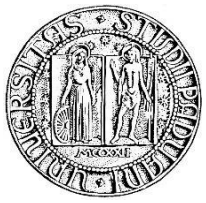

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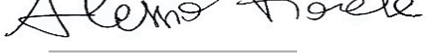

Ai miei nonni

Luciana e Giovanni

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Introduction

Every business transaction entails some degree of risk. When it occurs across international borders, it implies further risks than those merely present in a domestic market. These additional risks are called "country risks" and they stem from a wide range of different sources. What should be borne in mind throughout the whole discussion is that risk is not always an enemy. The riskiest countries are not necessarily the least attractive for foreign investors, nor it is true the opposite. Conversely, often risky markets present various sources of attractiveness which outbalance the increased riskiness. Typically, countries identified as emerging are those with higher country risks, but higher risks could be compensated with higher returns. If we also consider the diversification benefits arising from investments in these countries, it is easy to understand why the appeal of emerging markets has grown in the past years, becoming an important asset class for international capital markets. Emerging markets are a playground where projects and companies are seen as attractive targets by buyers looking for higher returns. Emerging markets are teeming with promising opportunities, vivid scenarios, and labile economies, which from an investment viewpoint, constitute an intermediate layer between developed and marginal markets.

The determination of value of companies and projects coming from such frameworks becomes then a crucial topic as they become larger players in the global economy as well as likely candidates for investment portfolios. But these markets exhibit so peculiar and different features that we must be extremely cautious in directly applying insights gleaned from the developed world, making them worthy of attention and deeper studies. Indeed, analysts are struggling with valuation questions that arise when dealing with non-developed market companies. Accordingly, they have developed an alternative solution more prone to be applied in the framework of emerging markets. This is called *multiples valuation* and has its foundations on the comparison with specific financial metrics of a group of similar companies. These metrics vary between sectors, inter alia, due to the impact of country risk. We believe that there are some sectors more prone to others to suffer from country effects, while others can be left untouched or even show better metrics.

The argument is organized as follows: the first chapter reviews and compares the broad academic and practitioner literature addressing the topic of valuation in emerging countries. The second section summarizes the main characteristics of emerging markets, gathering and presenting the most recent available data. Finally, the third chapter presents the empirical analysis on a sample of companies' multiples.

1 Valuing Companies in Emerging Markets: a literature review

The literature provides several valuation methodologies which lead to determining the price of a stock (Damodaran, 2006; Parra, 2013). The most accurate one consists of the present value of all the future benefits that are expected to be earned by stockholders (Koller et al., 2020; Lie and Lie, 2002). It will be presented in the following paragraphs *1.3 CRP and Valuation methods*, *1.4 CRP and Cost of Capital*, and *1.5 Determination of CRP*. The stock price thus determined should approximate its intrinsic value, if markets are efficient. The problem is that often, especially for EMs, this assumption does not hold, plus information needed to apply DCF methodologies is not available. Therefore, analysts and practitioners have come up with an alternative methodology, called multiples analysis, which consists of using financial ratios from a set of comparables to determine the value of a stock. The result is that "there is no clear single 'best practice' for the valuation of assets and securities in emerging countries" (Bruner et al., 2002).

In this chapter first it will be outlined what EMs are and the corresponding definition of country risk. Later, DCFs approach and CRP concepts are presented and discussed with relevant contributions from the literature. Finally, market multiples methodology is provided, with the indication of which multiples seem to better apply in the framework of EMs.

1.1 Definition of Emerging Markets

The term "Emerging Markets" (henceforth EMs) was first coined by the International Finance Corporation of the World Bank back in the 1980s, simply used to define a country with low to middle per capita income. Nowadays, this seems a too narrow definition to grasp the extent of the topic, which is of major importance, given that these countries are not only growing at a higher pace than developed ones, but they also account for 86 percent of the global population and almost 58 percent of its Gross Domestic Product (International Monetary Fund, 2021a).

But even today there is no universal and formal definition for EMs, since, given its nature, it is a dynamic concept whose features and issues are changed throughout the years. Generalizing, EMs are national economies that share some common developing lines:

- Reorganization of the political system, passing from autocratic and illiberal administrations to democratic governments; growing concern for most urgent social problems; stabilization of currency.

- Large-scale privatization of state-owned companies, deregulation of economic activity.
- Opening to foreign investors and capital, removing substantial trade and economic barriers.
- Introduction of new and advanced technologies, managerial practices, international standards.
- Reshaping of entire industries, which experience a surge in productivity and competitiveness.
- Establishment of a sophisticated and well-regulated stock exchange, attractive for the financial industry; increase in volume and value of stocks trading.
- Experiencing a growing activity in mergers and acquisitions (M&A), creation of subsidiaries and joint ventures, as multinational corporations land on the country; creation of a more hospitable environment for foreign direct investment (FDI).
- Increasing ties with neighboring markets, which are often going through the same development process.

What stands out from the previous discussion is that an EM is a country in the process of becoming advanced, displaying many features of developed economies but still failing to meet some important requirements to be considered as such. The only common denominator is the high attractiveness for investors, managers, and entrepreneurs, all keen to capture as much value as possible from EMs' raising opportunities.

Most of the authors, when referring to EMs, generalize their geographical identification to "Latin America, China, India, and Western European countries", but this is an over-simplistic way to draw up which are effectively EMs. It comes out the need to point out clearly the criteria deployed by the most authoritative institutions, coming up with a clearer identification.

Several agencies and financial institutions provide their own list of generally accepted EMs, also specifying the methodology which led the specific office to consider an economy as emerging or not. Two of the most prominent classifications are hereafter presented, in order to provide a clear picture of the existing EMEs list.

The first classification was formulated in the World Economic Outlook (WEO) by the International Monetary Fund (2021b), which provided the following set of criteria for the identification of emerging economies, each one accounted for a specific weight:

- Systemic presence, defined in terms of nominal GDP level (0.4x), the country's population (0.15x), and its share of exports with respect to total global trade (0.15x).

- Market access: derived from the share of country's external debt compared to global external debt (0.15x).
- Income level: nominal per capita GDP, expressed in US dollars (0.15x).

For each factor, the countries ranked in the world top 20 positions receive a score of 1, 0 otherwise. Then, the scores have to be weighted for the abovementioned proportion.

However, as it is stated in the WEO Statistical Appendix, the classification is not based merely on these strict criteria, but it also encompasses some qualitative evaluations by the IMF. This has led, for example, to the exclusion of Lithuania as it entered the European Union, considering it no longer an emerging economy.

Basing on this methodology, the IMF has achieved the following emerging countries table:

Table 11.01 WEO list of Emerging Countries (2021)

1. Argentina	11. Malaysia
2. Brazil	12. Mexico
3. Chile	13. the Philippines
4. China	14. Poland
5. Colombia	15. Russia
6. Egypt	16. Saudi Arabia
7. Hungary	17. South Africa
8. India	18. United Arab Emirates
9. Indonesia	19. Thailand
10. Iran	20. Turkey

Source: WEO (2021)

A broader but still similar list is provided by the Morgan Stanley Capital International (2021) through the construction of the MSCI Emerging Markets Index. The differences as compared to the list generated by the IMF regard the inclusion of Czech Republic, Greece, South Korea, Kuwait, Pakistan, Peru, Qatar, and Taiwan, and the exclusion of Iran. For the sake of this dissertation these differences are negligible, and the list provided by the International Monetary Fund is considered exhaustive.

1.2 Country risk

Although most of the literature on country risk concerns EMs, the topic is not relevant just for the less developed world but matters also for advanced economies.

In the literature the two terms most frequently used are "country risk" and "political risk". The latter represents the oldest terminology, while the former began to be widely used in the 1970s until

our days. Much less frequently it happens to encounter references to "cross-border risk" or "sovereign risk", thus these terms seem to have fallen into disuse (Clark, 2018). In this dissertation, it will be adopted the term "country risk" as for indicating any risk specific to a country. Moreover, in the following paragraph it will be also presented the different connotation acquired by "political risk", becoming a specific component of country risk and not a synonym of it.

To date, the vast majority of the literature on country risk concerns, besides a proper definition of it, the identification of the potential sources of risk and their classification.

Starting from the first point, the definition of "country risk" is disputed. In fact, some authors, such as Feils and Sabac (2000) and Haendel et al. (1975), define it as the variance of expected performance, assuming both positive and negative impacts of country risk. Other authors, like Simon (1982), Clark (1997), Meldrum (2000) and Nordal (2001), instead, see country risk as the probability of a negative outcome, which results in a varying degree of potential losses for investors, what is called downside risk.

As pointed out by Clark (2018) and Estrada (2002), the variance of returns is a questionable measure of risk, since at least two assumptions do not hold in practice. First, it is valid only if returns' distribution is symmetric; second, it requires returns to be normally distributed. Empirical evidence points out that both symmetry and normality are seriously questioned, which tips the balance in favor of the downside risk definition (Garcia-Sanchez et al., 2010).

Moreover, Miller and Leiblein (1996) as well as by Ruefli et al. (1999) demonstrate that managers and investors, when deciding about the investment, are motivated by the perceived gap between potential results and goals, rather than by the variance of returns, which assigns equal importance to upside or downside movements. Translated, investors are motivated by the aversion to downside risk, and not by the aversion to variance. This is corroborated by Pereiro (2002), who notes that "a substantial mass of empirical evidence suggests that investors and managers should carefully consider downside risk".

That defined, country risk refers to the additional risk faced by investors when dealing with a specific country as compared to the alternative of investing in other, much less risky (or "risk-free") ones (Nordal, 2001).

More specifically, the country risk is the portion of the investment's risk caused by the location of assets and operations within national borders. It is related to the uncertainty surrounding different aspects of a particular country, and it results in a reduction of the expected performance.

As it is largely presented below (see paragraph *1.5.2 Measuring country risk exposure*) country risk does not impact equally on all the investments, but it varies among industries and among companies within industries (Garcia-Sanchez et al., 2010; Goedhart and Haden, 2003; Damodaran, 2021).

The elements composing country risk are numerous and they differ in degree rather than in kind from those faced by advanced economies, a non-exhaustive list of sources includes (Lessard, 1996; Koller et al., 2020; Clark, 2018): war, foreign occupation, natural calamities, social unrest, strikes, political instability, revolution, debt default, recession, economic shocks, devaluation or depreciation of the currency, illiquidity of capital markets, uncertain legal framework, expropriation, indigenization, less stringent standards of accounting and disclosure, controls on the in- and outflow of capital.

To provide an overview of the most relevant risks present at the current time, Blackrock (2022) produces the Blackrock Dashboard, which tracks the relative frequency of brokerage reports and financial news associated with specific geopolitical risks using big data approach and machine learning. The results for April 2022 show the following ranking for the top-10 global risks:

Table 12.01 – Blackrock Dashboard (2022)

	Risk	***Description***	***Likelihood***
1.	Russia-NATO conflict	Russian troops launch a large-scale invasion of Ukraine. The U.S. and EU respond with harsh financial, energy, and technology sanctions on Russia.	High
2.	Major cyberattack(s)	Cyberattacks cause sustained disruption in the operation of critical physical or digital infrastructure.	High
3.	Global technology decoupling	Technology decoupling between the U.S. and China significantly accelerates in scale and scope.	High
4.	Major terror attack(s)	A terror attack leads to significant loss of life and commercial disruption.	Medium
5.	Emerging markets political crisis	Failure to arrest the COVID-19 pandemic severely stresses EM political systems and institutions.	Medium

6.	U.S.-China strategic competition	China takes military action to accelerate reunification with Taiwan or more forcefully assert claims in the South China Sea.	Medium
7.	North Korea conflict	North Korea continues its nuclear buildup and takes provocative actions, such as ballistic missile launches.	Medium
8.	Gulf tensions	Iran nuclear talks collapse, and tensions escalate, raising the risk of a regional conflict.	Medium
9.	Climate policy gridlock	Developed economies fail to increase public investment and regulatory action in pursuit of their stated ambitions for net zero emissions.	Medium
10.	European fragmentation	Ongoing COVID and inflationary pressures lead to a populist resurgence and economic volatility.	Low

Source: Blackrock (2022)

The risks are of various nature and a first classification provided by the literature divides them into three categories: political, economic, and commercial risk (Nordal, 2001).

The most prominent type is the political risk, and it is not by chance that the most relevant risk pinpointed by Blackrock belongs to this category. Businesses are impacted by political decisions to such an extent that very often analysts and managers, when assessing EMs' threats, just associate them with political ones. Every country is a political entity which establishes a more or less favorable regulation applying to investments, which can be subject to changes during their lifetime, constituting a specific source of risk. This political instability originates from discretionary powers attributed to governmental authorities, and the less structured and reliable is a country's institutional framework, the more relevant its government's powers are. This is the reason why political risk takes so much importance in EMs, countries typically characterized by weak institutions. Jodice (1982) defined political risk as "changes in operating conditions of foreign enterprises that arise out of political process, either directly through war, insurrection, or political violence, or through changes in government policies that affect the ownership and behavior of the firm. Political risk can be conceptualized as events, or a series of events, in the national and international environments that can affect the physical assets, personnel and operation of foreign firms".

Root and Kapoor (1972) distinguish between three types of political risk: transfer, operational, and ownership control risk. Transfer risk relates to the transfer of funds, such as obstacles to the

repatriation of invested capital or profits, or the transfer of products and services across national borders. Operational risk concerns the material activity of the company carried out on foreign soil, like the imposition of price conditions or the requirement to involve local companies, or even more extreme situations like war and civil unrest. Finally, ownership control risk category relates to the ability of the investors to manage their investment, which basically concerns the risk of expropriation. However, some types of political risks can be insured against through international agencies or other government bodies (Lessard, 1996).

The second category of country risk, namely economic risk, concerns fluctuations in the macroeconomic variables, like inflation, GDP and interest rates, as well as economic shocks and exchange rates swings. It may be a consequence of political mismanagement, but it should not result as the outcome of an explicit political choice, otherwise it should be part of the political risk of above (Clark, 2018). This type of risk stems from detrimental changes in economic policy goals, like the fiscal, monetary, international, or wealth distribution decisions, or from a relevant change in the national comparative advantage (Meldrum, 2000).

Finally, commercial risk relates to all the aspects concerning the relationships with foreign suppliers and buyers, like languages, cultures, customs, managerial practices, and so on.

A similar classification is provided by the International Country Risk Guide (2021), which is "the world's leading quant-driven geopolitical risk data and forecasting series for over 40 years". The proposed classification comprises, together with the political and economic risks, also the financial one. This is basically the ability of a country to meet its official, commercial, and trade debt obligations. It stands out that the categories presented tend to overlap in some areas, given the high level of interrelationship between each other, nevertheless they show up in risk ratings from most international services that are taken into consideration by practitioners and managers (Meldrum, 2000).

After having defined the classification of country risk, we have still to define how to measure it. There are at least three metrics used in practice (Damodaran, 2021). The first is the sovereign debt rating assigned to a country by ratings agencies, such as S&P or Moody's. Clearly, these ratings are intended to measure only the default risk of a country, but in their determination rating agencies consider many factors that enter into country risk too, like the macroeconomic uncertainty or currency fluctuations. Despite being an extremely easy and convenient indication of country risk, sovereign ratings present various drawbacks. Not only, due to their reliance on past historical data, they lag far behind the market in changes' responsiveness, but they also ignore relevant risks which

affect companies and not the country's default risk (Porras, 2011). Moreover, ratings are not available for all and every country, which limits the field of application for some EMs.

The second metric is composed by a wide array of different indexes crafted by international services, which consider various factor affecting country risk. These are estimated from a bottom-up perspective, starting from the very fundamentals of each country, coming to a numerical score which gives an overall measurement of country risk. Bouchet, Clark and Groslambert (2003) provide an overview on country risk assessment performed by these agencies, whose two most important indexes are the International Country Risk Guide and the Country Risk Service.

The International Country Risk Guide (henceforth ICRG) is a country risk measure developed by the Political Risk Service (PRS) organization, which encompasses three different types of country risks, differently weighted: political risk (50%), financial risk (25%), and economic risk (25%), measured by a total of 22 different indicators (PRS, 2021). It results in a score ranking from 0 to 100, with a higher score indicating lesser risk. Hereafter are presented the ICRG scores coming from the PRS, which are extrapolated from Professor Damodaran's online database. Only WEO EMs (2021) scores are here provided, for a comprehensive view the whole table is available in the appendix.

Table 12.02 - ICRG Scores as of 01/2022

Country	**ICRG score**	**Country**	**ICRG score**
Saudi Arabia	79,25	Philippines	69,75
United Arab Emirates	78,5	Brazil	69,5
Poland	74,5	South Africa	69,5
Malaysia	74	Indonesia	69,25
Hungary	74	Argentina	67
Chile	73,75	Thailand	65,5
Russia	73,5	Colombia	64,5
India	72,5	Egypt	64,5
China	71,75	Iran	63,75
Mexico	70	Turkey	58,25

Source: ICRG (2022)

It reveals that, under the undisclosed classification method adopted by the PRS, the two less risky countries are Saudi Arabia and the UAE, while the riskiest one is by far Turkey.

Harvey (2004) proved the usefulness of the ICRG as indicator of country risk, showing a correlation with future equity returns which is "most useful for the analysis of emerging rather than developed markets".

The Economist Intelligence Unit (EIU) also constructs its own country risk measure, called the Country Risk Service (henceforth CRS). The CRS encompasses currency, sovereign and banking risks through 220 analytical indicators on a continuous basis for 131 countries in the world (EIU, 2021). Similarly to the ICRG, also the CRS scale ranges from 0 to 100, but the higher score indicates higher risk. According to Damodaran (2021), these indicators, as well as many others provided by different services, despite resulting very useful in the evaluation of country risk both historically and forward-looking, they present several problems. The first one is related to the incomparability of scores across different services, though being internally consistent (namely, it does not make any sense to compare the ICRG with the CRS or with any other indexes). Second, the procedures for computing these metrics are undisclosed by agencies to prevent others from replicating them, making it impossible for practitioners to analytically evaluate them. Third, these indexes are not intended to be linear, therefore a country score double than another does not imply that one country is twice as risky as the other.

Finally, the third and last metric refers to market-based ones, whose most commonly used measures are bond default spreads and credit default swap (henceforth CDS) spreads. These show the benefit of constantly reflecting investors' expectations at any point in time, but on the other hand they could be affected by volatility, mood shifts, and irrationality, occasionally present in financial markets (Damodaran, 2021).

Bond default spreads are the difference in yield for the specific EM's bonds and for those of a risk-free country, denominated in the same currency and for the same time. In practice, a more updated and precise measure can be computed with CDS (Godfrey and Espinosa, 2002; Abuaf, 2011), which are spreads computed over contracts to insure against the default of a specific country (Borsa Italiana, 2019). Specifically, CDS' spreads are the periodic payments made by buyers to be protected from "credit events of a reference entity" (J.P. Morgan, 1999). Damodaran (2021) argues that another market-based measure used by some analysts consists in the market volatility, defined as the standard deviation in returns of the local stock market.

Practitioners usually deploy one of these three market-based measures in the determination of premiums to be included in asset pricing models. A discussion about each of them is addressed

below (see paragraph *1.5 Determination of Country Risk Premium*), together with their application for the estimation of the Country Risk Premium (CRP).

1.3 CRP and Valuation methods

Valuation is the core of corporate finance. The literature has provided broad consensus among various methods to assess financial and real assets, systematically deployed by managers and practitioners. Among the many ways to estimate the value of a company, in this paragraph we will focus specifically on the income approach to valuation, which is inherently forward-looking since it relies explicitly on company's cash flows projections into the future (Koller et al., 2020). Its most common implementation is the Discounted Cash Flows method (henceforth DCF), which applies a discount rate to expected cash flows. But deploying these methods in developed economies is something different from doing it in emerging ones, where several assumptions underpinning the valuation lack. The reason is that traditional valuation techniques have been designed to value "minority stock portions of large public companies in developed economies" (Pereiro, 2002), therefore they require some adjustments when applied to EMs. Under DCF and relative valuation approaches the higher riskiness carried by EMs is captured by just one number: either lower cash flows or a higher discount rate (Damodaran, 2012a). In the literature it is widely debated whether the higher risk should be accounted into expected cash flows through a scenario approach or incorporated into the discount rate through a CRP. Under the first option, the effects of country risks are reflected into corporate valuations through cash flows adjustments. The theory suggests that, rather than trying to gather with a single value all the different potential outcomes, it is more appropriate to build up a set of outcomes in what is called *Multiple-Scenario analysis*. This approach consists in estimating expected cash flows under numerous scenarios, with the aim of getting a better sense of the impact of country risk on value (Senechal, 2018). When dealing with EMs indeed actual cash flows could turn out to be very different from what expected at the time of valuation. A first rough solution could be to estimate cash flows if everything goes as well as it could be (so-called *best-case scenario*), and if, instead, everything results in the worst possible outcome (*worst-case scenario*). In-between these two extremes, the analyst can build up multiple other scenarios, varying the assumptions underpinning the model accordingly. There is not an optimal number of scenarios since it will depend on how different they are between each other and how precisely the analyst is able to predict cash flows in each of them (Damodaran, 2012a). After determining a reasonable number of scenarios and having estimated the cash flows under each of

them, these will be finally weighted for the assigned probability of every scenario to occur, resulting in expected cash flows to be discounted for a proper discount rate, as follows:

$$\text{Value} = \frac{\text{Expected Cash Flows}}{\text{Discount rate} = f(\textit{Time value of money, Market Risk})} \quad (1)$$

As it can be noted, the discount rate is a function of the time value of money and of market undiversifiable risk, and country risk is not factored into the function.

However, as pointed out by Garcia-Sanchez et al. (2010), the DCF technique is based on discounting *unconditional* cash flows, which are cash flows computed considering all and every possible outcome, including those associated with crises and economic distress. If in the developed world the probability of country-wide crises is not factored into the valuation, this would result in a negligible overestimation of cash flows, given the trivial probability of such events to occur. In other words, for developed economies, unconditional cash flows will be sufficiently close to those estimated in the DCF-scenarios, despite the mistake of ignoring extremely negative outcomes. Unfortunately, this is not true for EMs, where the probability of such events is material, leading to a substantial overestimation of cash flows (ibidem). Basically, we are estimating *conditional* cash flows, undermining the same DCF-scenarios technique. The correct equation underlying the approach then it turns out to be as follows:

$$\text{Value} = \frac{\text{Expected Cash Flows} \mid \text{No crisis events}}{\text{Discount rate} = f(\textit{Time value of money, Market Risk})} \quad (2)$$

Basically, since cash flows are conditional, a relevant portion of country risk is not accounted neither into cash flows nor into the discount rate, leading to an overestimation of value.

To contrast this problem, many academics and practitioners advocate the application of a CRP to the cost of capital, which bring us to the second approach deployed in the valuation of EMs' companies. Specifically, proponents of this approach require the CRP to be added as a spread to the discount rate, in order to account for country risks, lowering the present value of cash flows.

Cash flows are not computed through a scenario approach (otherwise we will end up double-counting a large proportion of country risks) but are just those expected under the most likely future of the company. The equation underlying this model can be written as follows:

$$\text{Value} = \frac{\text{Expected Cash Flows} \mid \text{Most likely scenario}}{\text{Discount rate} = f(\textit{Time value of money, Market Risk, Country Risk})} \quad (3)$$

As it can be noted, expected cash flows are still conditional, not accounting for country risks apart from those affecting the company under the most likely scenario, while the discount rate is dependent not only on the time value of money and on the systematic market risk, but also on country risk.

