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The financial impact of the coronavirus pandemic on selected companies from the e-commerce sector: A case study of Amazon, Alibaba, and Asos

Since 2020, the coronavirus pandemic has significantly impacted the functioning of various sectors and companies worldwide. The pandemic has accelerated the adoption of digital technologies, reshaped global consumer behaviour and triggered an unprecedented growth in online shopping. The aim of the article is to assess the influence of the coronavirus pandemic on the e-commerce sector by examining the financial standing, position, and performance of three e-commerce platforms from different regions such as Amazon, Alibaba, and Asos, both before and during the pandemic. The hypothesis of the article is that the coronavirus pandemic has significantly impacted the financial situation and operations of e-commerce platforms across various regions. The analysis focuses on the years 2017–2020 to provide a comparative perspective on financial conditions before and during the initial phases of the pandemic, highlighting the most disruptive period in 2020 while intentionally excluding the later stages of the coronavirus pandemic and the recovery period. While the final phase of the selected period reflects immediate disruptions, it also includes early regulatory and market adjustments, making this timeframe a combination of sudden impacts and initial responses. This approach captures the contrast between pre-pandemic stability and early-pandemic disruptions, avoiding complexities from prolonged pandemic phases and recovery. The article adopts a quantitative method using ratio analysis to analyse liquidity, debt, efficiency, and profitability by examining financial statements such as balance sheets and profit and loss statements. The findings demonstrate that the pandemic has indeed impacted the e-commerce sector. However, the extent of this impact varied across platforms and regions. The article provides a deeper understanding of the sector's financial performance during a pandemic crisis and identifies key indicators driving this growth. The results provide valuable implications for businesses and policymakers, emphasizing sector's evolving role in global economy.

Keywords: financial analysis, ratio analysis, e-commerce, coronavirus pandemic

JEL classification: G00, G32, L81

Introduction

The pandemic has changed the functioning of many sectors and companies in almost all countries since the beginning of 2020. One of the sectors that has been significantly impacted by the crisis is e-commerce. As the pandemic spread, demand shifted from traditional brick-and-mortar stores to digital commerce. Consumers were forced to change their daily habits, behaviours, and practices. This form of shopping became one of the leading alternatives for both businesses and private customers [UNCTAD, 2021].

This article assesses the financial performance of three major e-commerce platforms: Amazon, Alibaba, and Asos, both before and during the pandemic. The research focuses on key financial indicators such as liquidity, debt, efficiency, and profitability, covering the years 2017–2020. These metrics reveal patterns in the financial conditions of these platforms before and during the crisis, shedding light on how the coronavirus pandemic influenced their financial standing, performance, and operations. Analysing the year 2020 enables the study to capture the immediate impacts of the pandemic on financial performance, while also reflecting early regulatory and market adjustments that shaped initial responses to the crisis. By concentrating on this pivotal year, the research highlights the sharp contrast between pre-pandemic stability and the disruptions triggered by the early stages of the pandemic. This approach avoids the complexities of prolonged recovery phases and varying rates of adjustment, ensuring that the findings accurately reflect the sector's financial condition during the most critical period of disruption. The research problem is noteworthy because the coronavirus pandemic caused one of the most substantial global economic disruptions in recent history. This issue is particularly vital given the unprecedented shift in consumer behaviour towards digital commerce and the reliance on e-commerce as a key driver of global economic activity during the pandemic [OECD, 2020]. Understanding how major e-commerce platforms responded to the financial and operational challenges of the pandemic is essential for identifying strategies that would enhance resilience in similar future crises.

Prior to this research, existing literature highlighted the growing importance of e-commerce as a critical driver of global trade and its capacity to thrive in digital environments. Studies emphasised the sector's adaptability to rapidly changing market dynamics, supported by technological advancements and increasing consumer reliance on online platforms. However, limited empirical evidence existed on how individual e-commerce platforms managed their financial performance and operations during significant economic disruptions, such as the coronavirus pandemic. This research expands knowledge on the financial resilience of e-commerce platforms by providing empirical evidence of how major e-commerce platforms performed during extraordinary economic challenges, such as the coronavirus pandemic. The findings focus on key financial indicators, offering a detailed understanding of the financial impact of the pandemic on the e-commerce sector.

The aim of the article is to assess the financial impact of the coronavirus pandemic on the e-commerce sector by analysing the financial situation, position, and performance of three platforms from different regions before and during the pandemic. The hypothesis posits that the coronavirus pandemic has significantly influenced the financial situation and functioning of e-commerce platforms across various regions.

