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ORIGINALNI NAUČNI RAD

Komparativnost preduzeća u funkciji primene metoda EBITDA multiplikatora za vrednovanje preduzeća

Comparability of enterprises in the function of applying EBITDA multiplier methods for enterprise valuation

Rezime

U radu je sprovedeno istraživanje uspešnosti procenjivanja vrednosti preduzeća modelima EV/EBITDA multiplikatora sa ciljem da se oceni stepen komparativnosti preduzeća koja posluju u okviru iste industrijske grane, odnosno koja imaju istu šifru delatnosti. Kriterijum za ocenu kvaliteta procenjene vrednosti svakog modela, pa i modela multiplikatora jeste relativna greška procene, koja predstavlja odstupanje modelom utvrđene vrednosti od stvarne tržišne vrednosti. Osnovna karakteristika modela EV/EBITDA multiplikatora jeste da utvrđivanje vrednosti ciljnog preduzeća bazira na vrednostima njemu komparativnih preduzeća. Samim tim što je relativna greška procene manja, to znači da je veći stepen komparativnosti između preduzeća korišćenih u procesu vrednovanja. Istraživanje je sprovedeno na uzorku preduzeća koja posluju u okviru industrije telekomunikacija. Rezultati istraživanja ukazuju na to da, kada se radi o evropskom tržištu, možemo zaključiti da ne postoji visok stepen komparativnosti između preduzeća koja se vode pod istom šifrom delatnosti.

Ključne reči: komparativnost, EV/EBITDA multiplikator, procena vrednosti.

Abstract

The paper investigates the success of estimating the value of enterprises using EV/EBITDA multiplier model in order to assess the degree of comparability of enterprises operating within the same industry, ie having the same activity code. The criterion for assessing the quality of the estimated value of each model, as well as multiplier model, is the relative error of the assessment, which represents the deviation of the determined value of the model from the actual market value. The main characteristic of the EV/EBITDA multiplier model is that the determination of the value of the target company is based on values comparable to it. The fact that the relative error of the assessment is smaller, means that there is a higher degree of comparability between the companies used in the valuation process. The research was conducted on a sample of companies operating within the telecommunications industry. The results of the research indicate that when it comes to the European market, we can conclude that there is no high degree of comparability between companies that operate under the same code of activity.

Keywords: comparability, EV/EBITDA multiplier, value estimation.

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UVOD

Komparativnost preduzeća osnov je za donošenje različitih odluka stajholdera. Neke od tih odluka zahtevaju analizu komparativnosti opšteg karaktera, a nekada se analizira komparativnost sa aspekta pojedinačnog segmenta preduzeća. U eri globalizacije prisutna je ekspanzija investicionih aktivnosti, što za posledicu ima veliku koncentraciju aktivnosti usmerenih na vrednovanje akcija i celih preduzeća. Veza između problema komparativnosti preduzeća i tržišne vrednosti preduzeća ostvaruje se kroz upotrebu modela multiplikatora za vrednovanje preduzeća. Model EV/EBITDA multiplikatora vrednosti, kao tržišni koncept vrednovanja, najdominantniji je model vrednovanja danas u praksi. Ovaj model u širokoj je upotrebi od strane investicionih bankara, zatim, često se koriste u transakcijama otkupa celih ili delova preduzeća (MBO, LBO), inicijalnih javnih ponuda, kao i svih drugih transakcija i investicionih aktivnosti, koji podrazumevaju utvrđivanje stvarne vrednosti preduzeća. Čak i u slučajevima gde se vrednost preduzeća utvrđuje nekom tradicionalnom metodom, multiplikatorima vrednosti može se dati vrlo argumentovano drugo mišljenje.

Mišljenje o vrednosti preduzeća koje je doneseno ne osnovu EV/EBITDA multiplikatora vrednosti u najvećoj meri pod uticajem je stepena komparativnosti ciljnih sa komparativnim preduzećima. Dosadašnja iskustva procenitelja govore u prilog tome da EV/EBITDA multiplikatori imaju dosta uspeha u utvrđivanju vrednosti ciljnih preduzeća. Cilj ovog rada jeste da se na osnovu rezultata procene ciljnih preduzeća modelom EV/EBITDA multiplikatora izvedu zaključci o stepenu komparativnosti evropskih telekomunikacionih kompanija. Manja greška procene ukazuje na veću komparativnost preduzeća unutar iste klasifikacione grupe. Veća greška procene znači da stepen komparativnosti nije zadovoljavajući, ne samo za modele vrednovanja već, vrlo verovatno, i za druge vrste analiza. Ovo istraživanje za krajnji cilj ima da pomogne stajholderima kada donose odluke koje u sebi sadrže element

komparativnosti, zasnovan samo na šiframa delatnosti, odnosno klasifikacionim grupama.

1. VREDNOVANJE PREDUZEĆA EV/EBITDA MULTIPLIKATORIMA VREDNOSTI

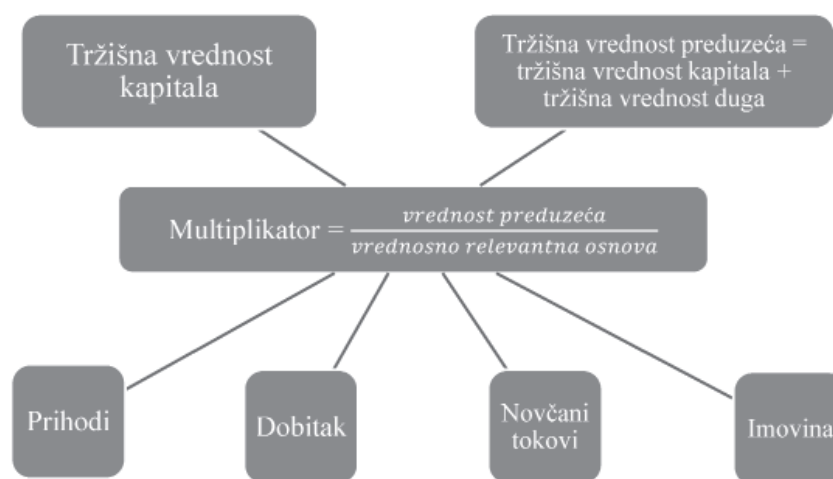
„Koncept tržišnog vrednovanja ili, kako se još naziva, koncept relativnog vrednovanja zasniva se na zakonu jedne cene“ (Esty, B. C., 2000). Po ovom principu, na efikasnim tržištima slična imovina treba da ima slične cene. U kontekstu vrednovanja preduzeća, to znači da slična (komparativna) preduzeća treba da imaju slične tržišne vrednosti. Pored zakona jedne cene, modeli multiplikatora vrednosti svoje postojanje zasnivaju na dve pretpostavke:

