

LOGISTICS RISK IN MANAGEMENT OF PROPERTY DEVELOPMENT ENTERPRISES (EMPIRICAL RESEARCH FINDINGS)

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Abstract

Risk is an inherent feature of property development projects conducted on the real estate market. Therefore, developers have to be able to manage risk using specific methods. This also refers to the category of logistics risk. In property development business, however, risk needs to be accurately identified before it can be quantified and adequate risk responses can be considered. These issues are addressed in the scientific paper, which aims to outline the risks encountered in the real estate market, with the focus on logistics risk. In particular, it constitutes an attempt to indicate possible applications of the risk management in property development enterprises as a way of supporting logistic activities undertaken by developers in investment processes. In addition to the theoretical deliberations, the findings of the empirical research conducted among the major property developers operating on the Polish market are presented.

Key words: construction risk management, logistics risk, enterprise management, development enterprises.

1. Introduction

A construction project is a complex process to carry out, when looking at technical, technological and organisational issues, but also in terms of logistics. Logistics risk is a sub-category that falls under the umbrella of global construction risk, which may be associated with having unreliable logistics systems to support the execution

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of construction undertakings, such as property development projects on the real estate market. The risk which tends to occur in activities carried out by development companies demonstrates some specific features, which are determined by the nature of property development business. It would be a highly challenging task to try and come up with a single and universal definition of a developer's risk, as there are a variety of ways in which development companies may conduct their business and, consequently, a multitude of risks they may be exposed to. These risks may be analysed in terms of who and how is affected. Since a property development process belongs to the category of construction and investment processes, attention should be paid to the role of a developer-constructor. In practical terms, many construction and assembly companies which operate on the Polish market deal with standard development investment projects, within the framework of their statutory activities (Tworek, 2013, pp. 163–175). The literature on the subject defines the developer-contractor as „(...) an entity that undertakes to construct a facility in order to sell it after the project is completed or – if possible – even in course of the completion process, not even intending to hold the facility in its possession or manage it after it is built” (Dąbrowski, Kirejczyk, 2001, p. 8). Such activities are always accompanied by risk, which has to be responded to appropriately by employing the right methods, techniques and tools. Whatever the definition of a developer, investment on the real estate market is invariably connected with risk (Gawron, 2007, p. 19). Looking from this perspective, developer's risk is most often defined by distinguishing a developer-investor, that is „(...) an entity conducting investment projects at its own risk, which plans – already at the beginning of the investment process – to sell a facility being the outcome of a project in order to make a profit” (Socha, 2000, pp. 1–2). In this context, developer's risk should be analysed from the angle of a development project risk, which also involves logistics risk, where „(...) effective logistics activities, supported by a risk management system, are one of the prerequisites for the success of the undertaking and contribute to its effective implementation (budget, deadlines, technical conditions, safety) and, at the same time, are an unquestionable component of a [development] company's competitive advantage” (Grzyl, Apollo, 2011, p. 1315). „(...) Logistics risk may be expressed as the likelihood that factors of production and finished products of the required quality and at acceptable prices may not be delivered to the right place at the right time” (Bizon-Górecka, 2002, p. 13).

Therefore, the aim of the article is to outline the issues related to the identification of developer's risk, with the focus on a specific category of logistics risk. In addition, the paper is an attempt to indicate possible applications of risk management in property development companies, as part of efforts intended to support logistics activities in investment processes carried out by developers. The paper contains theoretical and conceptual discussions but it also presents the findings of the empirical research conducted among the major development companies operating on the Polish market.