1. Literature overview

The e-commerce industry has undergone a transformative evolution, with its trajectory profoundly impacted by the coronavirus pandemic. Scholarly discussions have explored various factors influencing online consumer behaviour, but a synthesis of these findings highlights key insights relevant for understanding the financial impact of the pandemic on e-commerce platforms like Amazon, Alibaba, and Asos. Pandey and Parmar [2019] identified several critical determinants of online shopping behaviour, including demographic factors, technological proficiency, and the influence of website design, ease of navigation, and social media on user engagement. They also found that situational factors, product characteristics, and promotional strategies such as discounts, flexible payment options, and personalised offers were crucial in driving purchasing decisions. Delivery reliability and after-sales services were emphasised as key elements in building consumer trust and loyalty. These findings, while significant before the pandemic, are crucial for understanding the shifts in consumer expectations during the crisis, where platforms had to quickly adapt to new challenges. These insights are particularly significant in the context of the pandemic's impact on the e-commerce sector, where platforms had to rapidly adjust to the surge in demand for online services and shifts in consumer purchasing behaviour. The coronavirus pandemic accelerated these trends, highlighting the necessity for platforms to remain agile, responsive, and consumer-centric to maintain growth and competitiveness during times of crisis.

Further studies have examined the effects of the coronavirus pandemic on the global e-commerce market, with Elrhim and Elsayed [2020] offering an analysis of this impact on five of the largest e-commerce companies: Amazon (USA), Alibaba (China), Rakuten (Japan), Zalando (Germany), and Asos (UK). The study evaluated the relationship between the spread of COVID-19, measured by daily cumulative infections, new cases, cumulative deaths, and new deaths, and the stock performance of these companies. Using daily stock returns as the dependent variable, the analysis covered the period from March 15 to May 25, 2020, providing insights into the financial market responses to the pandemic. The study demonstrated that these companies experienced positive daily stock returns during the analysed period, emphasising their resilience in adapting to pandemic-induced market conditions. The impact varied by company and region, reflecting the local severity of the pandemic. For Amazon (USA) and Asos (UK), cumulative infections had the strongest effect on stock performance, consistent with the high levels of COVID-19 cases in these countries during the research period. In contrast, new cases had a greater impact on Alibaba (China) and Rakuten (Japan), while cumulative deaths were the most significant factor for Zalando (Germany). This study highlights the heterogeneity in the response of e-commerce stock returns to the pandemic, shaped by regional differences in the severity of the outbreak. The findings underscore how public health crises can significantly influence financial markets, particularly the growing e-commerce sector. By analysing the interplay between pandemic metrics and market performance, this research contributes to a deeper understanding of the resilience and variability of e-commerce platforms during global disruptions. While this study offers valuable insights into the resilience of these companies during the pandemic, it also highlights the need for a deeper exploration of how different firms adapted their business strategies and financial operations to survive and thrive under rapidly changing conditions.

Other research has analysed the impact of the coronavirus pandemic on consumer behaviour, with Jílková and Králová [2021] examining its effects on digital consumer trends and online shopping. Their study explored behavioural changes across generational cohorts using surveys conducted in two waves, one before the pandemic and one during it. These cohorts included Generation Alpha, Generation Z, Millennials, Generation X, Baby Boomers, and the Silent Generation. The findings revealed that fear of the pandemic, a desire for safety, and government restrictions drove consumers to engage in online shopping during the crisis. The research noted a sharp rise in online transactions, changes in search patterns, payment preferences, and delivery methods. Notably, Baby Boomers and the Silent Generation, previously less inclined to shop online, turned to e-commerce out of necessity during store closures and reported intentions to continue online purchasing post-pandemic. This shift indicates a significant broadening of the digital consumer base. The authors concluded that the coronavirus pandemic accelerated e-commerce adoption across all demographics, reshaping the profile of the typical online shopper. Their study provides valuable insights into the lasting effects of the crisis on digital consumer behaviour and highlights the importance of understanding generational preferences to effectively respond to evolving consumer demands. These generational shifts are particularly significant in understanding how e-commerce platforms had to adjust their financial and operational strategies to accommodate new consumer groups, especially older generations who had previously been less engaged with online shopping. This insight is critical for analysing the financial impact on e-commerce companies, as it underscores the need for platforms to modify their business models to meet the demands of an expanding and more diverse digital consumer base.

