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From "Junk" to Success: How Non-Investment Grade Ratings Shape a Firm's Financing Decisions

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TABLE OF CONTENTS

FIGURE INDEX

LIST OF ABBREVIATIONS

List of Abbreviations	
IG	Investment Grade
HY	High Yield
LL	Leverage Loan
S&P	Standard and Poor's
CRAs	Credit Rating Agencies
M&A	Mergers and Acquisitions
LBO	Leveraged Buyout
GFC	Great Financial Crisis
SACP	Stand-Alone Credit Profile
ICR	Issuer Credit Rating
MNPI	Material Non-Public Information
LGD Risk	Loss Given Default Risk
CLO	Collateralized Loan Obligation
SOFR	Secured Overnight Financing Rate
LIBOR	London Interbank Offering Rate
ESG	Environmental, Social, and Governance
PE	Private Equity
UoP	Use of Proceeds
ROA	Return on Assets
ROE	Return on Equity
OM	Offering Memorandum
TLA/B	Term Loan A/B
MTM	Mark to Market
AMD	Advanced Micro Devices

EXECUTIVE SUMMARY

This study investigates the effects a non-Investment Grade credit rating has on a company's financing strategies and the perspectives of potential investors. Initially, the focus is placed on credit rating agencies' methodologies, specifically those of "The Big Three" (Moody's, S&P, and Fitch), to understand their rating process and the differences between them. Subsequently, the theoretical framework encompasses a historical overview, characteristics of a non-Investment Grade classification, and the breakdown of non-IG financing instruments, focusing on the characteristics, similarities, and differences of Leverage Loans and High-Yield Bonds. This is later examined through a detailed analysis of AMD, a semiconductor manufacturer, during its transition to Investment Grade status in 2020, looking into the changes this caused to its capital structure, debt costs, and stock performance. The findings highlight the tangible benefits that arise after leaving the speculative grade realm, such as lower debt costs, increased financial flexibility, and enhanced investor confidence, emphasizing the pivotal role credit ratings play in shaping corporate financing strategies.

KEY WORDS: Leverage Finance, Non-Investment Grade, Leverage Loans, High Yield Bonds, Debt Financing, Credit Rating Agencies.

RESUMEN EJECUTIVO

Este Trabajo de Fin de Grado investiga cómo afecta una calificación crediticia de tipo Especulativo o *Non-Investment Grade* en las estrategias de financiación de una empresa y en el comportamiento de los posibles inversores. Inicialmente, nos enfocamos en el papel de las Agencias de Calificación Crediticia, en especial en las "*Big Three*" (Moody's, S&P y Fitch), para entender los criterios que utilizan para asignar sus calificaciones y las diferencias entre ellos. Posteriormente, desarrollamos desde el punto de vista teórico, un estudio cualitativo en el que analizamos las características y la evolución histórica de este tipo de empresas con clasificación especulativa, así como los instrumentos financieros de los que pueden disponer más habitualmente: *Leverage Loans* y *High Yield Bonds*. Acabamos con un análisis de caso de Advanced Micro Devices, una empresa fabricante de semiconductores, durante su transición hacia la categoría de grado de inversión en el año 2020, analizando los consecuentes cambios que experimentó en su estructura de capital, gastos financieros y rendimiento. Los resultados muestran que una mejora en la calidad crediticia conlleva una disminución en los costes de la deuda, una mayor flexibilidad financiera y un aumento en la confianza de los inversores, subrayando así la importancia de las calificaciones crediticias en las estrategias de financiación y expansión de una empresa

PALABRAS CLAVE: Leverage Finance, Grado Especulativo, Leverage Loans, High Yield bonds, Apalancamiento, Agencias de Calificación Crediticia.

1. INTRODUCTION

When we get asked to think about a company our mind tends to automatically shift to the giants in the market of the likes of Google, Nike, Saudi Aramco… However, we forget that much like in all other aspects of our lives, there are smaller yet equally significant players in the market. Throughout this dissertation, we will be focusing our analysis on non-Investment Grade ratings, exploring the issuers and the dynamics of the "junk" securities realm.

Whether a company is classified as non-Investment Grade, "junk", high yield or speculative is determined based on a relative scale by three credit rating agencies (CRA's): Standard & Poor´s (S&P´s), Moody´s and Fitch Rating. These agencies analyze the ability and willingness of a firm to repay its existing debt based on specific economic and financial indicators that affect their creditworthiness. If their conclusion lies on a rating of BB+ or below from S&P´s and Fitch, or Ba1 or below from Moody´s, they are considered non-Investment Grade (non-IG). Given the increased risk that arises from these "less creditworthy" companies, they will have to adjust the instruments they use to finance their operations in order to remain competitive in the market. Therefore, to compensate for the additional risk of potential default, these non-Investment Grade securities offer higher yields than their Investment Grade (IG) counterparts. More specifically, they offer two types of securities which we will be analyzing and comparing throughout this dissertation: High Yield (HY) Bonds and Leverage Loans (LL).

1.1. Rational behind the topic election

There are two fundamental reasons behind the election of this specific topic. Firstly, the surge in popularity that non-Investment Grade financial instruments have had in the recent past. Given the decade-long low-yield environment and the low financial market volatility we had been experiencing prior to the COVID-19 outbreak, investors sought alternative sources of increased yields, which led many to cross paths with below-investment Grade assets. As a result, we saw an increased presence of High-Yield bonds and Leveraged Loans in investor portfolios and strategies aimed at managing and targeting volatility. Nonetheless, whilst their presence has grown, they continue to be

widely misunderstood or unknown financial instruments. This characteristic lends an intriguing complexity to the subject, rendering it an interesting topic to further explore.

Secondly, having had the chance to work as an analyst in a Leverage Finance team whose focus is primarily on non-Investment Grade issuers, I have been able to observe the practical differences a rating has on debt issuances and investor perceptions. The preferences and nuances observed in investor dealings with "junk" issuances significantly differed from those involving traditional investment Grade issuers, visibly shaping the financial decisions of the firm. Therefore, I found it interesting to explore and analyze these distinctions and the consequential outcomes they bring about.

1.2. Objectives and Methodology

This study aims to analyze the consequences a non-Investment Grade credit rating has on the financing strategies available for a company, and, simultaneously, on the perspectives of potential investors. Our initial objective is to gain a thorough understanding of the process by which companies attain specific credit ratings. This entails a comprehensive inquiry into the methodologies employed by the three major credit agencies—Moody's, S&P, and Fitch—while also discerning the differences in their respective processes.

Upon establishing a framework to understand these rating distinctions, our focus turns to the second objective of the study. This involves dissecting the disparities between the financing instruments designed, both from an issuers perspective and an investors perspective, for both Investment Grade and non-Investment Grade issuers. We specifically concentrate on unraveling the complexities associated with non-IG securities: High-Yield bonds and Leveraged Loans. To illustrate these differences, we will analyze the case of Advanced Micro Devices (AMD), a semiconductor manufacturer that transitioned to Investment Grade in late 2020 and evaluate the implications of this upgrade.

The aim behind this comparative analysis is to shed some light on how financial strategies and instruments adapt to the varying risk profiles associated with different credit qualities.

2. THEORETICAL FRAMEWORK

To address the outlined objectives, we will develop a theoretical framework divided into three parts, with which we intend to provide a foundational basis for our study before proceeding with the empirical analysis.

In the initial section, we will focus on providing an overview of the rating analysis industry and system. This will include a historical recap of the matter, along with an analysis of the main three agencies ("the Big Three") and their differences. Following that, we will continue by conducting a thorough exploration of Non-Investment Grade classification including its characteristics and thresholds to evaluate how it differs from an Investment Grade (IG) classification. The third part will consist of a breakdown of the available financing instruments for speculative Grade: High-yield bonds and Leverage Loans.

2.1. Rating Analysis

A credit rating is a forward-looking metric that shows the ability of an issuer to meet its financial obligations in full and on time (Standard & Poor's, 2016). They can be assigned to any entity looking to borrow money: corporations, states, sovereign entities... In basic terms, it's a metric that provides transparency on a firm's credit risk to external parties (Chasiotis, 2019). The Rating system helps foster the development and smooth the functioning of capital markets by providing transparent information and insights to market participants.

Ratings help reduce information asymmetry between lenders and security issuers (borrowers). This is because potential investors will have to evaluate an issuer´s probability of failure to fulfill obligations, such as returning principal, interest, or any other necessary payments to a creditor. This estimation relies heavily on trusting the borrower's commitment to meet these financial obligations. Therefore, to solve these imperfect market conditions, credit ratings provide independent and clear metrics that help support lenders in their default assessments. However, it must be noted that they are

not absolute measures or exact sciences given the inherent uncertainty of future events and developments (Kiesel, 2016).

To fulfill this market transparency in a clear and easily understandable manner, credit rating agencies employ a simple letter-rating ranking system that indicates the creditworthiness of the borrower. Table 1 displays the different rating tiers for the Big Three, but they all range from AAA to C or D. A crucial distinction highlighted in Table 1 is the categorization into Investment Grade and Non-Investment Grade Bonds. IG bonds, rating Baa3, BBB- and above, are deemed by credit rating agencies as likely to meet their payment obligations, whereas, non-IG, with ratings Ba1, BB+, and below are considered to be significantly higher risk. The threshold distinction between Investment Grade and speculative Grade ratings holds crucial implications for market participants, as we will later analyze.

Table 1: Credit Ratings Table: Moody's, S&P, and Fitch

Moody's	S&P	Fitch		Non-IG
Aaa	AAA	AAA	Prime	
Aa1	AA+	AA+	High Grade	
Aa2	AA	AA		
Aa3	AA-	AA-		
A1	A+	A+	Upper Medium Grade	
A2	A	A		
A3	A-	A-		
Baa1	BBB+	BBB+	Lower Medium Grade	
Baa2	BBB	BBB		
Baa3	BBB-	BBB-		
Ba1	BB+	BB+	Non-Investment Grade Speculative	*"junk"* *"high yield"* *"speculative"*
Ba2	BB	BB		
Ba3	BB-	BB-		
B1	B+	B+	Highly Speculative	
B2	B	B		
B3	B-	B-		
Caa1	CCC+	CCC	Substantial Risk	
Caa2	CCC	CCC	Extremely Speculative	
Caa3	CCC-	CCC	Default Imminent with Little Prospect for Recovery	
Ca	CC	CCC		
Ca	C	CCC		
C	D	DDD	In Default	
-	D			
-	D	D		

Source: Own elaboration based on information from Afonso et al., 2006

An interesting addition to the concept of credit rating is the rating outlook, which when assigned, can fall into four possible categories: Stable, Positive, Negative, and Developing/No Outlook (ICRA, 2017). This provides lenders with supplementary details regarding the expected trajectory of the credit rating over the medium term, typically spanning six to twenty-four months. Moreover, some entities undergoing announced or anticipated major corporate events (often related to mergers and acquisitions), could be placed on credit watch pending the resolution of the event. Even so, in some instances, the agency may additionally offer insights into how various potential outcomes could impact their ratings (Santos, 2009).

