

Article

Research on Diversification Strategies of Terminal Operators—Evidence from Polish Seaports

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Abstract: In response to changes taking place in the global environment, seaport terminal operators constantly search for lines of development in their operations, choosing i.a. a strategy of diversification or specialisation. So far, the issue of applying a diversification strategy in business models used by operators of multipurpose terminals has not been sufficiently addressed in the literature on the subject. In view of the above, the purpose of this paper is to identify and hierarchize the motivations for diversification and to specify the areas of diversification strategies and corresponding measures taken by operators of multipurpose terminals. The multi-case-study method was applied to conduct the research, along with the research technique of semi-structured in-depth interviews held with representatives of five terminal operators that had been running their business activity in Polish seaports and applying a diversification strategy. As a result of the completed research study, it was possible to specify the motivations for implementing a diversification strategy, and to hierarchize them. The main motives in selecting a diversification strategy as the main business strategy among the interviewed terminal operators were safeguarding against seasonal or sporadic business cycle fluctuations, and changes taking place in maritime trade and transport. Moreover, four areas of diversification strategies pursued by the terminal operators were identified: cargo diversification, contract diversification, services diversification, and cargo flow direction diversification. The diversification measures taken by the terminal operators in the specified areas were analysed in detail. The most important areas of the diversification measures in the studied entities were cargo diversification and services diversification. A heat map was developed to present the dependencies between the motivations for diversification and the areas of diversification strategies implemented by the terminal operators. The identified specific measures taken by the terminal operators as part of the indicated diversification areas included technical and organisational measures. The diversification strategy developed by terminal operators proved to be an effective strategy in coping with the effects of economic slowdown and disruptions ensuing from the COVID-19 pandemic and war in Ukraine. The results of the considerations may be of interest to seaports, transshipment terminals or other entities interested in implementation of a business activity diversification strategy.

Keywords: seaport; multipurpose terminal operator; stevedore; business models; diversification strategy



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1. Introduction

With the development of technology and increased competition in the business environment, enterprises started to diversify their activity first and foremost to reduce the risk [1]. The turbulent competitive environment in which seaports now operate determines the way of strategic development of transshipment terminal operators (also referred to as stevedoring companies or stevedores) and inclines them to adopt an appropriate development strategy. Such a strategy should consider both the turbulent changes in the

port's environment (such as the COVID-19 pandemic and the war in Ukraine) and the specific conditions ensuing from the port's position in the global market of port services (hub ports and secondary ports). Specialisation and diversification are the two fundamental dimensions of development for a contemporary seaport [2], mainly identified with the types of cargoes handled.

Previous research studies regarding terminal operators' strategies focused predominantly on the activities and strategies of container terminals that operate in large seaports, i.e., specialisation strategies. There are few studies addressing diversification strategies in business models followed by operators of multipurpose terminals, operating in multipurpose, small and medium ports or secondary ports [3,4]. Secondary ports function in a highly competitive environment of large hub ports, also providing complementary functions for them [5]. This has a significant effect on the directions of strategic development of terminal operators in secondary ports. Compared to hub ports, secondary ports to a larger extent experience the effects of structural changes taking place in the world economy, maritime trade and transport, which are also stimulated by the increasingly strict climate policy [6–8]. The impact of those changes on the operations of seaports is manifested by the gradual decrease in trading of traditional bulk cargo groups (coal, ores) or general cargo. The competitiveness of this category of ports is also limited by their technical parameters, which prevent the ports from handling increasingly large vessels that are put in operation. Consequently, secondary ports are under strong pressure as they need to attract new cargo groups to replace those on the decline. This justifies implementation of diversification measures by terminal operators, focusing on the search for new cargo groups, new cargo flow directions and expanding the range of offered services.

The analysis of the available literature has shown that issues connected with operations diversification strategies adopted by multipurpose terminal operators have not been sufficiently addressed, which justifies the need to take up in-depth research in this regard. The purpose of this paper is to identify and hierarchize the motivations for diversification and to specify the areas of diversification strategies and corresponding measures taken by operators of multipurpose terminals. The study described in this article was based on the experiences of some terminal operators running their operations in Polish seaports. Over the past decades, these enterprises were subject to many transformation processes ensuing from changes in the global environment as well as in the Polish economy in connection with its transformation at the end of the 20th century followed by Poland's accession to the European Union [9,10]. In particular, the changes of key importance are those regarding the types of entities and cargoes involved in the Polish foreign trade as well as cargo flow directions, and changes connected with the possibilities of foreign capital flow to Poland. These factors had a significant impact on the activity of terminal operators in Polish seaports and were decisive in selecting their development strategies.

This article includes a Literature Review section where diversification in the ports' and terminal operators' strategies is analysed in detail. The Research Methodology section contains a description of the way the research was conducted. Motivations for and areas of diversification strategy implementation by multipurpose terminal operators in Polish seaports, as well as measures taken in the individual diversification areas, were analysed in the Results section. The Discussion section compares the research results with results of other research studies. A summary of the obtained research results can be found in the Conclusions section.

2. Literature Review Regarding Ports' Strategies Diversification

In the literature on strategic management, it is underlined that a diversification strategy refers predominantly to an increase in heterogeneity of the enterprise's products market [11]; therefore, it is a business strategy aimed at the development of new markets with new products. However, diversification is manifested not only by an increased number and diversity of finished products, but also by horizontal and vertical integration of enterprises [1,12,13]. Two main types (levels) of diversification strategy are distinguished:

related diversification and non-related diversification (related or unrelated to the firm's primary activity) [1,13]. The related diversification is also referred to as concentric diversification, which relates to choosing the enterprise's new product or market area based on its previous business activity or market. In comparison with the unrelated diversification, also referred to as centrifugal diversification, related diversification fosters full utilisation of the original knowledge held by the firm, own skills, marketing channels and other advantages, and the integration risk is small. The major reasons for choosing a diversification strategy by enterprises are as follows [1,11]: (1) to improve competitiveness (through economies of scale, scope and market influence), (2) to diversify a non-systemic risk (through diversified business portfolio), (3) to utilise the resources to the maximum (advantages of utilising them in various industries).

