



**Transilvania University of Braşov**

## **HABILITATION THESIS**

**Title: Sustainability Reporting and Financial Performance  
of the Economic Entities**

**Domain: FINANCE**

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The habilitation thesis entitled *"Sustainability Reporting and Financial Performance of the Economic Entities"* includes the most important achievements in my scientific research activity, after I was conferred the scientific title of doctor, as well as a professional career development plan.

In the pre- and post-doctoral period, my didactic and research activity took place in the Department of Finance, Accounting, and Economic Theory, Faculty of Economic Sciences and Business Administration, Transilvania University of Brasov.

After defending my doctoral thesis entitled *"Accounting instruments and statements utilized in accounting analysis and decision-making process"*, under the supervision of Professor Dr. Mihaela Dumitrana at ASE Bucharest, my scientific research activity focused mainly on financial and non-financial reporting of economic entities, as well as on the financial analysis of the main indicators provided by the financial statements.

My scientific preoccupations concentrate on topics in the field of finance in general and corporate finance in particular, with a focus on sustainability reporting and the financial performance measuring of the economic entities.

The research, published in ISI journals, has been carried out in research teams with fellow members from the Faculty of Economics and Business Administration, Transilvania University of Braşov, as well as members of faculties from university centres abroad (Portugal and Macedonia).

In this context, I consider the existence of the Doctoral School in the Finance domain at the Transilvania University of Brasov a great opportunity, and I reckon that obtaining the right to be a doctoral supervisor would be an opportunity to work with complex research teams consisting of specialists in the field and young PhD researchers. I would like to thank professors Gheorghița Dincă and Marius Dincă for the effort they made to set up the young doctoral school in the field of Finance, but also for the excellent collaboration in the research teams.

**(A) Summary**

Sustainability reporting has received increasing attention in recent years, being considered an important topic of debate that reflects the responsibility and commitment of entities to the economic, social, and environmental issues/problems. The approach includes the sustainability reports that outline an economic entity's sustainable development policies and strategies, as well as the impact they have on the economy, society, and environment.

The sustainability report is an important communication tool for companies. Transparency, openness, and communication carried out by means of sustainability reports can lead to increased trust, reputation among business partners and implicitly to an increase in the performance of economic entities.

The topic addressed in my research focuses mainly on sustainability reporting, as well as on the connection between the information disclosed by means of reports and the financial performance of economic entities. Trust in an economic entity and, implicitly, in its management depends on the degree of understanding and perception of the financial and non-financial information by those interested.

The research I have carried out lately has allowed me an insight into the field of financial and non-financial reporting, which is presented and analyzed both in terms of its role in substantiating user decisions and in terms of its role as a tool meant to increase the performance of economic entities. The habilitation thesis is elaborated on two main sections: scientific and professional achievements and career evolution and development plans. The scientific and professional achievements fall into five research directions, respectively five chapters:

- 1. The sustainability reporting of economic entities and their environmental responsibility*
- 2. Reorganization of economic entities by demerger and sustainable development strategies*
- 3. Financial sustainability and performance reporting of economic entities*
- 4. Measuring the risk of insolvency. Prevention methods*
- 5. Other research directions*

The published articles, transposed in research directions, contain an introductory part, an analysis of the literature in the approached field, the research methodology, as well as the main results and contributions.

The first research direction, entitled "***Sustainability reporting of economic entities and their environmental responsibility***," aims at the transparency and responsibility of companies to environmental issues, as well as the dependence relationship that may exist between the degree of disclosure of environmental information and various economic and financial measures (the performance of companies, their size, the seniority of the entity and degree of indebtedness).

In this sense, in order to evaluate the transparency related to the environmental aspects, data were extracted from the annual reports and the sustainability reports for 100 companies listed at the Bucharest Stock Exchange, companies that carry out their activity in areas with major environmental impact, with activities and products prone to damage the environment. For each of the 100 selected companies, an index was used to measure the degree of disclosure of environmental information. The environmental disclosure index is, in fact, a centralized list that allows a score to be assigned to each analyzed company, depending on the environmental information it presents in the annual reports or in their sustainability reports. The environmental disclosure index includes a

set of environmental performance indicators which are aligned to relevant international standards, in particular ISO 14031, as well as to the GRI (Global Reporting Initiative). The obtained scores reflect the degree of environmental information disclosure, transparency, and company responsibility in terms of environmental issues.

The analysis of the dependency relationship between the degree of disclosure of environmental information (DEI, Disclosing Environmental Information) and the financial and non-financial measures has been tested by several different econometric approaches.

The results of the study have shown that the interest in publishing environmental data is relatively low. The highest score obtained by the sampled companies has been 15, compared to the maximum possible value of 29. Unfortunately, there is still a significant part of listed companies that are reluctant to provide information on the impact of their activities on the environment. In Romania, only the companies with over 500 employees are obliged to publish sustainability reports. Equally, the results of econometric processing show that the disclosure of environmental information greatly depends on the size of the company and its performance.

This study adds value to the existing literature by completing and expanding the research area in the field of environmental reporting. The results of the study may contribute to: (a) the improvement of environmental reporting and disclosure practices; (b) the increase in managers' transparency about and awareness of environmental issues. Managers should be aware of the need to provide relevant, clear, real, and complete information on environmental protection. Managers could use our index as a guide for designing a framework for reporting environmental information in the companies they run; (c) the change of the behaviour/mentality of the listed companies; (d) the increase in awareness of regulators and the need to support them when taking steps to cause

companies to disclose the effect of their operations on the environment. Environmental information disclosure is based less on voluntary initiatives and more on official ones, on regulations.

The second research direction entitled "*Reorganization of economic entities by demerger and sustainable development strategies*" argues for the need to reorganize and rethink business strategy, especially in the context of the pandemic generated by Covid-19. One solution for the recovery and reorganization of the economic entities' activity is the partial division.

In this sense, in order to assess the impact of demerger on the sustainable development of Romanian economic entities, both a statistical analysis of the financial performance before and after the demerger was performed and a content analysis of 268 demerger projects have been carried out for the period April 2012 - April 2021.

The results of the study indicate that there are no significant differences between the financial performance (expressed by the return on assets - ROA and the return on equity - ROE) before and after the demerger, but the demerger still has a positive effect on companies helping them survive and rethink their business strategy and continue their long-term business. The demerger does not lead to an immediate improvement in performance, but rather to the maintenance of efficiency levels for about four years, after which it is possible to see a slight increase. The demerger leads to increased independence and a focus on core business, thus ensuring companies' efficiency and sustainable development. A smaller company can benefit from a greater efficiency in managing, using its resources more efficiently, and maintaining long-term financial profitability.

The statistical processing in this study provides a comprehensive analysis of the impact of the demerger of Romanian economic entities on the financial performance and



efficiency of their activity. The analysis of the financial profitability rates before and after the demerger is particularly important for the managers of an economic entity because they will be able to assess the impact and benefits of the demerger to decide on the form of restructuring they want to implement in the entity they lead. The study reveals the economic and financial implications that the demerger process may have on the sustainable development of economic entities.

The third research direction refers to "*Financial sustainability and performance reporting of economic entities*." The periods of economic and financial crisis impose on companies the need to develop a model of sustainable development. A sustainable company is an efficient company, and efficiency can be defined in the form of financial performance, profitability, or productivity.

Sustainability is an economic component that economic entities need to integrate into their business strategies in order to meet the challenges, but also in order to ensure the continuity and development of their long-term activity. Sustainability has a financial side as well, highlighted by financial indicators. Obtaining favourable financial results (profit) as well as the efficiency in the use of resources can be considered an expression of financial sustainability.

Zabolotnyy and Wasilewski (2019) define the financial sustainability of a company as the ability to generate value for owners and to provide continuity to long-term operations, using an optimal combination of investments and sources of financing.

*„Financial performance shows the success of a company and the attractiveness of shares in the financial markets. It helps investors make investment decisions in stock markets and managers make financial decisions”*(Madaleno and Bărbuță-Mișu, 2019).

The financial performance of the economic entities has been the subject of discussion in most of the articles we have published in recent years; either it was analyzed in

correlation with the degree of disclosure of environmental information; or it was analyzed before and after the reorganization process of an entity; or it has been analyzed as dynamic in different sectors of activity (pharmaceutical sector, construction, and textile industry).

In diagnosing the financial health of the analyzed companies, we have used the following indicators: return on assets, return on equity, turnover, net result, liquidity rates, solvency rates, degree of indebtedness, etc.

This section covers both published and forthcoming articles, an example being the research on the "*Financial Sustainability of Companies in the Agricultural Sector*." The mentioned article, currently forthcoming, offers a financial perspective on the sustainability of companies in the agricultural sector, using the econometric processing of the financial data for a sample of 524 companies in Romania, the analysis period being 16 years.

The fourth direction of research entitled "*Measuring insolvency risk. Prevention methods*" heads towards insolvency risk forecasting models. In this regard, a model for insolvency risk forecasting was designed and was econometrically tested by logit and logistic models. The model, unlike the models based on score functions, is based exclusively on the analysis of the fluctuation of financial rates over time, more precisely on the information provided by means of financial statements; this model provides generally valid and reliable results and allows of the generalization of data and implementation of results in any economic circumstances.

The model, designed for an early warning of financial difficulty of economic entities, is based on a set of five measures, respectively general solvency, patrimonial solvency, accounts receivable conversion period, assets' liquidity, and assets' efficiency ratio.

The selection of financial indicators was conditioned by the availability of financial data provided by Romania's Administration of Public Finance.

Based on the designed model, those interested can identify the companies at risk of insolvency and decide whether to start or continue business relationships with those companies. The insolvency situation in Romania has been analyzed, after the financial crisis of 2008, for a period of five years, for 70 companies from different domains. Regression results show assets liquidity and patrimonial solvability are insignificant factors for insolvency risk.

All five indicators which make up the model have had a descending trend (in the last three years preceding the insolvency entry), and values outside the ranges considered normal for healthy companies (having lower levels than the minimum accepted values).

The inability to honor creditors' obligations (general solvency with low and declining values), accelerated de-capitalization (unsatisfactory and declining level of economic solvency), growing delays in collecting the value of goods and services sold (increasing A/R conversion period), the lack of real liquidity (declining assets' liquidity) and inefficient use of assets (downward trend of assets' efficiency) are the five measures that, together, led to a situation of imminent insolvency, within a three years' period.

The end, the fifth chapter is reserved for "*other directions of research*". This section includes two articles published on the following topics: "*Cyclicalities of Fiscal Policy in the European Union*" and "*Explaining The EU Regional Economic Growth Through Regional- And Country-Level Achievements in Education*".

The article "*Cyclicalities of Fiscal Policy in the European Union*" analyzes the way in which fiscal policy works throughout the phases of the economic cycle, more precisely it verifies the pro-cyclical characteristics of this policy. The sample includes EU countries, except Cyprus and Malta, for the period 1995-2014. Multiple regressions have been used

to measure the pro-cyclicality and the way fiscal policy responds to social and political stimuli. It has been found that, throughout the period under review, most countries pursued a pro-cyclical fiscal policy, regardless of whether they were developed or developing countries.

The research entitled "*Explaining The EU Regional Economic Growth Through Regional-And Country-Level Achievements in Education*" examines the impact that factors such as investment in education and ICT (Information and Communication Technologies) have on EU country and regional growth Communication Technologies). The research methodology uses multi-level mixed-effects models, and the data cover the period 2001-2017, and they are available on Eurostat. The study shows that achievements in the field of education, when significant generate positive effects for the regional growth in both the new Member States (NMS) and in the old Member States (OMS), and it seeks to design measures for the regional-national policies in education and ICT.

The second section of the habilitation thesis summarizes the plans for the evolution and development of the future professional career, both in the direction of the teaching activities and in terms of the research activity.

The last section is intended for the bibliographic references used in the research approach.

## Rezumat

Raportarea sustenabilă a beneficiat de o atenție sporită în ultimii ani fiind considerată un subiect important de dezbatere ce reflectă responsabilitatea și angajamentul entităților economice față de aspectele/problemele economice, sociale și de mediu. Demersul include rapoartele de sustenabilitate care creionează politicile și strategiile de dezvoltare durabilă a unei entități economice, precum și impactul pe care acestea îl au asupra economiei, societății și mediului.

Raportul de sustenabilitate reprezintă un instrument important de comunicare pentru companii. Transparența, deschiderea și comunicarea realizată prin intermediul rapoartelor de sustenabilitate pot conduce la creșterea încrederii, a reputației în rândul partenerilor de afaceri și implicit la o creștere a performanței entităților economice.

Tematica abordată în cadrul activității mele de cercetare vizează în principal raportarea sustenabilă, precum și conexiunea dintre informațiile divulgate prin intermediul rapoartelor și performanța financiară a entităților economice. Încrederea într-o entitate și, implicit, în conducerea acesteia depinde de gradul de înțelegere și percepere a informațiilor financiare și nonfinanciare de către părțile interesate.

Cercetarea realizată în ultimii ani mi-a permis o incursiune în sfera raportărilor financiare și nonfinanciare, acestea fiind prezentate și analizate atât prin prisma rolului în fundamentarea deciziilor utilizatorilor, cât și prin prisma rolului jucat ca instrument de creștere a performanței entităților economice.

Teza de abilitare este elaborată pe două secțiuni principale: realizări științifice și profesionale și planuri de evoluție și dezvoltare a carierei. Realizările științifice și profesionale sunt conturate în cinci direcții de cercetare, respectiv, cinci capitole:

1. *Raportarea sustenabilă a entităților economice și responsabilitatea față de mediu*
2. *Reorganizarea entităților economice prin divizare și strategii de dezvoltare sustenabilă*
3. *Sustenabilitatea financiară și raportarea performanțelor entităților economice*
4. *Măsurarea riscului de insolvență. Modalități de prevenție*
5. *Alte direcții de cercetare*

Articolele publicate, transpuse în direcții de cercetare, conțin o parte de introducere, o analiză a literaturii în domeniul abordat, metodologia cercetării, precum și principalele rezultate și contribuții.

Prima direcție de cercetare cu titlul „***Raportarea sustenabilă a entităților economice și responsabilitatea față de mediu***” vizează transparența și responsabilitatea companiilor față de aspectele legate de mediu, precum și relația de dependență care poate exista între gradul de divulgare a informațiilor de mediu și diverși factori economico-financiar (performanța companiilor, mărimea acestora, vechimea entității economice și gradul de îndatorare).

În acest sens, pentru evaluarea transparenței față de aspectele legate de mediu, s-au extras date din rapoartele anuale și rapoartele de sustenabilitate pentru 100 de companii listate la Bursa de Valori București, companii care își desfășoară activitatea în zone cu impact major asupra mediului, cu activități și produse predispuse să provoace daune mediului înconjurător. Pentru fiecare dintre cele 100 de companii selectate s-a utilizat un indice pentru a măsura gradul de divulgare a informațiilor despre mediu. Indicele de divulgare a informațiilor de mediu este de fapt o listă centralizatoare care permite atribuirea unui scor fiecărei companii analizate, în funcție de informațiile de mediu pe care le prezintă în rapoartele anuale sau rapoartele de sustenabilitate. Indicele de divulgare a informațiilor de mediu include un set de indicatori ai performanței de mediu care sunt

aliniați la standardele internaționale relevante, în special ISO 14031, precum și la GRI (Global Reporting Initiative). Scorurile obținute reflectă gradul de divulgare a informațiilor de mediu, transparența și responsabilitatea companiilor în ceea ce privește aspectele de mediu.

Analiza relației de dependență dintre gradul de divulgare a informațiilor de mediu (DEI, Disclosing Environmental Information) și factorii financiari și nonfinanciari a fost testată prin mai multe abordări econometrice diferite.

Rezultatele studiului au arătat că interesul pentru publicarea datelor de mediu este relativ scăzut. Cel mai mare scor obținut de companiile incluse în eșantion a fost de 15, comparativ cu valoarea maximă posibilă de 29. Din păcate, există încă o parte semnificativă a companiilor listate care sunt reticente în furnizarea de informații referitoare la impactul activităților lor asupra mediului. În România, doar companiile cu peste 500 de angajați sunt obligate să publice rapoarte de sustenabilitate. De asemenea, rezultatele prelucrărilor econometrice arată că divulgarea informațiilor de mediu depinde în mare măsură de dimensiunea companiei și de performanța acesteia.

Studiul realizat aduce valoare adăugată literaturii existente prin completarea și extinderea ariei de cercetare în domeniul raportării de mediu. Rezultatele studiului pot contribui la: (a) îmbunătățirea practicilor de raportare și de divulgare a informațiilor de mediu; (b) creșterea transparenței și a conștientizării managerilor față de aspectele de mediu. Managerii ar trebui să fie conștienți de necesitatea furnizării de informații relevante, informații clare, reale și complete privind protecția mediului. Managerii ar putea folosi indexul nostru ca ghid pentru conceperea unui cadru de raportare a informațiilor de mediu în companii pe care le conduc; (c) schimbarea comportamentului / mentalității companiilor listate; (d) creșterea gradului de conștientizare a autorităților de reglementare și sprijinirea acestora în luarea unor măsuri care să determine companiile să dezvăluie

efectul operațiunilor lor asupra mediului. Divulgarea informațiilor de mediu se bazează mai puțin pe inițiative voluntare și mai mult pe cele oficiale, pe reglementări.

Cea de-a doua direcție de cercetare cu titlul „*Reorganizarea entităților economice prin divizare și strategii de dezvoltare sustenabilă*” pledează pentru nevoia de reorganizare și regândire a strategiei de afaceri, mai ales în contextul pandemiei generate de Covid-19. O soluție de redresare și reorganizare a activității entităților economice este divizarea parțială.

În acest sens, pentru a evalua impactul divizării asupra dezvoltării sustenabile a entităților economice din România, s-a realizat atât o analiză statistică a performanței financiare înainte și după divizare, precum și o analiză de conținut a 268 de proiecte de divizare, pentru perioada aprilie 2012 – aprilie 2021.

Rezultatele studiului indică faptul că nu există diferențe semnificative între performanța financiară (exprimată prin rata rentabilității activelor - ROA și rata rentabilității capitalurilor proprii - ROE) înainte și după divizare, însă divizarea are totuși un efect pozitiv asupra companiilor ajutându-le să supraviețuiască, să-și regândească strategia de afaceri și să-și continue activitatea pe termen lung. Divizarea nu determină o îmbunătățire imediată a performanței, ci mai degrabă o menținere a nivelurilor de eficiență pentru aproximativ patru ani după care este posibil să se înregistreze o ușoară creștere. Divizarea determină o independență sporită și o concentrare asupra activităților de bază, asigurând astfel eficiența și dezvoltarea durabilă a companiilor. O companie mai mică poate beneficia de o eficiență mai mare în gestionarea, utilizarea mai eficientă a resurselor sale și menținerea profitabilității financiare pe termen lung.

Prelucrarea statistică realizată în cadrul acestui studiu oferă o analiză cuprinzătoare a impactului divizării entităților economice din România asupra performanței financiare și eficienței activității acestora. Analiza ratelor de rentabilitate financiară înainte și după



divizare este deosebit de importantă pentru managerii unei entități economice deoarece vor fi în măsură să evalueze impactul și beneficiile divizării, să decidă asupra formei de restructurare pe care doresc să o implementeze în cadrul entității economice pe care o conduc. Studiul relevă implicațiile economice și financiare pe care procesul de divizare îl poate avea asupra dezvoltării durabile a entităților economice.

Cea de-a treia direcție de cercetare vizează *„Sustenabilitatea financiară și raportarea performanțelor entităților economice”*. Perioadele de criză economică și financiară impun companiilor necesitatea dezvoltării unui model de dezvoltare sustenabilă. O companie sustenabilă este o companie eficientă, iar eficiența se poate regăsi sub forma performanței financiare, a profitabilității, sau a productivității.

Sustenabilitatea este o componentă economică pe care entitățile economice sunt nevoite să o integreze în strategiile lor de afaceri pentru a face față provocărilor, dar și pentru a-și asigura continuitatea și dezvoltarea activității pe termen lung. Sustenabilitatea are și o latură financiară evidențiată prin intermediul indicatorilor financiari. Obținerea de rezultate financiare favorabile (profit), dar și eficiența în utilizarea resurselor poate fi considerată o expresie a sustenabilității financiare.

Zabolotnyy și Wasilewski (2019) definesc sustenabilitatea financiară a unei firme ca fiind capacitatea de a genera valoare pentru proprietari și de a oferi continuitate operațiunilor pe termen lung, utilizând o combinație optimă a investițiilor și a surselor de finanțare.

*„Performanța financiară arată succesul unei companii și atractivitatea acțiunilor pe piețele financiare. Ajută investitorii în luarea deciziilor de investiții pe piețele de valori și managerii în luarea deciziilor financiare”* (Madaleno și Bărbuță-Mișu, 2019).

Performanța financiară a entităților economice a reprezentat subiect de discuție în majoritatea articolelor pe care le-am publicat în ultimii ani; fie că a fost analizată în

corelație cu gradul de divulgare a informațiilor de mediu; fie că a fost analizată înainte și după procesul de reorganizare a unei entități economice; fie că a fost analizată ca dinamică în diferite sectoare de activitate (sectorul farmaceutic, construcții și industria textilă).

În diagnosticarea stării de sănătate financiară a companiilor analizate, am utilizat următorii indicatori: rentabilitatea activelor, rentabilitatea capitalului, cifra de afaceri, rezultatul net, ratele de lichiditate, ratele de solvabilitate, gradul de îndatorare etc.

Această secțiune are în vedere atât articole deja publicate, cât și articole în curs de publicare, un exemplu fiind cercetarea cu tema „*Sustenabilitatea financiară a companiilor din sectorul agricol*”. Articolul amintit, în curs de publicare, oferă o perspectivă financiară asupra sustenabilității companiilor din sectorul agricol, utilizând prelucrări econometrice a unor date financiare pentru un eșantion de 524 de companii din România, perioada de analiză fiind de 16 ani.

Cea de-a patra direcție de cercetare cu titlul „*Măsurarea riscului de insolvență. Modalități de prevenție*” se îndreaptă spre modele de previziune a riscului de insolvență. În acest sens, s-a proiectat un model pentru previzionarea riscului de insolvență care a fost testat econometric prin logit și modelele logistice. Modelul, spre deosebire de modelele bazate pe funcții scor, se bazează exclusiv pe analiza fluctuației ratelor financiare în timp, mai exact pe informațiile furnizate prin intermediul situațiilor financiare; acest model oferă rezultate valabile și fiabile în general și permite generalizarea datelor și implementarea rezultatelor în orice circumstanțe economice.

Modelul, conceput pentru avertizarea timpurie a dificultăților financiare ale entităților economice, se bazează pe un set de cinci indicatori, respectiv: indicatorul solvabilității generale, indicatorul solvabilității patrimoniale, indicatorul durata de conversie a creanțelor, indicatorul lichidității activelor și rata de rotație a activelor totale. Alegerea

indicatorilor financiari a fost condiționată de disponibilitatea datelor financiare furnizate prin situațiile financiare.

Pe baza modelului conceput, părțile interesate pot identifica firmele cu risc de insolvență și pot decide oportunitatea inițierii sau continuării relațiilor de afaceri cu firmele respective. A fost analizată situația insolvenței din România, după criza financiară din anul 2008, pe o perioadă de cinci ani pentru 70 de companii din diferite sectoare de activitate. Rezultatele regresiei arată că lichiditatea activelor și solvabilitatea patrimonială sunt factori nesemnificativi pentru riscul de insolvență.

Toți cei cinci indicatori care compun modelul au înregistrat o tendință descendentă (în ultimii trei ani care preced intrarea într-o stare de insolvență) și valori în afara intervalelor considerate normale pentru companiile sănătoase (înregistrând niveluri mai mici decât valorile minime acceptate). Incapacitatea de a onora obligațiile creditorilor, decapitalizare accelerată, întârzieri în creștere în colectarea valorii bunurilor și serviciilor vândute, lipsa lichidității reale și utilizarea inefficientă a activelor sunt cele cinci măsuri care, împreună, au dus la o situație iminentă de insolvență a companiilor incluse în eșantion.

