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Contents

Articles

ARTICLES

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CENTRAL BANKS AT A CROSSROADS – THE EFFECT OF INDUSTRY 4.0

Abstract

Industry 4.0 technologies are accelerating the digital transformation of financial systems, reshaping money, payment infrastructures, and the strategic role of central banks. This study examines the emergence of Central Bank Digital Currencies (CBDCs) within this evolving landscape, exploring the evolution of payment systems, fintech integration, and the implications of distributed ledger technology and private cryptocurrencies. Using qualitative content analysis of secondary data, the paper compares the approaches of the U.S. Federal Reserve, the Bank of England, and the South African Reserve Bank to CBDC design, adoption, and regulation. Findings highlight shared policy concerns including cybersecurity, privacy, regulatory gaps, financial inclusion, and the need for international interoperability while revealing notable differences in institutional priorities and pace of development. The study underscores that central banks stand at a pivotal moment: their responses to Industry 4.0 innovations and digital currency initiatives will shape future monetary stability and the global financial order.

JEL Classification: E58, G21, O33.

Keywords: Central Bank Digital Currency, Industry 4.0, Fintech, Payment Systems, Financial Regulation, Monetary Policy.

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Introduction

Global industrialization has been a revolving one. The first industrial revolution which lasted between the mid-1700s to 1830 was centered on mechanization, mass production steam and waterpower. Since the emergence of industry 1.0, there have been different cycles of industrial revolution leading to present day industry 4.0, which is the fourth industrial revolution. Industry 4.0 is the concept of automation and data exchange in manufacturing technologies, which enable the use of Internet of Things (IoT), Cyber-Physical Systems (CPS), big data analytics, cloud computing and cognitive computing to move towards a smart world (Hercko and Hnat, 2015). The concept of industry 4.0 started in Germany as a manufacturing drive to boost the country's economy. The twenty first century has witnessed the rapid emergence of technology in various fields. The introduction of technology into many organizations and sectors has changed the system of operations. The financial industry, just like many other industries, has evolved with the introduction of digital technology. Transactions within the final sector are becoming more virtual day in and day out. Financial institutions are integrating technology into their operations to improve customer experience, resulting into the phenomenon of Fintech which is the incorporation of technology in financial services. One key aspect of financial services digital technology is altering is currency and payment systems. This paper discusses the evolution of money and payments systems, Industry 4.0 and its changes to the financial sector and banking, crypto currencies, central banks and policy constraints facing monetary authorities and the advantages. This paper also focuses on three central banks and looks at how each is responding to digital currencies, including regulations or policies around cryptocurrencies as well as if they are creating their own CBDC. The three central banks are the United States Federal Reserve, the Central Bank of England, and the South African Reserve Bank, and were chosen as some of the largest central banks in the world that also represent some geographic, cultural, and policy-based differences. The objective of this research is to analyze the influence industry 4.0 has on economies, payment systems and the entire financial industry as a whole. This paper pays attention to digital currencies, cryptocurrencies, and the digitalization of banking with emphasis on three central banks: The Fed, The Bank of England, and the South African Reserve Bank. It also focuses on the evolution of payment systems and policy constraints facing monetary authorities in the wake of rapid digitalization. The paper is organized into seven sections. It begins by introducing Industry 4.0 and its implications for financial system digitalization, followed by a literature review on industrial revolutions, fintech, and emerging digital payment technologies. The methodology section outlines the qualitative content analysis applied to secondary data. Subsequent sections trace the evolution of payment systems and examine how digitalization is reshaping banking operations.

The core analysis evaluates distributed ledger technology, cryptocurrencies, and the strategic responses of central banks, with a comparative focus on the Federal Reserve, the Bank of England, and the South African Reserve Bank. The paper concludes by synthesizing these insights and discussing the policy and regulatory implications of CBDC development in a rapidly evolving digital landscape.

1. Literature Review

There have been quite a number of industrial revolutions since the 18th century. The term industrial revolution was first coined by Arnold Toynbee, an English Economic historian, to describe Britain's economic development. Today, the term is broadly used to describe the process of economic transformation. The first industrial revolution was mainly centered on the production of iron, coal textiles, the use of machinery and skilled labor. These new inventions greatly improved the British economy and made them the powerful economy at the time. Since then, industrial revolutions have been a determining factor of a nation's economy. Countries who effectively harness industrial changes witness growth in their economies. When economies are growing and are buoyant, they directly affect the socio-economic life of the citizens. Industrial revolutions also tend to alter the operations in certain sectors of an economy such as finance, health, social and education. The social phenomena of third, fourth and fifth industrial revolutions are radically changing the production basis, lifestyle, and activities of people (Melnyk, Kubatko, Dehtyarova, Matsenko, Rozhko, 2019). The President of the World Economic Forum, Klaus Schwab shared similar thoughts in Davos about industrial revolutions influencing social development (Schwab 2017). Presently, in the era of the fourth industrial revolution, technological innovations in the direction of comprehensive digitalization and sustainability are the norm. The intensive ICT development towards smart solutions for business management, production, supply and delivery chains determines growth in the era of private and public sectors digitalization, called Industry 4.0. Considering the idea and efforts to increase the customer value added (Topleva, 2018). Industry 4.0 transforms production models, business practice and economic theory. The achievements of every industrial revolution form so-called gales of innovation (Schumpeter, 2003). In this perspective outline, the achievement of high and sustainable business results consists in the proactive creation of value innovation (Chan and Mauborgne, 2015) that combines reduced production costs, eco- design and increased consumer value. The goal of industrial revolution is the complex satisfaction of consumer expectations and desires, which implies development and growth. Financial technology, a combination of financial technology Is used to describe any new technology that seeks to improve and automate the

delivery and use of financial services. At its core, fintech is utilized to help companies, business owners and consumers better manage their financial operations, processes, and lives by utilizing specialized software and algorithms that are used on computers and, increasingly, smartphones. Fintech also includes the development and use of crypto currencies such as bitcoin (Kagan, 2020). This has enhanced the 21st Century Payment System to greater deal and consists of a set of technologies, laws, and contracts that allow payments to occur and determine when a payment constitutes settlement. Payment systems include currency, checks, credit and debit cards, electronic funds transfers, internet banking, and so on (Boel, 2019). The further evolutionary dynamics has given rise to various crypto currencies and as defined as decentralized currencies that use cryptography to secure transactions and validate balance. The prefix crypto, meaning 'concealed' or 'secret', is derived from the Greek word κρυπτος´ meaning hide. Crypto-currencies rely on cryptography to facilitate and record transactions on a set of electronic ledgers – databases of financial accounts. Cryptocurrencies have no tangible existence, rather they are electronic signals and records that keep track of transactions mediated with the currency. Given their electronic representation, cryptocurrencies are also referred to as 'digital' or 'virtual' currencies, though distinctions can be made between all three (Kumar and Smith, 2017). Businesses have also become tech survey to a very large extent. Electronic commerce as a business model uses information technology to increase sales, business efficiency and provide a basis for new products and services (Išoraitė & Miniotienė, 2018). More often, though, it is used to define a broader process of how the Internet is changing the way companies do business, of the way they relate to their customers and suppliers, and of the way they think about such functions as marketing and logistics (Lindsay, 2002). As part of the research strategy a content analysis and comparative approach were used for this study. Content analysis is the approach employed to capture the state of knowledge in the classified areas. Thus, it enables an investigator to meaningfully interpret and make inferences about the patterns in the content of the overall study (Bowen and Bowen, 2008). There was a comprehensive analysis of literature based on Industry 4.0, Fintech, Cryptocurrencies, Industry 4.0 applications in the banking sector and its implications on central banks and monetary authorities. Secondary data was the sole source for data collection. Secondary data is used to review other writers' opinions on the subject matter and to form a theoretical background which serves as a backbone to this piece of work is built. Existing literature relevant to the topic under study was collected from online libraries such as…. This study gives insight into the incorporation of technology into the financial sector in the twenty first century and how it has changed the systems of operation.

2. Evolution of Payment Systems

Payment systems are the mechanisms that enable the smooth transfer of funds between buyers and sellers, and/or between banks. Payment systems over the years have evolved. Before the introduction of currencies, banks and financial institutions, payment between buyers and sellers took the barter form. Barter trading then was the trading of goods and services in return for other goods and services. Over time, other payment systems such as cowries were introduced and eventually money. When money became the medium through which payments were made each country, nation or jurisdiction adopted a particular money as legal tender which is known as currency. In society, economic activities are impossible without the transfer of money. In this sense, it can readily be said that payment systems are one of the most significant social infrastructures. As a limited scope of people in central banks and commercial banks play a central role in payment systems, the people on the street seldom or never notice the role and importance of payment systems (Nakajima, 2011). Payment systems in the twenty first century are rapidly evolving due to the development of Information Technology. Technology has enhanced payment systems and processing. Payment systems play a crucial role in an economy. The circulation of funds in economy revolves around payment systems, thus, if errors occur to payment systems, flow of funds may be restricted which may adversely affect the economy. Therefore, we can conclude that payment systems are social infrastructures that support all economic activities, including commercial activities and financial transactions (Nakajima, 2011). From a conventional payment system, the process of payment and settlement involves a buyer-to-seller transfer of cash or payment information (i.e., cheque and credit cards). The actual settlement of payment takes place in the financial processing network. A cash payment requires a buyer's withdrawals from his/her bank account, a transfer of cash to the seller, and the seller's deposit of payment to his/her account. Non-cash payment mechanisms are settled by adjusting i.e., crediting and debiting the appropriate accounts between banks based on payment information conveyed via cheque or credit cards (Sumanjeet, 2009).

3. Emergence and Process of Electronic Payment Systems

In the last two decades there has been a global incorporation of technology into all industries and operations. Like many other systems, technology has influenced payment which has resulted into some exceptional changes. Previously, the paper-based payment system involved the exchange of paper payment instruction between banks. With the global population growing and payments increasing processing paperwork and the manual operation of payments became very tedious. Therefore, people tried to utilize information technology (IT) regarding the payment system. This

endeavor resulted in developing the payment systems using computers and networks. In the beginning, these payment systems were called the "electronic payment systems". However, the name became obsolete soon and these systems came to be simply known as the "payment systems". That was because most payment systems became electronic within a short period of time (Nakajima, 2011).

Electronic payment dates to the late 1800s. and have been expanding and evolving with the continual advancement of technology. Physical payment at the point of sale was the requirement to complete a transaction until in 1871, the Electronic Fund Transfers (EFTs) was launched by the Western Union Telegraph Company, presently known as Western Union. Western Union further revolutionized payments in 1914, when it introduced charge accounts that could be used at a variety of businesses-whereas previous iterations had been restricted to the individual stores that provided them. These accounts were linked to cards that customers could then use to purchase items on credit, which would then have to be repaid to the issuer (Phillips, 2020). This was known as a charge card and was a popular electronic payment system in the early parts of the twentieth century. Charge cards continued to enjoy some popularity until the 1950s when credit cards were introduced. Examples of other pioneers of charge cards were the Diners Club, Carte Blanche and American Express. The first bank to create the modern-day credit card was Bank of America in 1958. The difference between charge cards and credit cards is that balances were required to be paid off completely at a predetermined interval whilst credit cards do not require just a minimum payment requirement each month, with balances carried over with interest fees. The credit system, as we know it today, has witnessed some changes over the years due to digitalization. At the advent of credit cards, credit card companies had to manually verify a customer's name and credit balance before a transaction could be approved. Today with technological advancement and the internet electronic payment systems have further evolved. E-commerce, a faster and more efficient system of payment has been introduced. There are also electronic verification systems that rapidly verify and authorize digital payments from different channels. Mobile devices such as mobile phones and tables have also become popular payment methods which allow customers to make payments easily and conveniently through mobile wallets such as Apple Pay and Google Pay. Digital payments continue to increase in popularity, rewarding forward-thinking organizations for meeting the demands of technologically advanced customers and pushing laggards to modernize to remain competitive (Phillips, 2020). Payment systems will keep changing and evolving rapidly. Examples of future digital transformation into payment systems include point-of-sale systems and Omni channel acceptance for payment processors. These will make accepting and processing transactions

extremely efficient and facilitate the collection of useful business data, resulting in more profits for producers and service providers as well as higher rates of adoption for payment service providers.

4. Banking, Industry 4.0. Banking and Digital Technology

There are not many interventions that have changed the business of banking as quickly as digital technology. This alteration has morphed into what is known as digital banking or E-banking today. Banks worldwide are reorienting their business strategies towards the new opportunities offered by e-banking. E-banking has enabled banks to scale borders, change strategic behavior and thus bring about new possibilities (Nitsure, 2003). Digital banking is the computerization of traditional banking services. It enables the bank's customers to access banking products and use banking services via an online/electronic platform. It is the digitalization of all banking operations to substitute the bank's physical presence, eliminating the customer's need to visit the branch. Digital banking includes activities like cash deposits, withdrawals, and transfers, bill payments, account management and services, applying for financial products, loan management, portfolio management and investment in financial services (Haralayya, 2021).

Today technology and digitalization form an integral part of the banking sector budget and operations strategy. Digital technology is rapidly changing every day, and banks must keep up with their changing trends to stay ahead in a highly competitive sector. The Deloitte team in Central Europe conducted research called "Digital Banking Maturity 2018. The goal of this study was to show a detailed picture of digitalization in Europe, the Middle East and African region (EMEA) area. 248 financial institutions were selected across 38 countries, and their performance was measured using the following criteria: functionalities benchmark, the importance of activity for the client and mobile user experience. The findings from this research showed that countries such as Poland, Slovakia and the Czech Republic are leading in digital maturity, thus they were tagged digital champions. There are also some countries who only incorporated digital technology into their banking operations and were tagged as 'digital adopters. These countries included Hungary, Romania, Croatia and Serbia. Industry 4.0 introduction into the financial services industry has resulted in the global phenomenon of Fintech. Although Fintech is very popular it has not caught up with all countries of the world. Internet accessibility, funding availability of expertise are some factors that determine the use of advanced technology or artificial intelligence in a country's banking industry. Many developed countries have their banking services and operations changing rapidly because of their accessibility to the internet and the availability of funding and human capital with the requisite expertise. On the other hand, developing and

underdeveloped countries still have a long way to go to streamlining digital and e-banking services due to constraints in accessing technology.

4.1. Digital Banking Products and Services

Digital technology has made the banking experience easier and more accessible to the customer. With an electronic device such as a laptop, tablet or mobile phone and good internet connection, customers can conveniently do so much without visiting banks physically. Today many banks and financial institutions have mobile applications which can be downloaded onto mobile phones. Through these mobile apps, customers can view and print their statements, deposit and send money, pay bills and ask questions. In the United States for example, most banks use a mobile payment application called Zelle to facilitate mobile payments between banks. Zelle is a mobile payment application that allows peer-to-peer (P2P) money transfers, simplifying the process of paying for things and making it easier to move money without handling cash or visiting the bank. Zelle was developed by more than 30 major U.S. banks. The service is also integrated within the mobile banking apps of banks including Wells Fargo, TD Bank, Bank of America and Chase (Stolba, 2020). Automated Teller Machines (ATMs) is also a product of advanced technology which has ameliorated banking services across the world. With a debit or credit card customers can withdraw money and deposit money without visiting the bank. More recently, cheques can also be paid into account at ATMs. ATMs are very popular across cities, towns and neighborhoods, each bank's ATM provides services of its customers for free but charge a fee for users from other banks. Another key service provided by banks with the help of digital technology is virtual assistants. With online and mobile banking, customers can have real time conversations with a virtual assistant. Instead of calling or visiting the bank in person, a virtual assistant may help find answers to your questions. Some banks have given personalized virtual assistance features by adopting a name for the virtual assistant. For instance, Bank of America's virtual assistant is called Erica, and she can help you to navigate the online banking and answer questions (Financial IT 2025).

4.1.1. Challenges of Digital Banking and its Future

A major advantage of digital banking is its affordability. Digital services help to reduce the cost of operations with such labor, rent and other miscellaneous cost in running a physical office. By moving into digital space, this makes data transfers go quickly, which allows for more time to work on other aspects of the online banking experience. This speed also allows users to spend less time on banking services and use their time efficiently (Pobre, 2020). The viability of digital banking also makes it beneficial to customers because most services are processed through secure servers

which protect the privacy of customers and allow them to monitor transactions. Due to digital banking's convenience and accessibility, customers are likely to stick with banks that provide seamless services and continue to be innovative with their service delivery. Thus, customer retention as well as attraction of prospective clientele is high. Every business seeks to increase revenue and make profits. Incorporating technology into banking services attracts and retains customers, resulting in an increase in demand for services. Customers are charged monthly or daily for the e-banking services, which ultimately increases annual revenue from banks. Although digital banking has incredible benefits for both banks and customers, there are also some shortcomings and limitations. Digital banking services are only user-friendly to customers who are tech-savvy. The processes could be complicated and difficult to understand for people who have limited access to technological knowledge, digital devices and the internet. Thus, completely adopting online and e-banking services can be a barrier to accessibility for certain audiences. With words of fraud, digital attacks, and cyber threats, winning and retaining customer trust can be difficult. Even with smaller instances or one big one, this can derail any momentum on gaining the trust of customers and they may turn to another method of banking quickly. Financial institutions work within a legal framework stipulated by regulatory authorities. Some regulatory requirements may be difficult to understand and cost more money to be implemented.