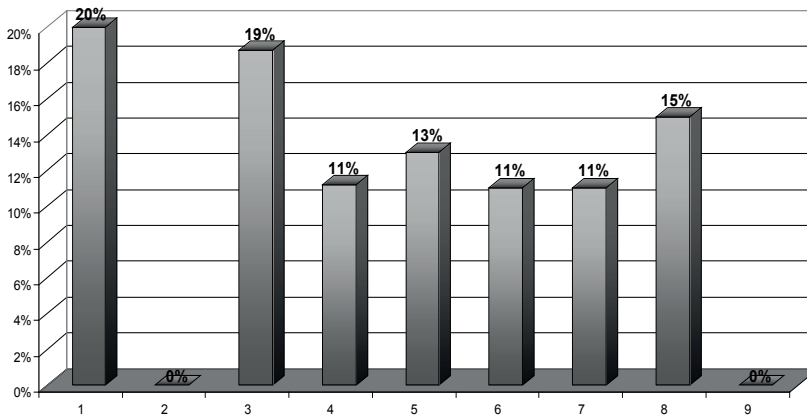
2. The condition of risk management in property development companies operating on the Polish market, against the background of the empirical research findings

2.1. Methodical comments to the empirical research

The empirical research was conducted in October and November 2013 among the developers belonging to a professional association of development companies i.e. Polish Association of Business Developers (PZFD), as of 31 October 2013, and covered 99 enterprises and developers included in a stock exchange index of WIG-Developers (as of 31 October 2013 – 25 listed companies). Out of these 124 entities, 100 property developers (joint-stock companies and limited liability companies), which employ more than 50 and 250 people and conduct property development activities as their core business (as specified in their incorporation deeds), ultimately took part in the research. The main method applied in the research was a survey (with the response rate of 27%) and face-to-face interviews. Also, the methods of deduction, induction and synthesis were used.

2.2. Identification of risk categories in property development business

The general conclusion from the research is that major developers operating on the Polish market are still not fully convinced about the importance of a systemic and organised approach to risk management. Such enterprises also hardly ever manage their risks in any integrated way. Many developers even seem to ignore the problem altogether, assuming that in case of any risk occurrence, the financial consequences of such risk are anyhow going to be absorbed (risk retention) or covered by compensations paid out by their insurers (risk transfer). At the same time a vast majority of developers are aware of risk existence but they – because of various reasons – are just not willing to or cannot afford to hire professionals to bear (immediate) responsibility for risk in their companies. 15% of the respondents claim that their counterparts (i.e. competitors) do not employ such staff either (Tworek, Myrczek, 2016, pp. 561–571). 26% of the respondents believe that the measures they have in place are sufficient to reduce risk, while 7% of the developers doubt whether risk is fully identifiable at all (Tworek, Myrczek, 2016, pp. 561–571). The results presented in Fig. 1 show the risk issues property development enterprises have to tackle in their business practice.



1 – developer's risk, 2 – risk related to a company's internal organisation, 3 – market risk, 4 – risk of legal procedures, 5 – risk related to technical execution of a construction project, 6 – investment financing risk, 7 – cost overrun risk, 8 – schedule slippage risk, 9 – other risk

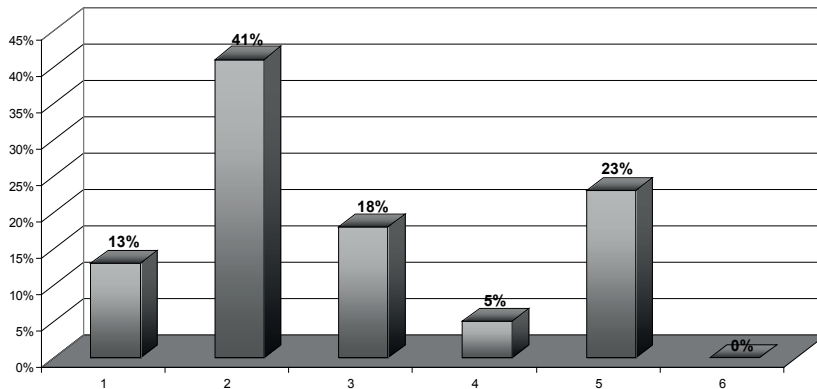
Fig. 1. Various risks related to property development business

Source: Tworek, Myrczek (2016, pp. 561–571)

