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THE TIME TO COMPLETION OF A LEGAL MERGER: GENERAL CONCEPTS, STATISTICAL ANALYSIS AND THE CASE OF POLAND

The legal process involved in domestic mergers has been considered. European Union regulations were investigated, as well as their direct transposition into Polish legislation. The process itself always consists of managerial, ownership and registration phases. Nevertheless, these phases are not homogeneous and may take different courses depending on the provisions prescribed by the regulations. Several methods of measuring the time to complete mergers have been presented. In the empirical part of the article, the definition of the private time to completion has been adopted which assumes that that the procedure starts by drafting the terms of the merger and ends with the registration of the merger. The influence of different provisions on this measure has been analyzed for the case of Polish domestic mergers. Moreover, statistical reasoning has been conducted for this market showing that several recent legal amendments have shortened the legal procedure involved in consolidation. Finally, some conclusions and suggestions for future research have been presented in the paper.

Keywords: *merger and acquisition process, legal procedure of mergers, duration analysis, Polish domestic mergers, statistical tests*

1. Introduction

Each merger or acquisition has its unique economic rationale, course and achieved synergies. This is one reason why it is quite common to treat such transactions as case studies in order to highlight their specific characteristics and conditions [7, 8, 16, 22, 23].

On the other hand, the process itself consists of clear steps which are applied in all such transactions. This opinion is shared by many authors, like DePamphlis [13], Frąckowiak [18], Herdan [19], Iannotta [20] or Zadora [29]. In general, they distinguish

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three main phases of the merger and acquisition process: preliminary, transaction and integration phases.

The preliminary phase is defined as the period in which the merging companies seek counterparts to such a transaction and establish initial contacts. In turn, the transaction phase concentrates on gathering the information needed to make a joint valuation of the merging entities, which serves as the starting point for the negotiations. Once all the conditions are agreed, the process enters into the consolidation stage. Afterwards, integration begins. In this period, the now formally merged companies need to synchronize their organizational structure and business processes in order to achieve the desired economic synergies. Without effective integration, this potential reward will be lost.

Reed et al. [25] define an acquisition as the process by which the stock or assets of a corporation come to be owned by another corporation. In turn, they understand a merger as the process in which one corporation is combined with and disappears into another corporation.

At this point, it is clearly visible that the main difference between mergers and acquisitions can be seen in the consolidation phase. In the case of an acquisition, the ownership or asset structure of the company being acquired changes in accordance with the percentage stake sold but the company still exists, at least from a legal point of view. By contrast, merger means that the companies being acquired cease to exist and all their assets and liabilities are transferred to the acquiring or new company.

The consolidation process involved in merger is perceived as being more regulated and complex than that involved in acquisition. In general, the merger process consists of the managerial, ownership and administration phases [21, 29]. The managerial stage concentrates on preparing and stipulating the draft terms of merger, while the ownership stage involves the shareholders meetings of the merging entities accepting or rejecting the transaction conditions. Administrative activities like registering a merger, closing acquired companies or public announcements finalize the consolidation procedure.

The time to completion of a legal merger is a significant parameter which should be taken into consideration during strategic transaction planning by the managements of the merging companies and legal departments responsible for the formal correctness of the procedure. A methodology for its measurement was proposed by Buczek and Mercik [10] and is presented in detail in Section 2.3 of this article. For Polish domestic mergers, the legal consolidation phase lasts for around 4.5 months (the median is equal to 140 days) on average and around a half of such transactions take between 4 and 6.5 months (the first and third quartiles are equal to 110 and 188 days, respectively).

It is worth noting that these results rely on the assumption that the entire procedure is always executed in the same way and has not changed over time. The purpose of this article is to verify whether these assumptions are reasonable as:

- Merger legislation provides for derogations in the consolidation procedure if certain prerequisites are met.

• Over the years, several amendments have been introduced to the procedure by the lawmakers.

In other words, the potential influence of these derogations and changes on time to completion should be investigated. From this perspective, this article should be treated as a follow-up to the Buczek and Mercik [10] paper.

This investigation is performed on a large sample of Polish mergers announced between 1st January 2002 and 31st December 2013. Following Buczek and Mercik [10], the private time to completion is adopted. Various parametric and non-parametric statistical tests of location, together with graphical methods in the form of box plots, are used to verify two sets of hypotheses formulated at the beginning of Section 3. These hypotheses represent the authors expectations regarding the relation between the factors considered and time to completion.

This article is arranged as follows. The next section outlines the regulatory landscape regarding mergers within the European Union. As the empirical part concentrates solely on Polish domestic mergers, the main differences between the European Union regulations and their transposition into Polish law are discussed as well. Section 3 presents the data collected about Polish merger procedures and provides a statistical reasoning for the research problems formulated. The article ends with some conclusions and suggestions for future research.

2. The legal process involved in domestic mergers

The legal process in a merger involves fulfilling all the regulatory requirements, in order to ensure an effective merger from the legal point of view. The companies taking part in a merger may originate from the same or different countries. In the former case, such a transaction is known as a domestic merger, in the latter one, as a cross-border merger.

European Union legislation makes a clear distinction between these types of merger and regulates their consolidation phase by separate directives. Domestic mergers are considered in the directive 2011/35/EU of 5th April 2011 [5], while cross-border mergers are the main subject of the directive 2005/56/EC of 26th October 2005 [3]. The first directive superseded the initial directive 78/855/EEC of 9th October 1978 [6], in order to ensure the clarity and rationality of the legislation, which has been amended substantially several times over the years.

As the empirical part of this article is related directly to domestic mergers in Poland, the main principles of the directive 2011/35/EU will be presented in detail in the next subsection. This directive forms one general framework for mergers in every European

Union member country. Thus, it is also a foundation of the Polish legislation on domestic mergers expressed in the Code of Commercial Partnerships and Companies[2] (CCPC), [1].

2.1. European Union regulations

In general, the directive 2011/35/EU regulates the mergers of public limited companies. However, when such a company is the subject of bankruptcy proceedings, proceedings related to the winding-up of insolvent companies, judicial arrangements, compositions or analogous proceedings, national law may exempt it from this regulation (2011/35/EU, Article 1)[3] or act only on the side of the company being acquired in the case of companies which have not yet begun to distribute their assets to their shareholders (2011/35/EU, Articles 3 and 4). Additionally, when a public company is organized in the form of cooperatives, it may also be exempt from this regulation (2011/35/EU, Article 1).

