Evaluating Competitiveness in the Supply Chain Management of Small and Medium Scale Enterprises

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Abstract

This research investigated Supply Chain Management (SCM) in Small and Medium Enterprises (SMEs) in Thailand, Slovakia, and Poland and compared the SCM practices among the three countries. The sole purpose was to first determine the various factors that influence SCM operations and SCM practices in each of the countries and then find out whether there is a difference among the three countries in terms of SCM operations and practices. The study was conducted using primary data collected from SME management personnel from the three countries. A structured questionnaire was used to collect the data using a 5-point Likert scale. The data was analyzed using multi-group Structural Equation Modeling (SEM). The results of the study indicated that supply chain management practices and operations adopted by the small and medium enterprises in Thailand, Slovakia, and Poland were invariant. The environmental sustainability elements in SCM and the social aspects of sustainability in SCM have positively influenced SCM practices in all countries. The study recommended that SMEs in the countries should consider adopting the factors that support SCM, operationalizing the SCM through enhancing the capabilities of the end-user, and vitally taking into consideration the environmental sustainability elements in SCM, such as environmentally-friendly production processes, taking action towards waste management, and adopting production processes that inhibit the emission of harmful substances into the atmosphere by encouraging the implementation of policies that foster the use of renewable energy sources in production.

1. INTRODUCTION

The concept of Supply Chain Management (SCM) involves the active management of the supply chain activities, including product development, sourcing, production, and operations, and

managing the supply in organizations (Zimon, 2020). SMEs play a vital role in the development of emerging economies across the globe (Dankiewicz et al., 2020; Belas et al., 2022; Kozubikova et al., 2015). Thailand, Slovakia, and Poland are considered some of the fastest-growing economies worldwide (Kafkadesk Prague Office, 2019; Silver, 2020). This was the major reason for selecting to research drivers of competitiveness among SMEs in the countries mentioned above. Slovakia was considered a secondary emerging market and a hub for investors as far back as 2013 (Gordin, 2013), while according to the Organisation for Economic Co-operation and Development (OECD, 2019), Thailand is one of the fastest emerging economies in Southeast Asia and aspires to be a high-income economy by 2037. On the other hand, Poland is one of the steadily growing European economies. Recent Financial Times Stock Exchange (FTSE) equity classification for countries of the world places Poland in the 'Developed' country category, Thailand in the Advanced Emerging category, Slovakia was categorized as a Frontier State (FTSE Russell, 2021).

Slovakia also has the largest share of micro firms among OECD countries; 97% of firms in the country employed less than 10 employees, compared with the OECD country average of 95% as of 2017, with value added by SMEs in 2019 towards the GDP reaching 52.7% compared to 47.3% by large organizations (OECD, 2021; Statista Research Department, 2021, Civelek et al., 2020). In Thailand, SMEs contributed to 99.8% of business enterprises in the country in 2019. Similarly, small and medium-sized enterprises in Thailand employ the bulk of the domestic workforce, accounting for 86% of the total employment in the country (Korwatanasakul & Paweenawat, 2020). The small and medium-sized enterprises in Thailand also contribute to the country's GDP. In 2019, for instance, SMEs contributed 45% of the country's GDP. Like in many emerging economies, SMEs form the backbone of the Polish and Slovakian economies (Bajdor et al., 2021; Ubreziová & Wach, 2010).

According to the OECD, SMEs contributed 99.8% of Polish enterprises in 2019. The SMEs' share contribution is enormous compared to the contribution by large organizations, at 0.2% of the market share (OECD, 2020). While other studies may have looked at the competitiveness of SMEs individually or in comparison with other markets (Gavurova et al., 2020; Kot et al., 2018), this research explores the Supply Chain Management (SCM) in Small and Medium Enterprises (SMEs) in Thailand, Slovakia, and Poland. This study's novelty is hinged on the analysis of three emerging market economies and the competitiveness of the SMEs in strengthening and revitalizing competitiveness in the selected countries. This can provide a broader outlook on the role of competitiveness in supply chain management in other emerging economies, as well as serve as a blueprint for developing economies to build their infrastructure around. The rest of the paper is structured into theoretical backgrounds, objectives and methodology, results and discussion, and a conclusion.

2. THEORETICAL BACKGROUND

2.1 Factors Supporting Supply Chain Management (SCM)

SMEs across the globe apply SCM strategies due to the demonstrated improvement in business performance. According to Kot et al. (2018), various factors support the application of supply chain

management in Slovakia and Poland, including information technology, trust, and openness in the supply chains. With the advancements in technology, new ideas and innovations are common in every part of the supply chain activities (Chen et al., 2014). Chin et al. (2014) suggest that the expansion of the market and economic competitiveness in terms of creating value are ensured by effective client engagement. One value-creation strategy that relies on a business' operational capabilities is creating close connections with customers. To gain a competitive edge and improve corporate performance, a company's relationship with its customers is a key strategy. Operational capabilities in terms of cooperation are closely related to customer relationship management. Quality management of materials is another factor that supports SCM (Nurakhova et al., 2020). In Thailand, SMEs ensure the supply of quality materials that lead to quality products, thus supporting the supply chain activities.