However, the hitherto-completed studies have shown that there is still no final answer to the question of whether or not a diversification strategy is advantageous in terms of the enterprise's financial results. There is no homogeneous consensus about a relationship between a diversification strategy and a company's financial results. Based on a literature review, Le (2019) [1] analysed the relationship between an enterprise's diversification strategy and the enterprise's financial results, and found that there are four different relationships: positive correlation, negative correlation, lack of significant correlation and non-linear correlation. Nevertheless, the author stressed that the core competences of an enterprise constitute a fundamental support for diversified business operations and a deeply rooted factor in formulation and implementation of diversified business strategies. Differentiation of diversification strategy effects is connected with the specific nature of the industry and the market in which the enterprise operates, particularly in the context of the influence of external factors.

Over the recent decades, the development of the maritime logistics has been considerably influenced by business environment factors whose impact is reflected by the changing role of seaports in supply chains and logistics [14]. The hitherto-completed studies underline that ports operate in a multi-stakeholder environment, which should be taken into account when measuring the performance, monitoring and planning the operations of ports and terminals. This in particular pertains to stimulating the cooperation and joint activities of port stakeholders in order to achieve common goals in the ports [15].

To plan their development, seaport authorities and operators of terminals located within the ports devise and regularly verify their development strategies. The strategies may cover various operation areas of ports and terminals, and they take into account not only the impact of external (e.g., import, export, investments) [16], but also internal factors (e.g., competition and performance may be diverse in various port sectors) [17]. The literature presents numerous analyses of seaport strategies which cover measures in the areas of infrastructure development, natural environment protection, automation and digitalisation, improved quality and scope of services provided, partnership, pricing, and other [18,19]. The current trend is to make ports more sustainable and smarter [20]. It is pointed out that there is a need for comprehensive improvement in the way ports are managed [21].

Nevertheless, one of the key areas of strategic decisions made by port authorities and terminal operators is figuring out the scope of cargoes to be handled in the port. The specialisation strategy is followed by single-function terminals, such as container terminals, ferry/ro-ro terminals or homogeneous bulk cargo (e.g., grain, fuel) terminals, whereas the diversification strategy is adopted by multipurpose terminals that handle cargoes from various cargo groups and provide services that are complementary to transshipment and storage.

Ducruet (2010) [2] pointed out that diversification of cargo traffic in a port is the most common, though costly, diversification strategy (investing in new facilities and equipment), whereas striving for specialisation corresponds to enhancement of the existing potential of the technical facilities (e.g., expanding the terminal). The authors indicated in particular that two major factors influence the diversity of cargo traffic in a port: continental hinterland

and local economy. Ports with a large and diversified hinterland may handle a greater variety of cargoes than ports with a narrow and specialised hinterland (e.g., mines or forest produce). Ports may also compete for the same cargo in a shared hinterland, and the competitiveness factor may be the quality of access from the land side (by road, rail, or inland waterway). It was pointed out that, from the perspective of the particular nature of a local economy, ports may develop into specific industrial clusters (e.g., refinery, petroleum) using the economies of scale and creating synergy effects between selected activities. The size and diversification of the economic structure of a port city also has an impact on the volume and variety of traffic in the port. Larger ports are also more diverse due to playing the role of a gate to a large hinterland or agglomeration (of port cities and regions). Smaller, local ports rely on a limited assortment of the local hinterland.

Ducruet (2010) [2] also indicated that concentration of containers in larger ports is detrimental to the development of secondary ports. Furthermore, Schubert (2012) [22] noticed that it is the changes in logistics and globalisation in the case of a large group of British ports that led i.a. to changes in the land use of former port areas and their re-use for residential and office development. In addition, the studies conducted in major ports on the east and west coasts of the USA have shown that some ports evolved from their traditional revenue flows connected with cargoes towards real property rental and related services [23]. Various factors inclined many ports to diversify their business models in order to ensure an alternative to their traditional activity. The mentioned factors included: long- and short-term trends in consumers' requirements, shipping trends, environmental restrictions, real property value, stakeholders' support, and governmental policy. In the latest study, [24], the authors focused on the model of the port life cycle and port entities' strategies followed in order to prevent deterioration of the port's competitiveness when the port experiences geographical or economic limitations. The authors analysed a conflict situation with regard to port management at a national and local level, and the division of the management between the neighbouring municipalities, which led to a situation where old and new ports appeared to compete with one another rather than become complementary transport and logistics nodes.

The identified problems regard in particular secondary ports threatened with ageing and negligence, ensuing from i.a. the ongoing transformation of port grounds to serve municipal and tourist functions, at the same time departing from the traditional port activity. Nonetheless, many secondary ports still intensively carry on the core, traditional function connected with ship handling, utilising their competitive potential such as the multipurpose type of activity and increasing the diversity of cargo groups handled. After all, the studies completed so far have indicated, for all ports, that a key requirement for commercial and economic viability is to retain the business of the ships served by them and to remain accessible to those ships [25].

The ports' ability to develop the core transshipment and storage function and selection of the type of cargo to be handled in the port to a large extent depend on the access to the dedicated port infrastructure and the indispensable equipment. It is believed that there is a significant relationship between port infrastructure development and foreign trade [16]. In [26], it is indicated that changes in imports and exports of selected cargo groups (e.g., raw materials) have a significant impact on ports' strategic decisions, while decreased dependence on raw materials and diversification of cargo flows may be decisive for the long-term stability of ports. It was also found that when the environment is unstable, any inappropriate, capital-intensive, large-scale port construction projects should be avoided. Instead, it is reasonable to save and focus on maximal utilisation of the current potential, upgrading of the existing infrastructure, increasing the ports competitiveness i.a. via the application of modern technologies, searching for opportunities and replacing some cargo groups with other cargoes. The relationship between implemented investment projects and the economic growth rate is also underlined.

As part of the scenario analysis, there were also studies comparing the port services prices, demand for port services and ports' profits in various combinations of competition

and cooperation [27]. In addition, simulation models are developed to make forecasts and evaluations of the ability to implement changes in the activities of ports and terminals [28]. Such models are based on selected criteria that take into account i.a. the global and regional economic situation, development of ports or terminals, competition growth, possible limitations due to the neighbouring countries, logistics platform functioning, and other factors.