Finalul, capitolul 5, este rezervat "**altor direcții de cercetare**". În această secțiune sunt incluse două articole publicate, cu următoarea tematică: „*Cyclicality of Fiscal Policy in the European Union*” și „*Explaining The EU Regional Economic Growth Through Regional - And Country-Level Achievements in Education*”.

Articolul „*Cyclicality of Fiscal Policy in the European Union*” analizează modul în care funcționează politica fiscală de-a lungul fazelor ciclului economic, mai exact verifică caracteristicile prociclice ale acestei politici. Eșantionul include țările UE, cu excepția Ciprului și Maltei, pentru perioada 1995-2014. Pentru a măsura prociclicitatea și modul în care politica fiscală răspunde la stimuli sociali și politici s-au folosit regresii multiple. S-a constatat că pe parcursul întregii perioade analizate majoritatea țărilor au condus o

politică fiscală prociclică, indiferent dacă au fost țări dezvoltate sau țări în curs de dezvoltare.

Cercetarea cu tema „*Explaining The EU Regional Economic Growth Through Regional - And Country-Level Achievements in Education*” analizează impactul pe care-l au asupra creșterii economice la nivel de țară și la nivel regional UE factori precum investițiile în educație și ICT (Information and Communication Technologies). Metodologia cercetării utilizează modele cu efecte mixte cu mai multe niveluri, iar datele cuprind perioada 2001-2017 și sunt disponibile pe Eurostat. Studiul arată că realizările în domeniul educației atunci când sunt semnificative generează efecte pozitive pentru creșterea regională atât în noile state membre (NMS), cât și în statele membre vechi (OMS) și încearcă proiectarea unor măsuri pentru politicile regionale-naționale în educație și ICT.

Cea de a doua secțiune a tezei de abilitare sintetizează planurile de evoluție și de dezvoltare a viitoarei cariere profesionale, atât în direcția activităților didactice cât și în ceea ce privește activitatea de cercetare.

Secțiunea finală este destinată referințelor bibliografice utilizate în demersurile de cercetare.

## **(B) Scientific and professional achievements and the evolution and development plans for career development**

### **(B-i) Scientific and professional achievements**

#### **1. Introduction**

The habilitation thesis entitled "*Sustainability reporting and financial performance of the economic entities*" is structured, depending on the research results, on five research directions, respectively: sustainability reporting of economic entities and environmental responsibility, reorganization of economic entities by demerger and sustainable development strategies, financial sustainability and entity performance reporting, insolvency risk measurement and other research directions.

The starting point in the research is the doctoral thesis entitled "*Accounting instruments and statements utilized in accounting analysis and decision-making process*." Following the research based on financial reporting, I have expanded the research area to sustainability reporting, which complements the financial information with non-financial, environmental, and social data.

The periods of the financial crisis have made the economic entities supplement their financial reporting with non-financial environmental, social, and economic information. Stakeholders aim for transparency and the complete and integrated reporting of financial and non-financial information.

Sustainability reports present an entity's policies and strategies for sustainable development and their impact on the economy, society, and the environment. They show the business model and the company values.

The term sustainability reporting is closely related to sustainable development and involves how the society handles its activity by using financial, social, and environmental risk indicators (Caloian, 2013).

The information contained in the sustainability reports highlights the behaviour and responsibility of economic entities concerning the impact of their activity on the environment, society, and the economy, making them more transparent about the risks and opportunities they face.

Sustainability reporting is a tool capable of helping companies and organizations satisfy the growing demand for transparency from customers, investors, other stakeholders, and society in general (Martínez et al., 2016; Girón et al., 2020).

Sustainability reporting standards, the Global Reporting Initiative (GRI), allow economic entities to communicate information on sustainability and their work's economic, environmental, and social impact. On the one hand, the GRI standards guide the economic entities, providing them with sustainability reporting rules and principles, and on the other hand, they provide to the interested ones criteria for assessing the economic, social, and environmental policies pursued by economic entities.

The reporting of the non-financial aspects in Romania is regulated by Order no. 1802/2014, which includes the amendments brought by the MFP Order no. 1938/2016 and the MFP Order no. 3456/2018, and it stipulates the obligation for companies with over 500 employees to report information on environmental, social and personnel issues, human rights observation, the fight against corruption and bribery. The MFP order no. 1938/2016 transposes the Directive 2014/95/EU of the European Parliament on the presentation of non-financial information and information on diversity by certain companies and large groups. A sustainable, credible, and accurate reporting ensures the

sustainable development of the economic entities' business and can implicitly influence their financial performance.

The literature on sustainability reporting has recognized the positive effect that companies obtain in disclosing information related to the sustainability of their daily activities (Hahn and Kühnen, 2013; Girón et al., 2020). Disclosure of information related to the sustainability performance of companies reduces information asymmetries and improves transparency (Nobanee and Ellili, 2016).

The relationship between sustainability reporting and entity performance has been addressed in various studies in the literature (Jones et al., 2007; Lo and Sheu, 2007; Schadewitz and Niskala, 2010; Reddy and Gordon, 2010; Ameer and Othman, 2012; Burhan and Rahmanti, 2012; Berthelot et al., 2012; Aggarwal, 2013; Caloian, 2013; Bachoo et al., 2013; Speziale and Klovienne, 2014; Kusuma and Koesrindartoto, 2014; Ngatia, 2014; Onyekwelu and Ekwe, 2014; Martínez et al., 2016; Joseph, 2016; Nobanee and Ellili, 2016; Utami, 2015; Lassala et al., 2017; Ching et al., 2017; Kuzey and Uyar, 2017; Loh et al., 2017; Alshehhi et al., 2018; Gunarsih and Ismawati, 2018; Laskar, 2018; Uwuigbe et al., 2018; Johari and Komathy, 2019; Fuadah et al., 2019; Carp et al., 2019; Girón et al., 2020; Hongming et al., 2020).

Most studies have concluded that sustainability reporting has led to an improvement in the financial performance of the economic entities; they confirm a significant positive relationship between firm performance and corporate sustainability reporting.

The research we have carried out in the last years aims at the two main research directions, highlighted/related by the title of the thesis, respectively the financial and non-financial reporting and the economic entities' financial performance.

The research results presented in the habilitation thesis were disseminated through specialized articles published in ISI Web of Science indexed journals or indexed in recognized international databases. These articles are presented below.

## 2. Representative papers

1. Dincă, M.S., Madaleno, M., **Baba, C.M.**, Dincă, G. (2019). Environmental Information Transparency—Evidence from Romanian Companies, *Sustainability* 2019, 11, 5040, ISSN: 2071-1050, WOS: 000489104700226, FI: 2,576, AIS: 0,332, <https://doi.org/10.3390/su11185040>
2. **Baba, C.M.**, Duguleană, C., Dincă, M.S., Duguleană, L., Dincă, Gh. (2021). The Demerger Impact upon Sustainable Development of Economic Entities: Evidence from Romania, *Sustainability* 2021, 13(15), 8316, 1-15, ISSN: 2071-1050, WOS: 000682240200001, FI: 3,251, AIS: 0,462, <https://doi.org/10.3390/su13158316>
3. Dincă, G., **Baba, M.C.**, Dincă, M.S., Dauti, B., Deari, F. (2017). Insolvency Risk Prediction Using the Logit and Logistic Models: Some Evidences from Romania. *Economic Computation and Economic Cybernetics Studies and Research*, 51(4), 139-157, ISSN: 18423264, WOS: 000423499200009, FI: 0,664, AIS: 0,093, [http://www.ecocyb.ase.ro/nr2017\\_4/09%20-%20Dinca%20Gheorghita,%20Dinca%20Marius\(T\).pdf](http://www.ecocyb.ase.ro/nr2017_4/09%20-%20Dinca%20Gheorghita,%20Dinca%20Marius(T).pdf)
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5. Szeleş Răileanu, M., Anton, C., **Baba, M.**, Busuioceanu, S., Litră, A., Suciu, T. (2019). Explaining The EU Regional Economic Growth Through Regional - And Country-Level Achievements in Education. *Romanian Journal of Economic Forecasting*, 22 (1), 143-157, ISSN: 15826163, WOS: 000464199700010, FI: 0,561, AIS: 0,051, [http://www.ipe.ro/rjef/rjef1\\_19/rjef1\\_2019p143-157.pdf](http://www.ipe.ro/rjef/rjef1_19/rjef1_2019p143-157.pdf)
6. **Baba, C.M.** (2016). Evaluating the financial performance of Companies from the Pharmaceutical Industry. *Bulletin of the Transilvania University of Braşov. Series V: Economic Sciences*, 9(58), 223-228, [http://webbut.unitbv.ro/BU2016/Series%20V/BULETIN%20I/23\\_Baba.pdf](http://webbut.unitbv.ro/BU2016/Series%20V/BULETIN%20I/23_Baba.pdf)
7. **Baba, C.M.** (2015). The financial position and performance of the economic entities from the Light Industry. *Bulletin of the Transilvania University of Braşov. Series V: Economic Sciences*, 8 (57), 261-268, [http://webbut.unitbv.ro/BU2015/Series%20V/BILETIN%20I/31\\_Baba.pdf](http://webbut.unitbv.ro/BU2015/Series%20V/BILETIN%20I/31_Baba.pdf)
8. **Baba, C.M.** (2014). Financial return in the field of constructions: What accounting issues should an investor know? *Bulletin of the Transilvania University of Braşov. Series V: Economic Sciences*, 7 (56), 175-180, [http://webbut.unitbv.ro/BU2014/Series%20V/BULETIN%20V/IV-01\\_BABA.pdf](http://webbut.unitbv.ro/BU2014/Series%20V/BULETIN%20V/IV-01_BABA.pdf)
9. **Baba, C.M.** (2017). Financial reporting in the Furniture Industry. *Bulletin of the Transilvania University of Braşov. Series V: Economic Sciences*, 10 (59), 179-186, [http://webbut.unitbv.ro/BU2017/Series%20V/2017/BULETIN%20I/19\\_BABA.pdf](http://webbut.unitbv.ro/BU2017/Series%20V/2017/BULETIN%20I/19_BABA.pdf)

## **Chapter 1. Sustainability Reporting of Economic Entities and their Environmental Responsibility**

### **1.1. Introduction**

Climate change and air pollution lead to greater awareness of environmental issues by economic entities, forcing them to correctly and transparently disclose information that impacts the environment, information published through sustainability reports.

Disclosure of environmental information reflects the companies' transparency and responsibility toward the environment and can increase the confidence in these companies.

The relationship between environmental reporting and entity performance has been addressed in various studies in the literature (Hart and Ahuja, 1996; Russo and Fouts, 1997; Ahmad et al., 2003; Nakao et al., 2007; Ngwakwe, 2009; Brammer and Pavelin, 2008; Buniamin, 2010; Andrikopoulos and Kriklani, 2012; Saha and Akter, 2013; Beredugo and Mefor, 2016).

Hart and Ahuja (1996) perform a linear regression using as variables the financial performance indicators calculated by accounting methods such as ROA (Return on Assets), ROE (Return on Equity), ROS (Return on Sales), and reduction of gas emissions. They find a positive correlation between the improvement of the analyzed index and financial performance.

Abd Rahman et al. (2013) examined the association between environmental reporting and firm performance in Malaysia. An environmental reporting was developed using content analysis. They reported that 68% of firms in Malaysia perform environmental practices by including separate sections in their annual reports. A positive

relationship was concluded between environmental reporting disclosure and firm performance in Malaysia.

Ngwakwe (2009) examines the relationship between environmental responsibility and the performance of environmentally-conscious firms, which in this paper are termed „environmentally responsible firms”. The author used three sustainable indicators for the measure of environmental responsibility, namely: Employee health and safety (EHS), Waste Management (WM), and community development (CD), which were identified within the environmentally responsible firms. The results obtained by the authors show that investment in social and environmental responsibilities such as employee health and safety (EHS), waste management (WM), and community development (CD) are related to improved return on total assets (ROTA) of the environmentally responsible firms.

Transparency is very important regarding the activities and investments made to counteract the impact on the environment, especially by those economic entities that operate in areas of activity recognized as polluting.

The paper published in 2019, "*Environmental Information Transparency — Evidence from Romanian Companies*", analyse disclosure of environmental information (DEI) for a set of 100 companies listed at the Bucharest Stock Exchange (BSE) and identify possible correlations between this and the evolution of some relevant economic and financial measures of companies' activities. For these purposes, it was calculated an environmental information disclosure index. We employed a system dynamic panel data estimation model and panel corrected standard errors for sampled companies for the 2013–2017 period. The results we have obtained show that sampled companies have a low degree of environmental information disclosure, as the highest registered score was 15 out of a maximum of 29 points, with an average of merely 6.37 points. Regarding the possible correlations, the tests performed have shown that entity size, expressed by the

number of employees, is the factor that positively influences environmental information disclosure. Results also evidence that performance determines the quantity of information the firm provides to external users instead of maturity/age. Our study is the first approaching companies from Bucharest Stock Exchange with data for 5 years using a mixed approach (DEI-index, and regressions), and we think the results obtained are useful for managers, the general public, and investors, considering that size and performance greatly influence companies' environmental awareness.

The ever more diverse requests coming from stakeholders' groups and the current economic context impose increased transparency regarding accounting and financial information and the risks economic entities currently face. The pressure originating from users of accounting and financial information requires a more attentive and responsible reflection upon the realization and presentation of annual and sustainability reports. Reporting sustainability development, along with the information regarding economic entities' financial situation and performances, has become a necessity, appreciated by both investors and business partners. Implicitly, the demand for information concerning companies' environmental impact has grown in the last years. According to Order no. 175/2005 and Order no. 680/2016, in Romania, economic agents are compelled to consider integrating environmental protection aspects into their companies' strategy. They have to create a department dealing with environmental protection's aspects, under the general manager's direct coordination and supervision.

In such circumstances, the topic of environmental protection seems to connect the private and the public sector. On the one hand, companies offer environmental information to public authorities; however, they can be made public only after a formal request made by any person (Decision, No. 878/2005 Regarding Public Access to Environmental Information). Starting from 2017, Romanian companies with more than

500 employees should now elaborate sustainability reports each year to show the positive impact of their environmental actions upon the sustainable development of the community in which they are located. Reporting their environmental actions and concerns can improve a company's image, increase its outer visibility and reputation. On the other hand, the state itself is concerned with the way it manages to protect the environment. Environmental protection is perceived as a public service for which, in most countries, local administrations are the ones directly responsible for providing it in a high quality, cost-efficient and sustainable manner. Moreover, environmental protection, as well as other public services, such as public order, social protection, modern sewage, water distribution and treatment, public transportation, and so forth, should be provided efficiently and sustainably in terms of timely delivery, costs, and quality. That is especially true in countries like Romania, where bureaucracy, social disparities, corruption, and economic development are still a matter of great concern (Dincă et al., 2016). The necessity of protecting the environment involves allocating significant amounts of money both for the state and its subnational levels and for the companies that comply with specific legislation. Nevertheless, unlike in the private sector, where efficiency aspects prevail, in the public sector, the level of expenditures, with environmental protection expenses included, increases steadily (Andronic, 2016). We have used in this paper DEI (Disclosure of Environmental Information) to reveal the extent of the environmental information a company offers to interested third parties. DEI supplies information about companies' environmental activities and reflects their transparency and responsibility toward the environment. Based on the DEI index we have conceived, we calculated a score for each sampled company and for each year of the analysed period (this information is also presented in Section 3—Data, Hypothesis, and Methodology). The paper follows two objectives: (1) identifying transparency in disseminating environmental

information by BSE-listed companies; (2) identifying the correlation between environmental information and some relevant economic and financial measures. This study contributes to existent literature in several different ways. Firstly, DEI helps companies recognize their business decisions' environmental impact, and we follow that for 100 of BSE listed companies. Secondly, we devise a DEI index collecting all the necessary data from published financial information, from sustainability's and administrators' reports. Thirdly, we made use of information from 100 BSE-listed companies whose activities bear a significant influence upon the environment. To evaluate transparency and disclosure regarding environmental aspects, we have extracted information from annual reports, sustainability reports, administrators' reports and the websites of the sampled companies, whereas for analysing the dependency between environmental information and economic and financial measures we have used a system dynamic panel data estimation model, considering a GMM two-step procedure and robust standard errors. Fourthly, we consider the size, age, performance, and indebtedness degree of these firms as factors likely to explain companies' environmental information disclosure. Results seem to indicate that both size and performance are important to explain DEI, as opposed to previous authors' results and by opposition age seems to be irrelevant. Moreover, indebtedness effects over DEI are not clear yet. Finally, we made use of different econometric specifications to provide robustness to overall conclusions using simultaneously common panel fixed effects and random effects models, panel corrected standard errors models, and system dynamic panel data models (GMM and robust standard errors specifications used). As such, this research analyses DEI on behalf of good practices promoted by the BSE listed companies and it is further associated with other variables from the firms' annual reports disclosures.

## 1.2. Literature review

Research regarding environment information disclosed by the companies is found quite often lately. Similar studies, from various countries, have investigated the relation between environmental performances and environmental information disclosed by the companies (Clarkson et al., 2008; Wu and Shen, 2010; Abba et al., 2018), the relation between environmental information and financial performances (Al-Tuwaijri et al., 2004; Sarumpaet et al., 2017; Deswanto and Siregar, 2018), the relation between company size and environmental information disclosed (Nurhayati et al., 2006; Brammer and Pavelin, 2008; Galani et al., 2012), the relation between environmental information disclosed and different financial and non-financial factors (Galani et al., 2012; Buhr and Freedman, 2001; Deegan et al., 2002; O'Donovan, 2002; Holland and Foo, 2003; Cormier et al., 2005; Frost, 2007; Taylor and Shan, 2007; Sumiani et al., 2007; Stanton and Suttipun, 2012; Murcia and Santos, 2012; Van de Burgwal and Oliveira Vieira, 2014; Akbas and Canikli, 2014; Wei and Peng, 2014; Dibia and Onwuchekwa, 2015). At a national level, Ienciu et al. (2011) investigated the quality of environmental information displayed by the Bucharest Stock Exchange-listed companies, performing a comparative analysis between Romania's and Hungary's environmental reporting and concluded that most of the environmental information supplied by Romanian companies is incomplete and irrelevant. Another study by Ienciu (2012) analysed the relationship between environmental reporting and corporate governance for the Bucharest Stock Exchange-listed companies. The relationship between environmental reporting and corporate governance was also analysed by other researchers (Ho and Wong, 2001; Haniffa and Cooke, 2002; Gul and Leung, 2004; Barako et al., 2006; Buniamin et al., 2008; Kelton and Yang, 2008; Al-Shammari and Al-Sultan, 2010). The impact of shareholders' structure and of administration board's structure upon environmental information was studied by

References (Huafang and Jianguo, 2007; Akhtaruddin et al., 2009; Klai and Omri, 2011). Currently, all economic entities grant more attention to the environment due to the pressure exerted by different parties such as clients, investors, and financial institutions, competition, global policies, and ecological associations (Martin Houldin, EMAG Limited). This theory regarding external pressure exerted upon companies is found in reference literature as stakeholders' theory (Freeman, 2001). The stakeholders' theory stands out as one of the most used theories to explain companies' intention to disclose environmental information. The pressure sources influence in a higher or lower measure the activity of entity's management through the information they have to present to financial and accounting reports' users. The number of "ethical" investors is growing and they want to invest in companies which respect the environment, leading to an increased demand for information regarding the management of the company environment [Feleagă and Feleagă, 2007]. The new accounting branch—environmental accounting—was approached by Caraianni et al. (2015) in their book *Green Accounting—Initiatives and Strategies for Sustainable Development*. As well, the International Federation of Accountants has published a brochure presenting the main information of interest for investors regarding social, environmental, and corporate governance aspects. Junquera and Barba (2018) studied the connection between environmental pro-activity and company performances for 142 Spanish wineries. The authors found that environmental proactivity was instrumental in obtaining both cost-based and differentiation-based competitive advantages, however, it did not significantly influence financial performance of sampled companies. Also, in a study published in 2018, Radhouane et al., analysed the potential benefits for shareholders and customers in cases in which companies report more about their environmental activities for the 120 largest publicly traded companies in France for the 2007–2011 period. One of their most important findings was that an



increase in the level of environmental reporting is valuable in terms of customer-related performance (i.e., sales growth and profit margin) as well as in terms of market value. This was more visible for companies operating in customer proximity industries. Chelli et al. (2018) analysed normativity in environmental reporting for Canada and France in the environmental reporting practices of a sample via institutional legitimacy. The three researchers found that the French parliamentary regime was apparently more successful than the Canadian stock exchange regulation in triggering environmental reporting and that the GRI reporting standards combined with local regimes generated more environmental disclosures.

Moseñe et al. (2013) performed a content analysis of sustainability reports for the 2005–2009 period for seven main Spanish wind energy companies. The analysis allowed them to realize a longitudinal comparison of compliance levels with Global Reporting Initiative indicators of sustainability. The authors learned that the disclosures were minimal, lacking effectiveness, and were quite unreliable. Hossain et al. (2017) have approached corporate social and environmental reporting (CSER) practices and motivations in Bangladesh. They found that community investment and development and governance codes and policies categories received the highest amount of disclosure, while the least disclosed was the workplace/human rights category. Radhouane et al. (2018) investigated whether customer-related performance affects the value relevance of voluntary environmental reporting, using a sample of French listed firms for the 2001–2011 period. Their results have showed that a higher level of environmental disclosure is valued negatively by shareholders for firms operating in environmentally sensitive industries.

### 1.3. Data, hypothesis, and methodology

#### *Transparency in Communicating and Disseminating Environmental Information*

A first objective of the research was to evaluate the transparency and responsibility of BSE-listed companies towards environmental aspects. In this direction, we have achieved a content analysis of annual reports, sustainability reports, administrators' reports, or websites of sampled companies. The sample includes 100 companies listed at BSE, considering the ease of access to annual financial situations, declarations and other types of reports made public on the websites of the respective companies or on Bucharest Stock Exchange's site. The data covers the 2013–2017 period, with selected companies operating in areas which have a major impact upon the environment, with activities and products prone to cause damage to the environment. The 100 companies, making up the sample were selected from different sectors of activity, as well as according to the availability of the financial and non-financial data for the 2013–2017 period. The sample was created considering three criteria: a) the sector of activity (mainly the industries/sectors with the highest pollution risks); b) Companies listed at Bucharest Stock Exchange; c) Companies active during the 2013–2017 period and which have published financial and non-financial data and information.

We have selected 20 of the most polluting sectors from Romania, with 15 companies from metallic construction industry, 11 companies from mineral non-metallic industry, 11 companies from the machinery and equipment production industry, 10 companies from the metallurgic industry, 9 companies producing electric equipment, 9 companies producing other transportation means, 6 companies producing rubber and plastic products, 5 companies from the pharmaceutical industry, 4 companies from land and piping transport, 3 companies producing electronic products, 2 companies from oil extraction and processing and one company from each of the following industries: coal

products; production and supply of gas and electricity; paper products; roads and highway construction; beverage; food processing and manufacturing; and one from clothing manufacturing. The 20 sectors include 123 companies listed with Bucharest Stock Exchange, which published financial and non-financial information throughout the entire 2013–2017 period, therefore our sample of 100 companies represents 81% of the total number of companies. For each of the 100 selected companies, we have used an index to measure the degree of disclosing environment information. The index of disclosing environment information is actually a centralizing list which allows the assigning of a score to each and every analysed company, according to the environment information it presents in its annual reports. These results are expressed and centralized as follows:

- 0: the entity does not present any environment information;
- 0.5: the entity provides only general information (only in a descriptive manner) regarding environmental aspects included in the index;
- 1: the entity offers detailed information regarding environment information, both descriptive and quantitative information.

Part of the information included in the index are also found in the Ministry Order no. 175/2005 regarding the procedure of data reporting for environment protection activities of Romanian industrial companies. The index of disclosing environmental information includes a set of indicators of environmental performance, which are aligned to relevant international standards, especially ISO 14031, as well as to GRI (Global Reporting Initiative). Where relevant, the environmental performance measures were adjusted to reflect specific requirements of Romanian legislation or to underline certain environmental aspects which have a specific importance in the Romanian context. Also, the list realized by the authors was adapted to Romania's economic and legislative situation, according to the list used in the Clarkson et al. study's (2008). The fore-

mentioned list was elaborated by Clarkson in cooperation with an expert from the environmental reporting field, and it is based on the guidelines offered by GRI (Global Reporting Initiative) to facilitate the understanding and communicating company's environmental impact. The GRI index was also used in some studies [He and Loftus, 2014; Iatridis, 2013; Moroney et al., 2012; Sutantoputra et al., 2012).

