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# Is Economic Theory, Presented in Basic Academic Textbooks, Applicable to the Digital Economy?

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**Abstract:** With the aim of improving modern methods for educating economists, the authors in this paper impose the following topics: What do we want to teach students, and do we teach them the right things? How transformative are our fundamental textbook bases to offer the new knowledge that the digital economy imposes? Bearing in mind previous questions, the aim of this paper is to highlight the gap that exists between economic theory and economic practice in terms of insufficient theoretical scope of the digital economy (DE) and its study, and DE's increasing participation in global practice as an economy based on innovation and new technologies. In the analysis, the authors concentrate on two levels: (1) they analyse the specifics of DE and in that context, they evaluate the applicability of traditional economic theory; (2) they review the representation of DE in university textbooks. Based on the results, the authors conclude that DE possesses specific attributes, and it is necessary to include these as mandatory lessons in university textbooks on the level of basic studies. They suggest some areas for which economic theory should be better explained and supplemented in future research (proposing appropriate guidelines for future efforts in theoretical work). Moreover, through a systematic literature review, the authors approach 90 basic university textbooks in economics and by analysing their content, they prove that DE is not sufficiently represented in them. The results of the paper suggest that economics textbooks, and thus the curricula of basic studies, should be supplemented with chapters on the digital economy, which will affect the modernization and adequacy of theory with practice.

**Keywords:** digital economy; economic theory; economics textbooks; principles of economics



**Citation:** Lazovic, V.; Rondovic, B.; Lazovic, D.; Djurickovic, T. Is Economic Theory, Presented in Basic Academic Textbooks, Applicable to the Digital Economy? *Sustainability* **2021**, *13*, 12705. https://doi.org/10.3390/su132212705

Academic Editors: Simona Sternad Zabukovsek, Jarmila Zimmermannová and Samo Bobek

Received: 2 October 2021
Accepted: 11 November 2021
Published: 17 November 2021



## 1. Introduction

The digital transformation has had significant effects in terms of improving methods and tools in the process of educating economists. At the same time, the fundamental changes that digital transformation has made in economic processes and the principles of functioning of the modern market, which represents a great challenge in the development of the economy as a science, are of enormous and primary importance. Therefore, in the context of improving education of modern economists (in the focus of their abilities, competencies, knowledge, and skills), one should understand, in theoretical and essential sense, the changes caused by digital transformation in the subject of their study, i.e., the principles of modern market functioning.

Professors of basic studies of economic, very often cannot offer students a complete answer to questions related to modern economics, which, thanks to new technologies, functions in a different way from what they can learn from textbooks. Modern economy based on innovations, knowledge, and technology, appears in the literature through different concepts and names within which similar or the same contents can be found. Thus, Atkinson and Ezell [1] talk about the Economy of Innovation, and for Gordon [2] it is a New Economy. Drucker [3] conceptually announced the New Economy as a Knowledge

Economy, back in the 20th century. For Rifkin [4], the Network Economy is at the forefront. However, in recent years in practice, and even in theory, the term Digital Economy is increasingly mentioned [5].

Digital Economy refers to "an economy which functions primarily by means of digital technology, especially electronic transactions made using the internet" [6]. The Digital Economy is treated as a new, post-industrial global economy, based on internet transactions and advanced technology, i.e., as a global network of the economic activities based on information and communication technologies, or more simply, as economy based on digital technology [7]. Despite the fact that it is very present in a practical sense, the term DE is still shyly, in a categorical, conceptual, and essential sense, mentioned in journals and professional literature. Therefore, the aim of this article is to contribute to the affirmation of this type of economy.

During the COVID-19 pandemic, the importance and potential of the digital economy (DE) in the functioning of modern society came to the fore. For more than two decades, this economy has existed not only as a form of doing business but increasingly as a new form of market structure, rules, and principles. In this sense, a number of world-renowned authors with their works and books have significantly contributed to the conceptual and essential understanding of the DE [5,8–11]. Despite this, there are still a lot of unknowns associated with the DE.

From year to year, the number of companies participating in the DE has grown, as well as the total turnover generated by the DE globally, which reached 15.5% of the world GDP [12]. Moreover, it is estimated that the DE is growing seven times as fast as the rest of the economy [13]. Research made by Yousefi [14] confirms that developed countries benefit more from digitalization than underdeveloped ones. At the same time, the DE has more effect on growth and the overall economy than traditional statistics can identify because there is still no developed analytical and methodological tool that can capture all the effects that the DE achieves [15]. Therefore, in the conditions of the DE, GDP becomes a peripheral economic indicator [16]. This problem is at the centre of many research works and papers, which result in interesting proposals, which are, for example, directed to 'new insights for measuring the digital economy which provide insight into integration of national accounts with product-oriented micro-analysis efforts' [17,18].

There is a wide range of other approaches that try to identify and model the impact of the DE on modern society through the technological, economic, and social dimensions. In recent years, this spectrum has started from scientific papers in which, for example, the economic impact of digital technologies [19], and the significant impact of the DE on employment and creative knowledge jobs is especially noted [20]. Moreover, there are papers which, for example, analyse the impact of digital platforms on the sharing economy [21], and those which deal with the influence of the DE on the fundamental theoretical debates of the neoliberal approach [22].

In line with the previously explained significance and growth of DE, a question arises that is in the focus of this work: Is DE studied sufficiently in undergraduate economics study programmes and is there any need to study it at all (do we need to know it to guide its development), and do basic economics textbooks adequately cover this field? This is a question that concerns both professors and students of economics. So, there is awareness of the economic effects of digitalization (not only in practical, but also maybe in theoretical terms), but first year economics undergraduates still do not study DE to a sufficient extent. The key question: Is this statement correct, and what actions can we implement if so?

The sequence imposed by the research logic, relevant for testing this hypothesis, requires answers to the following research questions:

RQ1: Is DE so different from the traditional one that there is a need for a special study treatment? And,

RQ2: Is DE studied enough in basic studies of economics or is it sufficiently represented in basic economics textbooks?

There are papers and research in the literature showing that textbooks and curricula lag behind the most modern economic theories. Thus, Ferguson [23] identifies six areas: game-theoretic modelling, collective-action problems, information economics and contracting, social preference theory, conceptualizing rationality, and institutional theory. He offers suggestions for incorporating these into the undergraduate lessons at various levels. Madsen [24] investigates how the financial crisis is studied in textbooks on the principles of economics, and concludes that it is not adequately covered. Fike and Gwartney [25] analyse Public Choice, Market Failure, and Government Failure in Principles Textbooks, as topics that are not sufficiently covered. Some authors analysed the teaching practices in economics in existing literature and found that the lecture method continues being the preferred method of instruction in economics [26]. Economics textbooks, as Colander [27] concludes, are not easy to change, because they are linked to institutional structure, but any slight evolutionary shift is relevant.

It can be noticed that in the available literature, there are no papers discussing the inclusion of DE in basic economic textbooks in the provocative, but also constructive way, that the authors present in this paper.

In accordance with the previous, the following goals of the research paper have been recognized:

1. Identify the specifics of the DE in terms of product character and production organization;
2. Indicate changes in the market structure under the influence of the DE, as well as differences in the functioning of the digital market compared to the traditional market;
3. Register some of the areas that are important for studying DE and suggest topics that should include a chapter on the digital economy in economics textbooks;
4. Point out the importance of knowledge in the field of DE in the modern education of economists and their training to function in the conditions of increasing growth of the digital market;
5. Create a model—a way to check the representation of the digital economy in the basic academic education of economists;
6. Conduct a systematic review of the literature and make a selection of representative textbooks related to the basics of economics and through individual content analysis, check the presence of digital economy problems in them, i.e., whether basic university textbooks treat this area sufficiently.

The paper is organized as follows: in Section 2 the authors give a description of the methodology used in the paper, in Section 3 the results of the analysis are presented and through discussion, elaborated on the achievement of work goals, and Section 4, covers the conclusion with recommendations for further research.

## 2. Methodology

In search of an adequate answer to the research questions, two levels of qualitative analysis will be applied (Figure 1). The answer to the first question requires an analysis—a cross-section of the novelty in the essential sense that the DE brings with it, and whether this can be covered by traditional economic analysis. Therefore, the authors will first turn to scientific discussions on this topic in order to later focus on the specifics of the DE that require a new (different) analysis and approach to study. To achieve this, a descriptive approach was applied, directing it, as far as possible, into the context of theoretical analysis. According to Jasso [28], there are two main activities of theoretical analysis: (i) speculative thinking, whereby the theorist identifies the starting ideas for the postulates; and (ii) formal reasoning, whereby the theorist constructs the postulates and derives predictions from them. Using existing knowledge (views of well-known scientists and researchers, books, studies and articles on this topic), guided by the objectives of the research, the authors tried to follow the logic of this method: (i) that the assumption set be as short as possible, (ii) that the observable implications be as many and varied as possible, (iii) that the observable implications include phenomena or relationships not yet observed [28].