Leveraged Finance credit analysis is a dynamic and complex process for which it draws upon tools traditionally associated with various assorted fields. While some are borrowed from fixed-income markets and equity markets, other tools are derived from probability and game theory. Nonetheless, as analyzed throughout Kricheff's book (2016), it generally begins with the analysis of two fundamental items: financial liquidity and asset protection. With the first of the two, CRAs will focus on analyzing whether an entity generates sufficient cash, either from its day-to-day operations or elsewhere, to meet its interest and principal payments obligations throughout the loan's duration. Secondly, they will shift their focus to asset value. When liquidity is insufficient for debt service, the issuer must seek recourse based on the value of the underlying assets. Moreover, in the event of bankruptcy, a scenario more likely when engaging with these higher-risk issuers, investors turn to the appraisal of asset worth as a tactical method for possible debt restructuring, debt servicing, or value recovery (Kricheff, 2016). As we´ll discuss further on, the rest of the analysis or evaluation will derive from these two basic ideas.

While CRAs have been on the back end of extensive criticism since the Great Financial Crisis (GFC), it is crucial to recognize that these agencies can indeed contribute value and as a result, play a significant role in the market nowadays. Typically provided with non-public internal projections from companies, they offer analysts and investors valuable insights – especially in the context of new issuances where information is typically rather limited. Additionally, these agencies bring attention to both short-term and long-term concerns, shedding light on crucial factors that could potentially trigger a rating change (Dimitar, 2011). Therefore, while not the sole determinants of trading levels

or performance for non-Investment Grade securities, credit ratings wield substantial influence over them.

Another important factor to take into consideration when trying to describe CRAs and their function is how they obtain their revenue. Not only is this important in our study given that we are analyzing how a non-IG firm finances its operations and as such, must consider all of the relevant costs incurred, but also because it has driven many to doubt the veracity of their credit opinions. Since the mid 1970's, companies rated by agencies pay fees for said ratings, which constitute the agency's revenues. Whilst being aware that revenues have to be generated somewhere, this does open the door to potential conflict of interest complaints. This issue came to light to the broader public following Enron's bankruptcy filing in 2001, marking the onset of criticism for the "issuer pays" business model (White, 2010) of the sorts of "so long as sellers are funding their ratings, it's hard to imagine raters being totally deaf to their needs. Buyers need to fund the ratings" (Klein, 2009), which were later intensified with all of the major downgrades that followed the subprime crisis. (Mügge, 2014).

Many studies, including that of Jiang, Stanford, and Xie (2012), support and prove the existence of a positive bias stemming from the issuer-pay business model. For example, when they tested historical ratings of 797 corporate bonds, they discovered that from 1971 to June 1974, when Moody's rating services were paid by the issuers and S&P's by investors, Moody's ratings were, on average, higher than that of S&P's on the same security. Later, when both agencies shifted to charging the issuers (1974-1978), they observed that Moody's ratings were no longer consistently higher than those of S&P (Jiang et al., 2012)

However, the CRA's business relies deeply on their perceived impartiality, transparency, and objectivity; and as a result, their reputation acts as a "market-driven safeguard" against potential exploitation or impartialities (Smith & Walter, 2002). In response to this continuous criticism, Moody's claims that they are "in the integrity business" (House, 1995), to which S&P adds that their "reputation is their business" (Tillman, 2007). This is supported by the SEC, who, in trying to restore calm within the markets, agreed that

The ongoing value of a rating organization's business is wholly dependent on continued investor confidence in the credibility and reliability of its ratings, and no single fee or group of fees could be important enough to the organization to jeopardize its future business. (SEC, 2003)

2.1.1. The Big Three

While several independent rating agencies exist, Standard & Poor's (S&P), Moody's Investor Services (Moody's), and Fitch IBCA (Fitch) stand out as the three primary credit rating providers often referred to as "The Big Three", see Annex III for complete market share breakdown. In the early 20th century, they all started out as business information publishers before branching out into securities rating (Vir Bhatia, 2002). Each of them has its own individual rating system in which Fitch and Standard & Poor's use pluses and minuses, whereas Moody's uses numbers. Nonetheless, there is a level of consistency across them all that facilitates comparison, for example, a Baa1 rating from Moody's aligns with a BBB+ rating from S&P and Fitch (refer to Table 1 for complete rating scales).

CRAs often assign varied ratings to the same entity, more often so when dealing with sovereign rather than corporate ratings. According to Alsakka & Gwilym (2010), their examination of sovereign ratings revealed a 50.6% discrepancy between Moody's and S&P, 46.9% between Moody's and Fitch, and the lowest, 35.9%, between S&P and Fitch. They identified three key reasons that explained these discrepancies: the factors and their weight within the analysis differ from one agency to the next; these disagreements are exacerbated when dealing with junk issuers due to higher levels of scrutiny; and a tendency for certain agencies to provide more favorable ratings to issuers in their home region. Overall, the authors concluded that Moody's has more emphasis on stability, S&P puts more weight on short-term accuracy, while Fitch typically follows the rating from the other two agencies (Alaskka & Gwilym, 2012). In the following table, we can see how the three main credit reporting agencies view their own ratings.

Table 2. Credit Ratings by The Big Three

S&P's	"Standard & Poor's credit ratings are designed primarily to provide relative rankings among issuers and obligations of overall creditworthiness; the ratings are not measures of absolute default probability. Creditworthiness encompasses likelihood of default and also includes payment priority, recovery, and credit stability."
Moody's	"There is an expectation that ratings will, on average, relate to subsequent default frequency, although they typically aren't defined as precise default rate estimates. Moody's ratings are therefore intended to convey opinions of the relative creditworthiness of issuers and obligations. Moody's ratings process also involves forming views about the likelihood of plausible scenarios—not forecasting them, but instead placing some weight on their likely occurrence and the potential credit consequences. Normal fluctuations in economic activity are generally included in these scenarios, and by incorporating our views about their likelihood, we give our ratings relative stability over economic cycles and a sense of horizon."
Fitch	"Credit ratings express risk in relative rank order, which is to say they are ordinal measures of credit risk and are not predictive of a specific frequency of default or loss. Fitch Ratings' credit ratings do not directly address any risk other than credit risk, ratings do not deal with the risk of a market value loss on a rated security due to changes in interest rates, liquidity and other market considerations."

Source: own elaboration based on information from the IMF (2020)

2.1.1.1. Standard and Poor's

Standard & Poor's rating system, dating back to 1916 (S&P Global, n.d.), employs a scale that spans from AAA, denoting an Investment Grade with an exceptionally robust capacity to meet all of its financial commitments, to BB, indicating a Speculative Grade for issuers less vulnerable in the near term but facing significant ongoing future

uncertainties in adverse conditions. At the lowest rank of the scale, a rating of D is assigned, signifying payment default on a financial payment or a breach of an implied promise (S&P, 2016).

Specifically for S&P, the rating process comprises eight distinct steps (S&P Global, n.d.). It starts with the initiation of a contract when the issuer requests a rating and formalizes the engagement through an agreement letter. Subsequently, a Pre-Evaluation is conducted by a team of analysts, culminating in a meeting with the management team to review and discuss the information provided. Following this, the analysis phase ensues, during which analysts propose the rating to a rating committee, who then reviews the recommendations and votes to make the final decision. Once the rating decision is reached, a pre-publication rationale is shared with the issuer for fact-checking and accuracy verification. After this stage, the rating is published on the website along with a press release. However, the process doesn't conclude here; the last step involves ongoing surveillance of issuers and issues to identify reasons for potential upgrades or downgrades.

The analysis stage is the pivotal phase of this process, holding the essence of the evaluation. The approach, however, varies based on the type of issuer, such as Corporate, Sovereign, Financial, Insurer, US Local governments, non-U.S. LRGs… Nonetheless, our primary focus will be on Corporate and Sovereign issuers, which are the most typical in this context.

Figure 1. S&P Corporate Criteria Rating Framework
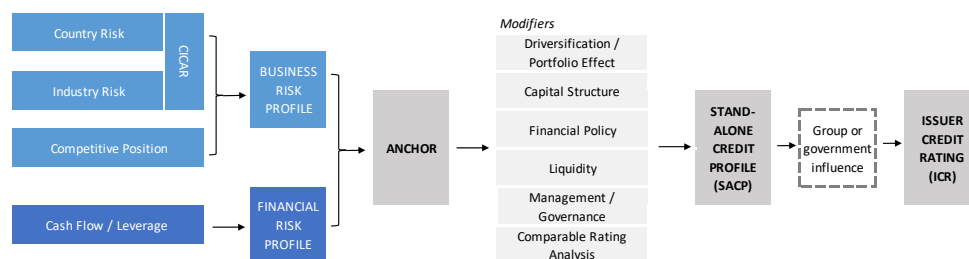
Source: own elaboration based on information from S&P Global (2021)

Specifically, for **corporate issuers,** S&P's rating process initiates with the evaluations of a company's business and financial risk profile, which are then combined to establish the issuer's anchor assessment. Following this, an examination of six factors (or "modifiers")

that may potentially affect the anchor conclusion occurs, leading to the determination of a stand-alone credit profile ("SACP"). Lastly, when relevant, group or government influence is taken into account to determine an issuer credit rating ("ICR"). Throughout this entire process, specific analytical adjustments are applied to reported financials, aiming to ensure enhanced global consistency and comparability of financial data (S&P, 2021).

Figure 2. S&P Sovereign Criteria Rating Framework
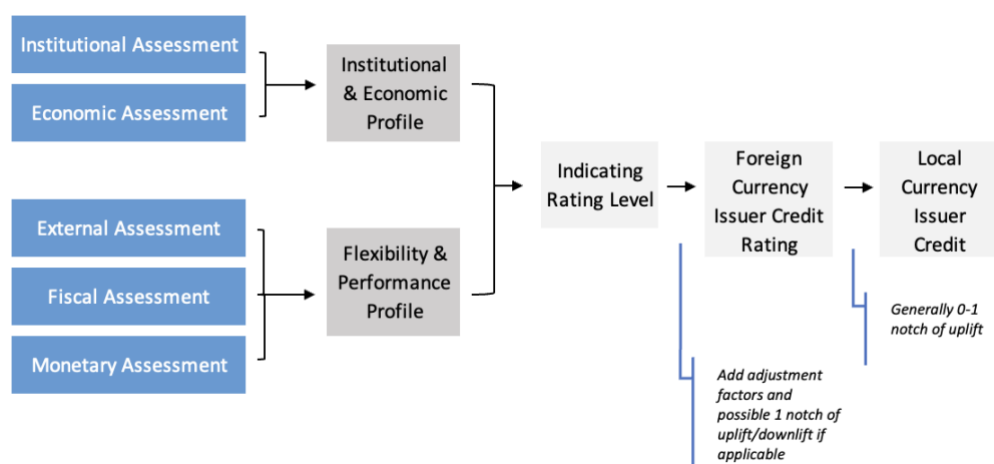
Source: own elaboration based on information from S&P Global (2022)

With regards to **sovereign governments and monetary authorities**, the analysis rests on five fundamental pillars that evaluate their institutional and economic profile, whilst looking at external, fiscal, and monetary criteria. Each of the five factors is evaluated on a six-point numerical scale ranging from "1" to "6" (strongest to weakest) based on a combination of quantitative and qualitative considerations (S&P, 2019).