Whether it is more appropriate to deploy the scenario or the CRP approach is still an open issue which has not been adequately addressed by the literature and there is not an established consensus on it (Walker, 2016; Keck et al, 1998; Garcia-Sanchez et al., 2010).

A first prominent strand of literature is provided by practitioners of McKinsey & Company, such as Keck et al. (1998), Goedhart and Haden (2003), Davies et al. (2012), together with Koller et al. (2020), then reiterated with Guimaraes (2021), who strongly affirm that including a country risk in the cost of capital is inappropriate.

Specifically, Keck et al. (1998) run a survey about the common practice adopted by professionals when evaluating projects from "risky countries", which points out that most managers tend to adjust for country risk by increasing the discount rate. For the authors this practice is not justifiable, since it undermines the theoretical foundations of DCFs models, incorporating diversifiable risk into the discount rate (see paragraph *1.4 CRP and Cost of Capital*). Consequently, it is suggested instead to go "back to the basics" through cash flows adjustments when considering an international investment. The notion is then revised with Davies et al. (2012), who assert that in valuing EMs' companies the most appropriate valuation method is DCFs with risk-weighted scenarios. In fact, marking up the discount rate "embeds opaque risk assumptions into the valuation process that are often based on little more than a gut sense that the risk is higher", while the scenario-based approach provides "the dual appeal of better answers and more transparency on the assumptions embedded within them". This is later corroborated by Koller et al. (2020), who affirm that, although it is a standard practice among analysts to introduce ad-hoc discount rate adjustments, the best option remains to model cash flow projections in a scenario approach. That is because, even if both methodologies can potentially lead to the same result, the scenario-DCF approach is "analytically more robust" and reflects better the impact of country risk on value, for the following reasons:

- Country risk are largely diversifiable, therefore once it has been accounted for its impact on expected cash flows, there is no need for an increase in the cost of capital if the risk is diversifiable (similarly to Keck);

- There is no unequivocal method to determine the CRP (see paragraph *1.5 Determination of Country Risk Premium*);
- Country risk does not impact equally on different industries and companies within the same country;
- Risk premiums are easily overestimated.

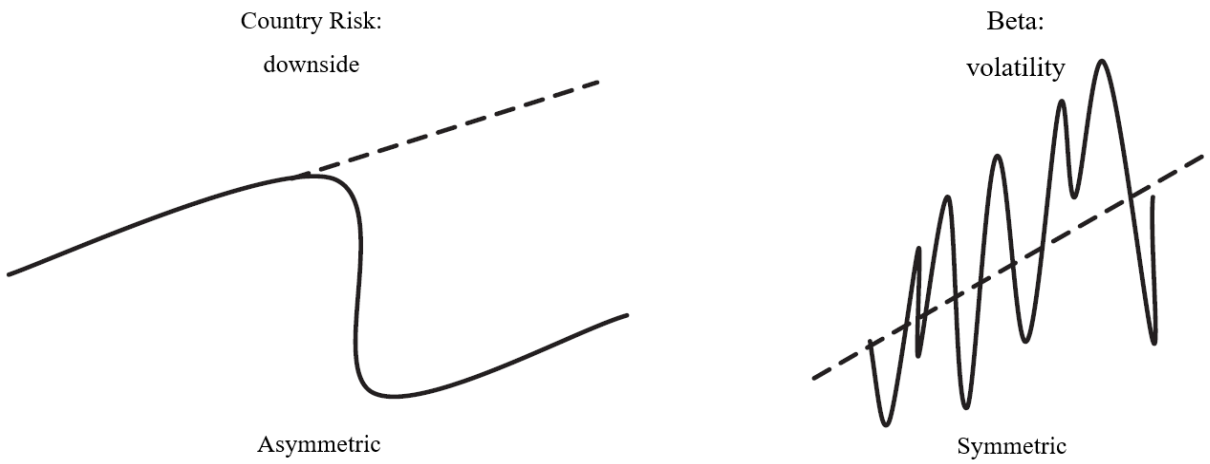
Consequently, it is suggested a "triangulation approach", with probability-weighted scenarios-DCFs as golden rule, while implementing DCFs with CRP and multiples valuation as a comparison. More recently, Guimaraes and the same Koller (2021) reaffirm that the very same valuation principles and methods used in developed markets are still valid and effective in undeveloped ones. Indeed, the authors argue that under conditions of high uncertainty, well-grounded and proven valuation techniques become indispensable, thus reiterating the validity and appropriateness of the triangulation approach.

Summing up, in the literature it can be clearly discerned a "McKinsey view", which argues that the best approach consists in DCF valuation with probability-weighted scenarios, while recommending DCF with CRP and multiples valuation as comparison, in order to contrast the volatility in values typical of EMs.

In line with the McKinsey view, Sabal (2004) points out that "adding some kind of CRP to the CAPM is not the best way to account for country risk", given that it is not entirely systematic and not all companies are exposed to it to the same degree. Thus, it is suggested to adjust cash flow projections as much as possible for country risk, while accounting for its systematic portion in the discount rate. This is corroborated by Lessard (1996), who reaches the same conclusions, stating that despite CRP approach being useful as "first cut for screening offshore investments", the final evaluation "should employ expected cash flows based on various scenarios, with discount rate adjustments reflecting only market covariance risk".

On this point agrees also Garcia-Sanchez et al. (2010), who consistently with other authors (Koller et al., 2020; Sabal, 2004; Lessard, 1996; Keck et al., 1996), argues that in the CAPM model the discount rate should include only (non-diversifiable) market risk, which is understood to be symmetric and normally distributed. The downside definition of country risk is already addressed above (see paragraph *1.2 Country Risk*), where it is presented that the literature agrees on an asymmetric definition of country risk (left portion of Figure 1). Betas, consistently with CAPM specifications, instead, represent a volatility measure, which is understood to be symmetric (right portion of Figure 1).

Figure 13.01- Country Risk and Beta representation



Source: Garcia-Sanchez et al., 2010

Therefore, the CRP approach violates the foundations of CAPM, mixing risks of different nature into the discount rate. Moreover, the same Garcia-Sanchez et al. (2010) argue that a proper application of DCF requires to discount *unconditional* cash flows, for which they propose to employ Monte Carlo simulations, computational algorithms that rely on repeated random sampling to obtain reasonable estimates, whose main advantage is that of providing a statistical distribution of values, allowing for a deeper consideration of the valuation process.

Abuaf (2015) proposes a compromise solution, namely that if there is a high correlation between EMs' stock returns (for that the author used ADRs, American Depository Receipts) and the spreads of country's CDS, then it seems more appropriate to adjust discount rates. If, instead, such stock returns show little correlation with CDS, then the best solution is to adjust cash flows. These conclusions are built upon a previous paper (Abuaf, 2011), where the author argues that CDS spreads' sensitivity is likely to be one of the most reliable indicators of exposure to country risk. Therefore, he advices to adjust the discount rate, mainly for two reasons: first, adjusting cash flows is a process "that cannot be made systematic and repeatable" and it will always be subjective; second, country risk is not fully diversifiable.

In Pereiro (2002) there can be found interesting critics to the methods presented so far, as well as an appealing solution for valuation in EMs. First, it is argued that multiples valuation is very unlikely to be applied in EMs, since stock markets are typically small and even devoid of whole industries, denying in this way one side of the McKinsey triangulation approach. Second, the author questions also Monte Carlo simulations, stating that though conceptually useful, they are very complex in terms of time and effort required, in the end doubting the effort is worth the

performance. Finally, also DCF-scenario approach is examined, concluding that it presents two main issues: the problem of estimating subjective probabilities for each scenario (somewhat similar to Abuaf's first critique) and that the more scenarios are embedded, the more the analyst risks losing focus. Therefore, the proposed solution concerns using a DCF model with CRP, given that it is extremely difficult to forecast the precise effects of country risk on cashflows. In addition, the discount rate may be time-varying, according to that "a general adjustment to a constant discount rate would not be able to account for the time-varying nature of country risk".

Also, Damodaran (2012a, 2021) concludes that "the evidence seems to suggest that you should incorporate country risk into your discount rates". In his opinion, theoretically only specific types of country risks are better embedded into cash flows than into discount rates, namely the risks which are discrete and isolated to individual countries, like earthquakes, hurricanes, or nationalizations. For all the remaining risks, the inclusion into expected cash flows is not appropriate. In fact, though technically correct, "adjusting cash flows for risk has to go beyond reflecting the likelihood of negative scenarios in the expected cash flow", since cash flows are not risk adjusted if investors are other than risk neutral. Including risks into cash flows requires anyway to determine the country risk given that to fully reflect country risk into cash flows requires us to compute the so-called *certainty equivalent*, which is the guaranteed amount of cash that would make the investor indifferent between it and the uncertain investment. But this, in turn, calls for the estimate of CRP, to be used to determine the certainty equivalent cash flows, requiring to address "exactly the same questions that we deal with when adjusting discount rates for risk".

On the other side, again Damodaran (2003, 2021), together with Koller et al. (2020) and Goedhart and Haden (2003) specify as drawback of the CRP approach that its computation is not unequivocal and that in the practical application there is a widespread overestimation of the risk, which could lead to reject profitable investment opportunities.

Ultimately, what emerges from the literature is that the best technique to value EMs is still an open issue, with relevant justifications for both the scenario and the CRP approach. The dispute stems from that some of the CRP justifications are controversial with the CAPM foundations and at the same time those who nevertheless advocate this adjustment recognize that the methods to estimate the CRP present important pitfalls. On the other hand, proponents of the cash flow method collide against subjectivity of scenario formulation, which often leads to material impossibility to compute truly unconditional cash flows.

1.4 CRP and Cost of Capital

Corporate valuation needs an appropriate discount rate to be used to obtain the present value of future cash flows. The problem is that tried-and-true models cannot be directly exported and at the same time the literature and the practice do not provide much guidance about if and how they should be applied also in EMs (Garcia-Sanchez et al., 2010). Indeed, as pointed out by Bruner et al. (2002), Pereiro (2002) and Walker (2016), there is no consensus about neither the valuation of assets and securities nor for the best practice for the estimation of the cost of capital. In the following lines it will be presented a review of the literature concerning the estimation of the cost of capital for companies based in EMs.

Whether analysts and practitioners prefer the scenario or the CRP approach, both rely on the Capital Asset Pricing Model (henceforth CAPM) to compute the cost of equity. The CAPM, theorized by Sharpe (1964), Lintner (1965), and Black (1972), is the most widely used model in finance, as demonstrated by Graham and Harvey (2001). The CAPM specifies a relationship between the expected return of any asset and its risk, which is measured through a parameter called *beta*. The model is based on the idea that the expected return of any asset in excess of a risk-free rate is proportional to that asset's systematic risk, measured by its covariance with the market wide portfolio return.

In principle, the CAPM is valid and effective to every investment. In practice though, there are some difficulties to address when applied for EMs. In fact, it is controversial whether the hypotheses behind the CAPM hold in EMs, making the straight application of the classical CAPM in such contexts debated and making room for many adjustments to the traditional model. This transforms the task of defining an appropriate cost of equity for EMs into a complex and challenging quest (Pereiro, 2002; Koller et al., 2020). The CAPM measures the cost of equity capital (K_e) as follows:

$$K_e = R_f + \beta * MRP \quad (4)$$

Where K_e is the cost of equity capital, R_f is the risk-free rate, and β is the measure of systematic risk. The right side of the formula is added with a CRP if such method is chosen for the valuation (see paragraph *1.3 CRP and Valuation methods*):

$$K_e = R_f + \beta * MRP + CRP \quad (5)$$

The cost of capital is the price charged by investors for facing the risk that the investment's future cash flows may vary from what expected at the time of valuation (Koller et al., 2020). Basically, it represents the opportunity cost of what it could have been earned from investing in another activity with the same level of risk. The cost of capital is expressed as a discount rate, used to discount future cash flows to get the present value of an investment, but this discount rate does not account for all the risks a specific company faces. In fact, one of the basic notions in finance concerns the effect of diversification. If diversifying the investment reduces risk for investors and, at the same time, for them it is not costly to do so, then investors will not require a return for any risk they can easily take away through diversification. The risk that commands an additional return is only that which cannot be diversified, namely the one affecting indistinctly all companies, which is called systematic risk. Therefore, given that many of the risks that companies usually face are in fact diversifiable, most risks do not enter into companies' cost of capital, and only the systematic risk must be priced into capital assets models. The CAPM measures the systematic risk with beta, which is standardized around one. Then, beta is translated into expected return, accordingly to [Equation (4)] or [Equation (5)]. The amount and types of risk that can be diversified depend on the degree of integration of markets. A perfectly segmented market is one in which foreign investors' capital cannot flow and from which local investors' capital cannot leave (Keck et al., 1998). Clearly, a market of this type is by definition of no interest for foreign investors, and each market will present an own unique model. Conversely, in perfectly integrated markets all the investors face the same investment opportunities regardless of their trading location, given the complete absence of barriers to international investment, and a unique CAPM can be implemented (Karolyi and Stulz, 2003). Therefore, the most appropriate pricing model will depend on the extent international financial markets are integrated (Walker, 2016). Note that integration is not a synonym for correlation: as demonstrated by Pukthuanthong and Roll (2009), cross-country correlations of stock index returns is indeed a poor measure of integration, and perfectly integrated markets may show weak correlation. A good measure of market integration is instead the explained variance from national index returns against common global factors. This is corroborated by Carrieri et al. (2007), who demonstrate that cross-market correlations, though informational, do not represent a good measure of diversification benefits nor degree of integration.

Moreover, in all risk and returns models, what matters are the characteristics of the marginal investor, not of every investor. In fact, the assumption behind the CAPM is not that all the investors are diversified, but that the marginal investors is (Damodaran, 2020). The marginal investor is defined as "the one who at margin sets prices for a stock" and must presents two features to be defined as such: first, owning a substantial number of shares; second, actively trading those shares on a regularly basis. Identifying the marginal investor is crucial in determining the level of segmentation of the market (Keck et al., 1998), indeed to include any additional factor into the discount rate, "one must explain why the marginal investor must be paid to bear that risk" (ibidem). That defined, we have still to point out the degree of integration of financial markets and the corresponding best model to employ.

In this regard, as wonderfully stated by Professors Bruner, Conroy, Estrada and Li (2002): "The cost of capital is fundamentally a bet on market integration, both on the extent and on future trends. In the limit of total world market integration, a global CAPM would be the approach to adopt. But segmentation requires adapting the global CAPM for unique risks faced by investors in emerging markets. In short, the model chosen by investors should incorporate information about the world expected during the life of the asset being valued". In principle, when financial markets are integrated, country risk becomes irrelevant and the cost of capital is best estimated following a global CAPM, that applies equally regardless of the country under consideration. If, instead, financial markets are segmented, investors have to bear country-related risk, thus it is recommended to deploy a local CAPM (Koller et al., 2020; Pereiro, 2002).

For both the global and local CAPM, the formula is the same as that of the standard CAPM [Equation (4)] but the global CAPM uses a global risk-free rate, computes beta with a univariate regression against a global index and uses a global market return. In contrast, the local CAPM is computed by using both the risk-free rate and the market return of the specific EM and beta is determined by regressing the EM's company returns against those of the EM's index (Roggi et al., 2017). Then, a CRP might be added to account for the additional risks that arise from operating in an EM, as in [Equation (5)] (see paragraph *1.3 CRP and Valuation methods*).

Authors addressing the degree of integration of financial markets are various. Bekaert et al. (2011) performed research on 69 countries, both emerging and developed, finding that segmentation has declined over time. This is corroborated by Pukthuanthong and Roll (2009), who run an analysis on 84 countries in the period 1973-2006, finding "strong evidence of growing integration for most countries". Also Stulz (1999) states that "world financial markets are now sufficiently integrated,

and investors are sufficiently internationally-diversified". The same is assumed by Keck et al. (1998) or, more recently, by Walker (2016), Koller et al. (2020) and Damodaran (2021).

Consistently with the "increasing integration" of markets, many authors such as Sercu (2009), Solnik and McLeavey (2009), and the same Stulz (1999), advocate the application of an international CAPM, even for EMs, whereas local CAPM is considered still valid only "in the passé setting of segmented financial markets and no international diversification" (Ejara et al., 2019).

In fact, as predicted by the theory and demonstrated by many academics (Dolde et al., 2011; Krapl and O'Brien, 2016), the application of a global or local CAPM returns negligible differences for the US market. Specifically, Dolde et al. (2011) analyze the estimates from the local and the global CAPM for almost 13,000 firms in the US over a 4-years period, finding that "the two models do not yield cost of equity differences that are economically very different". Similarly, Krapl and O'Brien (2016) came to the same conclusion, still focusing on the well-developed US market. The bridge with EMs is built by Karolyi and Stulz (2003), who argue that the difference between local and global CAPM is relevant just for EMs, reiterating also that it does not lead to substantial discrepancies in developed economies. This is corroborated again by Stulz (1995, 1999), who demonstrated that for EMs the application of a local CAPM lead to relevant errors in the estimation of the cost of equity if the global CAPM is valid. The bottom line is put forward by Garcia-Sanchez et al. (2017), who state that the application of a local CAPM in EMs is "generally inappropriate" since relying solely on EMs data requires to prove that EMs information is not only available, but dependable. Moreover, this in turn implies that the local capital markets should "be representative of the corresponding national economy, exhibit significant trading volumes and market liquidity, and have prices and returns that are established under something approximating free-market conditions". Clearly, where all these requirements are not met, the application of a local CAPM leads to wrong estimates (ibidem). Therefore, if the practice has established two "practitioner-friendly" models based on finance theory, namely the local and the global CAPM (Ejara et al., 2019), the first, traditional, local CAPM seems to cover an increasing marginal role, even for EMs. With regard to the global CAPM, the level of market integration, despite having experienced a significant growth in recent times, is far from accomplished to such an extent to justify the application of a "pure" global CAPM (Garcia-Sanchez et al., 2017). It is more likely that financial markets are in an intermediate situation (Bhamra et al., 2004; Coeurdacier et al., 2008; Garcia-Sanchez et al., 2017), where there is the widespread practice of "establishing the cost of capital using global data, but with adjustments for additional sources of risk that are typically associated

with EMs" (Garcia-Sanchez et al., 2017). A global CAPM involving two risk factors, which are the global market risk, as first factor, and either the exchange rate risk or the country credit risk as second one, is called "international CAPM", in line with the usual convention in the literature (Walker, 2016). It is straightforward that authors propend for exchange or credit risk basing on which one would represent the best proxy for country risk as a whole. Therefore, it is still to clarify whether, under the application of the international CAPM in EMs, the second factor should reflect the exchange rate risk or the country credit risk. Under the first strand of the literature, we can find Karolyi and Stulz (2003), Zhang (2006), and Antell and Vaihekoski (2007).

Specifically, in Karolyi and Stulz (2003), first they state that there is growing evidence that risk premia are determined globally. Then, building on the Siegel paradox, which consists in a discount bias for future exchange rates (Siegel, 1972), the authors point out that "it exists some reward for taking currency risk, so that exposures to foreign exchange rates will be priced in assets". Zhang (2006) demonstrates that exchange risk accounts for a significant part of the excess returns on international assets, consequently the conditional international CAPM with exchange risk performs the best. It must be noted, however, that the assumptions underpinning these conclusions (such as the absence of transaction costs) do not hold in practice, as stated by the same Zhang. Antell and Vaihekoski (2007), consistently with De Santis and Gerard (1998), conclude that "the price for currency risk is significantly different from zero", therefore currency risk must be priced as second factor. This view is contrasted by Koller et al. (2020), who argue that the exchange rate risk does not require any premium, since it is already incorporated into the local-currency-denominated interest rate, making the inclusion of this risk factor meaningless and negligible in practice.

Under the second strand of the literature, in favor of the country credit risk factor, we can find Erb et al. (1996a; 1996b), Bansal and Dahlquist (2002), Damodaran (2003, 2009, 2012a, 2014, 2021), Abuaf (2011, 2015), Walker (2016), Koller et al. (2020), and Avramov et al. (2012).

Damodaran (2003, 2009, 2012a, 2014, 2021), not only advocates the international CAPM, but also proposes an ad hoc method to estimate the exposure to country risk (see paragraph *1.5 Determination of Country Risk Premium*). The reasons are mainly two, hereafter presented. First, he believes that there has been an increase in correlation across markets, resulting in a significant portion of country risk to be not diversifiable. Second, for betas estimated through a global CAPM there is the possibility that they would capture some country risk, even though there is little evidence that they do in practice. This is due to the fact that global equity indices (like the MSCI World) are market weighted, resulting in lower betas for companies from small, very risky EMs

and higher ones for companies from developed markets. Therefore, using those betas would lead to lower costs of equity for EMs than for developed economies. Regarding the country risk exposure, also Abuaf (2011, 2015) proposes adjusting for country risk using CDS levels (2011), and later refined its notion considering CDS' changes and not their level (2015). Koller et al. (2020), despite recommending the so-called triangulation approach (see paragraph *1.4 CRP and Valuation methods*) suggests including the credit risk spread under the "business as usual" method (namely, under the CRP approach). Evidence from Avramov et al. (2012) proved that, in addition to the exposure to a global market portfolio, the asset pricing model improves its estimates if it is added also the exposure to global credit risk as second factor (measured as the difference between the equity returns for countries with low and high-risk ratings). In addition to claiming the credit risk as second factor, Walker (2016) points out that if betas are estimated using univariate regressions (namely, deploying a global CAPM), and market and credit risk factors are positively correlated, then betas will be overestimated with respect to those resulting from the two risk factors model (namely, the international CAPM). This drawback has been ignored by the authors of above. Moreover, the same Walker argues that it seems unlikely that proponents of credit risk as second factor are considering exchange risk as completely diversifiable. For example, in Erb et al. (1996) the country's credit risk is assumed to proxy many fundamentals risks affecting EMs, among which also the exchange risk. Indeed, it is more likely that they see credit risk as a more convenient measure of country risk given its greater easiness in measuring and quantifying the exposure to it. Therefore, it appears consistent with the literature for EMs to use each country's credit risk as a second factor in the international CAPM (Walker, 2016).

Aside from traditional local and international CAPM, many alternative methods to estimate the cost of equity for EMs have been proposed by the literature. Bodnar et al. (2003) argue that both local and global factors are relevant for the estimation of cost of capital in EMs, then proposing their own model, called the Hybrid model, whose beta is computed both in respect to the global and the local market through a multiple regression model. Respectively, global and local premiums are estimated with a global risk-free rate and the MSCI World Index, and with a local risk-free rate and the MSCI Emerging Markets Index. Lessard (1996) argues that the cost of equity for EMs can be approximated by the risk premium that investors would require for a comparable project located in the US, computed multiplying the beta of the comparable company (against the EM index) by the beta of the EM (against the US index). Pereiro (2002, 2010) advances an adjustment to betas computed through the local CAPM, in order to address the overestimation of cost of equity arising

from it. Building on Erb et al. (1995), who demonstrate that a large portion (≃40%) of the market returns' volatility is explained by country risk, Pereiro proposes to multiply the Local CAPM beta by one minus this portion. The resulting model is called the Adjusted Local CAPM. In order to address the same problem, Godfrey and Espinosa (1996) show that betas of some EMs might be negative if computed against the US market. Therefore, they propose a model which considers the CRP and reduces betas (computed against the US market) by one minus the portion of market risk related to country factors.

