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THE IMPORTANCE OF FINANCIAL FLOW DIGITALIZATION AND SUPPLY CHAIN INTEGRATION IN INCREASING COMPETITIVENESS THROUGH SUPPLY CHAIN RESILIENCE

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ABSTRACT

This study aims to analyze the effects of digitalization of financial flows in the supply chain and supply chain integration on firm competitive advantage through supply chain resilience in manufacturing companies in East Java. This study uses a quantitative, survey-based approach. Data were collected through questionnaires from respondents working in medium- and large-scale manufacturing companies who met the criteria of having at least 3 years of work experience and understanding the company's supply chain activities. Data analysis was conducted using the Structural Equation Modeling-Partial Least Squares (SEM-PLS) method. The results show that digitalization of financial flows in the supply chain has a positive and significant effect on supply chain integration and resilience. However, digitalization of financial flows does not directly affect a firm's competitive advantage. Supply chain integration has been shown to affect supply chain resilience and a firm's competitive advantage. The research findings also show that supply chain resilience has a positive and significant effect on a firm's competitive advantage. These results confirm that digitalization of financial flows in the supply chain does not directly create competitiveness but rather serves as a supporting capability that strengthens supply chain integration and resilience. Thus, companies need to manage financial digitalization, supply chain integration, and supply chain resilience in an integrated manner to build a more sustainable competitive advantage.

Keywords: financial flow digitalization in supply chain, firm competitive advantage, supply chain integration, supply chain resilience.

INTRODUCTION

The spread of the Coronavirus (Covid-19) pandemic, which began in Wuhan, China, at the end of 2019, has significantly impacted human activity globally. Beginning in December 2019, COVID-19 in China rapidly spread and became a national epidemic, peaking in February 2020 at an average of 4,000 new cases per day (Wang et al., 2020). The COVID-19 pandemic did not stop in China alone; it spread rapidly and massively throughout the world. Since the beginning of the first quarter of 2020, the daily COVID-19 case graph has continued to increase, averaging nearly 1 million cases per day. The Covid-19 pandemic reached its highest daily peak in the first quarter of 2021, when the Omicron variant was discovered, with an average of 3.5 million cases per day. This has caused paralysis of human socio-economic activities not only locally in China but also globally, becoming a major issue in the past two years.

From a global supply chain perspective, the COVID-19 pandemic has significantly increased uncertainty across both supply and demand (Ivanov & Dolgui, 2021). The COVID-19 pandemic has significantly impacted business continuity. Space restrictions and disruptions to activities to prevent the spread of the virus have led most socio-economic activities to shift from face-to-face to digital (Wang et al., 2020). This is evident in the rapid increase in internet users. The massive shift in digital activity caused by the COVID-19 pandemic has also accelerated the ongoing transformation of information technology over the past 20 years (Ivanov & Dolgui, 2021).

The use of information technology (IT) within a company plays a crucial role in supporting the overall connectivity of business processes, from supplier relationships and internal company coordination to customer service (Cai et al., 2016). When process integration is effective, companies can more easily improve their operational effectiveness and efficiency (Zadeh et al., 2020). In this context, information technology serves as a supporting tool that helps companies connect various departments, accelerate information flow, and streamline operational activities (Huo et al., 2015; Yu et al., 2021). Furthermore, information technology also contributes to strengthening supply chain integration by providing accurate, relevant, and easily accessible data to support decision-making (Panahifar et al., 2018; Ganbold et al., 2021; Huo et al., 2015; Han et al., 2017).

Today's business competition is no longer determined by a company's ability to produce products at low cost, but also by its ability to manage a fast, integrated, transparent, and resilient supply chain (Behl, 2022). Market uncertainty, changing customer demand, distribution disruptions, raw material delays, logistics cost pressures, and supplier financial risks require companies to view the supply chain as a source of competitive advantage. Competitive advantage is built not only on a company's internal efficiency but also on the entire supply chain's ability to respond quickly to changes and maintain operational continuity (Abdallah & Al-Ghwayeen, 2019).

The use of information technology through various company applications allows inter-departmental activities to be connected more quickly and coordinated, thereby reducing the need for unproductive physical mobility (Chege et al., 2020). In this context, IT not only serves as an operational support tool but also helps maintain company stability during changes or business disruptions (Tortorella et al., 2020). Through integrated information systems, companies can strengthen communication and collaboration, both internally and with external parties, resulting in more consistent and responsive organizational coordination (Verma & Bhattacharyya, 2017). Furthermore, Liu and Lee (2018) explain that the use of IT helps companies integrate various work systems across the supply chain, which can ultimately increase the company's resilience in the face of risk and uncertainty. This digitalization helps companies reduce administrative errors, accelerate transaction settlements, increase payment transparency, and improve coordination between finance, purchasing, production, and suppliers. The literature on digital supply chain finance shows that digital technology can improve operational efficiency through process automation and data-driven decision-making (Chen et al., 2021; Lamzaouek et al., 2021).