1. vrednost preduzeća je proporcionalna sa odabranom osnovom iz finansijskih izveštaja;
2. preduzeća u okviru iste industrije su komparativna, odnosno imaju slične rezultate, slične novčane tokove i preuzimaju slične rizike (Kronholm, M., 2013).

Ovakve pretpostavke podrazumevaju da se utvrđena proporcionalnost može prenositi na komparativna preduzeća i da se na taj način može utvrditi njihova vrednost.

Postoje brojne definicije multiplikatora vrednosti. Najčešće se multiplikator vrednosti predstavlja kao odnos stvarne vrednosti preduzeća i vrednosno relevantne osnove iz finansijskih izveštaja. U praksi analitičari pod pojmom „multiplikator vrednosti“ najčešće misle na tržišne multiplikatore vrednosti. Razlika je jedino u tome kojom informacijom raspolaže korisnik. S obzirom na to da je stvarna vrednost preduzeća uglavnom nepoznata, kao determinanta multiplikatora uzima se poznata tržišna vrednost (tržišna kapitalizacija sa berze). „Pojam tržišnih multiplikatora može se još definisati kao racio tržišne cene akcija i specifičnog analitičkog pokazatelja“ (Penman, S. H., 2004).

Prikaz 1. Definicija multiplikatora (Damodaran, A., 2012)



Popularnost modela multiplikatora proizlazi iz prednosti koje ovi modeli imaju u odnosu na tradicionalne modele vrednovanja. „Pre svega, multiplikatori su jednostavni za razumevanje i implementaciju“ (De Angelo, L. E., 1990). Drugo, zasnivaju se na tržišnim podacima, što znači da će bolje preneti trenutno raspoloženje na tržištu, i treće, vrednuju ciljno preduzeće u odnosu na njemu komparativna, čija je vrednost već poznata. U odnosu na tradicionalne modele diskontovanja novčanih tokova ili dividendi, kao najčešće citiranih u literaturi, modeli multiplikatora zahtevaju mnogo manje podataka za sprovođenje analize. Ako se pritom uzme u obzir da

modeli multiplikatora pokazuju zavidnu preciznost procene, jasno je zašto su vremenom postali najdominantniji model korišćen u praksi.

Damodaran ističe da su za većinu procena obavljenih na Wall Streetu, u razne svrhe, korišćeni modeli multiplikatora:

- skoro 85% izveštaja koji se bave analizom vrednosti preduzeća zasniva se na modelima multiplikatora,
- preko 50% svih merdžera i akvizicija vrednovani su modelima multiplikatora (Damodaran, A., 2012).

INTRODUCTION

The comparability of companies is the basis for making different decisions of stakeholders. Some of these decisions require an analysis of comparability of a general nature, and sometimes comparability is analyzed from the aspect of an individual segment of the company. In the era of globalization, there is an expansion of investment activities, which results in a large concentration of activities aimed at valuing shares and entire companies. The connection between the problem of enterprise comparability and the market value of the enterprise is realized through the use of the multiplier model for the valuation of the enterprise. The EV / EBITDA value multiplier model, as a market valuation concept, is the most dominant valuation model in practice today. This model is widely used by investment bankers, then often used in purchase transactions of all or part of the company (MBO, LBO), initial public offerings as well as all other transactions and investment activities that involve determining the real value of the company. Even in cases where the value of an enterprise is determined by some traditional method, value multipliers can be given a very reasoned second opinion.

The opinion on the value of the company that was made on the basis of EV / EBITDA value multipliers is mostly influenced by the degree of comparability of the target with comparative companies. The evaluators' experience to date suggests that EV / EBITDA multipliers have had considerable success in determining the value of the target company. The aim of this paper is to draw conclusions about the degree of comparability of European telecommunications companies based on the results of the valuation of target companies using the EV/EBITDA multiplier model. A smaller valuation error indicates a higher comparability of the enterprise within the same classification group. A larger estimation error means that the degree of comparability is not satisfactory, not only for valuation models, but very likely for other types of analyzes as well. The ultimate goal of this research is to help stakeholders when making decisions that

contain an element of comparability, based only on activity codes, ie classification groups.