2.2 Supply Chain Management Practice

The supply chain management practice involves the activities and actions employed by SMEs towards promoting their business supply chains. Effective supply chain management practices aim to provide products, services, and information that add value to the customers. Kot et al. (2018) infer that supply chain practices encompass strategic supplier partnerships in Poland and Slovakia. By creating strategic supplier partnerships, the SCM practices aim to develop supply chain responsiveness and create a competitive advantage for business organizations. The other concept in the determinants of supply chain practice involves customer relationships, global competitiveness, cost reduction, and internal cross-functional cooperation. With the increased competition in the markets, SMEs require greater customer responsiveness to meet their needs. Similarly, the concept of supply chain practice involves information sharing among Thailand's small and medium-sized enterprises (Islam & Anis, 2018). The practice of information sharing through supply chain management helps businesses to come up with reliable and valid measurements for evaluation and benchmarking within the supply chain (Ziaullah et al., 2017; Hariharasudan et al., 2021).

2.3 Environmental Sustainability Elements in Supply Chain Management

The significance and relevance of adopting and implementing sustainable supply chain management initiatives as economic drivers have created ecological, competitive, and financial incentives for those involved (Akhtar, 2019). Sustainability in supply chain management involves incorporating environmentally viable practices from the product design and development to final consumption by the end-user. Various environmental issues impact the supply chain, including toxic wastes, water pollution, deforestation, land use, water scarcity, energy use, and air quality. SMEs in Slovakia and Poland have rated various environmental elements considered vital in supply chain management, including the reuse and recycling of materials (Chaveesuk et al., 2021; Hong et al., 2018; Muangmee et al., 2021). Addressing the environmental sustainability elements in the supply chain thus involves addressing issues such as the amount of waste that the suppliers and the delivery logistics generate. Also, environmental sustainability in supply chain management can be attained through understanding the level of manufacturing operations polluting the environment and determining how to clean the pollution (Nguyet et al., 2020; Szczepańska-Woszczyna & Kurowska-Pysz, 2016).

2.4 Empirical Literature

Nyhuis & Hasenfuß (2006) state that the increased competitiveness of large organizations against SMEs necessitates the need for contextualization of supply chain concepts in their operations. From the logistical point of view, implementing supply chain concepts in business organizations demonstrates positive results in business efficiency. However, Sorak & Dragic (2013) opined that despite the increased demand for SCM concepts by SMEs, the concepts of supply chain management, in most cases, differ from some of the goals of small and medium-sized enterprises. For instance, the goals of many SMEs involve a focus on their core competencies. Thus, to achieve the benefits of the SCM concepts, the SMEs work with the simpler concepts that require specialized knowledge and align with their core competencies. Chin et al. (2012) articulate that using supply chain management concepts in small and medium-sized enterprises is vital in helping businesses adapt to the market operation environments that are continuously becoming dynamic and stochastic. Historical management strategies adopted by many SMEs involved the provision of excessive capacity to protect against changes in demand characterized by overstocking. The approach is, however, a great risk (Oláh et al., 2019), owing to frequent market changes, and may lead to adverse effects on the businesses. Chin et al. (2014) further affirm that companies need capability from their entire ventures, which comprises their trading and operating partners and the business outlay. Wu et al. (2010) espouse that operational capabilities (OC) are firm-specific sets of skills, routines, and processes that have been developed within the operations management system that are regularly used in solving its problems through configuring its operational resources, such as IT skills, inventory management, and transportation management and logistics coordination. In the study by Mafini & Loury-Okoumba (2018), the authors link the increasing interest in supply chain management (SCM) by SMEs to the inherent innovation and competitive advantage. Compared to large organizations, SMEs continue to lag in adopting the changing market approaches leading to increased competitive advantage. Innovation through supply chain management involves developing new ways to drive business, such as better-quality products and cost reduction. Many SMEs are adopting SCM to improve their business efficiency through reductions in operational costs and ensure better quality products that add value to consumers. However, according to Chin et al. (2012), small and medium-sized enterprises' adoption of supply chain management concepts continues to be low due to insufficient knowledge of SCM concepts, especially in developing economies. In other economies, such as Malaysia, SMEs underestimate the potential benefits of supply chain management concepts to their business growth. Although many small and medium-sized enterprises (SMEs) understand the inherent benefits that come with the adoption of SCM in their businesses, various challenges continue to exist. Chin et al. (2012) add that financial challenges serve as the most significant barrier to adopting SCM by SMEs. Supply chain practices require additional resources to ensure changes in the various supply chain touch points. Based on the critical review of the literature, the conceptual framework (see Figure 1) and the subsequent hypotheses were developed. The conceptual framework presented in Figure 1 encapsulates the hypotheses of the study, which are presented herein.
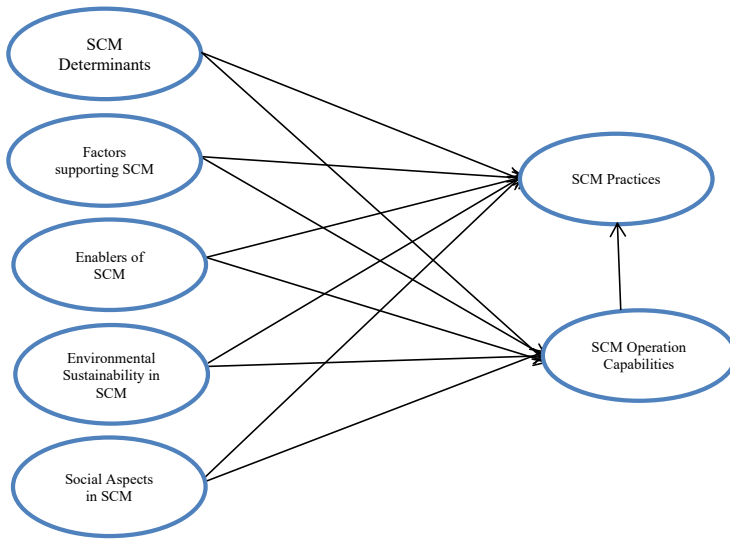
Fig. 1 – Conceptual Framework. Source: own research

H1: Determinants of SCM have a positive effect on the Operational Capabilities (OC) of the company's SCM practices.