The hitherto-completed studies have confirmed that the diversification strategy is particularly common in secondary port activity, and it is, among other things, an answer to their limited transport accessibility from the foreland and hinterland, and the risk of excessive financial dependence on the changing or vanishing cargo groups (financially fluctuating commodities) [29,30]. On the other hand, the other studies [2] have shown that large hub ports are better adapted to maintaining and expanding their cargo portfolio—i.e., to diversification based on effective integration of strong connections with the hinterland and foreland. The smaller ports, in turn, are constrained by the activity of hub ports when they attempt to achieve a better competitive position. At the same time, the research studies have proved that strategies of specialisation and diversification of port activities are co-existing, and both may contribute to development of seaports.

The evaluation of the effectiveness of 27 Spanish ports carried out by (Pérez, González, and Trujillo (2020) [31] has shown that the larger and more specialised ports are more efficient. It would be recommended to encourage port specialisation and cooperation between ports with different specialisations, and between smaller ports. That would enable the development of strategic planning that would facilitate coordination between ports, joint development of infrastructure and avoidance of service replication. In turn, Hidalgo-Gallego et al. (2020) [32] analysed the impact of cargo specialisation on the Spanish port authorities' technical efficiency. Port specialisation was examined on various levels. The research results have shown that the increasing specialisation in general cargo transport improves the technical efficiency. Nevertheless, it is not recommended to be specialised in liquid or solid bulk cargoes—these cargoes should preferably be transhipped together with other kinds of cargoes. Finally, full specialisation is not recommended in terms of an increase in technical efficiency.

Moreover, the studies completed so far have shown that even though specialisation has a positive effect on the results of seaport activity [33], excessive specialisation, understood as strong dependence on several kinds of cargoes, may be detrimental not only to the ports, but also to the local economy dependent on the port [34]. In turn, diversity of port activity unambiguously stimulates the port's growth and development [35]. On the other hand, according to some studies [34], the global shipping network is strongly dependent on the more diversified transport nodes which in turn take over the greatest traffic and show higher connectivity.

However, a diversified service offer at the seaport level does not have to translate into a diversified service range offered by operators of terminals operating in the seaport. The hitherto completed studies on diversification strategies were taken up mainly from the perspective of a seaport rather than from the level of individual stevedoring companies. Importantly, there are considerable differences in understanding 'a diversification strategy' in both research perspectives. From the point of view of a seaport, it may be said that the port offers a diversified range of services when, within its area, there are: (1) multipurpose terminal operators, handling various cargoes, (2) terminal operators specialised in handling one cargo type, but as a group handling several cargo types, (3) combination of multipurpose and specialised terminal operators (the mixed solution) (Figure 1).

From the point of view of a terminal operator, a multipurpose enterprise will be the one that is ready to handle several cargo types, whereas a specialised enterprise will handle only one.

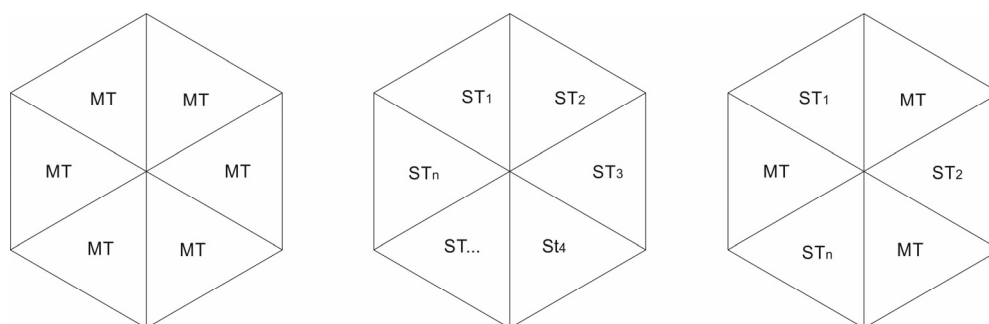


Figure 1. Types of multipurpose seaports. Key: *MT*—multipurpose terminal; *ST*—specialised terminal; 1,2,3, . . . ,*n*—type of cargo.

Studies of diversification strategies from the perspective of terminal operators are rarely carried out. The studies published to date mainly address specialisation strategies of terminal operators handling one cargo or freight unit type. In those studies (particularly the earlier ones), the focus was predominantly on analysing the operations of leading container terminal operators and their relations with shipping lines. They also underlined the issues of the increasing and aggressive engagement of shipping lines in stowage activities and development of dedicated container terminals in seaports [36,37]. Later studies also referred to the phenomenon of intensive competition between shipping lines and terminal operators, and to measures taken by the terminal operators in response to the aggressive strategies of container ship operators. The studies showed that the terminal operators started to expand their activity on the international level, developing extensive networks of terminals in various regions of the world [38].

However, it was only to a small extent that these studies analysed diversification strategies implemented by operators of multipurpose terminals that offer handling several different cargo types. The strategies are implemented in multipurpose terminals and in terminals being transformed from specialised ones towards diversified ones and/or expanding the range of handled cargo groups. One of few studies in this area, authored by Parola, Satta, and Panayides (2015) [39] has shown a positive relationship between diversification and terminal operators' financial results, but only in the case of the related diversification strategy, strongly relying on the core activity. This was also confirmed by later studies showing that a diversification strategy developed by terminal operators proved to be an effective strategy in coping with the effects of economic slowdown and disruptions ensuing from the COVID-19 pandemic [40,41]. In particular, flexibility of terminal operators' activities and ability to react quickly to disruptions in supply chains during the COVID-19 pandemic made it possible to maintain and even increase the transshipment level, and thus also business growth.

However, previous studies have not provided a complete answer to the question: which motives incline operators of multipurpose terminals to implement a diversification strategy? Apart from cargo diversification, in which areas are diversification measures implemented? Which measures are taken to implement diversification tasks in individual diversification areas? The study described in this article was aimed at filling this research gap.

3. Research Methodology

The multi-case-study method [42] was applied for the purposes of this paper. In the first stage of the research study, a literature review was carried out (presented in Section 2), which highlighted an existing research gap.

Based on the conclusions of the literature review, the following research questions were formulated:

1. What are the main motives inclining multipurpose terminal operators to implement a diversification strategy?

2. In which diversification areas do diversification activities take place?
3. What are the scenarios and effects of measures taken in connection with cargo diversification?
4. What is the course of diversification measures taken in other diversification areas?

In the second stage, the research techniques and the main objects of the research were selected.