1. COMPANY VALUATION USING EV/EBITDA VALUE MULTIPLIERS

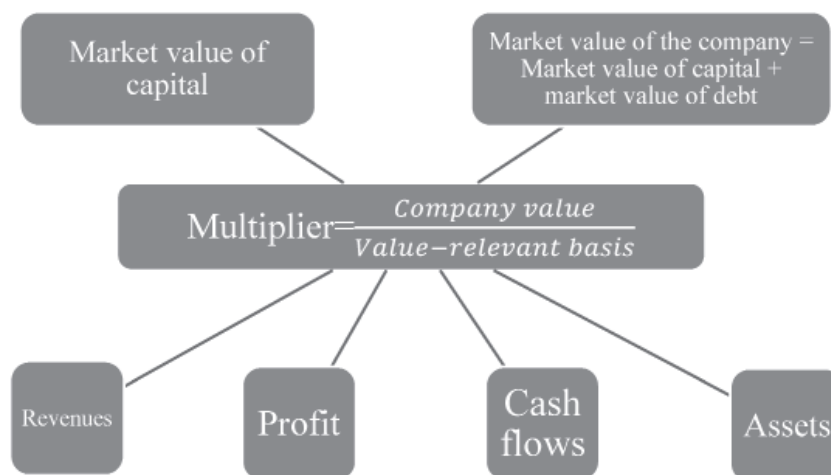
“The concept of market valuation, or as it is also called the concept of relative valuation, is based on the law of one price” (Esty B.C. 2000). According to this principle, in efficient markets, similar assets should have similar prices. In the context of company valuation, this means that similar (comparative) companies should have similar market values. In addition to the law of one price, multiplier models base their existence on two assumptions:

1. The value of an enterprise is proportional to the basis selected from the financial statements.
2. Companies within the same industry are comparative, ie they have similar results, similar cash flows and assume similar risks. (Kronholm M. 2013).

Such assumptions imply that the determined proportionality can be transferred to comparative enterprises and that their value can be determined in that way.

There are numerous definitions of value multipliers. Most often, the value multiplier is presented as the ratio of the real value of the company and the value-relevant basis from the financial statements. In practice, the term value multiplier is most often used by market analysts as market value multipliers. The only difference is what information the user has. Since the real value of the company is mostly unknown, the known market value (market capitalization from the stock exchange) is taken as the determinant of the multiplier. “The notion of market multipliers can still be defined as the ratio of the market price of shares and a specific analytical indicator.” (Penman S.H. 2004)

Chart 1: Multiplier definition (Damodaran A. 2012)



The popularity of multiplier models stems from the advantages that these models have over traditional valuation models. “Above all, multipliers are easy to understand and implement” (De Angelo L.E. 1990). Second, they are based on market data, which means that they will better convey the current mood in the market, and third, they evaluate the target company in relation to it, a comparative one whose value is already known. Compared to traditional models of discounting cash flows or dividends, as most often cited in the literature, multiplier models require much less data to perform the analysis. If we take into account that the models of multipliers show

an enviable accuracy of estimation, it is clear why over time they have become the most dominant model used in practice.

Damodaran points out that for most of the valuations performed on Wall Street, multiplier models were used for various purposes:

- Almost 85% of reports dealing with enterprise value analysis are based on multiplier models.
- Over 50% of all mergers and acquisitions are valued by multiplier models. (Damodaran A. 2012)

U situacijama kada se procena vrednosti preduzeća radi nekom tradicionalnom metodom, u većini slučajeva u svrhu dopunske analize koriste se modeli multiplikatora.

EV/EBITDA multiplikator najčešće je korišćen model za vrednovanje od strane investicionih bankara u SAD u prethodnom periodu (Evans, F. C., Bishop, D. M., 2001). EV/EBITDA multiplikator predstavlja odnos vrednosti preduzeća i dobitka pre poreza, finansijskog rezultata i troškova amortizacije. Njegova velika zastupljenost u praksi rezultat je prednosti obračuna EBITDA u odnosu na ostale kategorije dobitka preduzeća. Isto kao EBIT, ni ovde se ne uzimaju kategorije finansijskog rezultata i troškova poreza, ali, dodatno, u EBITDA se ne uzima ni trošak amortizacije, čime se smanjuje mogućnost uticaja na vrednost preko menadžerskih odluka. EV/EBITDA multiplikator kod praktičara je najzastupljeniji model iz razloga što je EBITDA vrlo retko negativan, tako da je multiplikator upotrebljiv kod velikog broja preduzeća. Takođe, EV/EBITDA multiplikator nije pod uticajem strukture kapitala i iz tog razloga je upotrebljiv kod procena preduzeća sa različitim nivoom duga.

Standardni proces vrednovanja modelima EV/EBITDA multiplikatora obuhvata četiri koraka:

1. definisanje kriterijuma za odabir multiplikatora;
2. utvrđivanje komparativnih preduzeća i kreiranje homogene grupe;
3. obračun jedinstvenog multiplikatora homogene grupe preduzeća;
4. primena tržišnih multiplikatora homogene grupe i vrednovanje ciljnog preduzeća (Schreiner, A., 2007).

Formiranje homogene grupe preduzeća najznačajniji je korak u procesu vrednovanja modelima multiplikatora. Uvažavajući sve pretpostavke modela u vezi s tržišnom efikasnosti i vrednosnom relevantnosti podataka iz finansijskih izveštaja, vrednost ciljnog preduzeća utvrđena modelima multiplikatora biće determinisana informacijama iz finansijskih izveštaja i vladajućim tržišnim vrednostima odabranih komparativnih preduzeća. Svaka greška u odabiru komparativnih preduzeća u homogenu grupu proizvodi odstupanje procenjene vrednosti ciljnog preduzeća od njegove stvarne vrednosti.

2. KOMPARATIVNOST PREDUZEĆA KAO PREDUSLOV PRIMENE METODA EV/EBITDA MULTIPLIKATORA

Homogena grupa entiteta predstavlja grupu preduzeća koja se za potrebe vrednovanja modelima tržišnih multiplikatora smatraju komparativnim sa ciljnim preduzećem čiju je tržišnu vrednost potrebno utvrditi. Homogena grupa preduzeća može se predstaviti kao korpa preduzeća ili korporativnih transakcija čiji su profili ili novčani tokovi komparativni sa profilom ciljnog preduzeća (Rappaport, A., 1981). Postojanje komparativnosti između ciljnog preduzeća i onih koja čine homogenu grupu osnovna je pretpostavka modela multiplikatora. Poštovanje ove pretpostavke zahteva odabir u homogenu grupu onih preduzeća koja će obezbediti maksimalno moguće pouzdanu procenu vrednosti ciljnog preduzeća. „Problem komparativnosti ključan je u modelima multiplikatora“ (Nel, W. S., Le Roux, N. J., 2015). Značaj odabira ispravnih komparativnih preduzeća u homogenu grupu naglašavaju i Vudkok i Bhojraj, Li i Ng, koji smatraju da je ovaj izbor esencijalan za proces vrednovanja i da treba da bude prepusten profesionalcima (Bhojraj, S., Lee, C. M.