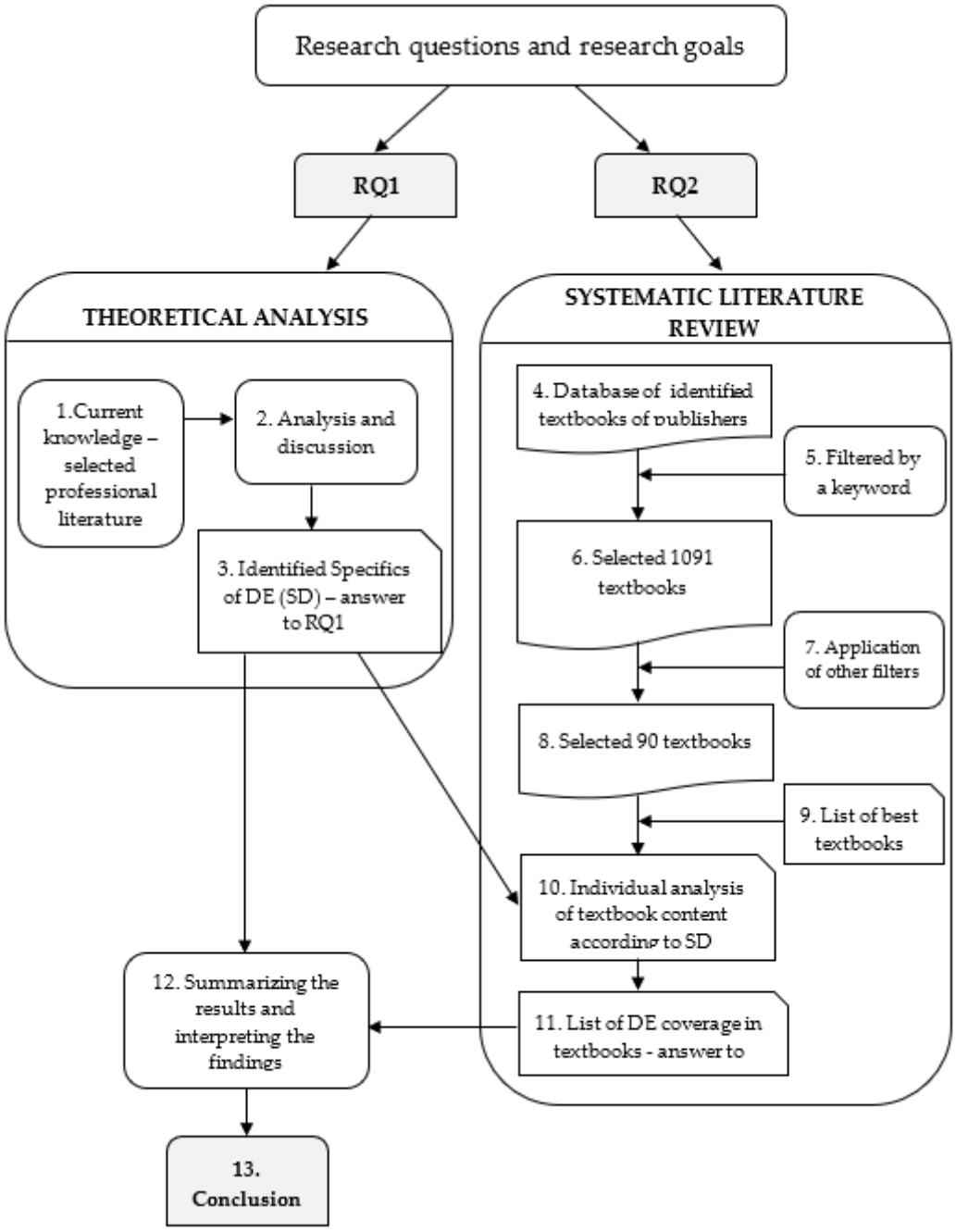


**Figure 1.** Suggested research model.

The answer to the second research question will be searched through a systematic literature review (SLR). Other methods are also available, primarily statistical methods based on the theory of the relevant sample (a representative sample of textbooks would be selected and their content analysed) as stated in Bourchtein [29] or in Bäuerle [30]. However, sample formation can be achieved by SLR, as selection and filtering leads to a quality sample based on which processing can lead to conclusions with a high degree of reliability. The SLR is used because it has been shown to be useful in other studies of a similar nature [31,32]. In its conceptual and methodological basis, SLR is conceived as a useful tool for such requirements. Therefore, the systematic review was initially approached [33,34], adjusted to the research of this paper, and it consists of the following steps: (1) defining appropriate questions for a review, (2) defining review protocol, (3) defining the textbooks' selection criteria and process, (4) assessing the quality of textbooks, and (5) summarizing the results and interpreting the findings.

Review protocol that includes research questions, search strategy, book selection criteria and process, quality assessment, data extraction and synthesis are presented through Figure 1. Figure 1 shows that the review protocol from SLR is crossed with the results from the theoretical analysis which arises from the RQ1.

*The Search Strategy and Textbooks' Selection Criteria*

In order to find out whether the chapter on DE is represented in the basic university economics textbooks, a search of several most famous publishers of university textbooks and educational online platforms was performed. A similar approach is used in the analysis of the economic textbooks that was conducted [35] and proved justified.

To collect the materials for basic economics textbooks, a search database of the following best publishers of academic textbooks was performed: (1) Cambridge University Press, (2) Oxford University Press, (3) Routledge of Taylor & Francis Group, (4) Princeton University Press, (5) Pearson, (6) McGraw Hill, (7) (8) WW Norton & Co., and (9) Wiley. The search was performed in February 2021.

This search has included both printed and electronic editions of textbooks. In addition, the Cengage Learning and Macmillan Learning educational platforms were included in the search. Finally, the results were also supplemented with an overview of basic economics textbooks used at the top ranked universities in the field of economics, as well as with available recommendations for the best economics textbooks.

To conduct the previously explained search, three types of filters were applied:

First, as a basis for the search, the authors used textbooks that include the following words in their titles: economics, basics of economics, principles of economics, and introduction to economics. As the topic of DE touches upon the field of micro and macroeconomics as well, it was taken into consideration the search based on the following terms: macroeconomics, microeconomics, principles of macroeconomics, principles of microeconomics, introduction to macroeconomics, and introduction to microeconomics. Through these 10 keywords in the title search, a wide selection of textbooks relevant to the analysis was created.

Second, given the goal of the search and the fact that the digital economy has been discussed much more frequently since 2010, the search was limited to textbooks published from 2010 to 2021.

Third, English editions of textbooks are considered as relevant. This can be treated as too rigid and restrictive a criterion, but a different analysis would be very complex and difficult to perform. This filter is imposed by selecting the publishers from the previous iteration.

Other phases and presentations of SLR results are given in Section 3.2.

## 3. Analysis and Results

### *3.1. The New Matters That the Digital Economy Brings in Practical and Theoretical Terms*

In order for the DE to require special interpretation and study, i.e., an economic analysis which is different from the traditional lessons of economics, then it must be proved that in terms of the character of goods and products, as well as in terms of the structure and functioning of the market, it is significantly different. The specifics of the DE derive from the specificity of information as a commodity and the specificity of the network as a market. Can the existing economic theory (the one studied in economics studies) be applied to the DE?

Analysing the views of several authors on the need for a new economic analysis, it can be seen that dissatisfaction with the inappropriateness of economic theory began long before the web economy was in full swing; and not just from anyone. Thus, when receiving the Nobel Prize, North [36] expressed an unequivocal position on this issue, claiming that neoclassical economic theory is an inadequate tool for analysing and recommending policies that will encourage economic growth. Classical analysis deals with the functioning of the market, not the development of the market. With an attitude of how it is possible

to prescribe policies when you do not understand how the economy develops, North announced a scientific revolution that was later joined by other well-known economists.

In this context, Romer's [37] contribution via his treatment of technology and economic growth is unavoidable, in which he states that an economy based on information will exhibit different behaviours than an economy based on the production of goods and services.

Other authors similarly define, because they believe that, due to the specificity of DE, a different analysis and interpretation is required. Thus, Benkler [8] emphasizes that the emergence of the DE developed possibilities that directly arise from our economic understanding of information and culture as objects of production. At the same time, the networked environment enables a new modality of organizing production: radically decentralized, common, and unprofitable, based on the exchange of resources and results between widespread, loosely connected individuals who cooperate with each other without relying on market signals or managerial orders. Benkler calls this production 'commons-based peer production'.

In this paper, the previous views will be tested with additional analysis that should confirm: (1) that a product in the DE is significantly different in an essential sense (i.e., has such a character and such features) so that its theoretical coverage would require a different approach or different economic analysis; (2) that the structure and way of functioning of the market has changed, so a fundamentally different approach is required when studying market phenomena and processes.

Information (ideas and knowledge) with its phenomenological nature represents the essence of the DE. As a product, it has a different content, appearance, different production, storage, distribution, and consumption. Information is an inexhaustible resource, its value increases by sharing (i.e., spending), it can be used by multiple consumers (better to say: millions of consumers) at the same time, and the costs of multiplication are negligible and minimal. In that context, Shapiro and Varian [11] cite three essential specifics of information as non-rival and non-exclusive goods: (1) information is costly to produce but cheap to reproduce, (2) information goods involve high fixed costs but low marginal costs, and (3) information is priced according to its value not to its cost. The above leads to the conclusion that the product (and also the raw material) in the DE is significantly different from what the same term refers to in the traditional economy. Is that sufficient to say that the DE requires a different analysis and theoretical treatment?

Information, as a raw material and a product, gains additional power thanks to technology. In the DE, thanks to the dynamic network, the structure and way of functioning of the market have changed. As previously stated, these changes are of such a nature that different rules of market functioning can be discussed, as well as the need for a new approach in the interpretation of economic phenomena and processes [8,38]. So here, to serve this analysis, is a short, mostly well-known, specification of these changes, simplified and systematized by individual segments of layered market relations [39].

The supply side of the market is being transformed by the emergence of a new form of products and services with a specific character and purpose. Digital, virtual, and imaginary products and services, produced and offered by digital, virtual producers, are appearing. At the same time, it is not only a question of the technological form, presentation, and distribution of these products, but also the character and the way of their consumption which determines the production process, relations in it, and the type and structure of the offer. This is accompanied by processes of specialization, concentration, and even monopolization of all segments of digital business.

