Policy Inhibitors of Petrochemical Product Export Development

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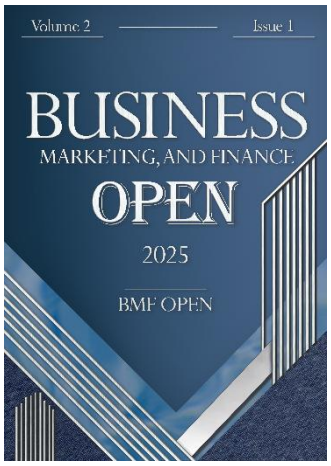

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Citation: Najafpour, H., Shirkhodaie, M., Aghajani, H., & Soltanzadeh, J. (2025). Policy Inhibitors of Petrochemical Product Export Development. *Business, Marketing, and Finance Open*, 2(1), 160-171.

Received: 18 November 2024
Revised: 06 December 2024
Accepted: 18 December 2024
Published: 01 January 2025

Abstract: Exports play a direct role in the economic development of a country. In the turbulent and competitive global environment, having a reliable approach to achieving short-term and long-term objectives in companies can support their growth and development. The aim of this study is to examine the inhibitors of petrochemical export development from the perspectives of industrial, trade, and technological policies. This research is applied in nature and has been conducted using the qualitative method of thematic analysis. Data collection tools included past documents and records as well as interviews. In this approach, 32 published articles from reputable domestic and international scientific-research databases were reviewed, and interviews were conducted with 16 experts and international consultants in the petrochemical industry, researchers from the Parliament Research Center, and policymakers. The sampling method was purposive, and the selection of interviewees followed a snowball sampling approach. Qualitative data were analyzed using thematic analysis. In the qualitative data analysis, 132 codes were identified, which, after merging similar codes, resulted in 81 final codes. These were classified into 14 similar concepts and ultimately grouped into 7 main themes. In the quantitative phase, a questionnaire was designed, and 10 experts were selected based on the judgmental sampling method to prioritize the identified themes using the DEMATEL method. The questionnaire analysis results indicated that "weaknesses in governance policies" had the highest impact among all factors. Furthermore, "weaknesses in governance policies," "structural and institutional issues," and "weaknesses in the supervisory and evaluation system" were identified as causal inhibitors.

Keywords: Exports, Petrochemical Products, Development Policies, Thematic Analysis

1. Introduction

One of the important and influential factors affecting a country's gross domestic product (GDP) is non-oil exports, such as petrochemical products, which impact GDP through various channels [1]. Given the crucial role of exports in the survival and growth of companies, especially petrochemical companies, the lack of knowledge regarding export innovation represents a significant gap in the literature [2, 3]. The export of petrochemical products faces numerous challenges, including currency contract barriers, extreme exchange rate fluctuations, the

absence of a well-defined monetary system, rising production costs, inadequate and inconsistent marketing, and weaknesses in economic diplomacy. Therefore, formulating an appropriate trade strategy for the country and determining how to engage with the global economy is one of the most critical steps in national trade policy. Having such a well-defined strategy enables exporters to plan for marketing their products, increasing production, and improving employment (Hosseinzadeh et al., 2018). Moreover, one of the major issues in the country's petrochemical exports is the lack of a long-term and stable trade policy aimed at enhancing engagement with destination countries. Additionally, the volume of non-oil exports does not align with the country's economic potential. To fundamentally and sustainably analyze the impact of non-oil exports, it is essential first to reform and strengthen the laws, regulations, and processes of foreign trade and industry and then focus on the organization of high-tech industries in these sectors. Thus, various approaches, including the activation of the country's diplomatic system, should be utilized to facilitate technology transfer, mitigate the effects of sanctions and related challenges, and ease the importation of necessary technologies, thereby enhancing financial credits [4].

Today, exports play a crucial role in the framework of any healthy economy [5]. If governments aim to shape their policies toward enhancing the collective competitiveness of industries under their influence and improving the quality of production factors in industrial units, they must enter global competition [6, 7]. Successful economies prioritize strengthening and supporting specific export sectors where they possess a competitive advantage [8, 9]. By expanding access to foreign markets, a company can achieve higher production levels, reducing product costs and enabling higher profit margins while also creating opportunities for market diversification. Additionally, by leveraging different growth rates in various markets, companies can reduce their dependence on a single market [10].