H2: Factors supporting SCM have a positive effect on the Operational Capabilities of the company's SCM practices.

H3: Enablers of Supply Chain Management have a positive effect on the Operational Capabilities of the company SCM

H4: Environmental sustainability elements in Supply Chain Management have a positive effect on the Operational capabilities of the company SCM

H5: Social aspects of sustainability in Supply Chain Management have a positive effect on the Operational capabilities of the company SCM

H6: Determinants of Supply Chain Management (SCM) have a positive effect on SCM Practices

H7: Factors supporting SCM have a positive effect on SCM Practices

H8: Supply Chain Management has a positive effect on SCM Practices

H9: Environmental sustainability elements in Supply Chain Management have a positive effect on SCM Practices

H10: Social aspects of sustainability in Supply Chain Management have a positive effect on SCM Practices

H11: Operation of the company within the supply chain has a positive effect on SCM Practices

H12: Supply Chain Management practices were similar in Thailand, Slovakia, and Poland.

3. RESEARCH OBJECTIVE, METHODOLOGY AND DATA

The target populations of this study were SMEs operating in the three countries; 1.98 million in Poland (Sas, 2021), 489 thousand in Slovakia (Statista Research Department, 2022), and 3.13 million in Thailand (OECD iLibrary, 2021) in 2020. They were purposively selected from the management cadre of SMEs in Thailand, Poland, and Slovakia because they were assumed to effectively understand the operations of their businesses and the concept of SCM supervisors and decision-makers. Representative samples of the populations were selected to evaluate the influence of supply chain management in small and medium-scale enterprises from sectors covering services, wholesale and trade, finance, agriculture, automobiles, telecommunications, and construction. Thus, purposive sampling was used to select the representative sample, and the questionnaires were distributed to them through email. Quota sampling was used to allocate 600 questionnaires for each country at a confidence level of 99% and a 5% margin of error (Krejcie & Morgan, 1970). The data was collected between April 1, 2021, and December 15, 2021. Upon receipt and evaluation of the responses, a total of 485, 305, and 317 copies of the questionnaires for Thailand, Slovakia, and Poland were received, respectively, corresponding to return rates of 80%, 50%, and 52%, respectively for the sampled countries. To evaluate the concept of SCM in small and medium-sized entities, a five-point Likert scale (1 = strongly disagree, 5 = strongly agree) was used, which measured the average level of factor ratings in the following areas of SCM. The data was collected between April 1, 2021 and June 30, 2021. Several techniques were used to analyze the data. The first technique used was descriptive statistics, which evaluated the demographic characteristics of the respondents. The Cronbach's alpha, Convergent Reliability (CR), and Average Variance Extracted (AVE) were used to evaluate the suitability of the model. Fornell & Larcker (1981) recommend threshold values above 0.7, and Hair et al. (2014) suggest a threshold above 0.5 for AVE. Studies (Bentler, 1992; Hayduk, 1987) highlight that for CFA indicators, >0.7 is considered acceptable, and >0.9 is considered a good level. When measuring the discrepancy divided by the degree of freedom (CMIN/DF), Kline (1998) states that a value of ≤3 indicates an acceptable fit. According to Garson (2012), the Comparative fit index (CFI) and Tucker-Lewis index (TLI) measures equal to or greater than 0.9, indicating good fit indices. Multi-group structural equation modeling (SEM) was used to evaluate the hypotheses of the study. (Streimikiene & Ahmed, 2021).

4. RESULTS AND DISCUSSION

4.1 Demographic Statistics

This section evaluated the demographic characteristics of the respondents. The first factor was the number of people currently employed by the company. The results showed that for the three countries, the majority used between 10-49 people (75.3%, 77.7%, and 73.8% for Thailand, Slovakia, and Poland, respectively). The other question of the study was the period the company has operated in the domestic market. For all three countries, most companies had operated for more than 15 years (48.9%, 43.6%, and 52.4% for Thailand, Slovakia, and Poland, respectively). The research also evaluated the industry in which the companies of the respondents operated. For Slovakia, the majority (14.4%) operated in the service sector, followed by wholesale and

trade (14.1%). For Thailand, the majority also operated in the service sector (16.3%), followed by wholesale and trade (15.3%). In Poland, the majority (16.7%) operated in the service sector, followed by wholesale and trade (16.1%). The last demographic factor evaluated was the position of the respondents in the company. In all three countries, most of the respondents were owners, directors, or presidents of the companies (56.9%, 60.0%, and 60.6% for Thailand, Slovakia, and Poland, respectively).

4.2 Evaluation of the Model Fitness

CFA Analysis

The CFA analysis was conducted for the proposed model, and the results of the CFA are presented in Table 1 for each country. The evaluation of these indicators showed that the model was not satisfactory. As a result, the proposed model was restructured by removing some observed variables and co-variating others. The observed variables that were removed include EN7, EN8, PS1, OC7, and DM8. The fitness indicators improved after the model modification. Inferring from Bentler (1992) and Hayduk (1987), all the indicators were within the acceptable level (>0.7) and good level (>0.9). Hence the model was fit to conduct the subsequent analysis.