The digital market is also a completely new demand side of the market. It is a global market for virtual customers, both individuals and companies, and both well-known and anonymous. This market is commensurate in size with the number of internet users. It is a market of well-informed, discerning, highly demanding consumers who take advantage of global competitiveness. This is why, in terms of information asymmetry, the responsibility of bidders who address this market has increased. The demand side of the market has its

own rules and it, in the same manner as the digital supply side of market, does not know the determinants locally, nationally, and regionally.

Digitalization has revolutionized brokerage and sales channels. The abolition of intermediaries significantly accelerates turnover, and it occurs at a much lower cost, becomes more efficient, comfortable, and high-quality; a symbiosis is achieved through the maxims 'the buyer goes to the seller, and the seller goes to the buyer' and 'the buyer becomes a worker at the seller/manufacturer'. Moreover, digitalization has caused changes in payment methods. Electronic money, and digital and mobile payments bring significant diameters to cash flows and global trade. Blockchain technology and cryptocurrencies impose different standards and transform the essence of the traditional institutional concept of a monetary economy.

Changes in management and organization are reflected in such a way that the emphasis is no longer on inherited power, hierarchy, and structure, but on dynamics, innovation, ideas, and flexibility. What once used to be a company is now a knowledge worker, as an individual, a generator of values, a production point in a networked economy. Therefore, the line of separation between management levels is dominantly erased, according to the principle that strategic management is experiencing a digital transformation, tactically; middle management is reduced or it disappears, and operational management is automated.

In the DE, the labour market is global, i.e., the workforce is a global resource, because in the digital business mode, all online workers are available for engagement to every company (or knowledge worker). As knowledge workers are networked, they do not need costs for premises and travel to work, etc., so there is a significant reduction in costs. Finally, in order to identify the effects of the DE (and working from home), a change to the standard division of the structure of the economy into three sectors is suggested by including a fourth sector, as well as the relativization of classical economic aggregates.

The fact that the digital market is networked and global, represents the biggest structural and conceptual leap compared to the standard notion of the traditional market. It can be said that everything that we presented was more a description of the phenomena of the DE and observed changes in the market structure than an essential economic analysis that would address issues such as: supply and demand, price, productivity, value creation, and competitiveness, etc. Therefore, in order to complete the previous approach, the differences (where they exist) in the basic categories and concepts between the traditional and the DE will be pointed out. It is not the intention to disavow and devalue such a sublime science as economics, but rather to point out the need for the special treatment and study of the DE.

The DE is not only an economy of scale, but also an economy of abundance. Marginal costs tend towards zero, as Rifkin [38] states, due to the technological platform, growth of competitiveness, productivity, and efficiency. Moreover, as they would add, because everyone loves to receive something for free. The dynamic network is imposing an economy of free products. Thus, an army of consumers, which is constantly growing, by using free products and services, imposes a different logic of economic processes and legality. We are used to the fact that value in the traditional economy, i.e., the price of goods, was predominantly associated with scarcity. In the first lessons of economics, we are taught that economics is the science of the rational distribution of scarce resources [40]. In contrast, the DE is characterized by abundance [10]. The economics of abundance is different from the economics of scarcity, so it cannot be fully identified with the scale economy, as it is interpreted in the framework of traditional analysis. It should be borne in mind that the new economy is the economy of sharing as well, and that all its logic and the process of functioning as a production model imposes CBPP (commons-based peer production) [8]. Furthermore, the DE's pricing policy should be interpreted differently from the supply–demand relationship [10], so standard equilibrium models cannot be applied.

Value in the DE is created by the human brain, computing resources, and network systems that unite and connect them. What is new here then, if (so far) analysis of the traditional economy, in addition to physical capital and natural resources, has also identified human capital and technological knowledge as a source of growth? The novelty is that the

human brain in the DE is a direct productive force. As we have stated, networking and technology have helped to exploit this resource to unprecedented proportions. The human imagination as an inexhaustible reservoir of innovation becomes an important factor of productivity, competitiveness, and thus growth, which means that not only is productivity based on technology important, but productivity based on knowledge is also important. At the same time, the issue of registration and coverage of the contribution of the intangible and virtual economy and its effects is still open.

Divisible digital products and the economics of their creation, distribution, and consumption impose a different nature of exchange and market relations. That market does not strive for perfect competition but for monopolization [10], or as Wang and Zang [41] state, instead of competition, the internet creates a system of winning companies, stating that: 'The Internet is changing the shape of the demand curve in favour of targeted products.' That is—the superstar effect dominates the long-tail effect. According to the 'winner takes all' theory in the initial phase of using the internet, competition can be fierce with a large number of participants, but later a few large companies, or only one, crystallize out and the market space for others narrows dramatically.

It can be concluded that the digital market is both global and networked, based on the different interactions of its constituents, in the sense of its organization, communication, and interest. Therefore, the authors conclude that the structure and principles of the functioning of the digital market are a necessary lesson in the first years of undergraduate studies in the process of educating future economists.

Based on the previous analysis, primarily due to the specifics and different functioning, it should be considered extremely useful to pay as much attention as possible to the study of the DE within undergraduate studies of economics. Emphasis of the differences brought by the DE, as well as the need for special treatment or even different economic analysis, is unavoidable in order to be able to give a quality interpretation of the DE. At the same time, the need to study the issues—the principles and laws according to which the DE operates separately—arises not only because of their diversity, but also because of the growing importance and participation of the DE in the overall economy. Statistics suggest that the DE is becoming an increasingly dominant form of economic activity day by day. It is estimated that by 2025, the DE will account for about 25% of global GDP [42]. What is more, as already seen, the expert public agrees that the DE has more effects on growth than the official statistics record and the traditional economic indicators suggest [15].

Finally, in this context there are three, and even many more (some were highlighted earlier), interesting topics that confirm the need for additional discussion and the need for special treatment of DE. Following the previous analysis, these topics will be shortly discussed here:

1. Production and production costs in the DE have a different economic nature than in the traditional economy. The question is whether the models—production functions and cost theories (total cost curves and marginal cost curves)—from the analysis of the traditional economy can be applied?

The basis of traditional microeconomics primarily includes the theory of the firm that is founded on the production function and profit-maximizing theory including well-known cost curves (average total cost curve—ATC, marginal cost curve—MC, and average variable cost curve—AVC). These models and theories are based on some traditional assumptions. In this way, the production function is the relationship between the input elements for production and the quantity of output obtained. The ATC is the ratio of total cost and total output, and it is U shaped. In other words, there are two opposing effects of increasing output, the spreading effect, and the diminishing return effect. Further, the MC becomes upward sloping because of diminishing returns and the ATC increases because of increasing marginal cost (e.g., production of automobiles).

In the digital economy, as we stressed earlier, we have information as non-exclusive, non-rivalrous and inexhaustible good. The nature of its consumption is different (it is not destroyed, but replicated by consumption). In this way, a great challenge for traditional mi-

croeconomics is represented by marginal costs, because in the digital economy they weigh or are equal to zero. For instance, although the fixed costs of producing digital services are high, its marginal costs and distribution costs are almost non-existent. Therefore, in this part, additional interpretations, or special treatment of this phenomenon in the digital economy are necessary.

2. The supply–demand ratio in the DE does not determine the price level, so when does, therefore, the equilibrium model (equilibrium price) apply?

As is known in the traditional economic theory, the relationship between supply and demand determines the price, and the equilibrium model implies the existence of a perfect competition market where firms sell standardized products, where firms are price takers, where new players have free access to the market, and where buyers and sellers have full information.

The digital market does not have these features because, under the dominant influence of digital platforms, it tends to monopoly. However, at the same time, unlike under traditional monopoly, a significant number of products and services in the digital market are available for costumers for free. Therefore, it can be said that the relationship between supply and demand does not determine the price, so the question of the equilibrium model is also open.

Yet, these "monopolies" earn enormous profits providing services at no cost, which additionally supports the claim that DE requires a special treatment. It can be argued that network users pay for free products with their own work, but then this implies a need for a new model or theory that will suggest an approach to measure the value (cost) of the work conducted by these users, and the benefits that the network (and platform owners) gain from it.

Existing statistical measures and econometric models have still not fully developed instruments that could offer quality answers to these questions. The economists are aware that there are various exceptions to the theory known as "market failures", but these are the subject of special studies and analysis in theory and in economics textbooks. Our goal is to check whether this is the case with DE.

3. Why productivity based on knowledge and the network contributes more to economic growth than productivity based on work and equipment?

The issue of productivity and sources of productivity growth are inseparably linked to issues of value, and it is part of all economic debates. The traditional economy has been characterized in this respect by various theories such as the theory of fair (just) price, physiocratic theory of value, labour theory of value, the theory of production costs and subjective theory of value. It is true that productivity based on traditional work and equipment also implied a significant role of knowledge.

However, DE expresses a different treatment of value in relation to all previous theories because in DE, value is created in a significantly different process. Value in DE is created by the human brain as a direct productive force together with innovation, and the computing resources and network systems that unite and connects them [39]. The best confirmation of the premise that the productivity on which the digital economy is based contributes more to economic growth is seen in the fact that digital giants (Google, Amazon, and Facebook, etc.) have experienced exponential growth and huge market capitalization with a relatively small number of employees and in just a few years thanks to innovation, knowledge, and network. Companies in the traditional economy needed decades to reach a much smaller capitalization with a huge number of employees (General Motors and General Electric, etc.). Therefore, we conclude that the phenomena of DE in terms of productivity must be further explained and studied by supplemented economic analyses.