The results of the research show that 20% of the developers face typical developer's risk in their activities (Tworek, Myrczek, 2016, pp. 561–571), i.e. some difficulties related to renting or selling of real property, forecast risk and planning risk (Biegańska, Piotrowska, 2016, pp. 1–4). The detailed findings of the research conducted in this respect are as follows: 59% of the developers tend to deal with renting or selling risk (Tworek, Myrczek, 2016, pp. 561–571), which „(...) results from a discrepancy between an underlying concept of an investment project and the current market needs, usually due to insufficiently attractive locations and intended use. (...) The risk grows as the developer moves away from the market segment of its origin and attempts to carry out projects for which they lack experience, in locations which they are not well-acquainted with and on a scale which exceeds their financial capacity” (Biegańska, Piotrowska, 2016, pp. 1–4); 26% of the developers mostly deal with forecast risk (Tworek, Myrczek, 2016, pp. 561–571), which „(...) results in a threat that forecasted general conditions, assumed in numerous analyses which serve as the basis for making a decision on a project, are in fact not present” (Biegańska, Piotrowska, 2016, pp. 1–4); only 15% of developers face planning risk most often (Tworek, Myrczek, 2016, pp. 561–571), i.e. „(...) in case the analyses, plans and designs produced during the conceptual stage prove negative and the project cannot be performed due to economic, technical and other reasons, all the preparation work done before will be useless and the related costs will mean a loss to be covered with the revenue generated on some other business” (Biegańska, Piotrowska, 2016, pp. 1–4). These are the basic components of a broadly under-

stood developer's risk. In addition, Fig. 1 shows that developers tend to associate risk which is specific to their business with market risk (19% of the respondents), which means the risk related to competition, reputation and image of a property development company (Tworek, Myrczek, 2016, pp. 561–571). None of the developers participating in the research indicated any risk which results from internal organization of their enterprise.

Developers encounter risks when implementing typical development projects, especially during the investment planning stage. This is also confirmed by the research findings, where as many as 55% of the respondents state that a risk they are exposed to occurs most often at the project planning stage. Only 12% of the developers claim that this is more about the facility operation stage, while 33% of the entities surveyed point out that they have to deal with risk, first of all, at the project execution stage, i.e. when proper construction and assembly work takes place. Therefore, the risk which is specific to business activities conducted by a developer-investor is the one which occurs at the development project planning stage, when the key sources of risk should be looked for in such actions as the selection of appropriate design, constructional, technical and other solutions. This makes up the industry profile of such risk. When it comes to construction execution, however, the major sources of risk are likely to be found in execution of construction and assembly work, with the focus on force majeure risk. When looking at the facility operation stage, risk results primarily from losses incurred due to errors and omissions at the project execution stage (e.g. faults). This is clearly reflected by the research findings presented in Fig. 2.



1 – risk related to property acquisition (valuation risk, transactional risk), 2 – risk related to sale of property (valuation risk, transactional risk), 3 – risk related to tenancy (risk of a failure to find tenants, risk of tenants' failure to meet contractual obligations), 4 – risk of property value loss due to incorrect use, 5 – other risk (e.g. political, market, etc. risk), 6 – other risk

Fig. 2. Risks in developers' investment processes

Source: Own elaboration based on collected replies.

As we can see in Fig. 2 the most common risk in an investment (property development) process is the risk related to the sale of real property (41% of the respondents), that is valuation risk and transactional risk. Currently this seems to be the most serious problem that numerous developers in Poland have to address due to the economic crisis, when property prices have dropped compared to the situation from before the crisis (Tworek, Myrczek, 2015, pp. 1348–1355). Also, the developers' perceptions of risk have evolved, when compared to the period before the crisis, i.e. the period of an economic upturn in the construction industry and the real estate market in the years of 2005–2007, when the demand for developers' services used to be much higher. At present, developers often find it quite difficult to sell the real property they have constructed at the prices they would like to charge and, as a result, are making losses. As a consequence, many developers in Poland have gone bankrupt. The financial condition of developers is not likely to improve until selling prices in the real estate market rise to reach the level which ensures higher returns on investment.

