

Contents

Pest Analysis of Greece's External Environment in the View of Digital Transformation of SMEs.	1
<i>Panta Maria and Xygkogianni Maria</i>	
COVID-19 Effects on Reward-based Crowdfunding Campaigns.	14
<i>Nikolaos Daskalakis</i>	
Augmented Reality Marketing Implementation in Greek SMEs - A SWOT Analysis.	25
<i>Xygkogianni Maria</i>	

Pest Analysis of Greece's External Environment in the View of Digital Transformation of SMEs

Panta Maria¹ and Xygkogianni Maria²

Abstract

The Digital Transformation has restructured entire sectors in recent years. The Covid-19 pandemic acted as an accelerator in the transition to the new digital era. Yet, SMEs struggle to successfully implement such profound organizational transformation and thus jeopardize their sustainability and their competitiveness. Greece still has a slow pace of digital transformation compared to other countries of the European Union. This paper applies the PEST-framework to investigate the factors of external macro-environment, such as political, economic, social and technological, that are related to the digital transformation of Greek SMEs. The analysis showed that Greek SMEs are facing multiples challenges, yet several environmental factors could be proved extremely beneficial and helpful for them.

Keywords: Digital Transformation, SMEs, external environment, Pest analysis, Greece.

¹National and Kapodistrian University of Athens, General Department, Greece.

²National and Kapodistrian University of Athens, General Department, Greece.

1. Introduction

Small and medium-sized enterprises (SMEs) are the driving force of the economy, both at national and European level, contributing significantly to the GDP, to the creation of new jobs and to the production of added value. They play an important role in boosting employment, competitiveness and innovation, while ensuring social stability. However, business growth, even survival, it is not an easy task in today's global competitive environment and in the post-COVID-19 era.

Innovation and continuous modernization of the production process is required, digitization and adoption of advanced technologies, with the maximum utilization of data, is a fundamental supporting system for their transition to a Circular and Digital Economy. Given their importance to the economy, SMEs are a strategic priority of the European Commission, served by numerous policies. Targeted actions promote entrepreneurship and innovation for SMEs, creating an environment in which they can innovate, grow and prosper.

The economy, at national and European level, is in a transitional phase, driven by both the opportunities and the threats it faces. The opportunities are related to the rapid development of digital technologies and the enormous potential of innovation, while the threats are located in the consequences of climate change, the loss of biodiversity, social inequalities and the increase in global competition.

In Greece, 99.9% of the total number of businesses are SMEs and they cover a wide range of activities and sectors. They account for about 19.3% of GDP and 87% of business employment, and are the largest contributors to national R&D spending (National Documentation Centre, 2021).

The purpose of this paper is to discuss the future of digital transformation in Greece's SMEs and investigate the factors of the external macro-environment that can be an opportunity or a threat to this process. PEST analysis will be applied to depict the political, economic, social and technological factors that are related to the digital transformation of Greek small and medium-sized enterprises.

2. Literature review

2.1 Digital transformation in Greece

The digital era, in which organizations of any nature, are trying to enter, is also characterized as the Fourth Industrial Revolution or Industry 4.0 or Digital Revolution (Digital Revolution) and is the period characterized by the rapid transition from traditional industry to an economy based on Information and Communication Technology (Zin et al., 2018). The ongoing digital age requires the extensive use of digital media and, against consequence, the changes in the business regarding the business relations, the customer processes, the value chain etc. This process can be defined as Business Digital Transformation (Schumann & Tittmann, 2015).

Digital transformation, using modern information technology (IT), represents large-scale change in fundamental business processes and components. These changes generally target business models, products, productivity, employee roles,

production, marketing, financial management, and other processes. They also include cultural changes that challenge the status quo, and the way information is managed, structured, and positioned within an organization. All parts of an enterprise can undergo, or feel the impact of, transformation — from infrastructure supply chain, sales, marketing, purchasing, finance, and human resource management, to customer relations (Savic, 2020).

Industry 4.0 consists of a number of new and innovative technologies (Matt & Rauch, 2020):

- Information and communication technology (ICT) to digitize information and integrate systems at all stages of product creation and use (including logistics and supply), both inside companies and across company boundaries.
- Cyber-physical systems that use ICTs to monitor and control physical processes and systems. These may involve embedded sensors, intelligent robots that can configure themselves to suit the immediate product to be created, or additive manufacturing (3D printing) devices.
- Network communications including wireless and internet technologies that serve to link machines, work products, systems, and people, both within the manufacturing plant, and with suppliers and distributors.
- Simulation, modeling, and virtualization in the design of products and the establishment of manufacturing processes.
- Big data analysis and exploitation, either immediately on the factory floor, or through cloud computing.
- Digital assistance systems for human workers, including robots, augmented reality, and intelligent aid systems.

This paper will focus on the current situation of digital transformation in Greece, where, according to Association of Business and Industries (SEV 2022), DT performances contribute to the overall ranking of the country as 25th in the EU of 27. Latest survey analyzes digital maturity of Greece through the SEV Digital composite index (Maturity Index). Greece achieves its best performance in the "policies & regulatory framework" dimension (23rd), in dimensions "connectivity infrastructures" (24th), in "digital maturity of enterprises" (24th) and in "digital maturity society" (24th), (SEV 2022). In dimensions of "ICT & high-tech sectors" and "public sector digital maturity" Greece occupies the last place in the EU (27th) (SEV 2022). Although investments in ICT equipment and systems range at comparatively high levels, in the digital dimension maturity of businesses, Greece ranks low (24th) (SEV 2022). Exempting implementation of ERP systems and Big Data Analytics, integration of digital technologies in businesses is slow compared to the European average –such an indicative examples adoption of Cloud technologies where the country ranks 27th (SEV 2022). Meanwhile, spread of electronic invoicing (B2B) has not still reached satisfactory levels (27th) (SEV 2022). Despite these results, in 2020, turnover of e-commerce in Greece showed the highest growth rate in Europe with 77%, due to pandemic measures (lockdown and

pause of business activity in presence) (SEV 2022). In addition, Covid-19 affected work organization through the implementation of telecommuting model, where this was possible. In Greece, the percentage of employed people who usually work remotely increased from 1.9% in 2019 to 7% in 2020 (SEV 2022). The factors of the external environment in Greece play a significant role in the issues discussed above; thus, a PEST analysis should be conducted.

2.2 Microeconomic environment

According to the business strategy, external environment includes all the dynamic, evolving dimensions that lie outside of organism and affect it to a greater or lesser extent (Banham, 2010). This approach accepts that external variables can influence the organizational development of an entity but cannot be controlled directly from it.

Regarding the external business environment, there are several definitions:

-All entities depend on certain elements of their exterior environment. The control of external resources that everyone needs entity for its operation, determines the degree of dependence (Kotter, 1979).

-The external business environment of many companies is changing globally (Vlados & Hatzinikolaou, 2020). International trade grows faster than the production of the countries, while the cross-border business investment is growing faster than domestic investment. Many businesses are oriented towards the global market and respectively to external suppliers.

- The environment consists of all the external elements that influence business decisions and performance. If from the universe subtract the subset representing the organism, what remains it is his environment (Georgopoulos, 2010).

The analysis of the external environment is considered critical, in order to determine and evaluate important facts and trends that are outside the control of the business so that they can be avoided unexpected situations and to identify potential ways of success and development.

2.3 Pest analysis

PEST (Indris & Primiana, 2015) analysis provides a framework for the investigation and the analysis of the external generalized macro-environment for one organization. It stands for environmental variables: Political, Economic, Social and Technological.

Business environment could be defined as all relevant physical and social factors outside an organization considered indecision-making process. What should be emphasized is that the changes in one environment category can affect the other categories (Georgopoulos, 2010). Also, the same environmental trend can have different results in companies in different industries.

PEST analysis is used as a strategic planning tool and enables businesses to understand market growth and decline; positioning businesses and knowing the

potential and direction for the activities (Koumparoulis, 2013).

PEST can be found also as PESTEL, PESTLE, PESTEEL or PEST DG. PESTEL or PESTLE has included the ecological/environmental and legal factors, PESTEEL has added the ethical factor, whereas the PEST DG includes demographic and global

factors. However, all the extra factors that were mentioned above (ecological, legal, ethical, demographic and global) can be included in the main four factors of PEST (G. A. Deirmentzoglou and E. A. Deirmentzoglou ,2022)

Regarding the definitions of these factors, it can be concluded that can be described as following: (Abdoh et. al 2020):

- Political Factors (P):
Political factors refer to stability of government, government regulations and policies regarding e-government, corruption level, inadequate government funding, transparency in government processes, inadequate organizational leadership commitment. Also, may includes tax policy, trade restrictions, tariffs, and bureaucracy.
- Economic Factors (Ec):
They refer to economic growth, inflation rates, interest rate fluctuations, GDP, income, government expenditure, economic stability, Internet high cost, inadequate allocation of funds for ICT education.
- Social Factors (S):
These factors refer to society cultures, education level, beliefs, behaviours, users' demographics, social conventions, lack of adequate IT skills in the public sector, insufficient IT skills of citizens in using computers and advanced technologies, poor awareness of the e-government benefits, absence of public trust in e-government.
- Technological Factors (T):
They refer to technology contribution to quality and quantity of e-services, infrastructure, Internet access and availability, technology development, lack of consistency in ICT applications and business processes, lack of adequate measures to guarantee security and privacy.

The above factors are interrelated. For example, wage can be both an economic and a political factor (G. A. Deirmentzoglou and E. A. Deirmentzoglou , 2022).

3. Exploration of external factors

3.1 Political factors

The extent to which policy makers are likely to intervene in the commercial environment is a crucial factor in a PEST analysis (Sammuto-Bonnici & Galea, 2014).

- In July 2021, a grant program of 8 million Euros, co-financed by the European Regional Development Fund (ERDF) of the European Union and by national resources, was putted in practice across the country. The Action aimed at

subsidizing SMEs in the retail sector for the development (5.000,00 euros) or the upgrade (1.500,00 euros) and management of an e-shop in order to support their operation during the pandemic (COVID-19), to strengthen the degree of integration of digital technology, as well as their digital transformation and to avoid overcrowding in indoor spaces (ESPA 2021).

- in March 2022, government announced a 30 million euros funding program: Subsidy for businesses providing accounting and tax services 1.500 or 2.000 determined by their previous year income. The Action was co-financed by the European Social Fund (ESF) of the European Union and by national resources. The Action concerns the support of Self-Employed Accountants, as well as Legal Entities providing accounting and tax technical services, in order to immediately respond to their digital modernization needs, due to the expanded and continuous needs for using digital applications to the provision of their services, fulfilling the criteria of being SME (ESPA 2021).
- In June 2022, a funding program, "Digital Transformation of Small and Medium Enterprises", part of the National Recovery and Resilience Plan Greece 2.0, was putted in action. Its purpose is to strengthen the digital maturity of the country's small and medium enterprises (SMEs), in order to modernize their productive, commercial and administrative functions. This Action is divided into three individual State Aid Programs.

Program I: "SME Digital Tools" provides vouchers that will be allocated for the acquisition, through purchase or lease, of new digital products and services, aiming to strength the digital maturity of the country's small and medium enterprises (SMEs), by using various digital tools.

Program II: "Development of Digital Products and Services", a budget of 100 million euros, digital investments will be subsidized, as a non-refundable grant, amounting between 200,000 and 2 million euros, for the development of infrastructure and cloud services.

Program III: "Digital Transactions", includes the upgrade or replacement of cash registers, as well as the replacement of old POS machines. This is a project implemented by National Recovery and Resilience Plan "Greece 2.0" framework, which is funding by European Union – NextGenerationEU. Its total budget amount to 445 million euros (Greece2.0, 2022).

- In May 2022, legislation L. 4935/2022 was passed by the government, referring to incentives for mergers and partnerships of medium-sized, small and micro-enterprises, including income tax relief up to 30% on profits. Moreover, it is exempt from income tax, the income which arises from the capital gain from the transfer of assets of the new company to a third party. Extremely important is the provision in article 11, which refers to the transfer of damage from transforming businesses on the balance sheet of the new company and the possibility tax offset against the profits of the new company. Significant economies of scale will be created and borrowing capacity will be increased (Hellenic Parliament, 2022).

- In September 2022, Ministerial Decision N. 139818/2022 was published. According to this, expenses related to the promotion of the green economy, energy and digitization, since these will be deducted from the gross income of small and medium enterprises, increased by a percentage of up to 100%.