This directive introduces two procedures in which a merger can be accomplished:

- Merger by acquisition, which should be understood as an operation whereby one or more companies are wound up without going into liquidation and transfer all their assets and liabilities to another in exchange for an issue of shares in the acquiring company to the shareholders of the company or companies being acquired and a cash payment, if any, not exceeding 10% of the nominal value of the shares so issued or, where they have no nominal value, of their accounting par value (2011/35/EU, Article 3). Refer to Fig. 1 for an overview of the process.

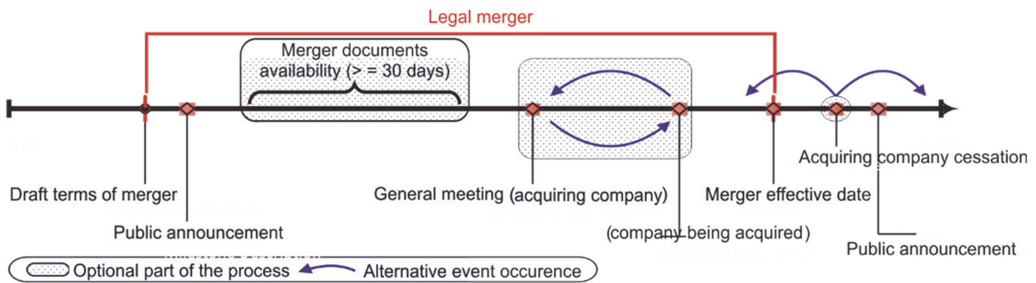

Fig. 1. Merger by acquisition (source: authors study)

- Merger by the formation of a new company, which should be understood as the operation whereby several companies are wound up without going into liquidation and transfer to a company that they set up all their assets and liabilities in exchange for the issue to their shareholders of shares in the new company and a cash payment, if any, not

[2]The consolidation of a cross-border merger is regulated by this code as well. The appropriate regulation was introduced by an amendment on 28th April 2008.

[3]References to the appropriate articles of a directive are given in the brackets in this section.

exceeding 10% of the nominal value of the shares so issued or, where they have no nominal value, of their accounting par value[4] (2011/35/EU, Article 4). Refer to Fig. 2 for an overview of the process.

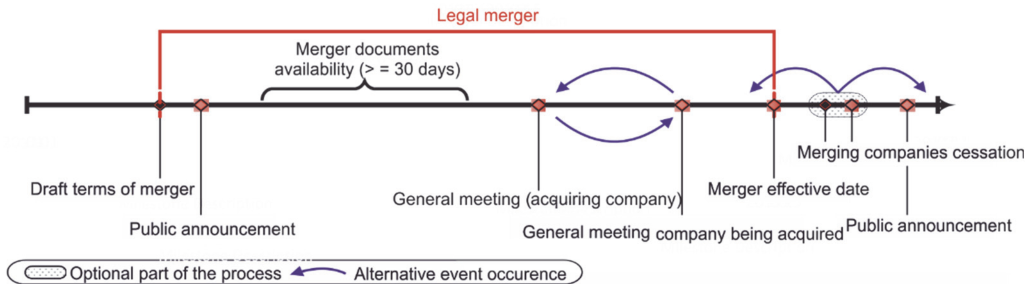

Fig. 2. Merger by the formation of a new company (source: authors study)

Both procedures are initialized by drawing up and stipulating the draft terms of merger. This document should contain the following elements:

• basic information such as the type, name and registered headquarters of each of the merging companies,

• the most important conditions agreed during the negotiation sub-phase, in particular (2011/35/EU, Article 5):

– the share exchange ratio and the amount of any cash payment,

– the terms relating to the allotment of shares in the acquiring company,

– the date from which the holding of such shares entitles the holders to participate in profits and any special conditions affecting that entitlement,

– the date from which the transactions of the company being acquired shall be treated for accounting purposes as being those of the acquiring company,

– the rights conferred by the acquiring company on the holders of shares to which special rights are attached and the holders of securities other than shares, or the measures proposed concerning them;

– any special advantage granted to the experts (...) and members of the merging companies administrative, management, supervisory or controlling bodies.

Once the draft terms of merger are agreed, they should be published by each of the merging companies at least one month before the date fixed for the general shareholder meeting(s) during which the merger proposal will be accepted or rejected. The manner of this public announcement should be individually specified by the national laws of each European Union member. However, merging companies may be deemed exempt from this publication requirement, if they make the draft terms of this merger document

[4]In both procedures national law may permit this cash payment to exceed 10% (2011/35/EU, Article 30).

available on their websites free of charge for a continuous period beginning at least one month before the date fixed for the general shareholder meeting(s) (2011/35/EU, Article 6).

In addition, at least one month before the date of the general meeting, all the shareholders should have the possibility to inspect the following documents (2011/35/EU, Article 11):

• the draft terms of merger,

• the annual accounts and annual reports for the last three financial years,

• if the latest annual accounts relate to a financial year which ended more than six months before the first day of the third month preceding the date of the draft terms of merger, an accounts statement should be provided based on a date no earlier than the date specified above,

• the reports of the administrative or management bodies of the merging companies explaining the rationale of the draft terms of merger, its economic and legal justification, especially in terms of the share exchange ratio (2011/35/EU, Article 9),

• the independent opinion about the draft terms of merger raised by the external expert(s) nominated by the appropriate juridical or administrative authority (2011/35/EU, Article 10).

All these documents should be available at the registered offices or websites of the merging companies. Accounting statements, management reports and the opinion of independent expert(s) are not required only if all the shareholders of the merging companies have so agreed. Additionally, no accounting statement is necessary, if a merging company regularly publishes half-yearly financial reports.

Inspection of the documents is not obligatory when one or more companies are acquired by another company which holds 90% or more but not all of the shares and other securities with embedded voting rights at the general meeting and the following covenants are in place (2011/35/EU, Article 28):

• the minority shareholders of the company(s) being acquired must be entitled to have their shares acquired by the acquiring company,

• if they exercise that right, they must be entitled to receive consideration corresponding to the value of their shares,

• in the event of disagreement regarding such consideration, it must be possible for the value of the consideration to be determined by a court or by an administrative authority designated by the Member State for that purpose.