Each of these topics is a suitable testing ground for new research in which the use of empirical data, and economic and econometric models could confirm or reject these hypotheses and thus further contribute to attitudes about the need for the special treatment of the DE.

As a summary of this analysis of the specifics of DE, it can be concluded that in basic university textbooks of economics, it would be desirable to have a separate chapter dealing with DE, which would cover topics such as: specifics of digital products, DE and different treatment of basic economic categories (costs, price, labour, value, productivity and competitiveness), structure and functioning of the digital market, creative destruction and disruption innovation, network externals, network economy and digital platform economy (monopolization and regulation), etc.

### *3.2. Results of Systematic Textbooks Review*

#### 3.2.1. Textbooks' Selection Criteria

The Table 1 shows the results of SLR process based on the set of criteria, listed in the methodology, by publishers: Cambridge University Press—63; Oxford University Press —155; Routledge of Taylor & Francis Group—399; Princeton University Press—140; Pearson—34; McGraw Hill—84; Macmillan Learning—50; Cengage Learning—111; WW Norton & Co.—43; and Wiley—12; which is 1091 textbooks in total.

**Table 1.** SLR Process.

| Search Library | The Best Publishers of Academic Textbooks |
|---|---|
| Keywords | economics, basics of economics, principles of economics, introduction to economics. As the topic of DE touches upon the field of micro and macroeconomics as well, we also took into consideration the search based on the following terms: macroeconomics, microeconomics, principles of macroeconomics, principles of microeconomics, introduction to macroeconomics, introduction to microeconomics |
| Period | 2010–2021 |
| Level of study | First year of undergraduate studies |
| Language | English |
| Exclusion | Older editions of the same authors |
| Total search | 1091 |
| Selected and reviewed | 90 |
| Search period | February 2021 |

Following research and analysis, the old editions of the same textbooks also appeared in the reports and they were eliminated. By carrying out a detailed analysis, the textbooks used in postgraduate studies were also excluded because this research paper covers only textbooks used in the first year of undergraduate studies. Thus, the number of textbooks that are interesting for analysis by publishers was reduced to 90 and the analysis of their content and inclusion of DE was presented in Table 2. The authors believe that the representativeness of publishers guarantees the quality of selected textbooks. In addition, for the validity of this analysis, reference to the (some) relevant textbooks used in the top ranked universities in the field of economics was made (Table 2) and it was found that they were all covered with the previous result of the SLR (Table A1). Moreover, the research included the lists of recommendations of the best economics textbooks (Tables 3 and 4) and they were analysed according to the set of criteria of the given search (basic textbook and year of publication, etc.). Finally, the assessments of analysts [43] about the prevalence of individual textbooks at the global level was taken into consideration, so that it can be ultimately concluded how much studying material of the digital economy is actually available.

**Table 2.** Textbooks from the best Universities of Economics (according to Chloe Lane, "Top Universities for Economics in 2020", 4 March 2020, https://www.topuniversities.com/university-rankings-articles/university-subject-rankings/top-universities-economics-2020, accessed on 20 April 2020).

| University [1] | Title of the Textbook | Author |
|---|---|---|
| Harvard University | Principles of Economics | N. Gregory Mankiw [2] |
| Massachusetts Institute of Technology (MIT) | Macroeconomics | Olivier Blanchard [44] |
| Stanford University | Principles of Economics | John B. Taylor and Akila Weerapana [45] |
| University of California, Berkeley (UCB) | Macroeconomics as a Second Language | Martha L. Olney [46] |
| The London School of Economics and Political Science (LSE) | Microeconomics | Acemoglu, Laibson and List |
| | Macroeconomics | N. Gregory Mankiw |
| | Macroeconomics | O Blanchard, D R Jonson |
| Princeton University | Economics Principles and Policy | William Baumol, Alan Blinder, Johan L. Solow |
| University of Oxford | Economics | R. Lipsey and A. Chrystal |
| | Macroeconomics | M. Burda and C. Wyplosz |
| University of Cambridge | Macroeconomics for Business | Lawrence S. Davidson |
| | The Manager's Way of Understanding the Global Economy | Andreas Hauskrecht, Jürgen von Hagen |

Remarks: [1] We included the University of Oxford and University of Cambridge to have more non-US universities represented in this table (although they are ranked 9th and 10th in this ranking). [2] It has been estimated that around 4 million copies of this textbook are sold, and that of all the basic economics textbooks at the global level, the Mankiw principles account for 25%. (Samuelson, 2019).

**Table 3.** The best economics textbooks according to Professor Conquer, "The Best Economics Textbooks of 2021", 2 January 2021, https://www.conqueryourexam.com/best-economics-textbooks/, accessed on 18 February 2021.

| Title of the Textbook | Author |
|---|---|
| Basic Economics | Thomas Sowell, Basic book 2000 |
| Principles of Economics | N. Gregory Mankiw |
| Economics Today: The Micro View | Roger LeRoy Miller |
| Economics of Money, Banking and Financial Markets (What's New in Economics) | Frederic Mishkin |
| Economics: Principles and Practices | McGraw Hill authors |
| Economics in One Lesson: The Shortest and Surest Way to Understand Basic Economics | Henry Hazlitt Published 1946 |
| Freakonomics: A Rogue Economist Explores the Hidden Side of Everything | Steven D. Levitt Published 2009 |
| Economics For Dummies | S. M. Flynn |

**Table 4.** The best economics textbooks according to Harleen Dhami, "Economics Textbooks: Which is The Best", 3 September 2019, https://tophat.com/blog/economics-textbook/ (accessed on 20 April 2020).

| Title of the Textbook | Author |
|---|---|
| Principles of economics (Up to date e-book) | Stephen Buckles (Vanderbilt University) |
| Principles of Economics | N. Gregory Mankiw |
| Principles of Economics | Case, Fair and Oster |
| Principles of Microeconomics | Campbell R. McConnell, Stanley L. Brue, Sean Masaki Flynn |

By analysing the contents of these textbooks, the authors found that they deal with issues related to basic economic categories and issues arising from them in an extremely professional, interesting, and popular way. Having in mind the fact that the dominant part of the economy still functions within the regime and framework of the real, traditional economy from the 20th century, it is quite natural that textbooks on the basic economic

disciplines at universities are focused on studying the principles and laws of that economy. However, it cannot be said that DE-related issues are not dealt with at all.

#### 3.2.2. Summarizing the Results and Interpreting the Findings

The analysis led to the conclusion that in a significant number of textbooks (29) there are chapters or sections that deal with asymmetric information, technological progress, externalities, public goods, and common resource etc. However, they are associated with DE in a broader context. It is probable that these topics are permeated within other chapters and other textbooks, but they are standard lessons from traditional economics textbooks, so they were not highlighted.

This is due to a number of specifics that DE has in relation to these categories, as well as in relation to the traditional economy. It was clarified in response to the first research question.

Thus, out of the total number of analysed textbooks, only 11 have chapters and sections partly dedicated to the digital economy. These are individual units that are close to issues from DE topics, such as: the economics of information [47–51], consumer choice and demands in traditional and network markets [52], innovation, information and the networked economy [53], economies of platform [54], the economy today [55], competitiveness in the IT industry and the market of the network of externals [56] and real-world competition and technology [57].

However, in these cases, the consideration is limited to specific dimensions related to the specifics of the information economy and competitiveness in the information technology sector. However, as already shown in a previous analysis, directly or indirectly, the information economy is not the same as the DE that further crystallizes out with the network economy as a generator of different market relations. Therefore, it can be noticed that the textbooks do not specifically deal with digital products, digital markets, and the work of digital companies, although, as stated, their nature is significantly different. In particular, although the issues of the functioning of the digital market (supply, demand, prices and costs, value creation, and monopolies, etc.) are new and different, they are not sufficiently addressed in the basic textbooks of economics. It is probable that the reason why these topics do not exist can be found in the fact that many issues related to the DE phenomenon have not yet been sufficiently researched or studied. However, due to its presence and growing importance, we consider it necessary for the scientific, professional, and research public to address this issue.

The fact is that in the later years of economics courses, there are specialized programs related to blockchain and cryptocurrency, etc. Although, the authors believe that it is important to study the new DE in the first year of study. Introductory economics education within undergraduate studies is very important for later success [58]. Equally, textbooks must follow the economic reality that students face and live in [24]. Even professors of economics must predominantly be committed to this goal [59].

It should not be forgotten that the students who are currently studying belong to the so-called Net Generation. After graduation, they will be working in an environment that will be much more coloured by the new DE. Here is one bitter observation on this topic: which economic science and business philosophy ensured the success of the digital giants, that is, of digital platform owners—was it from traditional economics textbooks? No! The fact is that the founders and owners of these companies were generally not economists and did not study Marshall, Keynes, or Friedman. The fact is that without any formal economic knowledge, they have achieved incredible success. Or so we think . . . They were not burdened by the traditional economy and its rules, they were only interested in the new economy whose rules they created themselves. Based on this, it would be too bold to say that one does not have to know traditional economic analysis to understand the DE. However, everyone needs to supplement their basic economic knowledge with knowledge from the DE.

It is not the intention of this research paper to make any final judgments in this type of discussion, because as in the 'old' economic science there was no agreement on the basic models and theories, so it should not be expected that in the DE there will be a unique dogma within the chosen paradigm.

At the same time, the shaped knowledge that, so far, has been related to the DE can be presented in all lessons, or else the DE can be presented as a separate area or a separate chapter. The authors do not want to go into details here, because the goal is to highlight the need, but not to give a complete explication of the lessons and program units, because these are reputable authors and respectable textbooks that have been analysed.