The list processed by the authors includes 29 questions, with a maximum possible score of 29 a company can obtain. For each of the 100 companies, we calculated a score based on the data extracted from annual reports, websites or sustainability reports. The scores obtained reflect the degree of disclosing environmental information, transparency, and responsibility of the companies regarding environmental aspects. The maximum score was obtained by the company which was the most involved in environmental activities and made most efforts to reduce its impact upon the environment (the most responsible company toward environmental aspects).

The sampled companies obtained a maximum of 15 points of the 29 possible. The average of 6.37 points confirms the opinion that analysed companies have a low degree of environmental disclosure. Figure 1 shows the scores regarding the disclosure of environmental information obtained by the sampled 100 companies for the 2013–2017 period.

In Figure 1 we can observe a higher score in 2017 compared with previous years, in disclosing the environmental information. Of the 100 companies, 24 have over 500 employees, therefore should present sustainability reports. The annual reports do not offer too many details regarding environmental aspects, the companies merely presenting general aspects regarding environmental authorizations and certificates; environmental policies and objectives; conformity with current legislation; existence or lack of litigations; data about CO<sub>2</sub>, water, energy consumptions, and waste management.

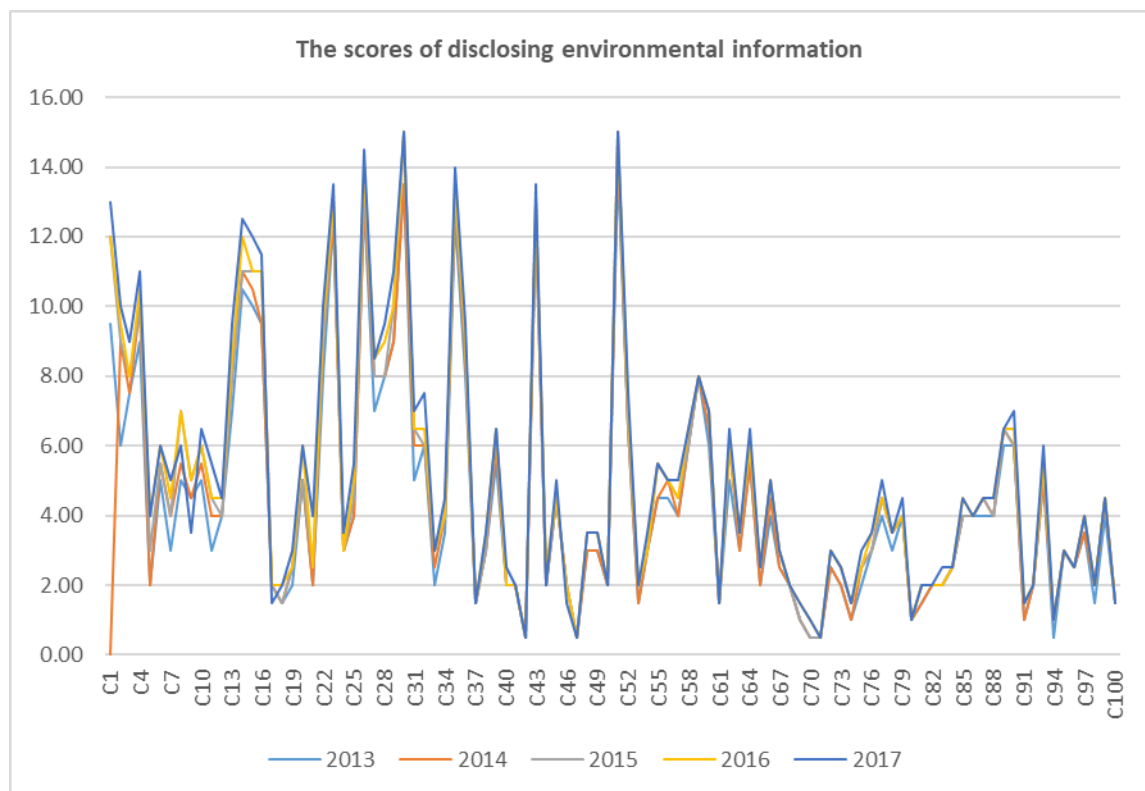


Figure 1. The scores of disclosing environmental information

The sustainability reports and websites offer more details, alas many companies do not present such reports. In what follows we have realized an individual analysis of each point/category from the index of disclosing environmental information for our sample.

#### *Company Management Structure*

In Romania, according to Order 175/2005, the companies have the obligation to set a department with attributions for environmental protection, under the direct coordination of the manager/general manager. However, only 65% of the evaluated companies have published information regarding the existence of this department. The companies focused mainly on getting the 14001 ISO certificate, with 86% of the evaluated companies (86 out of 100 companies) claiming they have this environmental certificate. ISO 14001 confirms the fact that the company complies with all the requirements regarding the environment management system. The results obtained suggest that BSE-listed

companies are interested and involved in tackling the environmental problems. Voluntary implementation and certification of the environmental management system according to the international standard ISO 14001 reflects a company's preoccupation for more than merely legislation compliance, that is, for a continuous improvement of environment performance. The companies seemed less interested in offering information about the existence of environmental protection departments, as well as about environmental demands imposed to their suppliers and clients. This result can be explained as those elements are actually absent from companies' structure. Also, the companies do not offer information about their accounting department or about green accounting. Green accounting can be a complement to traditional accounting and it is meant to account and present data about raw materials, water, and energy consumption; costs of protecting and restoring natural environment; gains from the policy led by the company to protect the natural environment and so forth. The economic entities which implement environmental accounting can benefit from a series of advantages such as a stricter control of environmental expenditures, knowledge of their environmental performance, obtaining more sustainable long-term revenues, improving their company image and so forth. The information from environmental accounting and the analysis of costs-benefits relation help managers to set their decisions regarding the environment and its protection, to take measures to prevent environmental damages and to evaluate environmental costs.

### *Credibility*

We have noticed that 92% of evaluated companies, respectively 92 out 100 companies have presented information about their environmental certificates. This result was expected, as Romanian legislation imposes to companies with a major environmental impact to own such certificates. 44% of the companies declared that they

adopted a set of rules by which they evaluate, report and improve the effect their activities or products have upon the environment. The companies have declared in their publish reports that they implemented and applied procedures for a periodic identification and evaluation of environmental aspects. The companies showed a lower interest for disclosing information regarding internal environmental audit, probably as they were looking to keep dormant the non-conformities found by this audit.

#### *Environmental Performance Measures*

The companies which offered details about this aspect were the ones which made and presented sustainability reports. Their sustainability reports presented information regarding the investments made to reduce water consumption; the consumption of electric energy, gas and water; quantity of waste generated/recycled; quantity of CO<sub>2</sub> emissions. Overall, 47% of the evaluated companies offered information about CO<sub>2</sub> emissions in their annual reports and/or on the company site, yet most of the times this information was presented only in a descriptive manner, mentioning that CO<sub>2</sub> emissions are within the limits stipulated by the law. From the total 100 companies, 29 declared they ensure in part or fully their energy consumption from renewable sources (either directly, from their own facilities or by acquiring energy from the producers which use renewable sources). These companies can be considered as environmentally responsible. Reducing energy consumption represented a major objective of their environmental policy for 83% of analysed economic entities. In 2017, the analysed companies reported an improvement of the quality of their used water released into the public sewage network and showed an interest in reducing water losses in their supply pipes or in sanitary installations. We have found little information concerning soil contamination, yet 67% of analysed companies declared they have adopted waste management policies. The companies also named responsible persons with waste management and reporting. The

companies supplied data regarding the actions they have undertaken to reduce energy, water and gas consumptions.

*Environmental Assets, Debt and Expenditures*

Another aspect which was almost neglected by the companies refers to investments in tangible and intangible assets connected with environmental protection activity. These investments are not presented in a distinct manner in their financial situations, with economic entities supplying only their overall value of such investments (19% of the companies published information regarding the total value of their environmental investments). The environmental expenditures are also not presented in a detailed manner (the companies published only total value of their environmental expenditures). The companies mentioned that environmental expenditures are connected with implementing their environmental management programs and aligned to existing environmental legal requirements. Of the 100 analysed companies, 61% offered information regarding litigations and fines received for non-compliance with environmental norms, mentioning that they did not receive warnings, sanctions or fines connected with environmental legislation. This statistic provides confidence that selected companies' approach in environment protection area was efficient, that they implemented successful organizing and technological measures and their personnel was aware and responsible. Environmental provisions are not presented distinctly, probably included in other provisions category. Still, we do not find inside annual reports data regarding their value and the situation/context they were created for. Environmental commitments provisions should be created when obtaining environmental authorization is contingent upon presenting a reducing pollution investment plan by the entity. These investments are programmed over several fiscal years and they involve setting installations and equipment to prevent the generation of environment damaging factors.



The expenditures which accommodate the provisions are not deductible for fiscal purposes. From one company's annual report we have extracted the following statement: "As of December 31-st of 2017, the Group does not register debt connected with anticipated expenditures regarding environmental aspects. The Group does not have significant environmental expenditures." This statement may suggest the fact that economic entities do not grant too much importance to financial aspects connected with protecting the environment and that financial information regarding the environment is not considered relevant.

### *Vision and Strategy*

The communication with the external environment is made via annual reports, whereas the internal one is done using the regular environmental training. The economic entities had a positive reaction towards disclosing their environmental mission and objectives, with 81% of analysed companies presenting this kind of information. A company's environmental policy or strategy is the formal way in which it shows commitment towards environmental protection and sustainability.

In total, 96% of sampled companies declared they have an environmental policy or vision complying with international environmental protection standards. In general, the companies have declared and defined their environmental objectives inside their annual or sustainability reports and part of them have also declared the degree of attaining these objectives. Only 32% of the companies declared they have fully attained their established environmental objectives.

Among the measures stated in the environmental action plans we have found proper waste management and minimizing the quantity of waste generated; the reduction of energy consumption; pollution prevention; the periodical monitoring of environmental factors; the modernization and updating of installations; an increased use of renewable

energy sources; implementing measures for improving the energy efficiency of company buildings; making sure the entire personnel knows and respects environmental legislation; preventing major accidents connected with hazardous substances.

#### *Entity's Environmental Profile*

Most information was presented as statements regarding economic entities' compliance with different environmental standards and laws. Compliance with the requirements of environmental protection laws represents the minimum objective for any company aspiring to green company status, according to the 2016 Catalogue of Green Business Index. In total, 89% of the companies have declared in their annual reports they have fulfilled their legal commitments towards the environment. We have also analysed companies which do not want to supply public information about the impact of their activities upon the environment, by claiming they have reported those data to local public authorities.

#### *Environment Initiatives*

The sampled companies have granted little attention to their environment initiatives. Less than 30% of the companies have offered information about professional training of their employees regarding environmental aspects. The companies which offered this information claimed they support continuous professional development of their employees via periodical preparing, qualification and certification programs. In one sustainability report we have found the statement: "The periodical trainings regarding environmental protection, respectively the permanent actions of raising employees and other stakeholders' awareness have had the designed effect and as such we will continue the efforts to uphold the growing trend of environmental performance and the clean statistics regarding environment incidents." The same low incidence is found in what regards involvement in community environmental projects. Very few economic entities

have supplied information regarding this aspect. The involvement in community environmental projects can be a company's sign/measure of assuming responsibility concerning its environmental impact. As a conclusion, we can state that companies' transparency regarding the environmental aspects/information is quite low. The highest score obtained by a company from the selected ones is 15, out of a maximum of 29 points. The companies declare they grant significant importance to environmental protection, assuming their commitment to integrate the best practices, yet they are reluctant to supply public information/details regarding environmental aspects. As a rule, companies offer details regarding environmental information to local authorities (where they have a legal obligation to do so) whereas in their public reports they disclose only information which provides them a positive image. The results suggest companies are interested first of all to comply with legal requirements and also to reach some performances in environmental management. The least disclosed information in company reports refer to financial aspects (environmental assets, debt and expenditures), with less than 20% of the companies offering such data. We can state that sampled companies do not consider relevant to provide such information for external users. In 12 of the 100 reports we found the following statement: *"All issues regarding environmental aspects (monitoring environmental factors, management of hazardous substances, management of waste and wrapping and other environmental requirements) are done according to existing legislation."*

#### ***Identifying the Correlation between Environmental Information and Economic and Financial Factors***

The lack of environmental information and implicitly of environmental problems could generate significant risks for the business environment, such as reputation risk, discontinuing the activity, lack of resources and high costs, supply chain risks, financing

risk (identified in a study by ACCA in partnership with KPMG in 2011). These risks can be reflected via economic and financial factors which can influence the degree of disclosing environmental information. Another objective of our paper is identifying the financial and non-financial factors which influence environmental information disclosure in case of BSE listed economic entities. To achieve this purpose, we have identified the following research lines: determining the elements which possibly influence the disclosure of environmental information; the calculus of scores based on the environmental information disclosing index; determining the connection between environmental information and economic and financial factors, using a multiple linear regression.

#### *Determining the Elements Which Possibly Influence Environmental Information Disclosure*

Most studies before now have shown that the most used economic and financial and non-financial factors which favour the disclosure of environmental information are entity size, financial performance, indebtedness degree, type of industry, type of property (state or private), age of the entity, existence of external relations and so on. In our analysis we decide to work with the factors size of the entity, financial performance, indebtedness degree and age of the entity.

##### *Entity Size*

Previous studies from different countries, such as Greece (Galani et al., 2012), Thailand (Suttipun and Stanton, 2012), Holland (Van de Burgwal and Oliveira Vieira, 2014), Turkey (Akbas and Canikli, 2014) and China (Wei and Peng, 2014) claim that entity size has a significant impact upon the degree of environmental information's disclosing. It is expected that bigger economic entities will offer more environmental connected information, considering the pressure originating from information users (Caraianni et al.,

2015), as well as in an attempt to improve their public image. Also, it is expected that this information would be published on company website (Akrout and Othman, 2013).

Also, Riahi–Belkaoui (2001) and Cormier et al. (2005) have shown that there is a correlation between company size (expressed via sales turnover) and the level of environmental reporting. The studies which analysed this dependency have used various measures to express entity size, such as total assets, number of employees or sales turnover. In the present article we use TA (log of total assets), ST (log of sales turnover) and also ANE (the average number of employees) as different proxies for the size of the entity, expecting a positive relationship between size and disclosure of environmental protection.

#### *Company Performance*

Previous studies have shown mixed results concerning the influence of profitability upon environmental information reporting. Some researchers have determined a positive relation between the two variables (Al-Tuwaijri et al., 2004; Murcia and Santos, 2012). However, the studies which did not find a significant relation between profitability and environmental information reporting are more numerous [Galani et al., 2012; Akbas and Canikli, 2014; Dibia and Onwuchekwa, 2015; Echave and Bhati, 2010; Alikhani and Maranjory, 2013). Although these results are contradictory, we can assume that a profitable entity has enough resources to invest in its environmental policy, respectively in improving company's environmental results and its image, mainly for investors. As such, entity's performance is an important factor in determining the environmental information to be disclosed. Many studies have used return on equity (ROE) and/or return on assets (ROA) to express company performance (Albertini, 2013; Angelia and Suryaningsih, 2015; Dobre et al., 2015; Hategan and Curea-Pitorac, 2017; Manurung et

al., 2017; Ong et al., 2014; Vogt et al., 2017; Omnamasivaya and Prasad, 2016; Makni et al., 2009). We have used ROE (net profit/equity) to accomplish our goal.

#### *Indebtedness Degree*

As total assets are also financed from other sources rather than equity holders, it is expected that the entity will report, alongside compulsory financial information, other voluntary information, both financial and non-financial. These are meant to increase transparency and confidence in the company. Also, in this case the studies realized showed contradictory results.

Clarkson et al. (2008) concluded that indebtedness degree (DD) has a significant influence upon the degree of environmental information disclosure, as creditors put pressure on the company to report environment information and analyse possible risks. Thus, it is expected a positive relationship between the two variables.

Nevertheless, the studies of Echave and Bhati (2010) and Murcia and Santos (2012) found no association between the two variables.

#### *The Age of the Entity*

Age is another characteristic of the entity that is less used in the research, yet it can influence the degree of environmental information reporting. A company which has been for a long time on the market is perceived as stable and aspects such as environmental policy and objectives are part of company's daily activity, as essential components of its environmental image and strategy. Hence, we expect a positive relation between the two variables. Akbas (2014) showed that age in the case of Turkey's Stock Exchange positively influences the degree of environmental information disclosure, yet the influence is not significant. The age of the entity is computed as the log of the difference between the year of the company constitution and the current year of analysis.

*The Calculus of Scores Based on the Environmental Information Disclosing Index*

The environmental information list (the environmental information disclosing index) is a summarizing situation, based upon which, the analysed company obtains a score according to the environmental information published in its annual reports, sustainability reports or websites. The DEI (disclosure of environmental information) index built will be the dependent variable used within estimations.

*Determining the Connection between Environmental Information and Economic and Financial Factors, Using Regressions*

Our study analyses the relationship between the degree of disclosing environmental information and factors such as the entity's age, financial performance, indebtedness degree and size. In our study, total assets, sales turnover and average number of employees (the size criteria specified/established by Romanian accounting regulation) express entity size.

Considering previous research and studies and our sample's characteristics, we have established and tested the following four hypotheses using different econometric specifications.

Hypothesis 1 (H1). Entity's size does not significantly influence disclosing of environmental information.

Hypothesis 2 (H2). Entity's financial performance does not significantly influence disclosing of environmental information.

Hypothesis 3 (H3). Indebtedness degree does not significantly influence disclosing of environmental information.

Hypothesis 4 (H4). Entity's age does not significantly influence disclosing of environmental information.

To test these hypotheses, the dependency relation is expressed using a multiple linear regression, expressed by Equation (1):

$$DEI = a + b_1 \cdot TA + b_2 \cdot ST + b_3 \cdot ANE + b_4 \cdot ROE + b_5 \cdot DD + b_6 \cdot AG + \epsilon \quad (1)$$

where DEI represents the dependent variable, respectively disclosed environmental information, whereas the individual independent variables used to test our hypotheses are represented by TA (total assets), ST (sales turnover), ANE (average number of employees), ROE (return on equity), DD (indebtedness degree), AG (age of entity). In equation (1)  $\epsilon$  stands for the standard error,  $a$  represents a constant and  $b_i$  are the regression coefficients ( $i = 1 \dots 6$ ). For all variables we have used their natural logarithms, except for ROE and DD, provided these are ratios.

We have chosen total assets (taken from the balance sheet) as they represent past investments made by the company and the productive capacity of the company, sales turnover (taken from the profit & loss account) representing the effective capacity of company assets of generating useful effects, average number of employees (as the most important productive factor), return on equity (calculated as net profit/equity owner), as one of most important measures of company performances, indebtedness degree (the ratio between total debt and total assets, all collected from the balance sheet) since it shows an important feature of company financial strategy and age (since it depicts continuity, sustainability in some way, investors' trust and other relevant features of a company's activity).

Panel data analysis is the most suitable to be applied provided the nature of our sample data of Romanian firms. Besides allowing to control for variables which cannot be observed or measured, it accounts for individual heterogeneity. The first models to be used into our analysis are those of random (RE), between (BE) and fixed effects (FE).



By applying FE, we are assuming that something within the firm can influence or bias the predictor (independent) variables, which we need to control. Or else, that there is correlation between firm's error term and predictor variables. Therefore, FE removes the effect of those time-invariant characteristics, allowing to assess the net effect of the predictors upon disclosed environmental information (DEI). Another important assumption in FE is that error terms are not correlated among firms. If not, the FE model would not be suitable, inferences could be wrong and we need to model this relationship probably using RE. In estimations we have added the option robust to control for possible heteroscedasticity. Unlike the FE model, in the RE model the variation across economic entities is assumed random and uncorrelated with the independent variables. If we believe that differences across firms have some influence over DEI, as we do, then we should use RE. The Hausman model is used to select which model is more suitable.

The BE model captures the cross-sectional nature of the data and as such allows us to estimate effects between RE and FE. Stata's RE estimator is a weighted average of FE and of BE coefficients, provided FE uses only the time series information and BE uses the cross-sectional information.

For robustness check we have also used the linear regression with panel-corrected standard errors (PCSE) which assumes that the disturbances are by default heteroskedastic and contemporaneously correlated across panels. We also use the system dynamic panel data estimation model in order to include lagged effects of dependent variables using both a GMM two-step standard errors procedure and a robust standard errors assumption. Moreover, we consider the high correlation values identified in Table 1 among independent variables and present estimation results which account for their inclusion individually to reduce multicollinearity issues and provide additional robustness check.

#### 1.4. Research results and conclusions

To analyse the relationship between the variables we have used the correlation matrix. The highest mean values are displayed by total assets and sales turnover, justifying also why these present the highest standard deviation. Both return on equity and disclosed environmental information present negative minimum values, yet DEI has the lowest maximum value. As a rule, correlation coefficients with values between 0 and 0.3 express a weak link, with values between 0.3 and 0.7 a moderate link, whereas values between 0.7 and 1 express a strong bond. The correlation coefficients as well as descriptive statistics are presented in Table 1 below.

**Table 1.** Descriptive statistics and correlation matrix

	Mean	Std. Dev.	Min	Max	DEI	TA	ST	ANE	ROE	DD	AG
DEI	1.310	0.776	-0.693	2.708	1						
TA	18.030	1.912	13.455	24.489	0.781***	1					
ST	17.320	2.218	11.639	23.618	0.850***	0.893***	1				
ANE	5.101	1.742	0.000	9.853	0.749***	0.694***	0.804***	1			
ROE	0.080	0.805	-4.259	10.131	0.019	0.002	0.026	0.025	1		
DD	0.413	0.478	0.000	5.009	0.157***	0.065	0.188***	0.115***	0.119***	1	
AG	3.248	0.231	1.386	3.912	-0.025	0.010	-0.043	-0.068	-	0.012	1

Notes: All variables except ROE and DD are in natural logarithms. DEI stands for disclosed environmental information; TA—total assets; ST—Sales Turnover; ANE—average number of employees; ROE—return on equity; DD—indebtedness degree; AG—age of entity. \*, \*\*, \*\*\* represent statistically significant at 10%, 5% and 1%, respectively

According to Table 1 we can notice a strong correlation between total assets and sales turnover, between average number of employees and total assets, as well as between average number of employees and sales turnover, all statistically significant. These correlations are actually expected, since these measures are used in Romania for expressing entity size. There is a strong and expected correlation between disclosed environmental information and number of employees, as in Romania companies with a large number of employees are the ones which publish sustainability reports and implicitly supply more environmental information. Also, previous studies support the fact

that there is a positive relationship between entity size and disclosure of environmental information (Nurhayati et al., 2006; Brammer and Pavelin, 2008; Galani, et. al, 2012; Cormier et al., 2005; Suttipun and Stanton, 2012; Van de Burgwal and Oliveira Vieira, 2014; Akbas and Canikli, 2014; Wei and Peng, 2014; Caraiani et al., 2015; Akrouit and Othman, 2013; Riahi-Belkaoui, 2001; Carreira et al., 2014; Jariya, 2015; Sahore and Verma, 2017). The association between disclosed environmental information and indebtedness degree, respectively age of entity, is very weak. The variance inflation factor (VIF) quantifies the severity of multicollinearity. If the VIF value is  $VIF < 0.2$  or  $VIF > 10$ , then multicollinearity is problematic [70]. To infer about VIF we have run a simple OLS regression and then applied the VIF test. Results Indicate VIF values for ST = 8.04; TA = 5.37; ANE = 2.88; DD = 1.12; AG = 1.05; ROE = 1.05; and a mean VIF of 3.25. Therefore, we should not worry with multicollinearity issues within our sample, turning multicollinearity among independent variables.