The general meeting of each merging company is the core part of the legal process of merging. Shareholders gather in order to vote on approving the proposed draft terms, as well as on potential amendments made to the memorandum and articles of association necessitated by the transaction. When companies are merging to form a new company, the memorandum and articles of association (or their drafts) of the new company should also be approved by the shareholders of each merging company, if they are not included in the draft terms of merger (2011/35/EU, Article 23). This decision should be supported

by a majority of not less than two thirds of the votes attached to the shares or to the subscribed capital. However, national laws may allow that a simple majority of the votes is sufficient to approve the merger in the situation when at least half of the subscribed capital is represented at the meeting. When there is more than one class of shares, approval of the merger needs to be obtained in separate votes by each class of shareholders whose rights are affected by the transaction (2011/35/EU, Article 7).

A general shareholders meeting is not always a mandatory element of the merger by acquisition process. The acquiring company does not have to call such a meeting once the following conditions are met (2011/35/EU, Article 8):

- For the acquiring company, the draft terms of merger are published or distributed electronically at least one month before the date fixed for the general meeting of the company(s) being acquired.
- At least one month before the date specified in the previous point, all the shareholders of the acquiring company must have the possibility to inspect all the documents relevant to the merger (2011/35/EU, Article 11 (1)) at the registered headquarters or internet website of the acquiring company.
- One or more shareholders of the acquiring company holding a minimum percentage (between 0% and 5%) of the subscribed capital must have the right to call a general meeting to decide whether to approve the merger. National law may state here that non-voting shares are excluded from the calculation of the minimum percentage.

This option holds as well in the situation when one or more companies are acquired by another company which holds 90% or more but not all of the shares and other securities with embedded voting rights at the general meeting (2011/35/EU, Article 27). It is worth noting that the general shareholders meeting of the company being acquired still needs to take place, in order to comply with the regulations. However, the directive also provides for the option to avoid calling a shareholders meeting for any of the companies involved when the following conditions are met (2011/35/EU, Article 25):

- The acquiring company possesses all the shares and other securities giving voting rights in each company being acquired.
- Each company involved in the deal needs to announce publicly or distribute electronically the draft terms of merger at least one month before the operation takes effect.
- At least one month before the operation takes effect, all the shareholders of the acquiring company must have the possibility to inspect all the documents relevant to the merger at the companys registered headquarters or via their internet website.
- One or more shareholders of the acquiring company holding a minimum percentage (between 0% and 5%) of the subscribed capital must have the right to call a general meeting to decide whether to approve the merger.

If the national law of a European Union member country does not carry out the juridical or administrative supervision of the legal acts required for a merger and does not check its legality, the minutes and, where required, the merger contract from the

general meeting should be written and certified in due legal form. When the merger is not approved by the general meetings of all the companies taking part in the transaction, the draft terms of merger need to be certified in due legal form, instead of the documents mentioned above (2011/35/EU, Article 16).

The national law of a European Union member should specify the date on which the legal process of merging becomes effective (2011/35/EU, Article 17). A merger should be understood as being legally effective when:

- All the assets and liabilities of the company being acquired have been transferred to the acquiring company.
- The shareholders of the company being acquired have become shareholders of the acquiring company.
- The company being acquired has ceased to exist, unless national law states differently (2011/35/EU, Article 31).

The merger should be announced publicly for each entity which has taken part in the transaction. The acquiring company may take full responsibility and publish the relevant announcement related to the company(s) being acquired (2011/35/EU, Article 18).

2.2. Legal landscape in Poland

The Code of Commercial Partnerships and Companies [1] defines the legal process of merging in Poland. This process is a transposition of the regulation imposed by the directive 2011/35/EU [5] (the directive 78/855/EEC [6] before 5th April 2011) and, in general, has the same structure as described in Section 2.1. Nevertheless, Polish merger legislation still provides additional clarification to the process which will be presented in the following section.

In Poland, the legal process of merging should be applied whenever corporations merge with other corporations or with partnerships. However, the latter cannot act as acquiring entities and may only merge together by forming a new company. Also, as a general rule, none of the merging companies can be in liquidation, division or bankruptcy (CCPC, Article 491).

The draft terms of a merger should be reported in the register court appropriate to the seat of the merging companies. In accordance with the directive 2011/35/EU [5], these terms have to also be publicly announced at least one month before the date fixed for the general shareholder meeting(s), provided that the merging corporations have not decided to give open access to them on their official websites. However, Polish legislation still does not require such an announcement if:

- The merging companies are limited liability companies with at most 10 individual shareholders, who all agree not to announce the draft terms of merger (CCPC, Article 516).

• The merging companies are partnerships and will form a corporation. In this case, publication of the draft terms of merger is voluntary (CCPC, Article 517).

Directive 2011/35/EU [5] provides for skipping the inspection of such documents, if the acquiring company holds 90% or more, but not all, of the shares of the companies being acquired. Polish legislation tightens EU regulations in this field, as this option is not available to all merging companies.

Additionally, Polish legislation broadens the responsibility to notify the public compared to the directive 2011/35/EU [5], as the management board of the merging companies should twice inform in a public manner all the shareholders about the intention to merge. If a merging company is a corporation, then the first notification should happen at least one month before the general shareholder meeting(s), while the second should happen at least two weeks after the first one. Notification shall contain at least:

• The issue number of the *Journal of the Ministry of Justice* (*Monitor Sądowy i Gospodarczy*) in which the draft terms of merger were announced[5]. It is possible that the first notification itself contains an announcement of the draft terms of merger.

• The place and the period (lasting at least one month) in which shareholders are able to review all the required documents related to the transaction (CCPC, Article 504).

If a merging company is a partnership, then it should twice notify the shareholders or partners who do not conduct any affairs of the company. The interval between these notifications should not be shorter than two weeks and the second should happen at least six weeks before the planned date of adopting the resolution on the merger. These notifications must contain, at the least, information about the place and the period (lasting at least one month as well) in which the merger documents can be reviewed (CCPC, Article 521).

As in the case of announcing the draft terms of merger, these notifications are not obligatory when the merging companies are limited liability companies and have at most 10 individual shareholders (CCPC, Article 516).

Moreover, Polish legislation requires a larger majority in order to approve a merger during the general shareholder meeting(s) in the case of private corporations. At least three-quarters of the votes must support the merger, assuming that at least half of the subscribed capital is represented. In the case of public corporations, this proportion is equal to the minimal two-thirds requirement mentioned in the directive 2011/35/EU [5]. If the resolution of the general meeting to merge is accepted, it should be reported in the register courts appropriate to the seat of each merging company, together with a statement about the company's role in the transaction (acquiring or being acquired) (CCPC, Article 507).

[5]All public announcements related to the legal procedure of merging must be posted in this journal [2].

