

Redefining Malaysia's Printing Landscape: Insights from Porter's CAN Model

Muhammad Yusuf Masod^{1*}, Siti Farhana Zakaria²

^{1,2} *Printing Technology, College of Creative Arts, Universiti Teknologi MARA, Malaysia*
Authors' Email Address: ¹ yusuf595@uitm.edu.my, ² farha981@uitm.edu.my

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*Corresponding Author

ABSTRACT

Malaysia's burgeoning printing industry, while showcasing potential, grapples with challenges that constrain its growth and global reach, underscoring the need for a deep and structured assessment. This pivotal study is designed to unpack the competitiveness of the Malaysian printing sector within the vast expanse of the global market, with a spotlight on the commercial printing segment. It revolves around the central inquiry: "Which critical factors mold the competitiveness of Malaysia's printing industry, and how can insights from Porter's Competitive Advantage of Nations (CAN) model illuminate them?" Anchored in the renowned Porter's CAN model, the research undertakes a multifaceted analysis of industry pillars, including intricate demand patterns, supply chain dynamics, prevailing competition, and the overarching influence of government directives. Data, meticulously sourced from 2015-2019 through national agencies and global institutions, forms the bedrock of this systemic examination. The study reveals that Malaysia stands fortified by assets like adept labor, contemporary infrastructure, and cost-effective energy provisions. Yet, it's not devoid of challenges, notably, the lag in embracing cutting-edge production tech and the absence of razor-sharp competitive strategies. However, the surge in both domestic and international demand sketches a promising trajectory. Beyond validating the robustness of the CAN model, the study weaves a tapestry of insights for industry stakeholders. It underscores the pivotal role of agile government interventions and the pressing mandate to integrate digital innovations. The findings beckon a targeted strategy to navigate and neutralize identified pitfalls, amplifying the industry's global resonance. While the study carves a panoramic landscape, its primary reliance on secondary datasets is its Achilles' heel. Still, it emerges as an invaluable compass for industry stakeholders, directing strategic investments and policy recalibrations to elevate the global stature of Malaysia's printing industry.

Keywords: *commercial printing, industry competitiveness, market dynamic, strategic industry innovation*

INTRODUCTION

Printing is an essential part of communication, art, and commerce. As an industry, it has been one of the most significant economic avenues in Malaysia, playing a vital role in the nation's development (Mohammed Ali et al., 2022), (Selamat & Mukapit, (2018)(Masod et al., (2015). According to the Malaysia Department of Statistics, the value of gross output for the printing industry was RM 2.153 billion in 2021, with an estimated 54,714 employees (Department of Statistics, 2022). The printing

industry is divided into four segments: commercial printers, packaging, security, and publications, with commercial printing being the most significant segment.

Globally, the printing industry is rapidly changing due to advances in technology and shifts in geopolitical realities. From 2011 to 2016, the global printing industry output grew from \$810.0 billion to \$890.0 billion, a compounded annual growth rate (CAGR) of 1.9% (Smithers, 2019). However, this relatively slow growth was primarily due to decreasing demand for printed commercial and published products, which was expected to continue beyond 2016. On the other hand, the packaging printing segment remained unaffected and is expected to reach approximately \$470.0 billion by 2021, at a CAGR of 4.1% from 2017 to 2021.

Malaysia has become one of the most important suppliers of print-related products among ASEAN countries, with an export value of USD\$1,619,488,000 from 2015 to 2019, according to International Trade Centre (ITC) calculations based on UN COMTRADE and ITC statistics (International Trade Centre (ITC), 2021). The printing industry has been a significant and dynamic force in Malaysia over the past few decades, with a significant impact on business operations and management in every sector. However, the global printing industry's changes have affected the Malaysian printing industry, creating challenges and opportunities for growth. This research aims to examine the Malaysian printing industry's competitiveness in the global market, particularly in the commercial printing segment, using Porter's Competitive Advantage of Nations (CAN) model. By analyzing the industry's strengths and weaknesses, we hope to provide insights into how the printing industry can adapt to new market conditions and improve production efficiency by providing innovative and value-added services through creativity complementary to existing offerings.

Therefore, the research question of this study is: "What are the factors that influence the competitiveness of Malaysia's printing industry, particularly in the commercial printing segment, using Porter's Competitive Advantage of Nations (CAN) model?"