Subsequently, Han et al. [2022] investigated the impact of the coronavirus pandemic on e-commerce sales and operational drivers, focusing on data from Alibaba's platform across 339 cities in mainland China. The study aimed to understand how e-commerce responded to the pandemic and identified both challenges and opportunities for platforms navigating the crisis. Using a city-day panel over three years, the authors employed year-on-year comparisons, COVID-19 intensity metrics (based on case numbers), and containment measures (such as checkpoint policies and partial or full shutdowns) to evaluate the pandemic's impact on e-commerce. Their findings revealed a distinct drop-and-recovery pattern in e-commerce sales, highlighting the sector's digital resilience. During the Wuhan shutdown (January 23–April 7, 2020), e-commerce sales decreased by 22% but rebounded in most cities within five weeks, showcasing the adaptability of digital commerce. This research provides essential insights for both platforms and policymakers, emphasizing the importance of digital strategies and robust logistics networks in ensuring resilience during crises. The authors challenged the assumption that e-commerce universally benefits from offline retail disruptions, showing that operational bottlenecks, such as limited logistics capacity, can hinder sales performance. The findings underscore the critical interplay between logistics infrastructure and e-commerce performance during a global crisis, highlighting how platforms like Alibaba leveraged adaptability and innovation to navigate challenges. This research contributes to a deeper understanding of the operational complexities faced by e-commerce platforms during the pandemic and provides actionable insights for ensuring continuity and growth in the face of uncertainty. It also makes a crucial contribution to understanding how the financial resilience of e-commerce platforms was shaped by their operational responses, which is highly relevant for analysing the financial impact of the pandemic on the e-commerce sector and companies like Amazon, Alibaba, and Asos.

Another important contribution to the discussion on e-commerce and consumer behaviour during the coronavirus pandemic was the work of Darwish and Gomes [2020], which explored the evolution of e-commerce services, including online shopping, banking, and enterprise, highlighting the accessibility these platforms provided to consumers worldwide, particularly in rural areas. The authors emphasised that e-commerce platforms needed to prioritise consumer privacy and security to build trust, addressing widespread concerns about data protection, fraud, and reliability of transactions. These issues remain key barriers to broader consumer adoption. The research applied of behavioural theories, including the theory of planned behaviour (TPB), to understand consumer adaptation to e-commerce. The findings suggested that public health laws and lockdown measures significantly accelerated the shift toward online shopping by increasing reliance on the Internet for purchasing goods and services. The authors highlighted that fast and reliable delivery services could further encourage consumer adoption by enhancing convenience and satisfaction, particularly in markets where traditional retail access was limited. The study also underscored the coronavirus pandemic's immediate and far-reaching impact on consumer behaviour, driven by fear of physical contact and safety concerns. These shifts, the authors argued, represented not only a temporary adaptation but also a long-term transformation in purchasing habits. As e-commerce platforms adapted to meet these demands, addressing trust and security concerns was essential to sustaining growth and attracting a broader consumer base. The authors provided valuable insights into how e-commerce platforms could align their strategies with evolving consumer expectations, emphasizing that transparency, reliability, and customer-centric operations were pivotal in fostering trust. This study adds to the broader understanding of how the coronavirus pandemic reshaped consumer behaviour and highlights the steps necessary for e-commerce platforms to remain competitive in a rapidly evolving digital, commercial, and technological landscape. This long-term shift is crucial for understanding the financial implications for e-commerce companies, as these changes in consumer behaviour are likely to result in new business models, pricing structures, and customer engagement strategies that will impact long-term profitability. This shift in priorities not only affects operational costs but also influences pricing strategies and long-term revenue generation, requiring e-commerce platforms to balance their investments in innovation with maintaining competitive pricing and profitability.

A significant addition to the understanding of e-commerce dynamics was the work of Rocha et al. [2021], which utilised an evolutionary game model to analyse interactions between consumers and producers within e-commerce marketplaces. The study focused on key determinants such as the availability of delivery services and consumer preferences, and examined their effects on trade patterns and strategic decisions. By adapting the game payoff matrix, the authors explored the distinct changes in trading behaviour observed in both traditional retail and e-commerce sectors during the pandemic. The research highlighted how e-commerce platforms, through investments in logistics and warehousing, were able to adapt to growing consumer demands for faster delivery services. This adaptability allowed e-commerce to set new benchmarks for convenience and responsiveness, significantly altering consumer expectations. The findings suggest that these advancements not only addressed immediate challenges but also facilitated a long--term shift toward digital purchasing behaviours. While the study provides critical insights into the structural and strategic adjustments within e-commerce, it also underscores the financial challenges that platforms faced when adapting to shifting consumer demands, particularly regarding the significant investments required in logistics and warehousing. These insights are directly applicable to understanding the financial resilience of e-commerce companies during the pandemic, especially in the case of Amazon, Alibaba, and Asos, where strategic financial investments are key to adapting to the new digital economy and ensuring business continuity.