A general shareholder meeting is optional for the acquiring company if all the conditions mentioned in the directive 2011/35/EU [5] are fulfilled and the company is a private corporation. This additional condition does not need to be met when the acquiring company merges with a subsidiary in which it possesses all the shares (CCPC, Article 516).

The directive 2011/35/EU [5] states that national law should define the moment when the entire merger becomes legally effective. In Poland, this happens on the day when the transaction is entered into the register appropriate to the seat of the acquiring company or the newly formed one (the so called effective date or day of merger). Registration of the merger means that the companies being acquired are dissolved and automatically removed from the register without initiating any liquidation procedure. It is worth noting that companies being acquired cannot be removed from the register before:

- the registration of the increase in capital of the acquiring company, if it takes place,
- the day of entering the merger in the register appropriate to the seat of the companies being acquired,
- the registration day of the new company, if applicable (CCPC, Article 493).

To finish the legal procedure of merger, the acquiring or newly formed company needs to take full responsibility for the public announcement of the merger (CCPC, Article 508). The directive 2011/35/EU [5] allows the companies being acquired to take this responsibility but this is not the case under Polish legislation.

Initially, the legal procedure for domestic mergers in the European Union was introduced by the directive 78/855/EEC of 9 October 1978 [6]. For the next three decades, this directive was subtly changed whenever a new country joined the European Union. In 2007, the first important amendment, the directive 2007/63/EC [3], was enacted, which meant that the written opinion of an assessor on the merger was not obligatory anymore. Moreover, the next and even more fundamental directive, 2009/109/EC [4], allowed the parties involved to exchange the transaction documents electronically. Additionally, opinions of the management on the merger transaction and additional accounting statements became an optional part of the entire procedure. All these changes were codified in the directive 2011/35/EU [5].

As the Code of Commercial Partnerships and Companies is a transposition of European Union regulations, the appropriate amendments were enacted by the Polish parliament in each case. Table 1 gives an overview of all the changes introduced in the Polish procedure for merger consolidation over the years.

The first important legislative change was introduced on 25th April 2008, when the period between the announcement of the draft terms of a merger and the general shareholder meeting was shortened from 6 to 4 weeks. This change was not related to any European Union directive. The next significant amendments, which were enacted on 5th December 2008 and 18th September 2011, respectively, were the result of the requirements of the directives 2007/63/EC [3] and 2009/109/EC [4].

Table 1. Changes in the legal procedure of merging (source: authors study)

Affected articles	Most important changes
First amendment from 12th December 2003 – effective on 26th December 2003	
494, 497, 509, 513, 516, 517, 520, 525	No relevant changes.
Second amendment from 25th April 2008 – effective on 28th May 2008	
491, 500, 504, 506	Regulation of cross-border mergers is introduced as a transposition of the directive 2005/56/EC [3]. The period between the announcement of the draft terms of a merger and the general shareholder meeting is shortened from 6 to 4 weeks (not related to any directive). The period between the first notification of a merger and the general shareholder meeting is shortened from 6 to 4 weeks (not related to any directive).
Third amendment from 5th December 2008 – effective on 4th January 2009	
503^1	A written opinion on the merger by an assessor is not needed anymore if all the shareholders of the companies involved in the transaction have given their consent (added as a new article). This change is concordant with the directive 2007/63/EC [3].
Fourth amendment from 19th August 2011 – effective on 18th September 2011	
496, 499, 500, 501, 503^1, 505, 516	Announcement of the draft terms of a merger in the Journal of the Ministry of Justice becomes optional if this document is continuously available on the website of the merging company for at least one month before the general shareholder meeting; A written opinion on the merger by the management board does not have to be prepared if all the shareholders of the companies involved in the transaction have given their consent; The management board is not obliged to publish relevant changes in a company's assets or liabilities noted after stipulating the draft terms of the merger, but before the shareholder meeting, under the same condition as above; The physical presence of the documents relevant to the merger at the companies' headquarters is not required anymore, if the merging company gives continuous access to these documents on its Internet page for at least one month before the general shareholder meeting. All the above amendments comply with the directive 2009/109/EC [4].

2.3. Time to completion

The time to complete the legal process of a merger (merger duration) should be defined as the timeframe in which all the stages inherent in the legal process of consolidating a merger are successfully completed. In other words, it is the time needed to complete the three main stages of the legal procedure of merging [21, 29], i.e. its managerial, ownership and administration phases.

This definition should be complemented by the definitions of the initialization and completion events of the legal process of merging, in order to ensure that the measurement of the merger duration is accurate.

Taking into consideration the characteristics of this process, initialization should be defined as the date on which the draft terms of a merger are signed by the merging entities. The stipulation of a merger plan formally triggers the legal procedure of merging and moves it into the pending state. The directive 2011/35/EU [5] does not provide an exact definition of completion, stating that it should be defined by the national legislation of individual European Union members. In Poland, the effective completion date is defined as the date when the merger is entered in the National Court Register [1].

By looking at Figs. 1 and 2, it is visible that completion can be defined variously as:

- the date on which the last company being acquired ceases its legal existence,
- the latest date among the effective merger date, its public announcement date and cessation dates. This approach ensures that all the elements of the procedure have taken place within the time horizon considered.

Moreover, it is possible to define alternative measures of merger duration. It could be simply defined as the time which elapses between the public announcements of the draft terms of merger and the completion of registration.

The definitions above were proposed by Buczek and Mercik [10]. Table 2 summarizes them.

Table 2. Definitions of merger duration (source: Buczek and Mercik [10])

Definition name	Initialization event	Completion event
Standard legal merger duration	Stipulation of the draft terms of a merger	Announcement of registration
Private legal merger duration	Stipulation of the draft terms of a merger	Registration
Public legal merger duration	Announcement of the draft terms of a merger	Announcement of registration
Maximal legal merger duration	Earliest event	Latest event

Buczek and Mercik [10] used the standard definition to measure merger duration. They showed that this economic phenomenon is concordant with a heavy-tailed Burr-type distribution.

Nevertheless, in the present literature, merger duration is still neither well defined nor investigated. Usually, researchers [11, 12, 14, 15, 24, 30] concentrated on the joint universe of mergers and acquisitions inheriting the definition of transaction duration from commercial data providers[6]. Thus, transaction duration is measured as the time

[6]Thomson Reuters SDC Platinium is the most common choice.

which elapses between negotiations and the announcement of transaction closure in the public media. Such an approach means that at the level of a single transaction, the time calculated may include different merger or acquisition phases depending on the strategy of information disclosure employed by the management boards of the merging entities.