The applied research technique was the semi-structured in-depth interview (IDI) [43], held with representatives of terminal operators who operate in Polish seaports and implement a diversification strategy. The study adopted a definition of a terminal operator as an enterprise operating within the territory of a seaport or several seaports (in one or several port areas), providing various port services, including, in particular, transshipment and storage [40]. Our IDI included the following stages: thematising, designing, interviewing, transcribing, analysing, verifying, and reporting.

The first step in conducting the semi-structured IDI was to identify the entities. The surveys were conducted among terminal operators located in Polish seaports in Szczecin, Gdańsk and Gdynia and running their activity in areas supervised by port authorities. Table 1 presents synthetic characteristics of the selected entities covered by the study.

Table 1. Synthetic characteristics of the surveyed terminal operators.

Terminal Operator	Location (Port)	Main Cargo Types Handled	Draught of Ships Handled at the Quays	Represented by (Respondent)
A	Szczecin	other bulk, coke, conventional general cargoes	up to 9.15 m	Board Vice-President
B	Szczecin	conventional general cargoes, containers	up to 9.15 m	Board Presidents
C	Szczecin	conventional general cargoes, other bulk	up to 9.15 m	Board President
D	Gdynia	ro-ro, conventional general cargoes, grain	up to 13.0 m ¹	Commercial Director
E	Gdańsk	coal and coke, general cargoes, grain	up to 10.2 m	Chief Dispatcher

¹ Draught of 8.8 m–13 m is found at one quay only at the other quays it is possible to handle ships with draughts below 8.8 m.

The selection of the entities to be covered by the study was based on a diverse profile of activity. Over the recent decades, each of the surveyed terminal operators experienced significant changes in the compositions of the handled cargo groups. Terminal Operator A is a company based on managerial capital, operating in the bulk cargo area of the Szczecin port. In the past, it specialised in transshipment of coal exports; currently, its transshipment volume is dominated by other bulk cargoes, conventional general cargoes, and coke. Terminal Operator B is a company that is part of a large European logistics group, operating in the general cargo area of the Szczecin port. In the past it handled conventional and containerised general cargoes, but it has now expanded its activity to include ‘other bulk cargoes’. Terminal Operator C operates in the general cargo area of the Szczecin port and is part of an international group of companies engaged in management of shipping and port activities. In the past, it handled conventional general cargoes, while it has now expanded its activity to include ‘other bulk cargoes’. Terminal Operator D is a company operating in the internal port in Gdynia and is part of a logistics group dealing with cargo transport and transshipment. In the past, it handled mainly multipurpose general cargoes; currently, it has expanded its share of ro-ro general cargoes and expanded its activity to include bulk (mainly agricultural) cargoes. Terminal Operator E is a company operating in the internal port in Gdańsk, currently looking for a strategic investor (the majority of its shares is held by the Port of Gdańsk Authority). In the past, it handled (mainly conventional) general cargoes and dry bulk cargoes (in 50/50 proportion), but

has now considerably increased the share of dry bulk cargoes, mainly in the coal and coke group.

The surveys were conducted via direct personal meetings or telephone calls in the period from April to June 2022. The time frame referred to by the interviewees covered the past 20–30 years. The surveys were held using the questionnaire specially developed for that purpose (see Supplementary Materials). The research results are presented in a descriptive and graphic form. Inductive reasoning was applied in the analysis of the research results [44].

The obtained research results served as the basis for identifying the areas of diversification and the terminal operators' motivations for diversifying their activity. Next, based on the results, a heat map was prepared to present the dependencies between the motivations influencing the terminal operators' activity and the diversification measures taken by them. On that basis, the identified motivations were hierarchized. The research results were compared with the related literature.

4. Results

4.1. Diversification Areas and Motivations for Diversification Strategies Implemented by Multipurpose Terminal Operators in Polish Seaports

At the beginning of the survey, each of the representatives of the terminal operators confirmed that the entity represented by them implemented a diversification strategy in its operations. The representatives of the terminal operators were asked to name their motivations for implementing a diversification strategy, by choosing them from among the motivations identified on the basis of the literature review and suggested in the questionnaire. The biggest set of motivations to implement such strategies was presented by Terminal Operator A, which was related, among others to: the initial specialisation in coal exports handling, the limited parameters of ships entering the Szczecin port, lack of capital ties with large cargo shippers, maritime or land transport operators).

The breakdown of the motivations for diversification strategies implementation, selected by the representatives of the terminal operators, is presented below:

- deteriorating competitiveness in connection with changes taking place in maritime trade and transport (A, B, C, D);
- changes in the hitherto served cargo markets or geographical markets (A, B, C);
- emergence of new cargoes or new geographical markets (A, B, C);
- expectations of cargo shippers regarding extension of the scope of services (A, B);
- changes in the energy policy/ climate pressure (A);
- safeguarding against seasonal or sporadic business cycle fluctuations, (A, B, C, D, E);
- other, such as e.g., intra-port competition.

A motivation mentioned by the representatives of all the entities was "safeguarding against seasonal or sporadic business cycle fluctuations", such as, e.g., pandemics or armed conflicts. The second most frequent motivation was "deteriorating competitiveness in connection with changes taking place in maritime trade and transport", including in particular the rising carrying capacity of ships and decreasing importance of maritime transport in Poland's total foreign trade volume, ensuing from the more advantageous freight sale/purchase conditions on the continental markets, particularly in view of the single EU market.

The surveys started shortly after the onset of the Russian invasion of Ukraine. During the interviews, the representatives of the surveyed entities confirmed that the theoretical assumptions of diversification strategy implementation in connection with the conflict had so far proved correct. This can be noticed in two areas, i.e.:

- minimising the losses in transshipment despite the problems ensuing from the embargo imposed on cargoes from Russia;
- high flexibility connected with the possibilities of handling new cargoes, i.a. the transit of grain and iron ore from Ukraine and coal imports arriving in Poland as a result of the embargo on Russian coal.

In the course of the research process, the following four areas of terminal operators' business activity diversification were identified:

5. cargo diversification—i.e., changes in the composition of cargoes handled at the terminal;
6. cargo flow direction diversification—i.e., changes in the flow direction of cargoes handled (unloading and loading);
7. contract diversification—i.e., changes in the number of cargo shippers served at the terminal;
8. services diversification—i.e., expanding the scope of offered services to include additional added value services which are complementary to the core services of transshipment and storage.