The final contribution to the literature review came from Chodak [2024], who examined how e-commerce influenced both microeconomic and macroeconomic dynamics. The study highlighted the pivotal role of the coronavirus pandemic in accelerating the shift from traditional trade to e-commerce, which significantly transformed consumer behaviour and market structures. The author explored the dual impact of e-commerce on the labour market, noting that new occupations (such as digital marketing specialists and logistics managers) emerged, while certain traditional roles became obsolete as a result of automation and evolving retail practices. The analysis emphasised how e-commerce reduced barriers to entry for businesses, enabling smaller enterprises to compete in the digital markets. The author addressed consumer privacy concerns, observing how online marketing strategies had become increasingly invasive, raising issues about the balance between personalisation and data security. The study also delved into the broader implications of e-commerce on consumer habits, which shifted toward greater reliance on digital platforms for convenience and accessibility. It briefly touched on the impact of e-commerce on tax avoidance, highlighting how global digital trade presented challenges for taxation frameworks. This work provides a perspective on the multifaceted effects of e-commerce, offering valuable insights into its economic, social, and regulatory implications within a rapidly evolving digital economy. Understanding the broader economic dynamics outlined in this study enables a more accurate assessment of the financial impact of the coronavirus pandemic on e-commerce platforms, especially in terms of how companies like Amazon, Alibaba, and Asos adapted to the crisis and implemented strategies to ensure both short-term survival and long-term growth.

In summary, the e-commerce industry – as it evolved during the coronavirus pandemic – has been the subject of numerous studies, primarily focusing on changes in consumer behaviour and the adaptation strategies of e-commerce platforms. The literature highlights the e-commerce sector's resilience during the coronavirus pandemic, driven by digital transformation, operational innovation, and shifts in consumer behaviour. Platforms adapted by investing in logistics, enhancing delivery services, and addressing evolving consumer needs, fostering long-term reliance on digital commerce. These findings demonstrate the importance of innovation, adaptability, and sustainability in ensuring continued growth and competitiveness in the face of future global disruptions. However, there remains a noticeable gap in research regarding a detailed, comparative analysis of how specific e-commerce giants such as Amazon, Alibaba, and Asos responded to the pandemic's financial and operational challenges. This research gap is particularly important because it provides an opportunity to examine how different e-commerce companies, such as Amazon, Alibaba, and Asos, developed distinct financial strategies to overcome pandemic-induced disruptions. While previous studies have explored the general impact of the coronavirus pandemic on the e-commerce sector, there is a lack of comparative analysis that focuses on the financial resilience and adaptation strategies of these key e-commerce platforms.

2. Methodology

The methodology applied in this research employs quantitative analysis to evaluate the financial performance of selected companies within the e-commerce sector. Specifically, the analysis employed in this research relies primarily on ratio analysis, a well-established methodology in financial studies. Ratio analysis provides a systematic approach to examining the relationships between financial metrics, enabling the assessment of a company's liquidity, efficiency, profitability, and overall debt management, including debt service coverage. By interpreting these ratios, the study aimed to identify patterns that indicate financial health, liquidity, operational efficiency, profitability, and debt sustainability [Suthar, 2018]. Liquidity ratios, such as the current ratio, quick ratio, and cash ratio, provide insights into the company's ability to meet short-term liabilities, ensuring financial stability in the face of immediate obligations. These ratios highlight the sufficiency of current assets in relation to liabilities, reflecting the organisation's resilience, stability, and ability to adapt during economic fluctuations. Efficiency ratios, including the asset turnover ratio and accounts receivable turnover ratio, offer a deeper understanding of how effectively companies use their assets and manage their receivables to generate revenue [Barnes, 2006]. These measures are critical for assessing whether resources are optimised or underutilised. Profitability ratios, such as return on sales and return on equity, highlight the company's ability to generate profits relative to its operational costs and equity investment. These metrics provide a benchmark for evaluating the overall success of the business in delivering value to shareholders. Lastly, debt service coverage ratios, such as the debt-equity ratio and times interest earned, are essential for understanding the company's financial leverage and ability to manage long-term obligations [Arhinful, Radmehr, 2023]. These ratios also assess the risks associated with external financing, highlighting the balance between profitability and debt management. All in all, these financial ratios allowed for a comprehensive evaluation of the companies' financial performance and strategic financial positioning.