The policy-making process consists of a set of rational actions carried out through a structured process, incorporating political measures. These political actions can be considered part of the policy-making process, visualized as a series of interrelated, time-sequenced steps: agenda setting, policy formulation, policy adoption, policy evaluation, and policy assessment. Policy analysts may provide information relevant to one or multiple stages of the policy-making process, depending on the nature of the issue being analyzed [11]. Some of the driving forces behind policy changes are social or environmental factors. From this perspective, policy-making is seen as a relatively stable behavioral shift resulting from accumulated experience. Typically, policy shifts occur in response to societal changes [12]. Policymakers seek to increase government revenue by focusing on various variables and policy reforms. Unfortunately, in many developing countries, revenue generation is significantly low, leading to severe budget deficits and escalating public debt issues [13].

Since working with foreign intermediaries is challenging, producers who export through non-integrated channels often experience poor export performance. Exporters' unfamiliarity with target markets, marketing tools, advertising, and credit validation, along with the costs of export investments and factors such as national economic recessions, exchange rate instability, government regulations, and political uncertainties, highlight the urgent need for greater awareness and effective government policies to enhance exports [14]. In oil-dependent countries, transitioning toward export diversification must commence swiftly. This requires two fundamental actions: developing competitive supply capabilities (coordinating economic activities and linking markets, firms, governments, and non-price factors such as institutions, organizations, and infrastructure) and modernizing productive capabilities (introducing new products, adopting innovative processes, improving quality, and implementing advanced technologies) [15].

Numerous studies have been conducted on the development of petrochemical product exports, particularly in the context of international trade, addressing various issues in the literature. One key aspect is the weakness in utilizing technology and the lack of awareness regarding technological capabilities in exports. Mazzi et al. (2020) examined how domestic technological capabilities influence the relationship between imported inputs and companies' export performance, highlighting that technological capabilities and the quality of imported inputs not only directly benefit firms but also complement each other in enhancing export competitiveness [16]. Similarly, Rahimi (2021) explored the impact of e-commerce capabilities on petroleum product marketing, finding that organizations with access to such capabilities lead in knowledge acquisition, storage, and transfer, ultimately improving export performance [17]. Shahmirzadeh et al. (2017) identified market development, market penetration, product development, and diversification as key strategies for increasing petrochemical sales, with product development and market penetration being the most effective. Another significant issue concerns governance mechanisms and legal frameworks [18]. Navarro-García et al. (2016) analyzed the impact of governance mechanisms on export activities among 212 Spanish exporting firms, concluding that adopting appropriate legal mechanisms ultimately enhances export capacity and competitiveness. Given the central role of governments in this domain [19], Ahmadi et al. (2021) identified major barriers to non-oil exports in Iran, including high production costs, high exchange rates for imported raw materials, U.S. sanctions, short-term pricing strategies, foreign policies, high tariffs in target markets, high licensing costs, and substantial customs clearance fees. Infrastructure and national capacity also play a critical role in maximizing export opportunities [3]. Rostami et al. (2020) examined Iran's strategic export capacity in Iraq compared to Turkey, identifying key challenges such as economic diplomacy, quality standards, value-added production, foreign direct investment, government support, infrastructure development, inefficiencies in export management firms, lack of export diversification, and structural economic complexities. Their findings emphasized that structural changes and the integration of economic complexity indices in technology-based production are prerequisites for Iran’s foreign trade. Moreover, establishing connections with international networks and leveraging embedded knowledge is essential in global trade [20]. Mirjalili et al. (2018) analyzed the factors influencing high-tech exports in selected countries, concluding that foreign direct investment, real effective exchange rates, economic openness, and governance indices positively impact exports, while information and communication infrastructure significantly affects exports only in developed nations, not in developing ones [21]. The literature review underscores the multiple barriers to petrochemical exports. Given the gap in domestic research, where petrochemical export inhibitors have not been adequately examined, and the limited scope of international studies focusing on production outlooks, this study employs a mixed-methods approach to extract these inhibitors from the literature and interviews with industry stakeholders. The findings are then prioritized using the DEMATEL method and expert data analysis.