The future for digital banking is bright and banking services and operations will continue to evolve rapidly with new developments in artificial intelligence. As artificial intelligence technology continues to influence other industries, banking is looking to advance their AI tools to help service more companies and save on time and efforts in that department. AI is the perfect asset to help aid millennials with online banking and can help teach older generations to efficiently bank digitally. (Pobre, 2020).

5. Central Banks and Digital Currencies: Distributed Ledger Technology and Cryptocurrency

One major part of the digitalization of Industry 4.0 is the development of distributed ledger and blockchain technology and its use by both private companies and central banks. Historically, money and banking has been controlled and regulated by central banks, giving governments power over the monetary system and currencies (Lye, 2017). The development of blockchain technology allows for private companies to create and control their own currencies that are outside of government control, allowing people to trade unofficial money and take some of the power of the financial system away from governments and central banks (Lye, 2017). Governments and central banks are starting to realize that as money continues to be digitized and circumvents previously established systems, they will have less and less

control over the economy and monetary and fiscal policy (Lye, 2017). One of the ways that governments and central banks are addressing this issue is by considering creating their own digital currency that would be issued and regulated by the central bank and would fill the space that private cryptocurrencies are trying to build. Distributed ledger technology is a database that exists in multiple locations and participants, not in one fixed location (Meola, 2020). Blockchain is a type of distributed ledger where each entry in the shared database is encrypted and confirmed (Meola, 2020). These technologies provide a secure and totally digital way to do banking transactions and make the entire process more efficient and more secure due to being decentralized and unchanging (Meola, J2020). Cryptocurrency is a type of digital money that uses blockchain technology, so it is encrypted and decentralized (Ashford & Schmidt, 2020). As it is not issued or controlled by a central bank but is spread across users, it can be more volatile and not as stable as other forms of money (Ashford & Schmidt, 2020). Typically, new units of cryptocurrency can only be made by mining, which is giving an algorithm to solve, and the winning computer gets a small amount of cryptocurrency, or through proof of stake, where users put up a small amount of cryptocurrency as collateral while validating a transaction, getting cryptocurrency in return (Ashford & Schmidt, 2020). Though proof of stake does not require much energy, it does require users to have some amount of cryptocurrency up front. On the other hand, mining does not require initial cryptocurrency, but takes up a huge amount of energy, which can be seen in the .21% of all energy in the world used to mine Bitcoin (Ashford & Schmidt, 2020). Cryptocurrency is not generally accepted by businesses as a form of payment but that is starting to change, such as with PayPal announcing that it will make it possible to pay with cryptocurrency on their platform, making it much more accessible to the public (Ashford & Schmidt, 2020). Though cryptocurrency is becoming more popular, members of the traditional financial sector see it as volatile and something with little to no intrinsic value (Browne, 2021a). Stablecoins are a specific subset of cryptocurrency that are valued based on a non-digital asset, including commodities (like gold), and fiat currencies (Sigalos, 2021). Though it performs some of the functions of money, cryptocurrency is not considered money by many central banks, regulators, and policy makers around the world (International Fintech Working Group [hereafter IFWG], 2021).

5.1. Central Bank Digital Currency

In order to understand a central bank digital currency (CBDC), it is necessary to understand the various types of money that are currently in widespread use. There are currently three types of money: physical cash, electronic central bank deposits, and private commercial bank deposits (Bank for International Settlements [hereafter BIS], 2020). Physical cash and

electronic central bank deposits are both run by central banks but only cash is available and accessible to the general public, while central bank deposits, also known as reserves, are only for eligible financial institutions (BIS, 2020). Commercial bank deposits are available to the public through private institutions but are supported by central banks (BIS, 2020). This means that the central banks have some control over all the types of money, even though some of it is being run through private institutions. Digital currency has created a new type of money. Digital currency is a currency that only exists electronically and has no reserve held by a central bank (Federal Reserve Board, 2021a). Non central bank digital currencies, such as Bitcoin, are totally outside of the monetary structure that central banks have created, meaning that there is no oversight by central banks or the government (BIS, 2020). Central banks are worried about losing control over the financial system if private digital currencies become more popular, causing many governments to start to explore and potentially create their own CBDC. As of 2020, 80% of central banks around the world were exploring CBDC and over 50% had started running experiments and pilot programs (BIS, 2020).

When creating a CBDC, central banks have to keep a number of things in mind while designing the actual currency and planning regulations and policy proposals. One of the main things is compatibility with the digital currencies being created by other central banks (BIS, 2020). To ensure that there is some coordination across international borders, some central banks have collaborated on research of CBDC, such as a report by some of the top central banks in the world about the foundational principles behind CBDC (BIS, 2020). Another issue that central banks have to consider when creating their own CBDC is security. With an entirely virtual currency that is not backed by any physical reserves, there are worries about cyber-attacks and currency being stolen with no physical failsafe (BIS, 2020). Central banks also must consider when creating their own digital currencies as the needs and wants of the public who are going to be using it. Not all members of the public will even be able to access digital currencies at all and will still need to rely on cash (BIS, 2020). If central banks do not take this into account when creating their CBDC, they will leave people stranded with no way to access a payment mechanism. CBDC cannot be a replacement for cash entirely but must supplement it and be another way for people to complete transactions, not the only way (BIS, 2020).

Central banks also need to keep in mind the digital literacy of the population when exploring, creating, and promoting a CBDC. Even if people do have reliable access to CBDC, they might not have the digital or financial understanding necessary in order to want to start using the new CBDC (BIS, 2020). Additionally, people might not trust the government to have the type of control over their money in the form of a digital currency where there

is no physical equivalent (BIS, 2020). Due to their inherent digital nature, CBDCs will never be able to be fully anonymous the way that cash is and it raises questions about whether people will be able to fully trust the new technology or if they will feel like they are being surveilled by the government (BIS, 2020). Not all considerations that governments are making are about potential negative side effects. One advantage of creating a CBDC would be that it would allow governments to make transfer payments more quickly (BIS, 2020; Cox April 21, 2021). These payments could be regular transfers or, like the Covid relief payments the United States government made, one-time following disasters or economic recessions. It would make the entire process faster and more efficient – getting the money into people's hands more quickly than individual checks sent to each person. If central banks do create a CBDC, it is possible that private banks could lose customers if people switch over to central bank accounts, though this depends on the exact way that the CBDC would be set up (Cox, 2021).

As of recent global assessments by international financial institutions, CBDC adoption remains limited, but momentum is rapidly building, with most central banks still in exploratory or pilot phases rather than full deployment. Only a small number – such as the Bahamas, Nigeria (eNaira), Jamaica (Jam-Dex), and select Eastern Caribbean nations have officially launched a functioning retail CBDC. Meanwhile, more than 80% of the world's central banks have initiated research, and over 50 jurisdictions are running pilots or advanced experiments, including major economies such as China (with its digital yuan), Sweden (e-krona), and India (digital rupee). This expanding global participation reflects a shared recognition that digital currencies could enhance payment efficiency, strengthen monetary sovereignty, and improve financial inclusion, even though most central banks remain cautious and have not yet committed to full-scale rollout (Kosse and Mattei 2023).

5.1.1. The United States Federal Reserve

The U.S. Federal reserve (hereafter "The Fed") is the central bank of the United States that, among other things, conducts monetary policy, monitors individual financial institutions and the financial system, fosters consumer protections in the financial system, and provides services to the banking industry (Federal Reserve Board, 2021b). The Fed contains 12 different districts that each contain a Federal Reserve Bank and the Fed is managed by a 7-person Board of Governors, with each member serving 14 years (Federal Reserve Board, 2021b). The Fed has not released its own CBDC but is currently undergoing an investigation process around CBDCs to see if they should develop and release one. In August 2020, the Federal Reserve Bank of Boston began a collaborative venture with the Massachusetts Institute of Technology (MIT) Digital Currency Initiative about the technology that would be required to make a CBDC (Federal Reserve Bank of Boston, 2020).

Just because the Fed is exploring options for creating a CBDC does not mean that it will necessarily create and issue one in the near future (Sloane, 2021). Though the Fed is expected to release a report on the potential positives and negatives of a digital currency later in 2021, statements from members of the Board of Governors can be examined to understand what some concerns and benefits are (Sloane, 2021). The report, which was spoken about by Board of Governors Chair Jerome Powell at a July 14, 2021, hearing in front of the House Financial Services Committee, will not just address CBDC, but also other forms of digital currency, such as cryptocurrency and stablecoins (CNBC Television, 2021). Powell also spoke about the need for public input into any plans to create a CBDC so that the Fed would understand what the risks and benefits to a CBDC would be for the general public, not just for the Fed and monetary policy (CNBC Television, 2021).

Some of the risks that the Fed see in creating a CBDC that are beyond the inherent structure of CBDC that were previously talked about have to do with the institutional structure of the U.S. and the place that it sees itself in the world (as the reserve currency). The Fed worries that if another countries CBDC, or even a private company's stablecoin, would be accepted by many other countries, than the USD would lose reserve status and would no longer be the dominant currency (Sigalos, 2021; CNBC Television, 2021). Though Powell is the chair of the Board of Governors of the Fed, there are other members who have different opinions on creating a CBDC and on stablecoins and other forms of cryptocurrency. Fed Governor Randal Quarles argues that stablecoins that are tied to the USD would help cement the place of the USD on the international stage and would have fewer risks than creating a CBDC (Sigalos, 2021).

One of the main benefits that the Fed would see to releasing its own CBDC would eliminate the need, and possibly the demand, for cryptocurrencies and stable coins (Sigalos, 2021). However, it is important to note that the demand would not entirely go away because much of it comes from people who want to separate their money and payment systems from government, not just using digital currency (Sigalos, 2021). The Fed creating its own CBDC would not address that part of the CBDC using population, meaning that if the Fed wanted to gain control over the cryptocurrency and stablecoin part of the market, it would need to figure out an effective way to regulate them.

Though the U.S. is looking into creating their own CBDC, they do not have a regulatory framework for cryptocurrencies and stablecoins. In a May 2021 video message that accompanied a press release, Chair Powell talked about how the Fed is working to create regulations around private- sector payments investors who are not covered by other, more traditional regulations (Federal Reserve Board, 2021a). Though Powell and the Fed have not gotten more specific about what cryptocurrency and stablecoin regulations would look like, they have made it clear that it is not just about adding new regulations

to current ones but about building a totally new regulatory structure that is made for addressing the new types of currency and bringing them into the financial system. Powell and the Fed are cognizant of the increase in use of stable coins and cryptocurrencies by the general public and want to write policies and regulations that fully oversee and address their use and providers and not just treat them like a bank or other traditional financial intermediaries.

5.1.2. The Bank of England

The Bank of England is the central bank for the United Kingdom (UK). It works to ensure the stability of the UK financial system, provide and supervise payment systems, and regulate banking services, among other things (Bank of England, 2021). The Bank of England (BoE) published a report outlining their approach to CBDC in March 2020, though they did not commit to creating or issuing one, though they did open a public comment period to hear about the concerns that people had around potential CBDC (Mutton, 2021).

In a July 2021 speech, Tom Mutton, the director of Fintech for the Bank of England talked about where the bank was in the CBDC development process after public comments had been received. Though he made it clear that the bank had not yet decided on whether or not to develop and issue a CBDC, it is still researching what one would look like (Mutton, 2021). Mutton talks about how due to its status and being issued by the central bank and not a private institution, if the BoE were to issue a CBDC, it would be the safest form of money available in the country (Mutton Speech, 2021). As the CBDC would be issued and controlled by the central bank, it would have the same level of trust as cash, which is generally accepted and available (Mutton Speech, 2021). With the introduction of a CBDC, people would be able to do digital transactions without having to go through any private providers or commercial banks, which a recent study showed were considered less trustworthy than the BoE (Mutton Speech, 2021). Mutton also replied to common responses that the public gave to the 202 CBDC discussion paper that the government released. Common responses touched on the need for CBDC to be easy, low cost, and reliable for users and that any system creation needed to keep in mind what the actual demands and needs of the users were (Mutton Speech, June 17, 2021). Responders were also worried about privacy and accessibility with a CBDC, two of the common concerns with CBDCs more widely. Mutton acknowledged these concerns as some of the considerations the bank was taking when researching and potentially creating their CBDC, including possible digital architecture that would ensure privacy for day-to-day users while also allowing transparency for the central bank (Mutton Speech, 2021). Mutton also talked about energy use around CBDC, pointing out that central bank digital currencies and private cryptocurrencies like Bitcoin use different

technology that use vastly different amounts of energy per transaction (Mutton Speech, 2021). He emphasized that creating a CBDC would help Great Britain get closer to a net zero economy using new technology that processes payments faster and with less energy (Mutton, 2021). Additionally, as CBDC would all be online, it would allow for advanced data and analytics that could be studied to figure out how to reduce energy consumption in transactions even more (Mutton, 2021). This shows how in Great Britain, CBDC is not just about keeping up with other country's technology or trying to stop private cryptocurrencies, but about a larger economic goal.

Mutton closed his speech by talking about the next steps regarding CBDC, including the main principles that further research will be guided on and some of the groups that are considering the question next. Though Great Britain has not made a final decision on whether to create a CBDC, this speech both gives insight into where the research process they are and their commitment to a public conversation about it. As Great Britain is considering creating its own CBDC, it is also starting to regulate some aspects of cryptocurrencies. One prominent instance is the banning of the firm Binance Markets Limited from undertaking any regulated activity in the UK by the Financial Conduct Authority (FCA) in June 2021 (Financial Conduct Authority, 2021). Binance is one of the largest crypto exchange platforms in the world and though they are banned, they can continue to provide access to cryptocurrencies in the UK, as that is not considered a regulated activity (Browne, 2021b). What the UK does regulate is crypto asset derivatives, which are things like futures contracts, and securities crypto assets (Financial Conduct Authority, 2021). Though the UK does not currently regulate cryptocurrency trading beyond what is currently covered by other regulations, the FCA does keep a list of firms that have had complaints filed against them for the public and require firms to be registered with the FCA and comply with Money Laundering Restrictions (Financial Conduct Authority, 2021). Additionally, they inform the public that if they choose to use firms operating outside of the UK regulatory field, that means that users will not have access to any FCA support, such as the Financial Ombudsman Service, if things go wrong (Financial Conduct Authority, 2021).

The banning of Binance shows that the current UK strategy around cryptocurrency firms is to regulate what they can under the laws they currently have and make it clear to the public that any other activity they partake in that is beyond the regulatory scope is done without the support of the government (Financial Conduct Authority, 2021). It is not clear whether the UK and FCA will take any further steps to bring cryptocurrency firms further into their purview or if they will continue to allow them to be relatively unregulated but with warnings from the government.

5.1.3. The South African Reserve Bank

The South African Reserve Bank (SARB) has not created its own CBDC but is in the process of conducting several feasibility studies. In 2017, the SARB began Project Khokha, which looked at how distributed ledger technology, which is a shared and synchronized database that allows witnesses for all transactions, could be used in interbank wholesale settlements (South African Reserve Bank [hereafter SARB], 2018). Not only did Project Khokha do research about how distributed ledger technology would work within the South African financial system, it also began trials to see how it reacted and functioned in real world situations (SARB, 2018). The project was done with the participation and support of not only the SARB, but also included seven members of the banking industry, a technical service provider, and a consulting group, which allowed for the viewpoints and concerns of a large number of involved parties, instead of the government just telling the banking industry what would be happening (SARB, 2018). The Project Khokha team also acknowledged how the global knowledge of distributed ledger technology has been built and how this specific report and trials would not have been possible without the previous work done by other countries and their central banks (SARB, 2018). The report found that technologically, it is possible for distributed ledger technology to process wholesale bank payments that is also completely visible to the central bank, which gives insight into the direction that SARB could be going if they were to create their own CBDC (SARB, 2018).

Though Project Khokha just focused on wholesale payments between banks, South Africa is also looking into a wholesale CBDC. The South Africa Intergovernmental Fintech Working Group (IFWG) Innovation Hub launched Project Khokha 2 in February 2021 to further study what a wholesale CBDC and a wholesale digital settlement token (like a stablecoin) would act like in the South African financial system (IFWG, 2021). Though the first two studies and trials that SARB did focus on wholesale and interbank transactions, they are also looking into what a retail CBDC would look like. In May 2021, SARB announced its intention to investigate the potential of a CBDC that would be tailored and accessible to the public (Ledger Insights, 2021). Though this is just a study, and no official policy decisions or recommendations have been made, if South Africa were to release a retail CBDC it could partly be to target some of the 14 million adults in the country who are unbanked, bringing them into the financial system in a way they have not been previously (Ledger Insights, 2021).