The analysis focuses on the years 2017–2020 to ensure a comprehensive and consistent examination of the financial performance before and during the initial stages of the pandemic. The selected timeframe captures the most immediate and significant impacts of the crisis, providing a focused view of how companies responded to unprecedented challenges. Limiting the scope to this period eliminates potential distortions introduced by prolonged recovery dynamics or varying regional policy interventions in subsequent years. Furthermore, the year 2020, i.e., the first full year of the coronavirus pandemic, reflects the peak of disruption, making it a pivotal reference point for understanding short-term financial resilience [Charles, Uford, 2023]. The empirical basis of the study comprises financial statements, including balance sheets and profit and loss statements, spanning a four-year period, which are complete, verified, and unaffected by the reporting delays or adjustments that could occur in later years due to prolonged pandemic impacts or regulatory changes. These data were collected from the Thomson Reuters Eikon database, which was selected for its comprehensiveness and reliability in providing financial information on a wide range of companies [Thomson Reuters, 2022]. In addition to the database, recent scientific articles, reports, and publications were used to provide supplementary insights and theoretical grounds for the study [Sari, 2019]. This approach ensured that the research results were based on a robust and reliable data set, minimizing biases that could arise from incomplete or inaccurate financial disclosures.

The study focused on Amazon, Alibaba, and Asos, three represent major players in the industry, offering insights into various operational and financial strategies. The selection of these companies was motivated by several key factors. Firstly, the principle of market representation played a central role in the selection process. Amazon is a leading multinational corporation headquartered in the United States, widely recognised as the largest and most diversified e-commerce company globally. It operates not only in online retail but also in cloud computing, digital streaming, and artificial intelligence. Amazon's retail sector is vast, with millions of products available across various categories, from electronics to groceries. The company's cloud division, Amazon Web Services, contributes substantially to its profitability, consistently accounting for a substantial portion of the company's overall operating income. Alibaba, a Chinese multinational conglomerate, operates with a distinct business model compared to Amazon. While both companies dominate the e-commerce sector, Alibaba's focus is more on connecting buyers and sellers through its online platforms, such as Taobao and Tmall, without holding significant inventory itself, unlike Amazon. In addition to e-commerce, Alibaba has a strong presence in cloud computing through Alibaba Cloud and in fintech with Alipay, providing a more integrated digital ecosystem. This business model contrasts with Amazon's approach of owning and managing a wide array of products and services, from retail to cloud computing. Compared to Amazon and Alibaba, United Kingdom – based Asos focuses more narrowly on fashion e-commerce. Unlike Amazon's broad range of product categories and Alibaba's diverse platforms, Asos operates exclusively in the fashion and apparel industry, offering a specialised online shopping experience for clothing, shoes, and accessories. While Amazon and Alibaba are major players in global e-commerce with a range of business divisions, Asos stands out with its niche focus on fashion, serving primarily young adult consumers. Thus, while all three companies are global e-commerce leaders, Amazon offers a highly diversified model spanning multiple industries, Alibaba focuses on a platform-driven approach with a major role in cloud and fintech, and Asos maintains a more specialised approach centred on online fashion retail. This diversity in business models provides a comprehensive basis for analysing the various strategies employed by e-commerce firms, especially in their responses to the unique and unprecedented challenges of the pandemic. Moreover, geographical diversity played a critical role in the selection of the companies. Amazon, Alibaba, and Asos represent major players in the e-commerce sector, each operating in distinct economic environments – North America, China, and Europe, respectively. These companies faced similar challenges brought on by the pandemic, such as disruptions in supply chains, shifts in consumer behaviour, and operational adjustments. However, each operated within unique regulatory frameworks, consumer behaviours, and economic conditions, providing a comprehensive view of how companies from different regions responded to the crisis. By including firms from three major global economies, this study offers valuable insights into the e-commerce sector's collective response to the pandemic. Additionally, these companies were selected due to their financial data accessibility and relevance to the research question. Amazon, Alibaba, and Asos are among the most publicly scrutinised e-commerce companies, with comprehensive and up-to-date financial reports readily available. This facilitates the comparison of key financial ratios such as liquidity, profitability, efficiency, and debt management, which are central to evaluating the companies' responses to the pandemic's economic challenges. The availability of consistent financial data across the study's timeframe further enhances analytical reliability, ensuring that the study's findings are based on comparable and verified data.