The competitiveness of domestic goods, when accompanied by technological and innovative policies in product design and production, can not only reduce costs but also drive economic growth. Achieving this requires the formulation of appropriate policies within the Trade Development Organization and the Economic Affairs Deputy of the Ministry of Foreign Affairs. These two organizations, with the support of competent and experienced commercial advisors, should effectively market national products for export. Additionally, diplomatic efforts, such as continuous, periodic, and joint meetings between Iranian economic officials and major trade partners, are crucial for discussing potential areas of cooperation and mitigating the impact of sanctions. Ultimately, increasing the export of Iranian petrochemical products and its effect on national production requires not only short-term measures but also structural and institutional reforms in the trade sector. Identifying national export capacities and

investing in the production of these commodities should be prioritized. Therefore, given these considerations, this study aims to identify the challenges and inhibiting factors affecting international cooperation in the country's petrochemical industry by leveraging the insights of managers in foreign trade sectors of petrochemical companies and experts in the field. The central research question of this study is: What are the inhibiting factors in the expansion and development of petrochemical exports in the country?

2. Methodology

The present study is applied in nature and employs a qualitative thematic analysis approach. The data collection method in this research is based on documentary information, and data collection tools include past records and interviews. In this method, 32 articles published in reputable domestic and international scientific-research databases were identified as the statistical population. These articles were retrieved from databases and search engines such as Google Scholar, Springer, ScienceDirect, Civilica, Scopus, and Magiran using specific keywords and related concepts. Additionally, interviews were conducted with 16 international experts and consultants in the petrochemical industry of the country. The sampling method was purposive, and the selection of interviewees was done using the snowball technique. To analyze qualitative data obtained from the interviews and previous studies, after transcribing the data, thematic or content analysis was employed.

In the quantitative phase, after identifying the seven main themes as a result of the thematic analysis method, a quantitative approach and the DEMATEL method were used to prioritize these themes. This method is utilized to incorporate expert opinions for prioritizing and structuring the influential factors in a specific domain. The DEMATEL method, based on graph theory principles, provides a hierarchical structure of influencing factors and their interdependencies. This method categorizes factors into two groups: causes and effects, representing their relationships in a comprehensible graphical format. The steps of the DEMATEL method include: Step 1: Forming the direct relationship matrix, Step 2: Normalization, Step 3: Computing the total relationship matrix, Step 4: Computing the internal relationship matrix, and Step 5: Final output and graphical representation. Subsequently, 16 experts were selected using a judgmental sampling method, and ultimately, 10 experts completed the questionnaire.

3. Findings and Results

At this stage, all existing sources from previous studies related to the subject were reviewed, and the existing inhibitors were identified. Given the need to recognize the policy constraints on the development of petrochemical exports, interviews were conducted with specialists and policymakers in this field. The selection of experts was carried out through judgmental and snowball sampling methods. Information about the interviewees is presented in Table 1.

Table 1. Characteristics of Experts in the Qualitative Phase

Abbreviation	Expert's Specialization	Field of Activity
P1	Economic Studies, Parliamentary Research Center	Research on non-oil exports and the petrochemical industry
P2	Director of Human Resources Development, National Petrochemical Company	Activities related to non-oil exports and the petrochemical industry
P3	Management, Petroleum Products Distribution Company	Activities related to exports and foreign interactions
P4	University Faculty Member	Research and activities in international trade relations

P5	University Faculty Member	Research on export strategies and international marketing
P6	Head of Public Relations, National Petrochemical Company	Consulting and activities in the field of trade
P7	University Faculty Member	Research and activities in exports and foreign trade
P8	CEO of Research and Technology, National Petrochemical Company	Research on export strategies, international marketing, and technology development
P9	Public Relations Manager, Chamber of Commerce, and Consultant to Parliamentary Committees	National exemplary exporter in 2016 and active in the petrochemical sector
P10	Consultant and Manager, Kermanshah Petrochemical Industries	National exemplary exporter in 2009-2010 and recognized as a top entrepreneur in the province
P11	University Faculty Member	Significant research background in petrochemical exports
P12	University Faculty Member	Member of the Iranian Economists Association, Iranian Scientific Marketing Association, and Iranian Executive Management Association with extensive research in exports
P13	Deputy Director of Petrochemical Complementary Industries Development Office	Extensive executive and research background in non-oil product exports and board member of Khuzestan Petrochemical
P14	Director of Foreign Trade Research Group, Institute for Trade Studies and Research	Representative of the Institute for Trade Studies and Research in the Commission for Trade Facilitation and Export Development, Tehran Chamber of Commerce, Industries, Mines, and Agriculture
P15	University Faculty Member	Research and activities in foreign trade transactions
P16	University Faculty Member	Research and activities in non-oil product exports

The qualitative data analysis in this section of the study revealed that from the analysis of 16 interviews and the review of 32 articles, a total of 132 initial codes were identified. After merging similar codes, 81 codes were extracted, categorized into 14 concepts, and ultimately classified into seven main themes. The categorization of the findings is presented in Table 2.