C., Ng, D. T., 2003). Komparativnost dva preduzeća može se utvrditi na različitim nivoima i za različite svrhe. Kada su u pitanju modeli multiplikatora, komparativnost preduzeća unutar homogene grupe mora biti u funkciji kreiranja tržišne vrednosti. Samo na osnovu tako definisanih komparativnih preduzeća moguće je ispravno proceniti vrednost ciljnog preduzeća.

O komparativnosti preduzeća homogene grupe i ciljnog preduzeća ne možemo govoriti ukoliko preduzeća posluju u različitim industrijskim granama, tj. ukoliko se ne bave istom ili sličnom delatnošću. Sektorska pripadnost preduslov je kreiranja homogenih grupa i na kraju efikasnih modela multiplikatora. Sektorska pripadnost kao osnov za kreiranje homogene grupe entiteta podrazumeva da je jedini kriterijum uvrštavanja preduzeća u nju delatnost kojom se preduzeće bavi. Ovo je najrasprostranjeniji način formiranja homogene grupe u praksi i u stručnoj literaturi. Pristup sektorske pripadnosti polazi od pretpostavke da su preduzeća koja se bave istom delatnošću, tj. koja posluju u istom industrijskom sektoru, u dovoljnoj meri komparativna po svim kriterijumima koji formiraju vrednost preduzeća (Park, Y. S., Lee, J. J., 2003), odnosno zagovornici ovog pristupa smatraju da se modeli multiplikatora efikasno mogu koristiti vodeći se samo sektorskom pripadnošću prilikom formiranja homogenih grupa.

Preduslov za funkcionisanje ovog načina kreiranja homogene grupe jeste da na tržištu postoji jasna podela delatnosti, odnosno klasifikacioni sistemi po kojima bi se preduzeća razvrstala u skladu sa osnovnom delatnošću. Zagovornici ovog pristupa smatraju da formiranjem detaljnih klasifikacionih sistema može da se odgovori na zahteve modela multiplikatora. „Po prirodi, što je industrija ‘finije’ strukturirana, preduzeća unutar nje su sličnija međusobno i moguće je lakše pronaći komparativno preduzeće koje će biti korišćeno kao benčmark za potrebe vrednovanja“ (Eberhart, A. C., 2001).

U svetu postoje brojni klasifikacioni sistemi delatnosti, nacionalnog i međunarodnog karaktera. S obzirom na procese globalizacije i na činjenicu da mnoga preduzeća posluju na različitim tržištima, za potrebe vrednovanja modelima multiplikatora, značajni su pre svega međunarodni klasifikacioni sistemi. Neki od najpoznatijih su:

- ICB – Sistem industrijske klasifikacije,
- SIC – Standardna industrijska klasifikacija,
- GICS – Globalni industrijski standard klasifikacije,
- NACE Rev. 2 – Statistička klasifikacija ekonomskih aktivnosti.

Korišćenje sistema za klasifikaciju delatnosti i koncentrisanje na neposredne konkurente ciljnog preduzeća jeste troškovno najefikasniji način formiranja homogene grupe (Goedhart, M., Koller, T., Wessels, D., 2005). Efikasni sistemi za klasifikaciju delatnosti zahtevaju pravovremeno korigovanje podataka i ažuriranje informacija kako u vezi s karakteristikama preduzeća tako i u vezi sa njihovim grupisanjem u sektore i podsektore. Ovi sistemi zasnivaju se na podeli industrija do najuže delatnosti. Obično pored klasične podele na industrije postoji i razgraničenje po dubini na podsektore, grupe, podgrupe. Na ovaj način zainteresovani korisnici mogu da pronađu komparativna preduzeća za usko specijalizovana ciljna preduzeća.

Bhojraj i drugi autori bavili su se komparativnom analizom sistema za klasifikaciju industrija. Analizirali su najčešće korišćene sisteme u stručnim publikacijama vezanim za vrednovanje modelima multiplikatora. Rezultati njihovog istraživanja ukazuju na to da globalni standard industrijske klasifikacije najbolje objašnjava razlike u visini multiplikatora koje se javljaju po sektorima, ključne finansijske pokazatelje i razlike u stopama rasta (Bhojraj, S., Lee, C. M. C., Ole, D. K., 2003).

In situations when the valuation of a company is done by some traditional method, in most cases multiplier models are used for the purpose of additional analysis.

The EV / EBITDA multiplier was the most commonly used valuation model by U.S. investment bankers in the previous period (Evans F.C., Bishop D.M. 2001). The EV/EBITDA multiplier represents the ratio of company value to profit before tax, financial result and depreciation expense. Its large representation in practice is a result of the advantage of calculating EBITDA over other categories of corporate profits. Like EBIT, the categories of financial result and tax costs are not taken into account here either, but additionally, depreciation expense is not taken into EBITDA, which reduces the possibility of influencing value through managerial decisions. EV/EBITDA multiplier for practitioners is the most common model because EBITDA is very rarely negative, so the multiplier is usable in a large number of companies. Also, the EV/EBITDA multiplier is not influenced by the capital structure and is therefore useful in valuation of companies with different levels of debt.