Supply chain integration should not be carried out in isolation at specific points but rather should be developed holistically from upstream to downstream (Abdallah & Al-Ghwayeen, 2019). This includes integration with suppliers, within departments within the company, and with customers (Zhao et al., 2023). When companies face resource constraints, closer collaboration with suppliers becomes crucial to building mutually beneficial, supportive relationships for both parties (Khanuja & Jain, 2022). The digitization of financial flows is also closely linked to suppliers' financial health. In many supply chains, small and medium-sized suppliers often face liquidity pressures due to slow payments, uncertain payment schedules, and limited access to financing (Chen et al., 2021). When payment processes are digitalized, invoice status can be more clearly monitored, the risk of delays can be reduced, and suppliers have a baseline of information (Harju et al., 2023).

Furthermore, internal integration plays a crucial role by unifying functions within a company, streamlining communication, and accelerating decision-making. This finding is supported by Tiwari (2021) and Siagian et al. (2020) survey of 55 FMCG companies. Companies' experiences in dealing with various business disruptions demonstrate that robust supply chain management is a crucial factor in mitigating the impact of crises on operational performance. A resilient supply chain can also be a source of competitive advantage, as demonstrated by Abeysekara et al. (2019) in a study of 89 apparel industries in Sri Lanka. Supply chain integration is becoming increasingly important because digitalization will not deliver its full impact if each function and supply chain partner remains siloed. Digital payment systems and e-invoicing in the supply chain will only be effective if data, processes, and decisions across departments are well-connected. Digital transformation can enhance supply chain resilience, and supply chain integration serves as a crucial mechanism linking digital transformation to supply chain resilience (Lamzaouek et al., 2021). Internal and external integration enables companies to share information, optimize processes, and accelerate coordination in dealing with risks.

Competitive advantage refers to a company's ability to win the competition while maintaining business continuity under uncertain or stressful conditions (Gligor, 2016). One form of this advantage is the company's ability to flexibly estimate, adjust, and measure supply chain performance (Yu et al., 2017). Financial flow digitization and supply chain integration can strengthen supply chain resilience through complementary mechanisms. Digitizing financial flows increases payment visibility, accelerates transaction settlement, and improves supplier liquidity (Martinez-Caro et al., 2020). Supply chain integration strengthens coordination, communication, and collaboration among supply chain actors (Ni & Sun, 2019). When the two work together, companies not only gain better operational information but also stronger financial readiness and network coordination to withstand disruptions. Research on supply chain finance shows that it is linked to collaboration and transparency in building supply chain resilience (Chen et al., 2021).

Supply chain resilience then becomes a crucial bridge to competitive advantage (Siagian et al., 2022). Companies with resilient supply chains can maintain smooth supply, respond more quickly to changes in demand, reduce the risk of delays, maintain service quality, and maintain customer trust. Competitive advantage arises not only from price or product quality, but also from a company's ability to ensure product availability, operational stability, flexibility, speed of recovery, and reliable relationships with suppliers and customers (Shou et al., 2018). Empirical studies show that cross-functional integration, supply chain partnerships, responsiveness, and resilience contribute to increasing a company's competitive advantage. The use of information technology also helps strengthen supply chain resilience. Liu and Lee's (2018) study of 161 logistics companies in Taiwan showed that the use of IT can help companies integrate existing systems, making the supply chain more responsive to change. Similarly, Liu et al. (2018) explain that supply chain resilience can be achieved through strong integration between suppliers, internal company functions, and customers. With this integration, supply chain activities from upstream to downstream become more adaptive, flexible, and better able to respond to the dynamics of the business environment (Han et al., 2017).

While digital transformation, supply chain integration, and supply chain resilience have evolved, there remains room for more specific research on the role of financial flow digitalization as a strategic factor in strengthening supply chain resilience and creating competitive advantage. Many studies still focus on the digitization of information and operations, while the financial flow aspect of the supply chain has not been widely positioned as a key variable. Therefore, research on Financial Flow Digitalization and Supply Chain Integration towards Competitive Advantage through Supply Chain Resilience is relevant to explain how financial digitalization and supply chain integration can build a more adaptive, resilient, and competitive supply chain.

LITERATURE REVIEW

Financial Flow Digitalization in Supply Chain with Supply Chain Integration, Resilience, and Company Competitiveness

Financial Flow Digitalization in Supply Chain is the use of digital technology to manage financial flows within the supply chain (Chen et al., 2021). The goal is to make financial processes faster, more transparent, and more integrated. Financial flows within the supply chain include ordering, billing, invoice verification, supplier payments, transaction reconciliation, trade finance, and working capital management. When payment and transaction data are accessible in real time, coordination between purchasing, finance, production, suppliers, and customers improves. Therefore, digitalization of financial flows can be a crucial foundation for strengthening supply chain integration, as all parties have the same, accurate, and timely financial information. Supply chain digitalization has been shown to increase data visibility and enable more connected digital business processes. Digital financial flow automation supports these needs by reducing manual processes, accelerating the exchange of transaction data, and reducing payment uncertainty. When supplier invoices are connected to digital information technology and payment systems, companies can more easily monitor purchase status, payment schedules, debt positions, and working capital needs. Internal integration across finance, purchasing, warehouses, and production utilizes the same data (Lamzaouek et al., 2021). The use of information technology can demonstrate a digital system that supports internal integration and supplier integration in supply chain management (Cai et al., 2016).