The institutional and economic profile, represented by the average of the institutional and economic assessment, reflects the country's economic resilience, the stability of its civil institutions, along with the efficacy of its policymaking. The flexibility and performance profile, derived from the average assessment of the last three criteria, encompasses the government's ability to sustain fiscal balance and manage debt in conjunction with the country's external position, as well as its fiscal and monetary flexibility. These assessments culminate in an indicative rating level, subject to potential modifications if

it deviates by more than one notch from the sovereign foreign-currency rating. The final sovereign local-currency rating may undergo a final adjustment, typically not exceeding one notch of uplift over the foreign-currency rating (S&P, 2019).

2.1.1.2. Moody´s

Moody´s corporation dates back to 1900, when company founder John Moody published "Moody's Manual of Industrial and Miscellaneous Securities" (Moody's, n.d.). After suffering the effects of the Bank Panic of 1907, the company reemerged with an analysis of railroad operations and finances. This analysis was presented using letter rating symbols, borrowed from the mercantile industry, and has evolved into the industry giant it is today (Christie, 2015).

Their rating scale, as seen on Table 1, spans from Aaa to C, with corresponding numerical modifiers to increase precision. A modifier of 1 signifies that the security holds the highest position in its generic rating category, while a modifier of 2 suggests a mid-range ranking, and a modifier of 3 implies a lower ranking. Additionally, hybrid securities issued by banks, insurers, financing businesses, and securities firms are marked with the "(hyb)" indicator across all ratings (Moody's Investor Relations, n.d.).

Moody's rating system typically spans around 8 weeks on average, though this timeline may vary based on complexity and specific circumstances. The process, similar to that of S&P, initiates with a rating application or request from the issuer that is constituted in the form of a commercial engagement and accompanied by the requisite signature. Subsequently, an analytical team, comprising a lead and backup analyst, will be assigned to the applicant, to whom the issuer will provide all necessary information. Following receival of the information, the analytical team will meet with the issuer management group to present to them the company information and discuss the applicable materials; after which they'll evaluate all the relevant information. Following this, the rating committee will review, vote, and decide on a credit rating, which will be communicated to the issuer before dissemination. After publication, Moody's will maintain ongoing monitoring of the assigned rating.

Moody's ratings are initially established or subsequently modified through committee decisions. In these, the lead analyst, responsible for a specific company, industry, country, or asset type, guides the discussion by presenting the rating recommendation along with its rationale. In forming their conclusions, Moody's analysts utilize diverse sources of information, encompassing publicly available data (e.g., annual reports), prospectuses, offering memoranda, or indentures of specific securities, market data (e.g., stock price, trading volume, spreads), and economic data from industry groups like the World Bank or agencies such as central banks, among others (Moody's Investor Relations, n.d.).

In addition to long-term rating opinions that assess the likelihood of default or financial loss on obligations with maturities spanning a year or more, Moody's employs other scales such as a global short-term scale. This scale evaluates an issuer's ability to repay all short-term obligations and ranges from a P-1 rating to a P-3, concluding with an NP for non-Investment Grade issuers (Moody's Investor Service, n.d.). They have also recently incorporated an Environmental, Social, and Governance (ESG) issuer rating score that classifies an issuers' exposure to considerations of that type. They range from E/S/G – 1 with lowest negative exposure to ESG considerations all the way to E/S/G – 5 that hold the highest exposure and risk.

2.1.1.3. Fitch

For long-term international credit ratings, Fitch's 'AAA' to 'D' credit rating scale is a generally recognized measure of credit risk. It was pioneered in 1924 (Fitch Group, n.d.) and has since been employed by other rating scale suppliers.

While their rating process bears similarities to other agencies, Fitch is commonly perceived as having less independence, as it frequently aligns its analysis with the assessments of other major credit rating agencies (OECD, 2010). Once again, the process is initiated after a request to engage from the issuer, leading the analyst to gather both publicly available and, when necessary, material non-public information (MNPI). This information guides the preparation of a detailed questionnaire to foster a productive dialogue with the issuer's management team. Following the meeting, there will be an in-

depth analysis in which the primary and secondary analyst will form a rating recommendation, that will be reviewed and voted through a committee process. Once the rating is determined, the outcome, accompanied by relevant explanations, is communicated in writing to the issuer and later published. Continuous monitoring and reviews occur consistently, with committees being held at least annually (Fitch Ratings, n.d.).

Two main factors differentiate Fitch's analysis from that of its competitors. Firstly, the use of "criteria complements". They start by focusing their analysis on business and other overlay risks to assign an IDR, but they later build upon it by applying specific, more intricate criteria to check and enhance their findings. Additionally, a unique analytical feature for Fitch is the use of "rating navigators," exemplified in Figure 3. This visual overview captures the key quantitative and qualitative factors analyzed to determine an entity's rating, aligning with their published Rating Criteria. It offers a transparent and easy-to-understand representation of how a rating is constructed (Fitch Ratings, n.d.).

Figure 3. Rating Navigator Fitch
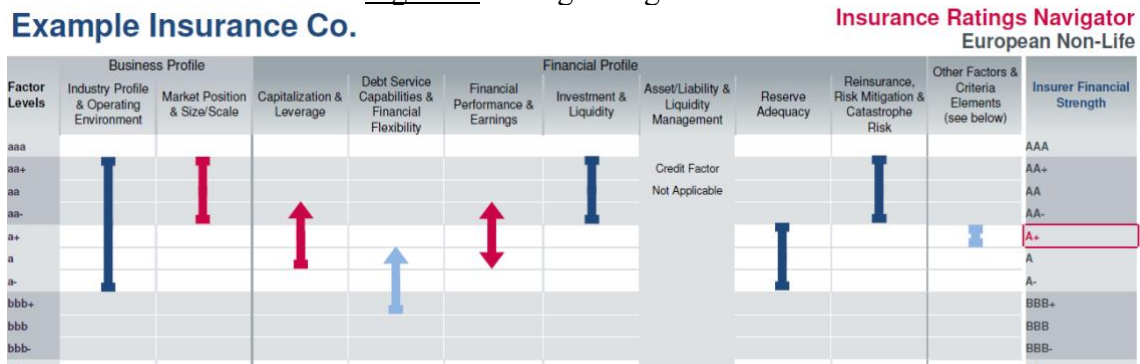
Source: (Carrier Management, 2015)

2.2. Non-Investment Grade Classification

Issuers and securities with ratings of BB+ or Ba1 and below fall into the non-Investment Grade spectrum, signifying a more speculative nature and a certain increased degree of risk that is often referred to as high-yield or "junk" (Basel, 2000). Because of this, the

incremental yield available on the instrument is generally higher as it must be adequate to compensate the investor for this risk (Bank for International Settlements, 2013).

Issuers with high-yield ratings can be classified into two categories: "fallen angels" and "original issue." The former refers to entities that have lost their Investment Grade status, having previously held a rating of BBB- and above, but subsequently fallen to speculative Grade (the opposite being referred to as "rising star"). "Original issuers" are companies that, due to market restrictions favoring larger IG entities, were initially compelled to finance their operations through banks or private debt. However, they later found opportunities to issue non-IG securities which opened them up to huge pools of new funding (Livingston & Zhou, 2020). These types of securities have created conflicting perspectives. Some consider them to be a stimulus for economic expansion, as they free firms from highly restrictive financing options. Conversely, others view them as an escape from the close monitoring of commercial banks, which could potentially lead to imprudent financing and investment decisions (Asquith et al., 1989).

2.2.1. History

Amidst the previous decade's low-yield environment, speculative Grade markets witnessed a resurgence, reminiscent of a similar trend in the 1980s (CNMV, 2015). During the 80s, the speculative markets boom was driven by a surge in Leverage Buyouts (LBO) operations and increase in fallen-angel companies. In this scenario, as explained by Martín's findings for the National Securities Market Commission (2015), small businesses secured the required resources to acquire larger companies, often facing financial difficulties but possessing substantial assets, by issuing high-yield bonds. They found that "junk" issuances could be done at cheaper rates and with greater liquidity than if obtained from private lenders. Mixed with the fact that, when compared to their bank debt equivalents, high yield securities had less strict incurrence covenants. Given the attractive circumstances, they were able to later amortize the bonds using the acquired assets. Investors also noticed that, compared to Investment Grade bonds, their speculative Grade counterparts offered superior risk-adjusted returns, and lenders were able to restructure defaulting debt with HY bonds, all of which contributed to their increased popularity at the time (Fitch Ratings, 2023). This surge in popularity became evident as

the market experienced a 34% annual growth rate throughout the 80s, resulting in an increase from $10 billion to $189 billion in outstanding issuance (Leverage Lion Capital, 2023).

However, unlike in the eighties, the more recent surge in demand was not tied to LBO operations but rather reflected the need to refinance companies in the restricted bank credit environment (Wilmarth, 2005). This surge in demand could also be attributed, amongst other factors, to their higher profitability relative to other investment assets, and the diverse economic sectors to which the issuers belong. Collectively, all of these factors rendered these securities an attractive option for portfolio managers who were looking for profitability in higher yields during record low rates (CNMV, 2015). As of now, the current macroeconomic and financial scenario, still signals slight levels of uncertainty but has significantly improved compared to the peak period of the crisis. Therefore, it does not completely eliminate the inherent risks in this market segment, but it creates a potentially opportunistic scenario. We now expect a new surge in speculative market movements as rates are expected to return to "normal" levels, and entities will be seeking to refinance their existing debt to adapt to the more affordable rate environment (ECB, 2023).

2.2.2. Characteristics and Thresholds for Non-Investment Grade

The spectrum of non-Investment Grade Issuers is hugely varied, so it is difficult to understand what constitutes the junk Grade "criteria". It will generally be based on certain ratios or metrics, that if not met, tend to be correlated to a certain degree of risk for future default or unpayments. The specific requirements vary for each entity based on the sector and their unique characteristics. However, there is some cohesiveness in the key ratios used to determine a speculative Grade rating, which fall into four categories: profitability, leverage, coverage, and liquidity ratios (BDC, n.d.); all derived from financial statements and adjusted to meet the specific criteria set by each CRA.

Firstly, within the profitability "group" we find the metrics that measure an entity's capability to generate profit relative to its revenue, assets, and equity (Oxford University Press, 2016). Again, it can be sub divided into margin ratios (EBITDA margin, Operating

Profit margin…), and return ratios (ROA, ROI) – see annex 1 for complete ratio breakdown. It can help determine whether that entity´s stock value will appreciate and is an indication on their ability to re-pay debts. This can therefore be a pointer on determining ratings because a strong profitability profile increases the entity's perceived credibility with creditors and investors as it suggests robust financial performance and positive insight into the efficiency of operations and cost management (Vipond, 2023).

As per leverage ratios, they focus on examining indebtedness in relation to other entries on a balance sheet, income statement, or cash flow statement and include ratios such as debt to assets, to capital, or to equity (CFI, 2024). The higher this metric is, the higher the level of financial risk, as a greater proportion of total asset or capital will be funded by debt. And, even if leverage can increase returns, it can also exacerbate losses, hence, it can be a potential source of financial instability hurting a company's financial health and consequently, its rating.