This study is essential because it addresses the printing industry's competitiveness and its potential impact on the Malaysian economy, social development, and technology. It is timely because of the global printing industry's rapid changes and the increasing importance of Malaysia as a print-related product supplier. Additionally, it is novel because there is a limited amount of research on Malaysia's printing industry competitiveness, particularly in the commercial printing segment, using Porter's CAN model.

To achieve the research goal, we will use both primary and secondary data. Primary data will be collected through surveys, while secondary data will be obtained from academic journals, government reports, and other credible sources. We will analyze the data using Porter's CAN model to identify the strengths and weaknesses of Malaysia's printing industry, particularly in the commercial printing segment. The results of this study will provide insights into how the industry can adapt to new market conditions and improve production efficiency by providing innovative and value-added services through creativity as complementary to existing offerings.

The paper commences with an introduction to the printing industry in Malaysia, emphasizing its importance and the rationale behind the study. The literature review section covers the Competitive Advantage of a Nation (CAN) model and its attributes. The applicability of the CAN model in evaluating the Malaysian printing industry is also examined. The methodology section outlines the research design, data collection methods, and data analysis techniques. In the discussion section, the study's findings and conclusions are analyzed, including the strengths and weaknesses of the Malaysian printing industry, as determined by the CAN model. The implications of the study's findings are also discussed.

The Competitive Advantage of Nations (CAN) Model

The Competitive Advantage of Nations (CAN) model, developed by Porter's (1990), focuses on four broad attributes to explain why certain nations succeed in particular industries over others. These attributes include factor conditions, demand conditions, related and supporting industries, and firm strategy, structure and rivalry, with two external variables - government and chance. The CAN model is widely used for establishing policy, strategy, and structure of competitive advantage at the national and industry levels Hanafi et al., (2017). The model has made an important contribution to competitive studies and added new knowledge to international trade theories. According to Hanafi et al., (2017), Kharub & Sharma, (2016) and Guan et al., (2019), Although previous research has primarily focused on certain industries, this model is still applicable in assessing the Malaysian printing industry. Table I shows the list of determinants, elements, and respective variables affecting competitive performance. These include human resources, raw materials, technology and innovation, physical infrastructure, information infrastructure, domestic demand conditions, export demand conditions, the value chain of the Malaysian printing industry, firm strategy, structure and rivalry, and the role of the Malaysian government.

The CAN model provides a framework for analyzing the factors that contribute to a nation's competitive advantage in a particular industry. In this study, the CAN model is used to examine the competitive advantage of the Malaysian printing industry. Table 1 shows the list of determinants, elements, and respective variables affecting the industry's competitive performance.

Table 1: List of determinants, elements and respective variables affecting competitive performance; adapted from Shafaei, (2009)

Determinant	Element	Variables/descriptors
Factor conditions	Human resources	Quality of primary, secondary, and higher education and on-the-job training, human resource productivity and cost
	Raw materials	Availability, quality and accessibility
	Technology and innovation	Investment in printing and the paper industry; MIDA's National Survey of Innovation 2015 (Manufacturing and Services Sectors in Malaysia)
	Physical infrastructure	Quality of basic infrastructure (roads, ports, power systems) and advanced infrastructure (telecommunications, logistics)
	Information infrastructure	Availability of business and market information
Demand conditions	Domestic demand condition	Malaysian printing sales value (before the COVID-19 outbreak) Malaysian printing sales value (during the COVID-19 outbreak)
	Export demand condition	Malaysia's international export value
Related and supporting industries	Value chain of the Malaysian printing industry	Input providers: paper manufacturers and/or paper importers/traders, suppliers of printing equipment, suppliers of inks and rollers and electricity distribution companies
	Major suppliers of the printing industry	Strategic focus, value chain, management practices and goals
Firm strategy, structure and rivalry	Strategy, structure, and rivalry	Malaysia's printing industry competitiveness
Government	The role of the Malaysian government	Policy (environment and government support, export support, government support for technology adoption, training, tightness of regulation) Malaysia's economic stimulus package

The first determinant is factor conditions, which include human resources, raw materials, technology and innovation, physical infrastructure, and information infrastructure. Various studies such as (Moreira et al., 2018), (Varma & Lal, 2019) and (Guzikova, 2019) have determined that these factors affect the productivity and cost of the industry. In terms of human resources, the quality of education and training is important in producing skilled labour (Mundschenk, Martin; Drexl, 2005) (Singla, 2017). Raw materials such as paper are also essential, as well as accessibility and quality. Furthermore, an investment in technology and innovation is also critical in developing the industry's competitive

advantage, and the quality of physical and information infrastructure affects the industry's logistics and communication (Moreira et al., 2018).