This tax measure includes expenses related to:

- (a) Protection and management of forest environment, sanitation and cleaning of soil, water, marine areas, air and pollution control.
- (b) Improvement in energy efficiency, energy saving (produced and consumed), green transition and renewable energy sources, including research and the preparation of relevant studies
- (c) Research and experimental development in biotechnology and research in electricity technology.

Excluded from the application of this are small and medium-sized enterprises active in primary agricultural production and fishing- aquaculture sector (Taxheaven.gr, 2022).

- In September 2022, pre-publication of Action "Research - Innovation 2021-2027" was announced. It is co-financed by the European Union and the Greek State. The total public expenditure amounts to 300 million euros. The main objective of this program is to connect research and innovation with entrepreneurship and to strengthen competitiveness, productivity and extroversion of businesses towards international markets (Special Action Management and Implementation Service in the areas of Research, Technological Development and Innovation, 2022).
- In June 2022, a Guarantee program, which will enable the granting of loans, working capital and investment purposes, totaling 2.5 billion euros, was announced. Greece is committing 500 million euros, which will be allocated to finance the national leg of InvestEU for investments across the country. The 500 million euros of "Greece 2.0" that will be channeled into this specific financial instrument, will act as a guarantee, so Greek commercial banks, cooperating with the program, will grant working capital and investment loans to small and medium-sized enterprises, from the beginning of 2023(greece2.0.,2022).

3.2 Economic Factors

Economic conditions affect how easy or how difficult it is to be successful and profitable at any time because they affect both capital availability and cost, and demand (Koumparoulis, 2013).

- Economic activity recovered strongly at full speed during 2021, after the forecast recession recorded in 2020 as result of the effects of the pandemic. The 2021 GDP increased by 8.3% in relation to 2020 (National Bank, 2021).

- In Greece, as in most developed economies, since the beginning of 2021 there has been a significant rise in industrial import price index, as well as in goods (National Bank, 2021).
- The increases in energy prices and other basic commodities intensify inflationary pressures, resulting in increase of cost-of-living standards and in limitation of net disposable income of households for consumption. In addition, significant disruptions in production are caused due to increased production costs and transport, with negative consequences for business investment (National Bank, 2021).
- Recovery product of services (mainly in tourism and technical sector), but also of industry and of constructions, characterized the developments from supply side. The dynamic recovery of the economy's product in 2021 is also reflected to the strong increase in the turnover of all businesses in the Greek economy by 21.1% (National Bank, 2021).
- The data of the non-financial accounts of ELSTAT's institutional sectors of 2021 show a significant increase in business profits in relation with the corresponding period of 2020. The lifting of the restrictive measures that were in force until in the first months of 2021, as well as the recovery that has been observed in almost every forms of Greek economy and mainly in the tourism and transport sector have helped Greek businesses to recover significantly. More specifically, the gross operating surplus of businesses increased by 45.8% in first nine months of 2021 (against a decrease of 18.9% in the corresponding period of 2020) (National Bank, 2021).
- Private consumption recovered strongly due the second quarter of the year, as it supports from the release of the deferred of household consumption, but also from the rise in real disposable income (National Bank, 2021).
- In 2022, minimum monthly salary has been increased 4% (from 650 € to 713 €). Although this measure aims to improve the income of low wage earners and boost disposable income and private consumption, labor costs will be affected (National Bank, 2021).
- In 2022, government activated new employment policies by subsidizing 150.000 jobs (National Bank, 2021).
- Access to finance remains difficult for many companies. The percentage of SMEs whose banks loan's applications were refused or rejected is much lower than the EU average. Similarly, venture capital investments and business angels funding is lower than EU average. Over the last two years, public support measures have helped many businesses survive during the COVID-19 crisis (European Commission, 2022).
- According to the Tax Foundation's International Tax Competitiveness Index (18.10.2021), which examines over 40 tax policy variables, Greece was ranked 29th among 36 states in 2021, as it was in 2020. However, its performance in absolute terms marginally improved as further reductions were made in corporate tax rate (to 22% from 24%) (National Bank, 2021).

- Due to Russia's military invasion in Ukraine on February 2022, the direct impact in European Economy is the consolidation of inflationary rates pressures at a higher level and for a longer period of time than initially was expected. War and accompanying economic sanctions cause higher energy prices, given the very high energy dependence of EU to Russia, and higher prices in industrial metals and food. Under these circumstances, inflation rise caused, affects household consumption, reduces income business viability and increases uncertainty of investors with risk of canceling or postponing investment decisions (National Bank, 2021).

3.3 Social Factors

Social factors depict the society's culture and readiness for change. Human factor is of great importance in entrepreneurship.

- Although levels of educational attainment in Greece have increased over time, there are concerns that the education and training system is not sufficiently aligned with labour market needs. In fact, university education is frequently criticized for not conferring upon its graduates the cutting-edge skills that the labour market needs.
In other words, one of the major problems facing the Greek labour market is the relatively large share of low-skilled population. Indeed, Greece had one of the lowest overall scores in the European Skills Index (ESI) survey of 2022, only marginally improving its performance relative to 2020 (Anyfantaki et al., 2022).
- Greece's performance in terms of digital skills in relation to society is at low levels compared to the rest of the European Union countries. The incomplete connection of education with the labor market, the leakage of talent abroad (brain drain), the low level of reskilling and upskilling can be considered the main causes of this phenomenon (SEV, 2022).

3.4 Technological Factors

Technological factors determine, by their availability or lack, the technical requirements that enterprises need to meet their objectives.

- SMEs access to public administration is improving thanks to the recent digitalization efforts of the public domain and the implementation of several laws aimed to simplify the framework for business activities. Further progress is expected since modernization of the regulatory framework to reduce the administrative burden on businesses is a key priority of the Recovery and Resilience plan (European Commission, 2022).
- Greece is implementing significant investments for the further penetration of high-speed connections (3rd place in 5G readiness) and almost all of the spectrum has been allocated through the relevant tender procedures (SEV,2022).

4. Discussions

The above recording and exploration of the external environment for the adoption of digital transformation through Pest analysis framework, the following conclusions can be drawn:

Regarding the political external environment of businesses, Greek government and Greek companies seem to adopt a more active perspective, considering digital transition. At this point it is important to say that the Greek economy seems to be recovering from the effects of the Covid-19 pandemic.

Stability has been observed in the political environment, which is necessary for the implementation of investments. The government, following European policy and aiming to further develop the domestic economy, is trying to create incentives for businesses to adopt new practices and evolve. The offering subsidies are relatively recent and only the creation of e-shops has managed to be completed. The rest are at the initial stage of applications. From the above, it is understood that there are still no data and results to research. The same applies to the tax incentives given for the mergers of SMEs and the tax exemptions concerning expenses related to the digitization.

The analysis of the economic external environment of businesses highlighted the recovery of the tourism sector, construction and the services provided. However, it was highlighted the existence of difficulty of businesses in bank lending, the increase in wage costs, the prices of fuels, metals and raw materials in general. The increase in inflation is mainly due to the ongoing war in Ukraine and the global energy shortage. On the economic side, the war causes economic disturbances in the market. As a result of these, a sense of insecurity is created in businesses and investment freezes. Accordingly, private consumption is also affected, as it had decreased during the period of the pandemic, when there was uncertainty again.

As far as social factors are concerned, the problem is found in low digital maturity. The digital skills of Greek society are deficient both from the employee and consumer side. This acts as a deterrent to business staffing.

Finally, in terms of the digital infrastructure of the external environment there are positive elements, but digital governance is still at an early stage and the 5G installation projects have not yet been completed.

5. Conclusions

Greek SMEs can take advantage of governmental policies to adopt DT in long-term. Using subsidies for their own benefit, companies may confront economic environment challenges and war uncertainty. However, the state should support and reorganize its educational system to align labor market need in digital skills and knowledge with its provided education. In addition, it has to reinforce, through legislation, digital reskilling and public sector assessment. Digital transformation refers not only in implementation of digital processes, but also to adoption of client-centric business culture. So, it is of high importance to establish digital culture in

society. Finally, it is crucial for government to accelerate installation of technological infrastructure, to facilitate entities adjustment in digital era.

The present research is limited to secondary data regarding digital transformation in Greece after the pandemic. Future research should be conducted after the completion of funding and financial programs that government has applied, to identify impacts and results of external factors that were discussed.

References

- [1] National Documentation Centre (2021). "Innovation, Research & Technology" magazine. Issue 120, p.28, ISSN 2732-6174. <http://ereader.ekt.gr/books/ifav/#p=28>
- [2] Zin, T., Nang, W. and Kham, S. M. (2018). "Transformation of Project Management in Industry 4.0", Proceeding of the 12th International Conference on Project Management (ProMAC2018), November 27th - December 1st, Bangkok, Thailand, 37-44. https://www.researchgate.net/publication/329415337_Transformation_of_Project_Management_in_Industry_40
- [3] Schumann Christian-Andreas and Tittmann Claudia (2015). West Saxon University Zwickau, Germany: Digital Business Transformation in the Context of Knowledge Management. European Conference on Knowledge Management; KidmoreEnd: 671-675.: Academic Conferences International Limited. <https://www.proquest.com/openview/dd82218cdc957bbcea8addf16ed50f53/1?pq-origsite=gscholar&cbl=1796412>.
- [4] Savic Dobrica (2020). "From Digitization and Digitalization to Digital Transformation: A Case for Grey Literature Management." *The Green Journal* (16). https://www.researchgate.net/publication/340183219_From_Digitization_and_Digitalization_to_Digital_Transformation_A_Case_for_Grey_Literature_Management.
- [5] Dominik T. Matt and Erwin Rauch, (2020). 'Industry 4.0 for SMEs Challenges, Opportunities and Requirements'. ISBN 978-3-030-25425-4 (eBook). <https://doi.org/10.1007/978-3-030-25425-4>.
- [6] Digital Transformation Observatory of Hellenic Federation of Enterprises (SEV) (2022). Digital and technological maturity economy and business. 3rd Annual Edition. <https://www.sev.org.gr/ekdoseis/psifiaki-kai-technologiki-orimotita-oikonomias-kai-epicheiriseon-3i-etisia-ekdosi-paratiritiriou-psifiakou-metaschimatismou-sev/>
- [7] Banham, H. C. (2010). External environmental analysis for small and medium enterprises (SMEs). *Journal of Business & Economics Research (JBER)*, 8(10), 19–26. <https://doi.org/10.19030/jber.v8i10.770>.

- [8] Kotter John P. (1979). 'Managing External Dependence'. The Academy of Management Review. Vol. 4, No. 1, pp. 87.
<https://www.jstor.org/stable/257406>.
- [9] Vlados Charis & Chatzinikolaou Dimos (2020). 'Macro, Meso, and Micro Policies for Strengthening Entrepreneurship: Towards an Integrated Competitiveness Policy'. Journal of Business & Economic Policy Vol. 7, No. 1. doi:10.30845/jbep.v7n1p1.
<https://www.semanticscholar.org/paper/Macro%2C-Meso%2C-and-MicroPolicies-for-Strengthening-VladosChatzinikolaou/ac1568211e45000a9bd589f9b2eef2920bab8462>.
- [10] Georgopoulos N. (2010). Strategic Management, pp. 83-137, G. BENOS, Greece.
- [11] Sofyan Indris & Ina Primiana (2015). 'Internal And External Environment Analysis On The Performance Of Small And Medium Industries (Smes) In Indonesia'. International Journal of Scientific & Technology Volume 4, Issue 4. <http://www.downloadmaghaleh.com/wp-content/uploads/edd/9936.pdf>.
- [12] Koumparoulis, D. N. (2013). 'PEST Analysis: The case of E-shop'. International Journal of Economy, Management and Social Sciences, 2(2), 31-36. <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.684.6630&rep=rep1&type=pdf>.
- [13] Deirmentzoglou Georgios A. and Deirmentzoglou Evangelos A. (2022). 'Pest Analysis of the E-commerce Industry: The Case of Greece'. Business Development and Economic Governance in Southeastern Europe pp 315–323. https://link.springer.com/chapter/10.1007/978-3-031-05351-1_17.
- [14] Hazem M Bani Abdoh, Syarilla Iryani A. Saany, Hamid H. Jebur, Yousef A. Baker El-Ebiary (2020). 'The Effect of PESTLE Factors on E-Government Adoption in Jordan: A Conceptual Model'. International Journal of Engineering Trends and Technology, <http://ijettjournal.org/Special%20issue/CAT-2020-III/CATI3P203.pdf>.
- [15] Sammut-Bonnici Tanya and Galea David (2014). 'PEST Analysis'. Wiley Encyclopedia of Management, John Wiley & Sons, Ltd.
<https://www.um.edu.mt/library/oar/bitstream/123456789/21816/1/sammut-bonnici%20pest.pdf>.
- [16] ESPA (2021). Ε-λιανικό – Επιχορήγηση υφιστάμενων ΜμΕ επιχειρήσεων του κλάδου του λιανεμπορίου για την ανάπτυξη, αναβάθμιση και διαχείριση ηλεκτρονικού καταστήματος.
<https://www.espa.gr/el/Pages/ProclamationsFS.aspx?item=5113>
- [17] ESPA (2021). Επιχορήγηση επιχειρήσεων παροχής λογιστικών και φοροτεχνικών υπηρεσιών.
<https://www.espa.gr/el/Pages/ProclamationsFS.aspx?item=5515>
- [18] Greece 2.0, (2022). 'Digital Transformation of Small and Medium Enterprises' Funding Program. <https://greece20.gov.gr/ellada-2-0-epidotiseis-ypsous-445-ekat-evrw-gia-ependyseis-psifiakoy-metaximatismoy-mikrwn-kai-mesaiwn-epixeirisewn/>