Table 2 below presents the fixed, random and the between effects estimation results, as well as Hausman test' results, suggesting that fixed effects' model is the most suitable one. All models present global statistical significance provided that appropriate tests indicate all model's coefficients are different from zero. Both the fixed and random effects models indicate total assets have a clear positive and significant influence over disclosure of environmental information, suggesting that the bigger the firm the higher environmental information's disclosing. This means that size positively influences this disclosure, probably due to company's need to keep a good image for existing and potential investors. The same occurs with indebtedness degree, whose coefficient is positive and significant. It means that the higher the indebtedness degree, the higher the probability of a company disclosing environmental information, as it needs to display a favourable image for financial creditors. This in turn contradicts the assumed hypothesis

that indebtedness does not influence disclosed environmental information (DEI). The average number of employees, which also accounts for company size, with statistical significance in both the FE and the BE effects model, displays negative and positive coefficients respectively. Therefore, our first hypothesis is not confirmed, since results seem to indicate that size influences DEI. Provided that TA is also a measure of firm size, results are contradictory in the FE model, indicating that results might be biased depending upon considered measure of size. However, we can state that size determines the quantity of information it provides to external users.

**Table 2.** Panel data simple model estimations

	Fixed Effects (FE)		Random Effects (RE)		Between Effects (BE)	
Dependent: DEI	Coefficient	t-test	Coefficient	t-test	Coefficient	t-test
TA	0.0834	2.70***	0.1634	6.75***	0.0568	1.20
ST	0.0123	0.56	0.1005	5.01***	0.1226	2.09**
ANE	-0.0146	-2.20**	-0.0074	-1.05	0.2113	3.80***
ROE	-0.0005	-0.07	-0.0033	-0.43	-0.0063	-0.05
DD	0.0777	3.61***	0.1142	5.54***	0.0169	0.15
AG	-0.1079	-2.55**	-0.0988	-2.23**	0.1103	0.53
Constant	-0.0130	-0.02	-3.0644	-8.74***	-3.2808	-4.11***
Hausman chi(2)	68.88***					
F-test	4.39***				54.94***	
Wald chi(2)			241.17***			
R <sup>2</sup> within	0.0627		0.0400		0.0089	
R <sup>2</sup> between	0.6123		0.7034		0.7800	
R <sup>2</sup> overall	0.5953		0.6890		0.7145	
Number of obs.	500					

Notes: All variables except ROE and DD are in natural logarithms. DEI stands for disclosed environmental information; TA—total assets; ST—Sales Turnover; ANE—average number of employees; ROE—return on equity; DD—indebtedness degree; AG—age of entity. \*, \*\*, \*\*\* represent statistically significant at 10%, 5% and 1%, respectively

Age connected results indicate a negative and significant impact over DEI and therefore company maturity influences DEI and our no. 4 hypothesis is also not verified. The remaining explanatory variables of the models, namely ST and ROE, are not statistically significant under the FE model. For all models, ROE is not statistically significant, leading us to accept the null hypothesis thereby concluding that financial

performance does not influence DEI. The results of our study resonate with other previous studies which do not find a significant relation between financial profitability and environmental information reporting (Brammer and Pavelin, 2008; Van de Burgwal and Oliveira Vieira, 2014; Wei and Peng, 2014; Radhouane et al., 2018; He and Loftus, 2014). However, considering the RE and BE results, they contradict our no. 2 hypothesis, provided that ST coefficient is positive and significant. Moving one step further we present the results obtained for the panel corrected standard errors (PCSE) model in Table 3 and the results achieved using the system dynamic panel data estimation model considering GMM two-step procedure and robust standard errors in Table 4.

**Table 3.** Panel corrected standard errors (PCSE) model results

	Model 1		Model 2		Model 3		Model 4	
Dependent: DEI	Coeff.	z-test	Coeff.	z-test	Coeff.	z-test	Coeff.	z-test
TA	0.0547	4.38***	0.2055	7.53***	0.0433	3.30***	0.3143	85.95***
ST	0.1992	7.57***			0.2639	18.76***		
ANE	0.0876	2.36**	0.1731	3.97***				
			-		-			
ROE	-0.0012	-0.07	0.0022	-0.11	0.0008	-0.04	-0.0017	-0.09
DD	0.0302	0.94	0.1292	4.94***	0.0135	0.43	0.1740	7.87***
			-					
AG	0.0355	0.81	0.0182	-0.35	0.0191	0.52	-0.1159	-4.62***
			-		-			-
Constant	-3.7003	-16.19***	3.2715	-12.66***	4.1093	-27.75***	-4.0518	29.21***
Wald chi(2)	9522.69***		6217.47		12152.62		8937.73	
R2	0.7388		0.6985		0.7254		0.6219	
Number of obs.	500							

Notes: All variables except ROE and DD are in natural logarithms. DEI stands for disclosed environmental information; TA—total assets; ST—Sales Turnover; ANE—average number of employees; ROE—return on equity; DD—indebtedness degree; AG—age of entity. \*, \*\*, \*\*\* represent statistically significant at 10%, 5% and 1%, respectively. Model 1: Including all independent variables; Model 2: Excluding ST provided we have 3 size measures; Model 3: Excluding ANE provided we have 3 size measures; Model 4: Excluding ST and ANE provided we have 3 size measures.

Results from Table 3 reinforce the idea that DEI is positively and statistically influenced by size, as expressed by total assets, average number of employees, as well as by sales turnover. As sales turnover is also a measure of financial performance, results seem to indicate that financial performance does influence disclosure of environmental

information. We cannot state the same for ROE, since there is no evidence of statistical significance for its coefficient value. Therefore, this also contradicts our no. 2 hypothesis. Both size and performance positively increase the probability of company's DEI, as does indebtedness. However, DD is sensitive to inclusion of other explanatory variables in the model. As such, the inclusion of accounting variables in the model used to explain DEI is sensitive to the selection of variables used. The overall significance of models presented in Table 3 is high, meaning that all these variables are important to explain DEI. However, there might exist other relevant variables besides the accounting ones to explain DEI. Environmental protection is a complex issue and the decision of disclosing environmental information is not always rational and as such it might not only depend on quantitative data, as the ones obtained from the accounting. We should also evidence that company age or maturity seems to have a negative impact over DEI. The result was only significant when we removed the variables of sales turnover and average number of employees from the analysis. As such there is evidence that age in fact influences DEI. Moreover, results are sensitive to the model chosen as comparing among different estimations showed.

**Table 4.** System dynamic panel data estimation models: GMM  
(generalized method of moments) and robust

	GMM-M1	Robust-M1	GMM-M2	Robust-M2	GMM-M3	Robust-M3	GMM-M4	Robust-M4
Dependent:								
DEI	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
DEI (-1)	0.8776***	0.8776***	0.8622***	0.8622***	0.8498***	0.8498***	0.8168***	0.8168***
TA	0.0569*	0.0569	0.0819***	0.0819**	0.0634**	0.0634	0.0898***	0.0898***
ST	0.0564*	0.0564*			0.0614**	0.0614		
ANE	0.0090***	0.0090**	0.0097***	0.0097**				
ROE	-0.0069	-0.0069	-0.0033	-0.0033	-0.0085	-0.0085	-0.0050	-0.0050
DD	0.0352	0.0352	0.0439*	0.0439	0.0398*	0.0398	0.0500**	0.0500*
AG	0.0404	0.0404	0.0418	0.0418	0.0345	0.0345	0.0361	0.0361
Constant	-2.0028***	-2.0028***	-1.4676***	-1.4676***	-2.1087***	-2.1087***	-1.4835***	-1.4835***
Wald chi(2)	235.76***	118.07***	259.74***	109.77***	236.22***	102.51***	247.15***	92.86***
Number of obs.	400 - Two Step Results							

Notes: All variables except ROE and DD are in natural logarithms. DEI stands for disclosed environmental information; DEI (-1)—disclosed environmental information lagged one period; TA—total assets; ST—Sales Turnover; ANE—average number of employees; ROE—return on equity; DD—indebtedness degree; AG—age of entity. \*, \*\*, \*\*\* represent statistically significant at 10%, 5% and 1%, respectively. Instruments for differenced equation: GMM type L (2/2). DEI; Standard: D.TA, D.ROE, D.DD, D.AG. Instruments for level equation: GMM type LD.DEI, Standard \_cons. Results have been obtained through STATA version 14. M1—Model 1: Including all independent variables; M2—Model 2: Excluding ST provided we have 3 size measures; M3—Model 3: Excluding ANE provided we have 3 size measures; M4—Model 4: Excluding ST and ANE provided we have 3 size measures.

To provide more robustness check in terms of analysis Table 4 presents the results obtained using the system dynamic panel data estimation model, considering GMM two-step procedure and robust standard errors. Once more, there are some results which might be validated through robustness check as Table 4 evidenced. It is possible to conclude that there are differences upon model's assumed form and that GMM type is more robust. Despite, all the coefficients are different from zero and the model is valid using these regressors. Still there might be other factors able to explain DEI. Moreover, we need the lagged values of DEI to explain present DEI, which means that once the firm starts disclosing environmental information, its investors demand more from it, forcing it to continue doing that. In terms of general conclusions, it is possible to observe that size is an important (positive and significant) factor to explain DEI. This somehow contradicts the results obtained by Junquera and Barba (2018), as the two authors analysed mainly SME companies (wineries). Radhouane et al. (2018) showed that it is important to account for an industry's environmental sensitivity when investigating the value relevance of a company's environmental commitment and disclosure.

The same happens in terms of performance, when measured through sales turnover (ST), provided that ST coefficient reveals to be positive and statistically significant. Both results invalidate our hypothesis 1 and 2. These results are also seemingly different from the ones obtained by Junquera and Barba (2018) and of Radhouane et al. (2018).

Indebtedness positively influences DEI only when some variables are removed and under the GMM assumption. As such, we have mixed evidence if in fact indebtedness

does or does not influence DEI, since robustness check provides mixed evidence. So, we cannot completely confirm or invalidate hypothesis no. 3. With respect to the age variable and provided it is not statistically significant, we can confirm hypothesis no. 4 that maturity does not influence DEI but as seen previously results are also sensitive to the model specification and as such we must be careful while providing conclusions. To sum up all our conclusions, we present in Table 5 a summary of our main findings.

**Table 5.** Summary of the main findings

	PCSE				Dynamic GMM				Dynamic Robust			
	M1	M2	M3	M4	M1	M2	M3	M4	M1	M2	M3	M4
DEI(-1)					+	+	+	+	+	+	+	+
TA	+	+	+	+	+	+	+	+		+		+
ST	+		+		+		+		+			
ANE	+	+			+	+			+	+		
ROE												
DD		+		+		+	+	+				+
AG				-								
H <sub>1</sub> :	Not verified; Size + influences				Not verified; Size + influences							
H <sub>2</sub> :	Verified; No significance				Verified; No significance of performance							
H <sub>3</sub> :	Not verified; Debt + influences				Not verified; Indebtedness degree + influences							
H <sub>4</sub> :	Mixed; AG - influences in M4				Verified; No significance of Age							

Notes: All variables except ROE and DD are in natural logarithms. DEI stands for disclosed environmental information; DEI (-1)—disclosed environmental information lagged one period; TA—total assets; ST—Sales Turnover; ANE—average number of employees; ROE—return on equity; DD—indebtedness degree; AG—age of entity. \*, \*\*, \*\*\* represent statistically significant at 10%, 5% and 1%, respectively. H1: Entity's size does not significantly influence disclosing of environmental information; H2: Entity's financial performance does not significantly influence disclosing of environmental information; H3: Indebtedness degree does not significantly influence disclosing of environmental information; H4: Entity's age does not significantly influence disclosing of environmental information. M1—Model 1: Including all independent variables; M2—Model 2: Excluding ST provided we have 3 size measures; M3—Model 3: Excluding ANE provided we have 3 size measures; M4—Model 4: Excluding ST and ANE provided we have 3 size measures. GMM—generalized method of moments; PCSE—Panel corrected standard errors. When significant, + means positive coefficient attained through results—means a negative coefficient sign.

Our paper evaluated transparency and responsibility of some BSE listed companies toward environmental aspects, as well as the dependency relation between degree of disclosing of environmental information and economic and financial factors such as entity's size, profitability, indebtedness degree and age. The data were collected from annual reports, sustainability reports and websites of sampled companies.



Our research can be of interest for potential investors concerned by companies' environmental responsibility, for existing shareholders, as well as for other stakeholders (local community, local and central authorities), besides providing several different contributions for the existent literature. This research brings value added to existing literature by completing and expanding the research in the environmental reporting area. The results of our study can contribute to: (a) improving environmental reporting and environmental information disclosure practices; b) increasing transparency and managers' awareness toward environmental aspects; (c) changing the behaviour/mentality of listed companies; d) increasing awareness of regulating authorities and supporting them in taking measures to determine companies disclosing the effect their operations carry upon the environment. Supplying the environmental information is less based on voluntary initiatives and more on official regulations. The authorities should know (and we reveal this) that only big companies, with a high sales turnover are willing to report environmental data/information; (e) revealing the relation/connection between DEI and various economic, financial and non-financial factors (relation we have tested through various econometric approaches).

The results show environmental reporting largely depends upon company size and its financial performance/profitability.

As opposed to previous studies, which analysed environmental information disclosure for a maximum of three years, our research employs a longitudinal analysis following disclosure trends for a five years period for 100 companies pertaining to 20 different activity sectors. We feel this period is sufficient to formulate clear and relevant conclusions regarding sampled companies' environmental information disclosure.

Studies using an index of disclosing environmental information (DEI index) are numerous. Usually, precedent research has built the DEI index with a focus upon the non-

financial information, the financial information being less approached. Our paperwork completes previous studies by conceiving a DEI index which includes and details financial information such as investments for environmental protection; costs with litigations or fines paid for disregarding environmental regulations; ecological taxes; environmental provisions and other costs. In building our DEI index we have used as a reference the Global Reporting Initiative (GRI) and the list used by Clarkson et al. study (2008), while we have adjusted the measures to reflect Romanian specific legislation.

The evaluation results show that the interest for publishing environmental data is relatively low. The highest score obtained by sampled companies (calculated based on the environmental information disclosing index) was of 15, compared to the maximum possible value of 29. Unfortunately, there is still a significant part of listed companies which are reluctant to supply information concerning the impact their activities have upon the environment. The motives behind that can be diverse, that is, they do not want to acknowledge the impact their activities have upon the environment, no matter if they comply or not with legal requirements, they fear a reaction from environmental agency or from general public or from ignorance or indifference.

In Romania, only companies with over 500 employees listed on the stock exchange market or with state ownership have the obligation to publish a sustainability report. The other companies (even if their activity has a significant impact upon the environment) are not obligated and they do not present voluntarily sustainability reports. We can state that transparency is only the result of obligation and does emerge voluntarily.

The environmental information provided by sampled companies are mostly general, with details offered only about the environmental policies, objectives and in some measure environmental performances. The financial aspects concerning the implications upon environment are scarcely approached. Communication and transparency concerning

environmental problems is still quite low, yet we can notice some positive aspects such as: (a) declaring the reduction in water and energy consumption by a large number of companies; (b) waste management policies (reducing the quantity and impact of waste); (c) formulating the environmental objectives and reaching them in a significant proportion; (d) stating the plans and actions programs concerning environmental protection and (e) legal conformity (aligning to environmental protection standards and complying with existing legislation). Companies offer detailed information about environmental aspects only to public authorities, whereas the public authority can supply data on request from any natural or legal person (according to the Government Decision no. 878/2005 concerning public access to environmental information). Transparency could increase only if high-risk pollution companies would be legally obligated to fulfil public environmental reports. Our paper also looked to determine the influence of financial and non-financial factors and measures (such as entity's size, financial performance, indebtedness degree and age) upon the environmental information disclosure degree of BSE-listed Romanian economic entities. The connection between environmental information and financial and non-financial factors was tested through several different econometric approaches. In light of the tests performed we have noticed that entity's size, expressed via average number of employees, significantly influences the quantity of information supplied by the companies. As a company gets bigger, increases the pressure from the general public and other stakeholders for the company to publish more information about its environmental activity. Also, the company becomes more interested to disclose more information to attract more investors and create a better image on the market. Results also seem to point that financial profitability, when measured through sales turnover (not true for ROE), influences the disclosure of environmental information and in a positive way. Thus, as company performance

increases there might be more resources to affect to environmental awareness and firms might also do it for image concerns. However, indebtedness degree, with mixed results and entity's age do not have a significant influence upon disclosing environmental information. Therefore, even if a company has a long history of existence it does not guarantee that it will disclose more environmental information. The results we have obtained can also indicate that profit generating economic entities are starting to be interested to invest in company environmental activities or in their reporting. The number of employees can influence disclosing environmental information, as economic entities with over 500 employees have obtained a higher score, being legally committed to present sustainability reports. Economic entities are not obligated to disclose environmental information for interested information users. Romania has regulations, however, such as Government Order no. 178/2005, which obligates certain companies (from polluting industries) to report some information, at determined time intervals, toward a certain state authority. However, this information is not public.

## Chapter 2. Reorganization of Economic Entities by Demerger and Sustainable Development Strategies

The Covid-19 induced economic crisis has significantly affected almost all businesses from nearly every sector, causing severe financial problems, lack of cash assets, and decreased revenues. In this context, the economic entities were forced to look for adjustment and rescue solutions of their activities. One possible solution for the recovery and reorganization of economic entities' activities is demerger.

The paper published in 2021, *The Demerger Impact upon Sustainable Development of Economic Entities: Evidence from Romania*, evaluates the impact of demerger upon economic efficiency and financial performances of economic entities. To achieve this goal, a statistical analysis of profitability ratios before and after the demerger, as well as a structural analysis of 268 demerger projects for the April 2012–April 2021 period, were performed. The results attest there are no significant differences between the ex-ante and ex-post financial performances. However, demerger seems to have a positive effect upon analyzed companies helping them to overcome economic hardships, rethink their business strategies, and continue their activity in the medium and long-term time horizon.

### 2.1. Introduction

To cope with economic hardships exacerbated by the sanitary crisis and avoid bankruptcy, economic entities need to look for solutions to continue their activities and develop sustainably. One of the main measures economic entities can adopt to protect their businesses in the context of the pandemic is restructuring.

Demerger represents a type (a mechanism) of restructuring, a strategy for rescuing economic entities in financial difficulties, and implicitly an instrument supporting the

sustainable development of businesses. The demerger process allows the identification and focusing on a given market segment for each company resulted from the process, as well as for the cedent company.

The partial division (demerger) represents a reorganizing operation and “implies the secession of part of a company’s wealth/patrimony, which still continues to exist, and in transferring this part to one or more legal entities which already exist or they are created in this way”. The demerger is defined in Romania by Fiscal Code’s Law no. 227/2015, subsequently added and modified and by the Law of Economic Societies no. 31/1990, republished with subsequent additions and modifications in Ministry of Public Finances Order no. 897/2015. The dividing company is called assignor, whereas the companies already existing or which are created in the demerger process are called beneficiaries. The main objective of this paper is to evaluate the impact of demerger upon the sustainable development of economic entities in terms of economic efficiency and financial performance. A structural analysis for 268 demerger projects from the April 2012–April 2021 period and a statistical analysis of profitability ratios before and after the demerger were performed to reach this objective. The profitability analysis before and after the demerger was necessary to properly highlight the effects generated by the demerger.

The purpose of this paper is to realize a statistical analysis of the ex-ante and ex-post demerger performances and find whether the demerger had a positive impact upon sampled companies’ efficiency and financial sustainability. The studies from reference literature pay more attention to the typology of these transactions and/or their tax and accounting treatment, with a lesser focus on the effect demerger may have on the efficiency and financial performance of economic entities. The analysis of financial profitability ratios from before and after the demerger is essential for the managers of involved companies, allowing them to assert the impact and benefits of the demerger and

decide the restructuring format best suited for the success of the operation. The detailed analysis of demerger projects and the study of demerger impact upon sampled economic entities' financial performances may represent an approach of the demerger analysis. This study contributes to an in-depth knowledge of economic entities' restructuring and identifying the financial characteristics of these transactions. It shows the economic and financial implications which the demerger process can have upon these economic entities' sustainable development.

## **2.2. Literature Review**

In the Romanian legislation, reorganization is approached in various ways, such as mergers, demerger, sector/sectors' activity transfer, acquisition-sale of sector/sectors' activity. The demerger was analyzed in reference literature either from the perspective of typology characteristics or from the standpoint of shareholders' wealth and value creation for the entity, respectively, for the impact demerger has upon company performances.

### *Demerger Characteristics, Typology of Restructuration through the Demerger*

Rachisan et al. (2008) analyzed demerger operations from the January 2006–30 June 2007 period. Their study looked to identify restructuring typology through demerger practiced by Romanian economic entities. The authors concluded demerger is a restructuring process that usually develops in the maturity stage of an entity's life cycle.

### *Impact of Demerger upon Shareholders' Wealth and the Price of Shares of Stock*

The impact demerger can have upon shareholders' wealth and the price of shares of stock was studied by recent research papers (Singh et al., 2009; Vyas et al., 2015; Padmanabhan, 2018; Aggarwal, 2019). Singh et al. (2009) have investigated the way in which shareholders' wealth was influenced before and after the demerger. The authors

have found that equity value increased following the demerger, due to the reduction of negative synergies and unlocking the value through a break-up. Vyas et al. (2015) analyzed the impact of spin-off announcements on stock prices. They took data of 51 spin off announcements from 2012 to 2014. Their results show that the spin-off announcements lead to a positive impact on the stock prices of the parent company. Padmanabhan (2018) and Aggarwal & Garg (2019) also analyzed the effect of spin-off announcements on share prices of Indian firms.

#### *Creating Value through Spin-Offs*

Some of the most recent studies from reference literature focused upon the relationship between spin-offs and value creation for shareholders and companies (Veld and Veld-Merkoulova, 2004; Veld and Veld-Merkoulova, 2009; Khurana and Gupta, 2013; Chai, 2018). Studies show that spin-offs generate both benefits and problems. Khurana and Gupta (2013) studied a few demergers in India to establish that demergers resulted in a significant increase in the total market capitalization of involved companies. The reason for that was attributed to improved focus. The authors suggest that demerger may allow companies to strengthen their core competencies and realize the true value of their business. Chai et al. (2018) studied the impact on spin-off announcements in Australia. The authors found Australian spin-offs are associated with a positive excess stock performance for up to 24 months after the spin-off. Basak (2017) produced another paper investigating whether demerger restructuring can create value for shareholders. The author realized a comparative analysis of ex-ante and ex-post performances, concluding that this restructuring format creates value for interested parties.

#### *Impact of Demerger upon Company Performances*

The consequences of demerger upon company performances and financial situation have been researched in various recent studies (Johnson et al., 1996; Mallick and Rakshit,



2006; Rakshit and Ghosh, 2010; Panda and Rao, 2012). In most cases, demergers tend to have a positive influence over the company. Johnson et al. (1996) consider spin-offs create value by improving investment incentives and economic performances. Mallick and Rakshit (2006) compared financial performances from before and after the demerger. The authors concluded that financial performances improved after the demerger, the latter allowing the companies to impose widened control and create value. Rakshit and Ghosh (2010) measured the financial and operational efficiency of JK Industries by comparing the ex-ante and ex-post demerger periods. The financial and operational efficiency improved after the demerger, which was the conclusion reached by the authors. Panda and Rao (2012) concluded there is a very significant improvement in the return and revenue performances of companies in the ex-post compared to the ex-ante demerger period. Bao (2017) realized another study measuring the impact of demerger upon financial performances. The author evaluated banks' financial performances from the ex-ante, respectively, ex-post demerger periods.

### **2.3. Data and Methodology**

The purpose of this paper is to evaluate the demerger's impact upon the sustainable development of economic entities, using a structural analysis of 268 demerger projects from the April 2012–April 2021 period and a statistical analysis of profitability ratios from before and after the demerger.

#### *Structural Analysis of Demerger Projects*

The first objective of this study is a detailed analysis of demerger projects to identify characteristics such as demerger year, companies' legal form, sector of activity, and number of beneficiary companies. The yearly evolution of demerger projects is shown in Figure 1.