Tab. 1 – Summary of CFA Analysis. Source: own research

Initial CFA Results							
Countries	**CMIN/DF**	**GFI**	**TLI**	**CFI**	**RMSEA**	**IFI**	**NFI**
Poland	4.672	0.627	0.639	0.692	0.072	0.671	0.718
Slovakia	5.432	0.728	0.772	0.762	0.082	0.714	0.729
Thailand	7.738	0.742	0.6389	0.643	0.062	0.683	0.762
CFA Results after adjustment and removal of observed variables and co-variating others							
Countries	**CMIN/DF**	**GFI**	**TLI**	**CFI**	**RMSEA**	**IFI**	**NFI**
Poland	1.852	0.811	0.896	0.903	0.052	0.904	0.812
Slovakia	1.842	0.802	0.894	0.901	0.053	0.902	0.808
Thailand	2.239	0.803	0.897	0.904	0.051	0.904	0.839

Note:GFI = Goodness-of-fit index; CFI = Comparative fit index (the fit index that takes sample size into account); RMSEA = Root mean square error of approximation (takes the error of approximation in the population into account); TLI = Tucker-Lewis index; NFI = Normed fit index; IFI = Incremental fit index; DF = Degrees of freedom; CMIN/DF = discrepancy divided by degree of freedom.

Validity & Reliability Analysis

The validity of the model was assessed using the average variance extracted (AVE), while the reliability of the model was evaluated using the Convergent Reliability (CR). For all the countries, Thailand, Slovakia, and Poland, the CR values were above the 0.7 thresholds recommended by Fornell & Larcker (1981), while the AVE(s) were above the 0.5 thresholds recommended by Hair et al. (2014). Therefore, it was concluded that there was a good degree of confidence that traits were well measured by their indicators. The validity and reliability results are presented in Table 2.

Tab. 2 – Reliability and Validity Analysis. Source: own research

Variables	Thailand		Slovakia		Poland	
	CR	AVE	CR	AVE	CR	AVE
SA	0.903	0.762	0.909	0.577	0.908	0.575
DM	0.816	0.629	0.801	0.628	0.801	0.517
FS	0.922	0.607	0.949	0.723	0.938	0.672
EN	0.862	0.558	0.701	0.629	0.795	0.61
ES	0.905	0.553	0.907	0.6	0.908	0.595

Having satisfied the above model fitness evaluation criteria, the researchers were satisfied with the suitability of the model to conduct the analysis that evaluated the hypothesis of the study.

4.3 Evaluation of Hypotheses

The hypotheses of the study were evaluated using multi-group Structural Equation Modeling (SEM). Before the multi-group analysis was conducted, individual SEM analyses for the three countries (Thailand, Slovakia, and Poland) were conducted. Hypotheses 1 to 11 were assessed independently for each country. Hypothesis 12 was evaluated using the multi-group analysis.

4.4 SEM Analysis for Thailand

The results revealed that Determinants of SCM (DM) do not have a positive effect on Operation capabilities (OC) of the company's SCM (DM) ($\beta = 0.028$, p-value (0.263) > 0.5). This led to the rejection of Hypothesis 1 that aspects such as global competitiveness against supply chain, cost reduction, and internal cross-functional cooperation do not significantly influence the Operation Capabilities of SMEs in Thailand. Results also indicated that Factors supporting SCM (FS) do not have a positive effect on the Operation capabilities (OC) of the company SCM (FS) since ($\beta = 0.007$, p-value (0.789) > 0.5), leading to the rejection of Hypothesis 2. The research also led to the acceptance of Hypothesis 3 that Enablers of SCM (EN) have a positive effect on Operation capabilities (OC) of the company SCM ($\beta = 0.226$, p-value < 0.5). This is because the beta coefficients of the results, though significant, were positive. These findings agreed with the views of Chin et al. (2014), which outline the benefits of OC to SCM and how it is critical for competitiveness. Hypothesis 4 of the study stating that Environmental sustainability elements in SCM (ES) have a positive effect on the Operation Capabilities (OC) of the company SCM was accepted since ($\beta = 0.569$, p-value < 0.5). This implies that sustainability factors based on environmental factors are an important part of the modern supply chain, as supported by Akhtar (2019). The results also indicated that social aspects of sustainability in SCM (SA) have a positive effect on the Operation Capabilities of the company SCM ($\beta = 0.285$, p-value < 0.5). This led to the acceptance of Hypothesis 5, which implies that elements of sustainable development based on social factors are an important element of modern supply chain management in Thailand. The findings were also supported by the assertions of Hong et al. (2018). The results also indicated that Determinants of SCM (DM) have a positive effect on SCM Practices (PS) ($\beta = 0.099$, p-value < 0.5).