The term "demand conditions" refers to the growth and nature of demand in the market, and this is particularly relevant in the case of the printing industry due to the impact of digital communications and media on print demand (Davis, 2014). In Malaysia's printing industry, both domestic and export demand conditions have an impact on the industry's sales value (Lee & Liang, 2018). The demand conditions of the market, which pertain to the growth and nature of demand, are especially relevant given the impact of the rise of digital communications and media on print demand. In the case of the Malaysian printing industry, both domestic and export demand conditions significantly influence the industry's sales value.

The third determinant is related and supporting industries, which include input providers, suppliers of printing equipment, suppliers of inks and rollers, and electricity distribution companies. The value chain of the industry is essential in developing a competitive advantage, and strategic focus, value chain, management practices, and goals of the major suppliers of the industry also affect competitiveness (Diar et al., 2020)(Mejtoft, 2009).

The fourth determinant is firm strategy, structure, and rivalry, which refer how a company is established, organized, and managed (Mross, 2005), (Jeong et al., 2017)(Eze et al., 2020). In the Malaysian printing industry, competitiveness is affected by the industry's competitiveness.

While the first, second and third determinants deal with factors that contribute to the growth of an industry, the fifth determinant considers the external elements which is the role of a government. Previous studies have highlighted the importance of the role of government in ensuring a conducive industrial environment for an industry. Previous studies (Rosnan et al., 2015) and (Chandran Govindaraju et al., 2013) have highlighted the role of the Malaysian government, which includes policy, government support for technology adoption, training, and regulation. In addition, the economic stimulus package also affects the industry's competitiveness (Baek et al., 2014).

Given the complex nature of competitiveness in the Malaysian printing industry, a comprehensive approach is required to develop a competitive advantage. Therefore, the authors propose the CAN model as an appropriate framework for examining the factors affecting competitiveness. Previous studies (Jelinek & Porter, 1992)(Hanafi et al., 2017)(Porter, 1990)(Morschett et al., 2009) have also acknowledged the significance of the CAN model in understanding competitive advantage and its potential implication for industry and national development.

METHODOLOGY

In this study, an analytical approach using systemic and comparative analyses is applied to assess the competitive performance of the printing industry in Malaysia. Figure 1 also illustrates the proposed approach based on Porter's model with the objective of establishing how each of the factors influences the competitiveness of the industry. The research is based on the collection and analysis of information and statistical data for the years 2015–2019 from various related government agencies such as the Department of Statistics Malaysia (DOSM) and the Malaysian Investment Development Authority (MIDA). As for international data, our analysis utilised datasets from various related agencies, primarily from the ITC, an agency of the World Trade Organization, and the United Nations. Furthermore, a reference to leading business information analyst firms provided commercial data, analytics and insights into print businesses.

The five-year period in the data allows for an analysis of changing global dynamics, which are especially important in fast-changing, emerging economies such as Malaysia. This is particularly significant because, during these five years, globalisation forces, trade liberalisation and political reforms in other countries facilitated accelerated trade and growth. Hence, assessing changes from 2015–2019 allows the authors to capture and consider some of the effects of the changing global business environment. The major advantage of this time-series analysis is that it identifies dynamic capabilities and superior performance over time based on patterns in the historical data (Oliver, 2017).