Coverage ratios determine the ability of a company to meet its financial obligations with their income, cash, or assets at hand, a clear indicator of their possibility of default. It includes metrics like interest coverage ratio, cash, or asset coverage ratio (CFI, 2023). Even with a high asset coverage ratio, its effectiveness during financial challenges hinges on its convertibility into cash. In times of immediate need (short term), having high coverage ratios might not be enough if they cannot be readily converted to cash. This is why, liquidity ratios, such as the current ratio, cash ratio, or working capital, are also considered in a ratio analysis, as they reveal an entity's genuine ability to settle current debts promptly (Kricheff, 2016). Therefore, coverage ratios provide valuable insights into an entity's overall financial health and the risk of default. However, as their immediate effectiveness of these metrics relies on the liquidity of the assets, liquidity ratios come into play, enhancing the assessment, and contributing to a more thorough evaluation of the entity's risk and creditworthiness to ensure an accurate rating.

We have clearly established that non-Investment Grade ratings are given to entities that pose higher risk for potential investors, however, what exactly are those risks? The primary one that becomes evident with these entities is credit risk, which denotes the potential loss resulting from an issuer's inability to fulfill its financial commitments in full (Baesens & Van Gestel, 2009). In addition, other factors contribute to the elevated

exposure or uncertainty around these entities, such as their increased sensitivity to potential interest rates changes, because of their higher yields and longer durations. Moreover, there's a heightened liquidity risk, as junk securities typically experience fewer transactions, leading to larger bid-ask spreads. Furthermore, these entities are more exposed to event and market risk; therefore, they often exhibit greater sensitivity to fluctuations in economic conditions, shifts in investor sentiment, regulatory changes, and broader market events. These characteristics, visible in sub-IG issuers, contribute to their lower credit ratings. Consequently they result in higher required yields, which consider factors such as Loss-Given-Default Risk (LGD) which has to calculate the potential loss in the event of default (BIS, 2016). Additionally, considerations like maturity risk play a role, wherein lenders demand greater returns for longer maturity dates due to the increased potential for default over an extended period before maturity.

2.3.   Financing instrument for non-Investment grade issuers

Given that entities with credit ratings below Investment Grade were previously excluded from traditional financing instruments, they actively sought alternative investment avenues that aligned with their risk profiles and specific characteristics (Jewell & Livingston, 1999). In light of this, the high-yield leverage market opened up attainable financing possibilities for these entities, particularly concerning two prominent instruments within this domain: High-Yield bonds and Leverage Loans. These financial tools play a crucial role in providing capital to non-Investment Grade entities, offering flexibility, and accommodating their unique financing needs (CNMV, 2015).

According to Eric Rosenthal, Senior Director of Leveraged Finance at FitchRatings, the HY leveraged bond and loan market is valued at well over three trillion dollars, highlighting its crucial role in the financial markets. It has grown 100% since the 2007-2009 financial crisis, with the Leveraged Loan market alone growing by about 130% (Rodriguez, 2023). This extensive market spans diverse industries and a wide array of issuers across continents, including North America (with the highest number of issuances), Europe, Asia, and South America, covering both developed and emerging markets (ICMA, n.d.). High-yield securities are issued in both public and private debt markets, creating a unique and dynamic investment environment. While sharing some

features with traditional IG fixed income, they also exhibit characteristics, such as event-driven volatility, more commonly associated with equity markets (CNMV, 2015). This combination of features makes it a unique and exciting investment option in the financial arena. Throughout this section, our focus will be on the two primary financing avenues readily available for non-Investment Grade issuers—High Yield bonds and Leverage Loans. We will delve into their unique characteristics and examine how they differ from the traditional financing methods employed by their Investment Grade counterparts.

2.3.1. High-Yield bonds

High-yield bonds, defined as corporate bonds rated below Investment Grade by CRAs, play a crucial role in the financing strategies of speculative Grade issuers and constitute a significant component in many investors' portfolios. Given their inherent risk, when issued parallelly, they offer higher coupons compared to government bonds or other IG corporate bonds. Often colloquially referred to as junk bonds, this type of security has been present for nearly as long as the more "traditional" corporate bond alternatives. Some investors, however, associate their prominence with the aforementioned surge in LBO activity during the 1970s and 80s (Gheorghe & Popescu, 2015).

Figure 4. Overall HY Issuance by Value Q1 2018 – Q4 2023.
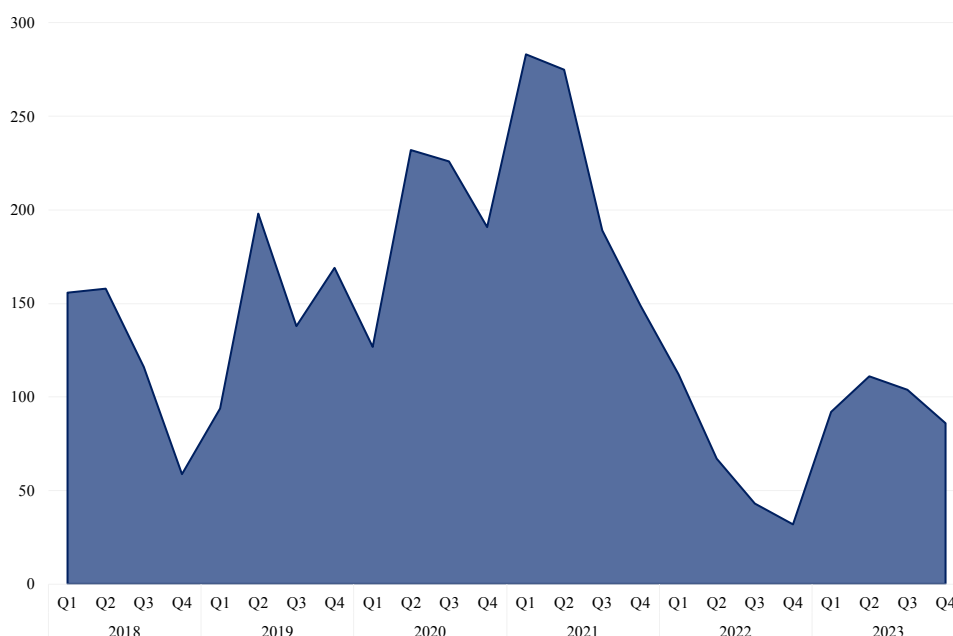
Source: own elaboration based on data from Debt Explorer Database 2023 (Annex IV).

It is noteworthy that, in 2023, amidst a high-interest-rate environment, high-yield bonds emerged as one of the best-performing bond investments (Martin, 2023), particularly in the first half of the year, as can be seen in figure 4. Driven by new financings, high yield new issuance more than doubled from Q4'22 to Q1'23 in the US, and Asia Pacific, with the European markets experiencing an uptick of almost 65% (Holden et al., 2023).

Despite being classified as fixed income securities, High-Yield bonds display distinct features more commonly associated with equities (CNMV, 2015). These characteristics are mainly shaped by the nature of the issuers and, occasionally, by the type of investors who include these assets in their portfolios. As a result, each of these products is crafted individually, posing a challenge when attempting to generalize their characteristics. Nonetheless, as established by Martin's (2015) analysis, they share common ground on certain aspects surrounding maturity, rates, priority, and covenants.

Starting with maturity, High-Yield bonds are long-term financial instruments. They will be issued with a single maturity date that traditionally ranges from seven to ten years, upon which the lender will receive the principal repayment (U.S. Securities and Exchange Commission, n.d.). Nonetheless, it is also common to see the borrower leave open an option for early re-payment when the half point mark of the security's life is reached. This second option is generally less favored, as investors lean towards the certainty of profitability, even with lower levels, and prefer the security provided by eliminating the risk of premature reinvestment (CNMV, 2015).

With regards to interest rate, even if floating rates (those linked to reference rates like SOFR or EURIBOR plus a specific margin) can be found, High-Yield bonds typically feature a fixed-rate structure with periodic coupon payments (Kricheff, 2012). A more recent alternative to these regular coupon payments involves the use of payment-in-kind ("PIK") or a combination known as "PIK-toggle." This approach has gained popularity as it operates as a form of mezzanine debt, relieving the issuer from the immediate financial obligation of making cash coupon payments to investors. In these cases, interest payments are made in the form of additional bonds rather than cash during the initial period. Therefore, throughout this arrangement, the issuer accumulates additional debt to generate new bonds that fulfill the interest payments, leading to an accrued interest that is not paid in cash (Private Debt Investor, 2023).

Non-Investment Grade securities come with an additional set of "rules" known as covenants, which exert control over the issuer's actions to limit the likelihood of default. These covenants entail mutually agreed-upon action clauses between the lender and borrower to prevent potentially harmful decisions that could impair the company's value. Examples include ratio compliance, restrictions on mergers or changes of control, and limitations on asset sales (Torgerson, 2023). Specifically for High-Yield bonds, these tend to be incurrence covenants, which are among the less restrictive types. Unlike other covenants, incurrence covenants are not regularly tested; they only come into effect when a company takes a specific action (Law Insider, n.d.), ex. *if the borrower's debt-to-EBITDA ratio goes above 5.0x, the covenants will be tested*.

Debt securities have a ranking that refers to the securities' priority. Given we are dealing with riskier issuers, the likelihood of default is inherently higher. Therefore, their payment collection priority gains significant importance to mitigate potential downsides (IMF, 2009). The hierarchy of securities can be simplified into the following ranking: senior secured, senior unsecured, senior subordinate, subordinate, preferred stock, and common stock (Kricheff, 2012). Bank loans, which as we'll later clarify always fall under the senior secured category, generally hold a higher position than junk bonds, which, whilst also having the possibility to be placed at the senior secured stance, are typically placed in lower priority stances like senior unsecured. Evidently, this positioning presents a disadvantage for high-yield bond investors, but it is not always the case as they may sometimes be placed pari-passu LL alternatives or even prioritized when placed within that same senior secured rank. An additional nuance unique to HY bonds is the intricate and costly documentation process associated with them, including the preparation of an Offering Memorandum (OM), a roadshow, and continuous and extensive public disclosures (Bohr, 2016).

2.3.2. Leverage Loans

Leverage Loans, also known as term loans, bank loans, syndicated loans, or simply loans, share several similarities with HY bonds, as they both fall under the category of speculative securities (see Table 4 for similarities and differences). Despite this shared classification, Leverage Loans have unique characteristics that contribute to their

individual appeal to investors (Kricheff, 2012). Contrary to their colloquial designation "bank loans", these instruments are typically not held by banks; instead, commercial banks structure them initially, and they are then subsequently syndicated to diverse buyers, which form a group of institutional investors, such as CLOs, credit funds or debt funds (IMF, n.d.). These high yield securities are a part of what is commonly referred to as the institutional loan market or syndicated loan market, constituting a private non-bank loan market. Within this market framework, the securities can be broadly categorized into two principal groups: term loans and revolving credit lines (Kricheff, 2012).