This methodological framework establishes a solid foundation for analysing the financial performance of Amazon, Alibaba, and Asos within the e-commerce sector. By leveraging financial ratio analysis and focusing on key indicators of liquidity, efficiency, profitability, and debt service coverage, the study ensures a comprehensive assessment of these companies' financial strategies. The choice of financial ratios aligns with the need to capture key aspects of financial resilience during economic disruptions, providing a comprehensive view of how the analysed companies managed their financial resources under the extreme conditions of 2020, a year defined by peak uncertainty and operational strain. Moreover, the choice of these three specific e-commerce platforms was driven by their significant role in the sector, accessibility of comprehensive financial data, and their relevance for analysing the sector's behaviour during economically challenging times, particularly during the pandemic, as well as their representation of diverse geographic regions, which allows for a broader understanding of the global impact of the pandemic on the e-commerce sector. The approach not only allows for an in-depth understanding of individual company performance but also facilitates comparisons that reveal broader trends and patterns within the e-commerce sector, forming a critical basis for the subsequent analysis and interpretation of results.

3. Results

The results of this study provide a comprehensive analysis of the financial performance of Amazon, Alibaba, and Asos within the e-commerce sector, focusing on the key indicators of liquidity, efficiency, profitability, and debt service coverage. This section presents the detailed findings derived from financial ratio analysis over a four-year period, thoroughly incorporating data from both the pre-pandemic and pandemic year.

Table 1 presents the liquidity ratios of Amazon, Alibaba, and Asos over the examined four-year period, covering the years from 2017 to 2020. For Amazon, the quick and current ratios remained quite stable over the four-year period, indicating that the company consistently maintained the financial resources needed to meet its short-term obligations. The cash ratio increased year by year, demonstrating an improved liquidity in 2020, with cash and short-term investments exceeding current liabilities. Alibaba exhibited a similar trend in liquidity ratios, with the lowest values recorded in 2019. By 2020, the company improved its liquidity position, holding more quick assets than current liabilities and meeting its short-term obligations. However, the cash ratio exceeded the optimal range, indicating inefficiencies in the management and deployment of cash resources. Asos experienced the most significant changes in liquidity. All the three indicators measuring financial liquidity improved in 2020 compared to previous years. Before 2020, the company struggled to settle its current liabilities due to insufficient cash and cash equivalents. During the pandemic in 2020, the company enhanced its ability to meet short-term obligations, marking a noticeable improvement in financial liquidity. Overall, the pandemic had the greatest impact on Asos's liquidity. In 2020, the company covered all its short-term liabilities while retaining additional cash.

Table 1. Liquidity ratios of Amazon, Alibaba, and Asos in 2017–2020

Company	Years			
	2017	2018	2019	2020
Current ratio				
Amazon	1.04	1.10	1.10	1.05
Alibaba	1.94	1.89	1.30	1.91
Asos	0.95	0.90	0.81	1.19
Quick ratio				
Amazon	0.76	0.85	0.86	0.86
Alibaba	–	1.86	1.26	1.85
Asos	0.35	0.17	0.11	0.57
Cash ratio				
Amazon	0.54	0.60	0.63	0.67
Alibaba	1.61	1.55	0.98	1.50
Asos	0.29	0.08	0.00	0.48

Source: Own contribution.

Amazon maintained a consistent liquidity position throughout the analysed period, with slightly higher levels of cash and short-term investments compared to previous years. Similarly, Alibaba exhibited stable liquidity indicators over the years, except for a significant drop in 2019. By 2020, Alibaba improved its liquidity, holding more quick assets than current liabilities and meeting short-term obligations. The company, however, was not using cash effectively.

Table 2 presents the debt service coverage ratios for Amazon, Alibaba, and Asos over the analysed period. Amazon exhibited a notable downward trend in its first two ratios, namely the debt ratio and the debt-to-equity ratio. This pattern reflected a progressive year-by-year reduction in the company's reliance on external sources to finance its assets. In earlier years, Amazon predominantly financed its assets through debt; during the period 2019–2020, it shifted primarily to equity financing. Moreover, in 2020, Amazon posed the lowest risk to investors and creditors. Similarly, Alibaba recorded the lowest debt ratio and debt-to-equity ratio in 2020, indicating a greater dependence on equity than debt. Furthermore, compared to prior years, Alibaba reduced its reliance on borrowing to fund its operations. In contrast, Asos maintained a consistent balance between debt and equity, showing minimal leverage before 2019. However, in 2019–2020, Asos also transitioned to equity as its main source of financing. Overall, when it came to the debt service coverage ratio, Amazon and Alibaba had previously financed their assets largely through debt. When the coronavirus pandemic began, both companies shifted primarily to equity, thereby posing less risk to investors and creditors than in previous years. The pandemic did not affect Asos's debt ratio to the same extent,