3. Risk management in operations conducted by property development companies, with the focus on logistics risk – an attempt at a synthetic approach to the issue

Risk management cannot be limited to a function which only supports corporate management in property development companies but it should also be seen as the one supporting logistics activities in investment processes carried out by developers. As mentioned before, risk management in development companies is very important in terms of investment planning, that is „(...) planning a production process, including the selection of subcontractors (decisions on how much should be done in-house and how much of the work should be contracted out: nature and type of outsourced services), the alignment of a work schedule (deadlines set in an optimistic, pessimistic or realistic, i.e. the most probable, way, which is the basis for the PERT method), planning of logistics processes (including the determination of purchasing sources, deadlines and methods of delivery, stock management, consideration of the just-in-time (JIT) system application). (...) An essential thing, when planning for specific projects, is to specify their duration, on one hand, and to estimate their costs, on the other hand” (Bizon-Górecka, 1998, p. 24). Any adverse deviations in this respect should be regarded as risk. Therefore, in practical investment and construction processes, there is a category of development process duration risk, which means a failure to complete a project within the planned timeframe

(Cristóbal, 2009, p. 1273), and the risk of development project costs, which should be associated with an unexpected rise in project execution costs (Godfrey, Halcrow, 1996, p. 13). The research shows that 7% of the developers tend to associate risk with project cost overruns, and 15% of them see an inability to meet a project completion deadline as the risk they need to tackle. „(...) As logistics means reducing the time of material and information flow as well as meeting customers' expectations and maintaining expected quality” (Lorenzem, Fischer, 1994, p. 17), the two risk categories should be expanded by adding quality risk (Melton, 2005, p. 5), which means the risk of an investment project being completed in a way which is not compliant with quality requirements. As a result, logistics has significant impact on any improvements in a property development company's operations „(...) due to a comprehensive approach to solving of constructional issues, with the focus on generation of gains. (...) Having an effective, smooth and uninterrupted flow of information and materials as its objective, it has to cover all the areas in which a company operates” (Lorenzem, Fischer, 1994, p. 17). In practical terms, developers should seek to mitigate logistics risk, and „(...) when analysing any threats which may have significant impact on logistics activities carried out [as part of development project work], market risk, i.e. the risk related to availability of funds needed to complete the project and affecting the cost, size, quality and timing of such funds (e.g. a risk of an inability to acquire any assets in kind: materials, equipment, labour of specific quality, in a specific amount or number and within specific time), appears to be highly relevant” (Grzyl, Apollo, 2011, p. 1314). Therefore, practical risk management in property development business has to take into consideration logistics risk, which results from a developer's immediate but also more remote environment as all the basic sources of risk for a developer are present in the environment. Participants in a property development project include „(...) financial institutions, construction companies, architects, designers, service providers from the real estate market, suppliers of utilities, local authorities and a number of other actors, depending on the type of undertaking, and – obviously – a customer (a future user)” (Zima, 2005, p. 24). Logistics risks for developers may be caused by almost all of these entities.

A catalogue of logistics risk factors in a business organization which deals with construction is presented in Table 1.

Table 1. A catalogue of logistics risk factors in a business organisation providing construction services

Links of a logistics chain	Logistics risk factors which appear in a specific link
1. Purchase of raw materials, materials, semi-finished products and immediate products	<ul style="list-style-type: none"> – Determination of raw material, material etc. requirements, is usually based on demand planning and a production schedule. Raw materials, materials etc. may be ordered based on fixed stock levels, regular time intervals, periodic forecasts, following valid planning procedures and taking into account average lead times and standard deviations. The right time to order is specified to ensure continuity of production processes. Risk factors: volume ordering. – Time of order is largely dependent on a production process. Risk factors: order deadlines. – Specifying a list of potential suppliers. In companies which have adopted a just-in-time (JIT) approach, a vendor evaluation procedure for bulky goods (concrete, aggregate, blocks of autoclaved aerated concrete etc.) may be conducted once a year or less frequently. Vendor behaviour (such as vendor's compliance with order, quality, timeliness etc.) are continuously monitored by the system, information is collected in a database to enable on-going evaluation of vendors. This may help in contract negotiations or termination, in case of any breaches during the cooperation. Risk factors: selection of reliable suppliers. – Selection of suppliers is based on an established set of criteria – the selection of the best supplier at the moment. An important thing may be a long-term framework agreement but also ongoing vendor evaluation especially when framework agreements for the same type of goods apply to a number of contracting parties. Risk factor: the right selection. – Transport control and monitoring. A supplier sends goods to a company which has placed an order. A company which transports goods (it does not have to be the supplier itself) should find a way to track a consignment in transit. One of such ways is to operate the satellite navigation system (GPS), which may be used to define a place of collection with a precision of up to a few metres (at least in non-military applications). Transport monitoring makes it possible to respond to any possible disruptions. An important role here is played by effective communication between the supplier and the ordering party. Risk factors: effectiveness of a control and monitoring system. – Collection of goods. After goods arrive they are transferred to a warehouse or directly to production. Before that they need to be identified and go through quality checks. Risk factors: quality and quantity of goods. – Invoice check. This stage may be combined with the previous one, if allowed by system integration. In case of most systems, a user may set invoice check parameters based on which it is approved, suspended or rejected. Such a criterion may be maximum / minimum deviation from an ordered quantity, a difference in price or a permissible delay in delivery. Risk factors: failure to detect errors. – Invoice payment. When an invoice is confirmed for its compliance with the order, a liability stated on the invoice is paid. Risk factors: due dates.