The use of information technology is a crucial part of supply chain integration because it provides companies with fast, accurate, and relevant information (Yu et al., 2021). In the supply chain, information technology helps connect company systems with suppliers and customers through an integrated information network (Abdallah & Al-Ghwayeen, 2019). Through this system, suppliers can support the timely delivery of goods, while customers can provide valuable feedback to the company. Furthermore, information technology-based business applications facilitate more structured data collection and processing, resulting in more accurate company planning (Panahifar et al., 2018). Digital payment systems, e-invoicing, and supply chain finance platforms help improve transaction transparency and expand access to financing for suppliers (Chen et al., 2021). Financial digitization makes transaction data more transparent, payment processes faster, cross-functional coordination easier, and supplier relationships stronger. However, these relationships are also two-way. Digital financial flow will be more effective if the company already has strong supply chain integration, because digital payment technology requires data integration, processes, and cross-departmental and cross-company commitment.

Supply chain resilience requires the supply chain's ability to anticipate, respond, adapt, and recover from disruptions (Zhao et al., 2023). The digitization of financial flows supports this capability through three main mechanisms. First, digitalization improves financial visibility, allowing companies to monitor payment risks and supplier liquidity conditions more quickly. Second, digitalization accelerates financial response, for example, through faster payments, invoice-based financing, or supply chain finance to assist suppliers experiencing cash pressures. Third, digitalization strengthens trust and coordination by reducing information asymmetry between companies, suppliers, and customers through transparent transaction data (Harju et al., 2023). Technology-based supply chain finance can help large companies manage working capital, mitigate supply chain disruptions, and enhance banks' ability to assess financing risks. Digital transformation has changed the way companies conduct their business. This change drives innovation in production processes through the use of technology and intelligent systems (Martinez-Caro et al., 2020). In the supply chain, information technology helps companies shift to digital supply chains that are more responsive to customer needs (Agrawal & Narain, 2018). In addition, the application of technology can significantly improve company performance by presenting new ideas, methods, and techniques in the production process (Chege et al., 2020).

Companies that can orchestrate digital resources, financial data, supplier relationships, and financing mechanisms will be better prepared to face supply chain risks. Supply chain finance plays a role in supply chain resilience. Digital technology support in supply chain financial management can strengthen the supply chain's ability to withstand and recover from disruptions (Chen et al., 2021). Financial digitization enables suppliers to maintain liquidity better, accelerate payment processes, reduce the risk of production delays, and improve coordination during disruptions. Digital technology innovation positively impacts company performance, and supply chain resilience acts as a mediating mechanism in this relationship (Ning & Yao, 2023). Resilience encompasses the ability to maintain the continuity of raw material, information, and cash flows during disruptions.

In the supply chain, competitiveness is determined not only by product price, quality, or production capacity, but also by a company's ability to manage payments reliably, invoices, working capital, and financial relationships with suppliers (Kwak et al., 2018). A company's competitive position improves when its supply chain becomes more stable and better able to meet customer needs more consistently. Supply chain finance is linked to improved company performance and can support competitive advantage through better supply chain financial management. Financial digitization reduces transaction costs by automating payment and invoice verification processes. Digitalization improves financial visibility, allowing companies to more accurately monitor payment status, accounts payable, cash needs, and supplier liquidity risks (Gligor, 2016). Digitalization strengthens collaboration with suppliers by enabling clearer, more transparent payments, which increase trust between actors. Digitalization can accelerate suppliers' access to invoice-based financing or supply chain finance platforms, enabling them to maintain smooth production and deliver better (Harju et al., 2023). Companies that can manage financial flows digitally will have faster payment processes, stronger supplier relationships, lower operational risks, and better responsiveness to market changes. This competitive advantage can be seen in cost efficiency, service speed, supply flexibility, delivery reliability, and the company's reputation as a credible business partner. Based on the explanation above, the following research hypothesis can be formulated:
H_1: Financial flow digitalization in the supply chain influences supply chain integration.
H_2: Financial flow digitalization in the supply chain influences supply chain resilience.
H_3: Digitalization of financial flows in the supply chain impacts company competitiveness.