As the trials and studies for wholesale and retail CBDC were done separately, it is likely that if South Africa decides to move forward with one or both, they will be announced and created separately. Like the other forms of money that are currently used by central banks, which are treated differently based on who can access them, the two types of CBDC have

different audiences and purposes.

South Africa does not currently have many regulations in place around privately owned cryptocurrency and there have been several incidents in the past few years that have increased the push towards regulation. In spring 2021, the founders of the largest cryptocurrency exchange in South Africa, as well as $3.6 in Bitcoin, disappeared after claiming a hacking incident (Morris, 2021). If the lost money cannot be recovered, it would be the largest cryptocurrency loss in history (Morris, June 24, 2021). Though South Africa is investigating this to the full extent they can, they are limited by the fact that cryptocurrency is not legally recognized in a way that their current financial regulatory laws would apply (Morris, 2021). To address that gap and to prevent similar incidents like this one from happening in the future, the SARB is looking into ways to bring cryptocurrency into its regulatory framework. As SARB has been researching potential options for creating a CBDC, they have also been figuring out their approach to cryptocurrency. The IFWG agrees with other central banks that cryptocurrency is not legally money, but that brings challenges as then cannot be regulated by the same laws that do regulate money in South Africa (IFWG, 2021). A June 2021 report from the IFWG gave recommendations about how to potentially create a legal framework for regulating crypto assets, while also acknowledging that because the field is so new and limited, much of the information and case studies they are working off of are anecdotal (IFWG, 2021). Despite this, the report offers some insight into what South Africa might do to regulate the crypto market and service providers in the country while also ensuring continuing innovation.

The recommendations of the report are mostly grouped into three main categories. The first talks about how classifying crypto asset service providers as an accountable institution under financial law, they will be subject to rules and obligations, including regulations to prevent money laundering and terrorism funding (IFWG, 2021). This would require the providers to keep more records, report suspicious activity to the Financial Information Centre, train employees according to specific standards, and more (IFWG, 2021). Even though crypto is not considered legally money, the providers would be treated like other financial institutions. The second group of recommendations center around giving the responsibility for monitoring crypto assets across borders to the Financial Surveillance Department of the SARB (IFWG, 2021). This would mean that crypto would need to be included in the definition of “capital” in order to fall under certain laws that would allow its regulation by the SARB (IFWG, 2021). These changes would give SARB a lot more regulatory power over how crypto is being traded internationally out of South Africa and would help to ensure that customers are not being exploited by the crypto asset service providers and are operating within South African law.

The third group of recommendations is around the inclusion of crypto asset service providers to be included in several financial services laws that would require them to register as financial products and would make them subject to other laws and penalties (IFWG, 2021). This would not encompass every type of crypto provider and would only be a temporary solution, but it would allow the government to gain some regulatory control over the crypto market while building longer term regulatory frameworks. The report does not just focus on the regulation recommendations that South Africa could put in place, but also cautions against allowing crypto assets and more traditional financial institutions to interact or become intertwined. The report notes that a crypto is currently so unstable, the more that it is linked with other financial institutions, the less stable those institutions are, leading to unnecessary risk (ISWG, 2021). This warning highlights the view that regulators and financial institutions take about crypto, which is that it is unstable and should be brought under oversight and control without unnecessarily threatening other institutions while doing so.

Conclusion

Changes and advances in financial technology throughout history have always brought new systems and policies. The digitalization of financial systems and the introduction of fintech to financial systems has resulted in fundamental changes to the ways that governments approach money and payment systems. Even though these changes are new, the emergence of distributed ledger technology and the ever-spreading use of cryptocurrencies means that unless governments act quickly to regulate or shut down private digital currencies, they could possibly lose control over the monetary system that they have previously held. The next few years will be illuminated in regard to government reactions to the new types of currencies, as more countries will start to indicate whether they will embrace digital currencies, both private and central bank controlled, try to shut them down altogether, or some combination. The banks studied in this paper will be included in those that should be watched closely, as their global influence is large, and other banks will likely follow their leads. Further research should be done after the banks studied in this paper release more official plans and regulations. All three of the banks talked about are during research ventures that are exploring the feasibility of central bank digital currencies and are expected to report results within the next few years. By that point, it is likely that other powerful central banks will also be in similar stages of the process and research should be done into the presumably different approaches that banks take to a central bank digital currency. As more central banks develop their own digital currencies, there should be research done into how the different digital currencies interact with each other across borders and what technological and policy changes are needed

to make the process more efficient and effective. There should also be research done into the effectiveness of various regulations that banks take regarding private cryptocurrencies. As each bank is in a unique financial system and has unique goals regarding regulating cryptocurrencies, this research should take those differences into account while also looking into what types of approaches are most likely to have an impact. Industry 4.0 is only going to continue, and it is important to understand the reactions of central banks to the new technological landscape and see if they can adjust smoothly and effectively. As technology continues to advance, it could also possibly give some indication of how banks will react and adapt after Industry 4.0, including the fifth industrial revolution and beyond.

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Appendix A: Summary of CBDC Actions by Central Banks.

Central Bank	CBDC Type	Current Status	Notes
Federal Reserve (USA)	Not specified	Research & pilot (Project Hamilton)	Emphasis on regulation, no CBDC yet
Bank of England (UK)	Retail	Public consultation, design phase	Exploring privacy and energy efficiency
South African Reserve Bank	Wholesale & Retail	Pilot projects (Khokha 1 & 2)	Focus on unbanked population

ARTICLES

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CUSTOMS DUTIES AND COMMON CUSTOMS TARIFF AS AN INSTRUMENT FOR THE PROTECTION OF THE EUROPEAN UNION INTERNAL MARKET: AN ECONOMIC AND FINANCIAL DIMENSION

Abstract

Customs duties and common tariffs remain a traditional instrument for protecting the European Union (EU) common market. The customs tariff embraces the customs nomenclature (a systematised list of goods) with the applicable duty rates, on the basis of which the duty payable on imports into the European Union is calculated. The customs tariff and the customs duties it contains not only have a protective function, but also possess an economic and fiscal dimension, as they ensure the EU budget revenue. The main objective of this study is to show the role played by customs duties and tariffs in the protection of the internal market and EU producers, including the economic and fiscal dimension of these market protection tariff instruments. The specific objective is to verify the research hypothesis that the role of customs duties and the common customs tariff in the protection of the EU common market is decreasing. The analysis of the level, types and changes of customs duties in the EU customs tariff confirmed the research hypothesis that customs duties generally no longer play a major role in the protection of the internal market. For more than twenty years, they showed a downward trend, starting in the mid-1990s. However, for some goods, mainly agricultural ones (dairy products, sugar and confectionery, cereals), but also

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textiles, clothing and motor vehicles, customs duties are still a barrier to access to the EU market, so they perform an important protective function and have a significant fiscal dimension. The study relies on traditional research methods: deductive reasoning and comparative analysis. For the purpose of the analysis, various sources were used, such as domestic and foreign literature, legal acts of the EU secondary legislation in the form of regulations, statistical data of the Eurostat, the World Trade Organization and the World Bank.

Keywords: common trade policy; Common Customs Tariff; tariff rate; most favored nationclause.

JEL: E60, F13, F15, F19.

Introduction

The common trade policy of the European Union provides a number of measures that can be classified according to various criteria. The Union Customs Code differentiates between tariff and non-tariff instruments. The first group comprises instruments used to protect the market of the European Union such as the EU customs tariff and customs duties and liberalisation instruments such as autonomous tariff measures, including tariff quotas and duty suspensions. The group of non-tariff measures includes contingency protection measures (defence instruments), namely safeguard measures against unfair (dumping, subsidy) and increased import; quotas, technical barriers to trade (TBT). As far as safeguard measures for the internal market (employed in the case of import) are concerned, these can be categorised into permanent protection instruments (customs duties) and contingency (temporary) protection instruments (temporary trade barriers, TTBs) (see: Bown (ed.), 2011, p. 2). The first group includes customs duties and tariffs, and the second one - measures to protect against unfair imports (dumping and subsidies) and excessive imports.

The customs union and the Common Commercial Policy are the exclusive competence of the European Union, so the rules, instruments and procedures are uniform in all Member States. The customs union is the backbone of the EU internal market, allowing goods to move freely within the EU by controlling external imports and exports.

There are relatively few up-to-date and detailed studies on tariff instruments, in particular customs tariffs, especially in the context of the role they play as instruments for protecting the domestic market and as a source of budget revenue. These include, among others, a study devoted to the determination of how much trade may have fallen due to the increase in tariffs and anti-dumping duties of in selected countries; to achieve the intended research objectives (Kee, Neaguz, & Nicita, 2013). The authors

conclude that fears of an increase in tariffs in the face of the 2008+ crisis in order to protect domestic markets have not been confirmed. Only in some of the countries surveyed, an increase in tariffs occurred. The authors also argue that in some countries, such as the US and the EU, most of the policy actions during the crisis period are not about tariffs but anti-dumping duties. Nevertheless, even after taking anti-dumping duties into account, evidence provided in their paper suggests that the trade impact due to trade policy changes during the crisis period is minimum, and can explain no more than 2 percent of the collapse in world trade (Kee, Neaguz, & Nicita, 2013, p. 245).

Similar analyses concerning protectionism in imports in the context of the financial crisis of 2008+ were made by other authors (Vandenbussche, Viegelahn, 2011). They point to three ways to rise import protection, for members of the WTO like the EU. First, countries can increase their tariff rates to the level of the WTO's bound MFN tariffs. The authors rightly argue that the average tariff rates applied remain roughly constant, and are close to the level of related customs, which means that the EU is not using this channel to increase protectionism in the EU imports. The authors only examine the trends of change in the two years 2008-2009, but observations over a longer period of time confirm this thesis.

Second, WTO members (including the EU) can increase protection by imposing technical barriers to trade, such as an increase in administrative obligations related to a shipment or the technical clearance time at the border. It should not be forgotten that technical barriers to trade include a wide range of measures, including sanitary and phytosanitary measures, pre-shipment inspection and other formalities. These barriers, as non-tariff measures, are not the subject of research in this study.

Finally, a third option to increase customs protection, especially in the context of an economic crisis, is the use of temporary trade barriers (TTBs), including safeguard, countervailing and anti-dumping measures (Vandenbussche, Viegelahn, 2011, p. 88). In recent years, there have been no studies in the literature on the EU customs tariff and the customs duties rates therein with regard to the protection of the EU market.

Customs duty rates are usually set based on the type and value of the goods, their country of origin, and other specific factors. In addition to customs duties, imported goods are subject to VAT. Goods such as alcohol, tobacco or energy products may be subject to excise duty. They must be paid to the relevant national authority.

Customs duties in the European Union have a financial dimension, as they provide revenues to the budget (they constitute the so-called traditional own resources therein), but also a protective and economic one, expressed by the level of customs protection. Tariff protection has two dimensions: the first determines the level of tariff rates (average duty rate, import-weighted average) and the second determines the so-called international tariff peaks,

defined as tariff rates higher than 15%, and national tariff peaks, i.e. tariff rates three times higher than the average tariff rate in the EU. In addition, the level of customs protection is also evidenced by the share of non-*ad valorem* tariffs. *Ad valorem* tariffs have several advantages. In multilateral trade negotiations, they are easily comparable, they automatically take into account price changes, they are in line with the principle of fairness (more expensive goods, better quality are subject to higher tariffs), and in the case of inflation, budget revenues remain stable, unless, of course, the volume of imports changes. The disadvantage of these rates is that if the prices of imported goods fall, such duties lose their protective function. Moreover, when the prices of imported goods fall, the budget revenues from customs duties decrease in nominal and real terms (Lux, 2004, p. 108). On the other hand, if import prices fall, specific tariff rates provide adequate protection, as they depend only on the quantity of imported goods and not on their prices. It should be noted that better protection is provided in this case for cheaper goods, and budget revenues remain stable as long as the quantity of imported goods does not change.

The main aim of this article is to show the role played by customs duties and tariffs in the protection of the internal market and EU producers, including the economic and fiscal dimension of these tariff protection instruments. The research hypothesis has been put forward that the role of customs duties and the common customs tariff is decreasing in the protection of the EU common market. For the purpose of the analysis, various sources have been used, such as domestic and foreign literature, legal acts of the EU secondary legislation in the form of regulations, statistical data of the Eurostat, and the World Trade Organization and the World Bank.

1. Construction of the EU customs tariff

The principal and traditional instruments for protecting the internal market of the European Union are customs duties and the Common Customs Tariff (CCT), which was first introduced on 1 July 1968. In the following years, the tariff rates were changed many times (a new version of the tariff is issued every year) both due to the concluded preferential trade agreements, customs preferences granted from mid-1975 to less developed countries (General System of Preferences, GSP), and in the course of subsequent negotiations at the GATT forum. The EU customs tariff applies to imports of goods into the EU and ensures uniform tariff rates in all Member States. Thus, the CCT is the EU main instrument for regulating trade with non-EU countries, protecting EU industry and generating revenue.

In practice, the applied version of the customs tariff is used, i.e. the Integrated Tariff of the European Communities – TARIC (*Tarif Intégré Communautaire*) (Weerth, 2008). The competent authority for the administration of the integrated tariff is the European Commission, and more

specifically the Directorate-General for Taxation and Customs Union – TAXUD, which, in accordance with Article 6 of Council Regulation (EEC) No 2658/87, establishes, updates, manages and disseminates TARIC (Council Regulation (EEC) No 2658/87). The TARIC online tariff database lists all EU measures related to tariff, trade and agricultural legislation (European Commission, 2023). TARIC contains five categories of information necessary for monitoring EU policies in the area of trade: 1) Tariff[2] measures, 2) Agricultural[3] measures, 3) Commercial measures[4], 4) Measures relating to restriction of movement[5], 5) Measures for gathering of statistical data[6] (Nilsson, 2009, p. 4).

The customs tariff plays an important role in protecting EU industry from foreign competition, in the administration of trade agreements, in influencing the flow of goods between the EU and third countries, indirectly affecting global supply chains, ultimately affecting consumers and producers. In addition, by protecting EU industry from foreign competition, customs tariffs promote local production and employment. On the other hand, they can influence economic behaviour, for example, by discouraging the import of certain goods or encouraging trade with certain countries.

The basis for the construction of each customs tariff is the commodity nomenclature, i.e. a systematised list of goods. The essence of the commodity nomenclature is to classify the traded goods, and thus to create a transparent and unambiguous system that allows for the identification of a given commodity by assigning a specific digital code thereto. In April 1987, the Council joined the Harmonised Commodity Description and Coding System (HS)[7]. The ratification of the HS Convention by the Community in 1988 meant that the EU nomenclature at the level of six characters had to be adapted to the harmonised system. The new nomenclature retains the same number of sections, chapters, headings and subheadings, and has been extended by two digits, so it represents an eight-digit extension of the HS system. This is how the Combined Nomenclature (CN) was created, i.e. a system for classifying and coding goods in the EU customs tariff, which

[2] Third country duty rates as defined in the Combined Nomenclature, Suspensions of duties; Tariff quotas; and Tariff preferences.

[3] Agricultural components; Additional duties on sugar and flour contents; Countervailing charges; and Refunds for export of basic (i.e. non processed) agricultural goods.

[4] Antidumping and Countervailing duties measures.

[5] Import and export prohibitions; Import and export restrictions; and Quantitative limits.

[6] Import surveillances and Export surveillance.

[7] This system was established by the international convention on the Harmonised Commodity Description and Coding System, adopted under the auspices of the Customs Cooperation Council on 14 June 1983 to ensure a uniform classification of goods throughout the world.

was introduced by Regulation 2658/87 and has been used in the EU tariff since 1 January 1988 (Council Regulation (EEC) No 2658/87). The Combined Nomenclature is of a dynamic nature, since necessary changes are made therein, e.g. from the technological progress perspective, it is needed to register certain groups of goods, changes in the CN result also from the volume of international trade, if it is small – some codes may be "closed". As a result, the number of tariff lines decreased: from over 10,300 at the beginning of the 21st century to 9,736 fare lines in 2022. These changes do not exert, however, any direct financial effects, but what is more relevant is the level of customs rates which reflect both the level of protection and customs revenues. Customs duties in the European Union have not only a financial dimension, they generate revenues for the general budget of the EU (in which they represent so-called traditional own resources), but also a protective and economic one, expressed through the level of customs protection[8].