The existing literature about merger and acquisition duration can be characterized as two streams. One of them treats merger and acquisition duration as a measure characterizing a market for corporate control in a given country or region. The European market is described by Campa and Moschieri [11], while the United States is analysed by Netter et al. [24]. Furthermore, the latter country is also analysed by Branch and Yang [9].

The other stream tries to determine the factors which influence merger and acquisition duration. Dikova et al. [14, 15] investigate the effect of formal and informal institutional differences, as well as the past history of merging companies, on transaction duration in the international business service industry. Deng et al. [12] analyse the influence of corporate social responsibility on merger duration in the United States between 1992 and 2007. Ekelund et al. [17] assess whether there is a difference in merger duration between regulated and unregulated industries, taking into consideration the level of their concentration. In turn, Zhu et al. [30] try to prove that the idiosyncratic volatility of a company being acquired has a significant impact on transaction duration. In addition, all these authors include control variables related to transaction characteristics in their models, e.g. value of deal, payment type, tender offer dummy or hostile takeover dummy. The influence of these kinds of factors is also assessed by Campa and Moschieri [11].

3. The Polish merger market: a case study

Polish, as well as European Union, legislation defines the legal procedure of merger as an inhomogeneous process, which may take different courses. In the case of the Code of Commercial Partnerships and Companies [1], the standard legal process of merger is regulated in Articles 491–515. However, Article 516 consists of provisions which introduce certain simplifications to the procedure dependent on the ownership structure of the company being acquired and its legal form, as well as the public status of the acquiring company. These provisions were described in detail in the previous section.

The empirical part of this research is an attempt to inquire whether the provisions applied have a significant influence on merger duration. Specifically, the author of this article considers the following hypotheses:

- **Hypothesis 1a.** In general, legal procedures executed without the provision of the article 516 take more time to complete than procedures which apply its provisions.

• **Hypothesis 1b.** Legal procedures executed without any provision take more time to complete that the ones executed under article 516 paragraphs 1, 6 and 7.

• **Hypothesis 1c.** There is no significant difference between merger duration for processes executed under various paragraphs (1, 6 and 7) of Article 516.

The application of various provisions is the primary reason for the legal procedure of merging not always being performed in exactly the same way. The second reason comes from the law makers, who have introduced several changes to the procedure over the years. As a design principle, these changes were supposed to simplify and speed up the entire procedure. Thus, the following hypotheses are considered:

• **Hypothesis 2a.** There should be significant differences between the expected time to completion between procedures executed in concordance with the various versions of The Code of Commercial Partnerships and Companies.

• **Hypothesis 2b.** Mergers should not take more time once a new amendment becomes effective.

• **Hypothesis 2c.** All the amendments have a significant influence on shortening merger duration.

These hypotheses will be tested in the next three subsections. Subsection 3.1 gives a brief description of the data collected, while Subsections 3.2 and 3.3 present the results of statistical inference.

3.1. Methodology and data

The Journal of the Ministry of Justice [2] is the best available source of information about mergers which have happened in Poland, as in the majority of cases it contains all the announcements required by the legal procedure of merger[7]. The journal enabled the construction of a dataset containing 3570 completed merger transactions which took place between 1st January 2002 and 31st December 2013. The following transaction specific information was collected: stipulation of the draft terms of a merger and announcement dates, date of registering a merger, as well as its announcement, number of companies taking part in the transaction, and an indicator variable stating whether provisions from Article 516 were mentioned in the draft terms of the merger.

Additionally, for each transaction, the following company specific information was extracted: KRS identification numbers[8], company names, cessation dates if applicable, legal form, initial capital and ownership structure. In order to test the proposed hypotheses, the dataset was enhanced with information on whether the merging entities were

[7]Refer to The Code of Commercial Partnerships and Companies [1] for such exceptions.

[8]National Court Register (*Krajowy Rejestr Sądowy*, KRS).

listed on the Warsaw Stock Exchange (WSE) and NewConnect[9] at the time when the draft terms of merger were announced.

529 merger transactions with more than two companies taking part were excluded from further analysis. In general, the draft terms of merger for these transactions are signed at the same time by all the parties involved and there is only one registration entry in the National Court Register, meaning that the time to completion is measured once at the transaction level. On the other hand, the application of various provisions depends on the stake of the acquiring company in the given target company, which means that merger duration depends on the buyer-target company level. This clear mismatch in the measurement approach was the reason for excluding such cases. Furthermore, 320 transactions were excluded, due to missing data about the initial capital of the target company and its ownership structure.

The definition of the private transaction time to completion was adopted in this study. The dates of stipulating the draft terms of merger were missing for 666 transactions and these cases were not included in the analysis. In conclusion, the author of this article conducted his analysis on a subset consisting of 2055 transactions.

After resolving all these data related issues, four additional variables were created for the purpose of this study:

• *isArticle516*: a two-level variable indicating whether the provisions of Article 516 were mentioned in the draft terms of the merger document (YES/NO),

• *eligibleForArticle516*: a two-level variable indicating whether the merging entities were eligible for the provisions of Article 516. It takes two values:

– YES: was applied whenever the *procedureType* category was different to NO provisions,

– NO: otherwise,

• *procedureType*: a variable which reflects the conditions granted by Article 516 for applying a simplified variant of the legal procedure of merger. It has the following four levels:

– Article 516 § 1 – if the buyer company is not public and it possesses more than 90%, but not all, of the target company shares;

– Article 516 § 6 – if the buyer company is not public and is the only shareholder in the target company;

– Article 516 § 7 – if both merging companies are limited liability companies which are owned by at most 10 individual shareholders;

– No provisions – in all other cases.

• *article516Provisions*: in order to test whether differences in the average time to completion exist according to given provisions, an additional variable was derived from

[9]This is an alternative stock exchange in Poland designed for smaller companies with simplified entrance criteria and limited reporting requirements.

the *procedureType* variable which contains all its categories except the No provisions category[10].

• *lawChange*: a variable noting which amendment to the legal procedure of merger was effective upon the announcement of the draft terms of a merger (refer to Table 1 for descriptions of these changes in procedure):

– No amendment – announcements made before 26th December 2003,
– 1st Amendment – announcements made before 28th May 2008,
– 2nd Amendment – announcements made before 4th January 2009,
– 3rd Amendment – announcements made before 18th September 2011,
– 4th Amendment – announcements made after 18th September 2011.