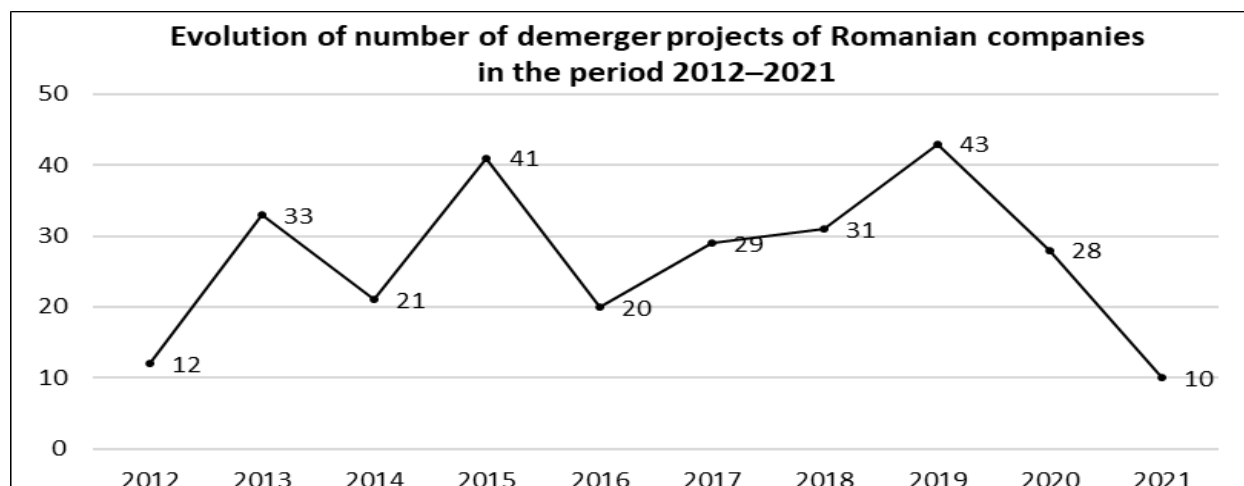


Figure 1. The evolution of the demerger projects during the 2012–2021 period

The structural analysis also envisioned identifying the causes, motivation, and advantages of the demerger projects. The database includes all the 268 demerger projects published by Romanian Trade Office Register for the April 2012–April 2021 period. The analysis counted 10 projects in 2021, 28 projects in 2020, 43 projects in 2019, 31 projects in 2018, 29 projects in 2017, 20 projects in 2016, 41 projects in 2015, 21 projects in 2014, 33 projects in 2013, and 12 projects in 2012. Most of the concerned societies are organized as limited liability societies, such as following the demerging, as it usually results from only one beneficiary company. Of the total 268 companies, 67 (respectively 25% of the demerger projects) are incorporated shares companies, whereas 201 are limited liability companies, respectively 75% of the total. The main type of demerger was the patrimonial transfer toward the newly established companies at the demerger moment. Figure 2 presents the distribution of the demerger projects by sectors of activity.

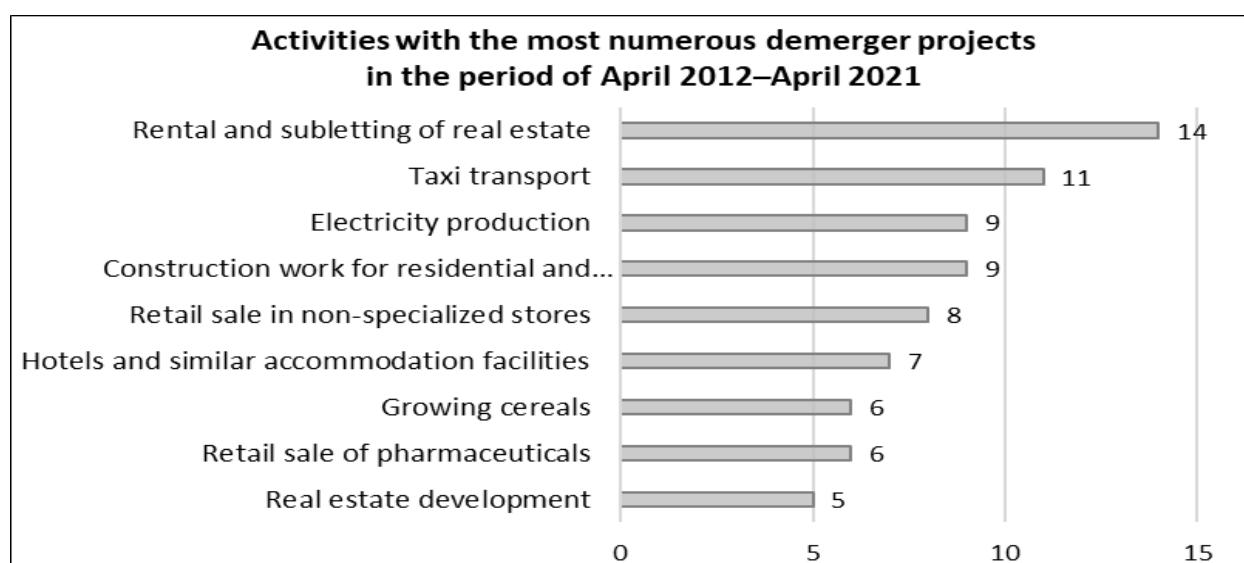


Figure 2. Main sectors of activity of demerged companies

The divided companies originate from virtually all activity sectors. Yet, predominant are the ones from letting and subletting real estate assets sector (14), taxi transportation (11), electricity production (9), commercial and non-commercial real estate construction companies (9), retail sales in non-specialized stores (8), hotels and assimilated accommodation structures (7), retail of pharmaceutical products (6), growing crops (5) and other activities with a smaller number of projects. The content analysis revealed the reasons and foundations of demerging the 268 involved economic entities. The main economic and commercial reasons substantiating the demerger projects are summarized and presented in Table 1, ordered by their decreasing frequency. The analysis reveals a variety of reasons which determine companies to subject themselves to a demerger process. The demerger is justified by the necessity of separating specific projects and activities realized by divided economic entities in view of better-focused and more efficient management of available resources. The content analysis revealed that increasing economic efficiency was the main reason for dividing the concerned Romanian economic entities.

**Table 1.** Advantages and motivation of demerger

<b>Advantages and Motivation of Demerger</b>
1. Increasing economic and financial efficiency and profitability
2. Specializing improves labor productivity, raises personnel's interest for contributing to economic efficiency
3. Distinct appraisal of financial performances and financial measures for each activity from the portfolio
4. More adequate management of available resources
5. Increasing efficiency and simplifying the decision-making process
6. Increasing decision making and operational flexibility
7. Optimizing the level of expenditures
8. Separating the competitive activities from the less competitive ones
9. Separating the risks associated with each line of activity
10. Separating investment objectives
11. Better choice of strategies for organizing and operating the activities, as well as of strategies of managing company assets
12. Higher flexibility in designing strategies and policies customized for each activity
13. Easier access to financing
14. Increasing the attracting, implementing, and managing of non-reimbursable funds
15. Smaller companies are easier to manage and control and more responsive to market reactions
16. Promoting a stronger brand image
17. Avoiding potential conflicts/misunderstandings between shareholders

Source: Data collected and processed from demerger projects

Creating distinct economic entities specialized in a specific sector of activity, with separated budgets of revenues and expenditures, can contribute to a better efficiency and profitability of each entity. Smaller companies are easier to manage and control and more responsive to market reactions. A smaller company can benefit from a more efficient management, more efficient use of resources, productivity increase, all resulting in increased profitability and quality of products and services offered to the clients.

The demerger process allows a proper identification and focus on a given market segment for each company resulted from demerger. In addition, splitting the activities can improve negotiation power with business partners, offering the companies an improved market response capacity and generating a consolidation of market positioning.

The content analysis revealed situations which justified demerging due to misunderstandings between shareholders/associates regarding the investment and management policies of concerned economic entities. A large number of shareholders/associates can generate problems in the decision-making process. Separating and empowering the management structures can optimize expenditures, reduce operating costs and increase long-term profitability.

Another reason for company demerger is the negative effects of the sanitary crisis upon sales turnover. The companies which divided in 2020 and 2021 maintained demerging was necessary due to current economic context (Covid-19 generated), due to financial and social crisis, and implicitly because of the need for a long-term increase of efficiency and profitability.

#### *Statistical Analysis of the Differences between the Ex-Ante and Ex-Post Demerger Sub-Periods*

Another objective of this paper is to evaluate the impact of demerger strategy upon companies' efficiency and profitability. The profitability analysis for the ex-ante and ex-post periods is necessary to ensure a better highlight of the effects generated by the demerger. One purpose of this paper is to realize a statistical analysis of the performance differences from the before and after demerger sub-periods and to find whether the demerger had a positive impact upon sampled companies' efficiency and financial sustainability. This paper investigates whether demerger can be a solution for saving and recovering the companies found in financial distress. To see whether companies' financial performances have improved after the demerger, it was selected a sample with 72 economic entities demerged, only from those entities which reported financial situations in the 2005–2019 period. The economic entities included in the sample were analyzed in four stages, using 4 panels, respectively, one with 8 companies demerged in 2012, one

with 22 companies demerged in 2013, a panel with 17 companies demerged in 2014, and another one with 25 companies demerged in 2015. The analysis also included 20 economic entities demerged in 2020 and 6 economic entities demerged in 2021 to find whether the demerger restructuring was needed and useful from an economic and financial point of view. The analysis started by selecting those economic entities which reported financial data in the 2005–2019 period. The main source of data was the financial statements of demerged companies, using the site [www.romanian-companies.eu](http://www.romanian-companies.eu) (accessed on 29 April 2021). We have selected as measures of financial performances the profitability ratios of ROA (Return on Assets) and ROE (Return on Equity). ROA shows management performances in using company assets to generate net income. We calculated ROA as Net profit after tax divided by Total Assets. ROE expresses financial performance, and it informs shareholders about the company's capacity to use its invested capital (Equity) to generate profits. We calculated ROE as Net profit after tax divided by Equity. The analysis of these profitability ratios for the sample considered can offer information about companies' financial performances from the before and after demerger periods.

The purpose of this research is to analyze the impact of demerger upon sampled companies' financial performances, these were established and statistically tested two sets of hypotheses:

*Testing the ROA level differences in the ex-ante and ex-post demerger periods*

Hypothesis 0 (H0): There are no significant differences between the ex-ante and ex-post demerger levels of ROA.

Hypothesis 1 (H1): There are significant differences between the ex-ante and ex-post demerger levels of ROA.

*Testing the ROE level differences in the ex-ante and ex-post demerger periods*

Hypothesis 2 (H2): There are no significant differences between the ex-ante and ex-post demerger levels of ROE.

Hypothesis 3 (H3): There are significant differences between the ex-ante and ex-post demerger levels of ROE.

## 2.4. Results, discussions, and conclusions

### *Statistical Analysis of 2012, 2013, 2014, and 2015 Panels*

The sample of 72 companies used in the statistical analysis was distributed in four panels, corresponding to the demerging years, respectively, 2012, 2013, 2014, and 2015. The demerging years were selected to allow a comparative analysis of the two sub-periods, from before and after the demergers.

### *Statistical Analysis of ROA in the Ex-Ante and Ex-Post Demerger Sub-Periods*

To ensure results' robustness, a statistical analysis of ROA and ROE was performed for the ex-ante and ex-post demerger sub-periods using the SPSS statistical software. Table 2 centralizes the descriptive statistics results, respectively, the average and standard deviation for ROA and each of the four panels, before and after the demerger.

**Table 2.** Descriptive statistics

ROA		Group Statistics for the Period 2005–2019				
Demerger Year	No. Companies	Sub-Periods	N	Mean	Std. Deviation	Std. Error Mean
2012	8	≥2013	56	−0.001696	0.254298	0.033982
		<2013	64	0.094323	0.269962	0.033745
2013	22	≥2014	132	0.100722	0.211805	0.018435
		<2014	198	0.060275	0.220937	0.015701
2014	17	≥2015	85	0.111806	0.213411	0.023148
		<2015	170	0.075973	0.119990	0.009203
2015	25	≥2016	100	0.083060	0.151103	0.015110
		<2016	275	0.098024	0.185228	0.011170

The first sub-period includes the demerger year, whereas the second sub-period starts with the first year after the demerger. For the 2012 and 2015 panels, the ROA

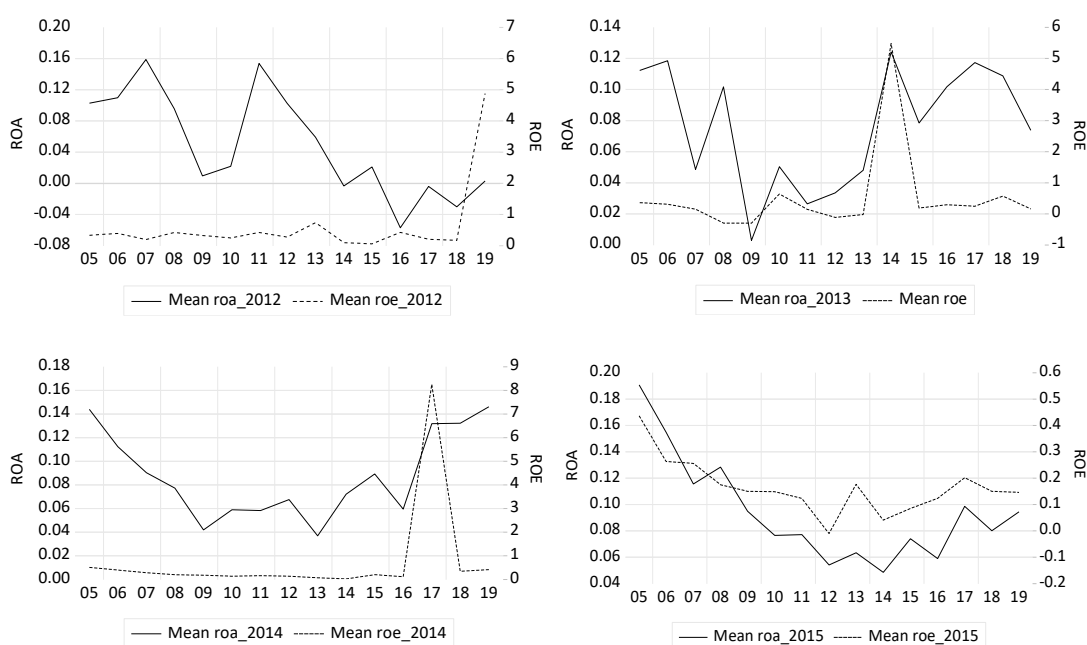
average from after the demerger decreased, registering a small decline for the 2015 panel and a dramatic fall for the 2012 panel, with the average ROA becoming negative. An explanation for the situation of the 2012 panel could reside in the smaller number of sampled companies. For the 2014 panel, a higher variation of ROA average after the demerger can be noticed compared to the ex-ante demerger sub-period. In the 2015–2019 sub-period, the ROA average is 11.2%, with a standard deviation of 21.3%, whereas for the 2005–2014 sub-period, before the demerger, the ROA average was 7.6%, with a standard deviation of 12%. To verify the statistical significance of ROA average differences between the two sub-periods (before and, respectively, after the demerger) the T-Test and F of Levene's tests were used. The two sub-periods are considered as samples originating either from equal or unequal variances' populations. The T-Test is calculated for both situations. The F test verifies variances' equality for the two sub-periods and indicates which of the two situations can be considered for interpreting the T-Test. The T-Test values for the F test's hypotheses are similar and do not affect the acceptance or rejection of the null hypothesis,  $H_0$ . The results obtained applying the T and F tests are presented in Table 3. The F test does not reject the  $H_0$  hypothesis of ROA variances' equality for the two sub-periods, for the 2012, 2013, and 2015 panels. For these panels, the T-Test and P-value (Sig. (2-tailed)), corresponding to variances' equality situation, in the bolded rows of Table 3 are considered. For the 2014 panel, the Levene's F test rejects the  $H_0$  hypothesis; hence, we conclude the two sub-periods originate from unequal variances' samples, in the bolded row of Table 3. For the 2012 panel, the T-Test rejects the  $H_0$  hypothesis of equality for ROA averages from before and after the demerger as Sig. (2-tailed) is lower than 5%. The negative difference of ROA averages is significantly different from zero, and the ex-post demerger ROA average is significantly lower compared to the previous period, at a 5% significance threshold. The conclusion of the T-



Test is also supported by a declining ROA trend for the 2013– 2019 sub-period on the ROA chart of the 2012 panel, in Figure 3. For the 2013, 2014, and 2015 panels, the T-Test fails to reject the H0 hypothesis as Sig. (2-tailed) is higher than 5%. For 2014 panel, the T-Test fails to reject the H0 hypothesis of the two sub-periods of ROA averages' equality; Sig. (2-tailed) equals 15.3%, which is higher than 5% significance level.

**Table 3.** T-test for equality of means

		Independent Samples Test								
		t-Test for Equality of Means								
ROA		F	Sig.	t	df	Sig. (2-Tailed)	Mean Difference	Std. Error Difference	95% CI of the Difference	
									Lower	Upper
2012	Equal variances assumed	0.182	0.671	<b>-1.997</b>	<b>118</b>	<b>0.048</b>	<b>-0.096019</b>	<b>0.048083</b>	<b>-0.191237</b>	<b>-0.000801</b>
	Equal variances not assumed			-2.005	117,341	0.047	-0.096019	0.047891	-0.190861	-0.001176
2013	Equal variances assumed	0.531	0.467	<b>1.656</b>	<b>328</b>	<b>0.099</b>	<b>0.040447</b>	<b>0.024421</b>	<b>-0.007595</b>	<b>0.088489</b>
	Equal variances not assumed			1.670	288,897	0.096	0.040447	0.024215	-0.007214	0.088108
2014	Equal variances assumed	14.380	0.000	1.715	253	0.088	0.035833	0.020894	-0.005316	0.076981
	Equal variances not assumed			<b>1.438</b>	<b>111,271</b>	<b>0.153</b>	<b>0.035833</b>	<b>0.024910</b>	<b>-0.013527</b>	<b>0.085192</b>
2015	Equal variances assumed	0.251	0.617	<b>-0.725</b>	<b>373</b>	<b>0.469</b>	<b>-0.014965</b>	<b>0.020647</b>	<b>-0.055565</b>	<b>0.025635</b>
	Equal variances not assumed			-0.796	213,698	0.427	-0.014965	0.018790	-0.052003	0.022074



**Figure 3.** Average evolutions of ROA and ROE in the 2005–2019 period  
for the four panels

The conclusion is that the differences between ROA averages of the two sub-periods do not significantly differ from zero at a 5% significance threshold. For these panels, the confidence intervals of averages' differences between the two sub-periods change the sign from "–" to "+", suggesting the averages' difference can be equal to zero; respectively, the ROA averages of the two sub-periods can be equal. The diagrams from Figure 3 reveal the evolution of ROA and ROE for the 2005–2019 period for the four panels.

ROA shows a declining trend during the second sub-period for the panel with the companies demerged in 2012 and a growing trend for the other three panels after the corresponding demerger year.

#### *Statistical Analysis of ROE in the Ex-Ante and Ex-Post Demerger Periods*

Table 4 centralizes the descriptive statistics results, respectively, the average and standard deviation for ROE and each of the four panels, before and after the demerger.

**Table 4.** Descriptive statistics

ROE		Group Statistics for the Period 2005–2019				
Demerger Year	No. Companies	Sub-Periods	N	Mean	Std. Deviation	Std. Error Mean
2012	8	≥2013	56	0.938089	5.074939	0.678167
		<2013	64	0.326131	0.776467	0.097058
2013	22	≥2014	132	1.155887	10.360811	0.901793
		<2014	198	0.096574	1.205931	0.085702
2014	17	≥2015	85	1.865111	14.868298	1.61269
		<2015	170	0.208705	0.335002	0.025693
2015	25	≥2016	100	0.155248	0.242907	0.024291
		<2016	275	0.167702	0.378698	0.022836

For the panels with companies demerged in 2012, 2013, and 2014, the average ROE is higher in the ex-post demerger sub-period. For these panels, which registered a higher ROE after the demerger, a larger variation of ROE in the second sub-period can also be noticed, as, during this sub-period, the average standard deviations of ROE are significantly larger compared to the previous sub-period.

For the panel of 2015 demerged companies, the average ROE is slightly lower in the ex-post demerger period of 2016–2019 compared to the previous sub-period of 2005–2015. This panel displays a lower variation of ROE after the demerger. To verify the statistical significance of ROE averages' differences between the two sub-periods (from before and, respectively, after the demerger) the T-Test and F of Levene's tests were used. The results obtained are presented in Table 5. The difference of sub-periods of ROE averages is negative for the 2015 panel and positive for all the other panels, respectively, the ex-post ROE averages were higher than the ex-ante ones. An explanation for 2015's panel could be the shorter ex-post sub-period, of only 4 years considered after the 2015 demerger. As in the ROA case, for the 2014 panel, the Levene's F test statistics reject the H0 hypothesis so that the two sub-periods originate from unequal variances' samples, in the bolded row of Table 5. For the other panels, the Levene's F test fails to reject the H0 hypothesis of the sub-periods' variances' equality; as seen in the bolded rows of Table 5.

The T-Test fails to reject the H0 hypothesis of insignificant differences between the ROE averages of the two sub-periods, having the value of Sig. (2-tailed) higher than 5% for all the panels. The diagrams from Figure 3 reveal the evolution of ROE in the 2005–2019 period for the four panels included in the sample. For the 2015 panel, there is an unfavorable evolution compared to the previous period, yet this difference is statistically insignificant. According to the results from Table 5 and to Figure 3, the ROE ex-post levels are quite similar to the ex-ante demerger ones for all the panels.

#### *Comparative Analysis of ROA and ROE for the Ex-Ante and Ex-Post Demerger Sub-Periods*

The comparative analysis of ROA and ROE was made for both company and panel levels. For the companies from each panel, the statistical signification of the ROA and

ROE average differences were computed for the two sub-periods delimited by the corresponding demerger year.

**Table 5.** T-Test for equality of means

Independent Samples Test										
ROE		t-test for Equality of Means								
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
2012	Equal variances assumed	3.307	0.072	0.953	118	0.343	0.611958	0.642427	-0.660222	1.884138
	Equal variances not assumed			0.893	57,255	0.375	0.611958	0.685077	-0.759754	1.983669
2013	Equal variances assumed	3.744	0.054	1.425	328	0.155	1.059313	0.743206	-0.402739	2.521365
	Equal variances not assumed			1.169	133,370	0.244	1.059313	0.905856	-0.732389	2.851016
2014	Equal variances assumed	7.068	0.008	1.455	253	0.147	1.656405	1.138671	-0.586077	3.898888
	Equal variances not assumed			1.027	84,043	0.307	1.656405	1.612898	-1.550995	4.863806
2015	Equal variances assumed	1.455	0.229	-0.307	373	0.759	-0.012454	0.040622	-0.092330	0.067422
	Equal variances not assumed			-0.374	274,000	0.709	-0.012454	0.033340	-0.078088	0.053181

The effects that demergers had upon these two profitability ratios were determined. The tests' results regarding the significance of sub-periods' averages' differences, for ROA and ROE, for each company inside the 2012, 2013, 2014, and 2015 panels, as well as at each panel level, are analyzed in Table 6.

**Table 6.** Summary of applying T-Test for means' equality, at company level

Effects after Demerger for:	Group Statistics of Companies				All	At Panel Level		
	Significant Differences after Demerger			Insignificant Differences after Demerger		Significant Differences after Demerger		Insignificant Differences after Demerger
	Positive	Negative	Total			Positive	Negative	
2012 panel								
ROA	1	1	2	6	8	-	X	-
ROE	1	2	3	5		-	-	X
2013 panel								
ROA	3	4	7	15	22	-	-	X
ROE	1	1	2	20		-	-	X
2014 panel								
ROA	3	4	7	10	17	-	-	X
ROE	3	1	4	13		-	-	X
2015 panel								
ROA	3	4	7	18	25	-	-	X
ROE	2	2	4	21		-	-	X

The results from Table 6 reveal that for all panels, most of the companies (about 60% of them) have not recorded significant changes in ROA and ROE in the ex-post period compared to the ex-ante demerger period.

The weight of companies registering significant changes is higher in the case of ROA compared to ROE, with the notable exception of the panel created for the companies divided in 2012.

In case of ROA, for all analyzed panels, negative changes are predominant for the companies which recorded significant changes, whereas, for ROE, the positive changes are predominant, obviously for the companies displaying significant changes.