Table 2. Debt service coverage ratios of Amazon, Alibaba, and Asos in 2017–2020

Company	Years			
	2017	2018	2019	2020
Debt ratio				
Amazon	0.79	0.73	0.72	0.71
Alibaba	0.44	0.49	0.48	0.42
Asos	0.66	0.56	0.64	0.59
Debt-to-equity ratio				
Amazon	1.59	1.13	0.67	0.55
Alibaba	0.33	0.34	0.27	0.17
Asos	0.00	0.00	0.17	0.39
Time interest earned				
Amazon	4.84	8.77	9.08	13.90
Alibaba	17.10	18.87	8.84	15.33
Asos	–	509.50	17.55	15.91

Source: Own contribution.

however, the company also began to finance its assets mainly with equity, whereas previously it had reported no debt.

Table 3 provides an overview of the efficiency ratios analysed in this study. Amazon exhibited a slightly lower asset turnover ratio during the pandemic, indicating somewhat less effective use of assets to generate sales. However, the accounts receivable turnover ratio, inventory turnover ratio, and accounts payable turnover ratio reached their highest levels during the period. These results suggest that Amazon collected receivables more quickly, experienced high demand for its products, and sold goods faster than in previous years. Additionally, the company repaid suppliers more quickly and managed payables more efficiently. Alibaba maintained similar values for the asset turnover ratio and accounts receivable turnover ratio compared to previous years. The accounts payable turnover ratio increased during the pandemic, reflecting faster payments to suppliers and improved debt collection processes. Nevertheless, the inventory turnover ratio decreased relative to the previous year, indicating higher inventory levels at the end of 2020. This outcome suggests challenges in demand forecasting, leading to over-purchasing and excessive stock. For Asos, almost all efficiency ratios declined during the coronavirus pandemic. The company managed its assets less efficiently and experienced difficulties in receivables collection, resulting in lower performance compared to previous years. Overall, Asos performed less effectively during the pandemic, showing lower productivity and less efficient asset management, lagging behind Amazon and Alibaba. Amazon improved its effectiveness on multiple fronts during the pandemic, including more frequent receivables collection,

Table 3. Efficiency ratios of Amazon, Alibaba, and Asos in 2017–2020

Company	Years			
	2017	2018	2019	2020
Asset turnover ratio				
Amazon	1.66	1.58	1.45	1.41
Alibaba	0.36	0.41	0.45	0.45
Asos	2.58	2.62	2.43	2.02
Accounts receivable turnover ratio				
Amazon	16.50	15.60	15.10	17.20
Alibaba	–	–	13.60	13.90
Asos	177.30	109.60	66.80	62.80
Inventory turnover ratio				
Amazon	8.10	8.40	8.80	10.50
Alibaba	–	–	31.20	23.90
Asos	3.30	3.20	3.00	3.20
Accounts payable turnover ratio				
Amazon	3.74	3.82	3.88	3.90
Alibaba	–	–	31.25	59.26
Asos	14.67	7.62	5.38	5.37

Source: Own contribution.

faster supplier repayments, and better management of receivables. Alibaba also accelerated supplier payments and improved debt collection compared to earlier years, although it ended 2020 with high inventory levels.

Table 4 exhibits profitability ratios for the analysed companies. For Amazon, the first two profitability ratios, namely return on sales and return on assets, were higher during the coronavirus pandemic than in previous years. These results indicate that the company achieved better selling prices and reduced unit costs. In 2020, Amazon operated more efficiently and generated a higher net profit. The final profitability ratio, return on equity, also increased in 2020 compared to 2019, suggesting that the company's management utilised equity more effectively. For Alibaba, the first profitability ratio, return on sales, was the lowest in 2019 and remained stable in subsequent years. However, the return on assets and return on equity ratios peaked in 2020, demonstrating that the company was able to generate a return on investment for shareholders during the coronavirus pandemic. These results also highlight Alibaba's improved productivity and efficiency in managing its economic resources. In the case of Asos, profitability ratios followed a consistent pattern. The indicators were at their lowest in 2019 but improved slightly in 2020. Compared to 2019, the company converted sales into profits more effectively in 2020, generating higher returns for its owners and reflecting