This means accepting Hypothesis 6, which inferred that the strategic factors adopted to

make it possible to achieve a competitive advantage help determine the appropriate level of implementation of SCM practices in Thailand SMEs. Factors supporting SCM (FS) were found to have a non-significant and positive effect on SCM Practices (PS) (β = 0.001, p-value > 0.5). This led to the rejection of Hypothesis 7, implying that the supporting factors of SCM as the elements of the supply chain environment do not make SCM easier to implement by SMEs in Thailand. The results of the study indicated that Enablers in SCM (EN) have a positive effect on SCM Practices (PS) (β = 0.158, p-value < 0.5). As a result, Hypothesis 8 of the study was rejected based on a positive path coefficient. This implies that obstacles in applying SCM and impediments do not potentially cause failure in applying SCM in practice by SMEs in Thailand. Hypothesis 9, that environmental sustainability elements in SCM (ES) have a positive effect on SCM Practices (PS), was rejected because (β = -0.167, p-value < 0.5). The results indicated that environmental sustainability elements in SCM (ES) have a negative effect on SCM Practices (PS) in SMEs in Thailand. Also, Hypothesis 10, that the social aspect of sustainability in SCM (SA) has a positive effect on SCM Practices (PS), was accepted because (β = 0.115, p-value < 0.5). This implies that sustainability factors based on environmental factors are an important part of modern supply chain management practices for SMEs in Thailand. The results indicated that the operation of the company within the supply chain has a positive effect on SCM Practices (β = 0.809, p-value < 0.5). This led to accepting Hypothesis 11, meaning that supply chain capabilities based on the requirements of the end customer helped in adopting SCM practices for SMEs in Thailand and the findings were supported by literature from Kot et al., 2018. Table 3 shows the SEM analysis for Thailand.

Tab. 3 – SEM Analysis for Thailand. Source: own research

Hypothesis	Relation	Path			Estimate	P	Accept?
Hypothesis 1	Positive	DM	→	OC	0.028	0.263	Reject
Hypothesis 3	Positive	EN	→	OC	0.125	***	Accept
Hypothesis 4	Positive	ES	→	OC	0.569	***	Accept
Hypothesis 5	Positive	SA	→	OC	0.285	***	Accept
Hypothesis 2	Positive	FS	→	OC	0.007	0.789	Reject
Hypothesis 10	Positive	SA	→	PS	0.115	0.002	Accept
Hypothesis 9	Positive	ES	→	PS	-0.167	0.011	Reject
Hypothesis 8	Positive	SC	→	PS	0.158	***	Reject
Hypothesis 7	Positive	FS	→	PS	0.001	0.978	Reject
Hypothesis 6	Positive	DM	→	PS	0.099	***	Accept
Hypothesis 11	Positive	OC	→	PS	0.809	***	Accept

Note: *** indicates that the p-value is less than 0.001. Also, for subsequent occurrences.

4.5 SEM Analysis for Slovakia

In this analysis, the independent factors were Determinants of SCM (DM), Factors Supporting SCM (FS), Enablers of SCM (EN), Social aspects of sustainability in SCM (SA), and Environmental

sustainability elements in SCM (ES). The dependent variables were Operation capabilities (OC) and SCM Practices (PS). Table 4 shows the SEM analysis for Slovakia.

Tab. 4 – SEM Analysis for Slovakia. Source: own research

Hypothesis	Relation	Path			Estimate	P	Accept?
Hypothesis 1	Positive	DM	→	OC	0.066	***	Accept
Hypothesis 3	Positive	EN	→	OC	0.226	***	Reject
Hypothesis 4	Positive	ES	→	OC	0.574	***	Accept
Hypothesis 5	Positive	SA	→	OC	0.279	***	Accept
Hypothesis 2	Positive	FS	→	OC	-0.138	***	Accept
Hypothesis 10	Positive	SA	→	PS	0.088	0.194	Reject
Hypothesis 9	Positive	ES	→	PS	-0.371	***	Reject
Hypothesis 8	Positive	SC	→	PS	0.135	***	Reject
Hypothesis 7	Positive	FS	→	PS	0.11	***	Accept
Hypothesis 6	Positive	DM	→	PS	0.043	0.153	Reject
Hypothesis 11	Positive	OC	→	PS	1.046	***	Accept

The SEM analysis for Slovakia revealed that among the five independent variables, Operation Capabilities (OC) was significantly influenced by all of them because their p-value was less than 0.05. Determinants of SCM (DM) have a positive effect on Operation capabilities (OC) of the company SCM (Hypothesis 1) (DM) (β = 0.019, p-value (0.022) < 0.5). This led to the acceptance of Hypothesis 1, that aspects such as global competitiveness against supply chain, cost reduction, and internal cross-functional cooperation, significantly influenced the operational capabilities of SMEs in Slovakia. Results indicated that Factors supporting SCM (FS) have a negative but significant effect on the Operational capabilities (OC) of the company SCM (FS) (β = -0.138, p-value < 0.5), leading to the rejection of Hypothesis 2 of the study for the case of Slovakia. The research also led to the rejection of Hypothesis 3 that Enablers of SCM (EN) have a negative effect on Operation capabilities (OC) of the company SCM (EN) (β = 0.226, p-value < 0.5). This is because the beta coefficients of the results, though significant, were positive. Hypothesis 4 of the study stating that Environmental Sustainability (ES) elements in SCM have a positive effect on the Operation Capabilities (OC) of the company SCM was accepted since (β = 0.574, p-value < 0.5). This implies that sustainability factors based on environmental factors are an important part of the modern supply chain. These findings were supported by the positions adopted in Kot et al. (2018) and supported by the study hypotheses. The results also indicated that social aspects of sustainability in SCM (SA) have a positive effect on the Operational Capabilities of the company SCM (β = 0.279, p-value < 0.5). This led to the acceptance of Hypothesis 5, which implied that elements of sustainable development based on social factors are an important element of modern supply chain management in Slovakia. The results also indicated that Determinants of SCM (DM) do not have a positive effect on SCM Practices (PS) (β = 0.043, p-value > 0.5). This means rejection of Hypothesis 6, inferring that strategic factors adopted do not make it possible to achieve a competitive advantage and help determine the appropriate