Table 3. TLA, TLB, and RCF Characteristics

	TLA	TLB	RCF
Security	Secured by assets of the issuing company	Secured, may have different collateral package than TLA	Secured or unsecured, often by working capital assets
Seniority	Senior / Secured	Subordinate to TLA	Senior to unsecured debt, subordinate to TL
Interest Rates	Floating rates tied to a benchmark	Floating rates tied to a benchmark	Variable rates based on short term benchmarks
Covenants	Maintenance Covenants	Maintenance Covenants / Cov-Lite[1]	May have financial and non-financial covenants
Maturity	3-5 years	3-5 years, possibility of longer duration	Has a revolving period and a maturity date
Market Liquidity (for Investors)	Limited to banks	More market depth, available for larger investor pool	Limited to banks
Cash Facility	Less liquid than HY Bonds	More liquid, broader pool of potential investors	Very liquid, used for short-term funding
Amortization	Generally scheduled payments (1%)	Generally scheduled payments (1%)	Revolving with periodic commitment reductions

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[1] Covenants for TLB's are usually more fixed or standardized than for TLA's.

	Used for general corporate purposes, acquisitions, or refinancing	Similar to TLA, but often with more specific purposes (dividends, acquisitions)	Working capital, bridge financing, general corporate purposes
Use of Proceeds			
Investor Base	Banks	Institutional investors, and non-bank lenders (CLOs)	Banks

Source: own creation

As for the latter, they are not intended as long-term financing instruments but instead enable borrowers to withdraw money when needed in order to meet immediate financing needs. This way, they are able to manage cash flow fluctuation with an uninterrupted source of funds, as they can be borrowed and repaid and reborrowed almost endlessly throughout the life of the loan (Volopay, 2023). On the other hand, term loans are more permanent high yield instruments as they typically run 3-to-5-year maturities, and once they've been repaid, they cannot be reborrowed. Another distinction with term loans is that they usually have principal amortization payments, around 1% quarterly. The most recurring type of term loans we currently see in the market are called term loan B (TLB) and are the tranches of term loans sold to nonbank institutions, those typically held by commercial banks are Term Loan A (TLA). TLB differ from other typical high yield securities in that they tend to have security, shorter maturities, laxer call protection, and floating rates.(Kricheff, 2012).

Interest rate rises typically pose challenges for traditional fixed-income investments – as rates go up, the value of fixed-rate bonds decreases – however, Leveraged Loans stand out as one of the few securities poised to potentially benefit from this scenario (Artisan Bonds, 2023). This is because loans, in contrast to bonds, typically contain floating-rate coupons, which means that their pricing is tied to a spread over an index (the base rate), reflecting the cost of short-term borrowing in the economy. Leverage Loan yields increase in tandem with interest rates since the coupon will fluctuate over time in response to changes in the base rate (IMF, 2023). For example, a loan with a spread of +200 basis points and a base rate of 150 basis points would yield 3.5% for investors. If the base rate rose to 300 basis points, the loan would yield 5%. Alternatively, a minimum floor can be

implemented. Continuing the example, if the base rate dropped to 50 basis points but the loan had a floor of 100 basis points, it would still pay a coupon of 3%, not 2.5%. This could be beneficial from an investor's perspective and drive them to choose these variable rate securities over fixed rate since they present them with higher yields in a rising interest rate environment. Leveraged Loans, with their floating-rate coupons, can see an increase in yields in tandem with rising interest rates, in contrast to standard fixed-rate bonds, which experience declining value as rates rise. Alternatively, from an issuer's perspective, the flexibility to align interest payments with prevailing rates allows for the optimization of debt structures, steering clear of the constraints imposed by fixed-rate commitments. This becomes especially helpful in the current unpredictable market environment.

Using different accounting standards for loans than for bonds, especially regarding mark-to-market (MTM) treatment, is another way that these non-Investment Grade securities differ from each other. Unlike bonds that apply the MTM method, which periodically adjusts the fair value of fluctuating assets based on market pricing, causing shifts in portfolio and financial reports, loans avoid such adjustments (Tuovila, 2023). This distinction is especially important due to the illiquid and long-term nature of loans, leading them to be accounted for at amortized cost thus increasing simplicity in reporting and ensuring stability in financial statements. As a result, issuers would choose loan or bond counterparts depending on how deep the market is for the specific investment, and after taking into account that valuations could differ from one security to another and as a result, could impact an investor's statements. Therefore, the decision between investing in loan or bond counterparts is taken after considering the potential differences in their valuations, as this would have an impact on their statements. Additionally, they consider the market depth for a specific investment in this decision-making process.

Moreover, their paperwork can differ significantly from that of bonds since they are not traded on an exchange and, unlike other securities, do not have central clearance for trades. A loan contract is made up of the agreements drafted by the lender and the issuing company; these agreements are far less standardized than bond agreements (Levine, 2023). Bank loans can be traded through two primary methods: participation or, more commonly, assignment. Through assignment, the buyer of the bank debt essentially becomes the owner of that specific portion, acquiring voting rights in the process.

Typically, both the corporation and the agent bank must approve an assignment, thereby restricting the number of market makers in a loan. Alternatively, loans can be traded through participation, wherein the buyer gains a legal claim to the economic ownership of the bank loan while the seller retains actual ownership of the debt, along with voting and other associated rights (Kricheff, 2012).

To continue with the unique features to leverage loans, they are senior secured instruments and, as such, are placed within the highest ranking in capital structures. In the event that payments are not made, lenders may be able to take possession of the security, which is a priority claim on particular assets. This implies that bank loans and other secured instruments would be paid off first, followed by unsecured bonds, preferred equity, and then common shareholder equity in the event of bankruptcy—which is more likely given the riskier issues at hand (S&P Global Market Intelligence, 2020) . However, it is crucial to realize that this does not imply that all bank loans will be ranked identically, bank debt may share the security ranking with other debt and even HY bonds at times. Just because it is secured does not indicate that all the assets are securing it (BIS, 2015), as within this highest tier, many securities can coexist, each arranged and organized to indicate further payment prioritization.

With regard to the more technical aspect, they evidently have different structures from those of bonds, and therefore yields and spreads are often looked at, and calculated, differently for loans than they are for bonds. Additionally, loans are usually callable by the company shortly after issuance; and if call protection is in place, the associated premium the firm must pay is typically modest and has a short expiration period. However, it is not uncommon for bank loans to be issued below par, effectively giving the initial buyers of the loans a premium if the loans are repaid early. Bondholders usually want some call protection to reap benefits from credit improvements. Occassionally, issuers or investors might enter into an Interest Rate Swap agreement to mitigate or hedge the variable cost or return by exchanging it for a fixed rate for a portion or the entirety of the loan's duration. Sometimes, in more traditional bank loans, there is a grid that lowers or increases the spread the issuer has to pay, depending on how strong a certain ratio or other metric may be. Lastly, all bank loan repayments – including open market

repurchases – must be distributed pro rata among all holders of bank debt and across all tranches (Kricheff, 2012).

These differences could explain the graph presented below, which illustrates the volume of LL and HY issuances from 2018 onward. The bank loan market consistently exhibits greater depth, evident in the consistent minimum 250 spread between them at any given point in time. This phenomenon could be attributed to the aforementioned characteristics unique to Leverage Loans.

Figure 5. Overall HY and LL Issuance by Value Q1 2018 – Q4 2023
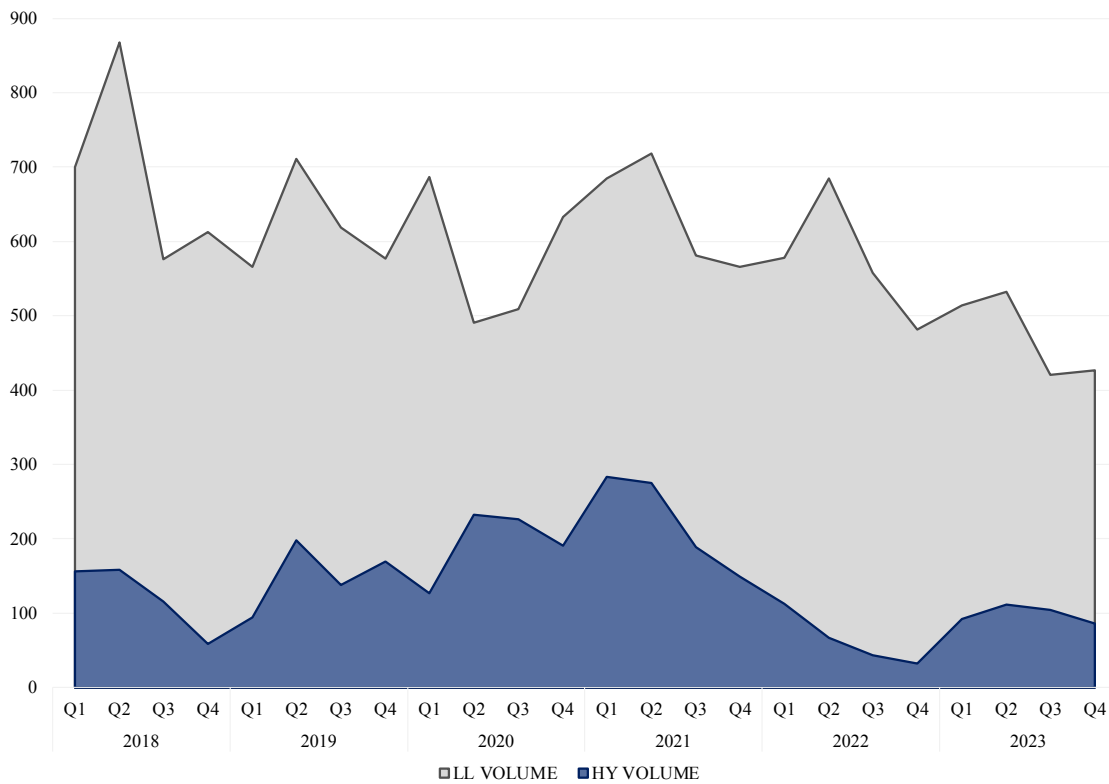
Source: own elaboration based on data from Debt Explorer Database 2023 (Annex IV).

Overall, Leverage Loans, despite sharing speculative security classification with high yield bonds, possess unique characteristics that clearly appeal to issuers and to investors, such as their unique structure, senior secured status, and flexibility in adjusting to rising interest rates. These characteristics, summed up in Table 3, combined with their accounting treatment and distinct trading methods, contribute to their appeal for both

investors and issuers, making them a noteworthy and valuable component within the non-Investment Grade financial landscape.

Table 4. Leverage Loans vs High Yield Bonds Characteristics

	Bank Loan	High Yield Bonds
Type of Security	Leverage Loan	High Yield Bond
Ratings	<BBB-/Baa3	<BBB-/Baa3
Maturity	5-7 yrs.	5-10 yrs.
Interest Rate	Floating	Fixed
Illustrative cost	E/L/S + 2.5-5%	2.5-10%
Seniority	#1 (Senior)	#1-2 (Subordinate)
Security	Secured	Secured or Unsecured
Amortization	Quarterly payments (1%)	Bullet payments at maturity
Pre-Payment Penalties	None or Minimal	Yes – usually call protected
Covenants	Maintenance	Incurrence
Disclosure	No disclosure requirements	Long documentation process – OM and roadshow required
Reporting	Private reporting and rating	Public (quarterly + annually)
Liquidity	Less liquid	Higher liquidity and actively traded in secondary markets
Typical Investors	Banks / CLOs / Institutional Investors / Private Debt and Credit firms	Banks / HY Institutional Investors / Hedge Funds / Mutual funds or ETF Funds / CLOs

Source: Own creation

2.3.3. Differences between IG and non-IG

Given the characteristics and information presented thus far, the differences between these two types of issuers appear evident. Yet, in real-world scenarios, there are additional significant distinctions worth noting.