The surveyed terminal operators have so far taken, to various extents, diversification measures in the following areas:

9. cargo diversification (A, B, C, D, E);
10. cargo flow direction diversification (A);
11. contract diversification (A, C, E);
12. services diversification (A, B, C, D, E).

The most significant area of diversification was the cargo diversification. However, the detailed scenarios of diversification processes differed for the individual terminal operators. Furthermore, the meaning of motivations for taking the diversification measures varied.

4.2. Measures in the Area of Cargo Diversification

In the area of cargo diversification, the main trend entailed increasing the share of bulk cargo transshipment (B, C, D, E), whereas an increase in the share of general cargoes was identified only in one case (A).

At the beginning of the 2000s, coal exports accounted for 2/3 of the transshipment volume of Terminal Operator A. As a result of the reduction in coal mining in Poland, in the years 2012–2020, the coal transshipment volume decreased eight-fold. As a result of the drop in coal exports and the ensuing need to search for alternatives, investments were made that enabled handling trucks to work directly at the quay, the existing warehouses were upgraded or new ones were constructed, and the terminal was additionally equipped with transshipment facilities and mechanised equipment. In the first place, the diversification measures resulted in an increased share in the total transshipment volume of dry bulk cargoes other than coal (mainly from the 'other bulk cargoes' group). As from 2015, the transshipment of general cargoes (mainly steel mill products and cellulose) increased significantly. However, the attempts to handle grain and feed cargoes failed.

Measures taken by Terminal Operator A resulted in significant changes in the composition of handled cargoes. At the beginning of the 2000s, coal accounted for nearly 70% of the cargo volume. The decrease in the coal transshipment volume was gradually compensated by an increase in the transshipment of other dry bulk cargoes. These changes were particularly visible after 2010. In 2015, the share of 'other bulk cargoes' in the total transshipment volume of Terminal Operator A was already as much as 43% (10% more than the share of coal). In subsequent years, conventional general cargoes started to gain increasing importance, and at the end of the studied period, their transshipment accounted for nearly 1/3 of the total transshipment volume.

In the case of diversification consisting in increasing the share of bulk cargoes in the total transshipment volume, the processes developed slightly differently depending on the individual terminal operators.

As for Terminal Operator B, their engagement in transshipment and storage of dry bulk cargoes was connected with seasonal fluctuations in conventional general cargo transshipment. The diversification measures required investments in transshipment facilities, handling facilities, storage facilities, and also obtaining the certificates and meeting other formal requirements connected with grain cargo handling. The highest share of bulk cargoes in the total transshipment volume amounted to 13–14% (2020–2021). However,

the main cargo groups handled by this operator are conventional general cargoes and containerised cargoes. Terminal Operator B also saw temporary changes in the proportion of conventional general cargoes and unitised general cargoes. For example, when the container freight charges were high, granite was transported in the conventional manner and cut in Poland, but when the container freight charges were lower, granite was transported in the form of cut-up slabs placed in containers.

Terminal Operators C and D followed similar paths of cargo diversification. Terminal Operator C constructed (in addition to the general cargo-handling terminal operating since 1989) a new terminal for handling dry bulk cargoes (2017); in addition, both terminals were managed by one operator. As for Terminal Operator D, commencing the handling of bulk cargoes (2010—agricultural, 2011—dirty bulk cargoes) entailed taking away some of the space previously used for handling conventional general cargoes, and dedicating it to handling dry bulk cargoes. These strategies required both entities to make investments in transshipment facilities, handling facilities and storage facilities for bulk cargoes. Terminal Operator C also invested in handling facilities for conventional general cargoes, while Terminal Operator D also acquired terminal tractors and reach stackers for ro-ro cargoes.

In the studied period, Terminal Operator C systematically increased the transshipment volume of the main cargo group handled—conventional general cargoes. In the 1990s, when the enterprise commenced its operations in the port of Szczecin, it had two large contracts to serve the English market. Over time, it successfully took over cargoes from competitors, offering faster service and minimising the number of handling operations, and in 2007 it started physical handling of the transshipments on its own. The construction of the bulk cargo terminal (2017) resulted in an increased share of bulk cargoes in the total transshipment volume of Terminal Operator C (from 0% to 30% in 2020).

As for Terminal Operator D, over the studied period there was an increase in the share of ro-ro general cargoes in relation to conventional /lo-lo general cargoes (from 25% to 40–45%). Significant changes in the composition of handled cargoes were seen after commissioning the agri-bulk cargo terminal (since 2010 the share of agricultural cargoes rose from 10% to 46%).

In the case of Terminal Operator E, the stronger and stronger tendency for unitisation of general cargoes and the vicinity of the Deepwater Container Terminal (DCT) resulted in a decrease in the share of general cargoes in the total transshipment volume in the studied period. Terminal Operator E systematically increased the share of dry bulk cargoes (mainly coal imports, coke exports, grain, and recently also ores) in their total transshipment volume. Furthermore, the investment policy supported this line of development, focusing on purchases of loaders and storage yards hardening. The outcome of the cargo diversification was the changed share of dry bulk cargoes in the total transshipment volume of Terminal Operator E. While in the 1990s, the shares of conventional general cargoes and dry bulk cargoes were equal, at the end of the 2010s it was ca. 30% conventional general cargoes vs ca. 70% dry bulk cargoes. The Operator totally abandoned the transshipment of containers.

Summing up the measures in the cargo diversification area, it should be stressed that:

13. In general, mainly dry bulk cargoes were used for the purposes of diversification measures.
14. Some of the cargoes found their way to the service offer of the individual operators as a result of their intentional marketing activities or starting cooperation with one or more cargo shippers; however, some part of the cargoes was an effect of the flexible response to the seasonal large cargo volumes.
15. In terms of durability, diversification scenarios based on dry bulk cargoes may be classified as follows:
 - permanent changes to the cargo composition, spreading over all months in a year and observed over periods of several years;
 - seasonal changes regarding cargoes such as grain or fertilisers.
16. The entities which experienced permanent diversification effects—as a result of utilisation of dry bulk cargoes—implemented:

- diversification strategies based on various dry bulk cargoes transhipped with the use of the existing infrastructure,
- diversification strategies based on investments in specialised dry bulk cargo terminals.