The customs tariff applied only to imports from third countries is common to all EU Member States. Duty rates depend on the economic sensitivity of the imported goods[9]. Currently, the Common Customs Tariff includes only one column of customs rates, and these are so-called conventional rates (Weerth, 2023). They apply to import from third countries which receive special treatment under the MFN clause, being both members and non-members of the WTO, however, in the second case, the EU accords the MFN (Most Favoured Nation) status to the states on a reciprocal basis. Under WTO agreements, these tariffs are 'bound' at maximum levels (bound duties), although countries may choose to set tariffs at lower rates than these bound maximums – applied MFN tariff rate (European Parliament, 2019, p. 14). It means all countries importing to a country pay the same tariff rates unless they have a preferential trade agreement, e.g. a free trade agreement or customs union (Bungay 2012, p. 10). In practice, the European Union applies a very complex system of customs preferences, hence the contractual duty rates apply mainly to imports from developed countries that have not yet benefited from preferential treatments, i.e. the USA, Australia,

[8] Since 2001, Member States had been obliged to allocate 75% of customs revenues to the EU budget, whereas the remaining 25% was retained for the purpose of state budgets and dedicated to cover operating costs connected, *inter alia*, with the functioning of national customs administrations. Pursuant to the Decision of the Council of 26 May 2014, the above proportions were changed in respect of a new financial perspective, i.e. as from 1 January 2014: 80% and 20% respectively. During the period 2021-2027, national authorities retain 25% of collected customs duties (Council Decision (EU, EURATOM) 2020/2053)).

[9] This will be discussed in detail below.

New Zealand, Hong Kong, Taiwan, but also those that have been excluded from the unilateral preferences system, e.g. from China.

2. The evolution of customs duties and the EU customs tariff in the light of EU market protection

Customs protection in the EU, expressed by the level of customs rates in the common customs tariff (simple mean MFN), has been on a downward trend over the years (reduction of customs duties at the GATT forum); it is also characterised by clear sectoral differentiation. The average MFN rate over the years for all goods has been relatively low: in 1995 it amounted to about 9%, and in 2022 – to about 4%, it was therefore twice as low[10]. The exception was the second half of the 1990s, when tariffs, both average and applied, increased significantly (Figure 1, Figure 2). This was the result of the tariffication of non-customs barriers to the import of agricultural goods and the conversion of other trade instruments, including variable levies, into customs duties, as a result of which customs duties on agricultural products increased. Customs duties on all agricultural products after tariffication were also bound, and subsequently reduced. On agricultural products (WTO definition), the EU reduced levels of bound tariffs by 36% on average, with a minimum reduction of 15% per line, during the implementation period of July 1995 to July 2000, which resulted in a visible decrease in customs duties in this group of products in the second half of the 1990s (Figure 2). For industrial goods, the changes in customs duties during this period were small and reflect an overall downward trend. This was due to the fact that the reductions in tariff rates made under the GATT in the group of industrial goods started from a lower level and were, on average, lower than in the case of raw materials and agricultural goods. The level of customs protection, expressed in terms of the level of customs duties in the common customs tariff, is different in the case of industrial and raw materials and agricultural goods. In the former group, the level of customs duties is significantly lower than in the latter; in the mid-1990s the difference amounted almost to 11 percentage points, and in 2022 - to 1.5 percentage points (Figure 1).

[10] In the case of the data provided by the European Commission, this average is slightly higher and has exceeded 6% in recent years. The situation is similar in the case of agricultural commodities – about 15%. This difference is due to a different degree of data disaggregation (in the EU – eight-digit CN subheadings, and in the WTO – six-digit HS subheadings, and some differences in customs equivalent calculations, which is particularly evident in the case of agricultural goods). This section uses data provided by the World Bank, which are based on WTO data, and therefore lower than those provided by the European Union.

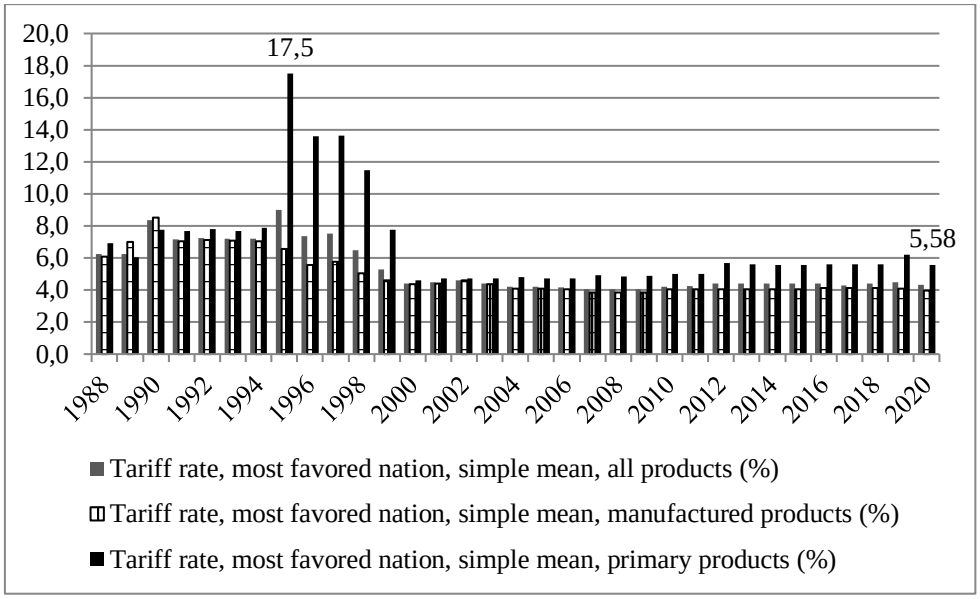


Figure 1. MFN custom duty rates (arithmetic mean)* of the European Union, in %

Source: Own elaboration based on (World Bank, 2023)

*The simple average MFN tariff rate, including the ad valorem equivalents (AVEs) of non-ad valorem tariff rates.

In practice, the simple mean customs duty rates applied and trade weighted average duties are more useful to determine the level of customs protection than changes in the level of average MFN tariffs (Fig.). For both the simple mean applied [11] and import-weighted rates, the trends are similar as shown for the mean MFN rates (Figure 2).

[11] The mean duty rate applied is the unweighted mean of the effectively applied duty rates on all traded goods, the commodity groups are defined at the level of six-digit or eight-digit HS codes. Non *ad valorem* duties have been converted to *ad valorem* equivalent *(*AVE) and included in the calculation of the mean duty rate applied. On the other hand, the mean weighted duty rate applied is the mean of the effectively applied duty rates, weighted by the shares of imports of individual goods from individual countries. If the effective duty rate was not available, then the MFN rate was used (World Bank, 2023).

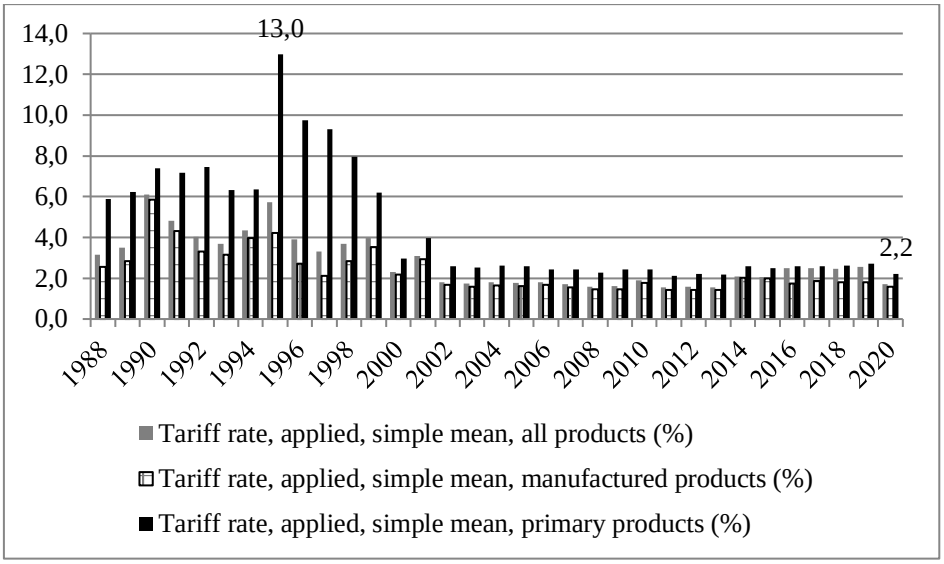


Figure 2. The level of applied duty rates (arithmetic mean) in the European Union tariff, in the years 1988-2020, in %
Source: Own elaboration based on (World Bank, 2023)

The mean tariff rates applied have decreased significantly, both for all goods as well as for industrial goods, and raw materials and agricultural goods (Figure 2), thus reducing the level of customs protection for imports into the European Union. When comparing the level of MFN tariffs and the applied tariffs, it can be noted that the rates applied are lower than the MFN tariff rates. The differences are far more visible in the case of raw materials and agricultural goods, and the decrease in customs duties is also more visible than in the case of industrial goods. This means that, in practice, the level of customs protection in the EU is lower compared to the maximum level of bounds negotiated under the GATT/WTO[12].

[12] It should be noted that in recent years there have been no significant changes in the MFN rates applied, the slight changes that occur in their level are mainly due to changes in tariff codes and world prices of certain goods to which non-*ad valorem* duties apply. If the prices of goods rise, the customs equivalent (AVEs) for non-*ad valorem* tariff rates decreases as a consequence.

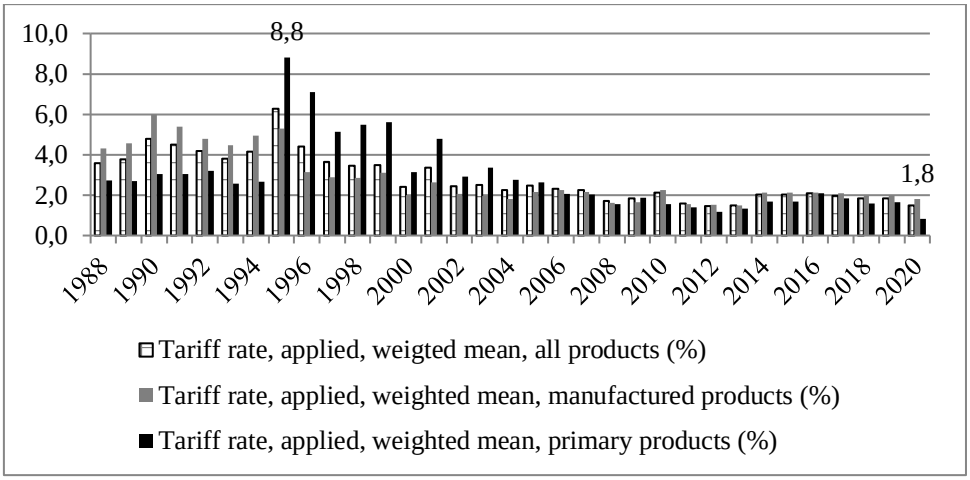


Figure 3. The level of the mean import-weighted duty rates applied in the European Union customs tariff, in %
Source: Own elaboration based on (World Bank, 2023)

Import-weighted mean tariffs can also be used to determine the actual level of protection (Figure 3). The weighted mean is usually lower than the arithmetic mean, as a higher duty rate is associated with fewer imports and thus a reduction in the weighted mean. Of course, we are analysing here a general trend in terms of the impact of the level of customs duties on the level of imports. The decrease in import-weighted mean tariffs (threefold compared to 1995) is more visible than in the case of mean customs rates applied in the EU. The largest decline occurred in 1997 (compared to 1995) and in the following years, until 2000. This means that the volume of imports to the EU was correlated with the level of customs duties in the EU (higher level of tariffs, lower imports, or in other words, it means an increase in the share of imports burdened with relatively low or no tariffs). The most dynamic decline in weighted mean tariffs was recorded in the group of raw materials and agricultural goods (fourfold: from 8.8% in 1995 to 1.8% in 2022), while for industrial goods the changes were smaller (2.5-fold decrease in the same period).

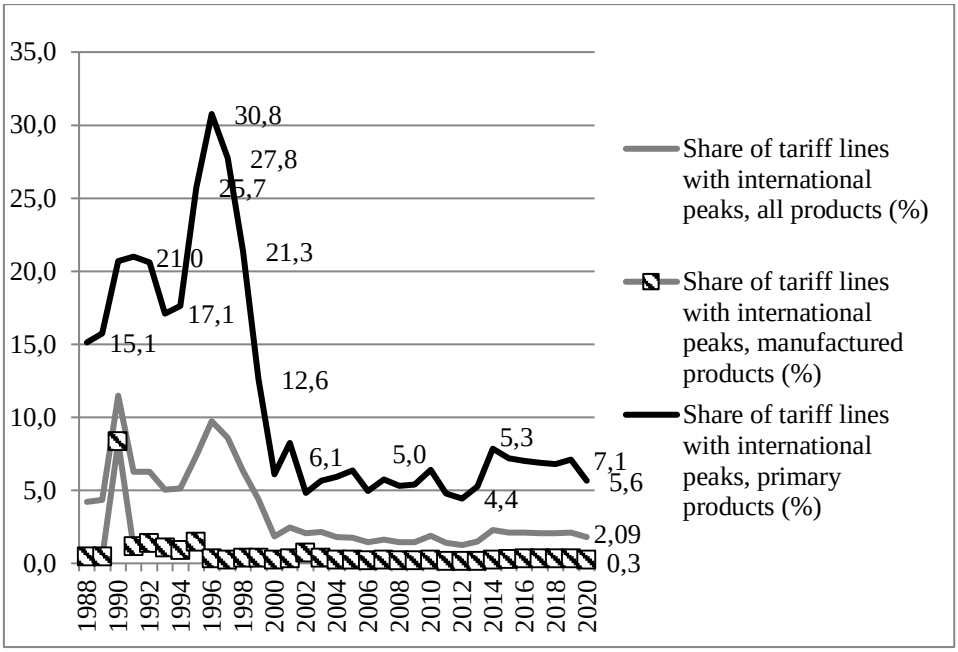


Figure 4. Share of international tariff peaks in the total number of tariff lines in the EU customs tariff in the years 1988-2020 (%)
Source: Own elaboration based on (World Bank, 2023)

The level of customs protection is also evidenced by – as previously mentioned – tariff peaks. From an economic point of view, tariff peaks cause significant economic disturbances, so their elimination means significant benefits for consumers. Moreover, they also have a political dimension, as they may result, among others, from the pressure of a strong lobby that is able to protect its own interests and inefficient sectors (Messerlin, 2010, p. 7). The share of international tariff peaks in the total number of tariff lines shows a downward trend (Figure 4). It was the highest for all goods in 1996 and amounted to almost 10% of all tariff lines (tariffication effect), while currently it is much lower and amounts to approx. 6%. If we take into account commodity groups, the share of international tariff peaks is much higher for raw materials and agricultural goods, with the maximum level in 1996 – over 30% (currently about 6%), while in the case of industrial goods this share is much lower and amounts to about 0.3%.

Finally, the level of customs protection is also evidenced by the share of non-*ad valorem* duties in the total number of tariff lines. On average, non-*ad valorem* rates represent a higher level of tariff protection than *ad valorem* rates. When converting them into value rates, as previously mentioned, the ad valorem equivalent (*AVE*) is used.

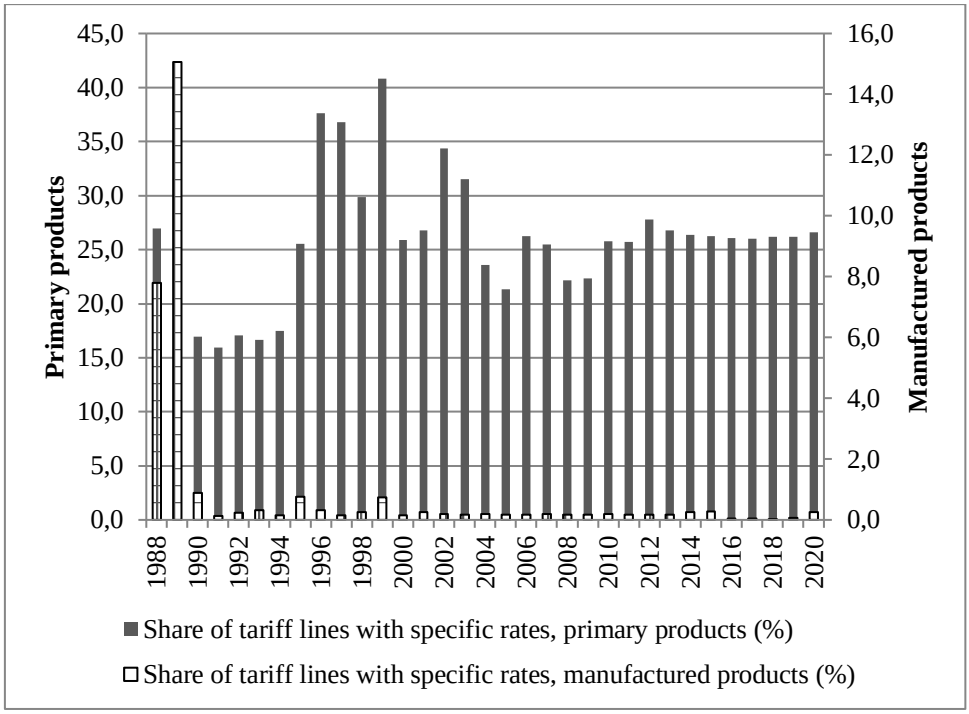


Figure 5. Share of tariff lines subject to non-*ad valorem* duties, in %
Source: Own elaboration based on (World Bank, 2023)

The average level of *ad valorem* equivalent according to the European Commission's calculations is 24.5%, compared to 4.8% of *ad valorem* duties (WTO, 2013, p.48). The share of tariff lines subject to non-*ad valorem* duties has been declining over the years (Figure 5). There were and still are definitely more of them in the case of agricultural goods than in the case of industrial goods. This demonstrates greater customs protection for agricultural goods, in particular those covered by the common agricultural policy. In particular, there is a predominance of *ad valorem* duties for non-agricultural products (HS sections 25-97 – 99.2% of all tariff lines); in the case of agricultural goods, specific duties are widely applied, as well as mixed duties (HS sections 1-24 – 38.9% of all tariff lines).