For all the panels, except for 2012, divided companies registered insignificant changes for both ROA and ROE. For the 2012 panel, significant differences were reported ex-post in case of ROA, with a negative trend, whereas ROE did not mark any significant changes. One explanation could be that the number of companies included in the 2012 panel is considerably lower than for the panels with companies divided in the following years.

The conclusions of this research reflect the working hypotheses of the statistical tests initially established. The previous results lead to accepting the null hypothesis,  $H_0$ , for both indicators. There are no significant differences between the ex-ante and ex-post demerger levels of ROA and ROE.

#### *Statistical Analysis of ROA and ROE for the 2020 and 2021 Panels*

Looking further to the panels with recently demerged, from 2020 and 2021, the results of the descriptive statistics for ROA and ROE previous to the demerger years, i.e., for the entire period of 2005–2019, are centralized in Table 7 and Figure 4.

Table 7. Descriptive statistics

Indicators for Period 2005–2019	2020 Panel		2021 Panel	
	ROA	ROE	ROA	ROE
Mean	0.017033	0.034011	0.112941	0.173387
Median	0.035464	0.079699	0.061670	0.130952
Maximum	0.571602	17.54900	0.497373	0.650401
Minimum	-14.49125	-41.1688 4	-0.187362	-0.745479
Std. Dev.	0.854532	2.693701	0.132229	0.224228
Skewness	-16.39820	-11.3252 0	0.949292	-0.979728
Kurtosis	278.8407	190.7937	3.447364	6.491664
Sum	5.109931	10.20330	10.16470	15.60485
Sum Sq. Dev.	218.3374	2169.552	1.556131	4.474771
Observations	300	300	90	90

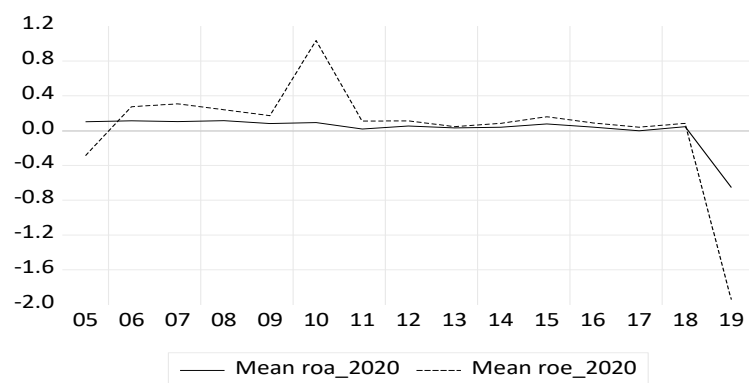
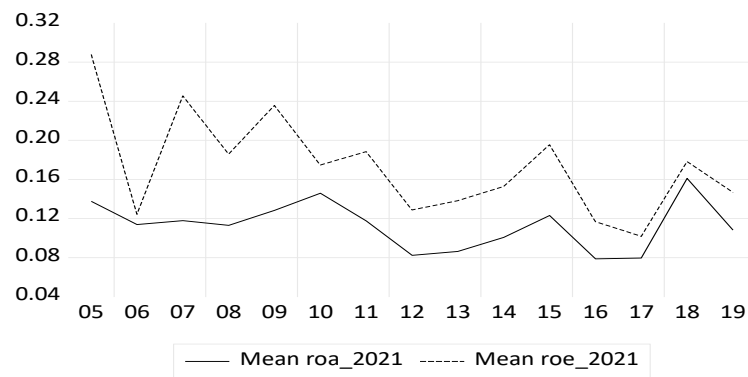


Figure 4. The evolution of average ROA and ROE for the 2020 panel

The ROA and ROE variables have registered a declining trend before 2020, the year of the demerger, indicating that some form of reorganizing the activity of sampled economic entities was needed (see Table 7 and Figure 4).

Regarding the economic entities divided in 2021, the ROA and ROE variation was more intense, still with a declining trend in the period preceding the demerger (see Figure 5).



**Figure 5.** The evolution of average ROE and ROA for the 2021 panel

The decrease in profitability and efficiency revealed by ROE levels under the economic crisis generated by the Covid-19 pandemic in 2020 is a factor which determined the companies to reorganize and appeal to demergers. Investors often use ROE measures to set their investment strategies in any given company.

The fact that ROA and ROE levels did not change significantly after the demerger can reveal some interesting aspects. Given the technical construction of ROA and ROE ratios, if their levels remain the same in the ex-post demerger period compared to the ex-ante period, this could signal that the demerger process was carefully planned and implemented. Since total assets (from the denominator of ROA ratio) decrease following the demerger action and yet ROA remain virtually the same, it means the divided companies maintained approximately the same efficiency as previously. The resulting companies obtained a portfolio of assets with relatively the same profitability as cedent company. The same reasoning is probably valid for ROE levels.

In the coming periods, both ROA and ROE could increase if their managers implement investment strategies that best suit the specific features of their clients and markets.

The current crisis, generated by the Covid-19 pandemic, has produced and still produces significant effects upon companies' sustainable development. The current paper evaluated whether demerger can represent a recovery solution for the companies in distress or even generate beneficial effects upon sampled companies' economic and

financial profitability. Usually, demerger is justified by the necessity of reorganizing, restructuring, and rethinking companies' activity and business. The content analysis showed that demerger was mainly performed for economic reasons, respectively, for reasons of increasing the profitability and efficiency of company activities. Through the demerger, the companies follow an increase of profitability and efficiency. Yet, the demerger does not determine an immediate improvement (as proven by the statistical analysis) but rather a preservation of existing efficiency levels for about four years, after which it is possible to register a slight increase. The statistical analysis results revealed that for all the panels, most of the companies (over 60% of them) did not register significant changes in ROA and ROE levels in the ex-post period compared to the ex-ante demerger period; respectively, the H0 hypothesis was validated.

The demerger did not generate an immediate increase of profitability ratios for neither ROA or ROE, yet it did allow the companies to survive and continue the activity for a period of at least 4 years after the demerger, as evidenced by the evolutions from Figure 3. This study supports the conclusion that demerger determines increased independence and a focus upon base activities, thereby ensuring long-term efficiency and favoring companies' sustainable development. A smaller company can benefit from more efficient management, more efficient use of its resources, and preservation of financial profitability levels for a longer-term. The results obtained are in the same line with previous studies, as they support the conclusion of a positive impact of demerger upon financial performances and efficiency of sampled companies. This study differs from previous ones in this segment by the statistical analysis performed in four stages, using four panels, pertaining to the years when demergers took place. Our study encompasses a longer period of time, of 15 years, to allow an ex-ante and an ex-post demerger performance analysis, as well as a relatively significant number of divided companies (72



companies). Moreover, the study performed a detailed analysis of 268 demerger projects. We consider that both managers and investors can use the results obtained from this research to assess the growth and development potential of the economic entities resulted from the demerger. Our study can help managers identify the restructuring method for the company they administrate. This study revealed that ROA and ROE levels do not register an immediate increase after the demerger; however, this process allows companies and managers to continue their activity in the medium and long run, for at least four years (as it resulted from available data analysis). The demerger allows increased independence and a focus upon the underlying activities, ensuring increase of efficiency and a sustainable development of these companies. This aspect can be revealed by the graphs put together for each separate panel (for both ROA and ROE measures). The experience acquired by demerger companies, reflected by this research, can represent a model of good practices for other companies confronted with financial difficulties after the Covid-19 pandemic. 5.1.

The paper brings value to reference literature to complete the research area in economic entities' restructuring direction. This study represents a useful analysis tool for characterizing the demerger phenomenon in any economy. The present study is the first one in Romanian approaching demergers from a financial perspective, also looking to the demerger effects upon the companies' sustainable development. The statistical processing from this research offers a complex analysis of the impact demergers have upon Romanian companies' financial performances and economic efficiency.

The research contributes to the existing literature in several ways.

First of all, it assessed the impact demergers had upon the sampled companies (72 Romanian companies), using ROA and ROE, during fifteen years. Secondly, it applied some tests to check the statistical significance of the differences between the ex-ante

and ex-post demerger performances and provided robust results. Thirdly, it found whether demerger companies have endured in the market for at least 4 or 5 years after the demerger (they did not file liquidation procedures) and if they registered positive values of ROA and ROE. Fourthly, it assessed and analyzed in detail a great number of demerger projects (268 projects) published in the 2012–2021 period. The analysis of demerger projects is meant to identify the characteristics of this restructuring phenomenon.

## **Chapter 3. Financial Sustainability and Performance Reporting of Economic Entities**

### **3.1. Introduction**

The periods of economic and financial crisis impose on companies the need to develop a model of sustainable development. A sustainable company is an efficient company, and efficiency can be defined in the form of financial performance, profitability, or productivity.

Sustainability is an economic component that economic entities need to integrate into their business strategies to meet the challenges and ensure the continuity and development of their long-term activity. Sustainability has a financial side as well, highlighted by financial indicators. Obtaining favourable financial results (profit) as well as the efficiency in the use of resources can be considered an expression of financial sustainability.

### **3.2. Literature review**

In the literature, studies have addressed companies' sustainability in various sectors of activity from a financial perspective, based on a set of economic and financial measures.

Zabolotnyy and Wasilewski (2019) define the financial sustainability of a firm as the ability to generate value for owners and provide continuity (the concept of continuity refers to the going concern principle of accounting) of operations in the long term, using an optimal combination of investments and sources of financing. They used the fuzzy logic method to quantify complex interrelations among various financial factors and divided the companies according to their financial sustainability level.

*"Financial sustainability is the main pillar of the economic sustainability of companies that reflects the efficient use of the company assets to generate profit"* (Sabău et al., 2020).

Financial sustainability is a crucial aspect of firms' sustainable development. Meanwhile, it concerns the existence and growth of the enterprise directly and is a key to ensure enterprises' performance and sustainability (Popescu, 2019).

The approach to financial sustainability is found in various specialized studies (Lebacqz, 2013; Sanz, 2016; Paun, 2017; Maciková et al., 2018; Sannikova, 2019; Henock, 2019; Lampridi, 2019; Schwab et al. 2019, Tzouramani, 2020). Also, the effect of sustainable development on financial performance has been a topic of research in other specialized papers (Chang and Kuo, 2008; Wagner, 2010; Lassala et al., 2017; Alshehhi et al., 2018; Martínez-Ferrero and Frías-Aceituno, 2015; Amacha and Dastane, 2017).

The paper by Chang and Kuo (2008) shows a positive relationship between the sustainable development of a company and financial performance.

Usually, studies that considered the relationship between business sustainability and financial performance concluded a positive relationship between the two.

### **3.3. Methodology and results**

This section covers both published and forthcoming articles, an example being the research on the "Financial Sustainability of Companies in the Agricultural Sector". The mentioned article, currently forthcoming, offers a financial perspective on the sustainability of companies in the agricultural sector, using the econometric processing of the financial data for a sample of 524 companies in Romania, the analysis period being 16 years.

The financial performance of the economic entities has been subject of discussion in most of the articles we have published in recent years; either it was analyzed in

correlation with the degree of disclosure of environmental information; or it was analyzed before and after the reorganization process of an entity; or it has been analyzed as dynamic in different sectors of activity (pharmaceutical sector, construction, and textile industry).

In diagnosing the financial health of the analyzed companies, we have used the following measures: return on assets, return on equity, turnover, net result, liquidity ratios, solvency ratio, degree of indebtedness, etc.

The financial health and implicitly the financial sustainability of the companies from the textile, pharmaceutical, and construction sectors, from Romania, was also analyzed in the articles:

- *Evaluating the financial performance of Companies from the Pharmaceutical Industry, an article published in 2016;*
- *The financial position and performance of the economic entities from the Light Industry, an article published in 2015;*
- *Financial Reporting in the Furniture Industry, an article published in 2017.*

Profitability continues to be the most important indicator of financial sustainability as the survival of any business depends, to a large extent, on its periodic profitability (Alshehhi et al., 2018).

*„Financial performance shows the success of a company and the attractiveness of shares in the financial markets. It helps investors make investment decisions in stock markets and managers make financial decisions”*(Madaleno and Bărbuță-Mișu, 2019).

Financial performance is usually measured by return on equity (ROE) and assets (ROA). Return on Assets (ROA) gives us an overview of the ability of companies to generate profit based on existing assets. We calculated ROA as Net income divided by Total assets.

Return on Equity (ROE) expresses financial performance, and it informs shareholders about the company's capacity to use its invested capital (Equity) to generate profits. We calculated ROE as Net income divided by Equity.

The article, "*Evaluating the financial performance of Companies from the Pharmaceutical Industry*", focused on investigating and analyzing the financial statements for 12 drug-producing companies in Romania. The analysis is based on data corresponding to the period 2008-2015.

Financial performance is a vast topic developed at all academic levels and in professional practices. The interest shown in this topic was present in the concerns of Romanian and foreign authors, experts in finance, accounting, financial management, evaluation, general management, value management. Deari and Dincă (2015) have analyzed the financial performances of 40 selected Romanian companies for the 2009-2013 period. They found that the companies with a higher current to total assets ratio have higher assets turnover and ROA.

The main objective of this study is represented by the analysis of the financial performance of companies from the pharmaceutical sector in terms of their ability to obtain profit in the difficult economic context of the period after 2008. The population on which the study was conducted targets 12 economic entities which produce pharmaceutical products. There were chosen the first 12 economic entities which recorded the highest sales in 2015. The paper focuses on analyzing the performance of economic entities from this sector. The author calculates the financial performance indicators based on the information provided by the individual financial statements of these categories of companies, elaborated for the period 2008-2015. The analysis involved the investigation of financial statements from several consecutive financial years over a period of 8 years (2008-2015). Examining the financial statements over

several consecutive financial years is supposed to enhance the value of the analysis. The financial situation in the case of an economic entity is highlighted through the financial - accounting information published in financial reports, namely by reflecting the financial position in the balance sheet and the financial performance in the profit and loss account. Every economic decision taken by an entity involves a rigorous and precise analysis of all economic and financial events and transactions as well as of the data provided by the financial statements. This paper presents an analysis of the evolution and dynamics of the financial performance reflected in the financial statements of the economic entities from the pharmaceutical sector.

The study addresses the financial performance in terms of the profit and loss account by analyzing the following indicators: turnover, the net result, and the return on equity (ROE). Performance is not just about an entity's ability to make profit, but also its ability to pay its short and long-term debts. Thus it was also calculated the degree of indebtedness for the 12 economic entities from the pharmaceutical sector. An economic entity's financial performance represents its ability to obtain profit from its business as a result of carrying out its economic activity. Thus, for an economic entity to be efficient from a financial point of view, it is imposed the condition to conduct a profitable activity, which enables first of all the remuneration of all the factors of production involved, as well as achieving a surplus, represented by the overall result of the economic activity. An indicator that measures the performance of companies, used as a criterion for ranking them in terms of their economic importance, is turnover. The turnover represents the value of sales made over a period of time by an economic entity. This indicator allows assessing the place of the company in its sector, its market position, its skills to launch and develop different activities which would bring profit. However, the change of the turnover is reflected on the main financial indicators as well as on the efficiency of the

activity of economic entities. In the manufacturing sector, the net turnover expresses the total volume of businesses and includes all the revenue from the sale of the products obtained.

Another indicator showing the financial performance recorded by each sector is the net result. This indicator expresses the efficiency of the entire activity developed by economic entities. The indicator that expresses the ability of an economic entity to generate profit is the rate of return on equity (ROE). Return on equity is a significant indicator for assessing the economic and financial performance of a company for its internal diagnosis and the analyses required by the external partners (Căruntu, 2009). Return on equity expresses the ability of the equity to generate profit and the efficiency of using the own equity. Depending on the value of this indicator, shareholders can appreciate if their investment is justified and whether they should continue investing. A high rate of return on equity thus enables the shareholders to obtain consistent revenues. The higher the return on equity is, the more financial resources the company has at its disposal (Vasilache, 2009).

The degree of indebtedness is an indicator that can quantify the amount of external financing in relation to the possibility of self-financing of an economic entity. This indicator may also be a barometer of the entity's independence face to its creditors (Anton, 2009). The degree of indebtedness is calculated as the ratio between total debt and equity. The higher this indicator is, the more dependent the economic entity is on commercial loans or debts. A reasonable situation demands that this indicator does not exceed the threshold of 0.5.

The economic entities from the pharmaceutical sector have managed to overcome the difficult times specific for a period of economic crisis, registering an upward trend in turnover. The indicator return on equity recorded fluctuating values with a decreasing



tendency in 2009-2012, but with a strong recovery in the coming years. The carried out diagnostic analysis has shown that the economic entities from the pharmaceutical sector have gone through difficult periods, especially between the years 2009-2012. Another finding of this study refers to the rather sensitive position concerning the degree of indebtedness. In the case of four out of the twelve analyzed companies, the degree of indebtedness has recorded relatively high values mostly in 2009-2011, which indicates a relatively low potential for self-financing, meaning that the economic entities finance themselves from external sources. One possibility for reducing debts would be compensating claims with debts, and thus eliminating the possible delay penalties.

In conclusion, the economic entities from the pharmaceutical sector show an overall positive financial performance that might generate significant added value, as evidenced by the calculated indicators. The research has some limitations, inevitable in any scientific endeavor of this kind that only opens up new horizons for future research. A first restriction in appreciating the performances refers to the number of analyzed companies and the temporary horizon.

The article, *"The financial position and performance of the economic entities from the Light Industry"*, focused on investigating and analyzing the financial reports of 45 business economic entities representing the Romanian light industry. The study's main purpose is to determine the financial health of the business economic entities from the textile, clothing, and footwear industry.

The analysis implied the investigation of the financial statements of certain consecutive financial years. Hence, for the analysed period of six years (2008-2013), the examination of financial statements enhances the value of this paper. The selection of the set of financial indicators was conditioned by the availability of financial data provided by the Romanian Administration of Public Finance.

Hence, this paper analyzes the evolution and dynamics of the financial standing and financial performance reflected in the financial statements of the textile, clothing, and footwear industry economic entities. The analysis is based on seven variables: asset liquidity, solvency ratio, degree of indebtedness, labor productivity, turnover, net profit, and financial return. The selected financial indicators can be used to make predictions about the financial health of a business entity and the capacity to attract investment to analyze tendencies and compare the performance/profitability between fields or companies.

Achieving the objectives of the research takes into consideration the following hypotheses:

H0: There are no significant differences in liquidity, solvency, and financial return of companies in the three fields: textiles, clothing, and footwear

H1: There are significant differences between the liquidity, solvency, and financial return of companies in the three fields: textiles, clothing, and footwear.

Moreover, the pieces of information needed for the analysis of a company's financial standing are provided mainly by the balance sheet. The analysis of the financial standing involves an analysis of the evolution and structure of assets, liabilities, and equity. The rates of the structure of the financial standing (assets, liabilities, and equity) highlight the entity's financial characteristics such as the ability to turn assets into cash, autonomy and financial independence of the entity, the quality of the financial balance on short and long term, etc. Regarding the financial standing, the financial equilibrium of an economic entity may be measured with the help of the liquidity and solvency indicators. A first embodiment of the entity's financial balance is achieved by ensuring the continuous ability of the company to pay, both on short and long term. In general, liquidity and financial solvency represent the entity's ability to meet its due payments (Borlea, 2010).

The study shows that light industry business economic entities present, overall, a favorable financial standing and positive financial performances, which may generate them a significant added value. With the results of this study, the stakeholders (users of the accounting information) may be able to shape the profile and observe the financial structure of the economic entities from the light industry, also appreciating the policy of collecting the claims, of managing current assets, the financial profitability, the ability to pay debts and by default, the risk of insolvency.

In this regard, the values and tendencies registered by the calculated indicators (especially the overall solvency and the degree of indebtedness) reveal that the business economic entities from the light industry find themselves at a certain distance from the risk of insolvency and inability in paying debts. However, it is required that the managers of these companies be aware of the necessity of a precise diagnosis of the economic entity in time, within the contemporary business environment, to be able to notify as early as possible the financial difficulties (the level of the risk) and to plan a long term strategy. Thus, financial and accounting information can help managers and other users of accounting information to reduce uncertainty in the decision-making process. Furthermore, our further research may be centered on a more detailed analysis of the factors that affect liquidity, solvency, and profitability, but it should focus on an increase in the sample size to analyse small and medium-sized economic entities too. An empirical quantitative analysis (based on questionnaire) regarding the frequency which companies from the light industries undertake analysis of their financial reports with, may also be performed trying also to identify the main strategic alternatives used by the companies in the light industry to meet the challenges of the heterogeneous business environment.

The article, *“Financial return in the field of constructions: What accounting issues should an investor know?”*, focused on analyzing the financial statements of companies within the construction field.

The financial and economic crisis has affected the economic entities from the constructions field quite significantly. The number of companies from the construction field that have declared insolvency has increased from one year to another because of the crisis. The top ten fields affected by insolvency in Romania in 2013 were those presented in Table 1.

**Table 1.** Fields of activity most affected by insolvency

Fields of activity most affected by insolvency in 2013	Number of economic entities
Wholesale and retail trade, repair of motor vehicles, motorcycles, of personal and household goods	10,436
Constructions	3,889
Hotels and restaurants	3,418
Manufacturing	3,153
Transport, storage, and communication	2,049
Real estate, rentals	1,253
Professional, scientific, and technical activities	1,176
Agriculture, hunting, forestry	811
Activities of administrative services and activities of support services	688

It can be seen that the fields most affected by insolvency in 2013 are those in the field of wholesale and retail trade, repair of motor vehicles, motorcycles, of personal and household goods with 10,436 economic entities; followed by the construction field with 3,889 economic entities. This study includes an analysis of the financial indicators of five construction companies in the city of Braşov. The field of activity of the analysed economic entities is the construction of residential and non-residential buildings. The

selected companies are large and medium-sized, and the selection is made based on the value of their turnover and the number of employees.

The analysis of the financial statements was conducted over a period of six years (2008-2013). A total of four relevant financial indicators were analysed in terms of profitability of economic entities from the constructions field, namely: return of equity, return of assets, turnover, and net result.

The profitability indicators analysed highlight the ability of an economic entity to remunerate its capital, a consistent remuneration, aspect sought by any investor, will cause the attraction of additional resources from the market. The analysed period 2008-2013 is characterized by the decrease of the four reviewed indicators, especially the net profit compared to the moderate decrease of the equity, leading to a lower financial return. Through the analysis of the data taken from the financial statements, it can be seen that construction companies from Braşov (Romania) registered financial difficulties, recording a downward tendency of the indicators during the period analysed herein. The financial difficulties and the decreases of the analysed indicators are the results of underfunded works, high indebtedness to banks, non-collection of claims, increase in the prices of utilities, raw materials, and other services provided by third parties.

The article, „*Financial Reporting in the Furniture Industry*”, focuses on investigating and analysing the financial reports of 15 companies in the furniture industry in Romania. The analysis is based on data collected between 2008 and 2016. This paper presents an analysis of the evolution and dynamics of the financial position and the financial performance reflected in the financial statements of the economic entities in the furniture industry. The study is based on a set of 6 indicators: asset liquidity, general solvency, degree of indebtedness, turnover, net result, and return on equity. The selected financial indicators can be used to predict the financial health of an economic entity and the

attractiveness of an investment, analyze trends, and compare performance/profitability across industries or companies. The economic entities from the furniture industry managed to overcome the specific difficult moments of the economic crisis, registering an upward trend of the turnover. The economic entities analyzed in this paper are of large dimensions, with a minimum number of 50 employees and a maximum of 4,100. Generally, there exists a growing trend in this sector, with significant benefits for Romania. From an economic point of view, the furniture industry is the most profitable activity in terms of the possibilities of capitalizing wood. The rate of financial return has registered fluctuating values, with a decreasing trend over the period between 2009 and 2012, but with a strong recovery in the coming years. The diagnostic analysis demonstrated that the furniture industry has also experienced difficult times, especially in the 2008-2012 period. Another finding of this study relates to the rather sensitive position of the degree of indebtedness. For four out of the fifteen surveyed companies, the borrowing rate has registered rather high values, especially in the 2008-2011 period. This points to relatively low potential for self-financing, meaning that external sources mainly finance the companies.