Supply Chain Integration with Supply Chain Resilience and Company Competitiveness

Supply chain integration generally encompasses three main aspects: supplier integration, internal integration, and customer integration. Supplier integration is necessary to help companies overcome resource constraints by involving suppliers in supply chain activities (Agyei-Owusu et al., 2022). Well-established relationships can create mutually beneficial collaborations between companies and suppliers (Khanuja & Jain, 2022). Meanwhile, internal integration helps unify the company's functions. This integration facilitates smoother communication between departments and accelerates decision-making (Tiwari, 2021; Siagian et al., 2020). Customer integration is also crucial because it helps companies better understand customer needs, enabling faster, more accurate delivery (Lii & Kuo, 2016). A study conducted in Taiwan showed that internal integration

and customer integration significantly impact supply chain resilience (Liu & Lee, 2018). Furthermore, Liu et al. (2018) also found that integration within the supply chain system plays a crucial role in strengthening a company's ability to withstand disruptions. Therefore, comprehensive integration between suppliers, internal functions, and customers can improve communication quality and strengthen supply chain resilience during a crisis (Ning & Yao, 2023).

In general, companies do not always have sufficient resources to carry out all business activities optimally. Therefore, the existence of supply chain partners is crucial for expanding capacity and increasing company productivity (Shou et al., 2018; Khanuja & Jain, 2022). Good collaboration with suppliers can help companies develop more accurate production plans, optimize raw material procurement, and align production processes. This ultimately reduces operational costs and creates added value that differentiates the company from its competitors (Kim & Chai, 2016). Internal integration helps reduce inter-departmental silos within a company. Through this integration, various functions such as R&D, demand planning, procurement, production, and marketing can work more closely together to create value for customers (Qi et al., 2017). In addition to streamlining coordination, internal integration also supports company performance by reducing lead times, meeting customer needs, increasing customer satisfaction, and improving other operational indicators (Yunus & Tadisina, 2016). Lii and Kuo (2016) concluded that integration has a significant impact on company performance and can be a source of competitive advantage.

Information exchange is a crucial aspect for companies in understanding demand patterns and downstream supply chain activities (Ni & Sun, 2019). Strong customer relationships can help companies plan production more accurately, thereby reducing the risk of production errors and logistics costs (Wang & Zhang, 2019). Furthermore, customer feedback is also useful for reducing product defects, improving design, and enhancing product quality (Khanuja & Jain, 2022). Parast and Spillan (2014) explain that supply chain strategy plays a crucial role in strengthening customer integration, which ultimately supports a company's competitive advantage. Accurate, timely, and regularly updated information can deliver greater value to customers (Kim & Chai, 2016). Based on the explanation above, the following research hypothesis can be formulated:
H_4: Supply chain integration influences supply chain resilience.
H_5: Supply chain integration influences a firm's competitive advantage.

Supply Chain Resilience with Company Competitiveness

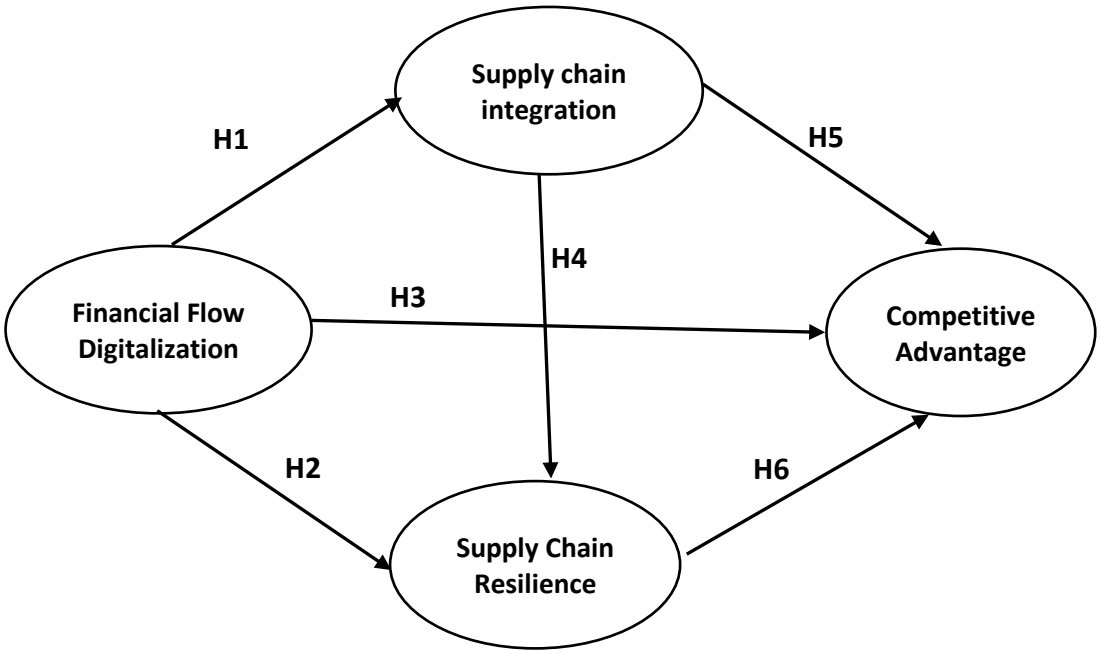

Figure 1. Research Concept Framework

Supply chain resilience describes a company's ability to anticipate, respond to, adapt to, and recover from disruptions, such as supply delays, demand fluctuations, rising logistics costs, raw material crises, transportation disruptions, disasters, or regulatory changes (Siagian et al., 2021). Companies with resilient