Before concluding, it should be pointed out that this analysis has made a significant contribution to the further treatment of this issue, although the authors are aware that economics textbooks are slowly changing [29]. Ultimately, the view presented in this paper can be understood within the Colander's dilemma "Why economics textbooks should, but don't, and won't, change" [27].

## 4. Conclusions

In this paper, the gap that exists between economic theory, presented in economic textbooks, and economic practice, which is reflected in the insufficient scope and study of DE, was highlighted. The authors analysed the specifics of DE and assessed that it, primarily as an economics of innovation and new technologies, has enough specifics and that its principles of functioning must be specifically explained within the basic lessons of economic theory.

Based on the analysis of 90 representative basic university textbooks of economics, the authors proved that the issue of DE is not sufficiently represented in them. In that sense, the authors, based on the results of the research, suggest topics and lessons that, in terms of studying of DE, should be included in the basic university economic textbooks.

Limitations of this paper, represent, at the same time, a strong message for future research and they focus on two levels. On the first level, in addition to the analysis of textbooks, according to a similar methodology, an analysis and review of the curriculum and syllabus of teaching disciplines in the initial years of economics studies should be made. This would improve the research knowledge on this topic and validate the results derived from this paper. On the second level, to test the applicability of existing, traditional models and theories, individually, on all specifics of the digital economy. If possible, to suggest upgrading them or creating new models and theories. This could further confirm or reject the hypothesis of the need for a special economic analysis for the digital economy. In that sense, this paper suggests some areas that should be the focus of future research, such as: structure and functioning of the digital market (supply, demand, prices and costs, productivity, and value creation, etc.); network economy and digital platform economy (monopolization and regulation); and marginal cost theories of digital products, etc.

**Author Contributions:** Conceptualization, V.L., B.R. and T.D.; Formal analysis, V.L. and D.L.; Methodology, V.L. and D.L.; Writing—original draft, V.L. and D.L.; Writing—review & editing, B.R. and T.D. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research received no external funding.

**Institutional Review Board Statement:** Not applicable.

**Informed Consent Statement:** Not applicable.

**Data Availability Statement:** Publicly available datasets were analyzed in this study (Reference list, ref. no. 60–142).

**Conflicts of Interest:** The authors declare no conflict of interest.

## Appendix A

**Table A1.** Textbook analysis [60–142].

| Publisher | Title of the Textbook | Author | Year of Publication | Coverage of the DE | Converging Topics [1] |
|---|---|---|---|---|---|
| Cambridge University Press | Microeconomics for MBAs—The Economic Way of Thinking for Managers (3rd edition) | Richard B. McKenzie, Dwight R. Lee | 2020 | Consumer choice and demands in traditional and network markets, Software networks | / |
| | Applied Intermediate Macroeconomics | Kevin D. Hoover | 2015 | / | / |
| | Macroeconomics for Business—The Manager's Way of Understanding the Global Economy | Lawrence S. Davidson Andreas Hauskrecht, Jürgen von Hagen | 2020 | / | / |
| Oxford University Press | Economics—A Primer | Simon Hayley, Alec Chrystal | 2018 | / | / |
| | Economics (14th edition) | Richard Lipsey, Alec Chrystal | 2020 | / | Costs in the very long run: endogenous technical change. new technologies, the information and communication technology (ICT) revolution |
| | Economics | David King | 2012 | / | Public goods, The problem with common resources, Asymmetric information |
| | The Econom—Economics for a Changing World | Samuel Bowles, Wendy Carlin, Margaret Stevens The CORE Team | 2017 | Innovation, information and the networked economy | / |
| | Principles of Macroeconomics (3rd edition) | Soumyen Sikdar | 2020 | / | / |
| | Lectures in Macroeconomics—A Capitalist Economy Without Unemployment | Kazimierz Łaski, Edited by Jerzy Osiatyński and Jan Toporowski | 2019 | / | / |
| | Foundations of Economics (5th edition) | Andrew Gillespie | 2019 | / | / |
| | Economics for BusinessTop of FormBottom of Form | Andrew Gillespie | 2019 | / | Public goods, Asymmetric information |
| | Microeconomics—Principles and Analysis (2nd edition) | Frank Cowell | 2018 | / | Information |
| | Macroeconomics—a European Text (7th edition) | Michael Burda and Charles Wyplosz | 2017 | / | / |
| | Microeconomics: A Very Short Introduction | Avinash Dixit | 2014 | / | Information asymmetries |

**Table A1.** *Cont.*

| Publisher | Title of the Textbook | Author | Year of Publication | Coverage of the DE | Converging Topics [1] |
|---|---|---|---|---|---|
| Routledge | Principles of Economics in Context (2nd edition) | Neva Goodwin, Jonathan M. Harris, Julie A. Nelson, Brian Roach, Mariano Torras | 2020 | / | / |
| | Principles of Economics in a Nutshell (1st edition) | Lorenzo Garbo, Dorene Isenberg, Nicholas Reksten | 2020 | / | Market failures: public goods and externalities |
| | Principles of Macroeconomics Activist vs. Austerity Policies (2nd edition) | Howard J. Sherman, Michael A. Meeropol, Paul D. Sherman | 2020 | / | / |
| | Foundations of Real-World Economics: What Every Economics Student Needs to Know | John Komlos | 2020 | / | / |
| | Economics: The Basics, (3rd edition) | Tony Cleaver | 2015 | / | / |
| | Essentials of Economics in Context (1st edition) | Neva Goodwin, Jonathan M. Harris, Pratistha Joshi Rajkarnikar, Brian Roach, Tim B. Thornton | 2020 | / | / |
| | Macroeconomics (1st edition) | Robert J. Rossana | 2020 | / | / |
| | Macroeconomics in Context, A European Perspective | Sebastian Dullien, Neva Goodwin, Jonathan M. Harris, Julie A. Nelson, Brian Roach, Mariano Torras | 2018 | / | / |
| | Microeconomic Principles and Problems—A Pluralist Introduction (1st edition) | Geoffrey Schneider | 2019 | / | Public Goods and Services |
| | Essentials of Microeconomics (1st edition) | Bonnie Nguyen, Andrew Wait | 2016 | / | / |
| | Microeconomics, A Global Text (1st edition) | Judy Whitehead | 2014 | / | / |
| Princeton University Press | Economics in Two Lessons—Why Markets Work So Well, and Why They Can Fail So Badly | John Quiggin | 2019 | / | Time, Information, and Uncertainty<br>Market Failure: Information, Uncertainty, and Financial Markets |
| | Microeconomics for Managers (2nd edition) | David M. Kreps | 2019 | / | Uncertainty and Information |
| | Microeconomic Foundations I: Choice and Competitive Markets | David M. Kreps | 2013 | / | / |

**Table A1.** *Cont.*

| Publisher | Title of the Textbook | Author | Year of Publication | Coverage of the DE | Converging Topics [1] |
|---|---|---|---|---|---|
| Pearson | Economic Way of Thinking (13th edition) | Paul L. Heyne, Peter J. Boettke, David L. Prychitko | 2014 | / | / |
| | Essential Foundations of Economics (9th edition) | Robin Bade, Michael Parkin | 2021 | / | / |
| | Essentials of Economics (7th edition) | Glenn Hubbard, Anthony Patrick O'Brien | 2021 | / | Technology, Production and Cost |
| | Survey of Economics: Principles, Applications, and Tools (8th edition) | Arthur O'Sullivan, Steven Sheffrin, Stephen Perez | 2020 | / | Production Technology and Cost |
| | Macroeconomics (10th edition) | Andrew B. Abel, Ben S. Bernanke, Dean Croushore | 2020 | / | / |
| | Macroeconomics: A European Perspective (3rd edition) | Oliver Blanchard, Prof Alessia Amighini, Prof Francesco Giavazzi | 2017 | / | Technological Progress and Growth |
| | Macroeconomics: Policy and Practice (2nd edition) | Freeric S. Mishkin | 2015 | / | Drivers of Growth: Technology, Policy, and Institutions |
| | Economics of Money, Banking and Financial Markets (What's New in Economics) | Freeric S. Mishkin | 2016 | / | / |
| | Macroeconomics (2nd edition) | Glenn Hubbard, Anthony Patric O'Brien, Matthew P. Rafferty | 2014 | / | / |
| | Macroeconomics: Theories and Policies (10th edition) | Richard Froyen | 2013 | / | / |
| | Macroeconomics (12th edition) | Robert J. Gordon | 2012 | / | Human Capital and Technology |
| | Microeconomics (3rd edition) | Daron Acemoglu, David Laibson, John List | 2021 | The Economics of Information | / |
| | Economics Today: The Micro View (20th edition) | Roger LeRoy Miller | 2021 | / | / |
| | Foundations of Microeconomics (9th edition) | Robin Bade, Michael Parkin | 2021 | / | / |
| | Principles of Microeconomics (13th edition) | Karl E. Case, Ray C. Fair, Sharon E. Oster, | 2020 | / | Externalities, Public Goods, and Common Resource |
| | Microeconomics: Principles, Applications and Tools (10th edition) | Arthur O'Sullivan, Steven Sheffrin, Stephen Perez | 2020 | / | Production Technology and Cost |
| | Economics, Global edition (2nd edition) | Acemoglu, Laibson, and List | 2019 | The Economics of Information | / |
| | Principles of Economics (13th edition) | Karl E. Case, Ray C. Fair, Sharon E. Oster | 2020 | / | Externalities, Public Goods, and Common Resource |