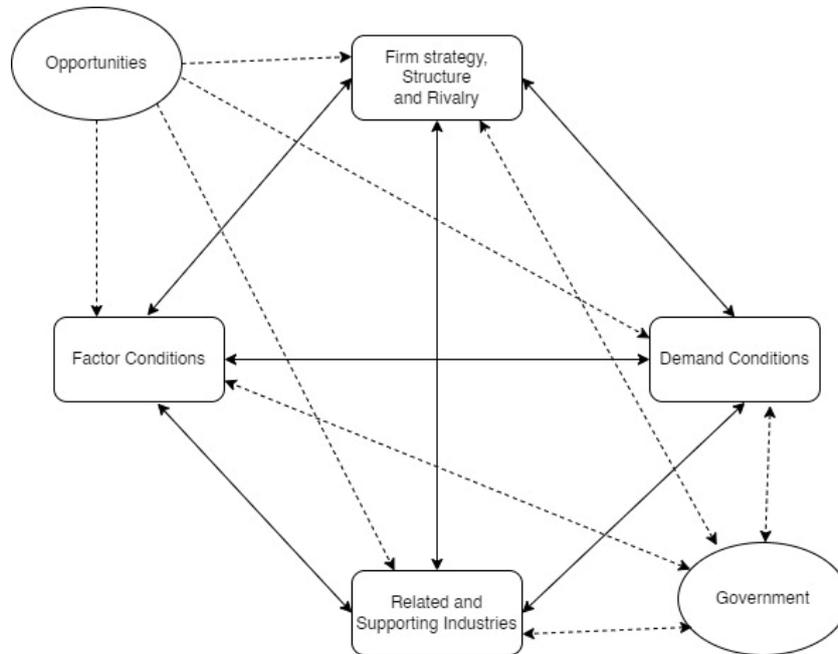


Figure 1: Competitive Advantage of Nations (CAN). Source: (Porter, 1990)

RESULTS

The development of the printing industry in Malaysia cannot be viewed apart from the influence and development of the international printing market. The international market position of Malaysia's print-related exports is directly influenced by the country's degree of competitiveness with other exporters, making this the major factor, among many, affecting the development of its printing industry. To analyse this development, we look at Porter's model. We begin with a closer look at its four main components and their elements, discussed above.

Factor Conditions

The analysis of factor conditions in the Malaysian printing industry showed that the industry has a well-educated workforce, with formal education in printing offered at the tertiary level. Additionally, technical education is also available, and it covers graphic design, printing, and digital printing. This skilled workforce is prepared to achieve managerial and supervisory levels in the printing industry. However, the industry struggles with a lack of technological advancements and innovation, which may hinder its competitiveness in the global market. While some firms focus on innovation activities, they only constitute about 2.4% of the printing industry. In terms of investment, the paper, printing, and publishing industry ranked second compared to other industries in Malaysia, with a total proposed capital investment of USD\$1313.10 million in 2019 (Table 2). Nonetheless, the industry struggles with a lack of investment in technology and innovations, particularly in the adoption of advanced digital

production technologies as the findings from the National Survey of Innovation 2018 (Ministry of Science Technology and Innovation (MOSTI), 2020) (United Nations Industrial Development Organization (UNIDO), 2019).

Table 2: Investment in Paper, Printing and Publishing industry, 2018 to 2019 (2018: \$1 = RM4.14)
 Source: (Malaysian Investment Development Authority (MIDA), 2018)

Rank	Industry	2018			2019			
		Domestic Investment (USD Million)	Foreign Investment (USD Million)	Total Proposed Capital Investment (USD Million)	No.	Domestic Investment (USD Million)	Foreign Investment (USD Million)	Total Proposed Capital Investment (USD Million)
1	Electronics & Electrical Products	338.5	4 818.30	5 156.80	56	112.8	2 587.60	2 700.40
2	Paper, Printing & Publishing	252.9	1 668.00	1 920.90	30	108.5	1 204.60	1 313.10
3	Transport Equipment	1 053.30	321.9	1 375.20	61	294.2	167.1	461.3
4	Scientific & Measuring Equipment	6.1	853.7	859.7	22	20.2	117.9	138.1
5	Chemical & Chemical Products	398	416.9	815	68	136.2	1 071.50	1 207.70
6	Non-Metallic Mineral	579.5	218.7	798.2	39	173.4	416.7	590.2
7	Food Manufacturing	387.6	220.2	607.7	63	312.5	124.3	436.8

Physical Infrastructure

Malaysia's physical infrastructure contributes many possibilities and opportunities to the printing industry. Developed industrial parks, high-tech telecommunications, a good coverage network of highways, efficient seaports, and international airports provide a conducive environment for the printing industry to operate (Jabatan Perancangan Bandar dan Desa Semenanjung Malaysia, 2016).