Finally, the empirical research has proposed also models with different additional pricing factors, estimated starting from the fit with historical data, which can be referred to as "academic-crafted" models. Proponents of these models, among them Bekaert et al. (2011; 2014), Griffin (2002), Hou et al. (2011), have created a wide range of types, often including time-varying factors. Despite country risk factors may render a market riskier than another, they do not necessarily require the use of a multi-factor model. Indeed, as stated by Keck et al. (1998) it could be "either the case of same risk priced differently or different risks are priced, and just the last condition justifies the usage of a different model". The common problem of these models is that the historical data underpinning their creation are inefficient, as stated by Damodaran (2021) and reiterated by Ejara et al. (2019).

Ultimately, the choice of the cost of equity model for EMs "is not a mechanical exercise" (Koller et al., 2020), since it depends on how conceptually sound the model seems to the analyst and on a subjective evaluation on which types of risk are present in the specific market (Pereiro, 2010; Koller et al., 2020). Although the topic is still debated, for EMs most of the literature reviewed identified the need not only for a global factor, but also for a second one that reflects an additional source of risk.

1.5 Determination of CRP

1.5.1 Approaches

At this point it should be clear that betas by themselves do not adequately represent EMs' country risk. Indeed, above it was pointed out the need to incorporate the higher country risk into either the discount rate or the expected cash flows. If we choose to follow the first option, as recommended by part of the literature, then it comes up the need to present the various ways to compute the CRP.

Assessing a reliable historical premium for advanced markets is made possible thanks to their stability and the abundance of data, but doing the same for EMs becomes doubly difficult, given their short, volatile and transitional history. This calls for always checking the standard error of estimates, since often for EMs it is not even possible to reject the null hypothesis of risk premium equal to zero, making them close to useless. If this is the case, EMs' risk premiums may provide for interesting anecdotes, but they clearly should not be used in valuation models (Damodaran, 2021). Moreover, there is broad consensus in the literature on the absence of an objective and unequivocal way to determine the CRP (Koller et al., 2020; Goedhart and Haden, 2003; Damodaran 2003). The most prominent reference that gathers widespread approval in the literature is Damodaran (2003, 2011, 2012a, 2012b, 2021). Therefore, his methods are explained in detail in the following paragraph, together with some relevant contributions from other authors.

First of all, the author specifies that the exposure to country risk is not caused by where a company is incorporated or traded, but by where it actually conducts its business and operations. Therefore, the determination of the country risk is matter of interest also for developed countries' companies if they carry out some businesses in undeveloped countries. Second, as already broadly pointed out above, Damodaran remarks that the part of risk that could be diversified away should not be considered for estimating the cost of equity.
Specifically, he proposes to start from the following basic proposition:

$$\text{Equity Risk Premium} = \text{Base Premium for Mature Equity Market} + \text{Country Risk Premium}$$

The CRP is a measure of the extra risk of investing in a specific emerging market. Estimating the base premium is extremely easy and usually analysts take for it the US market. For the extra risk of investing in an emerging market, now made explicit in the equation, first it is necessary to estimate the country risk and then to convert it into the CRP.
The most widely used method is to take the bond default spread as proxy for the CRP. Under this choice, called *sovereign bond spread*, the measure of country risk comes from a comparation between yields on bonds issued by the given country and those of a risk-free one, issued by a default-free country in the same currency. Note in fact that it is impossible to compare interest rates across bonds in different currencies.
Since CDS are standardized contracts that are far more liquid than EMs bonds, often they are used, in lieu of bonds, as reliable publicly available indicators of country risk (Godfrey and Espinosa, 1996; Abuaf, 2011). Moreover, considering that EMs' bonds or CDS spreads, despite representing

an appropriate measure of default risk, typically exhibit high volatility, analysts often take the average spread over a longer period of time instead of just the current one. Damodaran indicates as an appropriate period from 5 to 10 years, but it must be carefully evaluated whether during this time span the country has experienced some structural change in its fundamentals, which could impact the soundness of the normalization.

Note that it is very likely that many EMs would not issue bonds denominated in a suitable currency (basically Euro or Dollar). In this case, the first solution is to use CDS spreads, which are far easier to retrieve, but it could happen even for the CDS' to not exist. In this situation the solution is to adopt the so-called *Imputed spread* approach, which approximates the default spread of the country with that of another EM with the same default rating, as provided by rating agencies. It would be even better to consider also the country risk scores, like the ICRG or the CRS presented above (see paragraph *1.2 Country Risk*), in order to approximate the default spread with that of the most similar country possible.

In the literature it is debated the soundness of these approaches. Goedhart and Haden (2003) argue that the sovereign bond spread method has a fundamental pitfall, since investing in a company may have little to do with the risk of lending money to its government. Therefore, this approach is appropriate only if the quality of local government debt service is perfectly correlated with returns on investments. Indeed, it could happen for the company to have a cost of equity lower than the cost of debt for the country, or even more, the cost of debt to be lower than that of the country in which it operates. Moreover, the authors stress that for the calculation it must be used the promised yield rather than the expected yield on government bonds since the latter already accounts for the probability of distress. Contrarily, Damodaran (2021) states that despite the yield of a country bond, from which default spreads are computed, is based upon the promised cash flows (as recommended by Goedhart and Haden), in order to measure a risk premium for bonds, "we would need to estimate the expected return based upon expected cash flows, allowing for the default risk".

The sovereign bond spread method is recognized as the most used proxy for country risk also by Garcia-Sanchez et al. (2010), who nevertheless point out the inconsistency of this method, broadening the insights from Goedhart and Haden (2003). In fact, the size of the default premium will be dependent on two components: the default probability of the specific government and the recovery rate bondholders expects to receive in case of default. Using the sovereign bond spread as proxy for country risk implies considering both these components as relevant for country risk, which in turn means assuming that, first, default probability of the government equals crisis

probability in its economy and, second, that recovery rate for state bond holders equals shareholders' expected recovery rate. If the first assumption is reasonable, the second one is not justifiable at all, given that in a crisis scenario the cash flows to shareholders generated by a company are likely to differ widely from governmental cash flows to bondholders. Even though, as argued by Longstaff et al. (2005), most of the premium size is related to the most justifiable component, the default risk, this does not take away the general poor soundness of the method. Regarding CDS spreads, the same Damodaran (2021) concedes that their market shows some level of risk exposure even for the safest countries regarded as default free by the whole financial world. This means that CDS spreads do not measure pure default spread and consequently it does not exist an entity with spread equal to zero. A tentative solution would require netting the EM's CDS spread by the US one, getting an adjusted measure.

The literature provides another, more sophisticated, measure of country risk, alternative to the default spread one. Specifically, it is called *Relative Equity Market Standard Deviations* and it comes from the comparation of volatilities between stock markets. Under this approach, the standard deviation of the specific country's market is scaled against another, risk-free, market, leading to a relative measure of risk:

$$\text{Relative Standard Deviation}_{\text{Country x}} = \left(\frac{\sigma_{\text{Equity market Country x}}}{\sigma_{\text{Equity market US}}}\right)$$

Then, the relative standard deviation is multiplied by the premium for a risk-free market, such as the US one, resulting in a reasonable proxy for the CRP, as follows:

$$\text{Country Risk Premium}_{\text{Country x}} = \text{Risk Premium}_{\text{US}} * (\text{Relative Standard Deviation}_{\text{Country x}} - 1)$$

The problem with this method is that very often emerging markets are illiquid, which in turn translates into low market volatility, inevitably underestimating the risk premium. Moreover, as pointed out above, the country default spread accounts just for the default risk of the country, ignoring all the other aspects adding up into the country risk, while intuitively the default risk is just a portion, though significant, of the country risk. To address this issue, it is proposed a third approach, often referred to as the *melded approach,* which combines the previous two bringing together the country default spread with the relative standard deviations. Specifically, the default spread is multiplied by the ratio between the volatility of the country's equity market and the volatility of government bonds, resulting in the following equation:

$$\text{Country Risk Premium} = \text{Country Default Spread} * \left(\frac{\sigma_{\text{Equity}}}{\sigma_{\text{Country bond}}}\right)$$

The main difference with the relative standard deviation is that, in this case, it is measured in relation to the same EM's bond market, and not across the country's equity market and the US one. Basically, if in the previous method (Relative Equity Market Standard Deviations) investors were assumed to choose between the equity market of the emerging country and that of the US, in the melded approach investors are considered to be more likely to choose between the country's equity and bonds market. The main problem related to this approach is that it requires long-term government bonds not only to exist but also to be sufficiently traded, since if the trading is scarce the standard deviation is underestimated, resulting in an overestimation of the relative volatility value. Unluckily, in many EMs' bonds the trading volumes are so poor to result in an extremely unreliable measure, and the same applies for CDS markets. Therefore, Professor Damodaran advances one last approach which requires to scale down the default spread for the ratio between standard deviations of a global EM equity index and a global EM bond index, in order to aggregate across multiple emerging countries, coming to a more stable measure of country risk. An example of these indexes could be, respectively, the S&P Emerging Broad Market Index and the Bank of America Emerging Markets Bonds Index.

All the Damodaran's presented approaches are recapped in the following table, also listing their modifications. Please note that it is assumed a dollar viewpoint and accordingly the US market is taken as benchmark. For the Euro currency it is sufficient to substitute the US' bonds, CDS or equities with those of Germany.

Table 15.01. Damodaran's approaches

Approach type	***CRP computed as:***
Default Spread – Sovereign Bond	Country Bond yield – US treasury bond rate
Default Spread - CDS	Country CDS – US CDS
Normalized Default Spread	Average of 5-to-10 years of Default spreads
Relative Equity Market Standard Deviations	$\text{Risk Premium}_{US} * \left(\frac{\sigma_{\text{Equity market Country}}}{\sigma_{\text{Equity market US}}} - 1\right)$
Melded approach	$\text{Country Default Spread} * \left(\frac{\sigma_{\text{Equity}}}{\sigma_{\text{Country bond}}}\right)$
Melded approach – global indexes	$\text{Country Default Spread} * \left(\frac{\sigma_{\text{S\&P EM BMI}}}{\sigma_{\text{BoA EM BI}}}\right)$

Source: personal elaboration

The outputs resulting from the various approaches are clearly different between each other. Typically, the melded approaches provide larger premiums than country default spread and the relative equity standard deviation approaches. Therefore, he believes that the greater premiums resulting from melded approaches are the most appropriate for near future projections, while for longer periods the premium will converge towards other approaches' premiums, as the market becomes more mature over time.

Roggi et al. (2017) in their discussion about EMs' companies' valuation implement the "pure" melded approach, without any consideration regarding the valuation time span. Lessard (1996) instead uses the sovereign bond spread against US treasuries or indirectly derives the CRP from country risk scores. Mariscal and Hargis (1999), who developed the Goldman-Sachs Model, adopt the sovereign bond spread approach as well as Pereiro (2010) for his local CAPM model. Garcia-Sanchez et al. (2010), as pointed out above, recognize the sovereign bond spread as the most popular among practitioners, despite arguing it is substantially flawed.

Damodaran proposed also a completely different approach, opposed to those presented so far since it is not based on historical information, but it assumes that the market is overall correctly priced. This approach is called *Implied premium* and it basically consists in reverse-engineering the equity risk premium from valuation models, supposing that the market is fairly pricing assets and assuming all the other inputs. Taking as an example the following very basic valuation model:

$$\text{Value} = \frac{\text{Expected Dividends}_{t+1}}{\text{WACC} - \text{g}}$$

where g is the expected growth rate, three of the four inputs can be retrieved externally. For the value, it is simply necessary to take the current market estimation, same for expected dividends and their growth over the long term. Then, this approach just requires solving for the (implied) WACC, which is the required return on capital. Once the process is run and the result for an EM is available, there is the need to break up it into country specific risk premium and basic mature market premium. This can be done repeating the same approach for a mature market, like the US one, and then comparing the result with the one achieved in the EM.

This approach eludes the need of reliable historical information, presenting the advantage of being market driven and current, but on the other hand it heavily relies on the correctness of valuation models and on the availability of inputs often hard to retrieve for emerging markets, such as the long term expected growth rate.

1.5.2 Measuring Country Risk exposure

After having achieved a reasonable estimation of the CRP, there is still the need to measure each firm individual exposure to country risk. In fact, it is pointless to apply the same risk premium for all the sectors within a specific country, given that the exposure to the country risk varies between sectors and even between companies within sectors (Garcia-Sanchez et al. 2010; Goedhart and Haden, 2003; Damodaran, 2003; Damodaran, 2009). Moreover, a company incorporated in an emerging market might operate mainly in mature markets, or vice versa, one incorporated in a developed market might have a great portion or even all of its facilities and operations in EMs (Roggi et al., 2017) (Koller et al. 2020). This idea is brilliantly captured by a statement reported by Bruner et al. (2002), who quotes that "it is firms, not countries or markets, that are emerging".

Accordingly, many practitioners and academics have presented their own model to capture the specific country risk exposure of each company, giving rise to a colorful framework.

Despite this brief introduction, in practice the simplest assumption and the one that is often made when dealing with country risk exposure is that all and every company in the same market is exposed to the same level of country risk. This method is called the *Bludgeon approach* (Damodaran, 2003), and it applies the same CRP regardless the industry and the individual company under consideration. The computation of the cost of equity can be then summarized as follows:

$$\text{Cost of Equity} = \text{Risk-free rate} + \beta * \text{Market Risk Premium} + \text{CRP}$$

As argued by many authors above, this approach is inconsistent with the real-world framework and it is overly simplistic.

A second approach that encompasses a first step in the direction of a varying country risk exposure is called the *Beta approach* (Damodaran, 2003). Basically, it assumes the exposure to country risk to be proportional to the exposure to the market systematic risk, as measured by the beta. The cost of equity under this approach is computed as follows:

$$\text{Cost of Equity} = \text{Risk-free rate} + \beta\ (\text{Market Risk Premium} + \text{CRP})$$

It emerges clearly that the impact of CRP is dependent on the systematic risk factor, namely the beta. The advantage of using betas to scale down or up the impact of country risk is appealing for its easiness, but it is conceptually wrong, since betas do not, and are not intended to, capture country

risk exposure. This method has been criticized by Kruschwitz et al. (2010) who argue that basically it consists in raising the market risk premium by a CRP, while "within the framework of CAPM a market risk premium is an entity that is wholly independent of the company under review", therefore this method is irreconcilable with CAPM foundations.

Damodaran (2003) proposes another more elaborated option called the *Lambda approach*, which requires country risk exposure to be separately estimated from betas. This allows for each individual company to have a different risk exposure measured through a parameter that Damodaran calls *Lambda*. Under this approach the cost of equity is determined as:

$$\text{Cost of Equity} = \text{Risk-free rate} + \beta * \text{Mature Market Premium} + \lambda * \text{CRP}$$

Similarly to betas, lambda is scaled around one, therefore a lambda greater than one indicates a higher-than-average exposure to country risk, while a lambda lower than one denotes a lower-than-average country risk exposure. If it is common sense that different companies should be impacted differently by country risk, it is still debated which should be the determinants of this exposure.

The first straightforward solution could be to compute lambdas basing on the share of turnover produced in the specific country on the average turnover of other companies. If the firm's share of revenues in the country can be easily retrieved, the same does not apply for the average firm, irremediably spoiling the application of this method. Moreover, this approach in estimating the lambda was seriously criticized by Kruschwitz et al. (2010), who argue that using just revenues misses other aspects of country risk exposure and it not based on any theoretical foundation. Professor Damodaran (2012) responded to criticisms, conceding that using just revenues misses other aspects of country risk exposure, but arguing that "richer approaches (…) require access to information on individual companies that is not widely available".

A second option to measure lambda is represented by accounting earnings. Intuitively, the more earnings a company does in the country, the more it is exposed to country risks. Even this method is not devoid of drawbacks, given that earnings recognition often lags far behind the changes in the company's fundamentals, earnings can be manipulated through accounting procedures, and they are available only when disclosed by the company through financial statements.

The third and last method to measure country risk exposure entails market prices. Specifically, Damodaran proposed to run a process similar to that for the computation of betas, determining the sensitivity of stocks returns to government bonds' yields. The lambda will be then the coefficient

of the interpolating line in the regression, which is equal to the covariance of stock returns with government's bonds yields divided by the variance of government bonds yields, as follows:

$$\lambda = \frac{\sigma \text{ Stock returns, Government bonds returns}}{\sigma \text{ Government bonds returns}}$$

Clearly, this method is applicable only in the event of a largely liquid bonds' market, denominated in a stable currency. Moreover, it must be paid attention to the standard error of estimates, which could undermine the soundness of the lambda value.

1.6 Multiple valuation

DCF models and CRP determination presented in previous paragraphs are not easily applicable within the framework of EMs, since they require detailed financial information that are not always available or reliable (Festel et al., 2013). Moreover, even if such information is available and reliable, it should also be comparable (Choi et al., 2019) to be effectively used for valuation purposes. Therefore, analysts and practitioners have developed a more feasible valuation method when dealing with context of information scarcity, unreliability, or incomparability. This relates to multiples analysis, a relative valuation methodology which uses different financial ratios from a peer group to determine the value of a comparable company. It is defined as "an expression of market value relative to a key statistic that is assumed to relate to that value" (Suozzo et al., 2001). It represents a shorthand for summarizing how the stock market values a target company, commonly deployed by analysts. Damodaran (2005) indeed found through 550 reports from investment banks that multiples were used ten times more than DCF, often even when information was available. Mutiples can be split between two categories (Damodaran, 2006; Massari et al., 2014):

- Enterprise value multiples, such as EV/Sales, EV/EBITDA, and EV/EBIT;
- Equity multiples, such as P/E, PEG, P/BV, and P/S ratios.

As pointed out by some studies (Bhojraj and Lee, 2002; Bernström, 2014; Deloitte, 2020), valuation through multiples shall be forecast-based. Only when no reliable forecasts are available then historical multiples can be used as second-best solution. Indeed, forward-looking multiples are more accurate predictors than historical ones (*ibidem*). The problem is that, when dealing with

EMs' companies, forecasts are often not available, or if so, they are unreliable. Regarding the appropriate time-frame of multiples valuation, indeed, the vast majority of the literature performed an historical analysis on a 1-10 years interval (Damodaran, 2013; Lie and Lie; 2002; Omran, 2013; Salmanov et al., 2015; Goh et al., 2015), while other focused on 10 to 20 years of investigation (Bagna and Ramusino, 2017; Liu et al., 2002; Trejo et al., 2015). The intuition is that longer time frames are appropriate in the valuation of developed countries' companies, while it is not the same for fast-changing and growing economies, given that an emerging country today could be regarded as developed 20 years apart.

Many studies focus on which multiples constitute the best in estimating companies' value. To date, there is no clear consensus on the topic, especially for EMs (Salmanov et al., 2015; Barbier and Farfan, 2021). In fact, multiples better determining companies' value in developed countries are not necessarily the same for EMs (Omran, 2003). Throughout the years the debate has focused mainly on two alternatives, one for EV and one for equity multiples: the P/E and EV/EBITDA.

The P/E ratio measures a company's share price relative to its earnings per share (EPS) of the period, returning how much an investor is willing to pay for one dollar of earnings from that company. The formula is very simple, and it can be described as follows:

$$\text{P/E Ratio} = \frac{Market\ value}{Earnings}$$

This ratio is ubiquitous but distorted by differences in the capital structure, which means that a company financed with a higher proportion of debt will have a lower P/E ratio, ceteris paribus, than a company with lower debt. As an alternative to the P/E, the EV/EBITDA ratio compares the value of the company, computed as the total value of all the stocks plus the outstanding debt, net the available cash resources, to the earnings before interest, taxes, depreciation and amortization, as follows:

$$\text{EV/EBITDA} = \frac{Market\ capitalization + Total\ debt - Cash\ \&\ cash\ equivalents}{Earnings\ before\ interest, taxes, depreciation\ and\ amortization}$$

This indicator presents the advantage of being independent from how the company is financed, allowing for the comparation among companies and sectors with different level of leverage.

For developed economies, Liu et al. (2002) conducted a study concluding that multiples based on earnings seem to present a greater ability to estimate the value of US companies, identifying the P/E ratio as the best one. The same conclusions were corroborated by a more recent study from the same authors (Liu et al., 2007). Focusing on European companies, Schreiner and Spremann (2007) similarly point out that equity multiples (P/E and P/BV) overall are more accurate than enterprise value multiples (EV/EBITDA and EV/EBIT). This was corroborated by Pinto et al. (2019), Damodaran (2013) and Yin et al. (2018). In contrast, Bagna and Ramusino (2017) state that the EV/EBITDA performs better than any other multiple for European companies.

Passing to studies conducted for EMs, despite Lie and Lie (2002) arguing in favor of the EV/EBITDA, Zelazowski (2015) and Goh et al. (2015) demonstrated the superiority of P/E ratio. Mild results were found by Trejo et al. (2015), who indicates the P/E and EV/EBITDA as having similar potential. Given these premises, in the subsequent empirical analysis of Chapter 3 we decided to stick with the majority of the current literature, adopting the P/E ratio.

Another crucial element in every multiple valuation is the definition of the "right" panel of peers, which are "those that compete in the same markets, are subject to the same set of macroeconomic forces, and have similar growth and returns on capital" (Foushee et al., 2012). The predictive capacity of multiples valuation indeed can be greatly improved by accurately selecting a set of comparable companies (Bhojraj and Lee, 2002; Foushee et al., 2012; Cooper and Cordeiro; 2008). Cooper and Cordeiro (*ibidem*) argue that ten closely comparable companies form an adequate set of companies, since the relative accuracy of the valuation does not depend on the size of the panel but on the similarities among the companies composing it. Comparable companies should be active in the same or closely related industries (Plenborg and Pimentel, 2016), be of similar size (Cheng and McNamara, 2000), and present similar liquidity in the market (Bolsa de Valores de Lima, 2018). Damodaran (2009) believes that even when the comparison can be easily built on a large number of firms, the differences between these firms on risk and growth characteristics can lead to erroneous conclusions. Therefore, he suggests controlling for differences using regression analysis, especially in the case of EMs. Moreover, the same author points out that EMs often present a great disparity between stocks' liquidity, as the less traded stocks are frequently illiquid. As a solution, he recommends controlling also for differences in liquidity (e.g. through trading volumes).

Differences in multiples are driven mainly by three factors (Bouchet et al.; 2003; Gaio, 2009; Pereiro, 2010; Damodaran, 2013; Salmanov et al., 2016): country, industry, and company-specific factors. Countries' characteristics take priority over firms' characteristics in EMs, while firms'

characteristics are more relevant in developed countries (Gaio, 2009). However, the impact of countries' features on valuation differs for various countries, also among developed economies (An et al., 2010). The empirical analysis performed on Chapter 3 tries to shed light on this topic, investigating the importance of country factors in the determination of multiples.

2 Emerging countries: a deeper insight

This chapter provides a detailed overview of EMs data and characteristics, whenever possible also comparing data coming from the rest of the world. The reference panel of emerging countries is consistent with that identified in the first chapter (see paragraph *1.1 Definition of Emerging Markets*). Accordingly, one of the aims of the following examination is to pave the way to the subsequent empirical analysis on EMs in the third chapter.