**Table A1.** *Cont.*

| Publisher | Title of the Textbook | Author | Year of Publication | Coverage of the DE | Converging Topics [1] |
|---|---|---|---|---|---|
| McGraw Hill | Economics (22nd edition) | Campbell R. McConnell, Stanley L. Brue, Sean Masaki Flynn | 2020 | / | Technology, R&D, and Efficiency |
| | Issues in Economics Today (9th edition) | Robert Guell | 2020 | / | / |
| | Economics, The Basics (4th edition) | Mike Mandel | 2020 | / | The Nature of Technological Change |
| | Economics (3rd edition) | Dean S. Karlan, Jonathan J. Morduch | 2020 | / | Information |
| | Economics (12th edition) | Stephen L. Slavin | 2019 | Economies of Platform | / |
| | Essentials of Economics | Bradley R. Schiller, Karen Gebhardt | 2019 | / | / |
| | Economics (11th edition) | David C. Colander | 2019 | Real-World Competition and Technology | / |
| | Economics (11th edition) eBook | David Begg, Gianluigi Vernasca, Stanley Fischer, Rudiger Dornbusch | 2014 | / | / |
| | Principles of Economics (3rd edition) | Moore McDowell, Rodney Thom, Ivan Pastine, Robert H. Frank, Ben Bernanke | 2012 | The economics of information | / |
| | Macroeconomics (11th edition) | David C. Colander | 2019 | / | / |
| | Principles of Microeconomics (7th edition) | Robert H. Frank, Ben Bernanke, Kate Antonovics, Ori Heffetz | 2018 | The economics of information | / |
| | Principles of Economics (7th edition) | Robert H. Frank, Ben Bernanke, Kate Antonovics, Ori Heffetz | 2018 | The economics of information | / |
| | The Economy Today (15th edition) | Bradley R. Schiller, Karen Gebhardt | 2018 | / | / |
| | Economics: Principles and Practices | Gary E. Clayton | 2012 | / | / |

**Table A1.** *Cont.*

| Publisher | Title of the Textbook | Author | Year of Publication | Coverage of the DE | Converging Topics [1] |
|---|---|---|---|---|---|
| Cengage Learning | Essentials of Economics (9th edition) | N. Gregory Mankiw | 2020 | / | / |
| | Principles of Economics (9th edition) | N. Gregory Mankiw | 2020 | / | Asymmetric Information |
| | Economics (5th edition) | Gregory N. Mankiw, Mark P. Taylor | 2020 | / | Information and behavioural economics |
| | Survey of Economics (10th edition) | Irvin B. Tucker | 2019 | / | / |
| | Business Economics (3rd edition) | Gregory N. Mankiw, Mark P. Taylor, Andrew Ashwin | 2019 | / | Asymmetric Information |
| | Economics for Today (10th edition) | Irvin B. Tucker | 2019 | / | / |
| | Economics (13th edition) | Roger A. Arnold | 2019 | / | / |
| | Economics (10th edition) | William Boyes, Michael Melvin | 2016 | / | / |
| | Basic Economics (International edition) | Frank V. Mastrianna | 2013 | / | / |
| | Economics Principles & Policy (14th edition) | William J. Baumol, Alan S. Blinder, John L. Solow | 2020 | The Economy Today (Artificial Intelligence Leave No Work for Humans to Do? Are Uber and AirBnB the Markets of the Future? Is the "Gig" Economy the Future of Work?) | / |
| | Macroeconomics for Today (10th edition) | Irvin B. Tucker | 2019 | / | / |
| | Microeconomics for Today (10th edition) | Irvin B. Tucker | 2019 | / | / |
| Macmillan Learning | Economics (5th edition) | Paul Krugman, Robin Wells | 2018 | / | / |
| | Essentials of Economics (5th edition) | Paul Krugman, Robin Wells | 2020 | / | Positive Externalities in Today's Economy |
| | Principles of Economics (1st edition) | Betsey Stevenson, Justin Wolfers | 2020 | / | / |
| | Economic Principles (1st edition) | Stephen Rubb, Scott Sumner | 2019 | / | Markets with Adverse Selection and Asymmetric Information |
| | Modern Principles of Economics (5th edition) | Tyler Cowen, Alex Tabarrok | 2021 | / | / |
| | Economics: Principles for a Changing World (5th edition) | Eric Chiang | 2020 | / | / |

**Table A1.** *Cont.*

| Publisher | Title of the Textbook | Author | Year of Publication | Coverage of the DE | Converging Topics [1] |
|---|---|---|---|---|---|
| W.W. Norton & Co. | Principles of Economics (3rd edition) E-Book and Learning Tools | Dirk Mateer, Lee Coppock | 2020/21 | / | / |
| | Principles of Macroeconomics (3rd edition) | Lee Coppock, Dirk Mateer | 2020 | / | / |
| | Principles of Microeconomics | Dirk Mateer, Lee Coppock | 2020 | / | / |
| | Intermediate Microeconomics, A Modern Approach (Ninth International Student EditionNinth International Student EditionNinth International Student Edition9th international student edition) | Hal Varian | WW Norton & Co222020 | Information technology (Systems Competition, LockIn, Model of Competition with Switching Costs, Markets with Network Externalities) | / |
| | Macroeconomics (4th edition) | Charles I. Jones | 2016 | / | / |
| Wiley | Economics: Theory and Practice (11th edition) | Patrick J. Welch, Gerry F. Welch | 2016 | / | / |
| | Microeconomics as a Second Language (e-book) | Martha L. Olney | 2011 | / | / |
| | Macroeconomics as a Second Language (e-book) | Martha L. Olney | 2011 | / | / |
| | Macroeconomics: Understanding the Global Economy (3rd edition) | David Miles, Andrew Scott, Francis Breedon | 2012 | / | Total Factor Productivity, Human Capital and Technology |
| | Microeconomics (6th edition) | David Besanko, Ronald Braeutigam | 2020 | / | / |
| For Dummies | Economics For Dummies | Sean Masaki Flynn | 2018 | / | Asymmetric Information and Public Goods |
| Worth Publishers | Principles of economics | Stephen Buckles et al. | 2012 | / | / |
| FlatWorld | Principles of Economics | John B. Taylor and Akila Weerapana | 2017 | / | Informational Efficiency |

[1] The topics we have identified here as converging can be found in almost all economic textbooks. Here, for the purposes of our analysis, we have registered only those textbooks where they are treated as separate units or chapters.

## References

1. Atkinson, R.D.; Ezell, S.J. *Ekonomika Inovacija: Utrka za Globalnu Prednost*; Mate: Zagreb, Croatia, 2014.
2. Gordon, R.J. Does the 'New Economy' measure up to the great Inventions of the Past? *J. Econ. Perspect.* **2000**, *14*, 49–74. [CrossRef]