Table 2. Inhibiting Factors in the Development of Petrochemical Products Exports

Main Theme	Sub-theme	Extracted Codes from Interviews	Sources of Code Extraction
Weaknesses in governance policies	Lack of coherent and integrated national and international regulations	Frequent enactment of laws within very short timeframes (P2, P3) / Conflicts between national and sectoral interests in regulations (P7, P3) / Lack of full alignment between sectoral regulations and national laws (P11, P12, P3) / Discrepancies between executive regulations and the needs of producers and exporters (P4, P14, P16) / Unreliability of regulations due to rapid political changes (P2, P3) / Inefficiency of national laws in resolving export barriers (P11, P2) / Ineffectiveness of governmental and sectoral regulations in addressing export issues (P7, P14, P4) / Multiple amendments and supplementary directives in laws / Insufficient knowledge among experts and law enforcers (P7, P2, P12) / National regulations not facilitating international trade cooperation (P11, P7) / Excessive high-level regulatory documents in non-oil exports (P12, P11)	[2, 3, 20, 22-24]
	Absence of appropriate trade strategies in laws	Lack of a strategic plan for petrochemical industry development / Insufficient consideration for compliance with international trade laws (P2, P3) / Differences between national and destination country trade regulations (P7) / Weaknesses in customs regulations and tariffs of target countries / Ineffective utilization of membership in international trade organizations (P4, P2) / Failure to implement initial internationalization strategies / Lack of understanding of the trade strategies of target countries	[22, 25-27]
Structural and institutional issues	Lack of a proper economic and financial governance structure	Investment insecurity (P6, P10, P2) / Severe exchange rate fluctuations (P6, P3) / Price instability of raw materials and significant delays in investment returns (P16, P3, P13) / Issues related to currency fluctuations in the country / Lack of competitive advantage due to artificially suppressed exchange rates (P12, P15, P16) / Challenges in direct currency exchange between exporters	[10, 22, 25, 27-30]

		and importers at negotiated rates (P10, P12, P7) / Inability to utilize foreign investments due to sanctions (P6, P2)	
	Insufficient government support	Weak banking facilities and high loan interest rates (P3, P8, P1) / Ineffective government subsidies for exports and insufficient financial support (P9, P5) / Inefficiency of the stock market in securing investment for production units (P5, P11, P3) / Lack of direct government support in facilitating raw material purchases or guaranteeing product sales (P8, P9, P11, P1)	[20, 25, 31-33]
Political issues	Political conditions overshadowing decision-making	Security-oriented perspective on international trade / Political instability (P2, P6, P1) / Fear of national security threats posed by international trade (P7, P6) / National Security Council's resolution banning official cooperation with the U.S., Canada, and the U.K. (P12, P11) / Lack of a global export perspective and failure to recognize the need for export expansion (P12, P13, P2)	[20, 25, 31, 32, 34-36]
	International political climate	Negative perception of Iran due to international media propaganda (P1, P2) / Poor reputation of Iranian companies in global markets / Skepticism towards Third World countries and reluctance to purchase Iranian products (P6, P2) / Rigid societal culture (P11, P6) / Distrust of foreigners and weak intercultural communication (P12, P2) / High tariff rates imposed by target countries (P11, P7)	
Weaknesses in monitoring and evaluation systems	Lack of a comprehensive quality assessment system (input, process, output)	Use of low-quality raw materials to reduce costs and compete with foreign products (P5, P3) / Weak regulatory and quality control systems (P10, P5) / Obsolescence of production machinery (P5, P3) / Lack of liquidity for timely procurement of raw materials / Limited production capacity and concerns about sustainability (P6, P7) / Weakness in supply chain management (P5, P3) / Low labor productivity due to insufficient specialized knowledge, lack of motivation, or inadequate skills (P7, P5) / Use of low-quality raw materials compared to foreign counterparts (P15, P16) / Unclear production policies and objectives (P7, P6) / Inefficient warehousing and strategic storage systems (P5, P3)	[2, 20, 22, 37]
	Absence of an appropriate environmental analysis system	Inability to analyze markets and predict future product trends (P11, P8) / Lack of proper risk management strategies in petrochemical industries (P15, P16, P14) / Instability in petrochemical export revenues (P12, P10) / Lack of analytical assessment in evaluating weaknesses and opportunities in the environment (P14, P15, P13)	[15, 22, 26, 27]
Weaknesses in technological policies	Lack of an integrated media and advertising sales structure	Weak branding, after-sales services (returns, exchanges, repairs, CRM) (P16, P3, P15) / High distribution costs in traditional retail networks (P10, P9) / Lack of specialized retail stores, online sales platforms, outlet stores (P9, P3) / Uncompetitive pricing and weak advertising (P6) / Outdated technology / Weak research and development sector (P14, P11, P13) / Lack of innovation among employees (P9, P5) / Failure to develop multilingual websites (P11, P13, P10) / Insufficient hardware and software infrastructure for digital exports (P12) / Weak international virtual collaboration networks (P5, P3)	[2, 3, 20, 21, 36, 37]
	Weak technological infrastructure	Lack of ICT funding (P7, P5) / Absence of support for R&D personnel (P7) / No specialized training programs for digital exports (P10, P16) / Lack of pre-competition cooperation consortiums (P15, P5) / Lack of joint investments with technologically advanced countries (P10, P14) / Low production capacity due to outdated technologies (P10, P5) / Low technological and innovative capacity in petrochemical firms (P7, P15)	[34, 36, 38-41]