Table 3. Private legal merger duration. Descriptive statistics (source: authors study)

Level	*N*	Mean	Mode	Min	*P*2	*P*9	*Q*1	Median	*Q*3	*P*91	*P*98	Max
isArticle516												
NO	673	161.51	125	30	58	71	98	134	189	291	442	979
YES	1382	137.966	118	14	55	68	87	111	148	220	459	1920
eligibleForArticle516												
NO	939	147.832	125	16	57	69	92	123	176	264	409	908
YES	1116	143.863	118	14	55	69	90	114	154	225	490	1920
procedureType												
No provision	*939*	147.832	125	16	57	69	92	123	176	264	409	908
Article 516 § 1	70	145.129	102	49	53	63	92	111.5	156	281	459	664
Article 516 § 6	1022	143.227	118	24	55	69	90	114	153	224	490	1920
Article 516 § 7	24	167.25	230	14	14	62	78	128	194	230	829	829
lawChange												
No Amendment	160	168.825	137	24	54	83	103	139	203	308	414	617
1st Amendment	700	166.343	118	16	63	82	102	128	177.5	268	699	1920
2nd Amendment	180	140.456	78	52	57	68	91	112	152.5	236	459	1125
3rd Amendment	702	136.628	99	27	55	66	85	109	154	236	439	1016
4th Amendment	313	110.92	93	14	55	63	75	94	125	189	301	493
Total	2055	145.676	94	14	56	69	91	118	160	246	448	1920

Private legal merger duration is measured in days. *Px*, where *x* is a number, denotes the *x*-th percentile, i.e. *x*% of the data are less than or equal to this value.

Table 3 presents descriptive statistics for merger duration for each level of the variables considered. The least frequent categories belong to *procedureType* and are related to situations when the buyer company is the biggest shareholder of the target company but not the only one (stake above 90% however below 100%) and when merging companies are owned by individuals. It is worth noting that the *lawChange* categories do

[10]As a consequence, the tests are conducted on a subset of the sample of merger transactions.

not have similar frequencies, as the amendments were effective over time ranges of different lengths. Merger duration is measured in days.

Percentiles and quartiles will be used to create box plots for the variables considered and their levels. Quantile selection was done in accordance with the seven-number summary approach, which enables checking the empirical distribution against the normal distribution. If the values of these seven quantiles appear to be equal distances apart on the box plot, this is evidence that the empirical data is normally distributed. Uneven spacing suggests non-normality. The graphs are presented in the next section.

Even without graphical illustration, it is visible from the data that merger duration has a non-normal distribution, as the differences between neighboring quantiles are not the same for each category analyzed. Additionally, the mean values are always greater than the median and mode, suggesting that the distribution is heavily right skewed. Figure 3 confirms these conclusions.

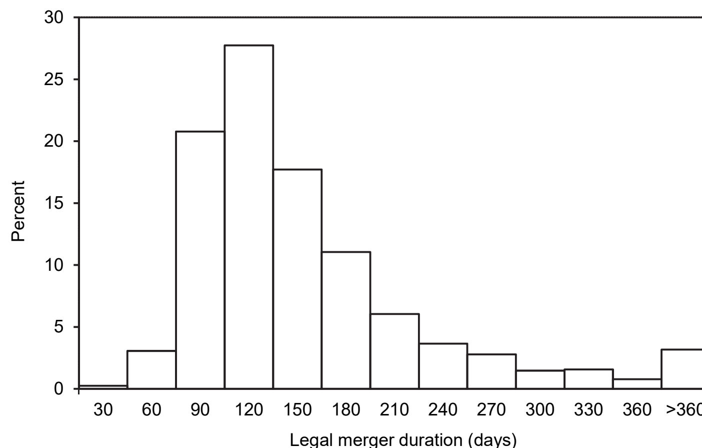

Fig. 3. Histogram of merger duration (source: authors study)

The author of this article, together with Mercik [10] claim that the distribution of merger duration depends directly on the nature of time and processes: merger duration is positively valued and generally right-skewed because of the differing natures of such economic processes. As previously mentioned, they suggested that various parametrizations of Burr Type III and XII distributions may reflect well merger duration, measured as the time elapsing between stipulating the draft terms of a merger and registering a merger. Thus, similar findings may be applied to the definition of the private legal merger duration.

Such evident right skewness requires that statistical tests which do not make assumptions regarding the normality of the data should be chosen to test the hypotheses formulated at the beginning of this section. The non-parametric Wilcoxon rank-sum

test[11] will be used whenever two categories are compared with each other. Additionally, a modified parametric T-test[12] will be implemented, which assumes that the data come from a lognormal distribution. This distribution has a positive support and long right tail, so it fits the data regarding merger duration better than the normal distribution. If more than two categories are compared, then the non-parametric Kruskal–Wallis test will be applied.

The results of the above tests will serve as the main basis of testing hypotheses 1a–c and 2a–c. Nevertheless, the test statistics and respective critical values of tests which assume the underlying normality of the data (standard *T*-test and ANOVA) will still be provided to the reader. They should be treated as a complement to the assumed methodology.

As all the calculations have been performed with the use of SAS software and its native procedures NPAR1WAY, TTEST and ANOVA, detailed specification of these statistical tests can be found in the documentation provided by SAS Institute, Inc. [26–28].

A significance level of 5% will be assumed to interpret the results. The more conservative, two-tailed versions of these tests will be used. As a consequence, the following set of hypotheses will always be tested:

$$\begin{aligned} H_0 &: \theta_1 = \theta_2 = \ldots = \theta_n \\ H_A &: \theta_1 \neq \theta_2 \neq \ldots \neq \theta_n \end{aligned} \tag{1}$$

where n denotes the number of categories compared.

In the case of the Wilcoxon and *T*-tests, only two categories are compared, while for the ANOVA and Kruskal–Wallis tests, more than two categories are possible. The parameter θ is the location parameter of the distribution. For non-parametric tests, this should be understood as the median, while for a parametric test, it is equal to the arithmetic mean (or geometric mean, if we assume that the underlying distribution of the data is lognormal).

Two tailed tests only indicate whether the investigated parameters are all equal to each other, or does at least parameter differ from the others. If there is a need to determine the nature of any differences, graphical analysis will be applied with the use of box plots.

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[11]Applying the appropriate normal approximation, as the sample size is sufficiently large.

[12]Pooled estimators of the variance and coefficient of variation will be applied to the normal and lognormal versions of the test, respectively.

3.2. The influence of provisions on merger duration (hypotheses 1a–1c)

Table 4 contains the *p*-values for the Kruskal–Wallis and ANOVA tests conducted on the basis of a variable level.