3. The structure of the current customs tariff and its application as the basic means of protection in imports

A detailed analysis of the current tariff (taking into account the above presented trends) includes the 2022 EU customs tariff, as developed by the European Commission, so the tariff rates differ (are higher) than those presented by the World Bank or the WTO.

After the Uruguay Round, tariffs on all tariff lines have been bound, and consequently cannot be increased. The EU has bound 100 percent of its tariff lines in the WTO, with an average WTO bound tariff rate of 5.3 percent (Office of the United States Trade Representative, 2023, p. 147). Tariffs on agricultural products (as defined by the WTO) have been tied at a high level, with the exception of a few for which the bound tariffs are close to zero (oilseeds, soybeans) (Pelkmans, 2006, p. 251). In practice, the MFN tariff rates applied to imports into the European Union are similar to the bound ones (Figure 6).

Table 1. Structure of MFN tariffs in Common Customs Tariff, 2004, 2011, 2019, 2022

	Number of tariff lines – MFN rate (%)							
	2004		**2011**		**2019**		**2022**	
All tariff lines	10,174	100%	9,294	100%	9533	100%	9736	100%
Bound tariff lines (% on all tariff lines)	–	100%	–	100%	–	100%	–	100%
Duty free lines	2,734	26.9%	2319	25.0%	2572	27,0%	2603	26,7
Ad valorem	9,167	90.1%	8,319	89.5%	8512	89,2	8718	89,5
Non-ad valorem, including:	1,007	9.9%	975	10.5%	1021	10,7	1018	10,5
Specific	642	6.3%	553	6.0%	674	7,0	675	6,9
Compound	199	2.0	193	2,1	199	2,1	200	2,1
Alternate	76	0.7	59	0,6	64	0,6	64	0,6
Other*	90	0.9	170	1,8	84	0,9	79	0,8

*Other includes Agricultural Components (EA), Additional Duties for Sugar (AD S/Z), Flour (AD F/M) and Entry Prices (EP).

Source: Own elaboration based on (WTO, 2006, p. 43; WTO, 2009, p. 40; WTO, 2015, p. 42; WTO, 2023, p. 62)

Table 2. Structure of MFN customs rates according to their volume in selected years

Specification	Simple average MFN tariff rate applied (in %)*							
	2002	**2004**	**2006**	**2008**	**2011**	**2014**	**2019**	**2022**
All products	6.6	6.5	6.9	6.7	6.4	6.4	6,3	6,5
Agricultural products (WTO definition)[a]	16.6	16.5	18.6	17.9	15.2	14.4	14,2	14,9
Non-agricultural products (WTO definition)[b]	4.3	4.1	4.0	4.1	4.1	4.3	4,2	4,3
Overall standard deviation of applied rates	11.4	11.5	14.0	14.1	10.3	12.0	10,0	10,1
Domestic tariff peaks[c] (% of all tariff lines)	5.7	5.8	5.6	5.3	5.7	5.6	5,5	5,9
International tariff peaks [d] (% of all tariff lines)	8.6	8.6	9.0	8.4	8.7	8.5	8,5	9,3
Nuisance applied rates (% of all tariff lines) [e]	12.9	6.8	9.4	9.6	8.8	6.9	6,8	6,9

The simple average applied MFN tariff rate, including the ad valorem equivalents (AVEs) of non-ad valorem tariff rates

[a] In the annex of the WTO agreement on agriculture, agricultural products are defined as those that are found in Chapters 1- 24 HS, do not include fish and fish products.

[b] Non-agricultural goods do not include petroleum and petroleum products.

[c] Domestic tariff peaks are defined as those exceed three times the overall simple average applied rate.

[d] International tariff peaks are defined as those exceeding 15%.

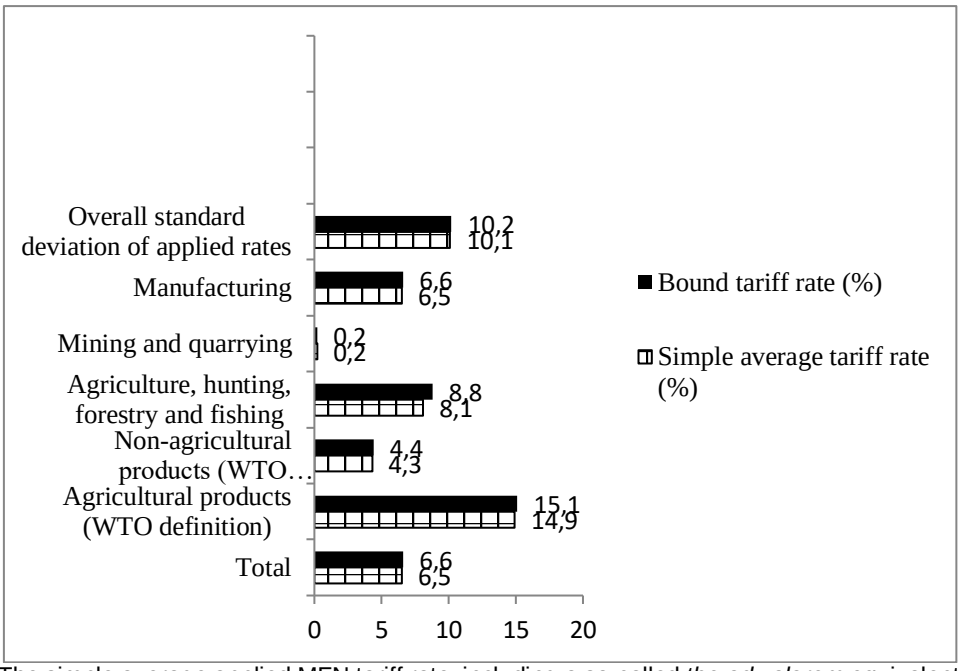
[e] Nuisance rates are those greater than zero, but less than or equal to 2%.

Source: Own elaboration based on (WTO, 2006, p. 43; WTO, 2009, p. 40; WTO, 2015, p. 42; WTO, 2023, p. 62)

Zero duty applies to 27% of all tariff lines. If we also take into account the 'non-essential' rates (i.e. different from zero and a maximum of 2%), the low MFN rates apply to approx. 1/3 of all tariff lines (Table 1 and Table 2). On the other hand, the so-called international 'tariff peaks', i.e. a duty rate exceeding 15%, cover almost 9% of all tariff lines, while the share of non-essential tariffs is smaller – 6.9% (Table 2). The number of tariff lines subject to zero duties in absolute terms increased slightly due to the ongoing implementation of phased reductions under ITA II (Kaliszuk, 2016, p. 7).

For years, the EU customs tariff has been dominated by *ad valorem* rates, calculated on the customs value of goods, which account for nearly 90% of all tariff lines, and the remaining tariffs, i.e. non *ad valorem* (NAV), 10%-11%, of which nearly 7% are specific tariffs, and mixed and alternative ones – approx. 3% (Table 1). In particular, there is a predominance of *ad valorem* duties for non-agricultural products (HS sections 25-97 – 99.2% of all tariff lines), non-*ad valorem* rates apply only to 35 tariff lines,

including, among others: glass, watches, and watch parts. In the case of agricultural goods, specific duties are widely applied, as well as mixed duties (HS sections 1-24 – 38.9% of all tariff lines), the most in the case of dairy products – 98.7% of tariff lines, sugar and confectionery – 88.6%, and cereals and cereal products – 80.0% (greater border protection). Specific duties in the EU are generally based on the quantity (most often weight) of imported goods (Czermińska, 2019, p. 128).



*The simple average applied MFN tariff rate, including a so-called *the ad valorem* equivalents *(AVEs)* of *non-ad valorem* tariff rates

Figure 6. Bound tariff rate and simple average applied MFN tariff rate* in the CCT, 2022

Source: Own elaboration based on based on (WTO, 2023, p. 62)

The average MFN duty rate amounts to approx. 6.5%, with a slight change due to changes in the value of *ad valorem* equivalents (AVEs) charged for non-*ad valorem* duties. Bound rates are almost at the level of applied rates, i.e. 6.6% (Figure 6). However, the import-weighted mean was only 1.1%, or about one-sixth of the unweighted mean, due to the large share of imports of duty-free or low-duty goods. Compared to the mean tariff rates of other WTO members, the European Union ranked 28th (the lowest-to-highest mean) and had the third-highest mean of the four members in the three-year TPR (Trade Policy Review Mechanism) review cycle, behind the United States and Japan, but ahead of China.

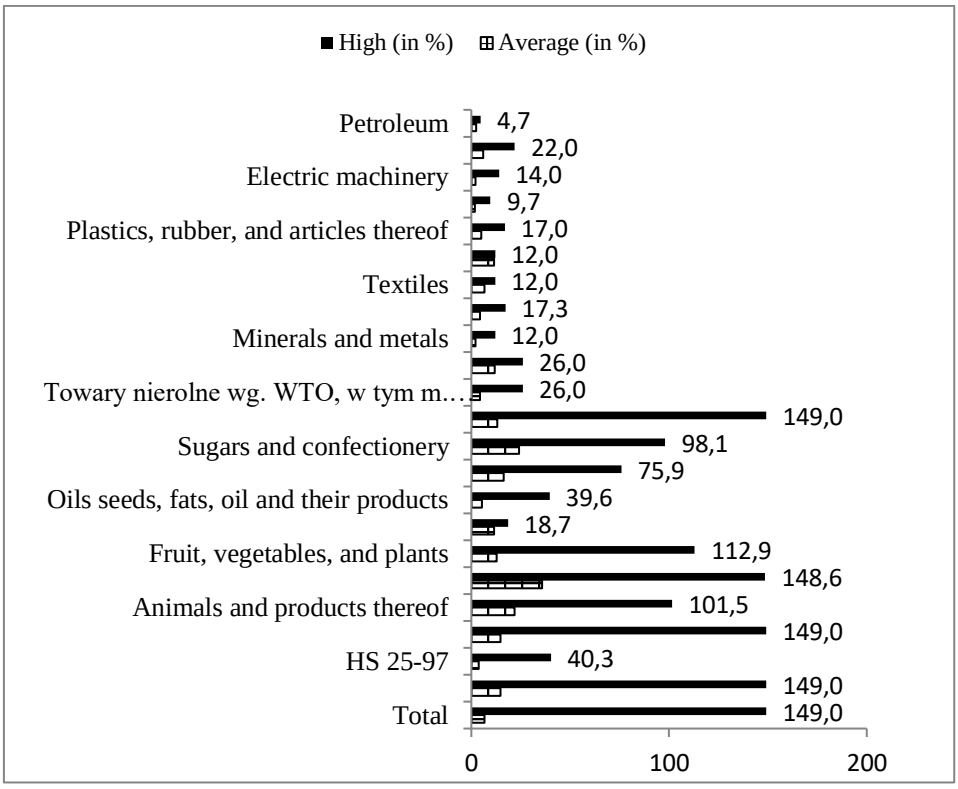


Figure 7. High and average tariff rate MFN in the CCT, 2022
Source: Own, based on: (WTO, 2023, p. 63)

By sector, high tariffs continue to prevail in the agricultural sector, in particular in the dairy and animal products, as well as sugar and confectionery sub-sectors (Figure 7). These sub-sectors, as well as beverages and fruit, have peak custom duties or exceptionally high tariffs on vegetables and other sub-sectors, mainly due to high AVEs for products subject to specific or compound tariffs. Again, the highest tariffs result from the calculation of the AVE in almost all cases and have led to several additional very high tariffs. On the other hand, many industrial sectors have very low mean tariffs, i.e. metals, wood, machinery and oil; the exceptions are fish and fish products, as well as clothing, which have an average share of more than 10%. There are significant differences in the overall average tariff rates for agricultural and non-agricultural products, as the mean tariff rates for agricultural products are more than three times (14.9%) higher than those for non-agricultural products (4.3%). In the agricultural sector, it is common to use non-*ad valorem* rates, i.e. specific, compound, mixed rates, agricultural components, additional duties and entry prices.

The EU is one of the most open economies in the world, with around 71% of imports being zero-duty goods. Among the selected partners, China had the lowest share of imports at zero tariff (45 %, no preferential trade agreement, MFN rates) and Nigeria had the highest share (98 %, GSP unilateral preferences), while the share was 72 % for the United States (no preferential trade agreement, MFN rates) (Eurostat, 2023).

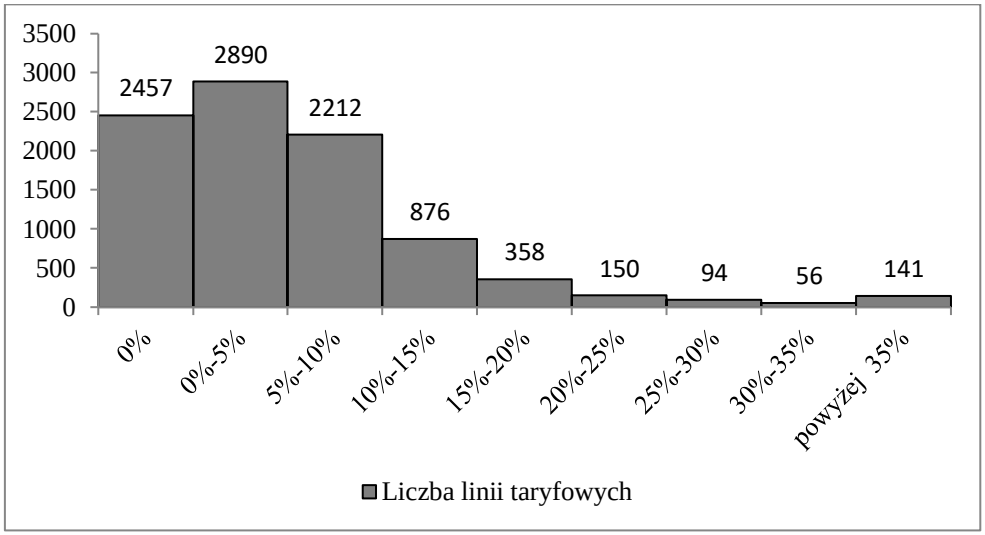


Figure 8. MFN rates applied in the EU tariff, by tariff line
Source: Own elaboration based on (WTO, 2017, p. 51)

Around 26% of tariff lines have a zero tariff rate, the largest number (about 30%) have tariffs in the range 0-5%>, of which non-essential rates (less than 2%) account for 8% of all tariff lines, and above 35% for only 1.5% of tariff lines (Figure 8). International tariff peaks (tariff rates above 15%) account for 8.5% of all tariff lines (Figure 8).

4. Financial Importance of Customs Revenues in the European Union

Customs duties, the EU traditional own resource, are an important source of revenue of the EU budget. The Member States have the right to retain part of the customs revenue (in the years 1970-2000, this percentage amounted to 10%, and in 2001 it increased to 25% and remained at this level until 2014, and then until 2020 it was 20%) (Reiwer-Kaliszewska, 2018, p. 151).

Other duties, such as anti-dumping duties and countervailing duties, are also collected together with ordinary customs duties (Reiwer-Kaliszewska, 2017, 421). Traditional own resources are collected by the Member States when goods enter the European Union. This revenue should then be

transferred to the European Commission, even if it has not actually been collected by the national customs authorities (Limbach, 2015).