Most of the data are extrapolated either from The World Bank's database (2021) or from Damodaran's online database, on its most recent update of January 2022. Damodaran's dataset aggregates many different sources of data for a long-time span, indeed it is the result of a consolidation of more than a hundred different datasets, whose most notable representatives are Bloomberg, Morningstar, Capital IQ, and Compustat. It is updated on a yearly basis and it encompasses 47.606 companies from all around the world, presented in aggregate form for countries and industries. The database divides companies' data into five distinct geographical areas, as in the following table:

Table 2.01- Damodaran's Database categories

Emerging Markets	All of Asia (other than Japan), Latin America, Africa, Middle East, Eastern Europe, Russia.
Europe	Western Europe and UK
Japan	Japan
United States	United States
Australia, New Zealand and Canada	Australia, New Zealand and Canada

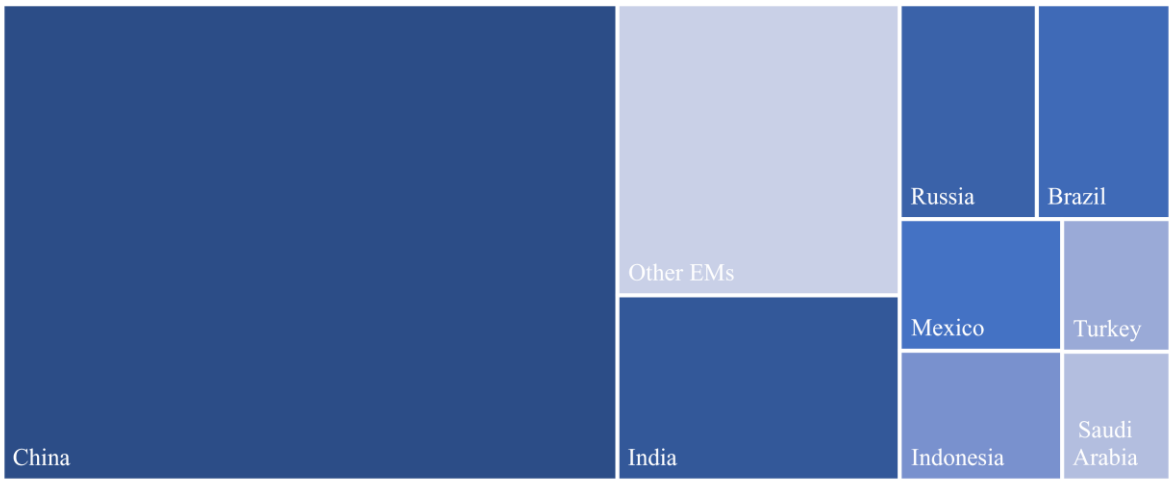
Source: Damodaran (2022)

The database makes also separately available data for China and India, the two most relevant players of EMs.

The panel of developed economies, often used in this chapter as comparation with EMs, encompasses 28 advanced countries and it is built coherently with the data sources we deploy. The detailed list of developed economies can be found in the appendix (see Appendix 4).

2.1 EMs' GDP – composition and comparation

Figure 21.01- Composition of Emerging countries' GDP



China	India	Russia	Brazil	Mexico	Indonesia	Turkey	Saudi Arabia	Other EMs
52,7%	*9,4%*	*5,3%*	*5,2%*	*3,8%*	*3,8%*	*2,6%*	*2,5%*	*14,8%*

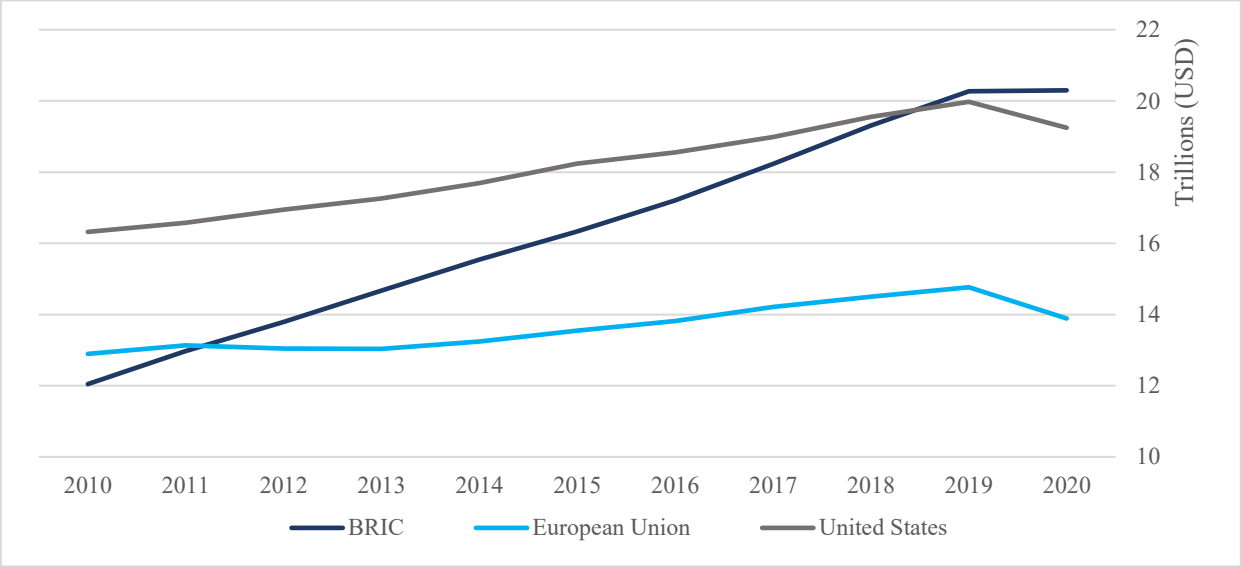
Source: personal elaboration on The World Bank (2020)

From the panel of EMs outlined above (see paragraph *1.1 Definition of Emerging Markets*), each country's Gross Domestic Product (henceforth GDP) has been retrieved. As presented, in 2020 China accounted for more than half of EMs' Total GDP (52%). On the second place, India lags far behind, accounting just for 9,4%, while Russia and Brazil are almost equivaling (≃5,3%). These four countries form what is known as BRIC, an acronym coined by Goldman Sachs back in 2003 to identify those emerging countries that were expected to dominate the world economy by 2050, becoming "together larger than the G6 in US dollar term". Specifically, BRIC countries share some common features (Goldman Sachs, 2003):

- developing economies with rising economic indicators;
- large population (hundreds of millions for Russia and Brazil, over one billion for China and India);
- vast territory with valuable natural resources.

In 2020 BRIC countries represented overall almost 73% of the total EMs' GDP, so it is worth comparing the GDP dynamics between them, the European Union and the US, as shown in the following graph.

Figure 21.02- BRIC, EU and U.S. GDP dynamics



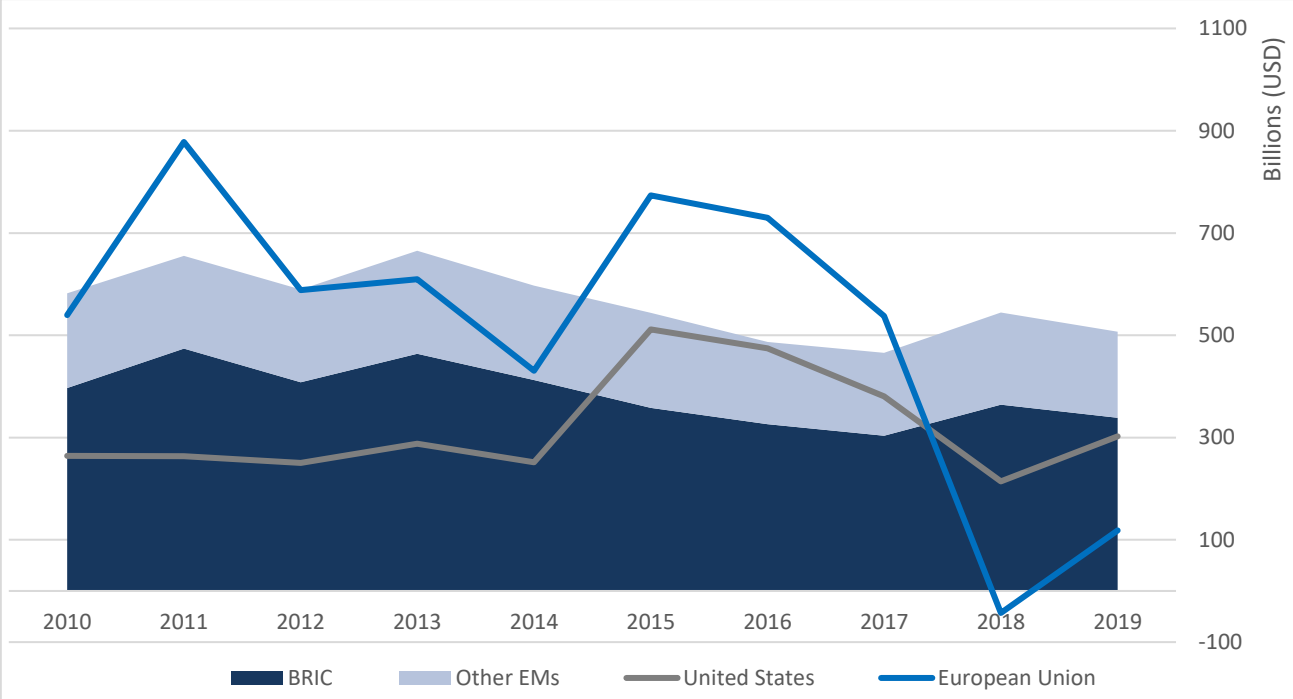
	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
BRIC	0,11%	4,98%	5,94%	5,95%	5,36%	5,08%	5,92%	6,38%	6,37%	7,67%
EU	-5,96%	1,82%	2,07%	2,81%	2,01%	2,31%	1,58%	-0,03%	-0,71%	1,86%
US	-3,64%	2,16%	3,00%	2,33%	1,71%	3,08%	2,53%	1,84%	2,25%	1,55%

Source: personal elaboration on The World Bank (2010 -2020)

Data are in constant 2015 prices, expressed in U.S. dollars converted from domestic currencies using 2015 official exchange rates. It can be seen the steep growth of BRIC economies (CAGR 2010-2020 = 5,36%), which brought them to overcome the EU in 2011 (CAGR = 0,74%) and, more recently, also the U.S. (CAGR = 1,66%). The detailed view of all the countries GDP can be found in the appendix.

2.2 Foreign Direct Investments- dynamic and comparation

Figure 22.01 - FDIs comparation and dynamic

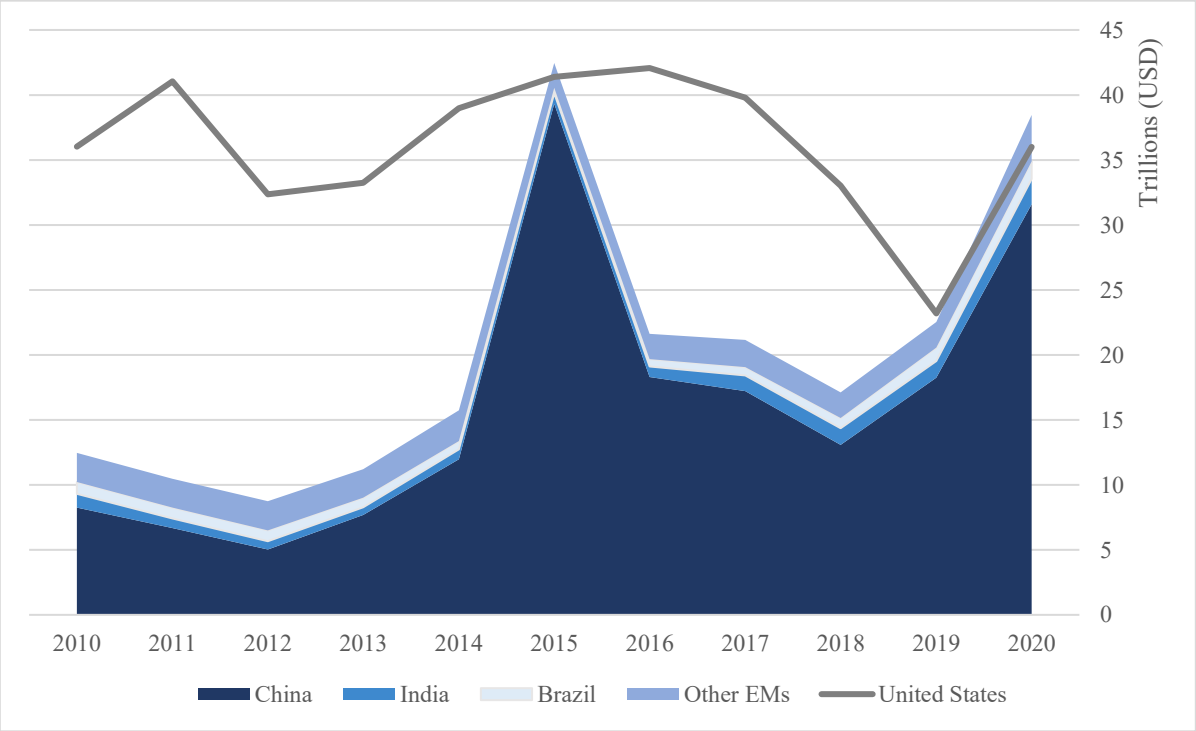


Source: personal elaboration on The World Bank (2010 -2020)

Foreign direct investments (FDIs), as defined by the International Monetary Fund (2004), are cross border investments associated with a direct investor, who is resident in given economy, owning or having significant degree of influence on the management of an enterprise that is resident in another economy, specified by the ownership of 10 percent or more of the ordinary shares or voting power (for an incorporated enterprise) or the equivalent (for an unincorporated enterprise). Specifically, FDIs are the sum of equity capital, reinvestment of earnings, and other capital inflows. They constitute a crucial factor of development for EMs, since they assist the growth and progress during or after institutional, infrastructural, and economic instability. In the graph above the flow of FDIs towards the specific area (BRIC, other EMs, US, or EU) is expressed in 2020 U.S. dollars. It can be seen as BRIC countries attract the great part of FDIs towards emerging economies ($\simeq$60% throughout the period of consideration) and also the stability of such flows, which are more constant and flatter than US or EU's ones. It is interesting to also note the aggregated level of EMs' FDIs, steadily higher than that of US. This is consistent with the role played by EMs, which become center of attraction for financial investments.

2.3 Value of annual shares traded

Figure 23.01 - Total value of shares traded



Source: personal elaboration on The World Bank (2010 -2020)

The graph shows the total value of shares traded intended as the total number of shares traded, both domestic and foreign, multiplied by their respective matching prices, for all the companies admitted to listing and trading. Figures have been single counted (only one side of the transaction is considered). Data are year-end values converted to U.S. dollars using corresponding year-end foreign exchange rates. Please note that U.S. figure for the year 2020 was not disclosed, therefore it is presented an estimation.

As shown, EMs traded shares' value is heavily dominated by the Chinese stock market, which accounts on average for the 75% of total EMs value (period 2010-2020). It stands out the tremendous surge occurred in 2015, caused by the Chinese stock market bubble, when the Shangai Stock Exchange hit a seven-year peak before falling of about 30% over three weeks. This represents a clear example of country risk we presented so far, as well as of the high market volatility typical of EMs. Apart from 2015, it can be noted that U.S. trade volumes have always been much greater

than all EMs together. This denotes the typical lower liquidity of these markets as compared to the U.S. one. However, in the time period 2016-2019, U.S. market has shown a downward trend, which, together with the impact of the pandemic, brought it to a substantial parity with EMs for year 2020.

2.4 Default Ratings

Table 24.01 - Emerging Countries Moody's Ratings (as of 01/2022).

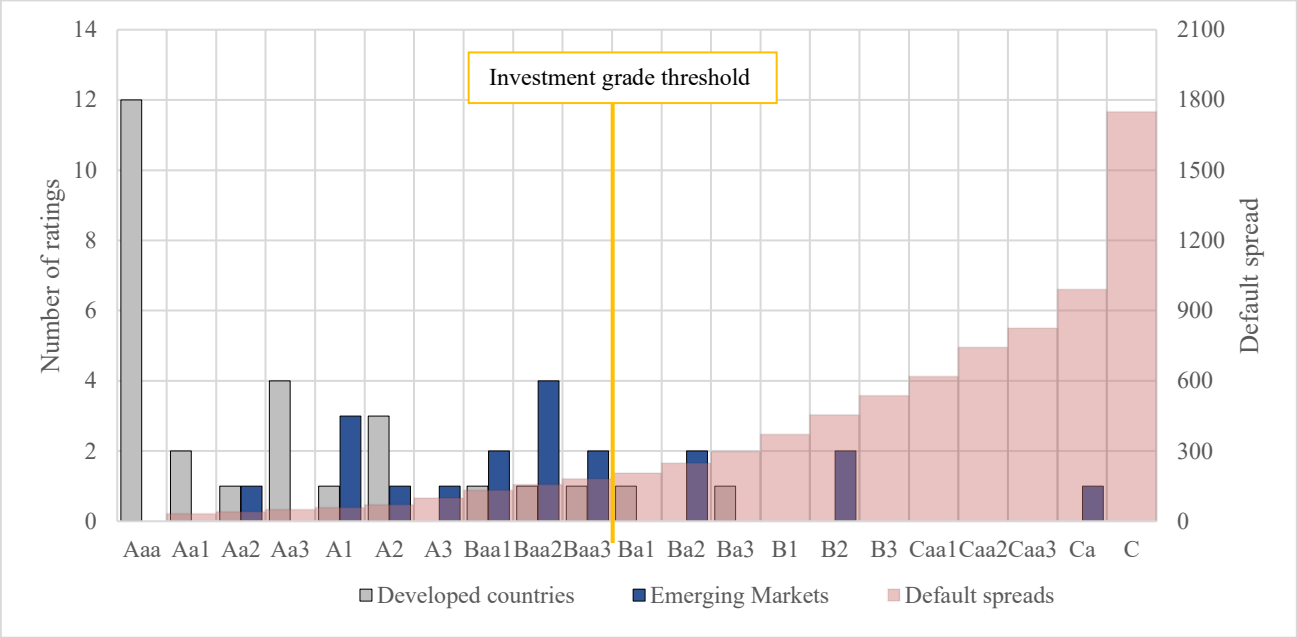
Country	Moody's Rating		Country	Moody's Rating
United Arab Emirates	Aa2		Indonesia	Baa2
Chile	A1		Philippines	Baa2
China	A1		India	Baa3
Saudi Arabia	A1		Russia	Baa3
Poland	A2		Brazil	Ba2
Malaysia	A3		South Africa	Ba2
Mexico	Baa1		Egypt	B2
Thailand	Baa1		Turkey	B2
Colombia	Baa2		Argentina	Ca
Hungary	Baa2		Iran	N/A

Source: personal elaboration on Damodaran database (2022)

To provide an insight of the ratings allocation among emerging and developed markets, here are presented Moody's' ratings, as of January 2022, for all the EMs considered above. As shown, most of them (14 out of 20) fall within the investment grade area, defined by ratings equal or higher to Baa3 in the Moody's classification. This is an important feature, since securities not included in the investment grade category will be regarded as "junk bonds" by investors, resulting in lower liquidity and higher volatility, which can negatively impact the soundness of CRP estimations of above (see paragraph *1.5 Determination of CRP*). Note that Iran's default rating was not issued neither by Moody's nor by Standard&Poor's.

To give a clearer picture hereafter is provided a graphical comparation with ratings coming from a panel of 28 developed countries, whose detailed view is available in the appendix.

Figure 24.02 - Moody's Ratings with relative default spread (as of January 2022)



Source: personal elaboration on Damodaran database (2022)

As it can be noted, developed countries are heavily concentrated on the triple A or slightly lower categories: 2 out of 3 are in the top-4 ratings, while in the same we find just one emerging country (United Arab Emirates). EMs instead exhibit a flatter distribution, with the median being in the Baa2 rating, in the proximity of the investment grade threshold. The only two developed countries outside the investment grade area are Cyprus (Ba1) and Greece (Ba3).

The graph is also enriched with a secondary axis, indicating default spreads for each category of ratings. These are computed by averaging CDS and sovereign bonds' spreads by rating class, at the start of the year. As it can be noted, default spreads follow a path resembling an exponential growth, ranging from 0 to 1750 bps. The average default spread for the panel of developed countries under consideration is equal to 55 bps (median 36,9), while the same for EMs is equal to 213 bps (median 157). This points out the higher country risk estimated for EMs, given that one of the most widely used methods to compute CRP (see paragraph *1.5 Determination of CRP*) concerns bonds or CDS spreads.

3 Empirical analysis

The first chapter provided a comprehensive analysis of the existing literature on the EMs' valuation problems and tools, and it ended with the crucial topic of multiples valuation. The second chapter presented some insights on EMs' distinctive characteristics, with a focus on the last decade. The following chapter, instead, includes an empirical analysis performed on 4.880 companies coming from a selected panel of countries' Stock Exchanges, considered for the same period, from 2011 to 2019. The goal of this analysis is that of investigating whether substantial differences between developed and developing countries' company multiples exist, and if so, which can be the reasons behind.

That is an empirical question which can lead to two antithetical conclusions. It could be the case that markets do not care about country risk and therefore it is not priced in the value of stocks, or it could be that pricing multiples, turn out to be substantially lower for EMs, which is consistent with the argument that country risk does matter. In the latter case then the tricky matter becomes "how low" multiples should be with respect to those of developed markets in order to be consistent with the existence of a CRP.

Firstly, this chapter outlines the methodology that will be used in performing the analysis. Later, the companies' sample is presented, introducing its main features and characteristics. Thereafter, the investigation is performed with the analysis on companies' indicators, segmented for sectors, which will lead to qualitative conclusions on the topic.

3.1 Methodology and Research approach

The empirical analysis performed in this chapter has been carried out on companies' multiples, working on aggregated data for industries. In the analysis we will employ one equity multiple, namely the P/E ratio, consistently with what exposed in Chapter 1 (*see paragraph* 1.6 Multiple Valuation). Indeed, we found enough evidence in the literature arguing in favor to

Moreover, we will segment data in order to respect as much as possible all Chapter 1 prescriptions, avoiding "apples to oranges" comparisons. In fact, it is intuitive, as well as demonstrated in practice that different industries present different exposure to country risks.