Table 4. Tests for differences between location parameters according to variable level (source: authors study)

Variable	Test statistic	Degrees of freedom	*p*-value
Kruskal–Wallis test			
isArticle516	70.194	1	<0.001
eligibleForArticle516	12.283	1	<0.001
procedureType	12.933	3	0.005
article516Provisions	0.594	2	0.743
lawChange	148.980	4	<0.001
Analysis of the variance test			
isArticle516	18.576	1	<0.001
eligibleForArticle516	0.590	1	0.443
procedureType	0.530	3	0.661
article516Provisions	0.376	2	0.687
lawChange	15.576	4	<0.001

The Kruskal–Wallis test reveals that there is a significant difference in merger durations between transactions executed with and without provisions from the Article 516. The analysis of variance partially confirms the result of its non-parametric counterpart – it rejects the null hypothesis for the *isArticle516* variable, but does not reject it for the *eligibleForArticle516* variable. As two-sided tests are used, it is still necessary to complete the test of hypothesis 1a by checking the nature of the difference. At this point, it is worth looking at the box plots (Figs. 4, 5).

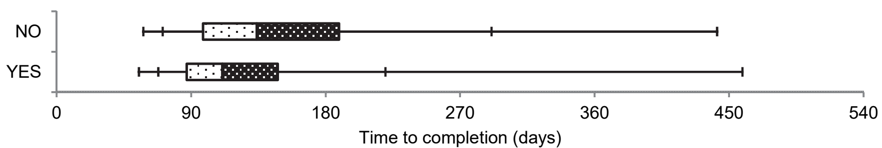

Fig. 4. Box plot of merger duration according to the variable *isArticle516* (source: authors study)

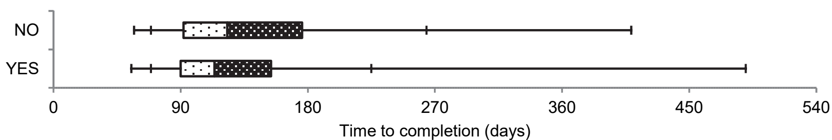

Fig. 5. Box plot of merger duration according to the variable *isEligibleForArticle516* (source: authors study)

The median for the category YES is smaller than for the category NO for both variables. Thus, hypothesis 1a is accepted – in general, the merger procedure takes more time to complete when the provisions of Article 516 do not apply.

In theory, the variables is *Article516* and *eligibleForArticle516* should be equivalent and for a given transaction they should have the same flag. However, reality is a bit different. Please refer to the contingency table below.

Table 5. Eligibility for and application of Article 516 (source: authors study)

eligibleForArticle516	*isArticle516*	Count (%)
NO	NO	574 (27.9%)
YES	YES	1017 (49.5%)
YES	NO	99 (4.8%)
NO	YES	365 (17.8%)

77.4% of the transactions in the sample exhibit concordance between both variables. This means that, in the majority of cases, merging companies have chosen the optimal way available to execute legal procedure of consolidation. In 4.8% of cases, companies were allowed to apply provisions of Article 516, but for some reason they decided to carry out the non-simplified legal procedure of merger. The remaining 17.8% of the sample is especially interesting, as it suggests that sometimes the transactions were not executed in line with the Code of Commercial Partnerships and Companies. On the other hand, this discrepancy may result from the way in which the *isArticle516* variable is created, as the flag YES appears for every transaction for which the draft terms of merger refer to Article 516.

The *Article516Provisions* variable was explicitly created in order to test whether there are any significant differences in the expected duration of a merger according to the various provisions of article 516 (refer to hypothesis 1c). The large *p*-values for the parametric and non-parametric versions of this test presented in Table 4 suggest that such differences do not appear in the sample investigated. Table 6 contains the results of the Wilcoxon and *T*-tests conducted based on the category level.

In order to test the hypothesis that on average it takes more time to complete a merger procedure without applying any provision (hypothesis 1b), the merger duration for the *procedureType* category *No provision* was compared to the durations according to the respective categories representing different simplifications to the procedure described in section 2 of this article. All these tests confirm that there is no significant difference between average times to completion according to whether a general shareholder meeting of the company being acquired is convened or not (Article 516 § 1). The same conclusion is drawn for the provision which negates the obligation to make a public announcement of the draft terms of merger and notifications about the merger itself when merging companies only possess individual shareholders (Article 516 § 7).

Table 6. Tests for a difference between location parameters according to category level (source: authors study)

Levels compared		Wilcoxon test		*T*-test			
				Lognormal		Normal	
First level	Second level	*Z*	*p*-value	*T*	*p*-value	*T*	*p*-value
isArticle516							
NO	YES	8.378	<0.001	7.573	<0.001	4.310	<0.001
isEligibleForArticle516							
NO	YES	3.505	<0.001	2.900	0.004	0.768	0.443
procedureType							
No provision	Article 516 § 1	–1.119	0.263	0.813	0.416	0.237	0.813
No provision	Article 516 § 6	3.546	<0.001	2.955	0.003	0.874	0.382
No provision	Article 516 § 7	0.066	0.947	0.231	0.818	–1.008	0.314
Article 516 § 1	Article 516 § 6	0.029	0.977	0.263	0.793	0.115	0.909
Article 516 § 1	Article 516 § 7	0.603	0.547	–0.184	0.855	–0.771	0.443
Article 516 § 6	Article 516 § 7	0.774	0.439	–0.405	0.685	–0.853	0.394
lawChange							
No Amendment	1st Amendment	1.881	0.060	–1.196	0.232	–0.200	0.842
1st Amendment	2nd Amendment	–4.107	<0.001	3.528	<0.001	2.152	0.032
2nd Amendment	3rd Amendment	0.536	0.592	0.490	0.624	0.455	0.649
3rd Amendment	4th Amendment	–5.134	<0.001	5.061	<0.001	4.376	<0.001

A significant difference between the expected durations of the legal process of consolidation only exists in the situation when the acquiring company is the only shareholder of the company being acquired (Article 516 § 6), as the *p*-values for the Wilcoxon and lognormal *T*-tests are well below the significance level of 5%. On the other hand, the standard *T*-test suggests that this difference is not significant. This interpretation is concordant with the previous conclusion about the equality of the expected durations according to different provisions of Article 516.