In conclusion, we can observe that the economic entities in the furniture industry present, as a whole, a positive financial performance that can generate a significant added value, as evidenced by the level of the calculated indicators. This research also has some limitations. A first limit in the performance appraisal refers to the number of companies that were analyzed, and to the time horizon.

## **Chapter 4. Measuring the Risk of Insolvency. Prevention Methods**

The insolvency situation of Romanian companies, after the crisis period of 2008, was analyzed in the article "Insolvency Risk Prediction Using The Logit And Logistic Models: Some Evidences From Romania". The analysis was performed over a period of 5 years for 70 companies from various sectors of activity, which went into insolvency in 2013.

We have designed a model for predicting insolvency risk that any interested party can use since the data for the model are readily available on the site of the Romanian Fiscal Administration Agency. The model uses five financial ratios, whose dynamics are analyzed for at least three years. We have used a logit and logistic model to test the model, which validated the significant influence of total assets efficiency and accounts receivable conversion period upon insolvency risk. As such, managers and investors can especially follow these two measures' evolution and make the best credit and investing decisions concerning analyzed companies.

### **4.1. Introduction**

In Romania recent years have accounted for a large number of companies which became insolvent, turning the issue of estimating this risk into a priority, both for managers (which need tools to predict and control the potential risks faced by their companies), as well as for trading partners (who need such information to design proper commercial credit and investment policies in relation with the analyzed company).

Most insolvency risk studies were based on multivariate, discriminant analysis, whose results were used to generate score functions to estimate companies' state of health. However, many insolvency risks' predicting models present a range of

shortcomings which makes them not applicable to all the companies requiring insolvency risks' forecast at a certain moment in time.

On the one hand, many of these models were aimed for companies listed on the stock exchange and on the other hand, even if such models are not intended for listed companies, they are based on accounting information not accessible to external users, thereby significantly reducing the range of models' potential users. In the same time, score functions' based models have, due to their invariable coefficients, an applicability confined to the economic-geographic area for which they were created. As such, the coefficients determined by authors according to the economic-geographic features of the industry and country for which they were designed, require caution while using them, even in case of similar geographic and economic conditions, yet at different moments in time. Unlike managers, which have at their disposal detailed information about their companies' economic and financial situation, the trading partners of unlisted Romanian companies cannot access other information than excerpts from these companies' financial statements data, published by the National Agency for Fiscal Administration (NAFA) on its website. Moreover, this information is processed and summarized and thus insufficient to be used in established prediction models to determine insolvency risk. We propose a model for insolvency risk's diagnosis which can be used by any party (especially external users) interested in the health of a Romanian company, based on public and official information originating from its annual financial statements, whether listed or not on the Stock Exchange and regardless of its size. The model is primarily intended for trading partners, who can thus establish the economic and financial health of their potential partners and identify those facing insolvency risk. Based on this information they can further decide about the opportunity of initiating or continuing their business relations.



## 4.2. Literature review

Starting with the 2008 global economic crisis, insolvency became a concept subject to numerous studies and debates. Many researchers from Romania and abroad analyzed and debated the delicate/thorny issue of economic entities' insolvency.

European cross-border insolvency rules are established by EC's Regulation 1346/2000 (Insolvency Regulation) regarding insolvency proceedings, applicable starting May the 31-th 2002. In Romania insolvency is regulated and defined by art. 3, paragraph 1, of Law 85/2006 as "the state of the debtor's heritage characterized by lack of funds available for payment of due debts". From a legal perspective, the causes leading to the dissolution of a company are those provided by Law 31/1990 on trading companies, republished, and are divided into common causes for all types of companies and specific causes for equity companies, respectively for partnerships. There are a variety of models for predicting bankruptcy. In the literature we can find several types of insolvency risk prediction models, respectively MDA (Multiple Discriminate Analysis) models, logical regression models, neural networks' models or mixed logit ones. The scoring method has become very popular over time due to its use of statistical methods for financial situation's analysis, starting from a set of ratios. The most common scoring method's models are Altman's, Springate's, Koh's model, Conan-Holder's, and the one of Banque de France. Scientific models for bankruptcy prediction based on financial indicators have been developed for the first time in the USA in the 1960's, by Altman (1968) and Beaver (1966). The first wide range model of bankruptcy risk analysis, commonly known as the Z score function, belonged to Altman, who published it firstly in 1968. Altman's model is based on the discriminate analysis, creating classification/prediction models which include data and observation in certain a priori determined classes. Altman et al. (1977) built another model known as Zeta model, analyzing 53 bankrupt and 58 viable

companies during 1969-1975. Ohlson (1980) and Platt & Platt (1990) conducted the first studies using the logit model for predicting companies' state of insolvency. Zmijewski (1984) advanced the probit model to predict companies' bankruptcy risk. The econometric models are based on logit and probit models in particular. Default-prediction literature acknowledged logit model as being the most used technique to determine default's probability. The results of Ohlson's model have shown that firm size, financial structure, performance and current liquidity were the main determinants of companies' insolvency. Shumway (2001) proposed a hazard model for predicting bankruptcy firms, defined as a multi-period logit model. One main feature of the hazard model is that explanatory variables vary over several time periods, resulting in more efficient estimators. In his work he studied 300 bankrupt firms from the 1962 to 1992 period. Decision trees method for predicting insolvencies (the advantages of using CHAID classification trees compared to a neural network model) was used by Zheng and Yanhui (2007). Bankruptcy is due to economic and financial factors, negligence, fraud, as well as other factors. Economic factors, causing 37.1% of bankruptcies, relate particularly to industry weakness and unfavorable location. Financial factors, holding the highest percentage, of 47.3%, include too much debt and insufficient capital. The analysis showed that most financial factors relate to huge errors, misjudgments, and management's reduced capacity of financial prediction (Brigham and Ehrhardt, 2007). There are many causes of business failure, some related to managers' experience and skills, while other causes are due to general economic conditions, the recession. As such, Burksaitiene and Mazintiene (2011) aim to provide managers with information about possible causes and consequences of failure in their companies. Other authors tried to demonstrate Altman's model effectiveness in predicting retail companies' financial difficulties (Hayes et al., 2010). Kiyak and Labanauskaitė (2012) conducted a comparative analysis for several models of bankruptcy

prediction and reliability, concluding that linear discrimination model most accurately reflected the financial position of the company (for companies in Lithuania). Pereira and Machado-Santos studied the way the established predictive models can be applied in various fields or types of economies in different countries, analyzing Portugal's textile companies insolvency (2007); Zeytinoglu and Akar (2013) attempted to identify bankruptcy risk for Istanbul Stock Exchange listed companies; Gharaibeh et al. (2013) analyzed insolvency of Jordan Stock Exchange listed companies (the applicability of prediction models for emerging economies - the case of Jordan); Szeverin and László (2014) analyzed bankruptcy prediction models' efficiency for small and medium size economic entities in Hungary. Certain studies (Karas and Režňáková, 2014) examined how bankruptcy prediction model's efficiency is influenced by the choice of a certain method, especially the linear discriminant analysis method. In Romania studies developing scoring functions for bankruptcy's risk analysis occurred much later compared to research conducted worldwide. Anghel (2000) conducted a comprehensive bankruptcy risk study, creating a score function based on a sample of 276 companies. Generally, the idea of limiting the findings and applicability of a score function only to the economic sector for which it was built is widely accepted, even if it turned out that some models have a high degree of applicability. This is because the models recognized worldwide were built under a stable economy, while the Romanian economy is still under a long process of consolidation. Studies concerning bankruptcy risk's estimation, aimed to discriminate bankrupt companies from the ones with a good financial situation, based on financial ratios, have been conducted by Vintilă and Toroapă (2012), which developed a bankruptcy predicting econometric model. Korol and Korodi (2011) aimed to demonstrate Fuzzy logic's effectiveness in predicting bankruptcy risk and proposed an econometric model in this regard. To highlight the financial strength and ability to meet obligations of

Romanian companies listed on Bucharest Stock Exchange, Armeanu et al. (2012) have performed an Altman scoring function on a sample of 60 companies, using seven financial indicators, representative for company's activity: total assets, net turnover, operating result, net cash flow from operating activities, net profit, debt – total liabilities and average market capitalization.

#### **4.3. The Model to Estimate Insolvency Risk and Data Analysis**

The purpose of our paper is to develop an insolvency risk's diagnosis model, usable by any party interested in an economic entity's health. The model can be applied by users with access to detailed financial statements, as well as by people with access only to summary information published by financial authorities. Unlike models based on score functions, influenced by invariable coefficients, our model is based solely on financial ratios fluctuations' analysis over time. In this way, the model can be applied to any company, regardless of the economic, geographical and temporal conditions. This study was conducted under the conditions of eliminating any outside influences, specific for the industry, geographic area, size of companies or the general health of the economy, relying exclusively on economic and financial information derived from the annual financial statements published by the commercial companies. The model, designed for an early warning of financial difficulty of economic entities, is based on a set of five measures, respectively: general solvency, patrimonial solvency, accounts receivable conversion period, assets' liquidity and assets' efficiency ratio. The selection of financial indicators was conditioned by the availability of financial data provided by Romania's Administration of Public Finance. To identify insolvency symptoms' occurrence, we have analyzed 350 financial statements from the last 5 years prior to insolvency of 70 Romanian economic entities. For all the 70 economic entities the insolvency proceedings opened in 2013. Our model is designed to identify the elements which help assess the probability a company

enters a state of insolvency, respectively the elements signaling decreasing financial stability of analyzed economic entities. Sampled economic entities, described in Table 1, originated from 12 activity sectors, and were completely randomly selected, without any focus on certain sectors of activity, territorial settlements and size of economic entities. The purpose was to generate a basis for heterogeneous research, able to provide generally valid and reliable results.

**Table 1.** The activity sector of the sampled economic entities

Sector of activity	No. of analyzed entities
Wholesale and retail trade, repair of motor vehicles, personal and household goods	16
Constructions	13
Manufacturing, Manufacturing products	13
Hotels and restaurants	8
Transport, storage and communication	6
Professional, scientific and technical activities	5
Agriculture, hunting, forestry	2
Activities of administrative services and activities of support services	2
Other activities of collective, social and personal services	2
Information and communication	1
Education	1
Water supply; sanitation, waste management	1
<b>TOTAL</b>	<b>70</b>

*Source: Authors' decision*

Analyzing sampled economic entities' financial statements, a first relevant financial indicator regarding insolvency risk and potentially bankruptcy (analyzed in its evolution for 5 years preceding the year of entering into insolvency) is general solvency.

This measure is intended to provide an overview of economic entity's ability to meet its payments to creditors, both on short and long term, as a ratio of total assets into total debt and liabilities. In table 2 below we present general solvency's evolution for sampled economic entities over the 5 years preceding their 2013 entering into insolvency.

**Table 2.** Distribution of sampled economic entities according to their general solvency

General solvency level		Years of analysis				
		2008	2009	2010	2011	2012
Unsatisfactory	< 1	28.57%	45.71%	50.00%	50.00%	61.43%
Satisfactory	[1 ; 1.3]	38.57%	32.86%	27.14%	25.71%	22.86%
Good	> 1.3	32.86%	21.43%	22.86%	24.29%	15.71%

Source: Data processed by the authors

The financial statements data revealed that starting with the third year of analysis preceding insolvency, more than 75% of companies showed a decreased general solvency and more than half experienced a reduced capacity of covering their financial commitments to creditors, both on short and long term. In the year preceding official insolvency's state (2012), weight of companies with decreasing general solvency reached over 84%, of which over 61% are already in general insolvency. Data analysis reveals sampled economic entities are actually insolvent starting with at least three years before the year of entering insolvency and also that their general solvency is decreasing throughout the review period, with a sharp decline in 2012. General solvency decrease, especially in the year preceding entry into insolvency was due to a slight total assets' decrease during the period 2008-2011 and an abrupt decline in 2012, and to a relatively steady growth of total debt throughout the period under review, also with a sharp increase in 2012.

The second financial indicator we found useful in assessing imminent insolvency risk is patrimonial solvency, calculated as a ratio of company's equity into its equity and liabilities (equity + debt + accrued income + provisions). In the five years preceding entry into insolvency state, analyzed companies experienced a continue de-capitalization, with a strong manifestation in 2012. Situation is described in table 3 below.

**Table 3.** Distribution of economic entities according to patrimonial solvency

Patrimonial solvency level	Year of analysis				
	2008	2009	2010	2011	2012
Unsatisfactory < 0,3	72.86%	82.86%	81.43%	80.00%	85.71%
Satisfactory [0.3 ; 0.5]	10.00%	4.29%	4.29%	10.00%	5.71%
Good > 0.5	17.14%	12.86%	14.29%	10.00%	8.57%

Source: Data processed by the authors

Financial statements' analysis reveals that, starting with the third year of analysis preceding the entry into insolvency, more than 85% of analyzed companies have registered a low patrimonial solvency, out of which over 80% recorded a significant de-capitalization trend. In 2012, the weight of companies showing decreasing patrimonial solvency reached over 91%, of which over 85% are actual insolvent. Overall analysis of sampled companies' patrimonial solvency reveals most of them are actually insolvent starting with at least three years before the year of entry into insolvency. Their patrimonial solvency decreased throughout the review period, with a sharp turn in 2012, the year preceding entry into insolvency, thereby achieving a high level of indebtedness both on short and long term. Analyzed commercial entities showed continuous increase of indebtedness' degree. Their indebtedness recorded very high values in 2012, when analyzed companies' de-capitalization reached peak values. Entering insolvency for an economic entity is closely related to a low assets' liquidity level, which in turn can very easily lead to slowing or even shutting down payments to its creditors. The third measure we have identified is accounts receivable conversion period, or accounts receivable to daily sales ratio. The measure is a reflection of commercial credit policy's effectiveness, a vital instrument of validating company efforts and generating the cash needed for settling financial commitments and resuming company business cycle. The 70 sample companies recorded, from 2010 and until 2012, for 3 consecutive years, significant and steady growth of accounts receivable conversion period. Thus, in the period prior entry

into insolvency, analyzed companies recorded increasing delays in cashing the goods sold or services delivered, making it more difficult to repay existing debt and being subsequently compelled to call in additional debt to continue. The progressive increase of account receivable conversion period was due to a slight yet steady turnover's decline during the five years analyzed and to a sudden rise of accounts receivable in the last two years' prior entry into insolvency, namely 2011 and 2012; these two elements combined generated a sharp increase of accounts receivable conversion period. Our model's fourth measure is assets' liquidity, or the ratio of current assets into total assets, designed to provide information regarding company's operational flexibility and its capacity to serve commercial and financial commitments. Analyzed companies recorded, starting with the third year before entry into insolvency, increases of asset liquidity, which could be a positive sign of their ability to service debts and therefore to keep away from insolvency risk. However, looking further into the evolution of current assets' components, we find that asset liquidity's increase was unhealthy. Two components of this assets liquidity's increase, respectively inventories and cash, fluctuated, yet remained somehow stable during the 2008-2011 period. This was followed by inventories and cash decreases in 2012. Thus, their cumulated evolution for the entire period is negative and opposite of growth tendency registered by assets' liquidity. The only current assets' component which recorded a sharp increase, especially in 2012, is accounts receivable, whose 2012 growth has been strong enough to more than compensate cash and inventories' decreases and determine assets liquidity's increase. However, correlating this with the evolution of accounts receivable conversion period, we find out that, although assets' liquidity grew in the period preceding the entry into insolvency, analyzed companies actually had increasing difficulties in covering their debts as they come due. The fifth measure we have considered is assets' efficiency, the ratio between company turnover



and total assets employed to generate respective sales. Overall, the 70 companies analyzed have recorded a slight decrease in total assets' efficiency. To illustrate we have analyzed the deterministic evolution 2012/2011 (the most relevant years of the five analyzed) of assets' efficiency ratio, taking into account the two level one influence factors (total assets and sales turnover), as well as second level (fixed assets and current assets) and third level factors (inventories, accounts receivable and cash). The findings are quite relevant and they correspond with the downward overall trend of analyzed companies and the entry into insolvency. The modification 2012/2011 of average (for the 70 companies) total assets' efficiency was of +3.24 lei (960.05 lei in 2012 compared to 956.82 lei in 2011) and is analyzed in table 4 below, with a deterministic factors' contribution measurement.

**Table 4.** Factors' contributions to total assets' efficiency modification 2012/2011

Measures	Factors' Contributions
1. Contribution of total assets: $TAE_{11} \left( \frac{1}{Index\ of\ TA\ 12/11} - 1 \right)$	+44.6411
1.1 Contribution of fixed assets: $TAE_{11} \left( \frac{1}{Index\ of\ TA\ 12/11 - K\%CA} - 1 \right)$	-8.6356
1.2 Contribution of current assets: $TAE_{11} \left( \frac{1}{Index\ of\ TA\ 12/11} - \frac{1}{Index\ of\ TA\ 12/11 - K\%CA} \right)$	+53.2768
1.2.1 Contribution of inventories: $TAE_{11} \left( \frac{1}{Index\ of\ TA\ 12/11 - K\%A/R - K\%M} - \frac{1}{Index\ of\ TA\ 12/11} \right)$	+13.1899
1.2.2 Contribution of accounts' receivable: $TAE_{11} \left( \frac{1}{Index\ of\ TA\ 12/11 - K\%M} - \frac{1}{Index\ of\ TA\ 12/11 - K\%A/R} \right)$	-16.3111
1.2.3 Contribution of cash and short-term investments: $TAE_{11} \left( \frac{1}{Index\ of\ TA\ 12/11} - \frac{1}{Index\ of\ TA\ 12/11 - K\%M} \right)$	+66.4021
2. Contribution of sales turnover: $TAE_{11} \frac{1}{Index\ of\ TA\ 12/11} (Index\ of\ sales_{12/11} - 1)$	-41.4028

Source: authors' calculation

Where:

TAE – total assets' efficiency, the ratio of sales to total assets;

Index of TA 12/11 – index of total assets 2012/2011;

*Index of sales*12/11 – index of sales 2012/2011;

k% CA – percentage contribution of current assets to total assets' change 2012/2011;

k% A/R – percentage contribution of accounts receivable to total assets' change 2012/2011; k% M – percentage contribution of cash & liquid assets to total assets' change 2012/2011.

From table 4 we can find that total assets' efficiency increased in 2012 compared to 2011 (a level higher by 3.23 lei for 1000 lei invested in total assets).

Nevertheless, this is not a favorable evolution, since it was due to total assets' decrease (thereby creating an apparently positive contribution of 44.64 lei) combined with a milder sales turnover's decrease (with a negative contribution of - 41.4 lei). We can substantiate this by deepening total assets' contribution analysis. As such, we can find fixed assets had a negative contribution of -8.64 lei, which reveals that sample companies made a reduced level of investments, most likely destined to replace depreciated fixed assets (obviously creating new fixed assets is virtually excluded under such circumstances). Furthermore, looking into the structure of current assets we can find that their apparently positive contribution (of +53 lei) was actually due to decreases in inventories and cash and increases in accounts receivable. This corresponds to the perfect recipe for insolvency (lower inventories, hence lower prospects of future sales combined with a slower recovery of accounts receivable and reduced cash amounts). After checking and correcting data for routing checks, descriptive statistics and means by year of selected ratios are presented in table 5 below. Descriptive statistics shows selected companies have on average 59% current assets and 41% noncurrent assets. On average selected companies have general solvability ratio of 1.32, respectively patrimonial solvability ratio of -1.31. Moreover, on average, companies generated 2.6

RON of sales for each RON invested in total assets and collected their account receivables in 98 days.

**Table 5.** Descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
<i>AL (assets liquidity)</i>	347	0.59	0.31	0.00	1.00
<i>GS (general solvability)</i>	346	1.32	2.15	0.00	27.74
<i>PS (patrimonial solvability)</i>	347	-1.31	11.09	-200.09	1.00
<i>TAE (total assets effic.)</i>	346	2.60	5.94	0.00	87.57
<i>A/R (Accts. Receivable Conv. Period)</i>	321	98.02	129.69	0.00	781.03
<i>Y (dependent variable)</i>	347	0.66	0.47	0.00	1.00

*Source: authors' calculation*

#### **4.4. Data and methodology**

##### *Applying the model*

We have applied the model for an economic entity (randomly selected) not listed in the Bulletin of Insolvency Proceedings. Practically, entity's insolvency risk simulation was conducted from a trading partner's point of view. The model implies calculating the five measures and establishing each measure's negative evolutions from one year to another (labeled YES if there is a negative trend and NO otherwise). The following steps consist in checking the years in which all five measure showed negative evolutions and finally counting the consecutive years in which all five indicators had negative evolutions. In case of our analyzed economic entity, there was no year in which all five measures concurrently recorded negative evolutions, therefore it appears it presents no insolvency risk. In the same way, the test can be performed for any economic entity, provided there is data available from the financial statements for the last five consecutive years. Table 6 shows means of selected ratios by year. Assets liquidity, total assets' efficiency and A/R conversation period have positive trends, whereas general solvability, patrimonial solvability negative.

**Table 6.** Means by year

Year	AL	GS	PS	TAE	A/R
2008	0.56	1.98	0.04	2.05	93.95
2009	0.54	1.54	-0.41	2.43	62.31
2010	0.59	1.13	-0.51	2.06	106.03
2011	0.63	1.10	-0.75	2.04	106.00
2012	0.64	0.83	-4.97	4.44	124.02
Total	0.59	1.32	-1.31	2.60	98.02

Source: Data processed by the authors

In case of analyzed economic entity, we can notice a good general and patrimonial solvency, exceeding the 1.3, respectively the 0.5 reference thresholds for general, respectively patrimonial solvency, throughout analyzed period. These values demonstrate economic entity's ability to pay its debts, a low degree of indebtedness and consequently a virtually non-existent insolvency risk. These arguments are also supported by the correlated evolutions of the measures presented in table 7.

**Table 7.** Indicator evolution analysis

Indicator evolution	Negative evolution period				No. of downside consecutive periods
	2010	2011	2012	2013	
<i>Decreasing general solvency (&lt; 1.3)</i>	NO	NO	NO	NO	
<i>Decreasing patrimonial solvency (&lt;0.5)</i>	NO	NO	NO	NO	
<i>Increasing A/R conversion period</i>	YES	YES	YES	NO	
<i>Simultaneous increase of assets' liquidity and of A/R conversion period</i>	NO	NO	NO	NO	
<i>Declining of total assets' efficiency</i>	YES	YES	YES	YES	
<b>Simultaneous negative trend for all indicators</b>	<b>NO</b>	<b>NO</b>	<b>NO</b>	<b>NO</b>	<b>0</b>

Source: Data processed by the authors

Linking economic and financial measures analyzed here to identify the causes that led the 70 sampled Romanian economic entities into insolvency in 2013 we have noticed a negative trend at least three years before the year of starting the insolvency proceedings (see table 8 below).

**Table 8.** Indicators evolution analysis

Negative trend indicator	Years of manifestation			
	2009	2010	2011	2012
<i>Decreasing general solvency (&lt; 1.3)</i>	YES	YES	YES	YES
<i>Decreasing patrimonial solvency (&lt;0.5)</i>	YES	YES	YES	YES
<i>Increasing A/R conversion period</i>		YES	YES	YES
<i>Simultaneous assets' liquidity and A/R conversion period's increases</i>		YES	YES	YES
<i>Decreasing total assets' efficiency</i>		YES	YES	YES

*Source: Data processed by the authors*

An economic entity's potential trade partner can perform the analysis of five financial measures using at least four yearly financial statements and assessing their evolution for at least three years. Based on this set of measures' evolution analysis, we can estimate the level of insolvency risk presented by a potential trading partner and the potential hazards which can affect its economic and financial situation. Should the five financial measures concurrently display a negative evolution, then, according to the number of years of downside trend, it is possible to determine the level of insolvency risk. If there is just one negative evolution (a negative evolution means that in a given year all the five measures have concurrently negative evolutions), then the company has a low risk of becoming insolvent; if two consecutive negative evolutions occur, then the company records an average risk of going insolvent; and if there are three consecutive years of negative evolutions the company has an increased risk of becoming insolvent.