- [19] Hellenic Parliament (2022). ‘L. 4935/2022’, Κίνητρα ανάπτυξης επιχειρήσεων, μέσω συνεργασιών και εταιρικών μετασχηματισμών και άλλες διατάξεις’. https://www.hellenicparliament.gr/Nomothetiko-Ergo/Katatethenta-Nomosxedia?law_id=e5f6ac3b-222b-4975-b672-ae94016ffba7.
- [20] Taxheaven (2022). ‘MinisterialDecisionN. 139818/2022, Προσαυξημένες εκπτώσεις για δαπάνες που αφορούν σε πράσινη οικονομία, ενέργεια και ψηφιοποίηση’. <https://www.taxheaven.gr/news/61002/prosayxhmenes-ekptwseis-gia -poy-aforoyn-se-prasinh-oikonomia-energeia-kai-pshfiopoihsh>.
- [21] Special Action Management and Implementation Service in the areas of Research (2022). ‘Ανακοίνωση της Δράσης «Ερευνώ - Καινοτομώ 2021-2027» Technological Development and Innovation’. http://www.eydetak.gr/central.aspx?sId=106I495I1274I646I439523&olID=777&neID=841 &neTa=20290_2&ncID=0&neHC=0&tbid=0&lrID=2&oldUIID=aI777I0I11 9I428I1089I0I3&actionID=load&JScript=1.
- [22] European Commission (2022). ‘Annual report on European SMEs’. Brussels. https://single-market-economy.ec.europa.eu/smes/sme-strategy/sme-performance-review_en.
- [23] National Bank (2021). Governor’s Annual Report. <https://www.bankofgreece.gr/ekdoseis-ereyna/ekdoseis/ekthesh-dioikhth>
- [24] Anyfantaki Sofia, CaloghirouYannis, Dellis Konstantinos, Karadimitropoulou Aikaterini, Petroulakis Fillipos (2022). ‘Skills, Management practices and Technology adoption in Greek manufacturing firms’. Economic Bulletin 55. Bank of Greece. ISSN 2654 – 1904 (online) <https://www.bankofgreece.gr/ekdoseis-ereyna/ereynitiki-drastiriotita/oikonomiko-deltio>.

COVID-19 Effects on Reward-based Crowdfunding Campaigns

Nikolaos Daskalakis¹

Abstract

This paper investigates the effects of the COVID-19 pandemic on reward-based crowdfunding campaigns. Using data from the Kickstarter platform, I compare the number and success rates of the reward-based crowdfunding campaigns before and during the pandemic, for 16 different sectors. I find that the number of campaigns generally reduced during the pandemic period, but their success rates increased. I also find that the success rate differences are statistically significant for 6 out of the 16 sectors, and that this difference is positive for all 6 sectors, showing a robust result of better performance in terms of success rates.

JEL classification numbers: G30, M20.

Keywords: reward-based crowdfunding, COVID-19, success factors.

¹ Panteion University, Department of Public Administration.

1. Introduction

The COVID-19 pandemic has had important and severe implications in the entire economic, financial and social systems, globally. Academics and researchers have done substantial work at trying to analyze the effects of the pandemic phenomenon in a plethora of economic areas, such as in trade (Baldwin and Tomiura, 2020; Bas et al., 2023), in monetary policy (Bhar and Malliaris, 2021; Cochrane, 2020) and of course in finance (Akhtaruzzaman et al., 2021; Beck; 2020, Mann, 2020; Zhang et al., 2020). On 5 May 2023, the World Health Organization officially declared the end of pandemic, so that academic and research communities can start looking at the pandemic as a past event, to measure its implications in a series of social and economic fields.

One of the areas that is worth looking at what effects the pandemic brought upon, is the crowdfunding area, because it is supposed to be an alternative way of financing, that was mainly developed and flourished in the context of another crisis, mainly the global financial crisis of 2008 (Daskalakis and Karpouzis, 2021). Therefore, it would be interesting to observe how the COVID-19 crisis affected the area of crowdfunding, given its past which shows that it flourishes during crises. Crowdfunding however is a vast area; it spreads from donation-based campaigns where ethical and social considerations are the main drivers for funders, to reward-based projects where funders are mainly attracted by their interest and excitement to fund a project, and to equity- and lending-based crowdfunding where the notion of financial returns is central, but not unique (Daskalakis and Yue, 2018). Researchers have long realized that there are severe differences across these various types of crowdfunding, so that not universal study for all types would make sense. In this paper, I focus on the effects of the pandemic crisis on reward-based crowdfunding campaigns. Following the rationale of Daskalakis et al. (2023), I choose this particular type of crowdfunding for the three following reasons: i) this is the model that applies in a broader type of entrepreneurial ventures, ii) it is simplest model to be used as it does not impose complicated regulations, and iii) it does not require any financial return to the backer, which makes it unique when compared with the traditional financing methods. To my knowledge, this is the first study to assess the effects of the pandemic crisis on reward-based crowdfunding campaigns. I find that the pandemic has influenced reward-based crowdfunding campaigns, decreasing their number but increasing their success rates. These are important findings that build our understanding of how a major global crisis affects entrepreneurial crowdfunding campaigns, so that we know what to expect in similar future events.

The remainder of the paper is structured as follows. Section 2 briefly describes reward-based crowdfunding as a financing tool and refers to the current literature of COVID-19 and crowdfunding. Section 3 introduces the methodology, the dataset, the variables and the research questions. Section 4 presents the results and Section 5 concludes the paper.

2. Crowdfunding and COVID-19

Raising finance from the crowd is not a new idea. One of the most well-known crowdfunded projects was the funding of the pedestal for the Statue of Liberty in New York. The rapid rise of crowdfunding however took place in the aftermath of the financial crisis of 2008, mainly due to the following two main reasons: (a) the development and commercialization of the Internet and (b) the acute funding shortage that the 2008 financial crisis resulted in (Kirby and Worner, 2014). This second factor was the fuel that triggered enormous growth in this infant industry in its early years. Crowdfunding expanded very quickly and very broadly during 2009-2015, and gradually took its place as an alternative tool of financing. Wardrop et al. (2015) wrote back in 2015 that access to finance remained one of the most pressing challenges facing European SMEs, and crowdfunding was widely seen to play a complementary role to traditional finance. One year later, Zhang et al. (2016) added that “2016 will be the year that so called ‘alternative Finance’ becomes mainstream”. Crowdfunding therefore emerged and flourished in the aftermath of a crisis, took its place as a financing alternative, and grew steadily until the COVID-19 pandemic stroke. It would thus be interesting to explore how it performed during another crisis, that may not have been financial in its origin, but did have tremendous financial consequences, namely the COVID-19 pandemic crisis. Bearing in mind that the pandemic officially ended on 5 May 2023, the academic community can now start looking at this area, as a past event; in this context, not a lot of papers have, to date, explored the effect of the pandemic crisis in crowdfunding.

It is worth looking at these handful academic efforts, to explore the approaches researchers have taken when exploring the link between crowdfunding and the pandemic. For example, Igra et al. (2021) look at charitable crowdfunding, examining the COVID-19 related campaigns in the early months of the pandemic and assess how existing social and health inequities shaped crowdfunding use and outcomes. They mention that during the first seven months of the COVID-19 pandemic, more than 175,000 crowdfunding campaigns were established in the US for coronavirus-related needs (data from the GoFundMe platform). They show that crowdfunding provides substantially higher benefits in wealthier counties with higher levels of education, concluding that there are inequalities of how crowdfunding is used in periods of crisis. Farhoud et al. (2021) also approach the pandemic-crowdfunding link from a social perspective, exploring the challenges for social enterprise crowdfunding during the pandemic (data from the UpEffect platform). They concluded that the government support schemes effectively froze the economy in the short-term, bringing negative effects on the social enterprise crowdfunding field, affecting the campaigns flows to platforms as well.

Focusing on the entrepreneurial crowdfunding area, Battaglia et al. (2022) investigate whether and to what extent the key drivers for equity crowdfunding backers to finance a specific project before COVID-19, are the same during the pandemic, and which type of backers are more prone to finance via equity crowdfunding in the aftermath of the crisis. They use a dataset of 437 Italian equity

crowdfunding campaigns over the period 2014–2020 and focus on a sub-sample of 79 projects posted on the websites during the pandemic. They find that the strength of the effect of their key variables on the campaign’s success has changed during the COVID-19 crisis and that backers are more prone to finance companies with a high level of R&D expenditure and technological projects.

The above papers are, to my knowledge, the only ones that link the COVID-19 pandemic and crowdfunding, exploring how the former influenced the latter. Here lies the contribution of this paper; namely to shed light on the effects of the pandemic to crowdfunding, focusing on the rewards-based crowdfunding area.

3. Data, the Model and Results

3.1 The Dataset

The dataset used in this paper comprises of reward-based projects uploaded on the Kickstarter platform, one of the most famous reward-based crowdfunding platforms worldwide. Several studies have already used data from Kickstarter (e.g., Agrawal, et al., 2011; Mollick, 2014), while projects on this platform tend to show the best outcomes (Cox and Nguyen, 2017). In this study I use publicly available data from Kickstarter² from December 2018 to March 2021; this period is evenly split between the following two 14-months periods: pre-COVID December 2018 to January 2020, and during-COVID February 2020 to March 2021; this implies that the cut-off date is at 31 January 2020, which is the date when Centers for Disease Control and Prevention (CDC) of United States announced as the first day of quarantine³. The final full sample consists of 53,528 campaigns, 28,308 of which are pre-covid, while the remaining 25,220 are during-covid.

Table 1 shows the full sample descriptives of pre- and during- covid campaigns per category (industry). Looking at the relative allocation of the campaigns before and during the pandemic we can observe that the categories/sectors that showed an increase in their percentage during the covid period were the following: comics, design, games, publishing, technology and other, out of which the comics and games sector showed a significant increase. This finding can be considered as an expected outcome of the crisis, since the outputs of these particular two sectors can easily be put in a pandemic context where movement restrictions were introduced.