continued tab. 1

<p>2. Production processes</p>	<ul style="list-style-type: none"> – Forecasted order portfolio. In case of production to be transferred to stock (manufacturing of semi-finished and immediate products for construction) demand forecasts are mostly based on econometric models, taking into consideration the data given by the sales department and business partners. In case of strongly customer-oriented production (erection of buildings) this directly reported demand determines an overall production schedule. Risk factors: reliability of forecasts. – Determination of production needs. When using a project analysis method, raw material, material, semi-finished product and immediate product requirements are determined. After comparing with available production capacities, production schedules are drawn up and subsequent planning steps are taken. At the same time, anticipated production costs are specified and broken down into specific products, construction facilities and organisational units. Risk factors: reliability of forecasts. – Material availability check. After a stock analysis a company carries out a purchase planning procedure and decides about the best time to place an order and the quantity of items to order. Risk factors: reliability of estimations. – Assignment of production tasks to worker teams. Tasks are assigned after a thorough analysis of available competence and personnel, taking into account worker personality types. Risk factor: the right selection. – Transfer of materials in co-production. If there is a need, materials and components are handed over to production from stock. In case of automatic production lines, a program to control a feeding system and stock management is created or updated. Risk factors: material faults. – Production process flow. Based on reports submitted by managerial staff at specific levels where reports are entered into the system, production flow is controlled and a schedule is adjusted. Quality control procedures may be embedded in a production process. The process should be designed in such a way as to enable work flow identification, detection of any potential areas where errors may occur and performance of the controlling function. Risk factors: deviations from a plan. – Finished products control. After completion of a production process, an acceptance process takes place. Risk factors: acceptance errors. – Transfer of finished products to stock (in manufacturing of immediate products). After a batch of products are completed, they are sent to a warehouse, where a recording process is carried out. At this stage, a statistical quality control may also be conducted. Risk factors: damage in transport.
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continued tab. 1

3. Sales and customer service	<ul style="list-style-type: none"> – Replies to enquiries, drawing up quotations. Risk factors: inappropriate marketing approach. – Drawing up contracts. Similarly, ready-to-use contract templates may be kept in a system and require only minor modification. Long-term contracts with customers help to reduce the number of transactions for which agreements have to be signed. Risk factors: mistakes. – Creation of sales orders and delivery notes (for immediate products). A delivery note initiates a dispatch process – it contains e.g. a packing list, a delivery schedule and a selected transport route. Risk factors: mistakes. – Freight forwarding (for intermediate products). A consignment which is ready for dispatch is shipped to a recipient. A frequent practice is to hire a freight forwarder to carry this out. In this case, an electronic channel for communication between a producer, a recipient and a freight forwarder would be advisable, in order to track consignments. Risk factors: damage in transit, deadlines. – Invoice generation. An invoice is agreed upon with a customer based on contractual provisions. Its electronic form simplifies the entire process. Risk factors: damage in transit, deadlines. – Payment collection. Payments are to be made by a customer by within a specified period of time. A payment confirmation should be sent to the recipient and then verified by the bank. Risk factors: deadlines.
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Source: Bizon-Górecka (2002, pp. 12–13).