#### *General form of the logit and logistic model*

We rely our estimations on a Logit and Logistic model, considering a class of binary response models with the following form (Måns, 2009):

$$Pr(Y = 1/x) = G(xB)$$

$$Pr(Y = 1/x) = G(B_0 + B_1X_1 + B_2X_2 + \dots B_kX_k) \quad (1)$$

where  $G$  is a function taking on values strictly between 0 and 1:  $0 < G(z) < 1$ , for all zreal numbers. The general form of the model (1) is a function of the xvector, through the index:

$$xB = B_0 + B_1X_1 + B_2X_2 + \dots B_kX_k \quad (2)$$

which is simply a scalar. The condition  $0 < G(xB) < 1$  ensures estimated response probabilities lie strictly between 0 and 1.  $G$  usually refers to the cumulative density function (cdf), and non-linear function which is monotonally increasing in the index  $z$  (i.e.  $xB$ ), with:

$$Pr(Y = 1/x) \rightarrow 1, \text{ as } xB \rightarrow \infty$$

$$Pr(Y = 1/x) \rightarrow 0 \text{ as } xB \rightarrow -\infty$$

The most common non-linear function is the logistic distribution, yielding the logit model, as follows:

$$G(xB) = \frac{\exp(xB)}{1 + \exp(xB)} = \Lambda(xB) \quad (3)$$

which has values between 0 and 1, for all values of the  $xB$  scalar term. The equation (3) refers to the cumulative distribution function (cdf) for a logistic variable. Since  $Pr(Y = 1/x)$  in the equation (1) is categorical, we use the logit of  $Y$  as the response in our regression equation instead of just  $Y$ , as follows:

$$\ln \left( \frac{P_i}{1-P_i} \right) = B_0 + B_1X_1 + B_2X_2 + \dots B_kX_k \quad (4)$$

The logit function (4) is the natural log of the odds  $Y$  will equal one of 0 and 1 categories.  $P$  is defined as the probability of  $Y=1$ .

#### *The logit and logistic model*

In this part we use a logit and logistic model to have a more rigorous estimate of selected companies' insolvency risk and validate the results of our previous model. Before

running regression, we have checked the data for routine controls. For example, assets liquidity, general solvability, assets' efficiency or accounting receivables conversion period cannot be negative. Since all selected companies have gone bankrupt we offer in this paper a unique methodology to estimate and evaluate insolvency risk. This case is not treated in previous empirical research. Hence, dependent variable is calculated based on general solvability. General solvability is the main indicator reflecting insolvency risk. As such we transform this indicator into two categories to denote the solvency, respectively insolvency risk. Thus, if a company's general solvability index (with current year against previous year's values) is lower than one, it denotes a solvability concern and is quantified with 1. Otherwise, if the index has a higher than one value (also with current year against previous year's values) the situation is quantified with zero, meaning solvability is not a concern. Thus, the dependent variable takes either 1 or 0 values.

The model we use to analyze the probability that a company becomes insolvent reads:

$$L = P_i \quad 1 - P_i = B_0 + B_1 \text{LogAL} + B_2 \text{LogPS} + B_3 \text{LogTAE} + B_4 \text{LogA/R} \quad (5)$$

Where: L denotes the calculated dependent variable of insolvency; for the comparison we have left solvency outside the model as a benchmark category;

LogAL represents log of assets liquidity;

LogPS the log of patrimonial solvability;

LogTAE the log of total assets' efficiency and

LogAR the log of A/R conversion period.

As logging the level of data variables results in negative observations, (since a large proportion of data from all matrixes of respective explanatory variables contain values above 0 and below 1), we have transformed these data, taking the log of explanatory variables in levels added by one (Guerin, 2006). Using this transformation, we

take care of negative values and we can interpret the coefficients from LOGIT regression as elasticity for the large values of transformed variable. The situation is represented in table 9 below.

**Table 9.** Regression results

VARIABLES	LOGIT	LOGISTIC (Antilog-odds ratio)	Predicted probabilities
<i>log of assets liquidity</i>	0.640	0.463	.713893
	[0.67]	[0.60]	
<i>log of patrimonial solvability</i>	-0.160	-0.117	.595157
	[-0.57]	[-0.49]	
<i>log of total assets' efficiency</i>	-1.224***	-1.064***	.596553
	[-2.90]	[-3.12]	
<i>log of A/R conversion period</i>	-0.388***	-0.367***	.840716
	[-2.67]	[-2.97]	
<i>Constant</i>	2.838***	2.614***	
	[3.52]	[3.92]	
<i>Observations</i>	258	258	
<i>Number of groups</i>	67		

Notes: z-statistics in brackets, \*\*\*, \*\* and \* indicate significance of coefficients at 1, 5 and 10 per cent, respectively.

Source: Authors' calculations

For the estimation purpose, we use LOGIT and Logistic regression as robustness check to logit model. Moreover, the LOGIT model produces predictions more consistent with underlying theory<sup>1</sup>, justified as LOGIT assumes log of odds ratio is linearly related to dependent variable, meaning that their marginal effect does not have a constant impact upon dependent variable. It also resolves predicted values' problem, because its logistic function has always values between 0 and 1 for all real numbers. After running the logit regression some important variables resulted insignificant for the 1, 5 and 10% levels. The likelihood ratio and Wald test suggest that we reject H<sub>0</sub>, respectively insignificant slope

<sup>1</sup>While Linear Probability Model measures the change in probability of the slope coefficient for a unit increase in the dependent variable, with the effect of all other variables held constant, in the logit model the slope coefficient of a variable gives the change in the log of the odds associated with the unit change in that variable, again holding all other variables constant.



coefficients are jointly zero. The p-value of the Wald test is 0.0230, so the null hypothesis is rejected at the 5% significance level. Interpreting results in terms of log of odds ratio<sup>2</sup>, means we have to account for partial slope coefficients in estimated equation measuring change in estimated logit for a unit change in value of the given regressors (holding other things constant).

### *Interpretation of results and discussions*

Estimated coefficients of total assets' efficiency and A/R conversion period of -1.064, respectively -0.367, in the logistic model mean that, other things held constant, assets efficiency and A/R conversion period are 10.64 and 3.67 times less likely to contribute to company insolvency. Thus, the value of -1.224 from table 9 for total assets' efficiency indicates that, holding other variables constant, total assets' efficiency would have a log of odds ratio of contributing to company insolvency, which is 1.22 less than that of a having a log of odds ratio contributing to company solvency, other things being equal. The value of -0.388 for A/R conversion period indicates that, other things being equal, A/R conversion period would have a log of odds ratio of contributing to company insolvency, which is 0.388 less than that of having a log of odds ratio contributing to company solvency, other things held constant. To find predicted value of log odds ratio, predicted probabilities are calculated taking into account mean values of continuous variables. In terms of predicted probabilities<sup>3</sup> the probability of companies becoming insolvent is of 0.56811 (56.8 per cent)<sup>4</sup> (Wooldridge, 2015). Contribution of total asset liquidity upon predicted insolvency probability is 71.3 per cent. The contribution of patrimonial solvability, total assets' efficiency and A/R conversion period, upon predicted insolvency probability are 59.51 per cent, 59.65 per cent and 84.07 per cent, respectively.

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<sup>2</sup>Odds interpretation is obtained by taking the antilog of various slope coefficients.

<sup>3</sup>In order to find the predicted value of log odds ratio, predicted probabilities are calculated taking into account the mean values of continuous variables.

Regression results show assets liquidity and patrimonial solvability are insignificant factors for insolvency risk. In other words, assets composition (current assets vs. noncurrent assets) has not played a significant role for insolvency risk. Also, patrimonial solvability calculated as equity to total assets has not significantly contributed to insolvency risk. This denotes risk originated from debt financing rather than equity financing. Total assets' efficiency and A/R conversion period are confirmed to be significantly related to insolvency risk with a negative contribution on insolvency. Results are in line with theoretical expectations. Hence, as total assets' efficiency increases, insolvency risk decreases. This means in turn that as assets generate more sales, insolvency risk becomes lower. Moreover, as companies decrease A/R conversation period, insolvency risk increases too. This means that reducing credit period to customers generated higher risk. Usually, as A/R collection period increases, future becomes more unpredictable and insolvency risk increases as well. However, our result in this case is slightly contradictory. The explanation of this result may be the fact that as companies shortened A/R conversation period, clients were more likely to switch to competitors, thus sales decreased.

#### **4.5. Conclusions**

Our sample with the 70 economic entities, is heterogeneous, with companies belonging to different sectors; they have different size and originate from different geographical areas. It is well known that score functions are appropriate for the period or economic situation in which they were created. Compared to this function, our model, comprising a set of five measures, can provide generally valid and reliable results and allows for data generalization and results' implementation under any economic circumstances. Correlated analysis of economic and financial measures was meant to shape a clearer picture regarding imminent insolvency risk for the 70 economic entities

studied. All five measure composing the model recorded a downward trend (in the last three years preceding the entry in a state of insolvency) and values outside ranges deemed as normal for healthy companies (recording levels lower than the minimum accepted values). From third year-on, more than 50% of analyzed companies experienced deterioration of marked indicators. Thus 75%, respectively 85% of analyzed companies showed a negative general, respectively patrimonial solvency, with a high level of debts toward creditors and failure to serve their due payments. Simultaneously, for three consecutive years, there can be noticed a significant and constant increase of A/R conversion period. Increasing delay in cashing receivables, caused mainly by commercial credit policy relaxation and insufficient analysis of potential credit beneficiaries, was the main insolvency reason. The increasing delays in collecting receivables led to delays in paying debt toward creditors and calling additional debt to continue their business. A second reason which caused many Romanian companies enter insolvency in 2013, was decrease of assets' efficiency, as companies registered a diminishing turnover along a lesser assets' decrease. This latter evolution is most likely a direct consequence of the delay of transforming receivables into cash (of increased balance of accounts receivable). The inability to honor creditors' obligations (general solvency with low and declining values), accelerated de-capitalization (unsatisfactory and declining level of economic solvency), growing delays in collecting the value of goods and services sold (increasing A/R conversion period), the lack of real liquidity (declining assets' liquidity) and inefficient use of assets (downward trend of assets' efficiency) are the five measures that, together, led to a situation of imminent insolvency, within a three years' period. Consequently, there can be seen a correlation of the five economic and financial measures and they have fairly equal influence in their ability to forecast whether an economic entity is at risk to become insolvent and then declared bankrupt.

## Chapter 5. Other Research Directions

This chapter includes two articles published, în 2019 and 2020, in the prestigious Romanian journal "*Romanian Journal of Economic Forecasting*", official publication of the Institute for Economic Forecasting.

### 5.1. Cyclicity of Fiscal Policy in the European Union

The article "*Cyclicity of Fiscal Policy in the European Union*" analyzes the way in which fiscal policy works across the phases of the economic cycle, more precisely it checks the pro-cyclical features of this policy. The sample includes the EU countries, except for Cyprus and Malta, for the 1995-2014 period. To measure the pro-cyclicity and the way in which fiscal policy responds to economic, social and political stimuli we used multiple regressions, tested for time-series for each country at a time, as well as for panel data for the entire sample. We started from an a-priori premise that the developed countries lead a non-cyclical/counter-cyclical policy, whereas the developing countries have a pro-cyclical one; yet, the analysis of the fiscal policy instruments adopted during the analyzed period showed that this particular insight is not necessarily valid for all the cases. We have found that throughout the entire analyzed period, most of the countries led a pro-cyclical fiscal policy, no matter if they were developed or developing countries. The influence the policy variable has upon the fiscal policy cyclicity is a constant result across the entire study.

This study brings a new perspective upon pro-cyclicity and anti-cyclicity of fiscal policy's public expenditures side and its determinants for the EU member countries, with the view of establishing a model which could support fiscal policy's sustainability. Starting from the Halland and Bleaney (2011) model we analyzed the way in which government expenditures' evolution responds to economic, social and political stimuli.

In our analysis, we noticed that inequality appears as the most important for the developing countries, and it is significant for the entire sample of analyzed countries, including the developed ones. For all the regressions, no matter the method or sample considered, politics appear as a factor which strongly impacts government expenditures. The influence political norms have upon fiscal policy's cyclicity is consistent across the entire study, resonating with the results of Alesina et al. (2008), stating that in countries with non-consolidated democracies, where corruption is active, pro-cyclicity is even more present. Such results are consistent during the study for both groups of developed and developing countries, offering a significant insight about the importance of designing good political institutions, as well as for decreasing corruption when aiming to conduct a sustainable fiscal policy. When analyzing the influence the public debt exerts upon government expenditures, we can see some significant results for selected EU countries; however, since debt is not decomposed into its external and internal components, the information does not provide a strong reason to associate the pro-cyclicity with an incomplete credit market in the EU - where countries would often resort to accessing more expensive external debt during recessions, worsening locally the economic context. To properly test the application of an incomplete credit market theory at the level of Member States and to expand the existent study, a useful future direction would include such a decomposition, as well as the addition of cyclicity's revenue-side analysis.

## **5.2. Explaining The EU Regional Economic Growth Through Regional - And Country-Level Achievements in Education**

The article "*Explaining The EU Regional Economic Growth Through Regional - And Country-Level Achievements in Education*" looks to identify what mix of public policies, among which the education and ICT policies are the main focus, is able to stimulate economic growth in the EU, when a special attention is given to the distinction between

the New Member States and Old Member States. The multilevel analysis represents the main quantitative method used here.

The empirical analysis uses Eurostat panel data running from 2001 to 2017, aggregated at the region- as well as at the country level. All 28 EU countries are included in the analysis. According to the NUTS 2016 classification, the 281 NUTS2 statistical regions of the EU group together basic regions for the application of regional policies. The selection of variables included in this study first depends on the data availability in Eurostat, and secondly has theoretical grounds.

The paper concludes is that only a mix of regional-national policy measures in education/ ICT could accelerate regional economic growth in the EU. Only a hierarchical model with time occasions nested in regions and regions nested in countries could reveal the impact of the two types of policy measures. When looking back at the last 17 years, important discrepancies still exist between NMS and OMS, and this is reflected in the impact of policy measures as well. Discouraging early leavers from education, increasing expenditure on R&D and enhancing the ICT development help boosting regional growth in both NMS and OMS, but the regional educational attainments are effective in NMS, while extending the technology sector is more effective in OMS. This finally leads to the conclusion that the EU regional policy is a key policy in stimulating regional growth.

## **(B-ii) The evolution and development plans for career development**

This section of the habilitation thesis summarizes the plans for the evolution and development of the future professional career, both as far as the teaching activities and the research activity are concerned. The plan is based on the experience accumulated as a university teacher from 2000 to the present.

### **1. Teaching experience**

Throughout the last 21 years, my teaching and research activity has taken place in the Department of Finance, Accounting, and Economic Theory, Faculty of Economics and Business Administration, Transilvania University of Brasov. In this context, I have participated in various didactic, scientific, and research activities.

In 2000, on the basis of competition, I held the position of instructor, and then I have climbed the ladder of professional development, respectively assistant (in 2002), lecturer (in 2004), and associate professor (in 2013). Throughout the mentioned period, I have held classes and seminars on the subjects: *Financial systems and reporting of the economic entities, International Financial Reporting Standards, Taxation, In-depth Accounting*, etc.

Throughout this period, I have been constantly concerned with the development of my teaching skills. In this context, I have participated in training and professional development courses, in the "*Training of External Evaluators*" in the field of higher education quality, organized in Brasov, by the Romanian Agency for Quality Assurance in Higher Education (ARACIS) together with the Department for Distance Learning and Part-Time Education (DIDIFR) of the Transilvania University of Braşov. As a result of the training programs in the Distance Education Technology, I have been awarded a

certificate attesting my ARACIS External Expert Evaluator competencies for the distance learning study programs.

Since 2008, I have been the coordinator of the Accounting and Management Informatics study program, bachelor level, distance learning, participating in this capacity in the elaboration of the periodic evaluation reports.

A continuous preoccupation has been that of improving the students' specialized practice from the Accounting and Management Informatics study program, both in my capacity of supervisor and of tenured teacher of some specialized subjects. Every year I coordinate and evaluate series of students as far as their practice activity is concerned.

We have supervised a large number of BA and MA students in carrying out their bachelor's and dissertation projects, seeking to propose topics with a high degree of novelty, harmonized and adapted to the demands of the labour market. At the same time, I have supervised students in writing their papers for contests and for the sessions of student scientific conferences. I would like to mention the yearly participation in the BA and MA graduation boards as member, or chairperson, for the Accounting and Management Informatics study programs.

The appreciation of my professional activity has contributed to having received the vote from my colleagues in order to be part in the Council of the Faculty of Economics and Business Administration, in the period 2008-2015 and in the Board of the Department of Finance, Accounting and Economic Theory, in the period 2015-2019.

Another responsibility I have been assigned is that of being in charge with the evaluation and quality assurance at the level of the Finance, Accounting and Economic Theory Department. In order to improve the teaching and research activity, by the Erasmus program, I have participated in experience exchanges; I have had teaching and research activities at prestigious universities in Greece.



## **2. Experience in research**

After defending my doctoral thesis, entitled "*Accounting instruments and statements utilized in accounting analysis and decision-making process*", under the guidance of Professor Dr. Mihaela Dumitrana, at ASE Bucharest, my scientific research has mostly focused on the financial and non-financial reporting of economic entities as well as on the financial analysis of the main indicators provided by the financial statements.

My scientific preoccupations converge on topics that fall both into the field of finance in general (corporate finance in particular) and the taxation and accounting field, emphasizing sustainability reporting and measuring the financial performance of Romanian companies.

The studies and research carried out have been capitalized, since 2000 until now by the publication of:

- 6 ISI Web of Science articles;
- publishing a number of 5 books as author or co-author at nationally acknowledged publishing houses;
- 15 articles indexed in international databases;
- 9 scientific papers published in the volumes of national or international conferences.

The relevance and impact of my research activity are demonstrated by the fact that my scientific papers have been cited in ISI Web of Science indexed journals, in BDI indexed journals, and in specialized books.

Similarly, the research career substantiates by the quality of member and financial manager in 8 research projects won as a result of the competitions organized at the national level:

- (2006-2008) Member in the research team of the project Laboratory of Statistical Analysis and Prospects of Social-Economics phenomena and Marketing research (ASPECKT), approved by O.M.Ed.C. 5066/6.09.2006, CNCSIS code 76/2006, beneficiary: Transilvania University of Braşov.

- (2008-2011) Member in the research and management team of the project "The development of entrepreneurial skills of the staff in the energy field", September 2008. Project won in a national competition, co-financed by the European Social Fund by the Sectorial Operational Program Human Resources Development 2007-2013. POSDRU contract /9/3.1/S/ 7/25, beneficiary: The Training and Development Centre (PERFECT SERVICE S.A.) in Bucharest.

- (2009-2010) Member in the research and management team of the project "Adapting professional life to the requirements and needs of family life - increasing the chances of women and vulnerable groups on the labour market", 09.02.2009. Project won in a national competition, co-financed by the European Social Fund through the Sectorial Operational Program Human Resources Development 2007-2013. POSDRU contract/40/3.2/ G/10786, beneficiary: The Training and Development Centre (PERFECT SERVICE S.A.) in Bucharest.

- (2011-2013) Member in the implementation team - financial manager in the project "Education and training in support of economic growth and development of the knowledge-based society", PERFORMER. POSDRU contract/86/1.2/S/ 62508, Priority Axis "Education and training in support of economic growth and development of the knowledge-based society". The major field of intervention "Quality in the higher education", beneficiary: Transilvania University of Braşov.

- (2012-2015) Member in the research team of the project "Risk and performance in the future of the Romanian banking". National competition research contract, no. 836/16.11.2011, beneficiary: Credit Coop Central Cooperative Bank, Braşov Agency.
- (2008-2009) Member of the implementation team - financial manager of the project "Financial support for the research-testing laboratory of wood products aligned to European standards". Contract no. 17787/24.11.2008, signed by the Transilvania University of Braşov and Kronospan Romania L.T.D. in Braşov.
- (2009-2013) Member of the implementation team - financial manager of the project "Financial support for the research-testing laboratory of wood products aligned to European standards". Contract no. 240/27.04.2009, signed by Transilvania University of Braşov and FLAK CONSULTING S.R.L from Braşov.
- (2012-2015) Member in the research team of the project "Risk analysis and the profitability growth factors of the Unirea Cooperative bank Braşov". Contract no. 1310/22.10.2012, beneficiary: Unirea Cooperative Bank Braşov

### **3. Relationship with the business environment**

Immediately after graduating from the Faculty of Economic Sciences at the Transilvania University of Braşov, I collaborated with various economic entities, holding the economist position in the financial-accounting department. In addition to the financial-accounting activity, I also dealt with internal and external financial reporting, consolidated reporting, an example being the collaboration with the Swedish company - Assa Abloy.

Equally, I have been an active member of CECCAR Braşov since 2008, as an accounting expert and qualified lecturer in the National Program for Continuous Professional Development, for the subjects: Taxation, International Financial Reporting Standards (IFRS) and Financial Accounting. I collaborated, as a training lecturer, with two

other private economic entities: the “Perfect Service” Training and Development Centre in Bucharest (2002-2007) and the “Form Expert” Training and Development Centre in Bucharest (2008-2009).

#### **4. Future career development and evolution strategies**

My main preoccupation in the next period will be focused on setting up and consolidating some research teams that will contribute to the development of scientific research in areas of interest.

Starting from the results of the research I have carried out so far, and from the research directions proposed in this habilitation thesis, I propose to continue my research activity in several directions, noting that the central pillar of these preoccupations will be the concept of integrated reporting and sustainable development of economic entities.

##### **The main objectives I propose in the field of scientific research are:**

- to continue the research activity in the field of sustainability and environmental reporting, with implications on the sustainable development and on the increase of the financial performance of the economic entities;
- to expand the research area to an integrated reporting and the relationship of dependence with the efficiency and sustainable development of the companies in Romania, but also in the EU countries.
- to study the modern methods of research, analysis, and evaluation of performance at the level of economic entities;
- the impact of the crisis caused by the pandemic triggered by the SARS-CoV-2 virus on the financial performance of economic entities in different business sectors;
- the study of risk factors that may affect the financial performance of economic entities;

- the intensification of the scientific and didactic research activity in the direction of the financial management and planning at the level of economic entities;
- to get involved in research and partnership projects for the development of the relations between specialists from different universities, from the country and abroad;
- to encourage the development of interdisciplinary collaboration with teachers from other departments of the faculty and the university in order to write scientific papers and research projects;
- to improve the visibility of my research activity by publishing in ISI journals, with the highest possible impact factor;
- to participate in international conferences in order to increase my visibility and that of the institution I come from, at national and international level, and for the widest possible dissemination of my research results;
- to continue the collaboration with the research team already formed that consists of colleagues from the Faculty of Economics and Business Administration, Transilvania University of Braşov, but also with colleagues and specialists from other university centres.
- to obtain the habilitation certificate and to evolve to a higher didactic degree.

**The main objectives I propose in the field of teaching are:**

- to improve the teaching activity by getting involved alongside the students in the educational process;
- to improve and update the contents of the taught subjects;
- to publish new teaching courses adapted to the current demands of the labour market;
- to enrich the documentary fund with specialized publications for the library of the Transilvania University of Braşov;

- to aim at the publication of books or chapters in books at prestigious international and national publishing houses with my teacher colleagues;
- to develop collaborative relationships with financial institutions and private economic entities in order to improve the practical activities and to adapt the theoretical and practical training of the future economists to the real requirements of the labour market;
- to support students by developing appropriate internship programs;
- to collaborate with specialists from the private sector in the teaching activity;
- to participate in the establishment of partnerships between the faculty and the business environment in order to stimulate research and the development of innovative ideas;
- to actively participate in maintaining and intensifying the collaboration with the CECCAR Braşov professional entity;
- to attract and get students involved in research papers and their presentation in student conferences and in AFCO - Graduates in front of companies;
- to deepen the pedagogical skills necessary for the application of updated models of good practice in the training of the future specialists in the field of finance-accounting.
- to participate in seminars, workshops or other training options aimed at developing teaching performance and to participate in experience exchanges in the country and abroad, with partner universities part of the Erasmus + program.

In conclusion, I consider that my skills, competencies, teaching experience, and scientific research, but also the experience I gained from the relationship with the business environment, will be particularly useful in carrying out the process of supervising and coordinating the research activities undertaken by PhD students in Finance, especially in the field of Corporate Finance.

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### ***Legislation and sites***

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