ICT Infrastructure

The information infrastructure in Malaysia is currently undergoing development, providing opportunities for businesses to access market information. An initiative from the Malaysian Investment Development Authority (MIDA) by introducing MIDA's 360° Comprehensive Business Facilitation and Support Services, Digital Transformation Initiatives, Implementation Tracking and Monitoring System (ITMS), One Stop Centre (OSC) for Business Travelers, and Online Applications are some of the online services available. This online service covers applications for import duty and/or sales tax exemptions and the issuance of confirmation letters. Additionally, new applications, extensions, further

applications for import duty/sales tax exemption, and appeals can be submitted online. This facility is integrated with the relevant ministries and agencies for a seamless flow of data and information and speedy approvals (Ministry of International and Trade Malaysia, 2019).

Demand condition

The demand condition of the Malaysian printing industry can be evaluated from two different aspects, namely domestic demand condition and export demand condition. In terms of domestic demand conditions, the COVID-19 outbreak has negatively affected the demand for print products in Malaysia. According to the sales figures of the printing and reproduction of the recorded media sector, there was a decline in the growth rate of domestic demand from RM 1,257,500 in 2019 to RM 1,153,300 in 2020, with an annual change of -8.30% (Table 3). This trend is consistent with global trends, as the pandemic has accelerated the shift towards digitalization, resulting in a decline in physical print products' demand. This decline in demand can also be attributed to the shift towards home offices and paperless work environments, resulting in lower orders for stationery items such as envelopes, business cards, letterheads, and binders.

Table 3: Sales figures (in RM) for the printing and reproduction of recorded media during the COVID-19 outbreak Source: Department of Statistics Malaysia, (2021)

	2019	2020	Annual Percentage Change
Printing and reproduction of recorded media	1 257 500	1 153 300	-8.30

On the other hand, the pandemic's impact on the printing industry has led to opportunities for domestic markets, manufacturers, and suppliers, as disrupted global distribution channels resulted in local automated print-on-demand becoming an attractive alternative. As a result, domestic markets gained an advantage over foreign competitors as they supplied the bulk of the nation's printing needs. Regarding export demand condition, the Malaysian printing industry's export value tended to increase during the pre-pandemic years, with a predicted global annual growth rate of 2% per year and a global printing industry sales volume of US\$824 billion by 2024 (Smithers 2019). However, the pandemic has caused a decline in Malaysia's exports of print-related materials. Figure 2 shows a decline in Malaysia's export value during the pandemic, while overall, Malaysia's exports represent 1% of the world's exports and rank 21st in world exports of print-related materials.

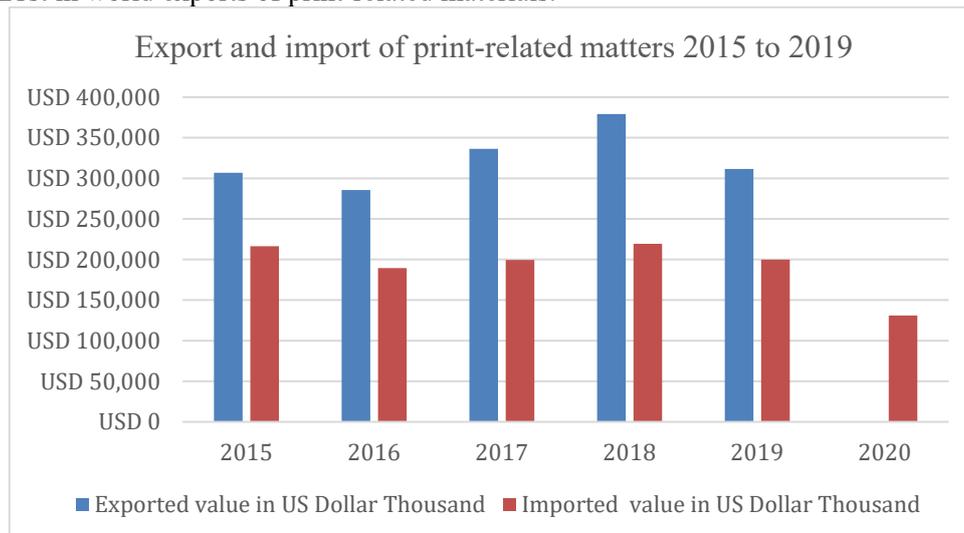


Figure 2: Malaysia's Print-related materials export and import values. ITC calculations based on Department of Statistics Malaysia (DOSM) statistics since January 2015; ITC calculations based on UN COMTRADE statistics until January 2015. Sources: International Trade Centre (ITC), n.d.)