4.3. Measures in the Other Areas of Diversification

4.3.1. Cargo Flow Direction Diversification

Over the studied period, Terminal Operator A implemented the cargo flow direction diversification. As recently as at the end of 1990s, its operations focused predominantly on coal export handling. Currently, cargoes from all the major cargo groups are handled on both export and import routes. In addition, the pick-up and delivery locations of cargoes in the foreland are more diverse than in the past. This regards cargoes being the object of the Polish foreign trade as well as those in transit.

As regards Terminal Operator B, cargo flow direction diversification was not observed in their operations over the studied period.

In the case of Terminal Operator C in the same period, a change in steel products flow directions was observed. The significant exports of Polish and Slovakian steel products declined over time, and was replaced by steel imports, mainly from Holland to car production plants in Poland. Thus, there was no cargo flow direction diversification, but the export route was replaced by the import route.

As for Terminal Operator D, no cargo flow direction diversification was identified—from the start of their operations, ro-ro general cargoes (similarly as agri-cargoes) had been transhipped on both export and import routes. ‘Dirty’ bulk cargoes were transhipped only on export routes due to the enterprise’s internal limitations (lack of rail scale).

A similar situation took place in the studied period at Terminal Operator E. The cargo flow directions were stable (coals imports, coke exports, conventional general cargoes and grain—both exports and imports).

4.3.2. Contract Diversification

Contract diversification, which consists in obtaining a larger number of cargo shippers, was identified in the case of Terminal Operator A. This kind of diversification in the case of a specific cargo sets significantly higher requirements for the terminal operator in terms of organisational issues. Each of the cargo shippers had individual requirements regarding the core (transshipment and storage) services or extra services. Each of them wanted their cargo to be treated on a priority basis in terms of handling time, or to be separated from other shippers’ cargoes. This forced Terminal Operator A to take a very flexible approach to organising the port’s operations and to engage its resources indispensable to meet the requirements.

In the case of Terminal Operator B, in the studied period the number of cargo shippers fluctuated (both over time and with reference to individual cargo groups). The cargo group where the number of shippers increased was steel semi-products. This was due to administrative restrictions rather than economic factors. As a result of the embargo on steel semi-products from Russia, they had to be imported from more distant and dispersed markets.

Terminal Operator C cooperates mainly with secondary cargo shippers—forwarders. In the case of one terminal (until 2017), Terminal Operator C had limited possibilities of signing contracts with subsequent cargo shippers (usually one was replaced by another). The corporate group to which Terminal Operator C belongs also includes a forwarding company. Initially, the company handled 90% of the terminal’s cargoes, but currently, it handles only 15%. Consequently, it may be said that there was diversification of secondary cargo shippers (forwarders).

The customers of Terminal Operator D are mainly forwarders, less often primary cargo shippers and operators (of semi-trailers). As for the number of cargo shippers over the studied period, no distinct trend was identified. In the case of grain cargoes, the enterprise

had several customers in one period, or one major customer operating under an exclusive contract in another. In the case of Terminal Operator E, an increase in the number of cargo shippers was identified, but only with regard to some specific cargo groups. In the past, the enterprise cooperated with forwarders in 100% of the cargo trade. Currently, in the case of 30% of cargoes handled, its partners are primary cargo shippers.

4.3.3. Services Diversification

Terminal Operator A provides numerous added-value services which are complementary to the core transshipment and storage services (e.g., cargo packing, mixing, unitising, sorting, crushing, labelling, etc.). According to the enterprise's experience, such services are provided not only in relation to general cargoes, but also to bulk cargoes. Terminal Operator A also offers transshipment services related to cooperation with port industry facilities and distribution terminals for specific bulk cargoes. Since 2001, Terminal Operator A has been providing freight forwarding services (mainly port forwarding), including predominantly documentation handling and supervising cargo-related additional services. Terminal Operator A also operates a bonded warehouse and a (short- and long-term) storage warehouse. Over the last years of the studied period, due to the limited interest of private carriers, Terminal Operator A engaged in rail services related to rolling rail wagons into and out of the port railway station. Terminal Operator A also serves as a link in land-land supply chains (e.g., when it handles the storage of biomass transported from the port's regional environment to the power plant located in the vicinity of Terminal Operator A).

Similarly, Terminal Operator B took measures focused on seaport economic functions other than transport (added-value services). At the request of major customers, Terminal Operator B also handled cargoes transported from one land-based location to another. Via a subsidiary, Terminal Operator B also provided temporary staffing services in the port of Szczecin and elsewhere.

In the years 1989–2007, Terminal Operator C engaged only in the commercial side of port handling, and cargo storage. From 2007, they expanded their activity related to physical transshipment of cargo. Similarly, as in the case of the previously discussed entities, the diversification measures taken by Terminal Operator C consisted in expanding their range of services that are complementary to transshipment and storage, which were provided initially at the general cargo terminal, then also at the bulk terminal. Sporadically, Terminal Operator C handled cargoes transported overland only (without a maritime transport link).

As for Terminal Operator D in the studied period, in this case the service diversification was also observed in the form of providing a wide range of services that are complementary to the core services i.e., transshipment and storage. However, according to the representative of Terminal Operator D, this should be viewed in terms of a trade-off (e.g., sorting steel rods in a warehouse which can hold 10,000 tonnes of unsorted rods and 4000 tonnes of sorted rods).

Similarly, as the other entities covered by this analysis, in the studied period Terminal Operator E engaged predominantly in provision of additional cargo-related services (i.a. sorting, labelling, repacking, etc.). However, transshipment and storage services were always a priority. For the past several years, Terminal Operator E has been offering ship mooring services. In the past, an important area of activity for Terminal Operator E was cooperation with distribution terminals located on the port grounds (cold storage facility, car terminal or grain terminal), for which they provided core operator services (i.e., transshipment). The role of these services has diminished over the recent years. At customers' request, Terminal Operator E handles overland transport of cargoes.

To sum up the achieved research results, it may be stressed that:

- diversification areas and motivations for diversification strategies implemented by multipurpose terminal operators were set;
- examples of diversification strategies implementation by the selected five terminals' operators of multipurpose terminals located in Poland were described;

- analysed terminal operators applied different strategies to diversify their activity; the strategy varied considering the type of cargo handled, motivation and measures chosen within diversification area.