3. Drucker, P. *The Age of Discontinuity; Guidelines to Our Changing Society*; Harper and Row: New York, NY, USA, 1969.
4. Rifkin, J. *The Age of Access: How the Shift from Ownership to Access is Transforming Modern Life*; Penguin Putnam: London, UK, 2000; pp. 4, 5, 35.
5. Tapscott, D. *The Digital Economy: Rethinking Promise and Peril in the Age of Networked Intelligence*, 2nd ed.; McGraw-Hill Education: New York, NY, USA, 2014.
6. English Oxford Living Dictionaries. Digital Economy. Available online: en.oxforddictionaries.com (accessed on 14 March 2018).
7. TechTarget; SearchCIO. Digital Economy Definition. Available online: searchcio.techtarget.com (accessed on 14 March 2018).
8. Benkler, Y. *The Wealth of Networks: How Social Production Transforms Markets and Freedom*, 1st ed.; Yale University Press: New Haven, CT, USA, 2006.
9. Castells, M. *The Rise of the Network Society*, 2nd ed.; Wiley-Blackwell: West Sussex, UK, 2009.
10. Mason, P. *Postcapitalism: A Guide to Our Future*, 1st ed.; Penguin, Allen Lane: London, UK, 2015.
11. Shapiro, C.; Varian, H.R. *Information Rules: A Strategic Guide to the Network Economy*; Harvard Business School Press: Boston, MA, USA, 1999.
12. United Nations. Digital Economy Report 2019-Value Creation and Capture: Implications for Developing Countires. 2019. Available online: https://unctad.org/en/PublicationsLibrary/der2019_en.pdf (accessed on 11 February 2020).
13. European Commission. *Digital Agenda for Europe-Rebooting Europe's Economy*; Publications Office of the European Union: Luxembourg, 2014. [CrossRef]
14. Yousefi, A. The impact of information and communication technology on economic growth: Evidence from developed and developing countries. In *Economics of Innovation and New Technology*; Taylor & Francis: London, UK, 2011.
15. Schwab, K. *The Fourth Industrial Revolution*, 1st ed.; Currency Books: New York, NY, USA, 2017.
16. Quiggin, J. National accounting and the digital economy. *Econ. Anal. Policy* **2014**, *44*, 136–142. [CrossRef]
17. Watanabe, C.; KNaveed, Y.T.; Neittaanmäki, P. Measuring GDP in the digital economy: Increasing dependence on uncaptured GDP. *Technol. Forecast. Soc. Chang.* **2018**, *137*, 226–240. [CrossRef]
18. Watanabe, C.Y.T.; Neittaanmäki, P. A new paradox of the digital economy-Structural sources of the limitation of GDP statistics. *Technol. Soc.* **2018**, *55*, 9–23. [CrossRef]
19. Evangelista, R.P.G.; Meliciani, V. The economic impact of digital technologies in Europe. In *Economics of Innovation and New Technology*; Taylor & Francis: London, UK, 2014.
20. Holford, W.D. The future of human creative knowledge work within the digital economy. *Futures* **2019**, *105*, 143–154. [CrossRef]
21. Sutherland, W.; Jarrahi, M.H. The sharing economy and digital platforms: A review and research agenda. *Int. J. Inf. Manag.* **2018**, *43*, 328–341. [CrossRef]
22. Cockayne, D.G. Sharing and neoliberal discourse: The economic function of sharing in the digital on-demand economy. *Geoforum* **2016**, *77*, 73–82. [CrossRef]
23. Ferguson, W.D. Curriculum for the Twenty-First Century: Recent Advances in Economic Theory and Undergraduate Economics. *J. Econ. Educ.* **2011**, *42*, 31–50. [CrossRef]
24. Madsen, P.T. The Financial Crisis and Principles of Economics Textbooks. *J. Econ. Educ.* **2013**, *44*, 197–216. [CrossRef]
25. Fike, R.; Gwartney, J. Public Choice, Market Failure, and Government Failure in Principles Textbooks. *J. Econ. Educ.* **2015**, *46*, 207–218. [CrossRef]
26. Ongeri, J.D. Instruction of economics at higher education: A literature review of the unchanging method of "talk and chalk". *Int. J. Manag. Educ.* **2017**, *15*, 30–35. [CrossRef]
27. Colander, D. Why economics textbooks should, but don't, and won't, change. *Eur. J. Econ. Econ. Policies Interv.* **2015**, *12*, 229–235. [CrossRef]
28. Jasso, G. Principles of Theoretical Analysis. *Sociol. Theory* **1988**, *6*, 1–20. [CrossRef]
29. Bourchtein, V. *The Principles of Economics Textbook: An Analysis of Its Past, Present & Future*; Leonard, N., Ed.; Stern School of Business New York University: New York, NY, USA, 2011.
30. Bäuerle, L. *The Power of Economic Textbooks: A Discourse Analysis*; Working Paper Serie. No. Ök-52; Cusanus Hochschule, Institut für Ökonomie und Institut für Philosophie: Bernkastel-Kues, Germany, 2019.
31. Thapa, D.; Sæbø, Ø. Exploring the link between ICT and development in the context of developing countries: A literature review. *Electron. J. Inf. Syst. Dev. Ctries.* **2014**, *64*, 1–15. [CrossRef]
32. Lwoga, E.T.; Sangeda, R.Z. ICTs and development in developing countries: A systematic review of reviews. *Electron. J. Inf. Syst. Dev. Ctries.* **2019**, *85*, e12060. [CrossRef]
33. Kitchenham, B. Guidelines for Performing Systematic Literature Reviews in Software Engineering. *Tech. Rep.* **2007**, No. 2.3.: 1–65. Available online: https://www.elsevier.com/__data/promis_misc/525444systematicreviewsguide.pdf (accessed on 23 January 2021).
34. Hemingway, P.; Brereton, N. What is a Systematic Review? *Hayward Medical Communications*; 2009. Report No.: NPRO/1111. 1–8. Available online: http://www.bandolier.org.uk/painres/download/whatis/Syst-review.pdf (accessed on 23 January 2021).
35. Lopus, J.; Paringer, J. *The Principles of Economics Textbook*; California State University, East Bay: Hayward, CA, USA, 2011.
36. North, D.C. Economic Performance through Time. *Am. Econ. Rev.* **1994**, *84*, 359–368. Available online: https://www.jstor.org/stable/2118057%0A (accessed on 17 January 2021).
37. Romer, P.M. Endogenous technological change. *J. Political Econ.* **1990**, *98*, 71–102. [CrossRef]

38. Rifkin, J. *The Zero Marginal Cost Society*, 1st ed.; Palgrave Macmillan: London, UK, 2014.
39. Lazovic, V.; Djurickovic, T. *Digitalna Ekonomija [Digital Economy]*, 1st ed.; Obod: Cetinje, Crna Gora, 2018.
40. Mankiw, N.G. *Principles of Economic*, 8th ed.; Harvard University Press: Boston, MA, USA, 2018.
41. Wang, F.; Zhang, X.P. The role of the Internet in changing industry competition. *Inf. Manag.* **2015**, *52*, 71–81. [CrossRef]
42. Huawai. Digital Spillover: Measuring the True Impact of the Digital Economy. 2017. Available online: http://www.huawei.com/minisite/gci/en/digital-spillover/files/gci_digital_spillover.pdf (accessed on 11 February 2021).
43. Samuelson, R.J. *It's Time We Tear Up Our Economics Textbooks and Start Over*; The Washinton Post: Washington, DC, USA, 2019. Available online: https://www.washingtonpost.com/opinions/its-time-we-tear-up-our-economics-textbooks-and-start-over/2019/06/23/54794ab8-9432-11e9-b570-6416efdc0803_story.html (accessed on 21 December 2020).
44. Blanchard, O. *Macroeconomics*, 8th ed.; Pearson Books: London, UK, 2021.
45. Taylor, J.B.; Weerapana, A. *Principles of Economics*; FlatWorld: Boston, MA, USA, 2017.
46. Olney, M.L. Macroeconomics as a second language. In *E-Book*; Wiley: Hoboken, NJ, USA, 2011.
47. Acemoglu, D.; Laibson, D.; List, J. *Microeconomics*, 3rd ed.; Pearson: London, UK, 2021.
48. Acemoglu, D.; Laibson, D.; List, J. *Economics Global ed*, 2nd ed.; Pearson: London, UK, 2019.
49. McDowell, M.; Thom, R.; Pastine, I.; Frank, R.H.; Bernanke, B. *Principles of Economics*, 3rd ed.; McGraw Hill: New York, NY, USA, 2012.
50. Frank, R.; Bernanke, B.; Antonovics, K.; Heffez, O. *Principles of Microeconomics*, 7th ed.; McGraw Hill: New York, NY, USA, 2018.
51. Frank, R.; Bernanke, B.; Antonovics, K.; Heffez, O. *Principles of Economics*, 7th ed.; McGraw Hill: New York, NY, USA, 2018.
52. McKenzie, R.B.; Lee, D.R. *Microeconomics for MBAs: The Economic Way of Thinking for Managers*, 3rd ed.; Cambridge University Press: Cambridge, UK, 2020.
53. Bowles, S.; Carlin, W.; Stevens, M.; The CORE Team. *The Economy-Economics for a Changing World*; Oxford University Press: Oxford, UK, 2017.
54. Slavin, S.L. *Economics*, 12th ed.; McGraw Hill: New York, NY, USA, 2019.
55. Baumol, J.W.; Blinder, S.A.; Solow, L.J. *Economics Principles & Policy*, 14th ed.; Cengage Learning: Boston, MA, USA, 2020.
56. Varian, H.R. *Intermediate Microeconomics, a Modern Approach*, 9th ed.; W.W. Norton & Company: New York, NY, USA, 2014.
57. Colander, D.C. *Economics*, 11th ed.; McGraw Hill: New York, NY, USA, 2019.
58. Pyne, D. Does the Choice of Introductory Microeconomics Textbook Matter? *J. Econ. Educ.* **2010**, *38*, 279–296. [CrossRef]
59. Payson, S. How economics professors can stop failing us. In *The Discipline at a Crossroads*; Lexington Books: Lanham, MD, USA, 2017.
60. Mankiw, N.G.; Taylor, P.M. *Macroeconomics*, 2nd ed.; W.H. Freeman & Co. Ltd.: New York, NY, USA, 2015.
61. Blanchard, O.; Johnson, D.H. *Macroeconomics*, 7th ed.; Pearson: London, UK, 2013.
62. Lipsey, R.; Chrystal, A. *Economics*, 14th ed.; Oxford University Press: Oxford, UK, 2020.
63. Burda, M.; Wyplosz, C. *Macroeconomics: A European Text*, 7th ed.; Oxford University Press: Oxford, UK, 2017.
64. Davidson, L.S.; Hauskrecht, A.; von Hagen, J. *Macroeconomics for Business: The Manager's Way of Understanding the Global Economy*; Cambridge University Press: Cambridge, UK, 2020.
65. Sowell, T. *Basic Economics: A Common Sense Guide to the Economy*; Basic Book: New York, NY, USA, 2000.
66. Mankiw, N.G. *Principles of Economics*, 9th ed.; Cengage Learning: Boston, MA, USA, 2020.
67. Miller, L.R. *Economics Today: The Micro View*, 20th ed.; Pearson: London, UK, 2021.
68. Mishkin, F. *Economics of Money, Banking and Financial Markets (What's New in Economics)*; Pearson: London, UK, 2016.
69. McGraw-Hill Education. *Economics: Principles and Practices*; McGraw-Hill Education: New York, NY, USA, 2007.
70. Hazlitt, H. *Economics in One Lesson: The Shortest and Surest Way to Understand Basic Economics*; Currency Books: New York, NY, USA, 1946.
71. Levitt, S.; Dubner, S. *Freakonomics: A Rogue Economist Explores the Hidden Side of Everything*; William Morrow Paperbacks: New York, NY, USA, 2009.
72. Flynn, S.M. *Economics for Dummies*; For Dummies; Wiley: Hoboken, NJ, USA, 2018.
73. Buckles, S. Principles of economics. In *Update E-Book*; Worth Publishers: New York, NY, USA, 2012.
74. Case, K.E.; Fair, R.C.; Oster, S.E. *Principles of Economics*, 13th ed.; Pearson: London, UK, 2020.
75. McConnell, C.; Brue, S.; Flynn, S.M. *Principles of Microeconomics*, 21th ed.; McGraw Hill: New York, NY, USA, 2017.
76. Hoover, K.D. *Applied Intermediate Macroeconomics*; Cambridge University Press: Cambridge, UK, 2015.
77. Hayley, S.A. Chrystal. In *Economics: A Primer*; Oxford University Press: Oxford, UK, 2018.
78. King, D. *Economics*; Oxford University Press: Oxford, UK, 2012.
79. Sikdar, S. *Principles of Macroeconomics*, 3rd ed.; Oxford University Press: Oxford, UK, 2020.
80. Łaski, K. *Lectures in Macroeconomics: A Capitalist Economy Without Unemployment*; Oxford University Press: Oxford, UK, 2019.
81. Gillespie, A. *Foundations of Economics*, 5th ed.; Oxford University Press: Oxford, UK, 2019.
82. Gillespie, A. *Economics for Business*; Oxford University Press: Oxford, UK, 2019.
83. Cowell, F. *Microeconomics: Principles and Analysis*, 2nd ed.; Oxford University Press: Oxford, UK, 2018.
84. Dixit, A. *Microeconomics: A Very Short Introduction*; Oxford University Press: Oxford, UK, 2014.
85. Goodwin, N.; Harris, J.M.; Nelson, A.; Roach, B.; Torras, M. *Principles of Economics in Context*, 2nd ed.; Routledge: Oxfordshire, UK, 2020.