² <https://webrobots.io/kickstarter-datasets/>

³ <https://www.cdc.gov/museum/timeline/covid19.html#Early-2020>

Table 1: Full sample descriptives

Category	Pre-Covid		Covid	
	Freq.	Percent	Freq.	Percent
Art	2,359	8.33%	2,048	8.12%
Comics	1,684	5.95%	1,769	7.01%
Crafts	514	1.82%	393	1.56%
Dance	135	0.48%	46	0.18%
Design	2,185	7.72%	2,039	8.08%
Fashion	2,136	7.55%	1,711	6.78%
Film & Video	2,590	9.15%	1,651	6.55%
Food	1,478	5.22%	979	3.88%
Games	3,745	13.23%	5,009	19.86%
Journalism	286	1.01%	169	0.67%
Music	1,890	6.68%	1,155	4.58%
Photography	475	1.68%	366	1.45%
Publishing	2,186	7.72%	2,075	8.23%
Technology	2,880	10.17%	2,678	10.62%
Theater	463	1.64%	119	0.47%
Other	3,302	11.66%	3,013	11.95%
Total	28,308	100%	25,220	100%

3.2 The effect of Covid

I first test whether Covid had a statistically significant effect on the success rate of the reward-based crowdfunding campaigns. To do so, I follow the rationale of Daskalakis et al. (2023)⁴ who run probit and logit regressions to identify the success factors of the reward-based crowdfunding campaigns, using a huge dataset of 179,066 campaigns covering the period of 2009-2021. Specifically, I use their logit and probit regressions, adding a Covid dummy, which takes the value of 0 for campaigns that took place during December 2018 to January 2020 and the value of 1 for campaigns that took place during February 2020 to March 2021. By doing so, I isolate the effect of the covid variable, by controlling for the other success factors. Thus, the model is the following:

$$\text{logit}(p(\text{Success})) = f(\text{Words}, \text{Backers}, \text{Country}, \text{LnAvgRaised}, \text{Goal}, \text{CovidDummy})$$

$$\text{probit}(p(\text{Success})) = f(\text{Words}, \text{Backers}, \text{Country}, \text{LnAvgRaised}, \text{Goal}, \text{CovidDummy})$$

⁴ I use the set of variables used of Daskalakis et al. (2023) since they are the most popular reward-based crowdfunding success factors described in the literature. For a detailed description about the literature behind these variables see Daskalakis et al. (2023).

While the variables description is as follows:

Table 2: The model variables

Variable Name	Description
Success	Equals 1 if the raised amount is higher than the initial "Goal" and 0 otherwise.
Words	The total number of words used to describe a campaign.
Backers	The total number of funders.
Country	Equals 1 if the country is US and 0 otherwise.
LnAvgRaised	The logarithm of the average amount per backer pledged in a project.
GoalPerDays ⁵	The funding goal each campaign had set divided by the campaign duration in days.
CovidDummy	Equals 1 for campaigns that took place during February 2020-March 2021 and 0 for campaigns that took place during December 2018-January 2020.

The results are the following:

Table 3: Summary of Logistic and Probit Regression Analysis for Variables Predicting success in crowdfunding projects

VARIABLES	Logit	Probit
Constant	-6.140***	-3.302***
	(0.102)	(0.049)
Words	0.005**	0.003**
	(0.003)	(0.001)
Backers	0.013***	0.004***
	(0.000)	(0.000)
Country	1.011***	0.534***
	(0.030)	(0.015)
LnAvgRaised	0.859***	0.453***
	(0.013)	(0.006)
GoalPerDays	-0.004***	-0.001***
	(0.000)	(0.000)
CovidDummy	0.162***	0.111***
	(0.030)	(0.016)
Model chi-square	29384.518	34667.002
	(<0.001)	(<0.001)

Note: Standard errors in parentheses. *** and ** denote statistical significance at 0.01 and 0.05 respectively.

⁵ Daskalakis et al. (2023) use a goal range set of variables in their paper. I use a GoalPerDays ratio as a similar proxy to capture the relative size of campaigns, scaled by their duration in days.

The control variables results are consistent with the literature in the sense that they show the expected signs (namely relationships with success) as in Daskalakis et al. (2023). The only difference with their study is that the “Words” variable is statistically significant and positive in our study (it was insignificant in their study), implying that the higher number of words per campaign, the higher the probability of success. Turning our focus on our “covid” variable, this is statistically significant at 1% and positive, showing that success rates during the pandemic were higher, when compared with the pre-covid period. This is an interesting result that deserves further exploring.

Given that the covid dummy variable was found to be positive and significant, I then dig deeper in exploring sector differentiations. Table 4 presents the change rates in the number of campaigns and the success rates pre- and during-covid for all categories/sectors.

Table 4: Successful projects

Category	Numbers of campaigns			Success rates	
	Pre-Covid	Covid	Change rate	Pre-Covid	Covid
Art	2.359	2.048	-13,18%	66,55%	75,93%
Comics	1.684	1.769	5,05%	85,87%	88,58%
Crafts	514	393	-23,54%	32,49%	40,71%
Dance	135	46	-65,93%	65,19%	60,87%
Design	2.185	2.039	-6,68%	91,90%	90,73%
Fashion	2.136	1.711	-19,90%	64,09%	65,17%
Film & Video	2.590	1.651	-36,25%	57,57%	57,12%
Food	1.478	979	-33,76%	30,51%	36,36%
Games	3.745	5.009	33,75%	84,99%	90,20%
Journalism	286	169	-40,91%	36,36%	40,24%
Music	1.890	1.155	-38,89%	67,14%	69,35%
Photography	475	366	-22,95%	51,37%	62,57%
Publishing	2.186	2.075	-5,08%	74,34%	80,48%
Technology	2.880	2.678	-7,01%	29,48%	32,26%
Theater	463	119	-74,30%	68,68%	62,18%
Other	3.302	3.013	-8,75%	98,82%	99,00%
Total	28.308	25.220	-10,91%	68,69%	74,47%

For example, 2,359 art campaigns were uploaded to Kickstarter in the 14-month period before Covid, while the number of the art campaigns uploaded to Kickstarter in the 14-month period during Covid dropped to 2,048, or by 13.18%. Also, 66.55% of the overall 2,359 art projects uploaded in the Kickstarter platform before the 31st of January 2020 (pre-Covid period) were successful, while the respective success rate during Covid was 75.93%. Several interesting results can be derived when looking at Table 2. First, there were fewer campaigns overall during the 14-months Covid period of the study (25,220) when compared with the 14-months pre-covid

period (28,308), showing a drop rate of 10.91% respectively, which can be considered a significant drop. However, if we look at the individual numbers of the categories, we observe that there were two specific sectors, those of Comics and Games, where the number of campaigns increased, by 5.05% and 33.75% respectively. This implies that Covid brought an overall drop in the number of campaigns, but favoured specific sectors that are mainly linked with staying home, which is an expected outcome.

Turning to the success rates, an interesting finding is that there are significant differences across categories for both periods. The highest rates are observed for Design, Comics, Games and Other, while the lowest rates are shown in Technology, Crafts and Journalism. This implies that there are inherent characteristics across sectors/categories that determine success. Focusing on the comparison between pre- and during-covid, a striking result is that the success rate for all projects is higher in the during-covid period when compared to the pre-covid period (74.47% vs 68.69% respectively). Looking at the individual categories, there are only four categories that success rates are lower during the covid period (Dance, Design, Film & Video and Theater). Last, I run a mean differences test to explore whether the success rates between pre- and during-Covid differ significantly across (at 95% level) for each category (Table 5).

Table 5: Mean Differences

Category	Mean			t-value	p-value
	Pre-Covid	During	Dif		
Full sample	0,687	0,745	-0,058	-14,798	0,000
Art	0,666	0,759	-0,094	-6,869	0,000
Comics	0,859	0,886	-0,027	-2,392	0,008
Crafts	0,325	0,407	-0,082	-2,562	0,005
Dance	0,652	0,609	0,043	0,524	0,699
Design	0,919	0,907	0,012	1,349	0,911
Fashion	0,641	0,652	-0,011	-0,693	0,244
Film & Video	0,576	0,571	0,005	0,026	0,614
Food	0,305	0,364	-0,059	-3,027	0,001
Games	0,850	0,902	-0,052	-7,428	0,000
Journalism	0,364	0,402	-0,038	-0,822	0,206
Music	0,671	0,694	-0,023	-1,267	0,103
Photography	0,514	0,626	-0,112	-3,263	0,001
Publishing	0,743	0,804	-0,061	-4,801	0,000
Technology	0,295	0,323	-0,028	-2,246	0,012
Theater	0,687	0,622	0,065	1,348	0,911
Other	0,988	0,99	-0,002	-0,708	0,240

A first result is that the overall success rates for the full sub-samples (68.69% vs 74.47%) do differ significantly, leading to the conclusion that, in general, campaigns that were uploaded during the pandemic period had higher chances of success than the ones that were uploaded before Covid. This is an important finding, since it seems that the crowdfunding tool displayed higher levels of performance during the pandemic. Looking at the results for each category, we observe that statistically significant differences in success rates were displayed for 6 out of the total 16 categories and that for all these 6 categories the success rate was (significantly) higher during the pandemic. It should also be noted that for both sectors that showed a significant higher percentage (comics and games), as highlighted in the previous section, their success rate increase was also significant.

4. Conclusions

In this study I investigate whether COVID-19 affected reward-based crowdfunding campaigns. Specifically, I first run a logit and a probit regression, using a set of control variables plus a covid dummy, to test whether there are different success probabilities between campaigns that ran before and during covid, and then I compare a. whether the number of campaigns was higher/lower before and during the pandemic per sector, and b. whether the campaign success rates were different before and during the pandemic per sector. The main findings are that, indeed campaigns that were launched during covid had higher chances of success and that the success rate might have increased, but the number of campaigns reduced during covid. It should also be noted that the success rate is statistically higher for 6 out of the total 16 sectors we analyze, while for the few cases that the performance is lower, the result is not statistically significant. The main conclusion of the study is therefore that the pandemic has influenced reward-based crowdfunding campaigns lowering their numbers but increasing their performance.

These findings have interesting practical implications. First, it is shown that crowdfunding seems to act as a “crisis buffer”, as it provides a funding alternative that seems to work better during the crisis, in terms of performance and success rates. Further analysis should be conducted in the reasons why the number of campaigns was decreased; a possible reason could be that the pandemic brought an initial shock to economies and societies, so that the first months of the pandemic could have passed while societies and economies were trying to adapt to the new economic context of doing business.

References

- [1] Agrawal, A. K., Catalini, C. and Goldfarb, A., (2011). *The Geography of Crowdfunding*, Massachusetts: National Bureau Of Economic Research.
- [2] Akhtaruzzaman, M., Boubaker, S. and Sensoy, A., (2021). “Financial Contagion During COVID–19 Crisis”. *Finance Research Letters* 38, 101604
- [3] Baldwin, R. and Tomiura, E., (2020). *Thinking ahead about the trade impact of COVID-19 in Economics in the Time of COVID-19*, CEPR Press, London
- [4] Battaglia, F., Busato, F. and Manganiello, M.; (2022). *Equity Crowdfunding: Brave Market or Safe Haven for the Crowd During the COVID-19 Crisis?* in Chapter 14, *Financial Transformations Beyond the COVID-19 Health Crisis*, World Scientific ed.
- [5] Bas, M., Fernandes, A. and Paunov, C., (2023). *How resilient was trade to COVID-19?*, *Economics Letters*, 111080
- [6] Beck, T., (2020) *Finance in the times of coronavirus in Economics in the Time of COVID-19*, CEPR Press, London
- [7] Bhar, R. and Malliaris, A.G., (2021). *Modeling U.S. monetary policy during the global financial crisis and lessons for Covid-19*, *Journal of Policy Modeling* 43(1), pp. 15-33.
- [8] Cochrane, J., (2020). *Coronavirus monetary policy in Economics in the Time of COVID-19*, CEPR Press, London
- [9] Cox, J. and Nguyen, T. (2017). *Does the crowd mean business? An analysis of rewards-based crowdfunding as a source of finance for start-ups and small businesses*. *Journal of Small Business and Enterprise Development*.
- [10] Daskalakis, N. and Karpouzis, E., (2021). *Exploring determinants in cross-border activity in equity crowdfunding and peer-to-peer lending, from a user’s perspective*, *Small Enterprise Research*, 28, Issue 3, pp. 293-313.
- [11] Daskalakis, N, Karpouzis, E., Benis, D. and Angelakis, A., (2023). *Investigating the success factors for reward-based crowdfunding campaigns*. *Journal of Entrepreneurship, Business and Economics*, V. 11, n. 1, pp. 134-152.
- [12] Daskalakis, N. and Yue, W. (2018). *Users’ perceptions of motivations and risks in crowdfunding with financial returns*. *International Review of Entrepreneurship*, 16(3), 427–454.
- [13] Farhoud, M., Shah, S.; Stenholm, P., Kibler, E. Renko, M. and Terjesen, S.; (2021). *Social enterprise crowdfunding in an acute crisis*, *Journal of Business Venturing Insights* 15, e00211
- [14] Igra, M., Kenworthy, N., Luchsinger, C. and Jung, J.K. (2021). *Crowdfunding as a response to COVID-19: Increasing inequities at a time of crisis*, *Social Science & Medicine* 282, 114105.
- [15] Kirby, E. and Worner, S. (2014). “Crowd-funding: An infant industry growing fast”, IOSCO, Working paper series, SWP3.