The standard valuation process for EV/EBITDA multiplier models includes four steps:

1. Defining criteria for selecting multipliers;
2. Determining comparative companies and creating a homogeneous group;
3. Calculation of a unique multiplier of a homogeneous group of companies;
4. Application of market multipliers of homogeneous group and valuation of the target company. (Schreiner A., 2007)

The formation of a homogeneous group of companies is the most important step in the process of valuation by multiplier models. Taking into account all the assumptions of the model regarding market efficiency and value relevance of data from financial statements, the value of the target company determined by multiplier models will be determined by information from financial statements and dominant market values of selected comparative companies. Each error in the selection of comparative enterprises into a homogeneous group produces a deviation of the estimated value of the target enterprise from its actual value.

2. COMPARABILITY OF ENTERPRISES AS A PREREQUISITE FOR THE APPLICATION OF EV/EBITDA MULTIPLIER METHODS

A homogeneous group of entities is a group of companies that, for the purposes of valuation using market multiplier models, are considered comparable to the target company whose market value needs to be determined. A homogeneous group of firms can be represented as a basket of firms or corporate transactions whose profiles or cash flows are comparable to the profile of the target firm (Rappaport A. 1981). The existence of comparability between the target company and those that make up a homogeneous group is the basic assumption of the multiplier model. Adherence to this assumption requires the selection of those companies in a homogeneous group that will provide the most reliable valuation of the target company. "The problem of comparability is crucial in multiplier models" (Nel W. S., Le Roux, N. J. 2015). The importance of choosing the right comparative companies in a homogeneous group is emphasized by Woodcock and Bhojraj, Lee and Ng, who believe that this choice is essential for the evaluation process and

should be left to professionals (Bhojraj S., Lee C.M.C., Ng D.T. 2003). The comparability of two companies can be determined at different levels and for different purposes. When it comes to multiplier models, the comparability of firms within a homogeneous group must be in the function of creating market value. Only on the basis of such defined comparative companies it is possible to correctly estimate the value of the target company.

We cannot talk about the comparability of a homogeneous group company and a target company if the companies operate in different industries, ie if they do not engage in the same or similar activities. Sector affiliation is a prerequisite for creating homogeneous groups and ultimately efficient multiplier models. Sectoral affiliation as a basis for creating a homogeneous group of entities implies that the only criterion for including a company in it is the activity in which the company is engaged. This is the most widespread way of forming a homogeneous group in practice and in the professional literature. The sector affiliation approach starts from the assumption that companies engaged in the same activity, ie operating in the same industrial sector, are sufficiently comparative in all criteria that form the value of the company (Park Y. S., Lee J. J. 2003). That is, proponents of this approach believe that multiplier models can be used effectively, guided only by sectoral affiliation when forming homogeneous groups.

The precondition for the functioning of this way of creating a homogeneous group is that there is a clear division of activities on the market, ie classification systems according to which companies would be classified in accordance with the main activity. Proponents of this approach believe that the formation of detailed classification systems can meet the requirements of the multiplier model. "By nature, the" finer "the structure of the industry, the more similar the companies within it are and the easier it is to find a comparative company that will be used as a benchmark for valuation purposes." (Eberhart A.C. 2001).

There are numerous classification systems of activities in the world, of national and international character. Given the processes of globalization, and the fact that many companies operate in different markets, for the purposes of valuation by multiplier models, international classification systems are important. Some of the most famous are:

- ICB - Industrial Classification System
- SIC - Standard Industrial Classification
- GICS - Global Industry Classification Standard
- NACE Rev.2 - Statistical Classification of Economic Activities.

Using a system for classifying activities and concentrating on the direct competitors of the target company is the most cost-effective way to form a homogeneous group (Goedhart M., Koller T., Wessels D., 2005). Efficient systems for classifying activities require timely correction of data and updating of information both in relation to the characteristics of enterprises and in relation to their grouping into sectors and subsectors. These systems are based on the division of industries into the most specific activities. Usually, in addition to the classical division of industries, there is a division by depth into subsectors, groups, subgroups. In this way, interested users can find comparative companies for highly specialized target companies.

Bhojraj and the authors dealt with a comparative analysis of industry classification systems. They analyzed the most commonly used systems in professional publications related to valuation using multiplier models. The results of their research indicate that the global standard of industrial classification best explains the differences in the amount of multipliers that occur by sectors, key

Eberhart je sproveo istraživanje na uzorku američkih kompanija, dodajući još pet sistema za klasifikaciju industrija. Njegovi zaključci slični su prethodnim istraživanjima i navode da bi istraživači u svojim radovima na temu relativnog procenjanja trebalo da koriste uvek iste sisteme klasifikacije industrija iz razloga uporedivosti rezultata. Bhojraj i autori smatraju da je učestala primena međunarodnih klasifikacionih sistema posledica odsustva drugih boljih rešenja, a ne rezultat njihovih dobrih karakteristika (Bhojraj, S., Lee, C. M. C., Ng, D. T., 2003).

Sličan način formiranja homogene grupe u odnosu na sektorsku pripadnost jeste pronalazjenje komparativnih transakcija (Pratt, S., 2005). S obzirom na to da je cilj modela vrednovanja utvrđivanje tržišne vrednosti, ovaj metod često je znao da pokaže najbolje rezultate. Naime, pronalaskom komparativnih transakcija procenitelj ima informaciju o tačno plaćenju za preduzeće koje je slično sa ciljnim preduzećem. Kreiranjem multiplikatora na osnovu ovog podatka može se utvrditi vrednost preduzeća koja je zasnovana na fer vrednosti koja je razmenjena između nepovezanih strana na tržištu, što je svakako ispravna tržišna vrednost. Najveći problem kod primene ove metode selekcije preduzeća u homogeni grupu jeste nedostatak javno dostupnih podataka o cenama i uslovima sprovedenih transakcija. Izvori ovih podataka obično su stručne publikacije ili specijalizovane baze podataka koje nisu uvek dostupne. Drugi problem koji se često javlja kod upotrebe komparativnih transakcija u formiranju homogene grupe jeste mali broj stvarno izvršenih transakcija sa kojima postoji sličnost, naročito u delatnostima koje nisu atraktivne za investitore, u kojima skoro da i nema prometa.