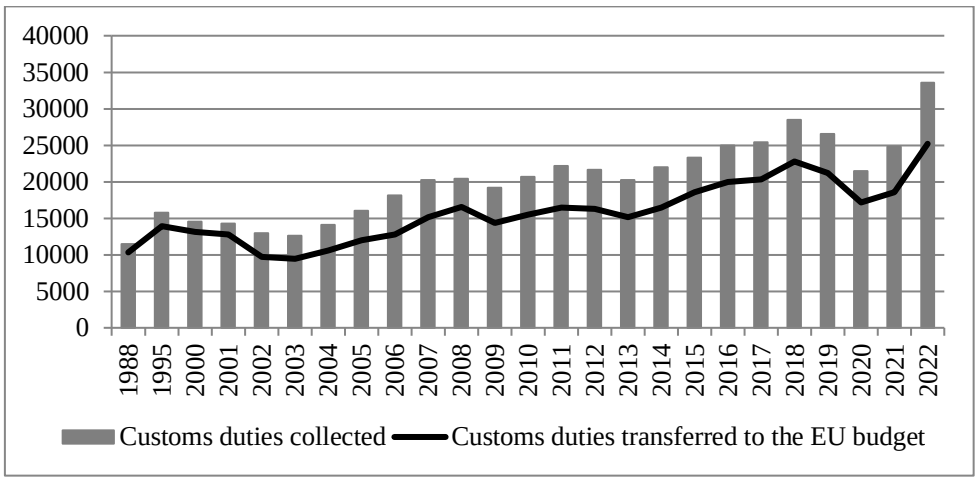


Figure 9. Revenues from customs duties in EU, million EUR
Source: Author's calculations, based on (European Communities, 1989-2023)

Customs revenues have fluctuated over the years, however an upward trend has been noticed. This is despite a decrease in the average level of customs duties applied in the EU tariff, not only as a result of the reduction of customs duties after the Uruguay Round, but also as a result of the conclusion of preferential trade agreements (primarily on the creation of free trade zones) concluded with many countries or even regions. At the beginning of the establishment of the customs union, customs duties constituted the main source of revenue for the EEC budget until the end of the 1970s. Since 1979, this share has declined mainly as a result of introducing VAT and GNI membership contributions to the budget. Between 1988 and 2002 there was a decline in the share of customs revenues in the general budget of the EU (in 1988 it accounted for nearly 25% of all revenues in the budget, while in the following years it showed a decreasing tendency, in 2002 it was slightly below 10%) (Figure 9). It should be noted that during this time there was a significant reduction in the proportion of customs revenues received by Member States and paid to the budget (from 90% to 75%). The years 2019-2020 are an exception, but the downward trends in this period are justified by the decline in the volume of trade turnover due to the pandemic. Currently, traditional own resources account for around 12%-13% of the EU budget. The need for Member States to pay a certain proportion of customs revenues to the EU budget is obvious. In 2022, Member States paid more than EUR 20 billion in customs revenues, the highest in absolute terms between 1988 and 2022.

This is despite the fact that in the current financial perspective (2021-2027), the percentage of customs revenues paid has decreased to 75% (previously 80%). Thus, despite decreasing tariffs, as outlined above, customs revenues play an important role in the EU budget.

Conclusions

Tariff protection has become relatively unimportant in the European Union, with the exception of agricultural commodities, food and a few industrial goods. This is confirmed by the fact that nearly 80% of imports to the European Union are duty-free or with tariffs lower than MFN. Tariff peaks in non-agricultural products are few and low (with the exception of a few commodity groups), while for some agricultural goods, tariff peaks are very high. However, since the end of the 1990s, the share of tariff lines subject to high tariffs has decreased significantly. After the Uruguay Round, the duties on all tariff lines have been bound and therefore cannot be increased. In the case of agricultural goods, customs duties were paid at a high level (after tariffication), and in practice the duty rates applied to imports to the European Union are similar to the related rates. Duty-free lines are concentrated in areas where the EU participates in multilateral or similar agreements, i.e. the Uruguay Round sectors and the pharmaceutical sector. The sectors with the highest percentage of duty-free lines include cotton, wood and paper, minerals, and metals. Customs protection is very low in these sectors. All this confirms the accepted research hypothesis that the role of customs duties in the protection of the EU market is decreasing, but there are some groups of goods for which customs duties are still a barrier to access to the EU market.

The share of customs duties revenues in the European Union budget in recent years has been at a similar level and amounts to about 12%. Customs revenues are not the main source of revenue in the EU, but they do not show a downward trend, despite the decline in customs protectionism, expressed in the level of customs duties rates in the EU tariff. Thus, the fiscal dimension of customs duties remains quite significant.

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ARTICLES

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CORRESPONDENCE ANALYSIS IN MARKETING RESEARCH

Abstract

The paper presents the theory and an example of the use of correspondence analysis in marketing research. Calculations were performed using the STATISTICA PL software package.

Keywords: Correspondence Analysis, marketing research, Burt table, factor space, row profiles, column profiles.

JEL: C00, C02.

Introduction

Living in an era of a knowledge-based economy and rapid technological development, it is impossible not to notice the immense importance of statistics. This discipline is developing very dynamically and finds applications in numerous scientific fields. It turns out that not only technical, economic, medical, and natural sciences benefit from its advantages, but also pedagogy, sociology, and history, which belong to the humanities. This broad use of statistics is primarily due to the rapid development of information technologies. Today's statisticians have an easier task, as computers have accelerated data processing. The use of advanced statistical methods has become simpler and faster thanks to computer software such as Statistica. Today, collecting, processing, and analyzing data is no longer a problem,

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even when dealing with large datasets. Access to many data sources – especially for scientific purposes – has also been facilitated, as numerous databases are available to researchers. In recent decades, we have witnessed the development of so-called multivariate data exploration techniques. These include principal component analysis, factor analysis, cluster analysis, discriminant analysis, canonical analysis, correspondence analysis, and multidimensional scaling.

This paper focuses on correspondence analysis, which is a descriptive and exploratory technique for analyzing qualitative variables. Its purpose is, among others, to provide a visual representation of relationships found in a contingency table. It allows one to obtain information about associations between particular rows and columns of a contingency table. The data from the table are presented graphically in a two- or three-dimensional coordinate space. This makes it possible, for example, to create perceptual maps for market segmentation and product positioning. This incomplete taxonomic method (Bacher 1996) also allows one to identify clusters and assign objects to those clusters. A sometimes difficult task is the interpretation of the spatial configuration of results by a statistician or analyst. Intuition plays an important role, as the analyst must relate the graphical results to known phenomena within the given domain.

Correspondence analysis also allows factor interpretation. It can be used to explain the tendency for a specific configuration of objects to appear by referring to the influence of latent features represented by the dimensions/factors obtained in the analysis.

Correspondence analysis is frequently used in marketing, social, and economic studies – typically based on surveys using questionnaires or interviews – because these disciplines most often involve qualitative variables measured on the weakest level of measurement, the nominal scale. In practice, the method enables researchers to move from raw survey results to insights about product preferences, trust in institutions, brand positioning, choice of marketing messages, and more.

This paper presents an example of the application of multiple correspondence analysis using seven qualitative variables. The case study concerns a statistical investigation related to beer consumption. A survey was conducted among 231 adults (aged 18-45). Respondents answered whether a given beer attribute was important in their decision to purchase a six-pack of beer (Karl Wuensch, 2010). The possible answers were only “yes” or “no.” The attributes included: low price, container size, alcohol content, brand reputation, color, aroma, and taste. Multiple correspondence analysis (MCA) was intended to determine which aspects should be emphasized when designing a beer advertising campaign, assuming all requirements for a representative sample were met.

Statistical analyses presented in this paper were conducted using STATISTICA 13.3 PL.

1. Correspondence Analysis and Multiple Correspondence Analysis

Two variants of correspondence analysis can be distinguished:

1. Simple Correspondence Analysis (CA),
2. Multiple Correspondence Analysis (MCA).

The first one is used to visualize dependencies in a two-way contingency table. However, CA can be applied to any data table when all cell values are non-negative and can be interpreted as measures of association between rows and columns. The main goal of simple correspondence analysis is to explore the structure of relationships between two qualitative variables. A traditional cross-tabulation is often sufficient, but when the number of categories becomes large, the table becomes difficult to interpret. In such cases, correspondence analysis is beneficial. For example, in marketing research, if we cross-tabulate consumers' most frequently purchased product brand with their occupational status, it is difficult to answer questions such as: Which occupational categories are similar in terms of brand preferences? Which brands have similar consumer profiles? Correspondence analysis is the most suitable tool for this scenario.

The second variant – MCA – is an extension of CA for more than two nominal features. Some statisticians treat homogeneity analysis as a more general framework for data analysis, with classical CA as a special case intended for two-variable relationships.

The steps of the correspondence analysis procedure (Clausen, 1998) can be found in (Stanisz, 2007), (Clausen, 1998), (Panek, 2009), (Greenacre, 1984), (Benzécri, 1973) and are briefly described below.

The starting point is a two-dimensional contingency table:

$$\mathrm{N} = \left[\mathrm{n_{ij}}\right], \quad 1 \le i \le r, \ 1 \le j \le c,$$

where $n_{ij}$is the number of observed units belonging to the i-th category of the first (row) variable and to the j-th category of the second (column) variable.

In the next step, a correspondence matrix of the form:

$$\mathrm{P} = \left[\mathrm{p_{ij}}\right] = \left[\frac{n_{ij}}{n}\right], \ 1 \le i \le r, \ \ 1 \le j \le c,$$

is constructed, where $n = \sum_{i,j} n_{ij}$ is the total number of sample elements. Below, the corresponding marginal frequencies are defined as row and column masses:

$$p_{i\cdot} = \sum_j p_{ij}, \quad p_{\cdot j} = \sum_i p_{ij},$$

and the matrices of row and column profiles:

$$W = [w_{ij}] = \left[\frac{p_{ij}}{p_{i\cdot}}\right], \quad K = [k_{ij}] = \left[\frac{p_{ij}}{p_{\cdot j}}\right], \quad 1 \le i \le r, \ 1 \le j \le c.$$

From the above equations it can be seen, for example, that the row profile matrix is obtained by dividing the elements of each row of the correspondence matrix by its mass.

Row/column profiles can be treated as coordinates of row/column vectors in the space $\mathbb{R}^c/\mathbb{R}^r$. The center of the corresponding coordinate system is the average row/column profile, which is the centroid of the considered row/column profiles. Since the average row profile is a vector consisting of column masses, and the average column profile consists of row masses, it is possible to compute distances between individual profiles (also between any profile and the average profile). Profiles that differ from the average will be located far from the origin of the corresponding coordinate system, whereas those similar to it will lie close to the origin.

These distances can be calculated using the χ^2 metric. For the distance between row profiles w_i and $w_{i'}$ the following formula holds:

$$\chi^2 = d(w_i, w_{i'}) = \sum_{j=1}^{c} \frac{\left(w_{ij} - w_{i'j}\right)^2}{p_{\cdot j}}.$$

It is important not to use the above metric to calculate distances between row profiles and column profiles. It can only be applied to two row profiles or two column profiles. Therefore, it is possible to analyze the distribution of row profiles across the categories of column profiles, and the distribution of column profiles across the categories of row profiles (examples of such analyses can be found in (Stanisz, 2007), (Clausen, 1998)).

In correspondence analysis, the analogue of the concept of variance is inertia. This results from the fact that total inertia is a measure of the dispersion of profiles relative to the average profiles. Row inertia measures the deviation of individual row profiles from the average row profile, which can be written as:

$$\lambda_w = \sum_{i=1}^{r} d^2(w_i) \cdot p_{i\cdot},$$

where $d^2(w_i)$ is the distance of the row profile w_i from the average row profile. For columns the following holds:

$$\lambda_k = \sum_{j=1}^{c} d^2(k_j) \cdot p_{\cdot j}.$$

In correspondence analysis, column inertia equals row inertia and is called total inertia:

$$\lambda = \lambda_w = \lambda_k.$$

When the value of inertia equals 0, the points representing row/column profiles are concentrated at the origin. With low total inertia, we cannot determine significant relationships between categories of variables due to small differences between them. Conversely, the greater the value of inertia, the greater the distances of the points representing particular profiles from the centroid. It is then possible to observe which categories are associated and which differ. The maximum value of total inertia is: $s = \min(r-1, c-1)$. There is a relationship between the value of the χ^2 statistic calculated in Pearson's test for independence for the contingency table of the variables under consideration and the value of total inertia. Since

$$\lambda = \frac{\chi^2}{n},$$

the lower the inertia, the smaller the chance of a significant association between the row and column variables.

The above results allow for separate analysis of row and column profiles. On the other hand, the main goal of correspondence analysis is the simultaneous analysis of these profiles while preserving as much information as possible about the variability of categories. Most often, geometric presentation in a two- or three-dimensional space is used for this purpose. The starting point is the construction of the standardized residual matrix:

$A = [a_{ij}]$ where the weighted deviations of profiles from row and column centroids are given by:

$$a_{ij} = \frac{p_{ij} - p_{i\cdot}p_{\cdot j}}{\sqrt{p_{i\cdot}p_{\cdot j}}}.$$

The next step is to identify the coordinate system in which the points representing the rows and columns will be projected. The construction of the factor axes of this system maximizes the sum of squared projections of the vectors $a_i$onto those axes. Geometrically, maximizing this sum of squared projections corresponds to maximizing the amount of variation among categories that is explained by successive factors. To solve this problem, the **singular value decomposition (SVD)** method is applied, (Greenacre, 1984). It presents matrix A in the form of the following product

$$\mathrm{A} = \mathrm{U}\Gamma\mathrm{V}^{\mathrm{T}},$$

where Γ $\Gamma$is an $s \times s$diagonal matrix consisting of the non-zero singular values γ_k, $k = 1, 2, \ldots, s$, ordered from largest to smallest; $U$is an $r \times s$ matrix whose columns are left singular vectors – eigenvectors of $A^T A$. They form an orthonormal basis for the row space of A and represent the principal axes for projecting column categories. $V$is a $c \times s$matrix whose columns are right singular vectors – eigenvectors of AA^T. They form an orthonormal basis for the column space of $A$and represent the principal axes for projecting row categories. There is also a relationship between total inertia and the eigenvalues $\lambda_k$of the matrices $A^T A$and AA^T, where $\lambda_k = \gamma_k^2$:

$$\frac{\chi^2}{\mathrm{n}} = \lambda = \sum_{\mathrm{k}=1}^{\mathrm{s}} \lambda_{\mathrm{k}} = \sum_{\mathrm{k}=1}^{\mathrm{s}} \gamma_{\mathrm{k}}^2,$$

Thus, total inertia is decomposed to obtain a representation of the variables in a low-dimensional space. The value $\lambda_k$is often referred to as the *k-th principal inertia*, and the ratio $\frac{\lambda_k}{\lambda} \cdot 100\%$ expresses how much of the original inertia is explained by the k-th dimension.

The principal task of correspondence analysis is to represent the points (variables or categories) in a factor space of minimal dimensionality such that the distances among points best reflect the original distances between profiles. Typically, the results are displayed in a two- or three-dimensional model. In the full-dimensional factor space, the representation involves no distortions. Unfortunately, reducing dimensionality always causes distortions in the configuration and entails a loss of information about the phenomenon studied. Because interpretation and visualization in higher-dimensional spaces may be difficult or even impossible, the final choice of dimensionality is a compromise researchers must make. This choice may rely on the scree/“elbow” criterion or the criterion of percentage explained inertia (see e.g. (Clausen, 1998), (Stanisz, 2007), (Greenacre, 1984), (Benzécri, 1973), (Blasius, Greenacre, 2006)).

In the obtained subspace, geometric properties are translated into interpretations of the studied phenomenon. The higher the quality of representation of a point by a given dimension, the better that dimension describes the point. This results from the fact that representation quality equals the squared cosine of the angle between the segment linking the point with the centroid and the considered factor axis. Moreover, the sum of the qualities of representation of a point across all dimensions equals 1. The quality of representation in a reduced subspace is therefore the sum of the qualities of representation in the retained dimensions. The importance of individual points in forming successive dimensions is measured by their contributions to the inertia of those dimensions. Therefore: points lying close to each other represent associated categories, distant points represent categories that are unassociated or weakly associated, points distant from the centroid represent categories deviating from the average. A major advantage of correspondence analysis is the possibility of adding supplementary (passive) points – categories or attributes not used in constructing the factor space and thus not contributing to total inertia.

In practice, it is common to encounter situations involving a large number of qualitative variables. Multiple correspondence analysis becomes useful here. Extending classical CA requires a modified approach to encoding information about joint occurrences of categories of many variables. The most commonly used solution is the Burt table, a contingency table in which both rows and columns represent all categories of all variables. Having contingency tables for all pairs of variables, the Burt table is constructed by adding blocks representing the association of each variable with itself. It is a symmetric matrix; therefore, in MCA, row and column profiles are identical.