Irrespective of a logistics risk factor (Tab.1), correct identification of risk sources and the specific categories of risk (Fig. 1, Fig. 2), with the use of appropriate methods (Cooper, et. al., 2005, p. 9), is a key stage in a risk management process in a property development company. Any negligence in this area is likely to lead to incorrect risk quantification and, consequently, inadequate risk responses. There are three basic stages of a risk management process in property development business, in which a developer may use appropriate methodology in order to identify risks and, more importantly, estimate these risk using, first of all, the probability approach (Smith, et. al., 2006, p. 57). This corresponds to the general definition of risk in science, according to which risk is a strictly quantitative category (Wang, Roush, 2000, pp. 5–6). Also, risk response requires the right techniques (Tworek, 2013, pp. 163–175). All the measures and activities undertaken as part of a risk management process should be monitored and subject to control by experts hired by property development companies. Therefore, „(...) the following overall principles of modern logistics should be implemented and applied by developers: firstly, relevance – the aim of logistics is to ensure best possible conditions for a company’s operations, in order to maximize economic benefits while maintaining planned expenditure or minimize expenditure while performing a specific type of production; secondly, effectiveness – every area of logistics, in conceptual and practical aspects, has to be dealt with in such a way as to ensure highest possible economic effectiveness; this applies to all elements of a logistics chain, seen from the angle of rational material needs and

services, provided at the right place and time and being of the right quality; thirdly, comprehensiveness – a holistic approach to logistics in the area of management at all levels within an organization, in order to ensure high effectiveness and planned economic efficiency; a comprehensive solution to logistics management problems in an enterprise is a requirement for successful day-to-day operations, therefore any aspects of logistics processes should be closely linked to other areas in which the enterprise operates; fourthly, flexibility – means an ability to adjust a logistics system to changes due to a dynamic character of process input factors, such as changing demand, quality requirements, legal regulations; fifthly, partnership – means that all participants of a logistics chain are treated as equal partners, affecting the final economic result of a given undertaking; sixthly, interdependence – all components of logistics may only do well if they work well together; any activities within a company (planning, organization, steering and control) have to be mutually dependent as only this will ensure optimal performance of logistics as a function; seventhly, reality – logistics has to incorporate conceptual solutions of an enterprise and a logistics chain, take into account internal and external conditions and must be based on current economic realities of the market” (Coyle, et. al., 2002, p. 14; Grzyl, Apollo, 2011, p. 1314). Practical implementation of such principles will ensure effective and successful risk management in logistics of a property development project.

4. Conclusions

A risk management concept – with the focus on logistics risk – to be applied by a property development company should be based on effective identification of a developer’s risk. Logistics risk is only one of many potential risks (Kauf, Płaczek, 2016, pp. 61–70) we can see when looking at a general picture of this specific business. The empirical research conducted in this field shows that only 7% of developers claim that a developer’s risk is a category which cannot be fully identified and, consequently, it would be pointless to hire anybody to deal specifically with risk management in a property development company. The findings also indicate that the number of risk sources which can be found in a property development process seems to be unlimited, with many of the risks being virtually impossible to predict. In many cases developers may even be willing to bear a high risk when investing on the real estate market. It should be noted here that this is also determined by the conditions in which developers have to operate in Poland, with the global risk in property development business being affected by an economic crisis which started in 2008. In particular, the current crisis has significant impact on the demand on the real estate (property development) market and determines the behaviour of entities participating in investment and construction processes, including developers themselves (risk perception). This concerns, first of all, developers-investors (project owners), which decide what, when and where should be built. Another important issue is protection