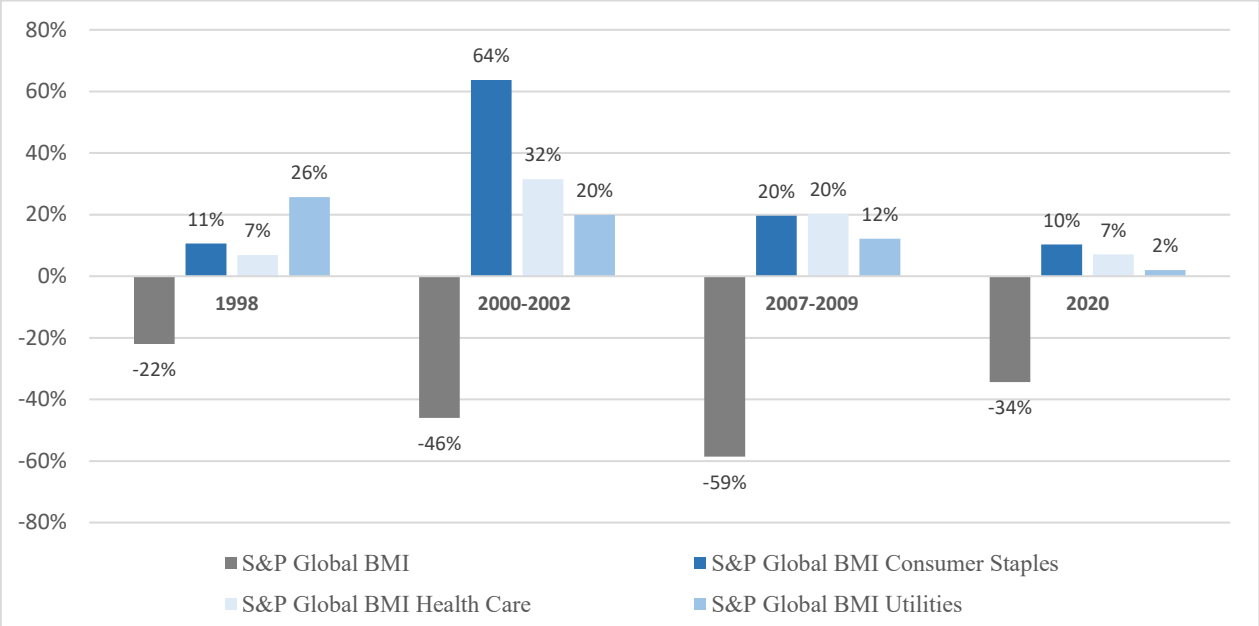
However, a simple comparison between emerging and developed countries' multiples would be pointless, not allowing to draw any meaningful conclusion. The problem is not in the data, but in the fact that multiples are affected by much more than just country risk. A stock's multiple, be it

EV/EBITDA or P/E, is impacted by several components other than pure country risk: the position of the industry in its life cycle, the strength of the competition, the degree of operating leverage, and even investor sentiment, just to name a few of them (Pereiro, 2010). All these factors compose what were categorized above as industry or company-specific characteristics, in addition to country's ones. Therefore, we will try to isolate as much as possible pure country risk from other factors still affecting companies' multiples. To do that, after having segmented for sectors, data coming from same sectors of different countries would be aggregated together, in order to smooth potential country-specific or area-specific effects present in the data, other than country risk.

Industries are not chosen randomly but basing on the theoretical impact of country risk to each. Indeed, as pointed out by S&P Global (2020) and Ilmanen et al. (2015), that are some business sectors which, in ordinary times, show below-average returns but prosper when a country faces war, instability, crisis, economic downturns, or pandemics. In other words, there is a category of stocks, often referred to as "*defensive"*, which are more than resilient to shocks but show standard performances during better times. Some prominent examples are consumer staples, health care, and utilities businesses. The first term refers to a set of essential products used by customers, such as food and beverage, household goods, and hygiene products. As argued by S&P Global (2020), "their underlying business models help to make the consumer staples, health care, and utilities sectors less sensitive to economic cycles and more resistant to the market downturns", basically helping these sectors to "generate steady revenues under various economic situations". The common feature of these industries is that they provide high-priority goods or services whose demand rise when the circumstances become unstable. This concept is brilliantly proved by a comparison between returns of four indexes during the deepest crisis of the last 25 years. The first one is the S&P Global Broad Market Index (BMI), which is a global benchmark including more than 14,000 stocks from 49 countries (25 developed and 24 emerging). Then, as comparison we take the S&P Global BMI Health Care index, the S&P Global BMI Consumer Staples and S&P Global BMI Utilities. The first includes those companies of the S&P Global that operate in the health care sector and its sub-industries. The same holds for the S&P Global BMI Consumer Staples and S&P Global BMI Utilities for basic goods and utilities industries respectively. The performance of all these indexes is measured during four moments of crisis. The first goes back to the late summer of 1998, when the *Asian financial crisis* occurred, heavily impacting on the economies of South-East Asia, predominantly emerging. Between March 2000 and October 2002 Nasdaq fell 78% in what is known as the *Dot-com bubble burst*. Some years later, the S*ubprime*

mortgages crisis exploded in the U.S., then affecting the whole global economy. Finally, in 2020 the *Covid-19 pandemic* spread worldwide, becoming one of the deadliest pandemics in history. In the following graph it is shown the comparison between the performances of the four S&P indexes:

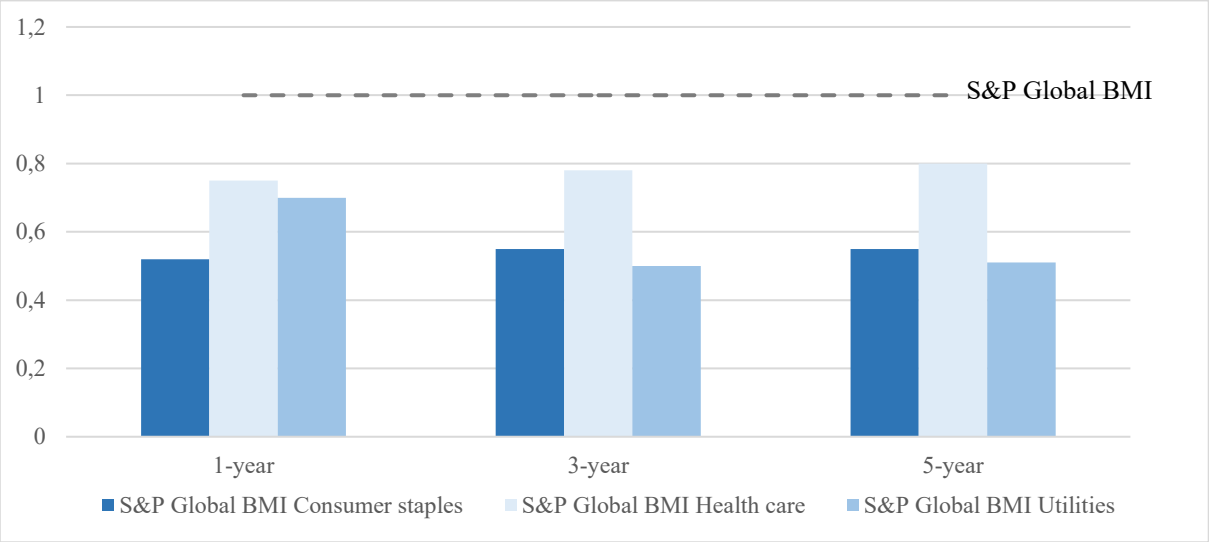
Figure 31.01 – Performances of defensive indexes during major crisis



Source: Re-elaboration from S&P Dow Jones Indices (2020)

It is overly evident that the Broad Global benchmark's returns move in the opposite direction with respect to the three *defensive stocks* indexes, which show a positive performance during all of the crisis. This is consistent with the concept that these industries, and in particular consumer staples, health care, and utilities, perform resiliently during downturns. Defensive stocks, indeed, tend to present less-than-one betas, which means that they move less than proportionally with respect to the overall market.

Figure 31.02 - Betas of defensive indexes



The graph highlights this concept, showing substantially lower betas for the three defensive stocks with respect to S&P Global benchmark, whose beta is equal to 1 being a broad global index.

However, as pointed out above (*see paragraph 1.5.2 Measuring Country Risk exposure*), beta measures the exposure to non-diversifiable market risk, while they are uncapable to capture the exposure to specific country risk. The intuition is that defensive stocks are simultaneously less exposed both to systematic risk and country risk, which will be one of the fundamental assumptions underpinning the empirical analysis.

On the other hand, there are some other sectors which thrive in quiet-as-usual or growing scenarios but are devastated when even the smallest element of instability come into the picture. This category, often referred to as referred to as *cyclical stocks*, encompasses companies that provide nonessential goods or services whose demand expands as the economy grows. Indeed, consumers tend to buy the discretionary products of these companies in a booming economy, but they cut down first their same consumption as periods of crisis approach (The Economic Times, 2022). There is a wide array of representatives for this category: financial services, real estate activities, travel and hospitality, construction, or automotive industry, just to name the most prominent.

The comparison between the six types of industries (three *defensive* and three *cyclical*) among developed and emerging countries brings an additional element to the analysis, enabling us to draw more compelling conclusions that those accessible with a simpler investigation. In fact, we assume the impact of country risk to be substantially different between the two types of industries. Moreover, at the same time we are comparing developed countries, whose country risk is by

definition around zero, with EMs, which show a meaningful level of it. As a result, the empirical analysis will be performed on four different classes of companies' multiples, here presented:

Figure 31.03 – Empirical analysis matrix by groups

Emerging countries	**GROUP 1** High Country risk but multiples slightly impacted by it	**GROUP 2** High Country risk and multiples highly impacted by it
Developed countries	**GROUP 3** Zero or low Country risk and multiples slightly impacted by it	**GROUP 4** Zero or low Country risk but multiples highly impacted by it
	Defensive stocks	Cyclical stocks

The four groups are labeled basing on the extent to which companies' multiples are expected to be affected by the country risk level, with Group 4 as the most affected and Group 1 as the least one. The groups breakdown, basing on the industries and countries presented above, is the following:

Table 31.04 – Empirical analysis groups' breakdown

Group #	Countries	Industries
Group 1	United Arab Emirates; Chile; China; Saudi Arabia; Poland; Malaysia; Mexico; Thailand; Colombia; Hungary; Indonesia; Philippines; India; Russia; Brazil; South Africa; Egypt; Turkey; Argentina; Iran.	Consumer staples; Health care; Utilities.
Group 2	United Arab Emirates; Chile; China; Saudi Arabia; Poland; Malaysia; Mexico; Thailand; Colombia; Hungary; Indonesia; Philippines;	Real estate; Financial services; Hospitality.

	India; Russia; Brazil; South Africa; Egypt; Turkey; Argentina; Iran.	
Group 3	United States; European Union*; United Kingdom; Japan.	Consumer staples; Health care; Utilities.
Group 4	United States; European Union*; United Kingdom; Japan.	Real estate; Financial services; Hospitality.

*Selected countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden.

As time span of the analysis, since there cannot be retrieved a consistent number of EMs' forecasted multiples, we will implement an historical-based analysis focusing on the period from 2011 to 2019. This is a sufficiently long and recent time span whose data are largely available, and it is immediately before the covid pandemic, whose effects' investigation goes beyond the scope of this dissertation. In fact, we believe that including in the time series such period of widespread crisis and instability would have added much noise to the analysis, potentially undermining the goodness of its results.

3.1.1 Data collection

As stated initially, data are extracted from Bureau Van Dijk's database called *Orbis*, which belongs to Moody's Analytics. Orbis is the world most complete source of comparable data for companies, providing data about 400 million firms (Orbis, 2022). Damodaran's database instead, despite aggregating many important data sources provides only data by country and industry, which are not enough for the analysis we are performing. Indeed, we need a level of data granularity which can be retrieved only through such dataset.

Therefore, we extrapolated data from Orbis performing Boolean research with the following six steps:

1. Just active companies;
2. Listed in a Stock Exchange among those in [Table 31.04] and [Table 31.05];
3. First two digits of NACE Rev.2 code being:

1	Crop and animal production, hunting and related service activities
3	Fishing and aquaculture
10	Manufacture of food products
11	Manufacture of beverages
12	Manufacture of tobacco products
13	Manufacture of textiles
14	Manufacture of wearing apparel
21	Manufacture of basic pharmaceutical products and pharmaceutical preparations
35	Electricity, gas, steam and air conditioning supply
36	Water collection, treatment and supply
38	Waste collection, treatment and disposal activities; materials recovery
55	Accommodation
64	Financial service activities, except insurance and pension funding
66	Activities auxiliary to financial services and insurance activities
68	Real estate activities
77	Rental and leasing activities
79	Travel agency, tour operator and other reservation service and related activities
86	Human health activities
93	Sports activities and amusement and recreation activities

4. Countries: Austria; Argentina; Brazil; Chile; China; Colombia; Egypt; Hungary; India; Indonesia; Iran.; Malaysia; Mexico; Philippines; Poland; Russia; Saudi Arabia; South Africa; Thailand; Turkey; Belgium; Denmark; Finland; France; Germany; Greece; Ireland; Italy; Japan; Luxembourg; Netherlands; Norway; Portugal; Spain; Sweden; United Arab Emirates; United Kingdom.
5. Current market capitalization > 1 billion USD.

For the second step of the Boolean research, we selected the following EMs' stock exchanges:

Table 31.04 – EMs' Stock Exchanges

Argentina	Bolsa de Comercio de Buenos Aires - [XBUE]
Brazil	BM&F Bovespa - [BVMF]
Chile	Santiago Stock Exchange - [XSGO]

China	Shanghai Stock Exchange - [XSHG]
China	Shenzhen Stock Exchange - [XSHE]
Colombia	Bolsa de Valores de Colombia - [XBOG]
Egypt	Egyptian Exchange - [XCAI]
Hungary	Budapest Stock Exchange - [XBUD]
India	National Stock Exchange of India - [XNSE]
Indonesia	Indonesia Stock Exchange - [XIDX]
Iran	Tehran Stock Exchange - [XTEH]
Malaysia	Bursa Malaysia - [XKLS]
Mexico	Bolsa Mexicana de Valores - [XMEX]
Poland	Warsaw Stock Exchange - [XWAR]
Russia	Moscow Exchange MICEX - RTS - [MISX]
Saudi Arabia	Saudi Stock Exchange - [XSAU]
South Africa	Johannesburg Stock Exchange - [XJSE]
Thailand	Stock Exchange of Thailand - [XBKK]
The Philippines	Philippine Stock Exchange - [XPHS]
Turkey	Istanbul Stock Exchange - [XIST]
United Arab Emirates	Abu Dhabi Securities Market - [XADS]

For developed economies, instead, we considered the following ones:

Table 31.05 – Developed countries' Stock Exchanges

Austria	Wiener Boerse - [XWBO]
Belgium	Euronext Brussels - [XBRU]
Denmark	Nasdaq OMX - Copenhagen - [XCSE]
Finland	Nasdaq OMX - Helsinki - [XHEL]
France	Euronext Paris - [XPAR]
Germany	Boerse Frankfurt - [XFRA]
Greece	Athens Stock Exchange - [ASEX]
Ireland	Euronext Dublin - [XDUB]
Italy	Borsa Italiana - MTA (Mercato Telematico Azionario) - [MTAA]
Japan	Tokyo Stock Exchange - [XJPX]
Luxembourg	Luxembourg Stock Exchange - [XLUX]
Netherlands	Euronext Amsterdam - [XAMS]
Norway	Oslo Bors - [XOSL]
Portugal	Euronext Lisbon - [XLIS]
Spain	Bolsa de Madrid - [XMAD]
Sweden	Nasdaq OMX - Stockholm - [XSTO]
United Kingdom	London Stock Exchange (SEAQ) - [SEAQ]
United Kingdom	London Stock Exchange - [XLON]
United States	NASDAQ Capital Market - [XNCM]
United States	NASDAQ National Market - [XNAS]
United States	NASDAQ/NGS (Global Select Market) - [XNGS]
United States	NASDAQ/NMS (Global Market) - [XNMS]
United States	New York Stock Exchange (NYSE) - [XNYS]
United States	NYSE ARCA - [ARCX]
United States	NYSE MKT - [XASE]

The fifth step was performed in order to ensure a sufficient level of stocks liquidity, as prescribed by Chapter 1. The threshold for market capitalization was decided basing on Borsa Italiana definition of *Blue chips,* which are the companies with a solid financial structure and a market capitalization higher than one billion, usually the most liquid in the market (Borsa Italiana, 2022).

The Boolean research returned 7,123 companies, for which we extrapolated the following specific data:

- P/E ratio from 2011 to 2019;
- Current market capitalization;
- NACE Rev.2 classification;
- ISO Country Code;

The report thus obtained was then cleansed of useless entries, such as those presenting P/E ratios just for few years of the period or not indicating the sector of activity, resulting in a final number of 4,880 companies, 2,084 from emerging countries and the remaining 2,796 from developed ones.

3.2 Sample description

Only positive multiples are taken into consideration. Please note that each observation is composed by the P/E ratio of every company for every year between 2010 and 2019, therefore the number of observations (48,800) is ten times the number of companies in the report (4,800).

3.2.1 Defensive sectors

As pointed out above, defensive category is composed of consumer staples, healthcare, and utilities sectors. In turn, each sector is made of some NACE Rev.2 codes which specifically identify the sub-industries of operation. All these industries observation coming from EMs are gathered under Group 1, while those coming from developed countries are pooled under Group 3, coherently with the classification presented in the previous paragraph. The breakdown of total observation by NACE Rev.2 codes and by groups is provided in the following table.

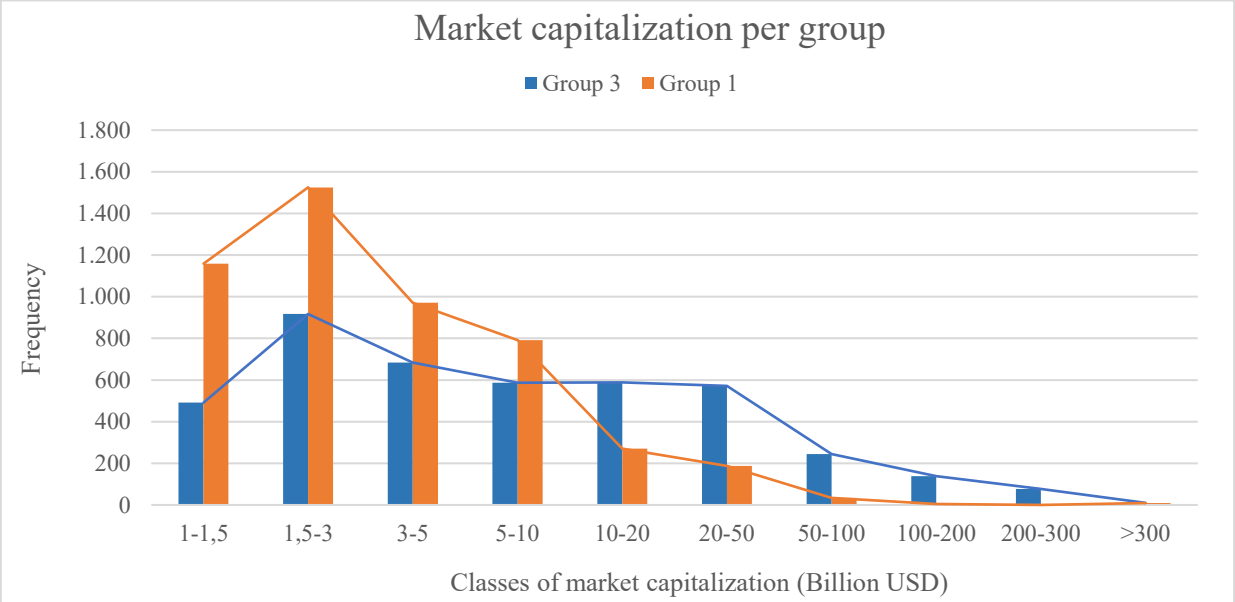
Table 32.01 – Breakdown of observations for defensive industries and type of countries' groups

			Group 3	Group 1	
	Nace Rev.2 (extended)	***NACE Rev.2***	***Developed***	***Emerging***	***Total***
Consumer staples	*Crop and animal production, hunting and related service activities*	*1*	93	402	**495**
	Fishing and aquaculture	*3*	74	9	**83**
	Manufacture of food products	*10*	1.288	1.045	**2.333**
	Manufacture of beverages	*11*	455	607	**1.062**
	Manufacture of tobacco products	*12*	136	56	**192**
	Manufacture of textiles	*13*	90	471	**561**
	Manufacture of wearing apparel	*14*	236	298	**534**
Healthcare	*Manufacture of basic pharmaceutical products and pharmaceutical preparations*	*21*	491	858	**1.349**
	Human health activities	*86*	318	298	**616**
Utilities	*Electricity, gas, steam and air conditioning supply*	*35*	993	877	**1.870**
	Water collection, treatment and supply	*36*	106	79	**185**
	Waste collection, treatment and disposal activities; materials recovery	*38*	42	12	**54**
			4.322	**5.012**	**9.334**

Total observations are 9,334, whose 54% comes from EMs (Group 1 numerosity=5,012) and the remaining 46% from developed economies (Group 3 numerosity=4,322).
As can be seen by the blue bars, the composition of each group differs slightly. The most important discrepancies are in the *Crop and animal production, hunting and related service activities* (NACE 1) where EMs hold 3.7x times the number of developed countries, after reproportioning for the different total amount, in the *Manufacture of textiles* industry (NACE 13), where the same ratio stands to 4.5x, and in the *Manufacture of basic pharmaceutical products and pharmaceutical preparations* (NACE 21), where Group 1 present 1,5 times the observations of Group 3.
The biggest gap, in absolute terms, in favour of Group 3 is in the *Manufacture of food products* sector (NACE 10), presenting 243 observations more than Group 1.

Breaking down data for classes of market capitalization, we can see that the two groups follow a different path:

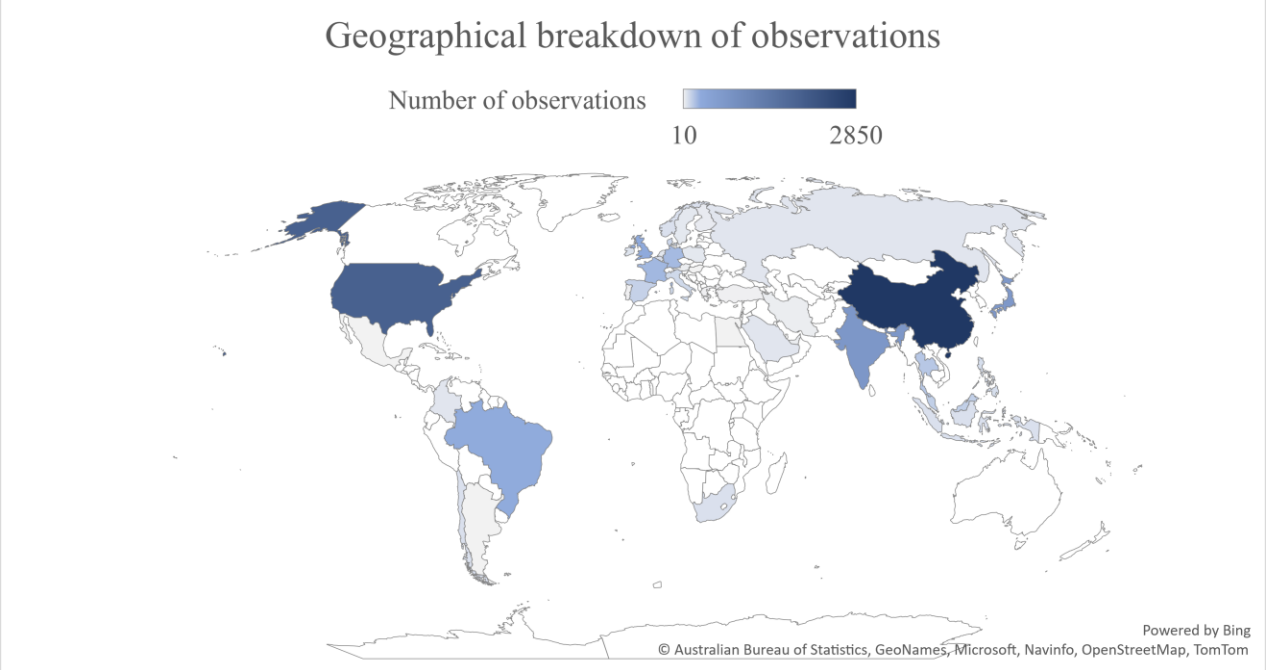
Figure 32.02 – Market capitalization per group (defensive sectors)



Both the groups are more concentrated in smaller classes, with the peak in the 1,5 to 3 billion category, but Group 1 observations are far more concentrated in lower classes than Group 3. Indeed, Group 3 frequency decreases more smoothly towards greater categories, surpassing Group 1 in the 10-20 billion USD category and greater classes.