- [16] Mann, C., (2020). Real and financial lenses to assess the economic consequences of COVID-19 in Economics in the Time of COVID-19, CEPR Press, London
- [17] Mollick, E. (2014). The dynamics of crowdfunding: An exploratory study. *Journal of business venturing*, 29(1), 1-16.
- [18] Wardrop, R., Zhang, B., Rau, R. and Gray, M. (2015). Moving mainstream the European alternative finance benchmarking report, University of Cambridge, pp. 1–44,
- [19] World Health Organization, 5 May 2023, Statement on the fifteenth meeting of the IHR (2005). Emergency Committee on the COVID-19 pandemic.
- [20] Zhang, B., Baeck, P., Ziegler T., Bone, J. and Garvey, K., (2016). Pushing Boundaries: The 2015 UK Alternative Finance Industry Report, University of Cambridge, Nesta.
- [21] Zhang, D., Hu, M. and Ji, Q., (2020). Financial markets under the global pandemic of COVID- 19. *Finance Research Letters*, 101528.

Augmented Reality Marketing Implementation in Greek SMEs - A SWOT Analysis

Xygekogianni Maria¹

Abstract

Augmented Reality (AR) has established itself as a transformative tool in the domain of marketing, enabling both immersive and interactive experiences for consumers. The inherent capability of AR to overlay digital content onto the real world provides marketers with unparalleled opportunities to connect with their target audience. For the effective integration of Augmented Reality Marketing (ARM) within Greek Small and Medium-sized Enterprises (SMEs), it's essential to capitalize on inherent strengths, address potential weaknesses, exploit existing opportunities, and strategically navigate anticipated threats. Fundamental to the successful incorporation of ARM in this context is the development of a carefully crafted strategy, enriched by a deep understanding of the local market dynamics. From a methodological standpoint, this research draws upon a set of predetermined keywords sourced from renowned databases such as Google, Google Scholar, Semantic Scholar, Science Direct, and Scopus. Using secondary data, the collated information was analyzed using the SWOT framework, facilitating a thorough examination of strengths, weaknesses, opportunities, and threats. To achieve this, a SWOT analysis was systematically employed, offering a comprehensive view of the potential for integrating augmented reality marketing within Greek SMEs.

Keywords: Augmenting Reality Marketing, Digital Marketing, SMEs, Swot Analysis, Greece, Greek enterprises.

¹National and Kapodistrian University of Athens, General Department, Greece.

1. Introduction

In recent years, there's been a significant surge in the popularity of Augmented Reality (AR) applications. The AR advertising sector shows great promise. In 2023, revenue from AR Advertising is projected to reach a remarkable US\$4.30 billion (Statista, 2023). This not only attests to AR's power but also underscores the enthusiasm with which businesses are adopting this technology, recognizing its potential to create immersive ad experiences that enthrall consumers in unprecedented ways. The future appears even more promising, considering the compound annual growth rate (CAGR) of the AR Advertising market. From 2023 to 2027, revenue is anticipated to grow at a notable rate of 11.81% annually, suggesting that by 2027, the AR Advertising market's valuation could rise to US\$6.72 billion (Statista, 2023).

The introduction of AR has made it possible for shoppers to experience products virtually in the absence of physical products, managing their expectations and instilling purchase confidence (Tan et al, 2022). For instance, IKEA introduced an AR app that lets users visualize furniture in their personal spaces, helping them see how various items would fit and appear in actual settings before buying. Brands like Sephora and L'oreal have crafted apps that let users virtually try out makeup, assisting them in their purchase decisions without the need for physical testing. Pepsi created an AR installation at a bus stop, presenting fantastical scenes, such as an alien invasion or a charging tiger, as if occurring in London's streets. Converse and Nike introduced virtual shoe-fitting apps that allow users to virtually try shoes by aiming their mobile devices at their feet. In select stores, presenting a Lego box to a special display reveals a 3D constructed toy, seemingly contained within the box. National Geographic and Cadillac incorporated AR to animate their magazine covers, providing readers with a heightened interactive experience. Patron Tequila designed an educational AR app journeying from the agave fields to the bottled product's completion. Many brands, like Taco Bell, have also utilized Snapchat's AR lenses for advertising campaigns.

With the rising wave of digital adoption, Greece, mirroring numerous other nations, stands at a juncture poised to derive considerable benefits from the assimilation of Augmented Reality (AR) technologies. Conducting a SWOT analysis would furnish Greek Small and Medium Enterprises (SMEs) with the requisite tools to gauge their preparedness and aptitude for leveraging this burgeoning technological potential. A comprehensive understanding of the inherent strengths possessed by Greek SMEs within the digital and AR spectrums provides a platform for these entities to discern potential competitive advantages.

In delving into the promise and inherent challenges associated with Augmented Reality marketing for Greek SMEs, the indispensability of a SWOT analysis becomes evident. Such an analytical approach would shed light on specific vulnerabilities—be they technological, financial, or skill-centric—that might hamper the seamless deployment of AR-centric marketing endeavors. Greece's storied historical legacy and its deep-seated cultural underpinnings offer a fertile

ground for AR to flourish, notably within the spheres of tourism and cultural heritage, transforming conventional tourist interactions through immersive historical explorations.

Yet, it's imperative for SMEs to maintain a degree of circumspection. They must be wary of potential pitfalls stemming from the nation's economic dynamics, the shadow of competition cast by well-entrenched corporations, regulatory intricacies, and the rapid trajectory of technological advancements. Early identification and mitigation of these challenges empower SMEs to devise strategies that are both prescient and adaptive. Furthermore, a nuanced appreciation of the unique attributes of the Greek market is paramount. Domestic consumers might exhibit differential engagement patterns with AR marketing initiatives in contrast to their international counterparts. Prudent allocation of resources becomes paramount in this context, especially considering the sizable investments AR marketing demands in terms of technological infrastructure, skill up gradation, and content creation. Intriguingly, a SWOT examination could also spotlight collaborative prospects among SMEs, where synergistic alignments can birth more potent AR outreach efforts. Given the recent economic challenges faced by Greece, there emerges a discernible window for digital metamorphosis, with innovations like AR serving as potential harbingers of an economic renaissance. By proactively integrating AR, Greek SMEs not only secure a vanguard position in contemporary technological paradigms but also fortify their readiness for imminent digital evolutions.

To encapsulate, undertaking a SWOT analysis for AR marketing within the context of Greek SMEs transcends mere strategic calculus. It embodies a holistic commitment to understanding regional nuances, synchronizing with global technological momentum, and orienting enterprises towards sustained innovation and growth.

For emphasizing please use italics and do not use underline or bold. Please do not change the font sizes or line spacing to squeeze more text into a limited number of pages.

2. Literature Review

2.1 Augmented reality marketing

Augmented Reality Marketing (ARM) employs augmented reality (AR) technology within marketing strategies to bolster brand engagement and fortify consumer-brand relationships. It intertwines virtual computer-generated data within a real-time direct or indirect view of a tangible environment (Scholz & Duffy, 2018). Mobile AR apps, along with other AR platforms, facilitate immersive and interactive experiences that captivate consumers and enhance brand perception (Rauschnabel et al., 2019).

AR marketing is an exponentially burgeoning domain, proffering a gamut of experiences tailored to magnify brand engagement and nurture consumer-brand interactions. A plethora of studies delve into various facets of AR marketing, gauging its potential ramifications on advertising and consumer behavior. For instance, Rauschnabel et al. (2019) shed light on the capacity of mobile AR apps to enthrall consumers and elevate brand stature. These authors underscore the indispensable role of quality in AR apps and accentuate the imperative for brands to meticulously craft and enact AR marketing blueprints.

In a different vein, Scholz & Duffy (2018) pontificate on AR's potential in revolutionizing mobile marketing and consumer-brand rapport. They vouch for the transformative prowess of AR in enhancing shopping experiences, fostering profound interactions between brands and consumers. Furthermore, they stress the salience of context within AR marketing, advocating for brands to tailor their strategies to the idiosyncratic needs and inclinations of their target demographics. Chylinski et al. (2020) delve into the nuances of ARM, emphasizing its role in curating situated customer experiences. Their discourse gravitates towards the escalating traction AR technologies are gaining within marketing strategies. They champion the potential of ARM to deliver personalized and contextually apt experiences to consumers. Subsequently, Rauschnabel et al. (2022) articulate a definition for ARM, discussing its multifaceted nature and prospective trajectories, while emphasizing the pivotal role of human-computer interplay.

Meanwhile, Zhang & He (2022) explore AR advertising's impact on college students' affinity for extreme sports, acknowledging AR's efficacy in capturing consumer attention. Sung (2021) delves into AR mobile app advertising, spotlighting its virality via shared social experiences. Lastly, Pozharliev et al. (2021) juxtapose AR with traditional advertising using both neurophysiological metrics and self-reported indices, highlighting AR's immersive and evocative nature.

Cumulatively, these studies corroborate the multifarious applications and inherent merits of ARM. They testify to AR's potential in inspiring consumers, metamorphosing mobile shopping paradigms, engendering situated customer experiences, and amplifying brand resonance. The quintessence of ARM hinges on impeccable AR apps, judicious design, strategic implementation, and acute cognizance of the target audience's unique predilections.

2.2 SWOT analysis

SWOT analysis has been recognized as a valuable tool in various fields. In the business and marketing domain, it is used to assess the internal and external factors that can impact the success of a business (Gurel & Tat, 2017). It helps organizations identify their strengths and weaknesses, as well as the opportunities and threats present in the market (Dyson, 2004).

In the business sector, SWOT analysis is commonly used to assess competitive advantage and strategic positioning. It helps organizations identify their strengths and weaknesses, allowing them to leverage their advantages and address areas of improvement (Barney, 1995). By analyzing opportunities and threats in the external environment, businesses can make informed decisions and develop effective strategies (Chung & Song, 2021).

SWOT analysis has been employed across a plethora of domains. For instance, within the realm of waste management, especially concerning pyrolysis-based municipal solid waste management in Poland, a SWOT analysis was pivotal in discerning the strengths, weaknesses, opportunities, and threats inherent to this approach (Ławinska et al., 2022).

In the healthcare sector, the SWOT framework has been harnessed to scrutinize the niche of virtual reality rehabilitation and therapy. This evaluation illuminated both internal and external factors that sway the competitive stance of companies specializing in virtual reality rehabilitation and therapy (Rizzo & Kim, 2005).

The aviation industry too has benefitted from SWOT analysis, particularly when devising airport-centric developmental strategies. By meticulously evaluating the strengths, weaknesses, opportunities, and threats tied to regional economic frameworks, airports are better positioned to craft efficacious growth and developmental blueprints (Chung & Song, 2021).

Notably, the scope of SWOT analysis transcends individual companies, encompassing entire nations and industry sectors. Recognized as a methodological stalwart for strategic positioning, it finds resonance in a myriad of business scenarios and analyses (Helms & Nixon, 2010).

The inception of the SWOT analysis is believed to be inspired scientifically and methodologically by the management technique known as Force Field Analysis. This technique was developed in the 1950s by K. Lewin, a trailblazer in the realm of social sciences (Nazarko et al., 2017). Contrarily, some sources suggest that the SWOT analysis was unveiled in 1971 by Harvard professor Kenneth Andrews in his work "Concept of Corporate Strategy". Later, Heinz Weihrich from the University of San Francisco refined this analysis, introducing the SWOT matrix, wherein S represents Strengths, W embodies Weaknesses, O signifies Opportunities, and T stands for Threats (Peng, 2021).

SWOT analysis's foundational history can be tracked as far back as the 1960s. Albert Humphrey, a management consultant affiliated with the Stanford Research Institute, is frequently credited with pioneering the SWOT analysis (Leong, 2021). Collaborating with his team, he birthed the tool during a project aimed at discerning

the reasons behind the frequent failures of corporate planning. After meticulous examination of data from prominent companies of that era, they introduced the SWOT analysis as an instrument to aid businesses in their strategic future planning. The contemporary iteration of SWOT analysis can also be linked to Robert Franklin Stewart and the Theory and Practice of Planning (TAPP) group at the Stanford Research Institute in California. Celebrated as a planning luminary from 1962 to 1971, Stewart delineated the role of a staff planner at Lockheed and constructed the "System of Plans", a pioneering compendium on long-range planning. Integral to this was the SOFT approach, represented by the acronym for Satisfactory, Opportunity, Fault, and Threat. Though 'Strength' and 'Weakness' would later supplant 'Satisfactory' and 'Fault' respectively, Stewart's oeuvre predominantly featured the original terms (Puyt, 2023).