Related And Supporting Industries

The value chain of the Malaysian printing industry includes several upstream and downstream industries, such as paper manufacturers and importers/traders, printing equipment suppliers, ink and roller suppliers, and electricity distribution companies. The inputs from these industries are transformed into a variety of print products for various consumers, including government, manufacturing firms, banking institutions, and educational institutions. The value chain is interdependent, and each process depends on the others to create added value and revenue as illustrated in Figure 3.

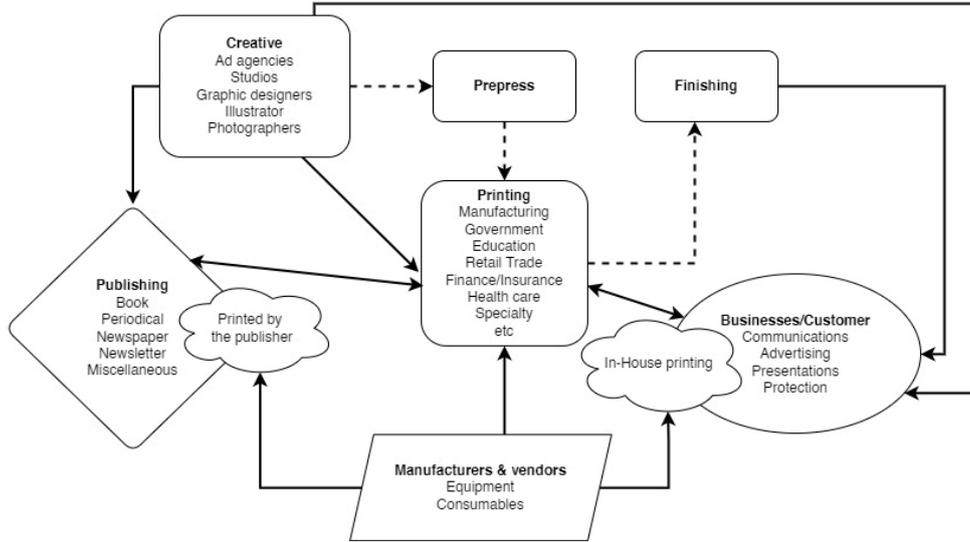


Figure 3: Interdependent value chain activities. Tasks that can be completed by an in-house department are shown by dotted arrows—source: adapted from Printing Industry Center at & RIT, (2007).

Major Suppliers of The Printing Industry

The top five domestic sources of inputs for the Malaysian printing industry are service activities related to printing, manufacturing of corrugated paper and paperboard and containers of paper, manufacturing of other chemical products, manufacturing of pulp, paper, and paperboard, and manufacturing of printing ink. Most pulp, paper, and paperboard products are imported from overseas as local pulp mills are unable to meet the high demand (Center for International Forestry Research, 2006). Malaysia needs to increase the output of printing substrates to become a regional printing hub. Currently, the local market can only meet half of the market demand, making Malaysia a net importer of paper to support its printing industry.

Table 4: Major domestic sources of inputs for the printing industry. Sources: Department of Statistics Malaysia, (2018)

Supplier	Value of gross output (RM '000)	Value of intermediate input (RM '000)	Value added (RM '000)
Printing and service activities related to printing	10 775 303	7 286 240	3 489 063
Manufacture of corrugated paper and paperboard and containers made of paper and paperboard	5 959 748	4 289 983	1 669 765
Manufacture of other chemical products n.e.c.	5 230 999	4 108 114	1 122 884
Manufacture of pulp, paper and paperboard	4 563 859	3 302 016	1 261 843
Manufacture of printing ink	1 059 640	787 725	271 915

Firm Strategy, Structure and Rivalry

The printing industry in Malaysia is relatively competitive in the global market, with Malaysia ranking as one of the top exporters of print-related products in ASEAN countries after Singapore (International Trade Center, (2019). Globally, Malaysia ranked 26th, with an export value of \$242,373 (thousand) in 2020 (Table 5). The industry is also geographically dispersed, with a presence in all 13 states and 3 federal territories, and has a diverse range of firm sizes, with small, medium and large businesses represented. However, there has been no specific strategy developed to enhance the industry's competitiveness, which may lead to a decline in the market value of Malaysia's print exports compared to other competitors in the future.