The findings from this section of the study identified several policies that have hindered the development of petrochemical exports, thereby slowing and prolonging the export growth process. The identified inhibiting factors stem from the current situation and indicate that certain impactful policy issues—including weaknesses in governance policies, structural and institutional issues, political challenges, deficiencies in monitoring and evaluation systems, market and marketing problems, lack of information and communication infrastructure, and weaknesses in technological policies—have created obstacles for petrochemical exports. Essentially, these inhibitors have led to the identification of policies required for the development of petrochemical exports. In the next stage, after recognizing the policy barriers to export development, the DEMATEL method was employed for prioritization.

The selection of experts in this section was conducted using a judgmental sampling approach. After identifying 16 experts, 10 completed the questionnaire. The number and specialization of these experts are presented in Table 3.

Table 3. Expert Characteristics in the Quantitative Phase

Field of Expertise	Number of Experts
University professors and experts in the petrochemical industry and exports	5
Policymakers in export and international trade	2
Petrochemical export companies	3

The DEMATEL method was applied to questionnaires designed based on the main categories extracted in the previous stage, which were completed by experts. Since multiple experts were consulted in this study, the calculation of an average matrix was required. Table 4 presents the mean matrix derived from the 10 completed questionnaires.

Table 4: Direct Relationship Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1)	0	3.2	3.1	2.7	2.8	2.3	2.4	2.8	2.2	2.5
(2)	1.3	0	2.1	2.3	3.1	2.8	2.6	3.2	3.1	3.1
(3)	1.2	0.9	0	1.6	1.4	2.4	2.2	1.8	1.3	1.1
(4)	2.2	3.2	2.1	0	2.7	2.4	2.3	2.3	2.7	2.0
(5)	1.8	2.2	2.1	1.8	0	2.4	2.5	1.9	3.2	1.8
(6)	1.4	1.9	1.3	1.2	3.3	0	2.4	2.1	1.8	2.5
(7)	1.2	1.7	1.8	1.7	3.1	3.5	0	2.7	1.6	1.7
(8)	0.9	1.8	0.9	1.3	2.9	3.1	3.2	0	2.4	1.8
(9)	1.6	2.1	1.8	1.6	3.2	2.7	3.1	2.3	0	1.6
(10)	0.9	1.3	1.1	1.0	1.6	3.2	2.5	2.4	1.3	0

At the final stage, the values for D, R, D+R, and D-R were calculated. D+R represents the level of interaction, while D-R indicates the influencing power of each factor. The final output is presented in Table 5.