level of implementation of SCM practices in Slovakia SMEs. Factors supporting SCM (FS) were found to have a significant and positive effect on SCM Practices (PS) ($\beta = 0.11$, p-value < 0.5). This led to the acceptance of Hypothesis 7, the supporting factors of SCM, as the elements of the supply chain environment make SCM easier to implement by SMEs in Slovakia. The results of the study indicate that Enablers in SCM (EN) have a positive effect on SCM Practices (PS) ($\beta = 0.135$, p-value < 0.5). As a result, Hypothesis 8 of the study was rejected based on a positive path coefficient. This implies that enablers of SCM encourage its application in practice by SMEs. Hypothesis 9, that Environmental sustainability elements in SCM (ES) have a positive effect on SCM Practices (PS), was rejected because ($\beta = -0.371$, p-value < 0.5). The results indicate that environmental sustainability elements in SCM (ES) have a negative effect on SCM Practices (PS) in SMEs in Slovakia. Also, Hypothesis 10 indicates that social aspects of sustainability in SCM (SA) have a positive effect on SCM Practices (PS) because ($\beta = 0.088$, p-value > 0.5). This implies that sustainability factors based on environmental factors are an important part of modern supply chain management practices for SMEs in Slovakia. Akhtar (2019) and Hong et al. (2018) earlier discussed the relevance of sustainability and how relevant it is in SCM. The results demonstrate that the operation of the company within the supply chain has a positive effect on SCM Practices ($\beta = 1.046$, p-value < 0.5). This led to accepting Hypothesis 11, meaning that supply chain capabilities based on the requirements of the end customer helped in adopting SCM practices for SMEs in Slovakia.

4.6 SEM Analysis for Poland

Considering the case of Poland, the first 11 hypotheses of the study were evaluated. The results are presented and discussed in this section. The SEM analysis for Poland revealed that among the five independent variables, Operation Capabilities (OC) were significantly influenced by four of them (p-value < 0.05). The results found that Determinants of SCM (DM) have a positive effect on Operation capabilities (OC) of the company SCM (DM) ($\beta = 0.057$, p-value < 0.5). This led to accepting Hypothesis 1 that aspects such as global competitiveness against supply chain, cost reduction, and internal cross-functional cooperation significantly influenced the operational capabilities of SMEs in Poland. The results also indicate that Factors supporting SCM (FS) have a significant but negative effect on the Operation capabilities (OC) of the company SCM (FS) since ($\beta = -0.131$, p-value < 0.5), leading to the rejection of Hypothesis 2 of the study for the case of Poland. The research has also led to the rejection of Hypothesis 3 that Enablers of SCM (EN) have a positive effect on Operation capabilities (OC) of the company SCM (EN) ($\beta = 0.235$, p-value < 0.5). This is because the beta coefficients of the results, though significant, were positively correlated to the impediments capable of affecting the implementation of SCM. Hypothesis 4 of the study stating that Environmental sustainability elements in SCM (ES) have a positive effect on the Operation Capabilities (OC) of the company SCM was accepted since ($\beta = 0.572$, p-value < 0.5). This suggests that Sustainability factors based on environmental factors are an important part of the modern supply chain in Polish SMEs. The results also indicate that social aspects of sustainability in SCM (SA) have a positive and significant effect on the Operation Capabilities of the company SCM ($\beta = 0.280$, p-value < 0.5). This led to the acceptance of Hypothesis 5, which signifies that elements of sustainable development based on social factors are an important element of modern supply chain management in Polish SMEs.

The results also indicate that Determinants of SCM (DM) have a positive but non-significant effect on SCM Practices (PS) ($\beta = 0.0499$, p-value > 0.5). This led to rejecting Hypothesis 6, inferring that strategic factors adopted do not make it possible to achieve competitive advantage and help determine the appropriate level of implementation of SCM practices in Polish SMEs.

Factors supporting SCM (FS) were found to have a significant and positive effect on SCM Practices (PS) ($\beta = 0.106$, p-value > 0.01). This led to accepting Hypothesis 7, implying that the supporting factors of SCM as the elements of the supply chain environment do make SCM easier to implement by SMEs in Poland. The results of the study indicate that Enabler of SCM (EN) has a significant positive effect on SCM Practices (PS) ($\beta = 0.521$, p-value < 0.5). As a result, Hypothesis 8 of the study was accepted based on a positive path coefficient. This indicates that obstacles in applying SCM and impediments do not potentially cause failure in applying SCM in practice by SMEs in Poland. Hypothesis 9, that Environmental sustainability elements in SCM (ES) have a positive effect on SCM Practices (PS), was rejected because ($\beta = -0.361$, p-value < 0.5). The results indicate that environmental sustainability elements in SCM (ES) have a negative effect on SCM Practices (PS) in SMEs in Poland. Also, Hypothesis 10, that social aspects of sustainability in SCM (SA) have a positive effect on SCM Practices (PS), was rejected because ($\beta = 0.087$, p-value > 0.5). This signifies that sustainability factors based on environmental factors are an important part of modern supply chain management practices for SMEs in Poland. The results indicate that the operation of the company within the supply chain has a positive effect on SCM Practices ($\beta = 1.036$, p-value < 0.5). This led to accepting Hypothesis 11, meaning that supply chain capabilities based on the requirements of the end customer helped in adopting SCM practices for SMEs in Poland, as highlighted in Table 5.