Table 4. Profitability ratios of Amazon, Alibaba, and Asos in 2017–2020

Company	Years			
	2017	2018	2019	2020
Return on sales (%)				
Amazon	1.26	4.25	4.14	5.52
Alibaba	29.22	32.85	21.15	28.66
Asos	3.33	3.41	0.90	3.47
Return on assets (%)				
Amazon	2.09	6.75	5.97	7.80
Alibaba	10.03	10.46	10.41	13.10
Asos	8.60	8.92	2.18	7.00
Return on equity (%)				
Amazon	9.55	27.83	21.95	27.44
Alibaba	17.50	19.67	20.19	23.63
Asos	26.30	22.70	5.51	17.93

Source: Own contribution.

more efficient use of its financial resources during that year. Overall, the pandemic positively influenced profitability for Amazon and Alibaba, both of which improved their efficiency in generating profits, achieving higher net profits, and providing greater returns to their shareholders. For Asos, the improvement in profitability ratios from 2019 to 2020 demonstrated that the company more effectively transformed sales into profits.

4. Conclusions and discussion

The ratio analysis has revealed that the coronavirus pandemic had significantly impacted the financial liquidity, efficiency, profitability, and debt management of major e-commerce platforms, although the extent varied across companies. The pandemic had the most notable effect on the financial liquidity of Asos, improving its ability to meet short-term liabilities and retain cash reserves. In contrast, Amazon displayed minimal changes in liquidity, maintaining consistent performance, while Alibaba's liquidity improved in 2020 following a significant drop in 2019. However, Alibaba did not use cash as effectively as expected.

In terms of the debt service coverage ratio, both Amazon and Alibaba transitioned from financing assets predominantly with debt to relying more on equity during the pandemic, thereby reducing their risk profiles. Asos, which had not heavily relied on external financing before, began financing its assets primarily with equity during this period.

Amazon demonstrated high efficiency, managing debt collection and supplier payments more effectively while experiencing robust demand for its products. However, a slight decline in asset turnover during the pandemic suggested somewhat less effective use of assets to generate sales. Similarly, Alibaba enhanced its efficiency during the pandemic by accelerating debt collection and supplier payments, although inefficiencies in inventory management, such as over-purchasing, indicated forecasting challenges. Asos experienced the greatest difficulties with efficiency ratios, reflecting challenges in managing assets and collecting payments.

For platforms such as Amazon and Alibaba, the pandemic had a positive impact on profitability. Amazon achieved better selling prices and lower unit costs, generating higher net profit and more effectively converting sales into profits in 2020. Alibaba was more productive in managing its economic resources and achieved a higher return on investment from shareholders in 2020. For Asos, profitability improved slightly in 2020 compared to 2019, suggesting better conversion of sales into profits during the pandemic.

This article demonstrates that the overall impact of the pandemic on the e-commerce sector was more positive than negative. The results confirm the hypothesis that the pandemic had a significant and varied impact on the financial performance of e-commerce platforms. The crisis accelerated the sector's growth, as restrictions and closures of physical stores pushed consumers toward online platforms. The study shows that the selected timeframe effectively captured the peak of the pandemic's financial effect, providing valuable insights into the immediate adaptations and resilience of major e-commerce platforms. By focusing on the years 2017–2020, the analysis isolates the critical period of disruption, highlighting how companies responded to unprecedented challenges.

This study provides valuable insights into the financial performance and resilience of e-commerce platforms during the pandemic, however, it is not without limitations. The analysis focuses on a four-year period, which captures the immediate effects of the pandemic but does not account for longer-term recovery trends or post-pandemic growth. Although the study examines the immediate impacts of the pandemic, it does not address the broader shifts patterns or the ongoing adjustments made by companies in later years. This deliberate limitation ensures that the findings remain centred on the crisis period, capturing the most critical phase of financial and operational disruptions. Additionally, the study examines only three companies, limiting the generalizability of the findings to the broader e-commerce sector. While these companies represent significant players in different regions, they do not fully reflect the diversity of the global e-commerce landscape, particularly smaller or emerging platforms.

Nevertheless, the article provides a foundation for exploring long-term implications of the pandemic on the e-commerce sector. Future research could expand the scope to examine post-pandemic evolution, including the strategies employed during recovery, the structural changes that reshaped the e-commerce sector, long-term consumer behaviour changes, and the role of technological innovation in sustaining the sector's growth. The findings presented in this article provide valuable insights for understanding the impact of global crises on digital business environments. These results could serve as a basis for future studies on how e-commerce platforms adapt to challenges and leverage opportunities during periods of economic disruptions. Exploring these dynamics further will enhance the understanding of resilience and strategic agility within the industry.

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