Table 5: Final Output

Factor	R	D	D+R	D-R
Weaknesses in governance policies	2.137	4.622	6.759	2.485
Structural and institutional issues	3.342	4.537	7.879	1.195
Political issues	2.837	2.642	5.479	-0.195
Weaknesses in monitoring and evaluation systems	2.474	3.812	6.286	1.338
Market and marketing problems	4.532	3.231	7.763	-1.301
Lack of information and communication infrastructure	4.547	3.481	8.028	-1.066
Weaknesses in technological policies	3.672	3.104	6.776	-0.568

The cause-and-effect diagram is presented in Figure 1, where factors below the x-axis are categorized as effects, while those above it are causes.

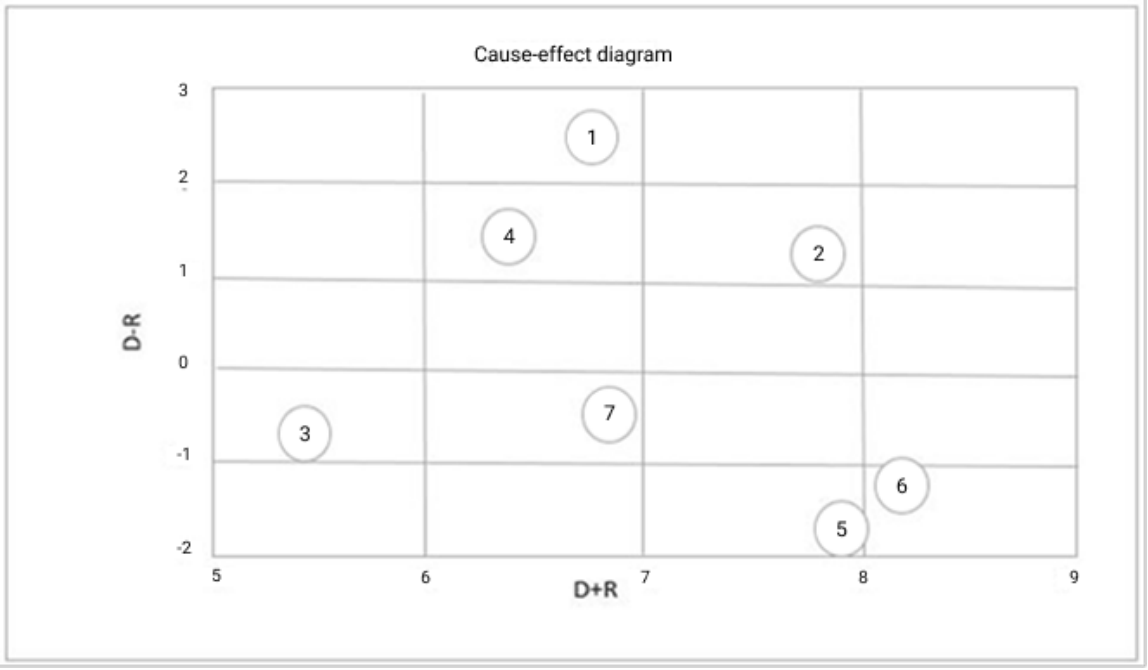

Figure 1. Cause-and-Effect Diagram

The D value indicates the degree to which a factor influences other factors in the system. Based on this measure, "weaknesses in governance policies" had the highest impact among all factors, followed by "structural and institutional issues." The sum of each column's elements (R) represents the degree to which each factor is influenced by other variables. In this study, "lack of information and communication infrastructure" exhibited the highest level of dependence.

Considering the D + R values, "structural and institutional issues" demonstrated the highest interaction with other factors. When analyzing the D - R vector, any positive value signifies a causal variable, whereas a negative value denotes an effect. Consequently, based on Figure 1, the factors categorized as causes include "weaknesses in governance policies," "structural and institutional issues," and "weaknesses in monitoring and evaluation systems", whereas all other factors are considered effects.

4. Discussion and Conclusion

The objective of this study was to identify policy-related inhibitors to the development of petrochemical product exports in Iran. To achieve this, interviews were conducted with experts in international trade within the petrochemical industry and relevant managers. The initial objective of identifying influential factors was accomplished in the qualitative phase. Using thematic analysis, 81 codes were extracted based on previous studies and interviews with experts and policymakers in petrochemical exports. These codes were categorized into 14 concepts and ultimately grouped into seven main themes: weaknesses in governance policies, structural and institutional issues, political challenges, deficiencies in monitoring and evaluation systems, market and marketing problems, lack of information and communication infrastructure, and weaknesses in technological policies. The next objective of the study was to prioritize these factors since any intervention to address the identified inhibitors requires a focus on the root causes. To achieve this, the DEMATEL method was used, and ultimately, three fundamental root causes were identified.