supply chains are not only able to survive disruptions but also maintain production continuity, meet customer demand, maintain service quality, and reduce operational losses (Siagian et al., 2022). This condition becomes a source of firm competitive advantage because the company is more reliable than competitors whose supply chains are easily disrupted. Supply chain resilience can be viewed as a valuable organizational capability that is difficult to imitate and helps companies navigate uncertainty (Harju et al., 2023). From a dynamic capability perspective, resilience reflects a company's ability to reconfigure resources, processes, suppliers, capacity, and information in response to changing environments. Supply chain resilience enhances responsiveness, namely the ability to respond quickly to market changes (Zhao et al., 2023). Supply chain resilience enhances flexibility by enabling companies to use alternative suppliers, distribution channels, production capacity, or order fulfillment strategies (Ning & Yao, 2023). Companies also need the ability to mitigate risk, accelerate recovery, and maintain service when competitors experience disruptions (Tortorella et al., 2020). Therefore, supply chain resilience can be a strategic differentiator. Companies with strong resilience can secure supplies, maintain price stability, reduce delays, and accelerate time-to-market. Based on the explanation above, the following research hypothesis can be formulated:
H_6: Supply chain resilience influences a firm's competitive advantage.

Based on the explanation above, the research conceptual framework is shown in Figure 1.

METHODOLOGY

This research uses a quantitative approach. Quantitative research is a research method grounded in positivism and used to examine specific populations or samples. Data collection is carried out using research instruments, while data analysis is quantitative or statistical to test the formulated hypotheses. This research uses a survey method, as data are collected from respondents via questionnaires. Surveys were selected to collect structured information from the research sample. The purpose of this study is to examine the effect of digitalization of financial flows in the supply chain on firm competitive advantage through supply chain integration and resilience in manufacturing companies in East Java.

The population in this study was medium and large-scale manufacturing companies in East Java with more than 20 employees. According to data from the Central Statistics Agency of East Java Province in 2020, the number of medium- and large-scale manufacturing companies reached 5,818. The sample for this study was medium and large-scale manufacturing companies in East Java. The selected respondents were employees with a minimum position of supervisor or senior staff and had worked at the company for more than three years. The sampling technique used was nonprobability purposive sampling. The sample size was determined using the Slovin formula at a 90% confidence level, yielding a minimum of 100 companies. The data sources in this study consisted of primary data obtained directly from respondents and required further processing.

Digitalization of financial flows in the supply chain refers to the use of digital technology to manage financial flows (Chen et al., 2021). Measurement items are determined and adjusted to the payment system in manufacturing using information technology, namely the company uses electronic applications to coordinate with internal parties regarding the payment process (FFDSC1), the company uses electronic applications to coordinate with suppliers, customers, or other external parties regarding payment transactions (FFDSC2), the company uses electronic applications to process payment administration (FFDSC3), the company's electronic payment system can provide real-time transaction information (FFDSC4), the company's electronic payment system can produce accurate transaction data (FFDSC5), and the company's electronic payment system has a good level of reliability in supporting the supply chain payment process (FFDSC6).

Supply chain integration is the process of aligning supply chain activities involving internal company functions and external parties, such as suppliers and customers, so that the flow of information, goods, and business processes can run more coordinated (Ganbold et al., 2021; Agyei-Owusu et al., 2022; Yu et al., 2021). Measurement items are determined in the manufacturing industry with supply chain integration, namely the company has an integrated system between departments (SCI1), all internal companies collaborate in developing the company's strategic plan (SCI2), the company shares information related to demand forecasts with external partners (SCI3), the company shares information related to production plans with external partners (SCI4), and the company shares information related to delivery schedules with external partners (SCI5).

Supply chain resilience is the ability of a supply chain to withstand disruptions, maintain operational continuity, and quickly recover performance after disruptions (Zhou et al., 2022; Liu & Lee, 2018; Siagian et al., 2021). Measurement items are established in the manufacturing industry related to supply chain resilience, namely the company has a system capable of providing rapid early warning when a supply chain disruption occurs (SCR1), the company has a system capable of responding and adapting quickly to supply chain disruptions (SCR2), the company has a system capable of quickly restoring operational activities after a supply chain disruption occurs (SCR3), and the company has adequate resources to address supply chain disruptions (SCR4).