Tab. 5 – SEM Analysis for Poland. Source: own research

Hypothesis	Relation	Path			Estimate	P	Accept?
Hypothesis 1	Positive	DM	→	OC	0.057	0.044	Accept
Hypothesis 3	Positive	EN	→	OC	0.235	***	Reject
Hypothesis 4	Positive	ES	→	OC	0.572	***	Accept
Hypothesis 5	Positive	SA	→	OC	0.28	***	Accept
Hypothesis 2	Positive	FS	→	OC	-0.131	***	Reject
Hypothesis 10	Positive	SA	→	PS	0.087	0.186	Reject
Hypothesis 9	Positive	ES	→	PS	-0.361	0.006	Reject
Hypothesis 8	Positive	SC	→	PS	0.118	0.05	Accept
Hypothesis 7	Positive	FS	→	PS	0.106	0.01	Accept
Hypothesis 6	Positive	DM	→	PS	0.049	0.088	Reject
Hypothesis 11	Positive	OC	→	PS	1.036	***	Accept

4.7 Multi-Group SEM Analysis

The first 11 hypotheses were addressed in the previous section for each country. This section

conducted an analysis to address the 12th hypothesis. The purpose of the multi-group analysis was to evaluate the SCM practices in Slovakia, Poland, and Pakistan to identify their similarities or points of divergence. The variable "country" was made as the moderating variable (1 = Slovakia, 2 = Thailand, 3 = Poland). The Chi-square difference technique was used to evaluate the hypothesis. The first step was to compare the results for the three countries to see whether the path coefficients and significance were similar. The comparison is summarized in Table 6.

Tab. 6 – Multi-Group SEM Analysis. Source: own research

Path			Thailand		Slovakia		Poland	
			Estimate	P	Estimate	P	Estimate	P
DM	→	OC	0.028	0.264	0.066	***	0.057	***
EN	→	OC	0.125	***	0.226	***	0.235	***
ES	→	OC	0.569	***	0.574	***	0.572	***
SA	→	OC	0.285	***	0.279	***	0.28	***
FS	→	OC	0.007	0.789	-0.138	***	-0.131	***
SA	→	PS	0.115	***	0.088	0.194	0.087	0.186
ES	→	PS	-0.167	***	-0.371	***	-0.361	***
SC	→	PS	0.158	***	0.135	***	0.118	***
FS	→	PS	0.001	0.978	0.11	***	0.106	***
DM	→	PS	0.099	***	0.043	0.153	0.049	0.088
OC	→	PS	0.809	***	1.046	***	1.036	***

To get the unconstrained model, the insignificant paths were trimmed, starting with the country having the fewest insignificant paths, in this case, Slovakia and Poland. The trimmed path was for Slovakia and Poland, SA ---> PS and DM --> PS, and for Thailand DM -->OC, FS -->OC, FS -->PS. The results of the unconstrained model are recorded in Table 7. The difference between Chi-square and degrees of freedom for the three groups (Slovakia, Thailand, and Poland) was calculated to determine whether the two groups were invariant. Three thresholds, 90%, 95%, and 99% significance levels, were used.

Tab. 7 – Chi-Square Test Results. Source: own research

	Chi-square	df	p-value	Invariant?
Overall Model				
Unconstrained	13942.823	4509		
Fully constrained	13975.385	4625		
Number of groups		3		
Difference	32.562	116	1.000	YES
Chi-square Thresholds				
90% Confidence	13947.43	4511		

Difference	4.61	2	0.100	
95% Confidence	13948.81	4511		
Difference	5.99	2	0.050	
99% Confidence	13952.03	4511		
Difference	9.21	2	0.010	

The results of the Chi-square test for the difference between the three groups show that the Chi-square difference was 32.562, and the degree of freedom (df) difference was 116. The p-value is 1.000. The study concluded that since the p-value (1.00) is greater than 0.1, 0.05, and 0.01 for 90%, 95%, and 99% confidence levels, respectively, the study concluded that the three groups were invariant (not different). These results led to accepting Hypothesis 12 of the study that supply chain management practices were similar in Poland, Slovakia, and Thailand. This means supply chain management practices were similar in Poland, Slovakia, and Thailand's small and medium-scale enterprises.

4.8 Implications of the Findings

The findings indicate different outcomes for all three countries surveyed. The common ground among all the findings of the study is the acceptance of the view by scholars (Dankiewicz et al., 2020) about the strategic roles played by SMEs in the development of emerging economies in national and regional development. Developing nations can key to this line of thought and enable the effective functioning of SMEs in their economies. The impact of SMEs has also been affirmed by various groups and researchers (OECD, 2021; Statista Research Department, 2021; Civelek et al., 2020). Thus, its operations can be harnessed to meet up to the current value of the GDP contribution (52.7%) or scale up on the already available data on its contribution to economic growth. As Chin et al. (2012) briefly elaborate, the application of SCM concepts in SMEs is central to enabling businesses to adapt to the realities of the market operations where they are located because of the dynamic and stochastic nature of economic and market forces. The contribution of approximately 86% of the Thai labor force by SMEs, as indicated by Korwatanasakul & Paweenawat (2020), is a pointer to the potential of SMEs. The results indicate that while H1 was rejected in Thailand, the significance and relevance of the Operational Capabilities of SCM in Slovakia and Poland were accepted. Operational capabilities can be linked to the openness of society. While Thailand is open to tourism and other forms of short-term visits, it, however, has a more stringent process for foreigners staying in the country on a long-term basis or for business purposes. In contrast, Slovakia and Poland do not have migration rules as rigid as Thailand. The migration rules for Poland and Slovakia are similar to what is acceptable in most European countries. This makes it easier for SMEs to function, giving them a competitive advantage in terms of doing business. It can also be seen that Europe has graduated from autocratic leaders to full forms of an all-inclusive democratic society. Democratic societies encourage the building of relationships, which can lead to lower running costs for the organization.