The results indicated that one of the most significant inhibitors of petrochemical export development in Iran is weaknesses in governance policies within the petrochemical industry. This issue includes the lack of coherent and integrated regulations at the national and international levels and the absence of an appropriate legal strategy. The commercial performance of a country is largely influenced by its governing laws. Developing countries must consider multiple factors when formulating and regulating petrochemical export laws. This inhibiting factor aligns with the prior findings [2, 19, 20, 22-25, 33]. These studies highlighted that many laws result in overlapping responsibilities among multiple institutions involved in export development. Additionally, policies and laws sometimes contradict one another and fail to clearly define responsibilities. The excessive and conflicting regulations prevent organizations from effectively planning their participation in export activities. It is recommended that regulatory bodies with greater precision and clarity in drafting laws be involved, and that government agencies such as provincial administrations, chambers of commerce, and other relevant institutions hold multiple meetings to prevent overlaps and contradictions in policies and to specifically address related issues.

Another major inhibitor is structural and institutional issues in petrochemical export policies. Weaknesses in monetary and exchange rate policies, investment insecurity, and severe exchange rate fluctuations were identified as critical concerns. This section of the study is consistent with the prior findings [10, 25, 28, 29, 33, 42]. Based on these findings, it is suggested that the government and parliament collaborate in developing initiatives to support petrochemical product exports as a national priority. Additionally, due to sanctions, access to foreign capital is severely restricted. To mitigate this issue, it is recommended that state-controlled currency exchange branches and a foreign exchange order registration system be established in strategic regions to resolve the challenges of direct currency exchange between exporters and importers. Another structural and institutional challenge is the lack of governmental support for petrochemical exports. The findings showed that not only is there insufficient government encouragement, but existing policies impose additional restrictions. The lack of governmental support and the minimal allocation of subsidies for petrochemical exports necessitate a fundamental shift in policies to incentivize exports and eliminate restrictive measures. This finding is consistent with prior findings [20, 22, 25-27, 30-33, 35]. These studies collectively suggest that strong governmental support for exports can attract international investment, improve foreign relations, and reduce inflation and production costs. Furthermore, reforms in customs regulations, market knowledge, and export-related legislation could significantly enhance and expand exports.

Another key barrier to petrochemical export development in Iran is weaknesses in the monitoring and evaluation system governing the industry. Unfortunately, the production of petrochemical products lacks adequate manufacturing capacity and quality control. Through effective monitoring and evaluation systems, producers could improve their production quality and enhance export competitiveness. Additionally, exporting companies could sustain and expand their operations despite environmental fluctuations by leveraging domestic resources with high differentiation potential. One of the most significant marketing challenges faced by petrochemical exporters is the lack of specialized research and development firms in petrochemical marketing, the absence of a comprehensive export strategy, weak environmental analysis, and insufficient market positioning capabilities on a global scale. To address this, it is recommended that a team of specialists with a market-driven approach be formed to generate and analyze market intelligence. This initiative would enable exporters to identify customer needs, assess competition, evaluate environmental threats and opportunities, and implement strategic policies in coordination with export firms, ultimately maximizing international market opportunities.

Future Research Recommendations

- Develop and implement appropriate strategies to analyze target markets from economic, social, and political perspectives.
- Establish comprehensive information banks to support companies in gathering relevant market data.
- Strengthen information and communication infrastructure to enhance e-commerce capabilities.
- Design research programs to identify quality and perceptual standards in target markets and provide this information to exporting petrochemical companies. Developing such standards and creating a supportive regulatory framework could encourage firms to comply with international quality benchmarks and enhance competitiveness in foreign markets.

Authors' Contributions

This article is derived from a doctoral dissertation in the field of Management and Science and Technology Policy at Mazandaran University.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

Acknowledgments

Authors thank all participants who participate in this study.

Conflict of Interest

The authors report no conflict of interest.

Funding/Financial Support

According to the authors, this article has no financial support.

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