A firm's competitive advantage is its ability to outperform competitors to survive and win in business competition (Abeysekara et al., 2019; Behl, 2022; Kwak et al., 2018). The determination of measurement items is set in the manufacturing industry related to the firm's competitive advantage, namely, the company has lower production costs than competitors (FCA1), the company has lower distribution costs than competitors (FCA2), the company can offer more competitive selling prices than competitors (FCA3), and the company has unique products that are positively assessed by customers (FCA4).

Data analysis is the process of grouping, tabulating, presenting, and processing data based on variables and respondent characteristics. This process is carried out to answer the research problem formulation and test the research hypothesis. This study used Structural Equation Modeling (SEM) with SmartPLS software. This method was used to process data and analyze the relationships among variables in the research model, using inner- and outer-model tests.

ANALYSIS AND DISCUSSION

Data collection at manufacturing companies in East Java used Google Forms, with some being sent directly as documents to well-known companies. Researchers reminded employees who had agreed to participate. The characteristics of the study respondents are shown in Table 1.

Table 1. Profile of research respondents

Characteristic	Description	Qty	Percentage
Respondent department	Accounting/Finance	7	7 %
	Operational & Production	52	49 %
	Purchasing/Export-Import	8	8 %
	Sales and Marketing	38	36 %
Respondent's position in the company	Top Management	9	9 %
	Manager	25	23 %
	Supervisor	44	42 %
	Staff	27	26 %
Amount of employee	20 – 99 employees	77	73 %
	More than 99 employees	28	27 %
Corporate sector	Health & Chemicals	13	12 %
	Food and Drink	59	56 %
	Wood, Leather, Paper & Cigarettes	16	15 %
	Printing, Plastic & Packaging	6	6 %
	Textile	8	8 %
	Mining	3	3 %

Table 1 shows that the respondent profiles are spread across all departments involved in the supply chain role. Based on the work department, the majority of respondents came from the operational and production department, with 52 respondents (49%). Furthermore, 38 respondents (36%) were from the sales and marketing department. Respondents from the purchasing/export-import department numbered 8 respondents (8%), and accounting/finance numbered 7 respondents (7%).

Based on respondents' positions in the company, most respondents (44, 42%) served as supervisors. Respondents with staff positions numbered 27 (26%), managers numbered 25 (23%), and top management numbered 9 (9%). This composition indicates that respondents are highly involved in operational activities

and in company decision-making. By business sector, the majority of respondents came from the Food and Beverage sector, namely 59 respondents (56%). Furthermore, the Wood, Leather, Paper & Cigarette sector numbered 16 respondents (15%), the Health & Chemicals sector numbered 13 respondents (12%), the Textile sector numbered 8 respondents (8%), the Printing, Plastic & Packaging sector numbered 6 respondents (6%), and the Mining sector numbered 3 respondents (3%). The next stage was to conduct outer and inner model tests, as shown in Table 2.

Table 2. Goodness of fit test of research instruments

Item	Mean	Factor Loading	Composite reliability	Cronbach alpha	AVE
Financial flow digitalization in the supply chain	4.135		0.898	0.863	0.595
FFDSC1	4.171	0.804			
FFDSC2	3.971	0.774			
FFDSC3	3.895	0.715			
FFDSC4	4.152	0.729			
FFDSC5	4.352	0.803			
FFDSC6	4.267	0.797			
Supply chain integration	4.013		0.857	0.794	0.548
SCI1	4.152	0.816			
SCI2	4.057	0.845			
SCI3	3.914	0.701			
SCI4	3.619	0.615			
SCI5	4.324	0.699			
Supply Chain Resilience	4.012		0.945	0.922	0.811
SCR1	3.886	0.908			
SCR2	4.019	0.900			
SCR3	4.029	0.892			
SCR4	4.114	0.903			
Firm's competitive advantage	4.057		0.853	0.770	0.597
FCA1	4.190	0.835			
FCA2	3.981	0.851			
FCA3	4.095	0.805			
FCA4	3.962	0.563			

Based on Table 2, the mean value for financial flow digitalization in the supply chain is 4.135, and the measurement items range from 3,895 to 4,352 in the high category. This condition indicates that the company has implemented digitalization in the supply chain and payment process, and that it has been running well. The mean value for supply chain integration was 4.013, and the measurement items ranged from 3,619 to 4,324, which is categorized as good. This condition indicates that the company's supply chain integration has been running adequately internally and with external partners. Meanwhile, the third variable, supply chain resilience, has a mean of 4,012 and measurement item values ranging from 3,886 to 4,114, which is categorized as high. These results indicate that the company has been able to overcome the problems it faced in maintaining the process's continuous operation. Finally, for the variable firm competitive advantage related to finance, the mean value obtained is 4,057, which is categorized as high. The mean value for the measurement item in the variable firm competitive advantage variable is lowest in FCA4 at 3,962 and highest in FCA2 at 4,190.