For consumer staples, in Group 3 the company with the biggest market capitalization is *LVMH Moët Hennessy Louis Vuitton SE*, French multinational operating in the wearing apparel industry, with a market cap, at the time of writing of this paper, of 324 billion US$. For Group 1 the most capitalized company is instead *Kweichow Moutai Co*., the Chinese most valuable non-technology company and largest beverage producer in the world, valued almost 339 billion US$. In the healthcare sector, the most prominent company is *Johnson&Johnson* for Group 3, U.S. company with a market cap of more than 466 billion USD, while for Group 1 it is *Wuxi Apptec Co*., which comes is established in China. Finally, for utilities the most capitalized company is *Nextera Energy*, Inc. for Group 3 (154 billion USD) and *China Yangtze Power Co*. for Group 1 (82 billion USD), operating respectively in the U.S.A. and, not surprisingly, in China. Indeed, looking at the geographical origin of observations for groups 1 and 3, it can be noticed that most of data come either from China, with 2,850 observations, or from the US, with 1,930. In third place it can be found EU (1,280), if we aggregate together all its components, followed by India (710) and Japan (690). Overall, almost 82% of total observations come from this list of geographical areas.

Figure 32.03 – Geographical breakdown of observations (defensive sectors)



Countries providing the lowest number of observations are instead Argentina, Egypt, Hungary and Mexico, with 10 observations each.

3.2.2 Cyclical sectors

Cyclical category includes real estate, financial services and hospitality sectors, whose precise industries are identified through the usual NACE Rev. 2 classification. Depending on whether the observations come from EMs or developed countries they will be labelled as Group 2 or Group 4, respectively.

The detailed composition of each category is provided in the following table, together with the detailed amount of the observation gathered. We specific that, for Financial services category, despite being NACE 65 "*Insurance, reinsurance and pension funding, except compulsory social security"* a suitable industry, we did not find an acceptable amount of observations for both groups, therefore such industry was discarded from the analysis.

Actually, for each of the three cyclical categories we retrieved an adequate number of observations, despite the groups' numerosity (2,930) results far lower than it was for defensive stocks (9,334). However, it was more than enough to conduct a deep and serious empirical analysis, whose assumptions were entirely respected.

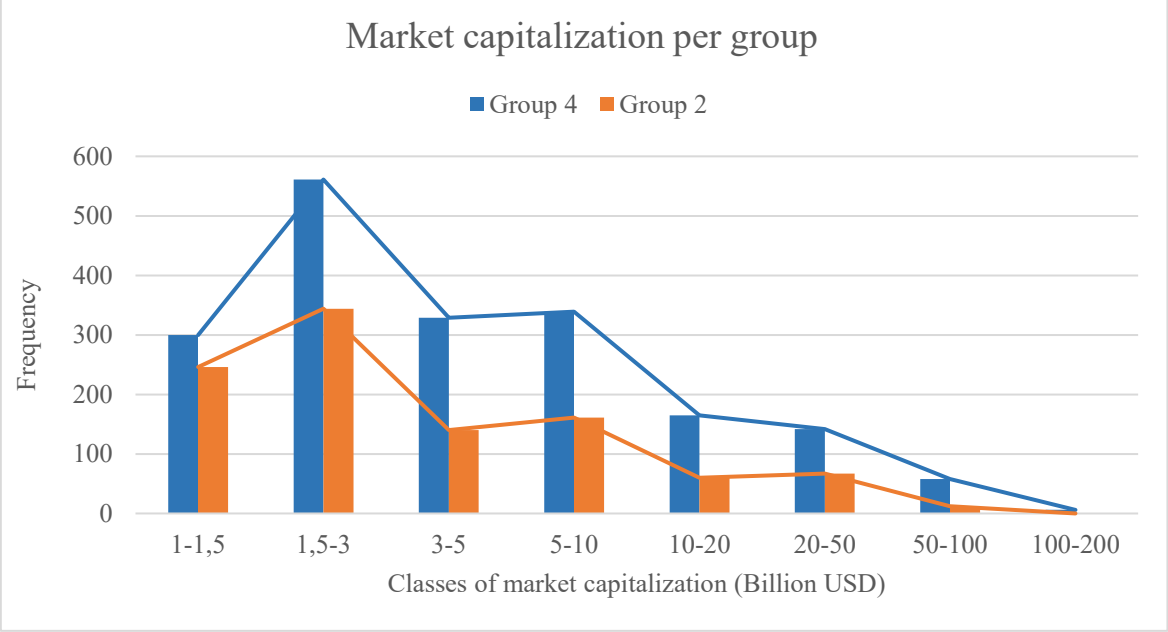
Table 32.04 – Breakdown of observations for cyclical industries and type of countries' groups

			Group 4	Group 2	
	Nace Rev.2 (extended)	***NACE Rev.2***	***Developed***	***Emerging***	***Total***
Real estate	*Real estate activities*	*68*	826	498	**1.324**
	Rental and leasing activities	*77*	145	13	**158**
Financial services	*Financial service activities, except insurance and pension funding*	*64*	180	105	**285**
	Activities auxiliary to financial services and insurance activities	*66*	339	265	**604**
Hospitality	*Accommodation*	*55*	167	71	**238**
	Travel agency, tour operator and other reservation service and related activities	*79*	104	60	**164**
	Sports activities and amusement and recreation activities	*93*	139	18	**157**
			1.900	**1.030**	**2.930**

The majority of observations come from Group 4 (65%), in contrast with what we saw for defensive stocks, where EMs provided the largest proportion of data (54%) with Group 1. In this case, Group 4 numerosity is more than 1,8x times that of Group 1, therefore we proportion the differences between groups for the respective numerosity. After that, it turns out that Group 2 presents, proportionally, a greater amount of NACE 66 *Activities auxiliary to financial services and insurance activities,* than Group 4, equal to 1,4x times its number of observations. On the other hand, Group 2 shows a trivial numerosity for NACE 77 *Rental and leasing activities*, which is just a fraction (17%) of Group 4 amount, proportionated for Group 1 numerosity.
However, despite such differences, looking at the blue bars it can be noticed that overall the two groups present similar compositions.

The breakdown by market capitalization is presented in the next table. We recall that due to the strategy of selection just companies with a capitalization bigger than 1 billion USD were retrieved, therefore that is the minimum threshold for our data. Moreover, for cyclical stocks, we did not find any company whose market cap was bigger than 200 billion, therefore the classes are reduced with respect to defensive stocks.

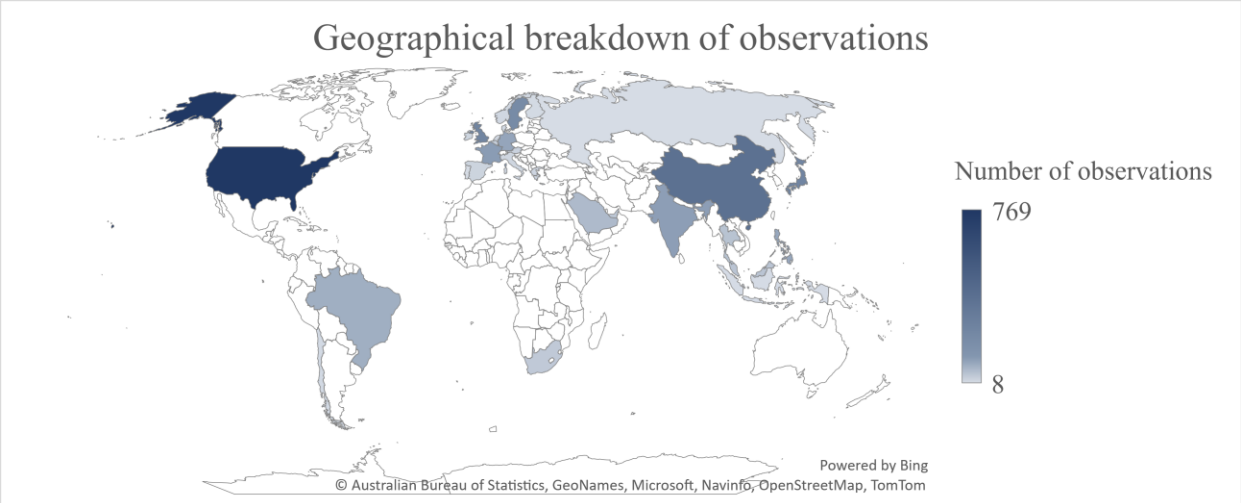
Figure 32.05 – Market capitalization per group (cyclical sectors)



	1-1,5	***1,5-3***	***3-5***	***5-10***	***10-20***	***20-50***	***50-100***	***100-200***
Group 4	15,8%	29,5%	17,3%	17,8%	8,7%	7,5%	3,1%	0,3%
Group 2	23,9%	33,4%	13,6%	15,6%	5,8%	6,5%	1,2%	0,0%

It can be glimpsed a similar path between the two groups, both being most concentrated in the 1,5-3 billion class. However, since the two groups present a quite different numerosity, we add a table with classes' percentage immediately below the graph. From that table we can notice that the smallest class presents a significant difference for the two groups, with Group 2 having almost 1 out of 4 observations in this class, while for Group 4 the value is of 1 out of 6. Overall, for the two classes below 3 billion, Group 4 accounts for 45,3% while Group 2 for 57,3%. Looking at the biggest classes, as anticipated for cyclical stocks we do not find observations for more than 200 billion, and at the same time even the 100-200 billion class is populated just by a handful of companies from Group 4. In detail, for Real estate sector the two biggest companies for each group are *Vici Properties Inc* (30 billion USD*)*, owner and acquirer of experiential real estate assets in the US, and *Poly Developments and Holdings Group Co*. (28 billion USD), company based in China focused mainly on commercial and residential buildings development. In the financial services sector, Group 4 most capitalized company is *Paypal Inc*. (102 billion USD), well-known company providing a worldwide payment platform, while for Group 1 it is *East Money Information Co.* (38 billion USD), Chinese financial and stock information provider. Finally, for Hospitality the company with the greatest market cap is *Marriott International Inc* (57 billion USD), firm operating in the franchising and licensing of lodging for US hotels and residentials. The Group 1 counterpart is for the first time not a Chinese company, since it is *Oriental Land Co.* (53 billion USD), which is a Japanese leisure and tourism corporation operating mainly in theme parks and hotels markets. Since we found the first "exception" to the Chinese predominance in EMs' observations, it can be worth looking at the global distribution of data, created in the following chart.

Figure 32.06 – Geographical breakdown of observations (cyclical sectors)



Indeed, the graph shows that the country providing the largest amount of observations are the US (769), followed by the EU, considering all its members, with 644 observations. Only in third position we find China, having 383 observations, before the UK and Japan, with almost the same contribution, 246 and 242 observations respectively.

As it can be grasped from the description made in this chapter, the four groups present different features in many respects. What we believe is that such discrepancies could be a positive indication for the empirical analysis of the next paragraph, since they could suggest that the groups are significantly different also for the variable of interest, namely the trailing P/E ratio.

3.3 Multiples analysis

The following pages presents the empirical analysis performed on multiples of 4,880 companies through the period 2011-2019. As anticipated, the analysis has been performed on the P/E ratios of the following macro-sectors: consumer staples, healthcare, utilities, financial services, real estate, and hospitality. The observations of each sector are then divided between the groups, following the classification provided in Table 31.03 and Table 31.04. Just as a recall, defensive sectors are split between groups 1 and 3, while cyclical sectors between groups 2 and 4.
Each sector will be investigated following a similar path of analysis, while qualitative considerations are left for the conclusive paragraph.

3.3.1 Consumer staples

First, we run an F-test Two-Sample for variances (Snedecor and Cochran, 1983), in order to detect whether the two samples' populations (developed and emerging) present a statistically different variance.

Table 33.01 – F-test two-sample for variances (CS)

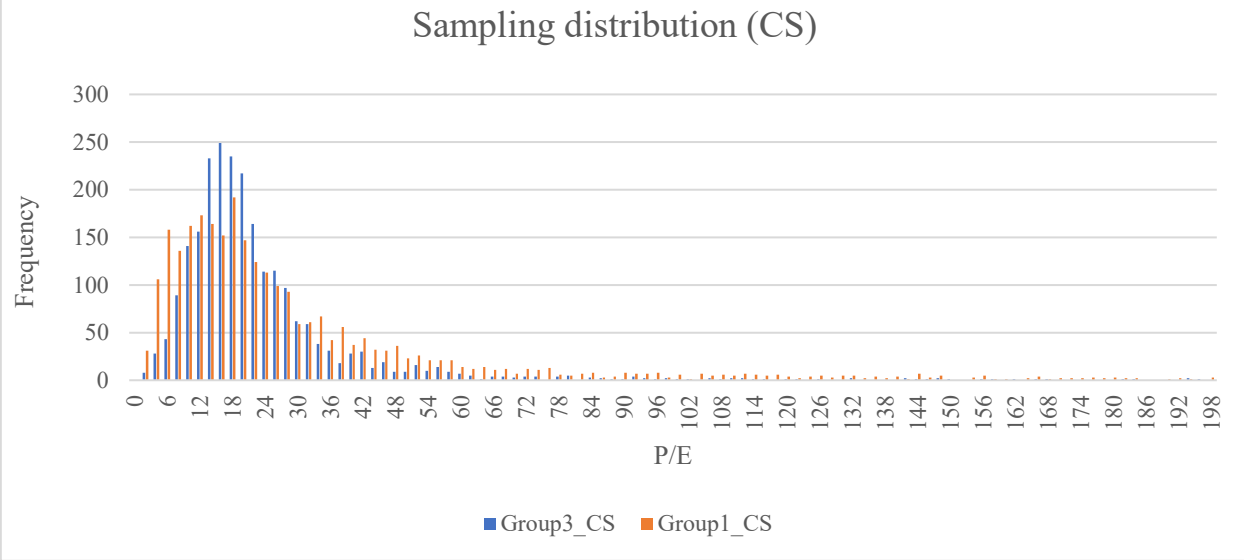
	Group1_CS	*Group3_CS*
Mean	56,5944162	33,20536931
Variance	48.799,32	45.911,69
Observations	2888	2372
df	2887	2371
F	1,062895385	

P(F<=f) one-tail	0,060197704
F Critical one-tail	1,066733302

Multiplying the p-value of a one-tailed F-test by 2 we obtain the p-value of a two-tailed F-test, with the same level of significance (NIST, 2022). Therefore, the p-value becomes 0.1204 and the hypothesis of equal variance between the two samples' populations cannot be rejected at a 0.05 significance level. However, considering the different sample size (2372 vs 2888 observations) we decide to perform an unequal variance t-test to avoid the risk of biased results.

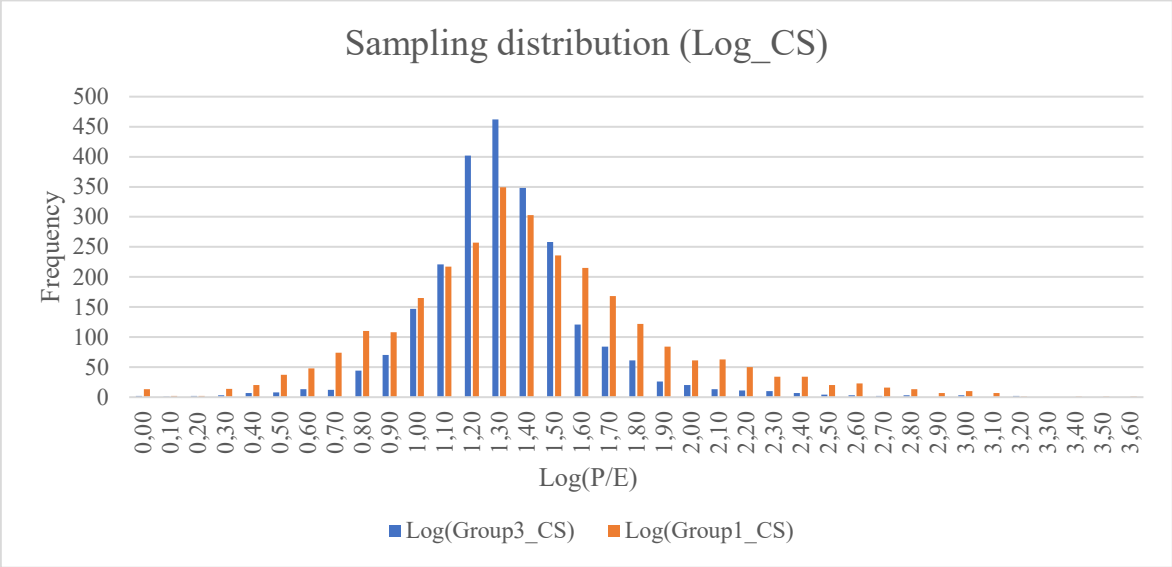
Secondly, we plot the data to check for the approximate normal distribution of the two samples.

Figure 33.02 – Sampling distribution (Consumer staples)



Both the distributions seem skewed by long right tails but still approximating normal distributions. The validity of t-tests is not affected by moderate-non-normal data, if no extreme outliers are present (Cessie et al., 2020). In such cases, it is recommendable to perform a logarithmic transformation of data (*ibidem*). Therefore, we transform data applying a Log base 10, after which we plot again the data in the following graph.

Figure 33.03 – Sampling distribution (Logarithm of consumer staples)



Now the distributions are almost perfectly normal, not showing abnormal tails or extreme values. Consequently, the two-sample t-test assuming unequal variances is performed.

Table 33.04 - Two-sample t-test assuming unequal variances (Log_CS)

	Log(Group1_CS)	*Log(Group3_CS)*
Mean	1,278046147	1,351808197
Variance	0,098944149	0,251382683
Observations	2372	2888
Hypothesized Mean Difference	0	
df	4937	
t Stat	-6,500505569	
P(T<=t) one-tail	4,39757E-11	
t Critical one-tail	1,645162328	
P(T<=t) two-tail	8,79514E-11	
t Critical two-tail	1,960444609	

The p-value is basically equal to 0, therefore we can strongly reject at every level of significance the null hypothesis of equal means between developed and emerging countries' companies. The difference is equal to 0.073762 in favour of Group1_CS, under logarithmic scale. Unfortunately, it is not possible to make statements about differences in means after a logarithmic transformation, since means cannot be easily interpretated (Cessie et al., 2020). Therefore, we take the medians of the two samples, given that for perfectly normal distributions the average and the median coincide, and our distributions are in fact very close to be flawlessly normal. Then, we re-transform back the median from logarithmic to linear, getting an average of 18.03 for Group3_CS and 20.30 for

Group1_CS. The intuition behind the difference of 2.27 is that on average, for the same level of earnings, the stocks of an EMs company are valued 2.27 times more than those of a company operating in a developed country.

3.3.2 Healthcare

Passing to the healthcare industry, the second defensive sector, we perform the same methodology of above. The one-tailed F-test on variances determines whether the null hypothesis of equal populations' variances can be rejected or not. In this case the null hypothesis is rebutted at any level of statistical significance, since the p-value is virtually 0.

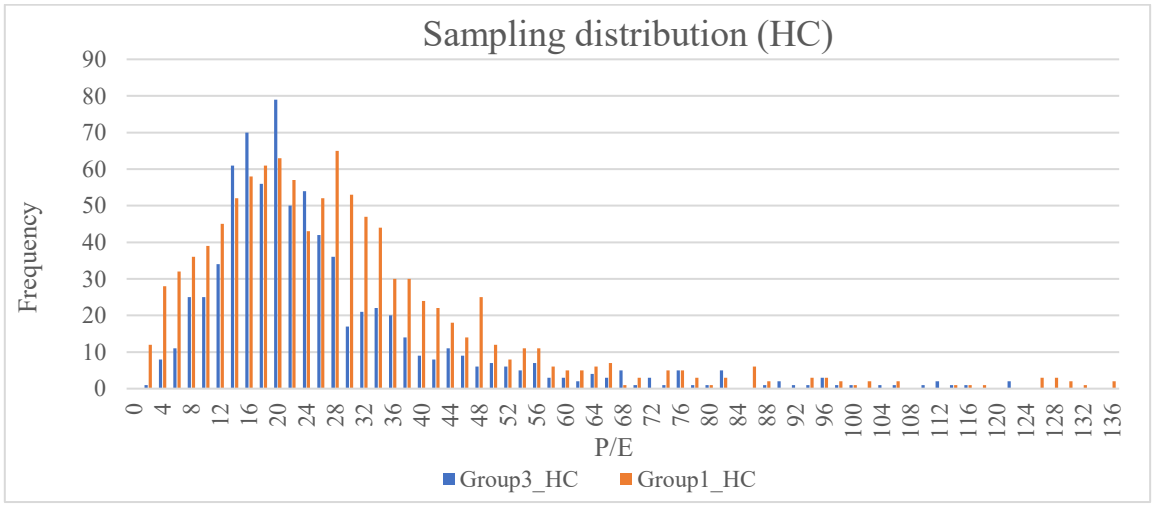
Table 33.05 – F-test two-sample for variances (HC)

	Group1_HC	*Group3_HC*
Mean	453,2615467	143,4984227
Variance	187.400.233,3	4.528.476,75
Observations	1156	809
df	1155	808
F	41,38262019	
P(F<=f) one-tail	.0	
F Critical one-tail	1,113294917	

Consequently, we can say that there is no chance the different sampling variability was caused by other than effective variance differences in the underlying populations.

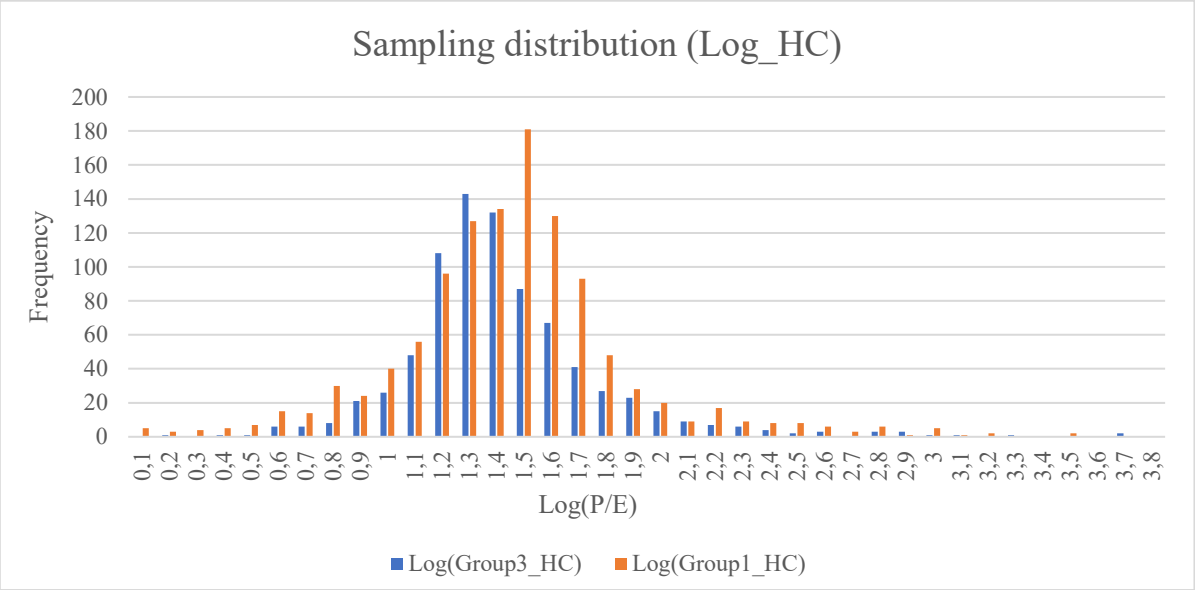
Afterwards, we compute the intervals of frequency and we plot the distributions, in order to check for approximate normality.