3. Research Methodology

For the study's objectives, data was collected between 20.09.2023 and 05.10.2023, utilizing databases such as Google, Google Scholar, Semantic Scholar, Science Direct, and Scopus. The investigative methodology initiated with an organized search approach, deploying keyword searches across reputable databases, focusing on article titles, abstracts, and associated keywords. To provide a comprehensive understanding of the topic, related abstracts and articles regarding ARM were thoroughly assessed. This analysis culminated in the determination of a wide range of keyword pairings. For instance, primary descriptors like "augmented reality" or "AR" were methodically linked with secondary terms including "marketing," "e-commerce," "consumer behavior," "advertising," "retailing," "online retailing," "online shopping," "digital marketing," and "Greek SMEs". Each keyword pairing was designed to link the primary with the secondary term using the "AND" connector, such as "augmented reality" AND "marketing." To maintain relevance and consistency in the search outcomes, "augmented reality" and "AR" were consistently featured in all search configurations. The primary goal was to capture a broad spectrum of ARM-related articles through varied keyword groupings. Queries, conducted in both Greek and English. Predominantly, secondary data from the reviewed studies was leveraged and this data was subsequently structured using a SWOT analysis.

Pertaining to the study's inclusion criteria, only research published within the aforementioned dates and aligning with the specified keywords were included. Consequently, publications not in Greek or English were omitted. Given that the study revolved around pre-existing literature, no special permissions or approvals from ethical committees were deemed necessary. This also meant that there was no requirement for informed consent or any additional legal permission to advance.

3.1 Insights derived from augmented reality marketing concerning its influence on end-users

Augmented reality (AR) marketing profoundly shapes consumer perceptions, influencing their engagement, decision-making processes, and behavioral tendencies. A myriad of studies have delved into AR marketing's implications on consumer behavior, unveiling its ability to produce both hedonic and utilitarian values (Kumar et al., 2022). The dynamic and augmented facets of AR proffer a captivating and immersive experience, amplifying users' intrigue in products or services (Zhang & He, 2022). AR seamlessly bridges the chasm between consumers and commodities, furnishing a novel, interactive medium for consumers to resonate with and engage in brands (Kumar & Srivastava, 2022).

Neuromarketing research posits that AR, in tandem with virtual reality (VR), elucidates the neural underpinnings governing decision-making and emotional processes (Russo et al., 2022). Such profound insights into consumer behavior grant marketers the acumen to devise highly efficacious, bespoke marketing campaigns. In diverse contexts, AR marketing has manifested its influence on consumer tendencies and decision frameworks. Within the fashion sector, for instance, AR-centric experiences have been proven to shape consumer behavior, purchase intent, and elation during the acquisition journey (Kazmi et al., 2021). AR-driven advertising, notably when facilitated via mobile applications, has burgeoned as an avant-garde marketing modality, bestowing personalized, dynamic engagements (Sung et al., 2021).

Comparative studies elucidating the potency of AR marketing vis-à-vis conventional advertising suggest that transitioning from traditional to AR advertisements augments consumer physiological reactions and their propensity to expend (Pozharliev et al., 2021). Such findings insinuate AR marketing's potential to refine customer categorization and refine marketing communication paradigms. Moreover, the pervasive impacts of AR marketing on facets such as consumer loyalty, behavior, engagement, and procurement choices are evident (Akash & Tajamul, 2022). Through its immersive and dynamic essence, AR marketing fortifies brand-customer engagements and steers their purchasing inclinations.

By superimposing digital data onto tangible entities and locales, AR accentuates the recognition and valuation of tourist attractions (Kurgun et al., 2018). For instance, AR platforms can equip tourists with real-time insights about historical landmarks, iconic sites, and cultural festivities, amplifying the richness of their sojourn and rendering it unforgettable (Ozkul & Kumlu, 2019).

Employing AR, marketers have the capacity to conceptualize virtual excursions, enabling prospective tourists to virtually traverse and appreciate a locale prior to finalizing their visit (Hyun et al., 2009).

AR tools also serve the purpose of simulating virtual shopping adventures, wherein tourists can virtually experiment with apparel or accessories preceding an acquisition (Huang et al., 2015). Such enhancements not only elevate the shopping journey but also open vistas for destination marketers to advocate indigenous products and enterprises.

3.2 Insights derived from augmented reality marketing concerning its deployment in SMEs

In recent years, Augmented Reality (AR) has surfaced as a pivotal development in the realm of marketing, presenting novel avenues for enterprises, notably small to medium-sized businesses (SMEs) (Kyguoliene & Braziulyte, 2022). Notwithstanding its potential, the assimilation of AR marketing within SMEs poses distinct challenges, divergent from those encountered by larger conglomerates (Taiminen & Karjaluoto, 2015). Predominantly, SMEs grapple with the intricacies of digitization, rendering the embracement of digital marketing conduits more intricate (Taiminen & Karjaluoto, 2015). Furthermore, innovative information systems, inclusive of AR, are nascent introductions to the SME landscape (Ramdani et al., 2009).

The utilization of AR in marketing holds the promise of surmounting some limitations inherent to online methodologies, furnishing innovative modalities to showcase offerings to the consumer base (Silvestru et al., 2021). By capitalizing on AR innovations, SMEs can architect immersive interactions for clientele, bolstering engagement and catalyzing revenue streams (Sung, 2021). Specifically, mobile application advertisements powered by AR have demonstrated efficacy in enhancing viral marketing via shared societal experiences (Sung, 2021).

Yet, it is imperative for SMEs to adopt AR marketing with a strategic lens, factoring in elements such as marketing attitudes and practices to harness peak performance outcomes (Indrapriyatna et al., 2020). The ethos of entrepreneurial marketing, underlined by agility and effective execution, resonates profoundly when considering the incorporation of AR marketing blueprints by SMEs (Indrapriyatna et al., 2020). To this end, a theoretical scaffold integrating marketing attitudes, practices, and performance emerges as a requisite for steering AR marketing endeavors (Indrapriyatna et al., 2020).

In this digital epoch, SMEs are beckoned to integrate digital novelties, exploiting technologies like AR to maintain a competitive edge (Zairis & Zairis, 2022). Terminologies encompassing social media, artificial intelligence, Internet of Things, big data, and more, alongside AR and virtual reality, transcend mere jargon to become quintessential facets of digital marketing (Zairis & Zairis, 2022). SMEs embracing this digital metamorphosis stand poised to unearth novel growth trajectories and potentially penetrate global markets (Serravalle et al., 2021).

Nevertheless, the fiscal implications of AR marketing integration in SMEs should be juxtaposed with its prospective dividends. AR's allure lies in its capacity to captivate and immerse consumers, which can catalyze brand recognition, client satisfaction, and, consequentially, augmented sales (Silvestru et al., 2021). Existing studies advocate for SMEs' leverage of cost-efficient social media channels to champion AR marketing, thereby accessing an expansive audience demographic (Shauri et al., 2023).

Financial constraints, particularly pronounced in SMEs, emerge as deterrents in the digital and AR marketing spectrum, especially when contrasted with the financial might of larger entities (Taiminen & Karjaluoto, 2015). The financial outlay for AR

marketing oscillates based on multifarious determinants like AR complexity and requisite technical prowess (Kyguoliene & Braziulyte, 2022).

Beyond fiscal considerations, managerial paradigms like Total Quality Management (TQM) and lean manufacturing can buttress AR marketing endeavors in SMEs. TQM tenets can amplify the operational resilience of SMEs and refine their output quality, positively influencing their marketing ventures (Ghobadian & Gallear, 1997; Temtime & Solomon, 2002). Lean manufacturing tenets, with an emphasis on wastage reduction and efficiency amplification, can engender cost savings, which can be funneled into AR marketing projects (Rose et al., 2013).

Moreover, SMEs must astutely navigate other challenges and prospects intrinsic to AR marketing. This encompasses the imperative for a skilled workforce adept in AR content development and maintenance (Kakumbi & Phiri, 2022). Investment in employee upskilling or external expertise procurement may be necessary for a fruitful AR marketing deployment. Additionally, SMEs must deliberate on the cultural ramifications of AR marketing and foster an organizational milieu conducive to innovation and digital evolution (Badi, 2019; D'Angelo et al., 2020).

3.3 Insights derived from augmented reality marketing pertaining to data privacy concerns during implementation and usage

Concerns surrounding data privacy have become paramount in the sphere of augmented reality (AR) marketing. With the increasing integration of AR technology into advertising and marketing campaigns, the ramifications for consumer privacy are becoming more pronounced. A wealth of research has been dedicated to understanding the interplay between AR marketing, privacy, and consumer behavior.

Recent scholarly work underscores the intricate issues of privacy within AR marketing. A comprehensive investigation by Cowan et al. (2021) explored the privacy dilemmas emanating from AR face filters on social media platforms. Their conclusions suggested that such privacy trepidations might lead to a decline in both word-of-mouth recommendations and intentions to use, hinting at consumers' possible reluctance to engage with AR marketing due to these fears. In a parallel vein, Smink et al. (2019) probed into how AR shopping experiences impact brand perception and the divulgence of personal information. While their research illuminated AR's unique ability to harmonize offline and online shopping experiences, it simultaneously accentuated the burgeoning concerns related to personal data disclosure. This points to a conceivable reticence among consumers to embrace AR marketing, anchored in potential privacy violations. Yet, Munilla et al. (2023) posit that there is an imperative need to weave stringent privacy and security protocols into AR platforms. They champion a meticulous scrutiny and protection of data characteristics, paired with fortifications against potential security infractions. Adopting such measures will likely assuage these concerns, paving the way for a more confident and trusting rapport between consumers and AR marketing proponents.

3.4 Insights derived from the complexities and strategies of augmented reality marketing

Augmented reality (AR) marketing, despite its potential for creating immersive and memorable brand experiences, is fraught with technical and logistical complexities. From a technical standpoint, crafting mobile AR applications that bolster brand resonance through innovative design is paramount. These applications, as Rauschnabel et al. (2019) postulate, must not only cater to ease-of-use but should also afford top-tier AR experiences that effortlessly meld with the tangible environment. Chylinski et al. (2020) further argue that the amalgamation of computer vision and advanced artificial intelligence is essential in ensuring that digital overlays are precisely superimposed onto real-world settings. Zhang & He (2022) resonate with this perspective, emphasizing the need for sophisticated technological frameworks to ensure seamless AR integration.

From a logistical perspective, the initiation and sustained execution of AR marketing demand meticulous strategizing and harmonization. Marketers are presented with the task of astutely discerning factors like the demographic they aim to engage, the setting for the AR deployment, and the overarching marketing aims they seek to realize (Scholz & Duffy, 2018). An alignment between the AR content's relevancy, its potential for user engagement, and its congruence with the brand's ethos is non-negotiable, as highlighted by Jessen et al. (2020). As AR campaigns unfold in real-time, the data generated can serve as a treasure trove of insights. As Alanazi (2022) elucidates, sifting through this data can empower marketers to refine their tactics, thus driving marketing efficacy to its zenith.

3.5 Insights derived from the digital and economic landscape of Greek SMEs and enterprises

Greek Small and Medium-sized Enterprises manifest particular financial tendencies, characterized by augmented liquidity, a preference for short-term financial liabilities, and a pronounced dependence on inventory management, accounts receivable, and supplier credit. However, a discrepancy in profitability is often observed, a phenomenon corroborated by Voulgaris et al. (2004). Furthermore, there is a notable centralization of managerial prerogatives, especially in enterprises with family ownership. This sometimes hampers their ability to embrace substantial product innovations, a perspective explored in depth by Salavou & Lioukas (2003). The Hellenic Republic has made commendable strides in cultivating digital acumen among its populace. Recent data suggests that a significant proportion of its citizens, specifically those aged 16-74, possess a fundamental level of digital proficiency, mirroring the European Union's average closely (European Commission, 2022). However, despite advancements at the individual level, the integration of digital technologies within the commercial sector leaves room for enhancement. A detailed examination reveals a considerable disparity in the extent of digital technology adoption among Greek SMEs compared to other European counterparts (European Commission, 2022). However, certain metrics, such as the predilection for online

sales and the exceptional digital literacy rate among the youth, are noteworthy (European Commission, 2022). Additionally, the nation registers a marginally higher percentage of female ICT specialists relative to the European Union average. Albeit, the area of corporate ICT training remains an aspect that necessitates focused attention (European Commission, 2022).