Dosadašnja istraživanja problematike komparativnosti, sastava homogene grupe i modela multiplikatora uopšte, uglavnom su uvažavala prethodno opisane metode formiranja homogene grupe: sektorsku pripadnost i uporedive transakcije. Ova istraživanja polazila su od pretpostavke da preduzeća koja posluju u istoj delatnosti imaju slične novčane tokove, profitabilnost, preuzimaju iste rizike, imaju sličnu strukturu imovine itd. te da su iz tih razloga dovoljno komparativna za potrebe vrednovanja.

Kritika sektorskog pristupa i pristupa uporednih transakcija pri formiranju homogenih grupa počiva na činjenici da su preduzeća unutar iste grane, iako komparativna po vrsti proizvoda i usluga koje pružaju, ne nužno komparativna po kriterijumima koji su od značaja za formiranje vrednosti. Npr., preduzeća iz iste delatnosti mogu biti u različitim fazama životnog ciklusa, mogu imati različito učešće na tržištu i odnos sa kupcima, zatim mogu imati različite nivoe duga, pokazatelje ekonomičnosti, profitabilnosti itd. Dakle, ovi pristupi kao kriterijum za formiranje homogene grupe samo pretpostavljaju sličnost preduzeća po osnovnim kriterijumima od važnosti za vrednovanje. Džonson smatra da ova praksa može dovesti do pogrešnih rezultata iz razloga postojanja razlika u utrživosti akcija preduzeća, jer se cene akcija pretežno formiraju na bazi ostvarenog trgovanja, gde je cilj kupovina ili prodaja malog broja akcija, a ne celih preduzeća (Johnson, H. E., 2001).

Problem kod upotrebe sektorske pripadnosti kao jedinog kriterijuma za selekciju preduzeća u homogene grupe jesu i potencijalno prevelike homogene grupe. U industrijskim granama koje se odlikuju velikom konkurencijom, broj potencijalnih preduzeća koja se mogu uvrstiti u homogeni grupu može biti prevelik, što bez uključivanja dodatnih kriterijuma povećava rizik pogrešne procene ciljnih preduzeća. S druge strane, kod upotrebe uporednih transakcija pri formiranju homogene grupe često se ne uzimaju u obzir specifičnosti pojedinačne transakcije, kao što su uslovi plaćanja, sinergetski efekti koji obično prate unutargranske akvizicije i druge specifičnosti koje utiču na ukupnu cenu transakcije.

3. METODOLOGIJA ISTRAŽIVANJA

Metodologija istraživanja podrazumeva analizu komparativnosti preduzeća u odabranim evropskim zemljama kroz utvrđivanje uspešnosti korišćenja EV/EBITDA multiplikatora u proceni vrednosti preduzeća. Što je EV/EBITDA model uspešniji u proceni vrednosti preduzeća, to znači da postoji veći stepen komparativnosti kompanija u okviru istih šifri delatnosti.

Cilj je utvrđivanje prosečne greške procene za model EV/EBITDA multiplikatora u skladu sa metodologijom odabira preduzeća u homogeni grupu koji podrazumeva samo kriterijum industrijske pripadnosti.

Empirijsko istraživanje podrazumeva sledeće osnovne korake:

1. Obračun EV/EBITDA multiplikatora komparativnih preduzeća. Da bi se izračunale vrednosti multiplikatora, korišćeni su podaci iz finansijskih izveštaja preduzeća, kao i javno dostupni podaci o tržišnim vrednostima akcija ili ostvarenim cenama u kupoprodajnim transakcijama celih kompanija.
2. Segmentiranje preduzeća po industrijskoj klasifikaciji. Preduzeća su segmentirana po sektorima, divizijama, grupama, klasama i potklasama. Za potrebe istraživanja formirane su homogene grupe na nivou grupa preduzeća (trocifrena šifra preduzeća).
3. Agregiranje tržišnih multiplikatora komparativnih preduzeća po homogenim grupama korištenjem aritmetičke sredine.
4. Obračun vrednosti ciljnih preduzeća primenom izračunatih, agregiranih EV/EBITDA multiplikatora homogene grupe na vrednosno relevantnu osnovu (EBITDA) ciljnih preduzeća.
5. Komparacija utvrđene vrednosti ciljnih preduzeća sa njihovom referentnom vrednošću. Tržišna kapitalizacija ciljnih preduzeća ili njihova poznata stvarna vrednost kao celine poslužiće kao referentna vrednost za testiranje multiplikatora. Upoređivanje izračunate vrednosti modelom multiplikatora i referentne vrednosti preduzeća radi se izračunavanjem relativne greške, korištenjem logaritmovanih odnosa dve vrednosti, što je u skladu sa formulom koju su Li, Li i Eberhart koristili u svojim istraživanjima (Lie, E., Lie, H., J. 2002).

$$\ln \left(\frac{EV^*}{EV} \right)$$

- EV* procenjena vrednost preduzeća modelima multiplikatora
- EV referentna vrednost preduzeća

Utvrđena relativna greška predstavlja meru efikasnosti multiplikatora da proceni stvarnu vrednost, odnosno mala relativna greška upućuje na postojanje veće komparativnosti preduzeća unutar homogenih grupa.

4. REZULTATI EMPIRIJSKOG ISTRAŽIVANJA

Empirijsko istraživanje sprovedeno je u okviru industrije telekomunikacija i informatike, na preduzećima iz evropskih zemalja koja su obuhvaćena međunarodnom klasifikacijom ekonomskih aktivnosti (NACE Rev. 2 – Classification of Economic Activities). Ukupan broj zemalja obuhvaćenih istraživanjem je 36, a ukupan broj preduzeća u uzorku iznosi 387. Istraživanjem su obuhvaćene sledeće podindustrije:

financial indicators and differences in growth rates (Bhojraj S., Lee C.M.C., Ole D.K. 2003).