Firstly, when considering the distinctions from an investor's standpoint, effectively leveraging the volatility in the speculative debt market can be highly advantageous. Still, many of them are faced with barriers as funds have strict policies and limits for speculative Grade investments (Kricheff, 2012). For instance, regulatory mandates dictate that regulated businesses, including banks and insurance firms, must maintain higher reserves and equity against non-Investment Grade assets. While this may diminish returns, it serves as a protective buffer against potential future losses, especially given the riskier nature of non-Investment Grade securities. These standards and regulations were further reinforced in the aftermath of the 2008 financial crisis, which highlighted potential deficiencies in credit ratings (BIA, 2016).

Despite the stringent regulations, High-Yield securities remain appealing to many investors not only due to their attractive returns but also because these investments enable portfolio diversification. They do this by including economic exposures of a less conventional nature and spanning riskier sectors, thus exhibiting lower sensitivity to interest rate risk and little correlation to other sectors of the fixed income market (CNMV, 2016). Table 5, is provided below to simplify and highlight the main differences between Investment Grade and non-Investment Grade issuers.

As for an issuer, this also entails certain specifics. The primary advantage is that it provides them with access to capital, sometimes on more favorable terms than what banks usually offer (Santos, 2009). This enables them to broaden their funding channels and reduce dependency on banks for debt management. Additionally, they may enjoy increased autonomy and flexibility due to fewer covenants and regulatory constraints. This flexibility becomes valuable when pursuing strategic objectives or navigating complex situations. It could also attract a broader pool of potential investors willing to embrace the associated risk for potentially higher returns. However, there is a higher cost of capital associated with this approach as they must offer a premium to attract investors willing to take on these risks.

Other distinctions involve the market liquidity encountered by IG securities compared to non-IG securities. Clearly, Investment Grade securities benefit from higher market liquidity, facilitating the sale of their securities in the secondary market. In contrast, their non-IG counterparts might face more challenges in doing the same, as market movements

for them could be less frequent and market perception is more negative (Kricheff, 2012). In addition, IG issuers are typically larger, more reputable businesses with a track record of solid financial management and an international presence. Their stable business operations and consistent revenue streams support their stability and positive market perception. Instead, non-IG equities are a combination of larger, mid-sized, and small businesses, some of which experience greater volatility or cyclical trends. Finally, unlike junk securities, which often have a higher concentration of near-term debt obligations and a shorter average maturity profile, IG securities do not share these characteristics (Darmouni & Siani, 2022). During periods of market stress, this distinction may expose speculative issuers to potential refinancing concerns.

In conclusion, the differences between Investment Grade and non-Investment Grade issuers is significant, and encompasses various aspects that could influence both investors and issuers. While the speculative debt market has its advantages, tight policies and regulatory restrictions indicate the need for a cautious approach to non-IG investments. Accessing finance with advantageous terms and enhanced autonomy is beneficial to issuers, but it comes at a higher cost. Therefore, it becomes clear that navigating these disparities is critical to make informed decisions when developing efficient company strategies.

Table 5. Investment Grade vs Non-Investment Grade Characteristics

	IG	Non-IG
Rating	AAA to BBB-/Baa3	BB+/Ba1 to D
Default risk	Lower, more secure	Higher default risk
Potential Securities Issued	Fixed income securities (e.g., corporate bonds, commercial paper), Bank Loans…	Leverage Loans, High Yield debt
Cost of Capital	Lower cost of capital due to lower perceived risk	Higher cost of capital to compensate for higher risk
Return	Lower coupon rate, lower yield	Higher coupon rate, and yield
Duration	Generally longer duration due to stable investment	Often shorter duration, higher market sensitivity

Liquidity	Higher liquidity due to broader investor base	Lower liquidity given more limited investor base
Volatility	Lower volatility, more stable	Higher volatility, more susceptible to market fluctuations
Capital Requirements	Lower capital requirements due to lower perceived risk	Higher capital requirements to compensate for higher risk
Flexibility	More flexibility in financial strategy and issuance terms	Less flexibility, may face constraints in financing options
Covenants	Generally, have fewer and less restrictive covenants	Tend to have fewer and less restrictive covenants
Type of Issuers	Larger, more reputable corporations	Smaller or less-established companies, may include startups
Diversification of Investors	Attracts a diverse range of institutional investors: conservative funds, insurance companies, pension funds…	May attract more opportunistic investors, hedge funds, and specialized credit funds, CLOs…

Source: Own creation

3. EMPIRICAL RESEARCH AND STUDY

3.1. Methodology

After conducting an in-depth qualitative analysis, which involved a literature review and a comparative study of financial documents, reports, articles… related to non-Investment Grade issuers and their corresponding securities, providing a comprehensive understanding of the fundamentals within the junk spectrum; we are now transitioning to the quantitative aspect of our investigation.

3.2. Research Process and Criteria

The aim of this part of this study is to put into practice the aforementioned technical information regarding the financing differences between IG and Non-IG entities by focusing on a specific case study: U.S.-based microchip manufacturer Advanced Micro Devices (AMD).

Following a sustained period of "growing business momentum, share gains, strong financial performance, excellent liquidity, and consistent execution" (AMD Investor Relations, 2020), AMD was upgraded to IG status in late 2020, making them a prime example of a "rising star." Therefore, we will conduct a comparative analysis of their financials before and after the upgrade to understand the implications a junk rating has on a company's financing decisions.

To undergo this analysis, we have used Bloomberg and FactSet as our primary sources of data and information. From these, we have extracted information of the sort of the historical evolution of AMD's sources of capital and their yield variations, stock price evolution, its main financial metrics…. We have concentrated our information on a timeframe generally spanning from 2016 to today, with some exceptions dating further back. This period enables a comprehensive study of the firm from its non-IG status, through the beginnings of their enhanced performance, the upgrade, and up to the present. This approach provided a comprehensive overview of the company's trajectory and the impact the ratings had on its financing decisions, allowing for a well-rounded conclusion.

4. Result Analysis

In order to analyze the differences in financing options for IG and non-IG issuers we first focused on the debt instruments they used as sources of capital. In the case of AMD, these are presented in the following graph.

Figure 6. Financial Instruments Launched every year ($mil) 2009 – 2022
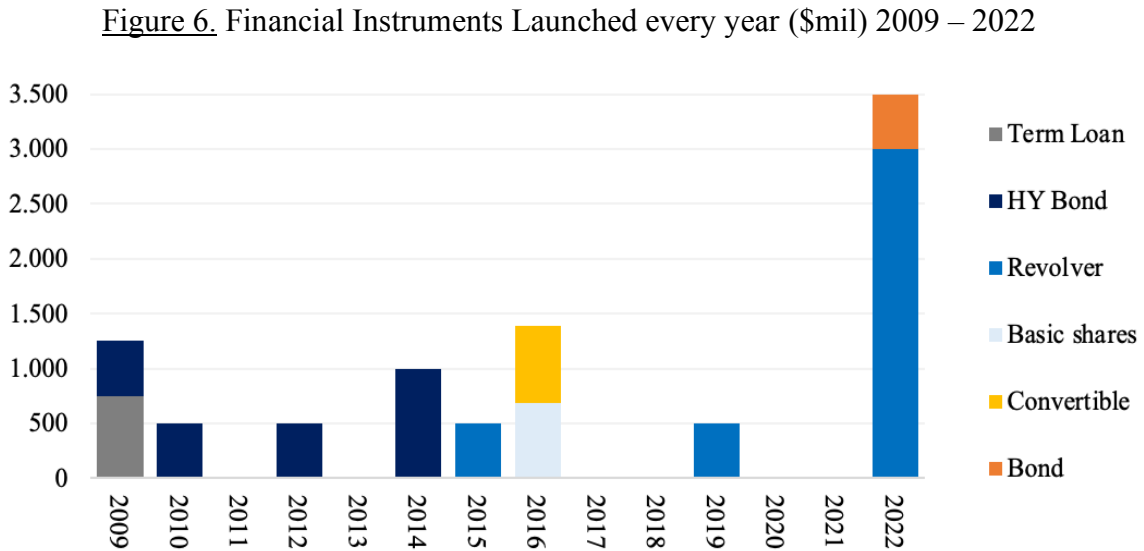
Source: Own elaboration using data from FactSet (annex V).

Figure 6 displays the historical trajectory of AMD's capital structure, which saw a significant shift following its upgrade from non-Investment Grade status after 2020. The analysis covers the various types of debt instruments used, emphasizing the changes in financing conditions and strategy that accompanied this credit change. During the initial phase of non-IG status, the firm relied mainly on High-Yield bonds, some term loans, as well as small and expensive revolving credit lines, to fulfill its capital needs. This combination of instruments, while functional, had higher associated costs and inherent risk, reflecting the riskier nature of the firm's credit at the time.

As AMD transitioned into its post-IG upgrade era, its capital landscape experienced drastic changes. The most noticeable change is the introduction of a traditional bank revolver, distinguishably larger in size ($3,000 mil). This points to the firm's improved creditworthiness, allowing them access to more favorable interest rate conditions. Additionally, the increased size of this "back-up" bank revolver not only signifies improved credit but also grants the firm more financial flexibility: since interest payments on revolvers are made only when drawn upon, the larger size indicates a newfound liberty

in managing their capital (Resuello & Lupini, 2023). This dynamic allows for strategic cost savings, as the firm doesn't incur interest expenses whilst the funds remain untapped.

Moving beyond the revolver, we observe a shift in the nature of their debt instruments. The firm has transitioned from High-Yield bonds and Leverage Loans to more conventional fixed-income instruments – regular bonds. This is significant as it reflects a shift towards more stable and affordable financing options, as seen by the fact that their cost of debt fell from roughly 7% during the non-IG era (with LL and HY bonds) to about 4% following the upgrade (see annex VI). This is due to the firm now being able to tap into a larger pool of investors (since IG securities are more liquid given their tradability in traditional markets with broader number of potential investors) at more favorable rates.

Figure 6 makes apparent that their financing strategy aligns with an opportunistic approach, where funding decisions are influenced by the availability and the costs of specific financing instruments over the company's lifespan. Consequently, they prioritize the "best financing alternative," meaning that as their previous and more expensive financing instruments matured, they chose not to reissue them. Later, they moved past these in 2022, and made use of their newfound financial liberty to access normal bank revolving credit, available at much cheaper rates. Therefore, the updated capital structure (as of 2022), made possible by the new IG status, brought about newfound possibilities for AMD. It provided access to greater amounts of debt from a wider investor pool, coupled with cost-saving advantages stemming from the lower rates of traditional fixed-income securities. This, in turn, enhanced operational flexibility and established a more robust foundation for future growth projects.