A comprehensive analysis conducted by SEV in 2023 provides insight into the impediments encountered by Greek organizations in their digital transformation endeavors. Paramount challenges encompass the absence of an appropriate organizational culture, financial limitations, and the intricate process of identifying suitable technological collaborations (SEV, 2023). In terms of technological incorporation, there is a discernible inclination towards digital communication channels, Customer Relationship Management (CRM) systems, and customer analytics instruments. Intriguingly, projections indicate a potential surge in the deployment of blockchain methodologies in customer engagements in the near horizon (SEV, 2023).

According to recent data, the financial landscape for Greek SMEs has been undergoing significant transformation. In the wake of the COVID-19 pandemic, there has been a noticeable increase in the availability of bank loans, driven by an enhanced propensity of financial institutions to lend (Bank of Greece, 2022). Notwithstanding the positive trajectory in credit procurement, SMEs persistently confront multifaceted challenges, notably the arduous task of recruiting specialized personnel and mitigating escalating operational expenditures (Bank of Greece, 2022).

EKT's evaluation in 2022 offers a nuanced perspective on the state of Greece's innovation infrastructure. While there are encouraging indicators in areas like knowledge-intensive service exports and employment metrics in avant-garde firms, there is a concomitant decline in ICT training initiatives and collaborative ventures among innovative SMEs (EKT, 2022).

On the digital marketing front, there exists a palpable disparity between Greek SMEs and larger corporations in their approach and tool adoption (Alpha Bank, 2022). Major platforms, such as YouTube and SlideShare, are predominantly favored by larger conglomerates. However, it is evident that entities, irrespective of their size, harness the potential of social media platforms assiduously for brand cultivation and customer engagement (Alpha bank, 2022).

In the aftermath of the economic perturbations post-2011, Greece has witnessed fluctuating dynamics in the ICT employment sector (Alpha Bank, 2022). Although 2021 registered a decline in unemployment statistics compared to a decade prior, the figures remain conspicuously elevated in contrast to the EU mean (Alpha Bank, 2022). Nonetheless, a glimmer of optimism is reflected in the robust growth in the number of Greek ICT professionals over the decade, a substantial fraction of whom are credentialed with tertiary education degrees, surpassing the EU's normative benchmark (Alpha Bank, 2022).

4. Presentation and Result Analysis

Upon a comprehensive and detailed review of the literature pertaining to the integration of Augmented Reality Marketing via a structured methodology, several pivotal conclusions have been discerned. Utilizing the SWOT analysis as a foundational framework, it enables a profound comprehension of the subtle complexities and evolving trajectories of ARM, specifically within the realm of Greek SMEs. Subsequent to this, the analytical breakdown of the data is provided, and the outcomes are systematically classified within the SWOT framework as illustrated in Table 1.

- **Augmented reality marketing (ARM) & consumer behavior:** Augmented Reality (AR) in marketing significantly influences consumer behavior, enhancing their engagement, decision-making, and purchasing tendencies. This innovative method provides consumers with an immersive and captivating experience, strengthening their connection with products and services. It's not just about engagement; neuromarketing research shows that the combination of AR with virtual reality (VR) provides profound insights into neural processes that govern decision-making. With its application, sectors such as fashion have seen a shift in consumer behavior and purchase intent. Moreover, transitioning from traditional to AR advertisements intensifies consumer reactions and willingness to spend. Overall, AR marketing holds the potential to refine customer segmentation, improve marketing communication paradigms, and bolster brand-customer interactions.
- **ARM's deployment in SMEs:** AR has emerged as a revolutionary tool for small to medium-sized businesses (SMEs), offering new marketing avenues. However, its assimilation comes with challenges, primarily due to SMEs' struggle with digital transformation and the novelty of such systems in their landscape. Utilizing AR can overcome some limitations of online methods, allowing SMEs to create immersive customer experiences. It's essential, however, for these businesses to strategically integrate AR, ensuring alignment with their marketing goals. In this digital age, embracing AR and other digital innovations is critical for SMEs looking to maintain a competitive edge and explore global markets. However, financial considerations remain paramount. Investment in AR marketing should be weighed against potential returns, and strategies such as leveraging cost-effective social media channels for AR promotions should be considered. Finally, embracing management practices like Total Quality Management and lean manufacturing can support SMEs in their AR marketing ventures.
- **Data privacy in ARM:** With the rise of AR marketing, concerns surrounding data privacy have gained prominence. Research indicates that privacy issues, especially with features like AR face filters on social platforms, could deter consumers from

engaging with AR content. To address these concerns and cultivate trust, it's crucial to embed stringent privacy and security measures within AR platforms.

- **Complexities and strategies in ARM:**

Despite its potential, AR marketing presents both technical and logistical challenges. Creating effective AR applications demands a synthesis of computer vision and advanced artificial intelligence to ensure the digital content aligns perfectly with the real world. Logistically, marketers must meticulously strategize their AR campaigns, considering factors like target demographics and overarching marketing goals. As these campaigns generate real-time data, marketers have the opportunity to continually refine their tactics for optimal results.

- **Digital and economic landscape of Greek SMEs:**

Greek SMEs showcase unique financial tendencies, such as increased liquidity and a preference for short-term financial obligations. While there's an impressive rise in the digital proficiency of the Greek populace, there remains a gap in the adoption rate of digital technologies among Greek SMEs compared to European peers. Barriers to digital transformation include the absence of an appropriate organizational culture, financial constraints, and challenges in finding the right technological partnerships. Despite these obstacles, there's an encouraging trend toward the adoption of digital communication channels and customer relationship tools. However, there's a noticeable difference in the digital marketing approaches of Greek SMEs versus larger corporations. Finally, while Greek SMEs have seen increased access to bank loans post the COVID-19 pandemic, challenges persist, including hiring specialized staff and managing rising operational costs.

Table 1: SWOT analysis of Greek SMEs against the AR implementation

STRENGTHS	WEAKNESSES
<ol style="list-style-type: none"> 1. AR's influence on consumer Behavior: AR profoundly shapes consumer perceptions and influences engagement, decision-making, and behavioral tendencies. 2. Digital acumen among populace: A significant proportion of Greece's population possesses a fundamental level of digital proficiency. 3. Potential for unique offerings: By integrating AR, SMEs can offer immersive interactions for clientele, thereby increasing engagement and potentially boosting revenues. 4. Mobile app potential: Mobile application advertisements powered by AR have shown efficacy in enhancing marketing efforts. 5. AR in tourism and shopping: AR has the potential to accentuate the recognition and valuation of tourist attractions and simulate virtual shopping experiences. 	<ol style="list-style-type: none"> 1. Complexity of digitization for SMEs: SMEs in Greece grapple with the intricacies of digitization, making the integration of AR more complex. 2. Centralization of managerial decisions: Especially in family-owned businesses, which may hamper substantial innovations. 3. Financial limitations: Fiscal implications of AR integration may prove to be too steep for many SMEs. 4. Skills gap: There's a need for a skilled workforce adept in AR content development and maintenance. 5. Digital adoption disparity: Despite individual advancements, the commercial sector's digital technology integration is lacking when compared to other European counterparts.
OPPORTUNITIES	THREATS
<ol style="list-style-type: none"> 1. Trending digital metamorphosis: SMEs can leverage evolving digital tools and technologies, including AR, to maintain a competitive edge. 2. Strategic AR marketing: SMEs can craft and refine highly efficient and bespoke marketing campaigns leveraging insights from AR's influence on consumer behavior. 3. Expanding online sales: Given the inclination towards online sales, AR can be a valuable tool to enhance the online shopping experience. 4. Collaborative ventures: Opportunities to engage in collaborative ventures in innovative arenas such as AR. 5. Enhanced loan availability: Post-COVID-19, there's an increased availability of bank loans, potentially facilitating AR investments. 	<ol style="list-style-type: none"> 1. Data privacy concerns: Concerns surrounding data privacy may deter consumers from engaging with AR platforms. 2. Technical complexities: Crafting AR applications requires sophisticated technology to ensure seamless AR integration. 3. Financial strain on SMEs: The cost associated with AR marketing, given the financial constraints SMEs face, can be a deterrent. 4. Cultural and organizational hurdles: The need to foster an organizational culture that's conducive to innovation and digital evolution. 5. Competitive landscape: Larger corporations might have more resources and expertise to leverage AR, potentially overshadowing the efforts of SMEs.

5. Conclusion

The utilization of augmented reality presents considerable opportunities for marketing and commercial endeavors (Gabajova et al., 2021). The emergence of Augmented Reality (AR) in the marketing sphere presents an influential instrument that significantly alters consumer engagement, behavior, and purchase decisions. With AR advertising revenues set to surge, global brands like IKEA, Sephora, and Pepsi have already capitalized on its immersive potentials. As Greece stands at the brink of a digital evolution, Greek Small and Medium-sized Enterprises (SMEs) are well-positioned to reap substantial advantages from the adoption of AR solutions. Greek SMEs are presented with a pivotal moment in this digital transformation, underscoring the imperative of forward-thinking strategies, dedicated resources, and alignment with prevailing technological shifts. A literature research approach was utilized to delve into the intricacies of ARM, encompassing keyword-driven searches within reputable databases, concentrating on ARM-centric articles. Paramount insights highlight ARM's sway over consumer behavior, the intricacies and opportunities of its assimilation in SMEs, the imperative for data protection, and the distinctive fiscal and digital characteristics intrinsic to Greek SMEs. This current inquiry, through a SWOT analysis framework, offers a tactical roadmap for Greek SMEs to adeptly maneuver the intricate AR domain, accentuating the essentiality of harmonizing innovation with economic and cultural nuances.

However, this research is not without its limitations. Its scope is confined to secondary data pertaining to the execution of augmented reality marketing in the Greek context. The depth and scope of these findings could be enriched by incorporating quantitative techniques and primary data sources. Furthermore, these insights stand as a benchmark for evaluating particular domains within the Greek SME sphere, notably in areas like commerce and services.

References

- [1] Statista Market Insight (2023). AR Advertising-Worldwide. <https://www.statista.com/outlook/amo/ar-vr/ar-advertising/worldwide>
- [2] Tan, Y.C., Chandukala, S.R., and Reddy, S.K. (2022). Augmented Reality in Retail and Its Impact on Sales. *Journal of Marketing*, 86(1), pp. 48-66. <https://doi.org/10.1177/0022242921995449>
- [3] Scholz, J. and Duffy, K. (2018). We are at home: how augmented reality reshapes mobile marketing and consumer-brand relationships. *Journal of Retailing and Consumer Services*, 44, pp. 11-23. <https://doi.org/10.1016/j.jretconser.2018.05.004>
- [4] Rauschnabel, P., Felix, R., and Hinsch, C. (2019). Augmented reality marketing: how mobile ar-apps can improve brands through inspiration. *Journal of Retailing and Consumer Services*, 49, pp. 43-53. <https://doi.org/10.1016/j.jretconser.2019.03.004>
- [5] Chylinski, M., Heller, J., Hilken, T., Keeling, D., Mahr, D., and Ruyter, K. (2020). Augmented reality marketing: A technology-enabled approach to situated customer experience. *Australasian Marketing Journal*, 28(4), pp. 374-384. <https://doi.org/10.1016/j.ausmj.2020.04.004>
- [6] Rauschnabel, P., Babin, B., Dieck, M., Krey, N., and Jung, T. (2022). What is augmented reality marketing? Its definition, complexity, and future. *Journal of Business Research*, 142, pp. 1140-1150. <https://doi.org/10.1016/j.jbusres.2021.12.084>
- [7] Zhang, S. and He, N. (2022). Augmented reality advertising and college students' interest in the extreme sports: Moderating role of innovation resistance and health consciousness. *Frontiers in Public Health*, 10. <https://doi.org/10.3389/fpubh.2022.978389>
- [8] Sung, E. (2021). The effects of augmented reality mobile app advertising: viral marketing via shared social experience. *Journal of Business Research*, 122, pp. 75-87. <https://doi.org/10.1016/j.jbusres.2020.08.034>
- [9] Pozharliev, R., Angelis, M., and Rossi, D. (2021). The effect of augmented reality versus traditional advertising: A comparison between neurophysiological and self-reported measures. *Marketing Letters*, 33(1), pp. 113-128. <https://doi.org/10.1007/s11002-021-09573-9>
- [10] Gurel, S. and Tat, M. (2017). SWOT Analysis: A theoretical review. *Journal of International Social Research*, 10(51), pp. 994-1006. <https://doi.org/10.17719/jisr.2017.1832>
- [11] Dyson, R. (2004). Strategic development and swot analysis at the University of Warwick. *European Journal of Operational Research*, 152(3), pp. 631-640. [https://doi.org/10.1016/s0377-2217\(03\)00062-6](https://doi.org/10.1016/s0377-2217(03)00062-6)
- [12] Barney, J. B. (1995). Looking inside for competitive advantage. *Academy of Management Perspectives*, 9(4), pp. 49-61. <https://doi.org/10.5465/ame.1995.9512032192>