of consumers, i.e. developers' prospective customers, in EU countries as it forces property development companies to take consumer protection regulations into account when planning investment projects and managing their portfolios. In Poland, development business is highly affected by so-called Developers' Act (Developers' Act, 2011), which is often criticised by experts due to faults in legal regulations (legal risk). Developers' legal risk is also affected by the provisions of the Polish Public Procurement Law (Polish Public Procurement Law, 2015), as bidding procedures contribute to the risk such companies need to consider. Legal risk should also mean a risk of developers' contracts, with a threat of their customers being in breach of contractual provisions. In practice, many customers withdraw from a contract, due to a variety of reasons, e.g. their inability to obtain a loan from a bank in order to perform the contract, at the moment the real property is to be sold. Such cases have been quite frequent over the last few years as banks have reduced their lending to individual customers, due to the financial crisis, introduced more stringent credit worthiness criteria and demanded higher credit rating. Nowadays the legal risk is even higher. As of July 22nd 2017 a new Law about mortgage credits is effective in Poland, which is much more rigorous than previous regulations. All this may mean that risk in property development business needs to be managed in an integrated way, taking into consideration logistics risk. Therefore „(...) the concept of a risk development system to be implemented in a [property development] enterprise, as part of support for logistics activities [in investment processes carried out by developers], should involve, first of all, designing, organising and ensuring a reliable and well-composed logistics system, supported with a risk management process in a company; secondly, [appropriate risk identification] (recognition of risk and its factors, calculating the probability of a given risky event, determining the size of potential risk consequences) when performing logistics activities; thirdly, establishing alternative courses of action in logistics when facing risk; and fourthly, remedying the consequences of a risky event. (...) That is why, when constructing a logistics system, one should ensure appropriate means and resources, to be able to repair the consequences of risk, establish the basic rules for communication and flow of information and appoint the people to be responsible for provision of information” (Grzyl, Apollo, 2011, p. 1314). The empirical research shows that so far property development companies have not managed to put in place any integrated risk management system. There are no patterns of behaviour or procedures which could be followed when dealing with risks, including logistics risk. Nevertheless, developers appear to be aware of the fact that risk management ought to be done in a structured and systemic way. Until now the companies surveyed have not set up any specific risk management departments. The findings show that 41% of the developers see risk as not high enough to hire any particular person to handle it (Tworek, Myrczek, 2015, pp. 1348–1355). As many as 51% of the developers believe that a company can gain most tangible benefits when they eliminate risk, while 12% of them think

that risk (in whole or part) should be transferred to another participant of a property development process (Tworek, Myrczek, 2015, pp. 1348–1355), e.g. a construction and assembly enterprise (contractor).

References

1. Biegańska, D., Piotrowska, K. (2016): *Ryzyko inwestowania w nieruchomości z punktu widzenia nieruchomości deweloperskich*. Retrieved from <http://www.ryzyko.pl/>
2. Bizon-Górecka J. (1998): Gra ryzykiem – źródłem sukcesu organizacji gospodarczej. *Przegląd Organizacji*, no. 12, p. 24.
3. Bizon-Górecka J. (2002): Ryzyko logistyczne w branży budowlanej. *Przegląd Budowlany*, no. 6, pp. 12–13.
4. Cooper D., Grey S., Raymond G., Walker P. (2005): *Project Risk Management Guidelines. Managing Risk in Large Projects and Complex Procurements*, Chichester: John Wiley & Sons.
5. Coyle J., Bardi E., Langley C.J. (2002): *Zarządzanie logistyczne*, Warszawa: PWE.
6. Cristóbal S.R.J. (2009). Time, Cost, and Quality in a Road Building Project. *Journal of Construction Engineering and Management*, vol. 135, no. 11, p. 1273.
7. Dąbrowski M., Kirejczyk K. (2001): *Inwestycje deweloperskie*, Warszawa: Wyd. Twigger.
8. Gawron H. (2007): *Zarządzanie ryzykiem projektów inwestycji na rynku nieruchomości w fazie ich przygotowania i realizacji*, in: Zarzecki D. (red.), Szczecin: Wydawnictwo Uniwersytetu Szczecińskiego.
9. Godfrey S.P., Halcrow W. (1996): *Control of Risk. A Guide to the Systematic Management of Risk from Construction*, London: CIRIA.
10. Grzyl B., Apollo M. (2011): Zarządzanie ryzykiem jako element wspomagania działań logistycznych w przedsiębiorstwie budowlanym. *Logistyka*, No. 6, pp. 1314 – 1315.
11. Kauf S., Płaczek E. (2016): *Asymetryczna alokacja ryzyka w realizacji zadań logistyki publicznej*, in: Tworek P., Myrczek J. (red.), *Public Risk Management T.2*. Katowice: Wyd. Uniwersytetu Ekonomicznego w Katowicach.
12. Lorenzem D.K., Fischer R. (1994): Jak zarządzać przedsiębiorstwem. *Przegląd Przemysłowy*, no. 2, p. 17.
13. Melton T. (2005): *Project Management Toolkit. The Basics for Project Success*, Burlington: IChemE.
14. Smith J.N., Merne T., Jobling P. (2006): *Managing Risk in Construction Projects*, Oxford: Blackwell Science.
15. Socha M. (2000): *Developing*, Warszawa: Wyd. C.H. Beck.
16. Tworek P. (2013): *Reakcja na ryzyko w działalności przedsiębiorstwa budowlano-montażowego*, Warszawa: Wyd. Difin.
17. Tworek P., Myrczek J. (2015): *Methodical problems of response to the risks in investment and construction processes: a case of Polish largest developers (survey research)*, in: Čulík M. (ed.), Ostrava: VŠB – Technická Univerzita Ostrava.
18. Tworek P., Myrczek, J. (2016): *Zintegrowane zarządzanie ryzykiem jako funkcja wspomagająca kierowanie przedsiębiorstwem deweloperskim*, in: Zakrzewska-Bielawska A. (red.), Warszawa: TNOiK.