This supports the view that aspects of global competitiveness in the supply chain, cost reduction, and internal management of the firm are boosted by SCM practices. Zimon (2020) earlier stated that the process of SCM involves managing the organization's activities, from running

costs down to the sourcing, production, and supply processes. Kot et al. (2018), supported by Min et al. (2019), equally specify that effective application of SCM is aimed at reducing the overall cost and, in effect, increasing the organization's profit margin by ensuring an efficient operation that maximizes values accruable to the SME through its product and service delivery. For organizations to maintain their sources and customer base, it is important that existing business relationships are maintained and harnessed for the long-term viability of the SME. Kot et al. (2018) buttressed that business organizations need to maintain good relationships with suppliers and their customers to ensure continued success and competitiveness. Without the relationships from prior business associations, firms may end up running losses and increase the possibility of friction along the supply chain. Kot et al. (2018) again inform us that the key to maintaining the organization's customer base in the SCM process lies with the firm's ability to meet its customers' needs and expectations, thereby giving the firm a competitive advantage over its rivals. Setyaningsih & Kelle (2021) elucidate that this is encouraged by the successful implementation of SCM strategies in the holistic strategies of the organization. The result from Hypothesis 6 infers the conferment of advantages to the organization for deploying SCM practices. In terms of environmental sustainability, the results indicate the positive effects of environmental sustainability initiatives in the SCM process. It specifies that sustainability factors based on environmental factors are an important part of modern supply chain management practices. Hong et al. (2018) affirm that different issues associated with environmental practices, such as toxic wastes, water pollution, deforestation, land use, water scarcity, energy use, air quality, etc., all have a significant influence on the implementation of SCM practices in SME operations. Addressing the environmental sustainability elements in the supply chain thus involves addressing concerns about issues such as the amount of waste the suppliers and the delivery logistics generate. Local laws are also capable of inhibiting the operational management of the SME. It is vital to consider these attributes and environmental influences to ensure viability and long-term stability.

5. CONCLUSION

The purpose of this research was to investigate supply chain management in small and medium enterprises in Poland, Slovakia, and Thailand and compare the SCM practices among them. The most important result of the analysis was to compare whether the practice of SCM among them was similar. This study concluded that supply chain management practices were similar for all three countries. This entails that supply chain management practices and operations adopted by SMEs in the selected countries share similarities. The individual factors influencing SCM operation capabilities and SCM practices were evaluated. The environmental sustainability elements in SCM, such as environmentally friendly production processes, acting towards reducing the amount of waste, engaging in production processes free from harmful substances emissions, use of renewable sources in production, reuse of materials, recycling of defective and waste products, and choosing partners in the supply chain based on environmental guidelines were found to significantly and positively influence SCM operations in all the countries SMEs. From the findings of this research, several recommendations were made. First, all SMEs in the

countries under study should consider adopting the factors that support SCM. These factors include information technology, the process of the integration of processes amongst members of the supply chain; concentration on end customers, understanding of the concept of SCM and the support from the managers, and an organizational structure designed for the promotion of cooperation and the coordination of activities, trust, and openness amongst members of the supply chain, and the readiness to share knowledge.

Another recommendation is that all stakeholders in the SME sector in the countries under study should operationalize the SCM by enhancing the capabilities of the SCM requirements to the end-user, as this positively and significantly improves SCM practices among SMEs. Additionally, it is critical to pay attention to the environmental sustainability elements in SCM, such as environmentally-friendly production processes, acting towards reducing the amount of waste, engaging in production processes free from harmful substances emissions, use of renewable sources in production, reuse of materials, recycling of defective and waste products, and choosing partners in the supply chain based on environmental guidelines as they enhance SCM operations and the resultant SCM practices. One of the study's limitations is the use of a biased sample arising from the selection of managerial/supervisory level employees of SMEs. There is the likelihood of them seeing the operations of the SMEs from a similar perspective. However, this cannot be helped as the study wanted employees that were part of the decision-making process in SMEs to determine their evaluation of competitiveness and how it could affect their operations. The study was also influenced by sampling errors arising from the data collection process. Some managers may not regularly check their emails, or the emails sent could go into the spam or bulk mail folders, making them less likely to be seen by the respondents. This was seen in the response rates of 52%, 50%, and 80% for Poland, Slovakia, and Thailand, respectively. The responses received were considered sufficient to provide significant insight into the competitiveness of SMEs in the three countries. An important study limitation is a focus on multiple SME sectors, limiting the depth of the results. Future research can focus on one or two sectors to understand the impact of competitiveness on business operations. A further limitation is that the study results cannot be generalized to other emerging economies. Future studies should be conducted with countries of similar profiles to test the replicability of the findings.

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