In conclusion, the graph provides a visual narrative of the company's financial evolution, illustrating not only the diversity of capital sources, but also the newfound freedom in deciding on financing and strategic options as a result of the improved available conditions. This argument becomes even more compelling when examining the cost of debt for these securities, which significantly decreased with AMD's upgrade to Investment Grade. The following graph illustrates the yearly variation (or lack thereof) in the average cost of all the company's debt instruments.

Figure 7. Variation of Debt Instrument's Average Coupon Rate 2016 – 2022
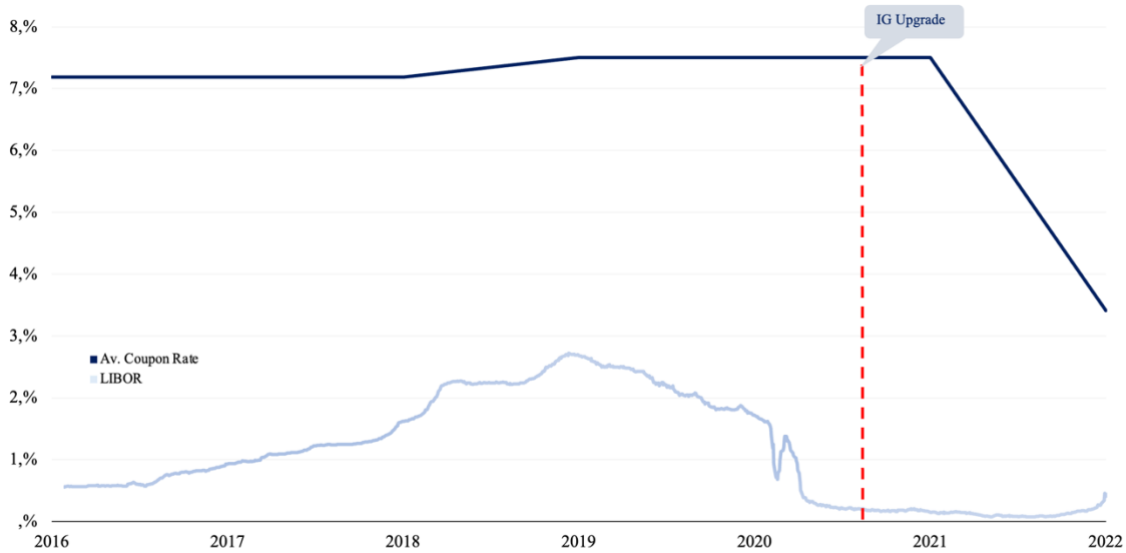
Source: Own elaboration using data from FactSet (Annex VI)

The graph provides a visual narrative illustrating the strategic shift in capital structure and coupon rates for AMD as it transitioned to Investment Grade, resulting in substantial cost savings. Initially, up to 2018, the active debt securities carried an average coupon rate of 7.188%. After meeting maturities and undergoing refinancing in 2018, the company retained only two instruments with an even higher average coupon rate of 7.5%. This is noteworthy considering that, at the time, the market's average cost of debt was 2.8% (KPMG, 2018), thus indicating that AMD was paying a nearly 5% premium due to its credit rating status. These conditions can have substantial consequences on any business model, including increased financial strain, reduced profitability, and limitations on investment and expansion opportunities.

Thus, 2021 represents a pivotal year, as it showcases a significant reduction in debt costs attributed to the new Investment Grade capital sources issued in 2021, as depicted in Figure 6. Leveraging its upgraded IG status, AMD strategically refinanced its capital structure, making use of its newfound creditworthiness. With this, the average coupon rates, once hovering at 7.5%, plummeted to less than 3.5%. The graph captures this drastic shift, visually representing the tangible benefits of AMD's upgraded status on its financial costs, setting the stage for improved general financial flexibility and future opportunities. As a final remark, upon comparison with the LIBOR rate, the benchmark used by all

major US banks at the time of the upgrade, we can refute the notion that the decline depicted in Figure 7 was a consequence of a general fall in US rates. As it becomes evident that they don't follow the same pattern and as such, the fall in AMD's average coupon rate is unrelated to the overall market trends and explained by their upgrade to IG.

To further assess the impact of a non-Investment Grade rating on a firm's financing decisions, we expand our analysis to delve into its effect from an equity standpoint, looking towards the trading levels of AMD US Equity.

Figure 8. AMD Stock Price Trading Levels 2016 – 2022

Source: Own elaboration using data from Bloomberg, BVAL (Annex VII)

Figure 8 clearly show that, following the upgrade in 2020-2021, AMD's stock witnessed a substantial uptick in its trading levels. However, it's crucial to acknowledge that stock performance is influenced by various factors beyond the cost of debt and the firm's ratings. Therefore, to understand whether this surge was a consequence of the rating upgrade or a response to overall better business practices, we delved into AMD's fundamental figures, including main margins, Return on Assets (ROA), and cash, outlined in Table 6.

Table 6. AMD Fundamentals 2017 – 2023

	2017Y	2018Y	2019Y	2020Y	2021 Y	2022Y	2023Y
EBITDA Margin	20.49	20.95	24.59	21.55	23.98	21.96	20.88
Operating Margin	14.75	15.32	11.95	7.33	10.90	12.41	13.78
Return on Assets	4.74	7.02	6.84	3.63	3.99	1.26	5.72
Cash Ratio	0.34	0.31	0.24	0.35	0.22	0.28	0.39
Current Ratio	1.33	1.29	1.02	0.98	0.88	0.92	0.96

Source: Own elaboration using data from FactSet

Clearly, AMD had demonstrated robust financial performance prior to the upgrade, evident from the positive trend in its stock price since 2019, which alongside "continued design wins, market share gains, and an expanded set of product offerings and customers" (Moody's, 2020), led Moody´s and S&P to change and improve their rating. Nonetheless, what we are trying to analyze here is whether the even deeper surge in share price observed towards the end of 2020 and beginning of 2021 can be attributed to this upgrade, or alternatively, was driven by the improvement of other substantial figures. Therefore by looking at Table 6, we become aware that the change within these figures before and after the upgrade was not significantly pronounced or even noteworthy; margins, sales, and other metrics did not experience substantial improvements. Consequently, we may infer that a considerable portion of the surge in the stock price can be attributed to the reduction in financing costs and the heightened credibility and visibility AMD gained as a result of becoming Investment Grade.

Moreover, the IG status positioned AMD in a far more liquid market. Previously, potential investors faced significant restrictions or hesitations due to the inherent risk associated with junk issuers, with many not be able to add speculative Grade issues to their portfolios. The upgrade eliminated these barriers, thus fostering increased demand for AMD's securities by now having the possibility to reach a much wider pool of potential investors. This increased liquidity enhances the company's financial flexibility, but also signals a positive shift in market perception given the newly acquired investor confidence.

5. CONCLUSIONS AND FINAL REMARKS

After thorough literature research and analysis wherein we established the fundamental principles behind non-Investment Grade assets and its issuers; and following the breakdown of AMD's data before and after their upgrade, we've been able to witness the effect a junk rating has on a company's financing decisions and investors' decisions. Overall, we have been able to provide an answer to the objectives we set at the start of our study, which include the following:

- By examining the credit rating process and the distinctions among the three major credit rating agencies (CRAs), we identified that, although they all adhere to very similar processes, S&P tends to emphasize short-term accuracy, Moody's prioritizes stability, and Fitch, the youngest of them all, tends to follow the patterns set by the other players.

- It has become clear that a speculative Grade rating, established through various different metrics and characteristics such as profitability or leverage ratios, constrains the financing alternatives available for a specific issuer by reducing the potential securities available to finance its operations to Leverage Loans and High Yield Bonds, each with its own set of positive and negative implications.

- High-yield bonds are long-term financial instruments that usually feature a fixed-rate structure with periodic coupon payments. Despite being categorized as fixed-income securities, they exhibit distinct features more commonly associated with equities, such as higher volatility and a heightened risk of default. As a result, investors are compensated for the increased risk with higher interest payments, resembling the risk-return profile typically seen in equity investments. Additionally, they usually have incurrence covenants, include a long documentation process, and are typically senior unsecured securities.

- Leverage Loans, including TLA, TLB and RCFs, despite sharing a non-IG classification with HY bonds, have unique characteristics that can attract specific issuers or investors. Features such as floating interest rates, senior secured rankings, more lenient call protections, or shorter maturities might explain the increased depth of the Leverage Loan market, making it a decisive factor for many.

- The shift in AMD's capital structure following the upgrade exemplifies the benefits of improved creditworthiness, such as access to more favorable interest rates, larger pools of investors, and enhanced financial flexibility. The significant decrease in the company's average cost of debt post-upgrade, dropping from 7.5% to less than 3.5%, showcases the tangible cost savings and strategic advantages associated with an IG rating. Additionally, the correlation between AMD's stock performance and the rating upgrade underscores the importance of credibility and market exposure.

In summary, our investigation into the financing dynamics of Investment Grade and non-Investment Grade entities, centered around the case study of Advanced Micro Devices, has provided a comprehensive understanding of the profound implications a credit rating can have on a company's financial strategies, and as a result, on potential investors' decisions. By limiting the available securities with which to raise capital to Leverage Loans and High Yield bonds, the potential investor base is reduced, thereby constraining the possibilities for the firm. Moreover, the perceived deficiencies associated with a junk-rating limit its maneuvering options, with many investors having established restrictions to buy into these companies. All in all, we have been able to shed light on the often misunderstood or unknown world of non-Investment Grade.

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7. Appendix

- **Annex I.** Ratio Definition and Formulae

PROFITABILITY		
Margin Ratios		
EBITDA Margin	$\dfrac{EBITDA}{Total\ Revenue} \times 100$	Shows how much operating cash is generated for each dollar of revenue earned.
Gross Profit Margin	$\dfrac{Net\ Sales - COGS}{Net\ Sales}$	Indicates how much profit is makes after accounting for direct costs associated with doing business.
Operating Profit Margin	$\dfrac{Revenue - COGS}{Revenue}$	Shows how much earnings from operations is generated from every dollar in sales after accounting for the direct costs involved in earning those revenues.
Return Ratios		
Return on Assets (ROA)	$\dfrac{Net\ Income}{Total\ Assets}$	Shows how efficient a company is at using its assets to generate profits.
Risk-Adjusted Return	$\dfrac{ROI - Risk\ free\ rate}{Standard\ Deviation\ of\ the\ Investment}$	Adjusts the return on an investment for the level of risk associated with that investment.
Return on Equity (ROE)	$\dfrac{Net\ Income}{Shareholder\ Equity}$	Indicates how much net income a company generates per dollar of invested capital.
LEVERAGE		

Debt to Assets	$$\frac{Short + Long\ term\ debt}{Total\ Assets}$$	It indicates how much debt is used to carry a firm's assets, and how those assets might be used to service debt.
Assets to Equity	$$\frac{Total\ Assets}{Shareholder's\ Equity}$$	Shows how much of a company's assets are funded by issuing stock, and how much shareholders might receive in the if the firm is forced into liquidation.
Debt to Equity	$$\frac{Total\ Liabilities}{Shareholder's\ Equity}$$	Measures how much debt a company has taken on relative to the value of its assets net of liabilities.
Debt to Capital	$$\frac{Total\ Debt}{Total\ Capital}$$	Reflects the proportion of a company's capital that is funded by debt and provides insight into a company's capital structure.