5. Discussion

The presented analyses of the operations of five multipurpose terminal operators running their activity in the Polish seaports of Szczecin, Gdynia and Gdańsk made it possible to identify the core areas of diversification: cargo diversification, contract diversification, service diversification, and cargo flow direction diversification, as well as the rationale that inclined the surveyed terminal operators to diversify their operations. These are: deteriorating competitiveness in connection with changes taking place in maritime trade and transport, changes in the hitherto served cargo markets or geographical markets, emergence of new cargoes or new geographical markets, expectations of cargo shippers regarding extension of the scope of services, changes in the energy policy, safeguarding against seasonal or sporadic business cycle fluctuations, or other, e.g., intra-port competition. Based on the analysis of the frequency at which the specific diversification motivations and diversification areas were identified in the terminal operators' activities, a heat map was developed to present the dependencies between the motivations for diversification and the areas of diversification strategies implemented by the terminal operators (Table 2).

Table 2. Heat map showing dependencies between the motivations for diversification and the areas of diversification in strategies followed by the surveyed multipurpose terminal operators.

Motivations for Diversification	Diversification Areas			
	Cargo Diversification	Services Diversification	Contract Diversification	Cargo Flow Direction Diversification
Seasonal or sporadic business cycle fluctuations	A B C D E *	A B C D E	A C E	A
Changes taking place in maritime trade and transport	A B C D	A B C D	A C	A
Changes in the hitherto served cargo markets or geographical markets	A B C	A B C	A C	A
Emergence of new cargoes or new geographical markets	A B C	A B C	A C	A
Expectations of cargo shippers regarding extension of the scope of services	A B	A B	A	A
Changes in the energy policy/climate pressure	A	A	A	A
Other, including intra-port competition	E	E	E	-

* A, B, C, D, E—terminal operators.

The obtained results confirm the outcomes of previous studies, i.a. by [1,11], showing that the main motivations inclining terminal operators to take diversification measures are focused on improving the competitiveness, diversification of operational risk, and maximising the utilisation of the existing resources. In addition to that, our study made it possible to identify within the three major motives some specific diversification motivations relevant for terminal operators as well as other enterprises operating in the area of maritime logistics (in its broad sense), and to hierarchize them (Figure 2).

The study has shown that it was external economic factors connected with changes in the national and international environment of the terminal operators that proved to be the most important motivators for the terminal operators to implement diversification measures, which was also confirmed by results of earlier studies, i.a. [14,16,26].

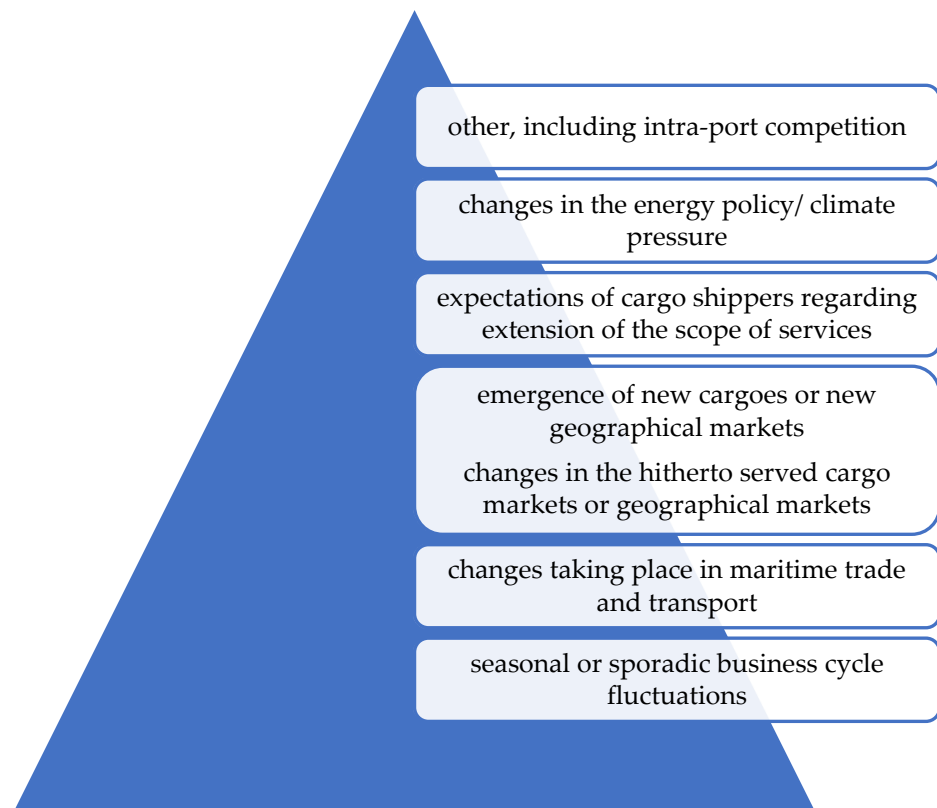


Figure 2. Hierarchizing the motivations for taking diversification measures in the strategies pursued by the surveyed multipurpose terminal operators.

Our research study has also confirmed the results of earlier studies showing the predominant role of cargo diversification in seaports' strategies [2]. Changes in the composition of handled cargoes are the main reason for diversification activities at the level of port terminal operators, particularly those operating in secondary ports, which, compared to hub ports, experience negative effects of long- and short-term changes in the market environment to a larger extent [22,23,30,40]. Referring to the results of the studies conducted by [2], the representatives of the enterprises covered by the study confirmed that a specialisation strategy is less expensive. However, they also pointed to the advantages of cargo diversification. What is worth noting here is that a problem on one cargo market does not have to mean a problem on several markets; losing some cargo shippers connected with one cargo group may be compensated by sourcing shippers of other cargoes.

Our research results have also demonstrated that diversification strategies implemented by the surveyed terminal operators are strongly connected with the core activities—transshipment and storage. Hence, these are related diversifications based on the key resources of the terminal operators, which was also confirmed by the previous studies by [1,39]. Our study results have shown that some measures connected with cargo diversification were seasonal (e.g., grain/fertilisers at Terminal Operator B), and specific enterprises abandoned some of the activities after a short (grain transshipment at Terminal Operator A) or long period ('dirty' dry bulk cargoes transshipped at Terminal Operator D).

We also found that each of the surveyed enterprises invested to a smaller (e.g., transshipment equipment and facilities) or a larger extent (e.g., a new transshipment terminal) in their diversification strategy, adapting their terminal's technical capabilities to handle new cargo groups. In such activities, the availability of space on the port grounds was vital, as it was a precondition for construction/expansion of terminals and providing space for rendering individual services. When access to the infrastructure was limited, it was necessary to decide which kind of service should be chosen to be provided (as was the case with Terminal Operator D—sorting services at the expense of storage capacity).