86. Garbo, L.; Isenberg, D.; Reksten, N. *Principles of Economics in a Nutshell*, 1st ed.; Routledge: Oxfordshire, UK, 2020.
87. Sherman, H.J.; Meeropol, M.A.; Sherman, P.D. *Principles of Macroeconomics-Activist vs. Austerity Policies*, 2nd ed.; Routledge: Oxfordshire, UK, 2020.
88. Komlos, J. *Foundations of Real-World Economics: What Every Economics Student Needs to Know*; Routledge: Oxfordshire, UK, 2020.
89. Cleaver, T. *Economics: The Basics*, 3rd ed.; Routledge: Oxfordshire, UK, 2015.
90. Goodwin, N.; Harris, J.M.; Rajkarnikar, P.J.; Roach, B.; Thornton, T.B. *Essentials of Economics in Context*, 1st ed.; Routledge: Oxfordshire, UK, 2020.
91. Rossana, R.J. *Macroeconomics*, 1st ed.; Routledge: Oxfordshire, UK, 2020.
92. Dullien, S.; Goodwin, N.; Harris, J.M.; Nelson, J.A.; Roach, B.; Torras, M. *Macroeconomics in Context: A European Perspective*; Routledge: Oxfordshire, UK, 2018.
93. Schneider, G. *Microeconomic Principles and Problems: A Pluralist Introduction*, 1st ed.; Routledge: Oxfordshire, UK, 2019.
94. Nguyen, B.; Wait, A. *Essentials of Microeconomics*, 1st ed.; Routledge: Oxfordshire, UK, 2016.
95. Whitehead, J. *Microeconomics: A Global Text*, 1st ed.; Routledge: Oxfordshire, UK, 2014.
96. Quiggin, J. *Economics in Two Lessons: Why Markets Work So Well, and Why They Can Fail So Badly*; Princeton University Press: Princeton, NJ, USA, 2019.
97. Kreps, D.M. *Microeconomics for Managers*, 2nd ed.; Princeton University Press: Princeton, NJ, USA, 2019.
98. Kreps, D.M. *Microeconomic Foundations I: Choice and Competitive Markets*; Princeton University Press: Princeton, NJ, USA, 2013.
99. Heyne, P.; Boettke, P.; Prychitko, D. *The Economic Way of Thinking*, 13th ed.; Pearson: London, UK, 2014.
100. Bade, R.; Parkin, M. *Essential Foundations of Economics*, 9th ed.; Pearson: London, UK, 2021.
101. Hubbard, G.; O'Brien, P.A. *Essentials of Economics*, 7th ed.; Pearson: London, UK, 2021.
102. O'Sullivan, A.; Sheffrin, S.; Perez, S. *Survey of Economics: Principles, Applications and Tools*, 8th ed.; Pearson: London, UK, 2020.
103. Abel, B.A.; Bernanke, S.B.; Croushore, D. *Macroeconomics*, 10th ed.; Pearson: London, UK, 2020.
104. Blanchard, O.; Amighini, A.; Giavazzi, F. *Macroeconomics: A European Perspective*, 3rd ed.; Pearson: London, UK, 2017.
105. Mishkin, F. *Macroeconomics: Policy and Practice*, 2nd ed.; Pearson: London, UK, 2015.
106. Hubbard, G.; O'Brien, P.A.; Rafferty, M. *Macroeconomics*, 2nd ed.; Pearson: London, UK, 2014.
107. Froyen, R.T. *Macroeconomics: Theories and Policies*, 10th ed.; Pearson: London, UK, 2013.
108. Gordon, J.R. *Macroeconomics*, 12th ed.; Pearson: London, UK, 2012.
109. Bade, R.; Parkin, M. *Foundations of Microeconomics*, 9th ed.; Pearson: London, UK, 2021.
110. Case, K.E.; Fair, R.C.; Oster, S.E. *Principles of Microeconomics*, 13th ed.; Pearson: London, UK, 2020.
111. O'Sullivan, A.; Sheffrin, S.; Perez, S. *Microeconomics: Principles, Applications and Tools*, 10th ed.; Pearson: London, UK, 2020.
112. McConnell, C.; Brue, S.; Flynn, S.M. *Economics*, 22nd ed.; McGraw Hill: New York, NY, USA, 2020.
113. Guell, R. *Issues in Economics Today*, 9th ed.; McGraw Hill: New York, NY, USA, 2020.
114. Mandel, M. *Economics, The Basics*, 4th ed.; McGraw Hill: New York, NY, USA, 2020.
115. Schiller, B.R.; Gebhardt, K. *Essentials of Economics*; McGraw Hill: New York, NY, USA, 2019.
116. Begg, D.; Vernasca, G.; Fischer, S.; Dornbusch, R. Economics. In *Ebook*, 11th ed.; McGraw Hill: New York, NY, USA, 2014.
117. Colander, D.C. *Macroeconomics*, 11th ed.; McGraw Hill: New York, NY, USA, 2019.
118. Schiller, B.; Gebhardt, K. *The Economy Today*, 15th ed.; McGraw Hill: New York, NY, USA, 2018.
119. Clayton, G. *Economics: Principles and Practices*; McGraw Hill: New York, NY, USA, 2012.
120. Mankiw, N.G. *Essentials of Economics*, 9th ed.; Cengage Learning: Boston, MA, USA, 2020.
121. Mankiw, N.G.; Taylor, P.M. *Economics*, 5th ed.; Cengage Learning: Boston, MA, USA, 2020.
122. Tucker, I.B. *Survey of Economics*, 10th ed.; Cengage Learning: Boston, MA, USA, 2019.
123. Mankiw, N.G.; Taylor, P.M.; Ashwin, A. *Business Economics*, 3rd ed.; Cengage Learning: Boston, MA, USA, 2019.
124. Tucker, I.B. *Economics for Today*, 10th ed.; Cengage Learning: Boston, MA, USA, 2019.
125. Arnlod, R.A. *Economics*, 13th ed.; Cengage Learning: Boston, MA, USA, 2019.
126. Boyes, W.; Melvin, M. *Economics*, 10th ed.; Cengage Learning: Boston, MA, USA, 2016.
127. Mastrianna, F.V. *Basic Economics*, International ed.; Cengage Learning: Boston, MA, USA, 2013.
128. Tucker, B.I. *Macroeconomics for Today*, 10th ed.; Cengage Learning: Boston, MA, USA, 2019.
129. Tucker, B.I. *Microeconomics for Today*, 10th ed.; Cengage Learning: Boston, MA, USA, 2019.
130. Krugman, P.; Wells, R. *Economics*, 5th ed.; Macmillan Learning: New York, NY, USA, 2018.
131. Krugman, P.; Wells, R. *Essentials of Economics*, 5th ed.; Macmillan Learning: New York, NY, USA, 2020.
132. Stevenson, B.; Wolfers, J. *Principles of Economics*, 1st ed.; Macmillan Learning: New York, NY, USA, 2020.
133. Rubb, S.; Sumner, S. *Economic Principles*, 1st ed.; Macmillan Learning: New York, NY, USA, 2019.
134. Cowen, T.; Tabarrok, A. *Modern Principles of Economics*, 5th ed.; Macmillan Learning: New York, NY, USA, 2021.
135. Mateer, D.; Coppock, L. *Principles of Economics*, 3rd ed.; W.W. Norton & Co.: New York, NY, USA, 2020.
136. Coppock, L.; Mateer, D. *Principles of Macroeconomics*, 3rd ed.; W.W. Norton & Co.: New York, NY, USA, 2020.
137. Mateer, D.; Coppock, L. *Principles of Microeconomics*; W.W. Norton & Co.: New York, NY, USA, 2020.
138. Varian, R.H. *Intermediate Microeconomics: A Modern Approach*, 9th International Student ed.; W.W. Norton & Co.: New York, NY, USA, 2019.
139. Jones, I.C. *Macroeconomics*, 4th ed.; W.W. Norton & Co.: New York, NY, USA, 2016.

140. Welch, P.J.; Welch, G.F. *Economics: Theory and Practice*, 11th ed.; Wiley: Hoboken, NJ, USA, 2016.
141. Miles, D.; Scott, A.; Breedon, F. *Macroeconomics: Understanding the Global Economy*, 3rd ed.; Wiley: Hoboken, NJ, USA, 2012.
142. Besanko, D.; Braeutigam, R. *Microeconomics*, 6th ed.; Wiley: Hoboken, NJ, USA, 2020.