Figure 33.06 – Sampling distribution (Healthcare)



Similarly to consumer staples, both the distributions resemble normality despite presenting important extreme outliers. As solution we discard three hugely extreme outliers (two for Group3_HC and one for Group1_HC) and then we perform a logarithmic transformation of data. After that, we plot again the results.

Figure 33.07 – Sampling distribution (Logarithm of healthcare)



Now both the samples are much more normally distributed and a t-test on means can be executed. Given the results of F-test, as well as the different samples numerosity, the t-test will be performed as a two-sample t-test assuming unequal variances.

Table 33.08 – Two-sample t-test assuming unequal variances (Log_HC)

	Log(Group3_HC)	*Log(Group1_HC)*
Mean	1,387322742	1,405340206
Variance	0,160561118	0,200472467
Observations	805	1137
Hypothesized Mean Difference	0	
df	1837	
t Stat	-1,720461818	
P(T<=t) one-tail	0,042708596	
t Critical one-tail	1,645683536	
P(T<=t) two-tail	0,085417192	
t Critical two-tail	1,961256205	

The two-tails p-value (0.085) tells us that it is not possible to reject the null hypothesis of equal means for the two populations at a statistical significance of 0.05. However, we can reject the null hypothesis for α=0.10, meaning that there is a probability lower than 10% that the difference in the samples' means was not due to an effective underlying difference in the population.
The means are then obtained looking at the corresponding values of the median for each sample and are equal to 21.09 for Group3_HC and 25.68 for Group1_HC.

3.3.3 Utilities

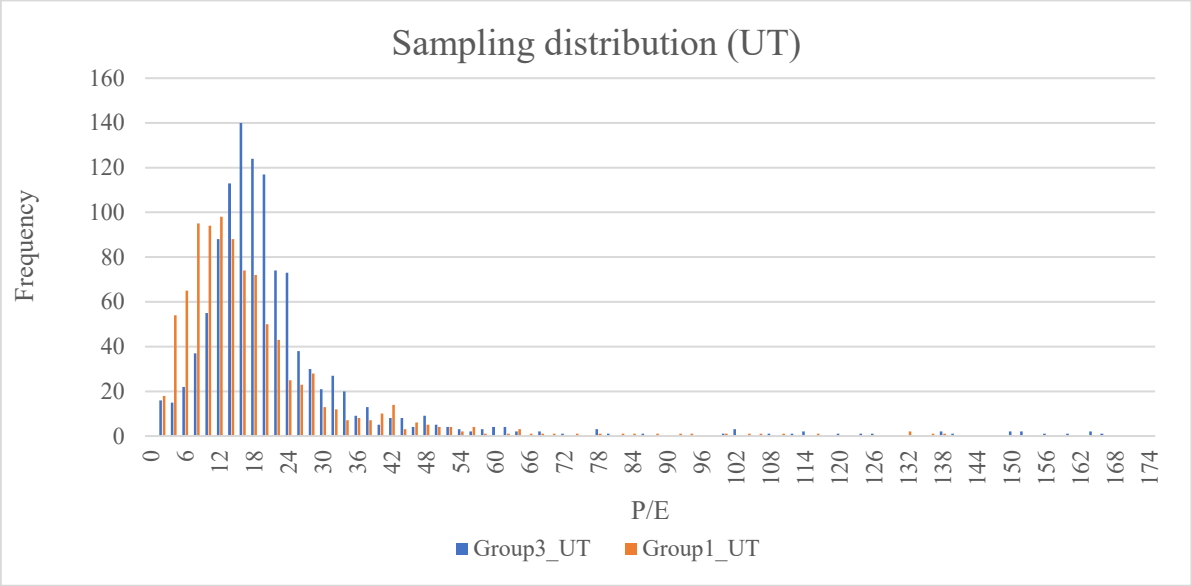
Coming to the last defensive sector under investigation, first, we perform an F-test for equal variances, with the final aim of determining which type of t-test best fits the samples. The F-test returns a p-value virtually equal to 0, which means that the null hypothesis of equal variances between the two samples' populations must be rejected for any level of significance.

Table 33.09 – F-test two-sample for variances (UT)

	Group3_UT	*Group1_UT*
Mean	36,02630675	21,45747521
Variance	44.880,69	2.709,62
Observations	1141	968
df	1140	967
F	0,060373945	
P(F<=f) one-tail	.0	
F Critical one-tail	0,903038589	

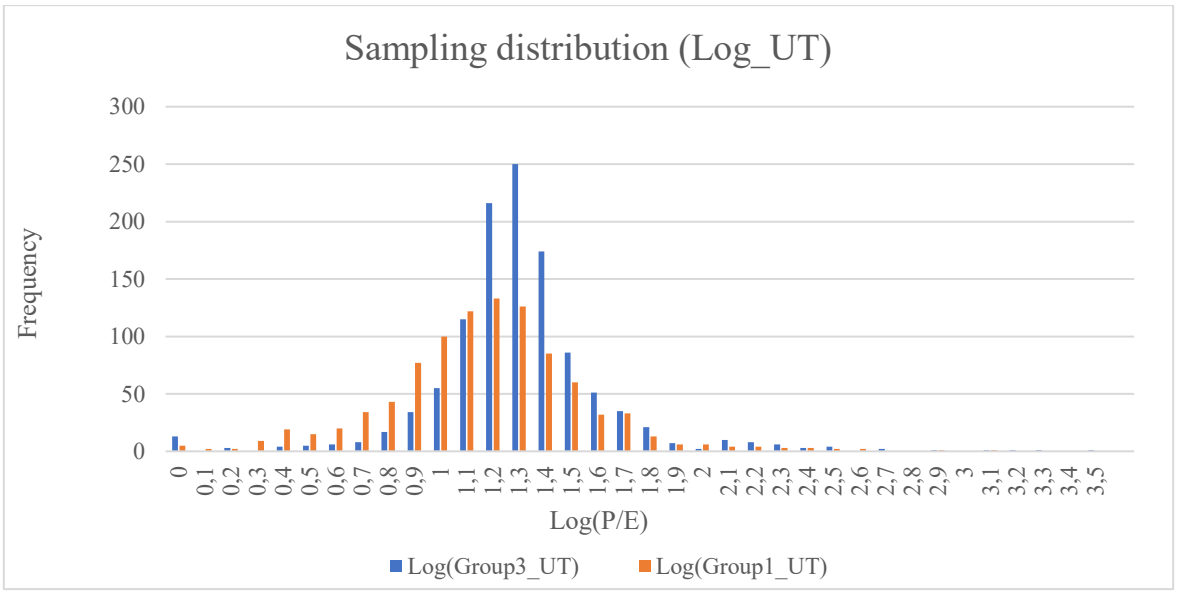
Therefore, we can safely assert that there is a difference in variance between the two underlying populations. Afterwards, we plot the two samples with the purpose of checking the normality or approximate normality of distributions.

Table 33.10 – Sampling distribution (Utility)



The distributions resemble some normality but still we find the same problem encountered previously about outliers in the right tail, therefore we apply a logarithmic transformation of data, resulting in the following distribution.

Figure 33.11 – Sampling distribution (Logarithm of utilities)



Now both the samples present a bell-shaped distribution, and we can finally run the unequal variances t-test on means, that provides us the results in the table below.

Table 33.12 - Two-sample t-test assuming unequal variances (Log_UT)

	Log(Group3_UT)	*Log(Group1_UT)*
Mean	1,217950295	1,178990414
Variance	0,147061318	0,42866917
Observations	1141	962
Hypothesized Mean Difference	0	
df	2051	
t Stat	2,33577602	
P(T<=t) one-tail	0,008746502	
t Critical one-tail	1,645596904	
P(T<=t) two-tail	0,017493004	
t Critical two-tail	1,961121297	

The results show that, for a statistical significance of 0.05, the two samples come from different distributions, with the developed countries' companies having a higher average than EMs. To find out the precise estimate of the two samples' means, we look for the value associated with the median of each distribution. For Group3_UT the median value corresponds to a P/E ratio of 16.181, for Group1_UT the corresponding it amounts to 15.584.

3.3.4 Real estate

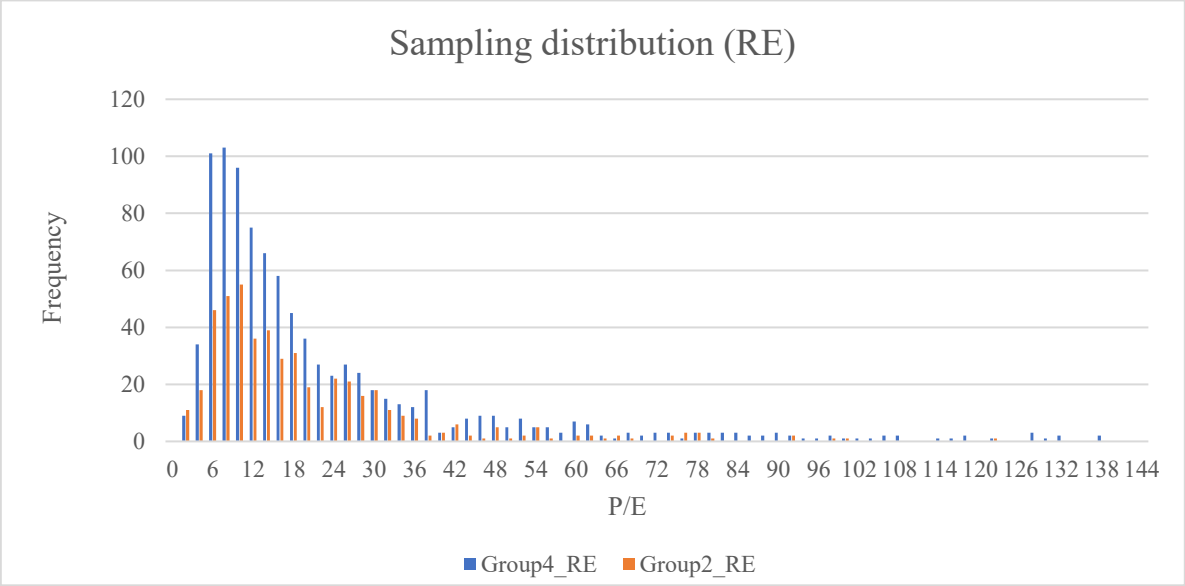
With the real estate industry we start analysing the first of the three cyclical sectors, whose observations are split between group 2 and 4 for EMs and developed countries, respectively.
We perform the same procedure of above, starting with the F-test for variances in order to choose the best t-test for the samples under analysis.

Table 33.13 – F-test two-sample for variances (RE)

	Group4_RE	*Group2_RE*
Mean	67,81529866	25,57221135
Variance	359.642,60	6.181,47
Observations	971	511
df	970	510
F	58,18075886	
P(F<=f) one-tail	.0	
F Critical one-tail	1,137453028	

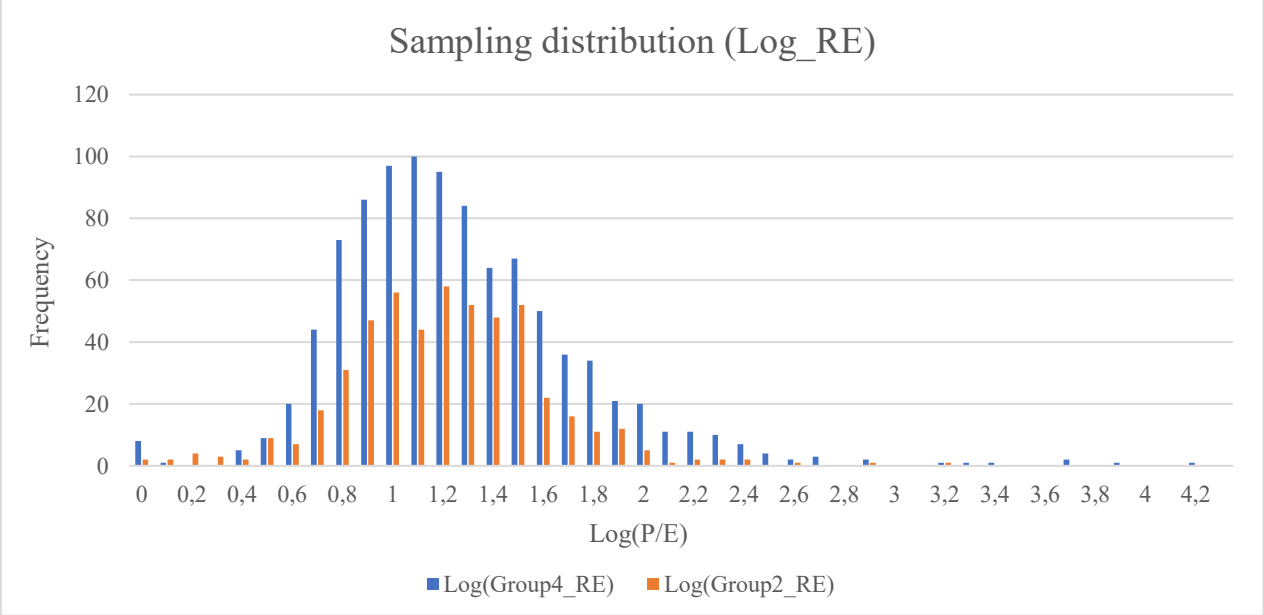
The results of the T-test show undoubtedly that the hypothesis of equal variances does not hold, given that the p-value is practically 0. This, combined with a different sample numerosity, lead us to perform an unequal variances two-sample t-test for means. But, before that, the theory requires us to check for normality of sampling distributions, which is performed in the following graph.

Figure 33.14 - Sampling distribution (Real estate sector)



Looking at the graph we can spot some resemblance of a normal distribution for both the samples, but definitely not enough to not jeopardize the stability of the t-test. Consequently, we perform a logarithmic transformation of the two distributions.

Figure 33.15 – Sampling distribution (Logarithmic of real estate)



After the transformation the sampling distributions seem to approximate much more conventional, bell-shaped distributions, and the two-sample t-test for unequal variances can be safely run.

Table 33.16 - Two-sample t-test assuming unequal variances (Log_RE)

	Log(Group4_RE)	*Log(Group2_RE)*
Mean	1,209650986	1,157853112
Variance	0,254341097	0,160142019
Observations	971	511
Hypothesized Mean Difference	0	
df	1257	
t Stat	2,159507173	
P(T<=t) one-tail	0,015499742	
t Critical one-tail	1,646066753	
P(T<=t) two-tail	0,030999485	
t Critical two-tail	1,961853021	

The results show that, for α=0.05, the null hypothesis can be rejected (p-value$\simeq$0.031), meaning that the two populations' means are statistically different. Taking the median of each logarithmic distribution and then the corresponding linear value, we get a mean of 16.042 for Group4_RE and 12.92 for Group2_RE.

3.3.5 Financial services

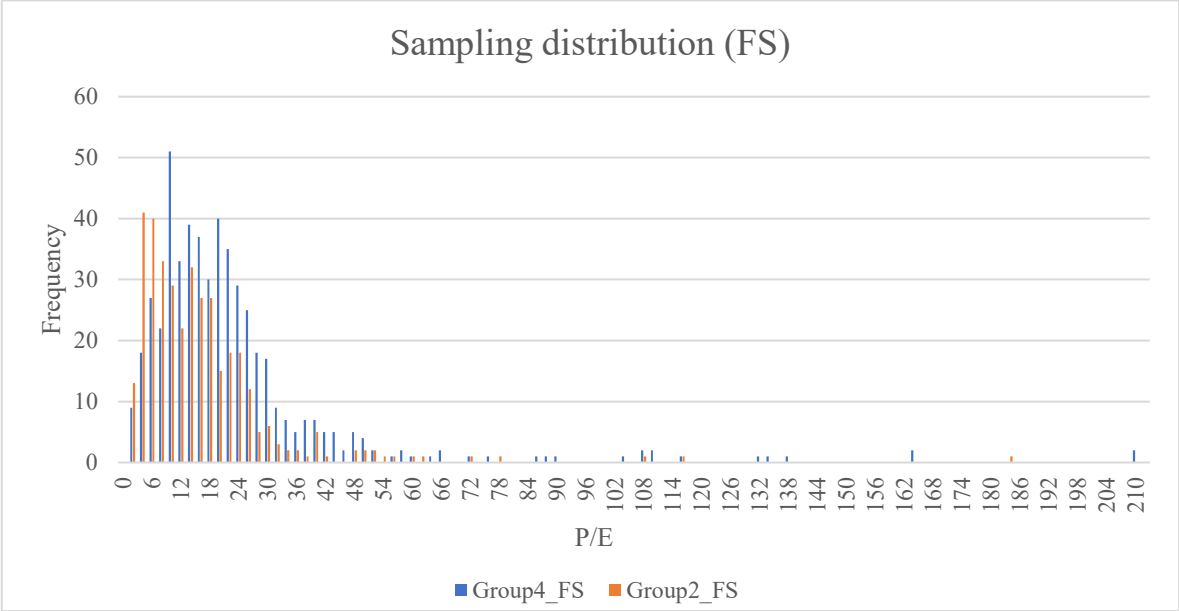
Passing to the second cyclical sector, we start with the F-test two-sample for variances, whose p-value returns that the underlying populations exhibit different variances, therefore requiring an adjusted t-test.

Table 33.17 – F-test two-sample for variances (RE)

	Group2_FS	Group4_FS
Mean	24,44068378	29,96559152
Variance	13458,88347	8606,691903
Observations	370	519
df	369	518
F	1,563769636	
P(F<=f) one-tail	1,41353E-06	
F Critical one-tail	1,170482598	

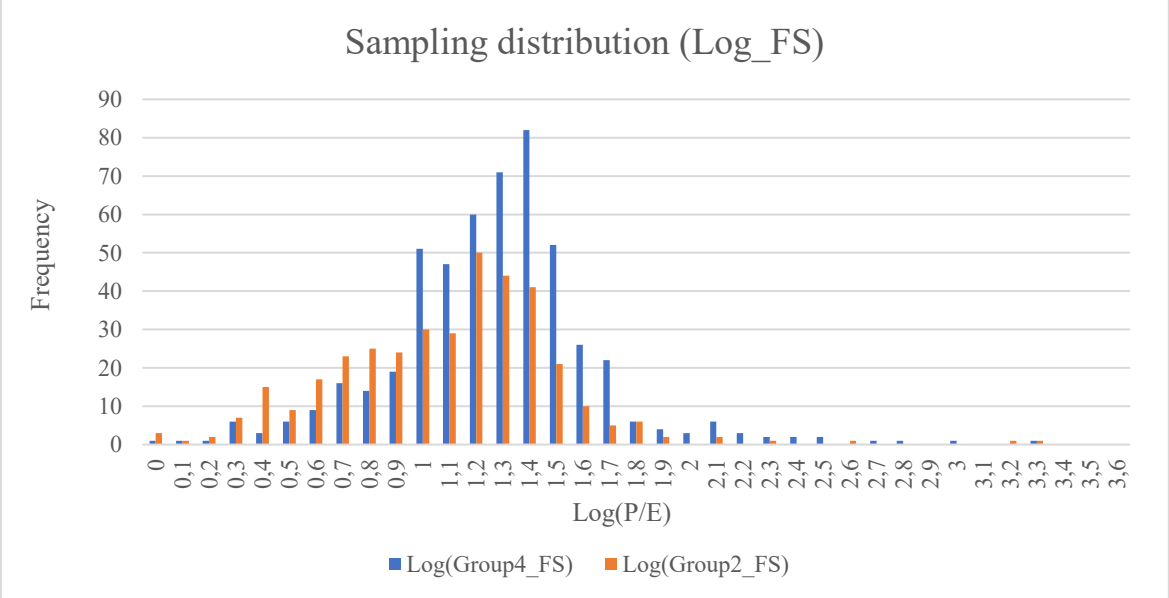
Indeed, the p-value (0.000000141) is confidently lower than the chosen level of statistical significance (0.05). Therefore, we can now plot the samples and look at their distributions.

Figure 33.18 - Sampling distribution (Real estate sector)



Looking at the sampling distributions it stands out clearly that data require some sort of elaboration to reach approximate-normality. Indeed, both samples seem to follow an unclear path, therefore we try with the usual logarithmic transformation, shown in the following graph.

Figure 33.19 – Sampling distribution (Logarithmic of financial services)



Now both the samples resemble much better bell-shaped distributions, despite some minor imperfections which can be safely let in the analysis given the great sample numerosity of our test. Thus, we can now perform the two-sample t-test assuming unequal variances, which provides the following results.

Table 33.20 - Two-sample t-test assuming unequal variances (Log_RE)

	Log(Group4_FS)	Log(Group2_FS)
Mean	1,222493769	1,039627043
Variance	0,149633832	0,177703825
Observations	519	370
Hypothesized Mean Difference	0	
df	752	
t Stat	6,596091034	
P(T<=t) one-tail	3,97852E-11	
t Critical one-tail	1,646882429	
P(T<=t) two-tail	7,95704E-11	
t Critical two-tail	1,963123598	

The results of the t-test rebut the null hypothesis at any level of significance, confidently ensuring that the two samples come from two populations with different means. Aiming at obtaining the averages, we take the medians and look for their corresponding linear values, getting 17.362 for Group4_FS and 12.461 for Group2_FS.

3.3.6 Hospitality

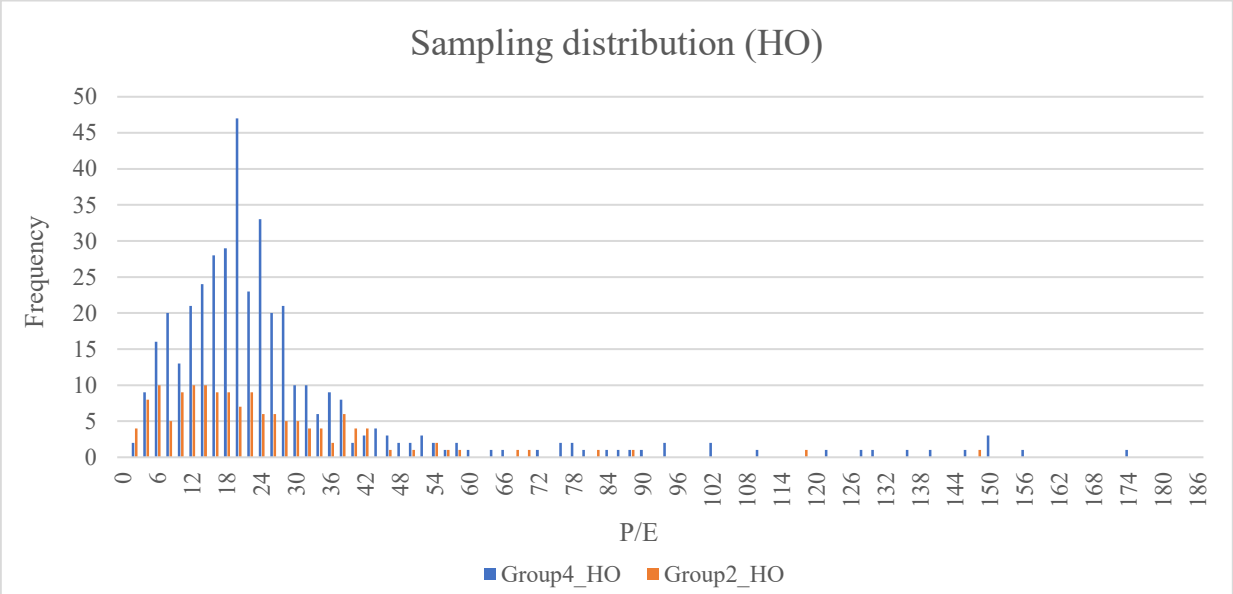
Finally, we analyse the third and last cyclical sector, the hospitality one. As first thing, as usual, we run the F-test for variances, which leads to an absolute rejection of the null hypothesis.