To summarize, it should be pointed out that terminal operators also take up diversification activities in areas other than cargo diversification. In addition to that, the identified motivations for taking up diversification measures in the individual diversification areas may show different levels of influence. Our research study made it possible to identify detailed measures taken by the terminal operators within the identified areas of diversification (Table 3).

Table 3. Measures taken within the specific areas of diversification.

Diversification Areas	Technical Measures	Organisational Measures
Cargo diversification	Adapting the infrastructure to handle new cargoes Adapting the port handling equipment to handle new cargoes	Planning the technological process necessary to handle new cargoes Obtaining certificates authorising to handle new cargoes
Services diversification	Adapting the transshipment facilities and mechanised equipment to render new services in relation to cargoes (crushing, sorting, packing, bagging, etc.) Allotting/ adapting a place for rendering the services (warehouse, storage yard, workshop, etc.)	Specifying the scope of indispensable services, a feasibility study regarding provision of individual services Expanding the service range to include e.g., forwarding services, customs services, mooring services, railway services, etc. Hiring new employees with appropriate qualifications
Contract diversification	Adapting the storage space to more atomised consignments	Adapting the service offer to suit customers' individual needs More flexibility in the approach to organising the port's operations and engaged resources, ensuing from an increased number of primary and/or secondary cargo shippers
Cargo flow direction diversification	Adapting the infrastructure to handle cargoes on both import and export routes Adapting the port handling equipment to handle cargoes on both import and export routes	Specifying the capability to handle cargoes travelling on various routes (including land-land and sea-land routes) More flexibility in the approach to organising the port's operations and engaged resources, ensuing from an increased number of cargo routes

The measures indicated above are mainly investment activities connected with adapting the infrastructure to handle new cargoes, purchasing new devices and mechanised equipment, and also organisational measures.

It should be highlighted that the obtained research results show the examples of implementation of diversification strategies and specify the measures needed to be considered by decision makers while applying the strategy in practice. It was shown that not only costly investments may be required to introduce a diversification strategy; in some cases, organizational changes may be enough to diversify the activity of multipurpose terminals. Implementing of identified specific measures within chosen diversification areas may help multipurpose terminals operators to increase the quality of services, receive profits and improve the company's position on the market.

6. Conclusions

In seaports, apart from terminal operators specialised in handling one cargo group and focused on the core services of transshipment and storage, there are also numerous terminal operators that apply diversification strategies. Diversification strategies in seaports' operations are equated mainly with existence of a range of conditions for handling various cargo groups. At the level of a seaport as a whole, the understood diversification strategy may be identified when there are enterprises within the port's area that handle various cargoes, enterprises that handle one cargo (while the individual entities have different specialisations) or when there is a mix of enterprises from both groups. At the level of an individual operator, a cargo diversification strategy may be identified only when the operator handles cargoes deriving from diverse cargo groups.

The completed study has shown that the main motives in selecting a diversification strategy as the main business strategy among the interviewed terminal operators were:

(1) safeguarding against seasonal or sporadic business cycle fluctuations, and (2) changes taking place in maritime trade and transport, mainly including the increased carrying capacity of ships. Based on the completed study, in addition to the main area of diversification that is strongly connected with the core activity of terminal operators, i.e., cargo diversification, three other areas of diversification were identified, namely: contract diversification, services diversification, and cargo flow direction diversification. The most important (the most frequently identified) areas of diversification were cargo diversification and service diversification.

On the basis of the results of the conducted research, it was stated that, for the cargo diversification area, the dominating trend was connected with increasing the share of dry bulk cargoes in the general transshipment volume. In most cases the changes were durable. The motivations which had the greatest impact on the decisions made by the surveyed terminal operators on increasing the share of dry bulk cargoes in the general transshipment volume were: departing from specialisation in handling one cargo group dominating in the past, periodic problems connected with maintaining similar cargo traffic levels in all months, deliberate decisions on developing new bulk terminals to diversify the current range of transshipment services, and reaction to changes taking place in the neighbourhood, connected with development of deepwater terminals for homogeneous cargoes. As for the service diversification, at the customers' request, the terminal operators expanded the range of services that are complementary to the transshipment and storage services and increase the added value of the handled cargoes. Nevertheless, their core services remained their priority (the first choice).

It is hard to unambiguously specify the impact of the diversification measures taken by the enterprises on their financial results, which is due to the inaccessibility of such data. In the case of some of the terminal operators, the diversification measures taken in the main area (cargo diversification) made it possible for them to mitigate the negative consequences of the decrease in transshipment of the cargo groups dominating so far, and to maintain the position of leading operators in the given seaport. In the case of two of the surveyed enterprises, the diversification measures taken by them have led to record levels of annual transshipment volumes. The fact that the surveyed entities chose to implement diversification strategies strongly connected with their core activities and relying on their key resources made it possible for them to survive and even expand their operations during the crisis (COVID-19 pandemic and war in Ukraine) and to dynamically adapt to the changing market environment. Moreover, also important were the high flexibility and ability to quickly react to changes by multipurpose terminal operators (as opposed to specialised terminal operators), which was indicated in the earlier studies.

Achieved research results allowed to fill the gap in current literature and contribute to the theory of seaport operation in the field of diversification strategies implementation. It was possible to systematize the knowledge related to motives and areas of diversification strategies applied by terminal operators, as well as measures taken by the terminal operators within the identified areas of diversification.

However, it must be stressed that the research results are based on the conditions in which terminal operators function in Poland, with the influence of the geopolitical situation, the ports' location, routes of transport chains, demand for services, etc. Therefore, it seems reasonable to examine the motivations for diversification and areas of diversification strategies applied by terminal operators functioning in seaports in other countries. Consequently, the authors will be continuing the research on the issues related to the operations of ports and transshipment terminals in the changing economic conditions.

The obtained research results can be applied in practice and may be of interest to port enterprises, terminal operators and other entities which plan or implement measures regarding strategies for diversifying their operations. Research results may be helpful for port and terminal operators' managers who take key decisions while shaping the diversification strategy, as well as raising their awareness about diversification areas and measures taken within these specific areas.

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