- [13] Chung, S. and Song, K. H. (2021). Regional economic structure and airport-centric development strategy formulation: The case of South Korea. *Science Progress*, 104(3_suppl). <https://doi.org/10.1177/00368504211021695>
- [14] Ławinska, O., Korombel, A., and Zajemska, M. (2022). Pyrolysis-based municipal solid waste management in Poland - SWOT Analysis. *Energies*, 15(2), pp. 510. <https://doi.org/10.3390/en15020510>
- [15] Rizzo, A. and Kim, G.J. (2005) A SWOT Analysis of the Field of VR Rehabilitation and Therapy. *Presence*, 14, pp. 119-146. <https://doi.org/10.1162/1054746053967094>
- [16] Helms, M.M. and Nixon, J. (2010). Exploring swot analysis – where are we now?. *Journal of Strategy and Management*, 3(3), pp. 215-251. <https://doi.org/10.1108/17554251011064837>
- [17] Nazarko J., Ejdyś J., Halicka K., Magruk A., Nazarko Ł., and Skorek A. (2017). Application of Enhanced SWOT Analysis in the Future-oriented Public Management of Technology. 7th International Conference on Engineering, Project and Production Management. *Procedia Engineering* 182, pp. 482 – 490. <https://doi.org/10.1016/j.proeng.2017.03.140>
- [18] Peng Y. (2021). TikTok's Business Model Innovation and Development - Porter's Five Forces Model, Business Model Canvas and SWOT Analysis as Tools. *Proceedings of the 1st International Symposium on Innovative Management and Economics. Advances in Economics, Business and Management Research*, volume 185, pp. 482-489. <https://doi.org/10.2991/aebmr.k.210803.066>
- [19] Leong, Y. (2021). The implementation of strategic threat intelligence for business organization. *Journal of It in Asia*, 9(1), pp. 41-48. <https://doi.org/10.33736/jita.3398.2021>
- [20] Puyt R.W., Lie F.B. and Wilderom C. P.M. (2023). The origins of SWOT Analysis, *Long Range Planning* Volume 56, Issue 3, 102304. <https://doi.org/10.1016/j.lrp.2023.102304>
- [21] Kumar, H., Gupta, P., and Chauhan, S. (2022). Meta-analysis of augmented reality marketing. *Marketing Intelligence & Planning*, 41(1), pp. 110-123. <https://doi.org/10.1108/mip-06-2022-0221>
- [22] Kumar, H. and Srivastava, R. (2022). Exploring the role of augmented reality in online impulse behavior. *International Journal of Retail & Distribution Management*, 50(10), pp. 1281-1301. <https://doi.org/10.1108/ijrdm-11-2021-0535>
- [23] Russo, V., Bilucaglia, M., and Zito, M. (2022). From virtual reality to augmented reality: a neuromarketing perspective. *Frontiers in Psychology*, 13. <https://doi.org/10.3389/fpsyg.2022.965499>
- [24] Kazmi, S., Ahmed, R., Soomro, K., E, A., Akhtar, H., and Parmar, V. (2021). Role of augmented reality in changing consumer behavior and decision making: case of Pakistan. *Sustainability*, 13(24), 14064. <https://doi.org/10.3390/su132414064>

- [25] Sung, E., Han, D., and Choi, Y. (2021). Augmented reality advertising via a mobile app. *Psychology and Marketing*, 39(3), pp. 543-558. <https://doi.org/10.1002/mar.21632>
- [26] Akash, B. and Tajamul, I. (2022). Impact of augmented reality marketing on customer engagement, behavior, loyalty, and buying decisions. *CM*, (23), pp. 545-553. <https://doi.org/10.18137/cardiometry.2022.23.545-553>
- [27] Kurgun, H., Kurgun, O., and Aktas, E. (2018). What does web 4.0 promise for tourism ecosystem? A qualitative research on tourism ecosystem stakeholders' awareness. *Journal of Tourism and Hospitality Management*, 6(1). <https://doi.org/10.15640/jthm.v6n1a6>
- [28] Ozkul, E. and Kumlu, S. (2019). Augmented reality applications in tourism. *International Journal of Contemporary Tourism Research*, pp. 107-122. <https://doi.org/10.30625/ijctr.625192>
- [29] Hyun, M., Lee, S., and Hu, C. (2009). Mobile-mediated virtual experience in tourism: concept, typology and applications. *Journal of Vacation Marketing*, 15(2), pp. 149-164. <https://doi.org/10.1177/1356766708100904>
- [30] Huang, Y., Backman, K., Backman, S., and Chang, L. (2015). Exploring the implications of virtual reality technology in tourism marketing: an integrated research framework. *International Journal of Tourism Research*, 18(2), pp. 116-128. <https://doi.org/10.1002/jtr.2038>
- [31] Kyguoliene, A. and Braziulyte, R. (2022). Application of augmented reality in product packaging: challenges and development opportunities. *Management of Organizations Systematic Research*, 88(1), pp. 85-100. <https://doi.org/10.2478/mosr-2022-0014>
- [32] Taiminen, H. and Karjaluo, H. (2015). The usage of digital marketing channels in SMEs. *Journal of Small Business and Enterprise Development*, 22(4), pp. 633-651. <https://doi.org/10.1108/jsbed-05-2013-0073>
- [33] Ramdani, B., Kawalek, P., and Quiles, O. (2009). Predicting SMEs' adoption of enterprise systems. *Journal of Enterprise Information Management*, 22(1/2), pp. 10-24. <https://doi.org/10.1108/17410390910922796>
- [34] Silvestru, C., Ifrim, A., Oncioiu, I., Lupescu, M., and Ramido, S. (2021). AR & VR Marketing: when and where?. *Proceedings of the International Conference on Business Excellence*, 15(1), pp. 664-671. <https://doi.org/10.2478/picbe-2021-0062>
- [35] Indrapriyatna, A., Darlis, V., Verinita, V., and Yeni, Y. (2020). The role of attitude toward marketing and marketing practice on marketing performance: A theoretical framework development for SMEs. *Proceedings of the 3rd Global Conference on Business, Management, and Entrepreneurship*, pp.37-40. <https://doi.org/10.2991/aebmr.k.200131.009>
- [36] Zairis, A. and Zairis, G. (2022). Digital innovation: the challenges of a game-changer. *European Conference on Innovation and Entrepreneurship*, 17(1), pp. 630-637. <https://doi.org/10.34190/ecie.17.1.774>
- [37] Serravalle, F., Viassone, M., and Vanheems, R. (2021). The dark side of retailers regarding digital growth strategies: an exploratory study on

- augmented reality perception. *Sinergie Italian Journal of Management*, 38(3), pp. 71-88. <https://doi.org/10.7433/s113.2020.05>
- [38] Shauri, N., Magaria, B., and Masanyiwa, Z. (2023). Utilization of social media and its implications on the performance of SMEs in Dodoma city, Tanzania. *Open Journal of Business and Management*, 11(02), pp. 660-672. <https://doi.org/10.4236/ojbm.2023.112035>
- [39] Ghobadian, A. and Gallear, D. (1997). TQM and organization size. *International Journal of Operations & Production Management*, 17(2), pp. 121-163. <https://doi.org/10.1108/01443579710158023>
- [40] Temtime, Z. and Solomon, G. (2002). Total quality management and the planning behavior of SMEs in developing economies. *The TQM Journal*, 14(3), pp. 181-191. <https://doi.org/10.1108/09544780210425900>
- [41] Rose, A., Deros, B., and N., A. (2013). Lean manufacturing perceptions and actual practice among Malaysian SME's in automotive industry. *International Journal of Automotive and Mechanical Engineering*, 7, pp. 820-829. <https://doi.org/10.15282/ijame.7.2012.2.0067>
- [42] Kakumbi, G. and Phiri, J. (2022). Adoption of social media for SME growth in the covid-19 era: a case of SMEs in the clothing industry in Lusaka, Zambia. *Open Journal of Business and Management*, 10(06), pp. 3202-3229. <https://doi.org/10.4236/ojbm.2022.106159>
- [43] Badi, K. (2019). Implementation of marketing concept and organizational culture in SMEs in Al Buraimi – Oman. *Benchmarking an International Journal*, 26(7), pp. 2401-2414. <https://doi.org/10.1108/bij-05-2018-0136>
- [44] D'Angelo, C., Gazzaroli, D., and Gozzoli, C. (2020). Organisational welfare in Italian SMEs: the process of valorising human resources. *Sustainability*, 12(22), 9318. <https://doi.org/10.3390/su12229318>
- [45] Cowan, K., Javornik, A., and Jiang, P. (2021). Privacy concerns when using augmented reality face filters? Explaining why and when use avoidance occurs. *Psychology and Marketing*, 38(10), pp. 1799-1813. <https://doi.org/10.1002/mar.21576>
- [46] Smink, A., Frowijn, S., Reijmersdal, E., Noort, G., and Neijens, P. (2019). Try online before you buy: How does shopping with augmented reality affect brand responses and personal data disclosure. *Electronic Commerce Research and Applications*, 35, 100854. <https://doi.org/10.1016/j.elerap.2019.100854>
- [47] Munilla, G., Nair, V., and Song, D. (2023). Sok: Data privacy in virtual reality. <https://doi.org/10.48550/arxiv.2301.05940>
- [48] Jessen, A., Hilken, T., Chylinski, M., Mahr, D., Heller, J., Keeling, D., and Ruyter, K. (2020). The playground effect: How augmented reality drives creative customer engagement. *Journal of Business Research*, 116, pp. 85-98. <https://doi.org/10.1016/j.jbusres.2020.05.002>
- [49] Alanazi, T. (2022). Marketing 5.0: An empirical investigation of its perceived effect on marketing performance. *Marketing and Management of Innovations*, 13(4), pp. 55-64. <https://doi.org/10.21272/mmi.2022.4-06>

- [50] Voulgaris, F., Asteriou, D., and Agiomirgianakis, G. (2004). Size and determinants of capital structure in the Greek manufacturing sector. *International Review of Applied Economics*, 18(2), pp. 247-262. <https://doi.org/10.1080/0269217042000186714>
- [51] Salavou, H. and Lioukas, S. (2003). Radical product innovations in SMEs: the dominance of entrepreneurial orientation. *Creativity and Innovation Management*, 12(2), pp. 94-108. <https://doi.org/10.1111/1467-8691.00272>
- [52] European Commission, (2022). Greece in the Digital Economy and Society Index. <https://digital-strategy.ec.europa.eu/en/policies/desi-greece>
- [53] Digital Transformation Observatory of Hellenic Federation of Enterprises (SEV) (2023). Digital Transformation of Greek Enterprises. <https://www.sev.org.gr/ekdoseis/psifiakos-metaschimatismos-ton-ellinikon-epicheiriseon>
- [54] Bank of Greece (2022). Governor's Annual Report. <https://www.bankofgreece.gr/ekdoseis-ereyna/ekdoseis/ekthesh-dioikhth>
- [55] EKT (2022). Greece's Position in the European Innovation Scoreboard 2015-2022. National Documentation and Electronic Content Center, Athens. ISBN: 978-618-5557-38-6. <https://metrics.ekt.gr>
- [56] Alpha Bank (2022). Information and Communication Technologies and Digital Transformation. Alpha Bank Economic Research. <https://www.alpha.gr>
- [57] Gabajova G., Krajcovic M., Furmannova B., Matys M., Binasova V. and Starek M. (2021). Augmented reality as a powerful marketing tool. *Proceedings of CBU in Economics and Business*, 2, pp. 41-47. <https://doi.org/10.12955/peb.v2.253>