Processing for validity testing on variables, the lowest financial flow digitalization in supply chain is found in items FFDSC3 with a value of 0.715; on the variable the lowest supply chain integration is found in SCI4 is 0.615; on the supply chain resilience variable the lowest is found at SCR3 with a value of 0.892 and finally on the firm competitive advantage variable the lowest is found at FCA4 is 0.563. Data processing for the validity test has met the requirements for each item, with all items above 0.500. For the second validity test, the lowest AVE value is 0.548 for supply chain integration, which meets the requirements above 0.500. Processing for reliability testing is indicated by composite reliability and Cronbach's Alpha values above 0.700. All variables studied have met the specified requirements, with the lowest value for the variable' firm competitive advantage' for composite reliability (0.853) and Cronbach's Alpha (0.770). The next stage is testing the research hypothesis, as shown in Figure 2 and Table 3.

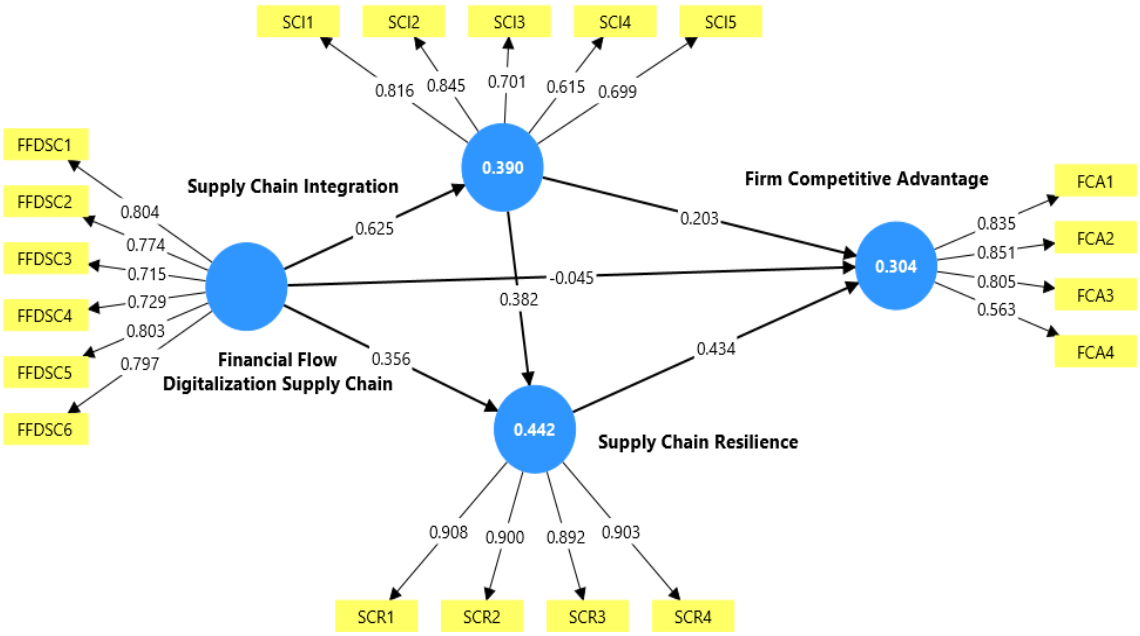

Figure 2. The results full model PLS

Table 3. Results of processing research hypotheses with PLS-SEM

Research Hypothesis	Original sample	T statistics	P values
H1. Financial Flow Digitalization Supply Chain -> Supply Chain Integration	0.625	10.364	0.000
H2. Financial Flow Digitalization Supply Chain -> Supply Chain Resilience	0.356	3.623	0.000
H3. Financial Flow Digitalization Supply Chain -> Firm Competitive Advantage	-0.045	0.399	0.690
H4. Supply Chain Integration -> Supply Chain Resilience	0.382	4.045	0.000
H5. Supply Chain Integration -> Firm Competitive Advantage	0.203	1.879	0.060
H6. Supply Chain Resilience -> Firm Competitive Advantage	0.434	4.658	0.000

Based on Figure 2 and Table 3, the research hypothesis testing was obtained. The first hypothesis (H1) was supported by financial flow digitalization in the supply chain, which affects supply chain integration, with a t-statistic of 10,364 (>1.96) and a p-value of 0.000 (<0.05), both declared accepted. Digitalization of financial flows in the supply chain in companies using electronic applications to coordinate with internal parties involved in the payment process, and the company's electronic payment system, can produce accurate transaction data that can improve supply chain integration and help form an integrated system across departments. The second hypothesis (H2), that financial flow digitalization in the supply chain affects supply chain resilience, was accepted with a t-statistic of 3,623 (>1.96) and a p-value of 0.000 (<0.05). Digitalization of financial flows in companies' supply chains increases supply chain resilience by enabling a system to provide early warnings quickly when a disruption occurs. The third hypothesis (H3) is formulated to examine whether financial flow digitalization in the supply chain affects the company's competitiveness, and the t-statistic of 0.399 (<1.96) and the p-value of 0.690 (>0.05) indicate that the null hypothesis is rejected. These results indicate that digitalization of financial flows in the supply chain does not directly affect the company's competitiveness. The fourth hypothesis (H4) states that supply chain integration affects supply chain resilience, with a t-statistic of 4.045 (>1.96) and a p-value of 0.000 (<0.05), and is accepted. Supply chain integration, formed with the company having an integrated system between sections and internal companies collaborating in preparing the company's strategic plan, has been able to produce supply chain resilience strength for the company in quickly restoring operational activities after supply chain disruptions and building a system that can provide early warnings when supply chain disruptions occur.