Eberhart conducted research on a sample of U.S. companies, adding five more industry classification systems. His conclusions are similar to previous research and state that researchers in their work on the topic of relative valuation should always use the same systems of classification of industries for the reason of comparability of results. Bhojraj and the authors believe that the frequent application of international classification systems is a consequence of the absence of other better solutions, and as a result of their good characteristics (Bhojraj S., Lee C.M.C., Ng D.T. 2003).

A similar way of forming a homogeneous group in relation to sectoral affiliation is to find comparative transactions (Pratt S. 2005). Since the goal of the valuation model is to determine the market value, this method was often known to show the best results. Namely, by finding comparative transactions, the appraiser has information about the exact price paid for companies that is similar to the target company. By creating a multiplier based on this data, the value of the company can be determined based on the fair value exchanged between unrelated parties in the market, which is certainly the correct market value. The biggest problem in applying this method of selecting companies into a homogeneous group is the lack of publicly available data on prices and conditions of transactions. The sources of this data are usually professional publications or specialized databases that are not always available. Another problem that often occurs when using comparative transactions in the formation of a homogeneous group is the small number of actually executed transactions with which there is a similarity, especially in activities that are not attractive to investors in which there is almost no turnover.

Previous research on the issue of comparability, the composition of a homogeneous group and the model of multipliers in general, mainly took into account the previously described methods of forming a homogeneous group: sectoral affiliation and comparable transactions. These studies were based on the assumption that companies operating in the same industry have similar cash flows, profitability, take the same risks, have a similar asset structure, etc. and that for these reasons they are sufficiently comparative for valuation purposes.

Criticism of the sectoral approach and the approach of comparative transactions in forming homogeneous groups is based on the fact that companies within the same branch, although comparative in terms of the type of products and services they provide, are not necessarily comparative in terms of value-relevant criteria. Eg. companies from the same industry may be at different stages of the life cycle, may have different market share and customer relations, then may have different debt levels, indicators of economy, profitability, etc. So, these approaches as a criterion for forming a homogeneous group only assume similarity according to the basic criteria of importance for evaluation. Johnson believes that this practice can lead to erroneous results due to differences in the marketability of company shares, because stock prices are mostly formed on the basis of realized trading where the goal is to buy or sell a small number of shares, not entire companies (Johnson H. E., 2001).

The problem with the use of sectoral affiliation as the only criterion for the selection of companies into homogeneous groups are potentially too large homogeneous groups. In industries that are highly competitive, the number of potential companies that can be included in a homogeneous group may be too large, which without

the inclusion of additional criteria increases the risk of incorrect valuation of the target company. On the other hand, the use of comparative transactions in forming a homogeneous group often does not take into account the specifics of an individual transaction, such as payment terms, synergies that usually accompany intra-branch acquisitions and other specifics that affect the total transaction price.

3. RESEARCH METHODOLOGY

The research methodology involves the analysis of company comparability in selected European countries by determining the success of using EV / EBITDA multipliers in company valuation. The more successful the EV / EBITDA model in valuing companies, it means that there is a greater degree of comparability of companies within the same activity codes.

The aim is to determine the average valuation error for the EV / EBITDA multiplier model in accordance with the methodology of selecting companies into a homogeneous group that includes only the criterion of industrial affiliation.

Empirical research involves the following basic steps:

1. Calculation of EV/EBITDA multipliers of comparative enterprises. In order to calculate the values of the multiplier, data from the financial statements of the companies were used, as well as publicly available data on the market values of shares or realized prices in purchase and sale transactions of entire companies.
2. Segmentation of enterprises by industrial classification. Companies are segmented by sectors, divisions, groups, classes and subclasses. For the needs of the research, homogeneous groups were formed at the level of enterprise groups (three-digit enterprise code).
3. Aggregation of market multipliers of comparative enterprises by homogeneous groups using the arithmetic mean.
4. Calculation of the value of target companies using calculated, aggregated, EV/EBITDA multipliers of a homogeneous group on a value-relevant basis (EBITDA) of target companies.
5. Comparison of the determined value of target companies with their reference value. The market capitalization of the target companies or their known real value as a whole will serve as a reference value for testing the multipliers. The comparison of the calculated value with the multiplier model and the reference value of the company is done by calculating the relative error, using the logarithm of the relationship of the two values, which is in accordance with the formula used by Lie, Lie and Eberhart in their research. (Lie E., Lie H., J. 2002)

$$\ln \left(\frac{EV^*}{EV} \right)$$

- Estimated value of the enterprise by multiplier models
- Company reference value

The determined relative error is a measure of the efficiency of the multiplier to estimate the real value, ie a small relative error indicates the existence of greater comparability of enterprises within homogeneous groups.

Tabela 1. Spisak grupa preduzeća (trocifrenih industrijskih šifara) koje su obuhvaćene empirijskim istraživanjem

Opis	Grupe preduzeća	Sektor
Fiksne telekomunikacione usluge	611	Informacije i telekomunikacije
Usluge bežičnih telekomunikacija	612	
Usluge prenosa i čuvanja podataka preko satelita	613	
Ostale telekomunikacione usluge	619	

Rezultati empirijskog istraživanja biće prikazani kroz relativnu grešku procene, i to kroz dva kriterijuma:

Tabela 2. Forma prikaza rezultata istraživanja efikasnosti procene

Utvrđena greška procene	
Aritmetička sredina	% preduzeća sa greškom ispod 15 %

Tabela 3. Deskriptivna statistika uzorka – finansijski podaci po grupama preduzeća

Informacije i telekomunikacije							
	Broj pred.	Tržišna kapital.	Vrednost preduzeća	Ukupna imovina	Neto profit	Prihod	EBITDA
611	143	4.009.690	6.145.680	8.503.981	339.947	1.907.474	630.884
612	59	11.507.689	15.146.724	17.447.414	2.855.827	6.186.183	3.206.511
613	20	2.839.623	3.419.742	1.835.779	218.054	368.233	301.026
619	165	2.285.865	3.302.209	2.607.759	223.740	1.698.646	474.677