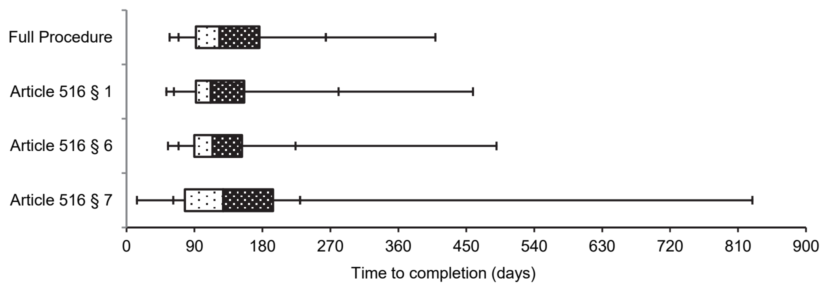

Fig. 6. Box plot of merger duration according to the variable *procedureType* (source: authors study)

Figure 6 shows box plots for merger duration according to each of the *procedureType* categories. Since Full procedure and Article 516 § 6 are categories which

contain a large proportion of the observations from the sample (refer to Table 3) and the median value for the former category is larger than for the latter one, it is possible to state that hypothesis 1b is correct in this case.

Table 6 confirms the conclusions previously drawn regarding hypotheses 1a, and 1c. However, if we look at the box plots from Fig. 6, we may get the impression that there are differences between the expected durations of the procedure according to different provisions of Article 516. At this point, it is important to remember that the categories referring to paragraphs 1 and 7 do not contain many observations and in such cases the difference between the location parameters needs to be large in order to be statistically significant.

3.3. The influence of legal changes on merger duration (hypotheses 2a–2c)

In Table 4, the low *p*-values for the Kruskal–Wallis and ANOVA tests based on the *lawChange* variable indicate that duration of consolidation depends on the various amendments made by the lawmakers over the years. This is the reason why hypothesis 2a is accepted.

In order to test hypotheses 2b and 2c, a more granular view is required and is provided by comparing the categories of variables as described in Table 6. Low *p*-values, indicating that the null hypothesis can be rejected, are associated with the 2nd and 4th amendments. This result is consistent with the description of the amendment presented in Table 1. The 2nd amendment shortened the obligatory period between announcing the draft of terms for a merger and the general shareholders meeting. The same applies to the requirements regarding notification. The 4th amendment allowed circulating all the documents relevant to a merger in electronic form. This change shortened the entire legal phase of consolidation as well.

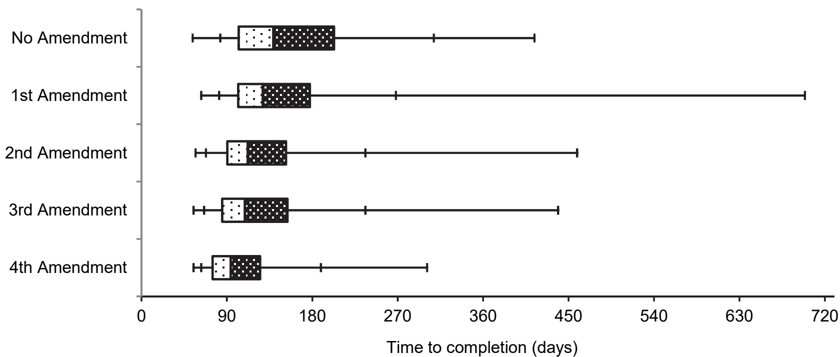

Fig. 7. Box plot of merger duration according to the variable *lawChange* (source: authors study)

In turn, the 1st and 3rd amendments did not introduce any fundamental changes to the procedure which could have influenced the expected time to completion. This statement is confirmed by the tests. The p-values are large, which means that there is no evidence to reject the null hypothesis.

In such a situation, hypothesis 2c is rejected – only some amendments have had a significant influence on shortening merger duration. However, this conclusion still confirms hypothesis 2a.

These tests themselves cannot yield an answer to the question of whether the legal consolidation phase is taking less time to complete once each subsequent amendment becomes effective. This is visible once box plots have been drawn. Figure 7 shows that the 1st and 3rd amendments did not change the average merger duration much, while the 2nd and 4th amendments caused this time to shorten. Thus, in conclusion, hypothesis 2b is confirmed.

4. Conclusions

This research was conducted on a sample consisting of 2055 domestic mergers in Poland completed between 2002 and 2013, so the results obtained are only applicable to this market.

It appears that the amendments introduced by the lawmakers have simplified the legal procedure of merger and caused merger duration to shorten over the years. This process was mainly driven by an amendment which initiated shorter periods between events (the 2nd amendment), as well as an amendment giving the possibility to publish all the relevant merger documents electronically (the 4th amendment). The remaining two amendments (the 1st and 3rd amendment) have neither shortened nor lengthened the expected merger duration.

Legal consolidation of a merger may be executed under different provisions if predefined prerequisites are fulfilled by the merging companies. All these conditions are given in article 516 [1] and have been described in detail in this article. Statistical tests revealed that simplifications arising from paragraph 6 reduce the expected merger duration (when the buyer company is the only shareholder of the target company). On the other hand, there is no statistical evidence that the simplifications related to paragraphs 1 and 7 have any influence on the expected merger duration. At this point, it is worth highlighting that this conclusion was based on a sample which does not contain many transactions executed under these provisions. Hence, statistical reasoning may not be reliable in this case.

These findings suggest that, during strategic planning activities, the management and legal departments of the merging companies should assume that the legal phase of consolidation will take less time to complete whenever the acquiring company is the

only shareholder of the company being acquired. Moreover, they may reduce their estimate of the merger duration if it is based on their own experience of merger transactions from the past (before 18th September 2011).

Some interesting extensions to this paper can be considered for future research. Buczek and Mercik [10] decided to fit various parametrizations of Burr type III and XII distributions to data regarding merger duration. They assumed that the entire legal procedure of merger is always executed in the same way and has not changed over time. These constraints could be relaxed by considering derogations of procedures and legal changes when fitting statistical distributions to data regarding merger duration. In the statistical field of survival analysis, this kind of model is known as an accelerated failure time model and it assumes that a covariate has a direct influence on the scale parameter of the distribution considered (via an exponential link function).

A much more broad research scope covering more than one country is still possible, as merger duration is based on regulations concordant with European Union legislation. As was previously mentioned, the legal procedure of consolidation in Polish law is a direct transposition of the directives 2011/35/EU [5] and 2005/56/EC [3] of the European Parliament.

Lastly, the approach presented is flexible and may be adapted to different legal procedures. The division of companies into separate entities is an obvious choice here – such a process is quite similar to legal consolidation, as it is initiated by a plan to divide and ends with the registration of the newly separated companies. In general, the approach proposed will be appropriate for any procedure where the initialization and completion events are possible to define and observe.

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