Table 5: Malaysia's key statistics of exported value of printed products of the printing industry. ITC calculations are based on Department of Statistics Malaysia (DOSM) statistics. (Sources: International Trade Center, (2021)

Product label	Value exported in 2020 (USD thousand)	Annual growth in value between 2016-2020 (% , p.a.)	Annual growth in value between 2019-2020 (% , p.a)	Share in world export (%)	Ranking in world export (The country ranking is based on the reported trade value)
Printed books, newspapers, pictures, and other products of the printing industry	242,373	-4	-22	0.7	26

There are 2,831 printing companies in Malaysia, with most concentrated in central Malaysia. The top printing and service activities related to printing companies, based on annual sales revenue in 2018 (USD), are presented in Table 6. Unlike some manufacturing industries, the printing industry's structure is not shaped by economies of scale, and the long-run cost curve exhibits constant returns to scale, with smaller- and medium-sized firms having no significant cost disadvantage compared with larger firms. This is due to several reasons, including the fact that printing utilises a job shop manufacturing process, making it possible for small- and medium-sized printers to produce a print job as efficiently as larger firms. Additionally, printing is a hybrid of manufacturing and services, with a mix of printed products and services that further reduces the influence of scale economies.

Table 6: Top 20 commercial printing companies in Malaysia (Source: Dun & Bradstreet, (2020).

Rank	Company	Annual Sales Revenue 2018 (USD)	Sector
1	Percetakan Nasional Malaysia Berhad	59.84M	Commercial
2	Twp Sdn Bhd	43.50M	Commercial, Book
3	Printronix Printers (M) Sdn. Bhd.	22.28M	Industrial Printing, Label, Line Matrix Printers
4	Interprint Decor (Malaysia) Sdn. Bhd.	17.63M	Industrial Printing
5	Janoschka Malaysia Sdn. Bhd.	17.02M	Gravure Cylinder
6	SE Printing (M) Sdn. Bhd.	16.16M	Screen Printing/Industrial Printing
7	Percetakan Mun Sun Sdn Bhd.	15.01M	Commercial
8	Mega Label (Malaysia) Sdn. Bhd.	13.33M	Label

9	Photobook Worldwide Sdn. Bhd.	11.40M	Digital Printing
10	Yamagata (Malaysia) Sdn. Bhd.	10.8M	Commercial, Book Printing
11	King Jim (Malaysia) Sdn. Bhd.	9.64M	Industrial Printing
12	Bagan Printers Sdn Bhd	9.16M	Flexible Packaging Industries
13	Graphic Press Group Sdn Bhd	9.02M	Commercial and Packaging
14	Toyo Sho Industrial Products Sdn. Bhd.	8.48M	Label, Flexible Packaging Industries
15	Percetakan Turbo (M) Sdn. Bhd.	8.10M	Commercial
16	Clariant Masterbatches (Malaysia) Sdn. Bhd.	7.89M	Printing Chemical Colorants
17	Pro Office Solutions Sdn. Bhd.	7.67M	Document Imaging and EDRMS,
18	Sanko Sangyo (Malaysia) Sdn. Bhd.	6.99M	Silk-Screen, Labels, Stickers and Precision Die-Cut Products,
19	Adigiprint Sdn. Bhd.	6.68M	Technology Solution Provider in the Areas of Digital Print and Imaging Systems
20	Flexi Components (Kedah) Sdn. Bhd.	6.07M	Industrial Printing, Screen Printing

Role of the Government and Opportunities

The Malaysian government has taken steps to promote the digital transformation of the manufacturing industry and related services sectors through the introduction of the National Policy on Industry 4.0, known as Industry4WRD (Ministry of International Trade and Industry, 2018). The government has also developed the Digital Economy Blueprint to accelerate Malaysia's adoption of digital technology in various sectors, including manufacturing, services, and agriculture. A range of incentives, such as the Automation Capital Allowance and Smart Automation Grant, have been introduced to encourage companies, particularly SMEs, to adopt digitalisation. In response to the COVID-19 pandemic, the Malaysian government has unveiled a National Economic Recovery Plan to provide some relief for stakeholders, particularly those in the manufacturing industry. The plan aims to boost initiatives in the Malaysian manufacturing industry and provides financial support to businesses, including SMEs, through various measures such as the Danajamin guarantee scheme and the Special Relief Facility. These initiatives by the government offer opportunities for businesses in the Malaysian printing industry to adopt digitalisation and enhance their competitiveness, as well as benefit from financial support during challenging times.