Correspondence analysis is increasingly popular in natural and human sciences. Statistical packages such as R, Statistica, SPSS, and SAS greatly facilitate its application. Researchers no longer need to perform complex manual calculations; knowledge of how to select the appropriate subspace and how to interpret results is sufficient. Additionally, graphical presentation can be both attractive and useful. The next chapter presents an example of using correspondence analysis in marketing research.

2. Example of Multiple Correspondence Analysis in Studying Beer Consumer Preferences

We now present an example of applying correspondence analysis to examine beer consumer preferences. We use data from a study by Karl Wuensch (2010), slightly modified for analytical purposes. Respondents were asked whether the examined attributes of beer were important in their decision to purchase a six-pack. The following features were considered:

1. Low price;

2. Bottle/can capacity;
3. Alcohol content;
4. Brand reputation;
5. Color;
6. Aroma;
7. Taste.

Responses (“yes”/“no”) were collected from 231 people. Their distribution is shown in Table 1 and Figure 1.

Table 1. Number and percentage of 'yes' responses in each category

N=231 Category	Number	Percentage
low price	**132**	**57,14**
container size	**132**	**57,14**
alcohol content	**132**	**57,14**
brand reputation	**209**	**90,48**
Color	**176**	**76,19**
Aroma	**171**	**74,03**
Taste	**209**	**90,48**

Source: Own elaboration

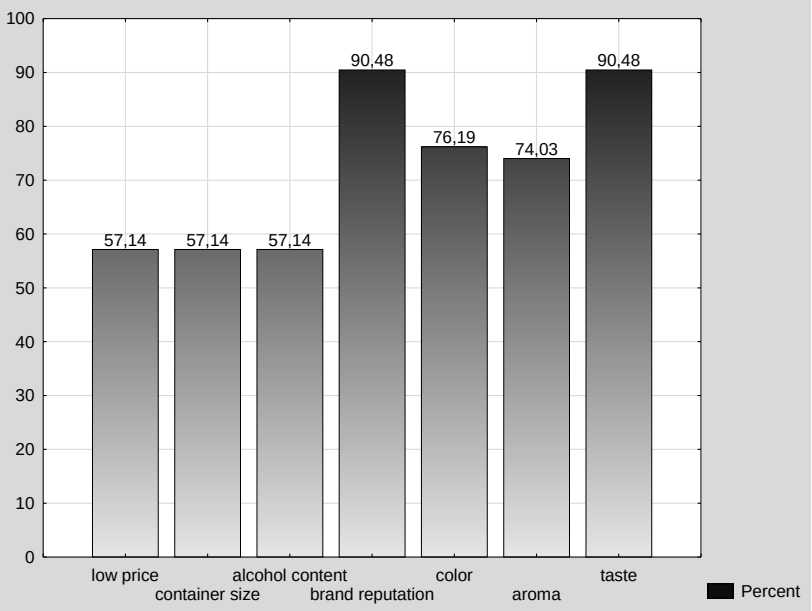

Figure 1. Percentage of 'yes' responses in each category
Source: Own elaboration

As one can see, the most frequently considered attributes are taste and brand reputation. Approximately 75% of respondents also pay attention to color and aroma, and about 50% consider low price, capacity, and alcohol content.

Using multiple correspondence analysis, we aim to examine the structure of dependencies in consumer preferences regarding these product attributes. This should allow us to identify the subgroup most similar to the average consumer profile, which may be valuable when designing an advertising strategy.

Six dichotomous qualitative variables were analyzed. A Burt table (a multidimensional contingency table of these variables) was constructed (Table 2).

Table 2. Burt's table for input data

	low price: no	low price: yes	container size: no	container size: yes	alcohol content: no	alcohol content: yes	brand rep.: no	brand rep.: yes	color: no	color: yes	aroma: no	aroma: yes	taste: no	taste: yes	Total
low price: no	99	0	88	11	88	11	0	99	11	88	11	88	11	88	693
low price: yes	0	132	11	121	11	121	22	110	44	88	49	83	11	121	924
container size: no	88	11	99	0	99	0	0	99	22	77	22	77	11	88	693
container size: yes	11	121	0	132	0	132	22	110	33	99	38	94	11	121	924
alcohol content: no	88	11	99	0	99	0	0	99	22	77	22	77	11	88	693
alcohol contetn: yes	11	121	0	132	0	132	22	110	33	99	38	94	11	121	924
brand rep: no	0	22	0	22	0	22	22	0	0	22	0	22	0	22	154
brand rep: yes	99	110	99	110	99	110	0	209	55	154	60	149	22	187	1463
color: no	11	44	22	33	22	33	0	55	55	0	49	6	22	33	385
color: yes	88	88	77	99	77	99	22	154	0	176	11	165	0	176	1232
aroma: no	11	49	22	38	22	38	0	60	49	11	60	0	22	38	420
aroma: yes	88	83	77	94	77	94	22	149	6	165	0	171	0	171	1197
taste: no	11	11	11	11	11	11	0	22	22	0	22	0	22	0	154
taste: yes	88	121	88	121	88	121	22	187	33	176	38	171	0	209	1463
Total	693	924	693	924	693	924	154	1463	385	1232	420	1197	154	1463	11319

Source: Own elaboration

Based on this table, calculations were carried out regarding the quality of representation of points corresponding to the categories of the variables in factor spaces of available dimensions. The results are shown in Table 3.

Table 3. Eigenvalues and inertia

Dimensions Numer	Eigenvalues and inertia				
	Singular values	Eingenvalues	Inertia (%)	Cumulative %	Chi squared
1	0,646385	0,417814	41,78138	41,7814	1461,696
2	0,579940	0,336331	33,63306	**75,4144**	1176,632
3	0,345597	0,119437	11,94370	87,3581	417,843
4	0,276784	0,076609	7,66091	95,0191	268,012
5	0,166370	0,027679	2,76791	97,7870	96,833
6	0,148763	0,022130	2,21304	100,0000	77,422

Source: Own elaboration

We may represent the points (categories) in a factor space with between 1 and 6 dimensions. The more dimensions, the better the representation of associations among categories. For graphical clarity, we choose a two-dimensional representation. The first two dimensions explain approx. 75% of total inertia, which is a good result (a common guideline is at least 80%).

Coordinates of the categories in the two-dimensional factor space are presented in Table 4. Almost all categories are adequately represented in this space (column: Quality). The categories "brand reputation: yes/no" show the poorest representation. The first dimension is primarily defined by the categories: low price (yes/no), capacity (yes/no), and alcohol content (yes/no). The second dimension is defined by: color (no), aroma (no), and taste (no).

Table 4. Coordinates and quality of category representation in a 2-factor space

Row Name	Row No.	Coordinate Dimension 1	Coordinate Dimension 2	Weight	Quality	Inertia.	Inertia Dim.1	Cos^2 Dim. 1	Inertia. Dim. 2	Cos^2 Dim. 2
low price: no	1	-1,06404	0,03529	0,061224	0,850070	0,081633	**0,165905**	0,849136	0,000227	0,000934
low price: yes	2	0,79803	-0,02647	0,081633	0,850070	0,061224	**0,124428**	0,849136	0,000170	0,000934
container size: no	3	-1,08390	0,26517	0,061224	0,933859	0,081633	**0,172154**	0,881124	0,012800	0,052735
container size: yes	4	0,81292	-0,19888	0,081633	0,933859	0,061224	**0,129116**	0,881124	0,009600	0,052735
alcohol content: no	5	-1,08390	0,26517	0,061224	0,933859	0,081633	**0,172154**	0,881124	0,012800	0,052735
alcohol contetn: yes	6	0,81292	-0,19888	0,081633	0,933859	0,061224	**0,129116**	0,881124	0,009600	0,052735
brand rep: no	7	1,06137	-1,23262	0,013605	0,278511	0,129252	0,036683	0,118579	0,061462	0,159932
brand rep: yes	8	-0,11172	0,12975	0,129252	0,278511	0,013605	0,003861	0,118579	0,006470	0,159932
color: no	9	0,51083	1,56450	0,034014	0,846442	0,108844	0,021243	0,081545	**0,247536**	0,764897
color: yes	10	-0,15963	-0,48891	0,108844	0,846442	0,034014	0,006638	0,081545	0,077355	0,764897
aroma: no	11	0,54664	1,44435	0,037106	0,836831	0,105751	0,026538	0,104849	**0,230155**	0,731982
aroma: yes	12	-0,19181	-0,50679	0,105751	0,836831	0,037106	0,009312	0,104849	0,080756	0,731982
taste: no	13	0,28148	2,36969	0,013605	0,599439	0,129252	0,002580	0,008340	**0,227159**	0,591099
taste: yes	14	-0,02963	-0,24944	0,129252	0,599439	0,013605	0,000272	0,008340	0,023911	0,591099

Source: Own elaboration

In the factor plane (Figure 2), four clusters of points can be observed, suggesting that the sample can be divided into four groups. Let us first examine the more atypical groups (points farther from the centroid).

The first group (leftmost cluster) consists of consumers who do not pay attention to price, capacity, or alcohol content. They tend to value brand reputation. Their distance from the second axis makes it difficult to assess their preferences regarding taste, aroma, and color (though one might speculate that they do not pay much attention to these either). We may refer to them as “Show-offs.”

The next atypical group (third cluster from the left) consists of consumers who strongly do not pay attention to color, taste, or aroma. Their position on the positive side of the first dimension suggests they pay attention to price, capacity, and alcohol content. Their attitude toward brand reputation is hard to determine.

Another group (far-right cluster) appears to prefer large amounts of cheap and strong beer and does not care about brand reputation (“beer is beer”). Their proximity to the first axis makes it difficult to infer preferences regarding color, taste, and aroma.

From the perspective of dominant consumer preferences, the most interesting cluster is the one near the centroid. It represents the average consumer profile. Based on its position, the average consumer considers brand reputation, taste, color, and aroma important, but pays relatively little attention to capacity, alcohol content, and price (although this tendency is weak).

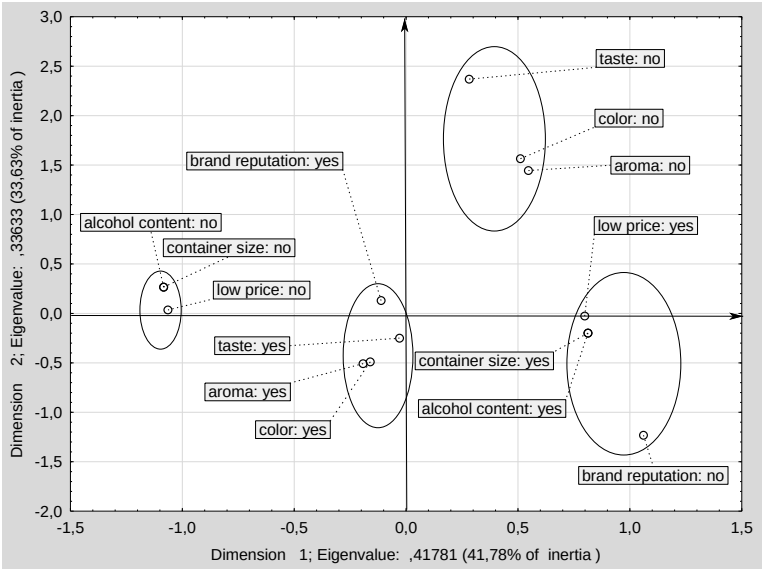

Figure 2. Positioning of the categories of the studied variables in a 2-factor space

Source: Own elaboration

Assuming the study was conducted in a commercial target group, the following conclusions can be drawn:

1. When designing an advertising campaign, it is important to emphasize product attributes such as color, taste, and aroma.
2. Brand reputation should also be strongly highlighted.

Adding supplementary points could enrich the analysis – for instance, grouping respondents by age categories to help tailor advertising strategies to specific age groups. Other potential supplementary variables could include preferred packaging type (bottle/can), possibly related to environmental attitudes. The possibilities vary depending on the product.

Conclusions

On the basis of multiple correspondence analysis applied to survey data on beer purchasing criteria, several important patterns of consumer preferences were identified. The results highlight the existence of distinct consumer segments and reveal which product attributes are most influential in shaping purchasing decisions. The key findings are summarized below.

- Consumers differ substantially in their evaluation of beer attributes, forming several distinct preference groups in the factor space.
- Taste, aroma, color, and brand reputation are the most influential attributes for the majority of respondents.
- Price, container size, and alcohol content are relatively less important for most consumers, although some subgroups value them more strongly.
- The largest cluster of consumers – the “average profile” – prioritizes sensory qualities and brand reputation, while showing limited concern for price and alcohol content.
- A segment of respondents appears focused on cheap, strong beer in large quantities, with little regard for sensory attributes or brand reputation.
- Another segment shows the opposite pattern, giving little importance to price-related attributes and greater attention to brand.
- The positioning of categories in the factor space confirms that consumer preferences can be meaningfully segmented using correspondence analysis.
- The first two dimensions of the factor model explain approximately 75% of the total inertia, indicating a good level of information retention in the 2D representation.
- Multiple correspondence analysis enables visual identification of clusters and facilitates interpretation of qualitative data that would be difficult to assess in traditional cross-tabulations.

- The results suggest that marketing campaigns should emphasize quality-related attributes, especially flavor, aroma, and brand identity, rather than purely economic features.
- Including supplementary variables (e.g., age groups) could enhance insights and support more precise market segmentation.

The study demonstrates that correspondence analysis is a useful exploratory technique for investigating associations among qualitative variables in marketing research. By transforming categorical survey data into a geometric representation, the method enables the identification of patterns in consumer preferences that are not easily visible in raw contingency tables. In the presented case study, multiple correspondence analysis revealed distinct clusters of consumers characterized by different attitudes toward beer attributes, as well as an "average" consumer profile.

The results indicate that sensory features such as taste, aroma, and color, together with brand reputation, play a central role in shaping purchasing decisions. In contrast, price, container size, and alcohol content appear to be relatively less important for the majority of respondents. These findings suggest that marketing campaigns should emphasize product quality and brand image rather than utilitarian characteristics.

Moreover, the analysis highlights the potential of correspondence analysis to support market segmentation and strategic communication. The method allows marketers to define homogeneous groups of consumers and tailor advertising strategies accordingly. Including supplementary variables – such as demographic factors – could further enhance the interpretative value of the analysis and help refine consumer targeting.

Overall, correspondence analysis proves to be an effective tool for transforming qualitative consumer data into actionable insights, offering both analytical rigor and intuitive visualization for decision-making in marketing.

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ARTICLES

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GREEN ORGANIZATIONS IN THE ESOTERIC INDUSTRY: THEORETICAL ANALYSIS OF VALUES, STRUCTURES AND MANAGEMENT

Abstract

The aim of this article is to present a theoretical analysis of green organizations in the context of contemporary management, with particular emphasis on value-based industries such as the esoteric sector. The first part presents Frederic Laloux's concept of organizational colors. This is followed by a discussion of the key characteristics of green organizations, emphasizing their culture of community, the importance of values and the participatory nature of their structures. The paper highlights the potential of green organizations in the esoteric industry as an example of a sector where values are paramount in shaping organizational relationships. The article is theoretical in nature and serves as a starting point for further analysis of the functioning of value-based organizations.

Keywords: Organizational colors concept (Laloux), Green organizations, Esoteric industry, organizational values

JEL classification codes: M14, M21, L84, D23, D63

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Introduction

In recent years, Laloux's concept of organizational colors has been a popular topic in management. Most often, one encounters works on teal organizations, while there is still much room for analysis when it comes to the others. Due to the ubiquitous trend of individualism and related emotional issues, green organizations seem to be trending on the market. Green organizations are characterized by a strong emphasis on shared values, participatory decision-making, stakeholder inclusion, and a culture of care and consensus. (Laloux, 2016; Hartung, 2018). This means that in industries focused on self-development and self-care, this type of organization will naturally occur. Although the green organization model has been widely analyzed in the context of education, healthcare and social entrepreneurship, its application in value-based industries, such as the esoteric sector, remains poorly recognised. The esoteric industry, which encompasses spiritual and holistic practices, operates on the basis of deeply rooted value systems that focus on meaning, transformation and relational depth (Lisak, 2023) and fits into the model of a green organization. The esoteric industry is primarily a service industry that focuses on people and their needs rather than hierarchies, which poses a challenge in terms of management. (Najafov, 2025). There is therefore a need to consider green organizations, their values and structures.