19. Wang X.J., Roush L.M. (2000): *What Every Engineer Should Know about Risk Engineering and Management?* New York: Taylor & Francis.
20. Zima K. (2005): Deweloper – koordynator procesu inwestycji. *Świat Nieruchomości*, no. 49–50, p. 24.
21. *Ustawa z dnia 16 września 2011 r. o ochronie praw nabywcy lokalu mieszkalnego lub domu jednorodzinnego* [Developers' Act, 2011]. (Dz.U. z 2011 nr 232 poz. 1377).
22. *Ustawa z dnia 29 stycznia 2004 r. Prawo zamówień publicznych (tekst ujednolicony) stan prawny na dzień 15 marca 2015 r.* [Polish Public Procurement Law, 2015]. (Dz.U. z 2013 r. poz. 907, poz. 984, 1047 i 1473, z 2014 r. poz. 423, 768, 811, 915 i 1146, 1232 oraz z 2015 r. poz. 349).

RYZIKO LOGISTYCZNE W ZARZĄDZANIU PRZEDSIĘBIORSTWAMI DEWELOPERSKIMI (WYNIKI BADAŃ EMPIRYCZNYCH)

Streszczenie

Immanentną cechą projektów deweloperskich realizowanych na rynku nieruchomości jest ryzyko. Deweloperzy muszą zatem umieć zarządzać ryzykiem wykorzystując w tym celu określone metody. Dotyczy to również kategorii ryzyka logistycznego. W działalności deweloperskiej zanim jednak ryzyko zostanie skwantyfikowane wymagana jest jego dokładna identyfikacja, co następnie umożliwi właściwą reakcję na ryzyko. Kwestiom tym poświęcony jest niniejszy artykuł naukowy, którego celem jest przedstawienie problematyki identyfikacji ryzyka deweloperskiego ze szczególnym uwzględnieniem kategorii ryzyka logistycznego. W szczególności jego celem jest wskazanie możliwości wykorzystania zarządzania ryzykiem w przedsiębiorstwach deweloperskich jako elementu wspomagania realizacji działań logistycznych w procesach inwestycyjnych realizowanych przez deweloperów. Rozważania teoretyczne uzupełniają wyniki badań empirycznych przeprowadzonych wśród największych deweloperów działających na rynku polskim.

Słowa kluczowe: zarządzanie ryzykiem w budownictwie, ryzyko logistyczne, zarządzanie przedsiębiorstwem, przedsiębiorstwa deweloperskie.