones in their centre. Such measures, even though noble in scope are difficult to implement on their own. When aiming to render pedestrian a central zone, simultaneously surrounding roads having the capacity to prevent traffic jams should be created, as well as parking lots in their vicinity, to enable access to the restricted area. In another example, some cities are planning to incentivise living within the work area, to mitigate the work-related commuting of the population. In the context of freedom of movement for workers, a fundamental principle of the European Union,[40] a legislation solely based on incentives might decrease, if not eliminate, the commute.

5.3 Gatekeepers' Control and Compliance

The legislative efforts to regulate new technologies include the unification of legislation. In this sense, an important step has been taken by the adoption of the Digital Markets Act (DMA)[41] and the Digital Services Act (DSA).[42] The considerable power of the undertaking controlling the access to the markets led to the solution of designating such undertakings as <gatekeepers>, the Digital Markets Act setting the following criteria for including undertakings in this category: their significant impact on the internal market, providing a core platform service necessary for business users to contact end users, as well as enjoying that durable position for the foreseeable future. The European Commission has designated six gatekeepers: Alphabet, Amazon, Apple, ByteDance, Meta, Microsoft. Also, 22 core platform services provided by gatekeepers have been designated to comply within 6 months with the Digital Markets Act (DMA).

715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council.

[39] For instance, the increase of storage by embedding batteries to the Regulation of the European Parliament and of the Council concerning batteries and waste batteries, amending Directive 2008/98/EC and Regulation (EU) 2019/1020 and repealing Directive 2006/66/EC.

[40] Enshrined in article 45 TFEU.

[41] Regulation (EU) 2022/1925 of the European Parliament and of the Council of 14 September 2022 on contestable and fair markets in the digital sector and amending Directives (EU) 2019/1937 and (EU) 2020/1828 (Digital Markets Act).

[42] Regulation (EU) 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market for Digital Services and amending Directive 2000/31/EC (Digital Services Act).

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Notwithstanding the objectivity of the criteria and the threats imposed by holding the position of gatekeeper, it is unclear how the DMA prevents the expansion of the number of undertakings to be considered as gatekeepers, as well as providing assurances that the undertakings that are not yet qualified as such would not pose competition risks.

This legislation is not however deemed to address directly sustainability concerns, but only in an indirect manner, by protecting the relevant markets – it preserves workable competition in the digitalised markets, and by protecting the consumer – it safeguards the legitimate aspirations of the population in the European Union to benefit from well-being and safety.

5.4 Sustainability Measures for Disruptive Economies

Yet the new technologies-based businesses that have broader applications than e-commerce and develop Artificial Intelligence are to receive integrated, harmonious legislation. The need for tough regulation for sensitive sectors is imperative, considering that products manufactured outside the European Union are present on the internal markets, and such products may not be under sustainability scrutiny in the countries they originate from.

This effort should be coordinated at the European Union level, though national legislations must complement the EU legal provisions with legislation not falling under the prerogative of the European Union. For instance, theft of energy, causing electric energy supply shortages or malfunctions, and manipulating the energy market require dedicated legislation at the Member States level, due to the criminal nature of such rules.

In another example, considering the extensive use of cryptocurrency as a means of payment and the accounting schemes enabling payment via off-shore companies or non-profits, more efficient fiscal legislation and its enforcement should be sought.

5.5 Sustainability Education

The limits of the legislation in achieving the sustainability goals are evident. In addition to the legislation regulating the new technologies to enable sustainability, other measures may be taken, such as public awareness of the impact of consumer behaviour.

Individual consciousness has a paramount role in ensuring a sensible life on the Planet. Every individual on the planet has a sustainability duty and a role to foster the environment. For instance, disposing of the waste separately cannot be ensured solely by legislation. The human consciousness is still at peril, considering the role of Artificial Intelligence is not yet determined (Falque-Perrotin, 2017), even though the new research comes at tremendous speed (Mantello, Ho, Nguyen, et al., 2023). However, more steps are required for education with this scope of the population of the European Union. Many of the national legislations do not organise education in public schools to prevent waste or to better manage personal finances. Sustainability may only be achieved through increasing awareness about the challenges.

6. CONCLUSION

Humanity may be in peril, in the current conditions of exploiting the Earth, considering the enormous risks of catastrophic climate events and the ecology risks entailed by the increased carbon footprint. Certain signs of these predictions result from the recent dramatic climate changes and events.

The sustainability requirement from the perspectives of ecologism, economic efficiency, and socio-cultural imperatives requires legal solutions having stronger compliance and enforcement. The European Union legislators and regulators are the first lines of action with this scope, though each member State should concentrate on harmonising their legislation with this goal.

In a century where technological progress profoundly changes the social, political, and economic environment, ignoring the trend is not a valid solution. The role of research in identifying the best legal solutions is paramount because it enables a better understanding of the challenges and supports efficient solutions to the problems.

Failure to regulate sustainability solutions adequately has as a consequence alternative solution. To this end, more education should be ensured, at least in the Member States of the European Union. Ignorance is not bliss.

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