Table 33.21 – F-test two-sample for variances (HO)

	Group2_HO	*Group4_HO*
Mean	36,41624667	41,51762195
Variance	29450,87219	18721,44105
Observations	150	410
df	149	409
F	1,573109256	
P(F<=f) one-tail	0,000255642	
F Critical one-tail	1,241650703	

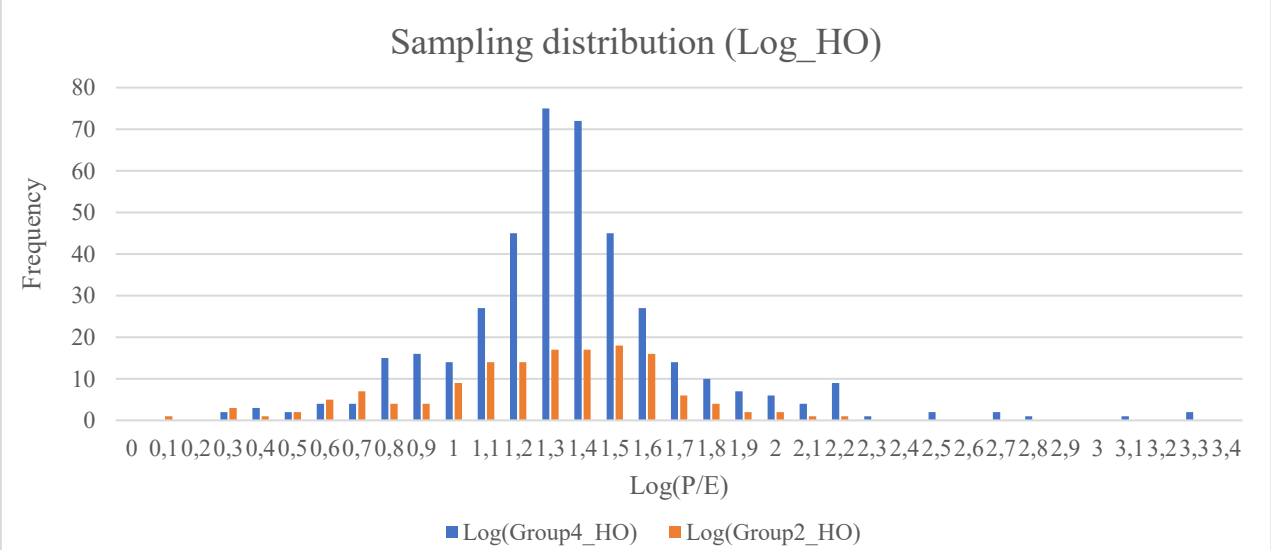
Indeed, the p-value is virtually 0, while our statistical significance is set at 0.05, therefore we can reject the null hypothesis at any level of significance. We can now plot the two sampling distributions, aiming at spotting normality in the data.

Figure 33.22 - Sampling distribution (Hospitality sector)



Data, especially for Group2_HO, do not seem to follow a clear path, being much flatter than any other sector analyzed so far. Moreover, both the samples show long right tails caused by extreme values, therefore we try to apply the usual logarithmic transformation.

Figure 33.23 – Sampling distribution (Logarithmic of hospitality)



Despite being still quite flat, Log(Group2_HO) resembles a discernible bell-shaped distribution, and the same applies for Log(Group4_HO). We can now perform the two-sample t-test on means, assuming unequal variances between the two underlying populations.

Table 33.24 - Two-sample t-test assuming unequal variances (Log_HO)

	Log(Group4_HO)	*Log(Group2_HO)*
Mean	1,320216469	1,22139809
Variance	0,151709063	0,176080135
Observations	410	149
Hypothesized Mean Difference	0	
df	246	
t Stat	2,508559047	
P(T<=t) one-tail	0,006383414	
t Critical one-tail	1,651071345	
P(T<=t) two-tail	0,012766827	
t Critical two-tail	1,969654176	

The results of the t-test tell us that, for α=0.05, we can safely rebut the null hypothesis of equal means for the two populations, which implies that the samples average values are then coming from two statistically different populations. Since the sampling distributions, after the logarithmic transformation, are normal, we can safely take the median and then the corresponding linear value in order to obtain the average for Group4_HO, which is equal to 19.888, while for Group2_HO it is equal to 18.332.

3.3.7 Summary of results

The results found in each of the six distinct macro-sectors are hereafter recapped:

Table 33.25 – Recap of final analysis (defensive sectors)

Macro-sector	**Group_3**	**Group_1**	**Difference**	**p-value**	**Level of statistical significance**
Consumer staples	18,03	20,30	-2,27	,0	***
Healthcare	21,09	25,68	-4,59	0,085	*
Utilities	16,18	15,58	0,60	0,017	**

Table 33.26 – Recap of final analysis (cyclical sectors)

Macro-sector	*Group_4*	*Group_2*	Difference	p-value	Level of statistical significance
Real estate	16,04	12,92	3,12	0,031	**
Financial services	17,36	12,46	4,90	,0	***
Hospitality	19,89	18,33	1,56	0,013	**

**** for α = 0.01; ** for α = 0.05; * for α = 0.1*

Conclusions

The empirical analysis provided some mixed evidence. We built four groups of observations, arising from the intersection of two axes: defensive/cyclical sector and emerging/developed countries. Depending on the features of each group we formulated our expectations on whether the corresponding P/E ratios would have been higher or lower than those of the comparable group. After the analysis, we believe it is worth presenting the results found through the same matrix we used for formulating our expectations (*Figure 31.03 – Empirical analysis matrix by groups*), presented hereafter:

Figure 33.27 – Final results' matrix

Emerging countries	**GROUP 1**	Average value	**GROUP 2**	Average value
	Consumer staples	**20,30**	*Real estate*	***12,92***
	Healthcare	***25,68***	*Financial services*	***12,46***
	Utilities	***15,58***	*Hospitality*	***18,33***
Developed countries	**GROUP 3**	Average value	**GROUP 4**	Average value
	Consumer staples	***18,03***	*Real estate*	***16,04***
	Healthcare	***21,09***	*Financial services*	***17,36***
	Utilities	***16,18***	*Hospitality*	***19,89***
		Defensive stocks		**Cyclical stocks**

For defensive sectors, we expected Group 1's P/E ratios to be somehow close to those of Group 3, basing on the assumption of lower company exposure to country risk. On the other hand, for cyclical sectors we expected Group 2's P/E ratios to be considerably higher than Group 4 ones, provided that such industries are far more exposed to country risk.

What we found is that 2 out of 3 Group 1 sectors showed statistically higher P/E ratios than Group 3 ones (consumer staples +2,27 and healthcare +4,59). The results were proved to be statistically significant for α=0.01 and α=0.10, respectively. This demonstrates that there are some sectors which, for their underlying business model, are not only just less exposed to country risk but they seem even to benefit from operating in riskier countries, feasibly for higher potential growth. We need to be cautious in drawing conclusions since, as stated in Chapter 1, differences in multiples are not only driven by country factors but also by industry and company-specific ones. However, we believe that gathering and aggregating thousands of observations allowed us to smooth potential differences in the data related to company-specific elements and, at the same time, targeting specific sectors and analyzing them between peers allowed us to minimize also differences due to industry factors. Nonetheless, if it is true that utilities' sector exhibited just a slightly higher average than developed economies (+0,60), still it represents some adverse evidence to the concept. However, we believe that these results can be partially explained by what was exposed in *Figure 31.01 – Performances of defensive indexes during major crisis,* where the Global BMI Utilities Index showed, for the last 20 years, the lowest performances as compared to defensive benchmarks during moments of crisis. Therefore, despite this concept required additional studies, we believe it has the potential to introduce an innovative idea in the current literature.

For cyclical sectors, what we expected was fully met, with 3 out of 3 Group 2 P/E ratios being considerably lower than those of Group 4. The results were found to be significant for α=0.05 or lower. Moreover, the sectors' averages proved to be not only higher but remarkably higher. This is consistent with the above conclusion, since it demonstrates that what found for defensive sectors is an exception to the rule. The exception we were looking for.

Limitations of research

The research has three main limitations. First, multiples are impacted by much more than pure country risk. What we studied here was just a component (namely, the Country Risk Premium) affecting the value of P/E ratios for developed and EMs. Moreover, there can be several differences between variables among countries, therefore, conclusions in such conditions might be misleading. Second, the utilities sector, despite being reckoned amongst defensive industries, showed a statistically significant lower P/E for EMs with respect to developed economies. This recalls the importance of performing additional research on the topic, since some mixed evidence was found. Finally, the third research limitation concerns the EMs group composition. In fact, there are some countries deemed as emerging by the most prominent global agencies which present a lower country risk than some other countries regarded instead as developed. An example could be that of China, whose country risk is lower than that of Italy or Greece. In practice, EMs panel was formed considering the lists provided by international institutions, but country risk attributed from financial markets is untied from the label of "emerging" attached from such agencies.

Appendix

Appendix 1 – ICRG scores for 141 countries (Political Risk Service, 01/2022).

Political Risk Service (01/2022)

Country	Risk Score	Country	Risk Score
Norway	88	Albania	69,25
Switzerland	86,75	Greece	69,25
Luxembourg	86,25	Indonesia	69,25
Taiwan	86	Paraguay	68,75
Denmark	85,5	Ecuador	68,5
Singapore	85,5	Bahrain	68,25
Sweden	83,5	El Salvador	68,25
Germany	82,5	Moldova	68,25
Ireland	82,25	Morocco	68,25
Finland	81,75	Honduras	68
Canada	81,25	Papua New Guinea	67,5
Iceland	81	Argentina	67
Korea, Republic	80,75	Ghana	67
Japan	80,25	Bangladesh	66,75
Netherlands	80,25	Nicaragua	66,75
Australia	80	Bolivia	66,5
New Zealand	79,5	Congo, Republic	66,5
Saudi Arabia	79,25	Ukraine	66,5
Brunei	79	Guyana	66,25
United Arab Emirates	78,5	Libya	66,25
Austria	78	Mongolia	66,25
Qatar	78	Gambia	65,75
Czech Republic	77,75	Thailand	65,5
Belgium	77,5	Gabon	65,25
Portugal	77,25	Iraq	65,25
Hong Kong	76,75	Belarus	65
Botswana	76,5	Armenia	64,75
Italy	76,5	Jordan	64,75
Trinidad & Tobago	76,5	Tanzania	64,75
Malta	76,25	Colombia	64,5
United Kingdom	76	Egypt	64,5
Israel	75,75	Iran	63,75
Croatia	75,5	Togo	63,75
Uzbekistan	75,5	Madagascar	63,5
Bulgaria	74,75	Kenya	63
Lithuania	74,5	Zambia	63

Poland	74,5	Angola	62,75
Uruguay	74,5	Guinea-Bissau	62,75
France	74	Tunisia	62,5
Hungary	74	Algeria	62,25
Malaysia	74	Senegal	61,75
Panama	74	Burkina Faso	61,25
Chile	73,75	Cameroon	61,25
Jamaica	73,75	Sri Lanka	61
Latvia	73,5	Zimbabwe	61
Russia	73,5	Cote d'Ivoire	60,5
Estonia	73,25	Nigeria	60,5
Slovakia	73,25	Malawi	59,75
Costa Rica	73	Uganda	59,5
Dominican Republic	73	Mali	59,25
Spain	73	Liberia	59
Kazakhstan	72,75	Turkey	58,25
Kuwait	72,75	Niger	58
India	72,5	Congo, Dem. Republic	57,5
United States	72,25	Guinea	57,5
Azerbaijan	72	Pakistan	57,25
Bahamas	72	Sierra Leone	57
Namibia	72	Ethiopia	56,75
Slovenia	72	Haiti	56,25
China, Peoples' Rep.	71,75	Cuba	55,25
Oman	71,75	Suriname	55
Guatemala	71,5	Myanmar	53
Cyprus	71,25	Yemen, Republic	52,75
Vietnam	71	Korea, D.P.R.	51,5
Peru	70,75	Lebanon	51,5
Romania	70,5	Somalia	51,5
Mexico	70	Mozambique	50,5
Philippines	69,75	Syria	45,5
Brazil	69,5	Venezuela	41,75
Serbia	69,5	Sudan	36,25
South Africa	69,5		

Appendix 2 – GDP Global Ranking (2020)

Abbr.	*Ranking*	*Economy*	*(millions of US dollars)*
USA	1	United States	20.936.600
CHN	2	China	14.722.731
JPN	3	Japan	*5.064.873*
DEU	4	Germany	3.806.060
GBR	5	United Kingdom	2.707.744
IND	6	India	2.622.984
FRA	7	France	2.603.004
ITA	8	Italy	1.886.445
CAN	9	Canada	1.643.408
KOR	10	Korea, Rep.	1.630.525
RUS	11	Russian Federation	1.483.498
BRA	12	Brazil	1.444.733
AUS	13	Australia	1.330.901
ESP	14	Spain	1.281.199
MEX	15	Mexico	1.076.163
IDN	16	Indonesia	1.058.424
NLD	17	Netherlands	912.242
CHE	18	Switzerland	747.969
TUR	19	Turkey	720.101
SAU	20	Saudi Arabia	700.118
POL	21	Poland	594.165
SWE	22	Sweden	537.610
BEL	23	Belgium	515.332
THA	24	Thailand	501.795
NGA	25	Nigeria	432.294
AUT	26	Austria	428.965
ARE	27	United Arab Emirates	*421.142*
IRL	28	Ireland	418.622
ISR	29	Israel	401.954
ARG	30	Argentina	383.067
EGY	31	Egypt, Arab Rep.	363.069
NOR	32	Norway	362.009
PHL	33	Philippines	361.489
DNK	34	Denmark	355.184
HKG	35	Hong Kong SAR, China	346.586
SGP	36	Singapore	339.998
MYS	37	Malaysia	336.664
BGD	38	Bangladesh	324.239
ZAF	39	South Africa	301.924
COL	40	Colombia	271.347
FIN	41	Finland	271.234
VNM	42	Vietnam	271.158
PAK	43	Pakistan	263.687
CHL	44	Chile	252.940
ROU	45	Romania	248.716
CZE	46	Czech Republic	243.530
PRT	47	Portugal	231.256
NZL	48	New Zealand	212.482
PER	49	Peru	202.014
IRN	50	Iran, Islamic Rep.	191.718
GRC	51	Greece	189.410
KAZ	52	Kazakhstan	169.835
IRQ	53	Iraq	167.224
UKR	54	Ukraine	155.582

HUN	55	Hungary	155.013
QAT	56	Qatar	146.374
DZA	57	Algeria	145.164
KWT	58	Kuwait	*136.197*
MAR	59	Morocco	112.871
ETH	60	Ethiopia	107.645
SVK	61	Slovak Republic	104.574
PRI	62	Puerto Rico	103.138
CUB	63	Cuba	*103.131*
KEN	64	Kenya	98.843
ECU	65	Ecuador	98.808
LKA	66	Sri Lanka	80.707
DOM	67	Dominican Republic	78.845
GTM	68	Guatemala	77.605
OMN	69	Oman	*76.332*
MMR	70	Myanmar	76.186
LUX	71	Luxembourg	73.264
GHA	72	Ghana	72.354
BGR	73	Bulgaria	69.105
TZA	74	Tanzania	62.410
AGO	75	Angola	62.307
CRI	76	Costa Rica	61.521
CIV	77	Côte d'Ivoire	61.349
BLR	78	Belarus	60.258
UZB	79	Uzbekistan	57.707
HRV	80	Croatia	55.967
LTU	81	Lithuania	55.887
MAC	82	Macao SAR, China	*55.154*
URY	83	Uruguay	53.629
SRB	84	Serbia	52.960
PAN	85	Panama	52.938
SVN	86	Slovenia	52.880
COD	87	Congo, Dem. Rep.	49.869
TKM	88	Turkmenistan	*45.231*
JOR	89	Jordan	43.698
AZE	90	Azerbaijan	42.607
CMR	91	Cameroon	39.802
TUN	92	Tunisia	39.236
BHR	93	Bahrain	*38.475*
UGA	94	Uganda	37.372
BOL	95	Bolivia	36.689
PRY	96	Paraguay	35.304
NPL	97	Nepal	33.657
LVA	98	Latvia	33.505
LBN	99	Lebanon	33.383
EST	100	Estonia	31.030
SDN	101	Sudan	26.111
LBY	102	Libya	25.418
KHM	103	Cambodia	25.291
SEN	104	Senegal	24.911
SLV	105	El Salvador	24.639
HND	106	Honduras	23.828
CYP	107	Cyprus	23.804
PNG	108	Papua New Guinea	23.592
YEM	109	Yemen, Rep.	*23.486*
ISL	110	Iceland	21.715
TTO	111	Trinidad and Tobago	21.530
AFG	112	Afghanistan	19.807

BIH	113	Bosnia and Herzegovina	19.788
ZMB	114	Zambia	19.320
LAO	115	Lao PDR	19.136
MLI	116	Mali	17.394
BFA	117	Burkina Faso	17.369
ZWE	118	Zimbabwe	16.769
GEO	119	Georgia	15.892
BWA	120	Botswana	15.782
GIN	121	Guinea	15.681
BEN	122	Benin	15.652
GAB	123	Gabon	15.593
PSE	124	West Bank and Gaza	15.561
ALB	125	Albania	14.800
MLT	126	Malta	14.647
MOZ	127	Mozambique	14.021
JAM	128	Jamaica	13.812
MDG	129	Madagascar	13.721
NER	130	Niger	13.678
HTI	131	Haiti	13.418
MNG	132	Mongolia	13.137
ARM	133	Armenia	12.645
NIC	134	Nicaragua	12.621
MKD	135	North Macedonia	12.267
BRN	136	Brunei Darussalam	12.016
MWI	137	Malawi	11.962
MDA	138	Moldova	11.914
BHS	139	Bahamas, The	11.250
MUS	140	Mauritius	10.914
COG	141	Congo, Rep.	10.885
NAM	142	Namibia	10.700
RWA	143	Rwanda	10.334
TCD	144	Chad	10.093
GNQ	145	Equatorial Guinea	10.022
TJK	146	Tajikistan	8.194
MRT	147	Mauritania	7.779
KGZ	148	Kyrgyz Republic	7.736
XKX	149	Kosovo	7.611
TGO	150	Togo	7.575
IMN	151	Isle of Man	*7.492*
BMU	152	Bermuda	*7.484*
MCO	153	Monaco	*7.424*
LIE	154	Liechtenstein	*6.839*
GUM	155	Guam	*6.311*
CYM	156	Cayman Islands	*5.936*
GUY	157	Guyana	5.471
SOM	158	Somalia	4.918
MNE	159	Montenegro	4.779
FJI	160	Fiji	4.376
BRB	161	Barbados	4.366
MDV	162	Maldives	4.030
VIR	163	Virgin Islands (U.S.)	*3.984*
SWZ	164	Eswatini	3.962
SLE	165	Sierra Leone	3.865
SUR	166	Suriname	3.808
DJI	167	Djibouti	3.384
BDI	168	Burundi	3.258
ABW	169	Aruba	*3.202*
AND	170	Andorra	*3.155*

FRO	171	Faroe Islands	*3.126*
CUW	172	Curaçao	*3.102*
GRL	173	Greenland	*3.052*
LBR	174	Liberia	2.950
BTN	175	Bhutan	2.409
CAF	176	Central African Republic	2.303
GMB	177	Gambia, The	1.902
LSO	178	Lesotho	1.845
TLS	179	Timor-Leste	1.821
BLZ	180	Belize	1.764
CPV	181	Cabo Verde	1.704
LCA	182	St. Lucia	1.703
SMR	183	San Marino	*1.616*
SLB	184	Solomon Islands	1.551
GNB	185	Guinea-Bissau	1.432
ATG	186	Antigua and Barbuda	1.415
COM	187	Comoros	1.220
SXM	188	Sint Maarten (Dutch part)	*1.185*
MNP	189	Northern Mariana Islands	*1.182*
SYC	190	Seychelles	1.125
GRD	191	Grenada	1.089
KNA	192	St. Kitts and Nevis	927
TCA	193	Turks and Caicos Islands	925
VUT	194	Vanuatu	855
VCT	195	St. Vincent and the Grenadines	810
WSM	196	Samoa	807
ASM	197	American Samoa	*638*
TON	198	Tonga	*512*
STP	199	São Tomé and Principe	473
DMA	200	Dominica	470
FSM	201	Micronesia, Fed. Sts.	*408*
PLW	202	Palau	*268*
MHL	203	Marshall Islands	*239*
KIR	204	Kiribati	200
NRU	205	Nauru	*118*
TUV	206	Tuvalu	49
VGB		British Virgin Islands	-
CHI		Channel Islands	-
ERI		Eritrea	-
PYF		French Polynesia	-
GIB		Gibraltar	-
PRK		Korea, Dem. People's Rep.	-
NCL		New Caledonia	-
SSD		South Sudan	-
MAF		St. Martin (French part)	-
SYR		Syrian Arab Republic	-
VEN		Venezuela, RB	-

Appendix 3 – Developed economies list

1.	Austria
2.	Belgium
3.	Denmark
4.	Finland
5.	France
6.	Germany
7.	Greece
8.	Ireland
9.	Italy
10.	Japan
11.	Luxembourg
12.	Netherlands
13.	Norway
14.	Portugal
15.	Spain
16.	Sweden
17.	United Kingdom
18.	United States

Appendix 4 – List of 28 developed countries' ratings, as of 01/2022

Country	***S&P Rating***	***Moody's rating***
Australia	AAA	Aaa
Austria	AA+	Aa1
Belgium	AA	Aa3
Canada	AAA	Aaa
Cyprus	BBB-	Ba1
Czech Republic	AA-	Aa3
Denmark	AAA	Aaa
Finland	AA+	Aa1
France	AA	Aa2
Germany	AAA	Aaa
Greece	BB	Ba3
Iceland	A	A2
Ireland	AA-	A2
Isle of Man	NA	Aa3
Italy	BBB	Baa3
Japan	A+	A1
Liechtenstein	AAA	Aaa

Luxembourg	AAA	Aaa
Malta	A-	A2
Netherlands	AAA	Aaa
New Zealand	AA+	Aaa
Norway	AAA	Aaa
Portugal	BBB	Baa2
Spain	A	Baa1
Sweden	AAA	Aaa
Switzerland	AAA	Aaa
United Kingdom	AA	Aa3
United States	AAA	Aaa

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