Na osnovu sprovedenog istraživanja na odabranim ciljnim kompanijama iz uzorka došlo se do rezultata relativne greške procene, koja je iskazana kao procentualno odstupanje vrednosti procenjene

modelom i stvarne, poznate vrednosti preduzeća. Posmatrano po podindustrijskim granama, rezultati su sledeći:

Tabela 4. Rezultati istraživanja greške procene za EV/EBITDA multiplikator

Industrija	Aritmetička sredina	% preduzeća sa greškom ispod 15%
611	31,34%	22,22%
612	24,21%	22,22%
613	35,49%	0,00%
619	29,25%	23,53%

Ovakvi rezultati upućuju da kod oko 20% preduzeća postoji greška procene koja je manja od 15%, što je rezultat niži od očekivanog. Takođe, po drugom kriterijumu vidi se da je prosečna greška kod svih industrija oko 30%, što je više od očekivanog i dobijenog rezultata u prethodnim istraživanjima. Ovakvi rezultati, uz pretpostavku valjanosti modela i procedura vrednovanja, upućuju na zaključke koji se tiču inputa, kao što je komparativnost koja je podrazumevana da postoji unutar grane industrije.

komparativnim ne dovode do ispravne procene vrednosti ciljnog preduzeća. Ovakvi rezultati upućuju na to da je vrlo teško sprovesti tačne analize i proračune bazirajući se samo na najopštijoj meri komparativnosti, a to je šifra delatnosti ili neki od klasifikacionih sistema po kojima su preduzeća grupisana. Konkretno, za potrebe modela EV/EBITDA multiplikatora, stepen komparativnosti preduzeća koja se koriste u vrednovanju ciljnog preduzeća mora biti viši, kako bi procena bila pouzdanija.

ZAKLJUČAK

Analiza komparativnosti, uopšteno gledano, veoma je značajna stajholderima za donošenje različitih odluka. Kada se vrši odabir komparativnih preduzeća, polazi se od šifre delatnosti, a daljom analizom moguće je suziti njihov krug na ona koja su više uporediva sa ciljnim. Za donosiocel odluka značajno je da je to inicijalno razvrstavanje pouzdano. Cilj empirijskog istraživanja bio je da se kroz proces vrednovanja preduzeća EV/EBITDA multiplikatorima utvrdi da li na uzorku evropskih preduzeća postoji značajan nivo komparativnosti preduzeća koja posluju unutar iste industrije, odnosno podindustrije.

Rezultati istraživanja pokazali su da stepen komparativnosti nije na očekivanom nivou, odnosno da preduzeća koja se smatraju

IZVORI

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4. RESULTS OF EMPIRICAL RESEARCH

The empirical research was conducted within the telecommunications and informatics industry, namely companies from European countries that are included in the International Classification of Eco-

nomical Activities (NACE Rev.2-Classification of Economic Activities). The total number of countries covered by the survey is 36, and the total number of companies in the sample is 387. The survey covers the following sub-industries:

Table 1: List of enterprise groups (three-digit industrial codes) covered by empirical research

Description	Enterprise groups	Sector
Fixed telecommunication services	611	Information and telecommunications
Wireless telecommunications services	612	
Satellite data transmission and storage services	613	
Other telecommunications services	619	

The results of the empirical research will be presented through a relative valuation error through two criteria:

Table 2: Form of presentation of valuation efficiency research results

Valuation error found	
Arithmetic mean	% of companies with an error below 15%

Table 4: Descriptive sample statistics-financial data by enterprise groups

Information and telecommunications							
	No. of companies	Market capital.	Company value	Total assets	Net profit	Revenues	EBITDA
611	143	4.009.690	6.145.680	8.503.981	339.947	1.907.474	630.884
612	59	11.507.689	15.146.724	17.447.414	2.855.827	6.186.183	3.206.511
613	20	2.839.623	3.419.742	1.835.779	218.054	368.233	301.026
619	165	2.285.865	3.302.209	2.607.759	223.740	1.698.646	474.677

Based on the conducted research on selected target companies from the sample, the results of relative valuation error were obtained, which is expressed as a percentage deviation of the estimated value

by model I of the actual, known, value of the enterprise. Observed by sub-industrial branches, the results are as follows:

Table 4: Valuation error survey results for EV/EBITDA multiplier

Industry	Arithmetic mean	% of companies with an error below 15%
611	31,34%	22,22%
612	24,21%	22,22%
613	35,49%	0,00%
619	29,25%	23,53%

These results indicate that about 20% of companies have a valuation error of less than 15%, which is lower than expected. Also, according to the second criterion, it can be seen that the average error in all industries is about 30%, which is more than the expected and obtained result in previous research. Such results, assuming the validity of valuation models and procedures, point to conclusions regarding inputs, such as the comparability that is assumed to exist within the industry.

CONCLUSION

Comparative analysis in general is very important for stakeholders to make different decisions. When selecting comparative companies,

the starting point is the code of activity, and further analysis can narrow their circle to those that are more comparable to the target. It is important for decision makers that this initial classification is reliable. The aim of the empirical research was to determine, through the EV/EBITDA company evaluation process, whether there is a significant level of comparability of companies operating within the same industry or sub-industry in the sample of European companies.

The results of the research showed that the degree of comparability is not at the expected level. That is, companies that are considered comparative do not lead to the correct estimated value of the target company. These results indicate that it is very difficult to conduct accurate analyzes and calculations based only on the most general measure of comparability, which is the activity code or some of the classification systems by which companies are

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grouped. Specifically for the purposes of the EV/EBITDA multiplier model, the degree of comparability of the companies used in the valuation of the target company must be higher, in order for the valuation to be more reliable.

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