The fifth hypothesis (H5), which posits that supply chain integration affects firm competitive advantage, is supported by a t-statistic of 1.879 (>1.65) and a p-value of 0.060 (<0.1) at a 10% significance level. Strong supply chain integration within companies, by sharing demand forecasts with internal and external partners, can increase a firm's competitive advantage by enabling lower production and distribution costs than competitors. The sixth hypothesis (H6) stated that supply chain resilience affects firm competitive advantage,

with a t-statistic of 4.658 (>1.96) and a p-value of 0.000 (<0.05), and is accepted. Supply chain resilience, built through systems that quickly restore operational activities after disruptions and provide early warnings when disruptions occur, positively affects a firm's competitive advantage by increasing product uniqueness, as assessed by customers, and by lowering production and distribution costs compared to competitors.

Theoretically, this study extends the study of supply chain digitalization by positioning Financial Flow Digitalization in Supply Chain as a strategic capability rather than merely an administrative payment process. This research enriches the supply chain integration literature by adding the dimension of financial flows as an important element alongside the flows of goods and information. This research also contributes to the development of supply chain resilience theory. The finding that financial flow digitalization has a significant effect on supply chain resilience indicates that supply chain resilience is not only built through operational flexibility, alternative suppliers, or information integration, but also through the visibility and speed of financial management. Payment certainty, transaction data accuracy, and the ability to monitor cash flow digitally can help companies and suppliers respond more quickly to disruptions. Supply chain resilience can be viewed as a valuable organizational capability because it helps companies maintain operational continuity and compete effectively when disruptions occur. The finding that supply chain resilience significantly affects a firm's competitive advantage indicates that a company's competitiveness depends not only on cost efficiency and product quality but also on the supply chain's ability to anticipate, adapt, and recover from disruptions. This means that resilience acts as a dynamic capability that transforms digital resources and supply chain integration into a competitive advantage. Furthermore, the insignificant direct effect of digitalization of financial flows on firm competitive advantage offers important theoretical implications. Digitizing financial flows does not automatically create competitiveness if it is not supported by process integration and supply chain resilience.

The results of this study indicate that manufacturing companies need to strengthen the digitalization of financial flows in the supply chain, particularly in payments, transaction administration, invoicing, and reconciliation. Effective financial digitalization will help companies reduce payment delays, accelerate transaction validation, and increase transparency in relationships with supply chain partners. These findings emphasize that technology investments in the supply chain should focus on strengthening process integration. Companies also need to make digitalization of financial flows part of their supply chain resilience-boosting strategies. Digital payment systems and real-time transaction data can be used as early warning tools to detect supplier financial risks, payment delays, supply disruptions, or changes in working capital requirements. New competitive advantages will be more apparent when digitalization helps companies reduce operational risks, maintain smooth supply, accelerate recovery after disruptions, and improve service reliability to customers.

CONCLUSIONS

The digitalization of financial flows in the supply chain plays a crucial role in strengthening supply chain integration and resilience. The use of electronic applications for payment processing, transaction coordination, payment administration, and the provision of accurate and real-time transaction data can help companies build more connected, transparent, and responsive supply chain processes. Digitalization of financial flows in the supply chain has a positive and significant impact on supply chain integration and resilience. This means that the better the digitalization of payment and transaction processes in the supply chain, the stronger the coordination between internal company departments and relationships with external partners. Furthermore, digitalization of financial flows also helps companies improve transaction visibility, accelerate payment processes, reduce financial uncertainty, and strengthen their ability to detect and respond to supply chain disruptions. These findings indicate that digitalization of financial flows does not automatically create a competitive advantage. Payment and transaction digitalization must first be translated into process integration, supply chain coordination, and operational resilience to have a tangible impact on competitive advantage. Therefore, financial flow digitalization is better understood as a supporting capability that strengthens the supply chain's foundation, rather than as a factor that directly generates competitive advantage. Supply chain resilience is a crucial factor in building a firm's competitive advantage. Companies with resilient supply chains are better able to maintain smooth supply, restore operational activities, mitigate the risk of delays, reduce costs, and maintain quality service to customers. Improving the competitiveness of manufacturing companies requires integrated digitalization of financial flows, supply chain integration, and supply chain resilience.

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