DISCUSSION

The research question for this study was to investigate the competitiveness of the Malaysian printing industry in the global market. The research used various sources such as reports and statistics to analyze the industry's factors, including demand, supply, competition, and government policies. The study revealed that Malaysia has the potential to be a major player in the printing industry, ranking 26th globally in terms of export value. The Malaysian printing industry is characterized by a diverse range of firm sizes, with no significant cost disadvantage for smaller and medium-sized printers compared to larger ones. The findings of this study reveal that Malaysia's printing industry is competitive in the global market, and the government has implemented policies to promote the industry's growth and advanced digital production technologies. The study indicates that the printing industry in Malaysia is

not shaped by economies of scale, and smaller and medium-sized firms have no significant cost disadvantage compared to larger firms. Based on this study the printing industry in Malaysia has several strengths, including skilled labour, low material costs, and growing demand both domestically and internationally (Table 7). The government is also supportive, and there is availability of input providers and suppliers. However, the industry faces weaknesses such as a lack of advanced science and technology, an absence of a clear strategy to increase competitiveness and a lack of regulations to improve the quality of print products. By addressing these weaknesses, the industry can further improve its competitiveness in the global market.

Table 7: The strengths and weaknesses of Malaysia's printing industry.

Determinants	Strengths	Weaknesses
Factor conditions	Skilled labour, low energy cost, good infrastructure	Lack of advanced adoption of advanced production technologies to improve efficiency and productivity
Demand conditions	Strong domestic and export demand conditions	Increased competition with non-print media and changes in consumer lifestyles
Related and supporting industries	Established value chain and major suppliers	Lack of supporting industries
Firm strategy, structure, and rivalry	Competitive industry and strong domestic rivalry	Lack of clear strategy to increase competitiveness
Government	Supportive government and economic stimulus package	Lack of regulations to improve print product quality

The results of this study align with existing research on the printing industry and its structure (such as: (Thomas & Douglas, 2021) (Watkins, 2012) and (Davis, 2014). The study highlights the importance of government policies in promoting the growth of the printing industry in Malaysia and the adoption of digital technologies. Additionally, the study contributes to the understanding of the factors that affect the competitiveness of the printing industry, including supply, demand, competition, and government policies.

Implication and limitations

The findings of this study are valuable and important for various stakeholders, including the government, printing companies, and investors. The study highlights the opportunities for investment in the printing industry, given its competitiveness in domestic and global markets. Additionally, the study suggests that the government's policies aimed at promoting the adoption of digital technologies and boosting the growth of the printing industry can contribute to the industry's competitiveness and growth. One of the limitations of this study is the reliance on secondary data sources, which may not be up-to-date or accurate. Additionally, the study focused on the printing industry in Malaysia, and the results may not be generalizable to other countries or regions.

CONCLUSION

In conclusion, this study examined Malaysia's printing industry's global competitiveness. Skilled labour, low energy costs, and supportive government policies are the industry's strengths. However, the industry lacks advanced production technologies, a clear strategy to increase competitiveness, and regulations to improve print product quality. Given its global and domestic competitiveness, the study also highlights investment opportunities in the printing industry. The printing industry can benefit from government policies that encourage digital technology adoption and growth. This study's limitations include using secondary data and focusing on Malaysia's printing industry. The printing industry in other countries and the impact of digital technologies need further study.

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AUTHORS' CONTRIBUTION

Muhammad Yusuf Bin Masod spearheaded the study's design, data collection, and initial draft. Siti Farhana Zakaria (Assoc. Prof) played a pivotal role in data analysis, result interpretation, and manuscript refinement. Both authors collaborated throughout, providing critical feedback and shaping the final manuscript. All contributions were integral to the research's development and completion.

CONFLICT OF INTEREST DECLARATION

We certify that the article is the Authors' and Co-Authors' original work. The article has not received prior publication and is not under consideration for publication elsewhere. This research/manuscript has not been submitted for publication nor has it been published in whole or in part elsewhere. We testify to the fact that all Authors have contributed significantly to the work, validity and legitimacy of the data and its interpretation for submission to Jurnal Intelek.

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