1. Management Concept Proposed by Frederic Laloux

Managing an organization is not an easy task, which is why researchers propose certain models that can be used to guide the organization. Based on extensive empirical research, Frederic Laloux presented in his book an axiological distinction between organizations, which referred to the advancement of individual consciousness (Musioł, 2024). In other words, the foundation of this concept is the assertion that human consciousness evolved in stages, and at each stage it became increasingly capable of solving increasingly complex problems. These changes are imperceptible, fluid and non-linear. They involve not only changes in human thinking and perception in general, but also sociological, social and market transformations, which ultimately lead to other organizational changes. These changes naturally became polarised, and as a result, people rediscovered new ways of operating, which translated into the emergence of a new organizational model trend that surpassed the previous one in terms of values (Otero de Navascués Viada, 2018). It is worth noting that the author describes four existing organizational paradigms and finally presents a fifth one, which will dominate in the coming years, namely turquoise (Musioł, 2024; Otero de Navascués Viada, 2018). It is also worth noting that the author of the concept

emphasizes that each of these models originated from a certain stage of human development in general, and therefore they can also be understood as stages of organizational development. However, this does not have to be the case, and each of them can be treated as a separate model of operation (Laloux, 2014). Frederic Laloux presents the following in his concept:

- **Red:** This is the first paradigm or stage, which is the most primitive stage of development, and the author refers here to prehistoric times when the struggle for survival, power and influence was paramount. This model is based on strong authority and hierarchy, and is usually led by an authoritarian superior. (Laloux, 2014). Another characteristic is that this model is aimed at small groups, mainly because of its reference to the original forms of human existence. The influence of managers stems from the fear of their subordinates and an unpredictable and dangerous environment.(Zalewski, 2023). Nowadays, there are few organizations representing this model. Examples of such organizations include gangs or some contemporary companies in crisis. This is not a recommended or lucrative model; rather, its dynamics do not work in the modern world. (Parnow, Schmidt, 2019).
- **Amber**: This is the next stage, or model, identified by Laloux. It is characterized primarily by the creation of clear role structures and procedures that help to achieve long-term goals (Zalewski, 2023). The author of the concept calls it the conformist stage and emphasizes that it results from developed social functions in people. It is not only about the desire to gain social approval, but above all about using the mechanisms that underpin the functioning of larger communities. In the context of how an organization functions, the model of conduct is fairly static, i.e. the rules are clearly defined and there is one correct way of acting, and predictability is paramount. The structure of the organization is usually pyramid-shaped, with decisions being made at the highest level and then implemented down through the lower levels. The leader may be replaced in accordance with established rules of succession. Examples of such organizations include religious communities such as the Catholic Church (Laloux, 2014).
- **Orange**: This model, referred to by the author as the stage of success, focuses on making decisions in accordance with social norms, while management awareness emphasizes the complex mechanism of the environment, which increases efficiency. Responsibility lies at the heart of the orange organization, and profit

is achieved through an understanding of the mechanisms that influence organizations externally (Laloux, 2014). The structure changes dynamically depending on needs, while maintaining the previously established framework. The key is effectiveness, a focus on achieving results, and continuous development. Everyone has a clearly defined role and scope of responsibilities (Rutkowska, 2020). This model usually works for corporations and banks (Zalewski, 2023).

- **Green**: This model, referred to as the pluralistic stage, primarily departs from the pursuit of success in terms of profit and focuses on harmony, justice, equality, a sense of community and peace. The most important values are higher ones such as freedom, dignity and spiritual goods. And while the orange or amber model dominates in business, the green model is present among non-profit organizations, activists and mentors (Laloux, 2014). In the organization, decisions are made jointly by employees, often together with customers. A shared mindset and values unite not only employees but also customers (Zalewski, 2023).
- **Teal**: This is the final stage in the concept and is considered the highest level. This model is related to Wilber's theory of needs fulfilment. The turquoise organization abandons structures and established patterns in favour of building relationships (Rutkowska, 2020). The structure is flat, and the leader is expected to build trust and focus on openness and flexibility in partnerships (Zalewski, 2023).

In his concept, Laloux refers to research in the fields of psychology and management, demonstrating that these are inextricably linked. The evolution of the individual translates into the evolution of the functioning of the organization, and atavistic mechanisms are replaced by the provision of people's needs (Kubek, 2025). For clarification, the most important characteristics of each color used by the organization are listed below(Figure 1).

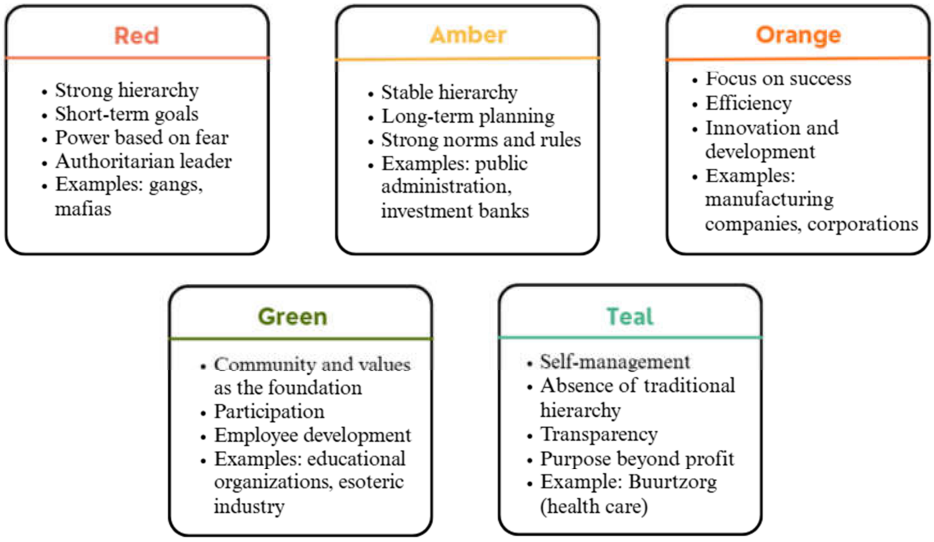

Figure 1. Typology of organizational colors according to Laloux
Source: own elaboration based on: Laloux, F. (2014). *Reinventing Organizations: A Guide to Creating Organizations Inspired by the Next Stage of Human Consciousness*. Nelson Parker; Laloux, F. (2015). *Pracować inaczej. Nowatorski model organizacji in-spirowany kolejnym etapem rozwoju ludzkiej świadomości*, Warsza-wa: Studio EMKA.

2. Characteristics of green organizations

Green organizations operate in the name of ideas, and community and consensus are key for them. Power is not important in this model, as it often conflicts with the values that form the epicentre of this model. Furthermore, setting a mission and taking into account the interests of all stakeholders, and therefore not only shareholders, suggests a high level of responsibility in a psychosocial context. Managers primarily act as guides and helpers, rather than imposing and demanding leaders (Chêne, 2014). One of the foundations of such organizations is the creation of motivation based on the conviction that they are pursuing an important goal (Ziębicki, 2017). Pluralistic organizations focus on sustainable development, which can lead to individual and organizational success (Beehner, 2018). Relationships are more important than results, which is why power is decentralized and consensus is sought when making any decision. Feelings and emotions are important and cannot be disregarded, which is why conventional roles typically found in most organizations will not be appropriate for this style. It is also important to oscillate around these

values, otherwise senior and middle management will find it difficult to give up even micromanagement, which often occurs in organizations. In addition, this requires a great deal of maturity on their part, as according to this principle, they are supposed to serve and assist their subordinates, rather than just evaluate and punish them, which can be quite a challenge in most companies (Laloux, 2014). A green organization is one in which leaders truly believe in shared values and assume that everything they do should lead to them, and therefore there is no competition as such. The color green is specific and can only be reflected in a very narrow sector of activities. It is not suitable for large-scale business in most types of activities. The author of the concept points out that culture-focused companies are an example of such firms. It should be noted, however, that green organizations, despite the dominant trend of teal organizations, will coexist with them because, in economic terms, they are a response to the postmodernist thinking that has shaped the current state of affairs. (Laloux, 2014). The most important characteristics of green organizations according to the author are presented below (Table 1).

Tabela 1. Characteristics of green organisations according to Laloux

Characteristic	Description
Values	The organization is based on shared values and a mission that are more important than making a profit.
Participation	Decisions are made in a participatory manner, with leaders acting as facilitators.
Trust	Relationships are built on trust, not control.
Inclusion	Flat hierarchical structure, everyone is equal
Consultative leadership style	Managers support group processes and do not impose decisions.
Empowerment	Employees have a real influence on decisions and the development of the organization.
Focus on people	People and their needs are at the centre.
Relationship orientation	Relationships between employees are crucial to the functioning of an organization.
Collaboration	Cooperation and mutual assistance instead of competition.
Work-life balance	Caring about work-life balance.
Involvement of stakeholders	The voice of customers, partners and the community is very important.

Source: own elaboration based on: (Laloux, 2014)

Laloux's concept has attracted considerable interest in management sciences, which is why new studies are constantly being published to expand on the information about individual models. When it comes to green organizations, such studies can also be found in the literature on the subject. Below are the most important statements on green organizations made by various authors (Table 2).

Tabela 2. Selected premises about green organizations

Contribution	Author
In green organizations, work should have a deeper meaning. An organization is a family where everyone should help each other.	Andersson, Nordenson (2015)
Green organizations have a specific sense of responsibility, and their main goal is to strive for harmony.	Hauser (2017)
The model for green organizations is to strive for consensus and organizational development.	Hartung (2018)
Green organizations are a transitional stage between orange and turquoise.	Dereń, Skonieczny (2019).
Green organizations are the foundation of teal organizations and emphasize the nature of cooperation, consensus and relationality.	Moreno Romero, et al (2020)
Green organizations are like communities and families.	Gesmann, Löhe (2023)
Green organizations as a set of practices that can be studied and compared in different contexts.	Davies, Buisine (2023)
Green organizations can be understood as humanistic structures in which values and concern for people are important.	Musioł (2024)
The acceptance of green organizations depends on the age and experience of employees, which affects the effectiveness of implementing this model in practice.	Sytnik, Franke, Stopochkin (2025)

Source: own elaboration based on: (Andersson, Nordenson, 2015), (Hauser, 2017), (Hartung, 2018), (Dereń, Skonieczny, 2019), (Moreno Romero, et al, 2020), (Gesmann, Löhe ,2023), (Davies, Buisine, 2023), (Musioł, 2024), (Sytnik, Franke, Stopochkin, 2025)

3. Green organizations in value-based industries: the esoteric industry as an illustrative example

The esoteric industry is based on values and for this reason fits perfectly into the green organization model. Alternative spiritual practices that take place in esotericism refer to intangible values believed in not only by those involved in these practices, but also by their recipients. Spiritual experiences are based on trust and a specific sense of belonging and

initiation. All this means that organizations belonging to this industry naturally fulfil the assumptions of the green model. The green type focuses on organizational culture and the accompanying overarching ideas (Musioł, 2024; Dereń, Skonieczny, 2019). However, research into the phenomenon of esotericism shows that all activities related to magic in this industry are understood as transformative processes that strongly reinforce a sense of community and connection. This, in turn, means that this industry is not typically profit-oriented, but rather focused on sharing mystical experiences and interpreting them (Bellisario, 2024). It can be said that esoteric organizations are a kind of community that creates a specific narrative and shares knowledge (Traub, 2020). The goal of most organizations is to maximise profits or achieve market advantage, but this is completely different in the case of companies or individuals operating in the esoteric sector, where the main goal is to create a kind of space for spirituality and community building (Asprem, Strube, 2021; Villalba i in., 2021). And despite the fact that, objectively speaking, not everyone has to agree with the values promoted in this industry, as they contradict scientific principles, the industry is still growing rapidly and gaining more and more supporters (Villalba et al., 2021). This growth is based on the typical assumptions of the green model. The focus on rituals, symbolism and astrological interpretations is constantly growing (Lisak, 2023, Cusack, 2025). Basu and colleagues (2023) even say that this industry is an emerging market and that values are its driving force. In esotericism, humans are analyzed from a social, emotional and spiritual perspective, hence the strong focus on providing a sense of care and security. Representatives and consumers of this industry often claim that it improves individual well-being, and some even say outright that it has therapeutic properties for them. Cusack (2025) writes in his works that esotericism refers precisely to basic human needs and mentions that feelings of anxiety and the hardships of everyday life cause people to seek deeper meaning and answers to questions and phenomena that they do not understand or with which they disagree. Humans are social creatures and, as such, are subject to narratives. This is why many people use esoteric services to obtain predictions and a kind of mentoring, in order to satisfy their need for control and to know what is unknown or what will be better for the individual (Basu et al., 2023). This type of knowledge management, especially hidden knowledge, strengthens bonds and is addictive (Gündüz, 2016). The esoteric industry is specific, and the measure of success is the satisfaction of all members of the community with life, not financial results. In this sense, the esoteric industry is an illustrative example of the application of Laloux's green organization model, as it combines value-based management, where all people are equally important (Moreno Romero et al., 2020).

4. Potential of green organizations and their role in contemporary management: theoretical reflections

Contemporary management faces challenges arising from the changing needs of employees and growing social awareness. Green organizations described by Frederic Laloux as pluralistic, are an interesting alternative to traditional models. Their potential lies in their values and humanistic approach to people, which makes them particularly relevant in an era of growing importance of self-fulfillment (Laloux, 2014; Musioł, 2024). In light of all this, the following questions arise: *Does the green organization model have potential, and do green organizations have a chance of survival, or will they merely be a phase that will be replaced by teal organizations?*

To answer this question, we need to consider the advantages and disadvantages of this model. In terms of advantages, the concept of self-fulfillment and a sense of purpose at work, which is an indispensable element of green organizations (Laloux, 2014), is certainly important, and may be particularly significant for young employees (Mazur-Wierzbicka, 2016Other advantages include pluralism and inclusiveness, thanks to which the different approaches and beliefs of community members are seen as a resource rather than a destructive force, which in turn contributes to the development of the organization and individuals (St-Pierre, 2015). The emphasis on relationships, including building bonds and a sense of security, is also viewed positively, as pluralistic organizations not only integrate but also strengthen the sense of meaning (Moreno Romero et al., 2020). Green organizations, as a kind of family, treat human feelings as important constructs, which in the age of the cult of the individual can be viewed positively (Gesmann, Löhe, 2023). Furthermore, these organizations focus on equality and the abolition of rigid hierarchies and authority in favour of support, assistance and unity, which is in line with the current economic situation (Hauser, 2017). Undoubtedly, innovation and openness to change are significant added values of this model (St-Pierre, 2015). The ever-increasing expectations and growing needs of society can be met by the results of such organizations' activities. And although not all elements are easy to implement, their values and management methods seem to be increasingly consistent with the expectations of contemporary generations. It can be assumed that the development of organizations will move towards diversity and openness, making green organizations an important reference point for the future of management (Hauser, 2017; Moreno Romero et al., 2020). Green organizations are not without their flaws, and their principles, although generally sound, can lead to certain logical conflicts. The author of the concept himself emphasizes that another drawback may be the fact that relationships are more important than results. Furthermore, the

pluralistic paradigm prioritizes bottom-up processes, which can lead to the misuse of ideas contrary to their noble intentions. Another problem noted by the author is the fact that reaching consensus in large groups is often difficult, and sometimes impossible, as it can lead to deadlock. Unfortunately, this may lead to power struggles within the community, which in turn will contradict the values presented (Laloux, 2014). Doubtlessly, this can lead to decision-making paralysis and blurred responsibilities (Rutkowska, 2020). Another negative factor of this model is the pursuit of unanimous consensus, as it slows down development and innovation (Moreno Romero et al., 2020). These issues are the weaker points of this model and show that it may hinder development in certain areas. However, it is important to realize that each of these models has its fundamental flaws, and the green model, being one of the last stages, has fewer flaws than the previous ones.

These considerations lead to the conclusion that green organizations have potential, especially when considering aspects of postmodern reality. This model can be implemented not only in industries strictly based on values such as esotericism, as mentioned in the article, but can also be applied in other areas. However, the answer to the second question is not so clear-cut. To be more precise, green organizations have existed, exist and will continue to exist, but they are unlikely to become mainstream; rather, they will remain a separate, narrow phenomenon affecting specific industries. Due to their connection to basic human needs, regardless of evolutionary developments, these sectors will not be displaced. Consequently, organizations based on values, the creation of a sense of belonging, and issues related to culture, spirituality, and mentality will remain present on the market to a certain extent (Cusack, 2025). The specific nature and character of these industries will mean that many organizations will automatically meet the criteria of a green organization.

However, this is only a first attempt at answering this question. Delving deeper into the subject, one should also take into account that a pluralistic approach is a kind of stage in the development of consciousness, and the author of the concept has already proposed the next stage, namely turquoise (Laloux, 2014). This in itself suggests that this stage has been surpassed in terms of development, which in turn may mean that the most prominent model will be the turquoise model, rather than the green model. This stems from the leading assumption of this concept that each previous stage had its flaws and that green organizations also exhibited certain problems. Nevertheless, it is worth bearing in mind that specific value-based sectors, such as the esoteric industry, are likely to gain in importance (Villalba et al., 2021) and will also grow despite the fact that there is another level of distinction within this concept. It is worth noting that these assumptions are an attempt to analyze trends and are the result

of theoretical reasoning, which should contribute to empirical research in this area of ideal exploration, not only theoretical but also strictly research-based.

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