COVERAGE		
Interest Coverage	$$\frac{EBIT}{Interest\ Expense}$$	Refers to the length of time or which interest payments can be made with the company's currently available earnings.
Asset Coverage	$$\frac{Total\ Assets - Intangible\ Assets}{Interest\ Expense}$$	Solvency ratio that determines a company's ability to cover its debt obligations with its assets.

LIQUIDITY		
Current Ratio	$$\frac{Current\ Assets}{Current\ Liability}$$	Measures a company's ability to cover its short-term liabilities with its short-term assets, and a ratio above 1 indicates potential

Cash Ratio	$$\frac{Cash + Cash\ Equivalent}{Current\ Liability}$$	liquidity to meet immediate obligations. Shows a company's ability to cover its short-term obligations using only cash and cash equivalents

Source: Own elaboration based on information from Corporate Finance Institute 2023-2024.

- **Annex II**. Key Words & Definitions

Key Words & Definitions	
Leverage	A company's level of debt
Issuer	The entity that issues the loan or bond - they create and sell the securities in the financial markets in order to raise capital
Indenture	A formal legal document encompassing all the terms to which the bond issuer commits. The equivalent for Leverage Loans would be a loan agreement or documentation
Coupon	The periodic payments that a borrower receives until maturity (fixed coupon rate for HY, and reference rate and spread in LL)
Yield	Reflects the overall return to the investor, accounting for potential changes in the reference rate over the life of the loan, and the changing market price for the bond
Maturity	Also referred to as due date, it's the date on which the bond or loan must be repaid
Duration	Indicates a bond's responsiveness to changes in interest rates or spreads, expressed in years
Spread	Refers to the additional yield or interest rate premium to be paid above a benchmark, to compensate for the increased credit risk linked to high-yield issuers

LIBOR	London Interbank Offering Rate, it worked as the standard for unsecured short-term borrowing within the interbank market, functioning as a benchmark for short-term interest rates
SOFR	Effective January 2022, LIBOR will not be used to issue new loans. Instead, it is replaced by the Secured Overnight Financing Rate, which many experts consider a more accurate and more secure pricing benchmark
Grace Period	Most loan and bond agreements provide a specific timeframe during which the borrowers can remedy a non-principal default before creditors can initiate a bankruptcy. This grace period usually extends for thirty days
Covenant	A provision stipulated in the bond and/or loan documents, outlining the terms by which the company commits to operate.
Incurrence Covenant	Specific limitations or restrictions that will only come into effect when a company takes a specific action
Affirmative Covenant	Proactive measures to maintain certain financial conditions, operational standards, or reporting requirements – regularly tested
Default	When the issuing company of a bond or a loan fails to make a required payment on time.
Technical Default	Occurs when there is a violation of a maintenance or an affirmative covenant. Many bond and loan agreements typically provide the company with a grace period during which it can attempt to rectify said default.
Par	When bonds are at par, the yield is equal to the coupon. Bonds trading below par are referred to as trading at a discount. Bonds trading above par are referred to as trading at a
Pari Passu	A Latin term that translates to "without partiality," generally used to denote two debt instruments with equal payment priority
Pro Forma	Literal Latin translation is"as a matter of form", refers to financial statements that have been adjusted for assumptions, such as a M&As, new debt issue…

Tranche	Derived from the French word for "cut"/"slice," typically refers to the various levels of debt in a capital structure
Private Debt Placing	When a loan is allocated privately with an investor instead of syndicated amongst potential buyers. Also referred to as direct lending, it implies there is no public market to buy or sell the debt
Collateralized Loan Obligation (CLO)	Having originated in the 1980s, a CLO is a portfolio of predominantly leveraged loans that is securitized and managed as a fund. It is structured as a series of tranches that are interest-paying bonds, along with a small portion of equity
Rising Star	Company that is upgraded from a Non-IG rating status to IG.

- **Annex III**. European CRA Market Share Breakdown

CRA European Market Share			
CRA	2023	2022	2021
S&P	**48,63%**	50,13%	51,17%
Moody´s	**31,45%**	32,79%	30,12%
Fitch	**10,26%**	10,05%	10,30%
DBRS	1,81%	1,31%	1,11%
Scope	1,72%	1,31%	1,23%
Cerved	1,16%	1,03%	1,18%
Kroll	0,72%	0,37%	0,45%
EthiFinance	0,69%	0,34%	0,42%
CRIF / ICAP CRIF	0,66%	0,48%	0,68%
modeFinance	0,61%	0,42%	0,33%
A.M. Best	0,49%	0,41%	0,41%
GBB	0,44%	0,33%	0,38%
CreditReform	0,42%	0,38%	0,84%
Assekurata	0,30%	0,25%	0,27%
Capital Intelligence	0,16%	0,11%	0,16%
Nordic	0,15%	0,11%	0,06%
ARC	0,13%	0,07%	0,19%
Inbonis	0,12%	0,06%	0,03%
BCRA	0,06%	0,03%	0,03%
EuroRating	0,02%	0,01%	0,01%
	100%		

CRAs European Market Share
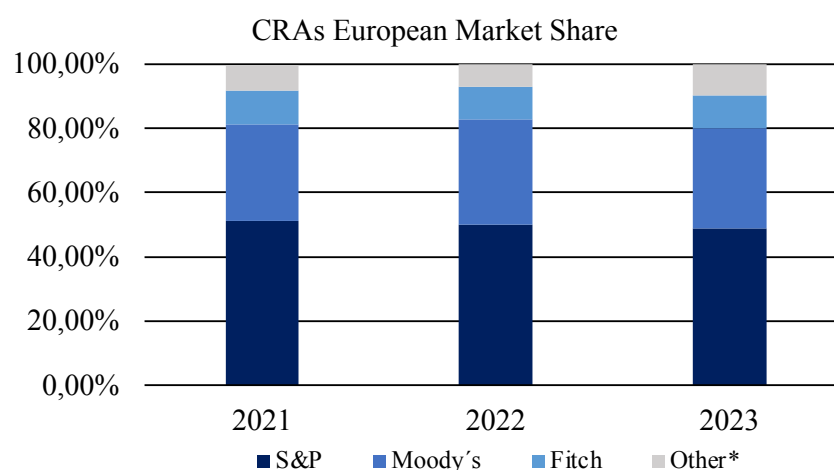
Includes all CRAs with a Market Share < 10%

Source: European Securities and Markets Authority annual CRA Market Report

- **Annex IV.** HY & LL ISSUANCE Q1'18 - Q4'23 (North America and Western & Southern Europe)

		VOLUME			VALUE		
	Overall Issuance	LL	HY	Issuance (Bn)		LL	HY
2018 Q1	856	81,78%	18,22%	$	527,38	85,23%	14,77%
Q2	1025	84,59%	15,41%	$	664,23	88,55%	11,45%
Q3	692	83,24%	16,76%	$	365,08	80,75%	19,25%
Q4	671	91,21%	8,79%	$	370,25	92,23%	7,77%
2019 Q1	660	85,76%	14,24%	$	292,20	75,20%	24,80%
Q2	909	78,22%	21,78%	$	397,71	74,99%	25,01%
Q3	757	81,77%	18,23%	$	375,15	76,84%	23,16%
Q4	746	77,35%	22,65%	$	435,82	74,49%	25,51%
2020 Q1	814	84,40%	15,60%	$	498,27	81,25%	18,75%
Q2	722	67,87%	32,13%	$	405,93	57,12%	42,88%
Q3	735	69,25%	30,75%	$	373,39	58,70%	41,30%
Q4	824	76,82%	23,18%	$	384,97	68,94%	31,06%
2021 Q1	968	70,76%	29,24%	$	699,83	71,71%	28,29%
Q2	993	72,31%	27,69%	$	625,29	71,77%	28,23%
Q3	770	75,45%	24,55%	$	515,72	73,96%	26,04%
Q4	715	79,16%	20,84%	$	511,27	81,07%	18,93%
2022 Q1	690	83,77%	16,23%	$	402,74	82,42%	17,58%
Q2	752	91,09%	8,91%	$	431,55	92,31%	7,69%
Q3	601	92,85%	7,15%	$	303,46	91,84%	8,16%
Q4	513	93,76%	6,24%	$	266,79	91,87%	8,13%
2023 Q1	606	84,82%	15,18%	$	331,45	82,77%	17,23%
Q2	643	82,74%	17,26%	$	349,40	79,70%	20,30%
Q3	524	80,15%	19,85%	$	297,40	80,94%	19,06%
Q4	512	83,20%	16,80%	$	305,02	84,42%	15,58%

Source: Own elaboration using data from White & Case's Debt Explorer

- **Annex V.** <u>AMD Sources of Capital 2009 – 2022</u>

	Amount ($)	Security type	Coupon
2009	750,50	Loan	-
2009	500,00	HY Bond	8,12%
2010	500,00	HY Bond	7,75%
2012	500,00	HY Bond	7,50%
2014	1000,00	HY Bond	6,75%
2014	500,00	Revolver	-
2015	500,00	Revolver	-
2016	690,00	Basic shares	-
2016	700,00	Convertible	-
2019	500,00	Revolving	-
2022	3000,00	Revolving	-
2022	500,00	Bond	4,39%

Source: Own elaboration using data from FactSet

- **Annex VI.** <u>Variation of Debt Instrument's Average Coupon Rate 2016 – 2022</u>

		2016						2017		
ID	Description	$ Outstdanding (mil)	Coupon Rate	YTW		ID	Description	$ Outstdanding (mil)	Coupon Rate	YTW
007903AZ0	AMD Inc	196,0	6,750%	3,26		007903AZ0	AMD Inc	166,0	6,750%	3,03
007903AV9	AMD Inc	0,0	7,500%	5,76		007903AV9	AMD Inc	0,0	7,500%	5,11
007903AX5	AMD Inc	349,8	7,500%	5,76		007903AX5	AMD Inc	346,8	7,500%	5,11
007903BC0	AMD Inc	416,0	7,000%	6,18		007903BC0	AMD Inc	311,0	7,000%	6,07
			7,188%						**7,188%**	

		2018						2019		
ID	Description	$ Outstdanding (mil)	Coupon Rate	YTW		ID	Description	$ Outstdanding (mil)	Coupon Rate	YTW
007903AZ0	AMD Inc	66	6,75%	5,04		007903AV9	AMD Inc	0,0	7,500%	2,49
007903AV9	AMD Inc	0	7,50%	5,27		007903AX5	AMD Inc	312,1	7,500%	2,49
007903AX5	AMD Inc	336,8	7,50%	5,27						
007903BC0	AMD Inc	250	7,00%	6,11					**7,5%**	
			7,188%							

		2020						2021		
ID	Description	$ Outstdanding (mil)	Coupon Rate	YTW		ID	Description	$ Outstdanding (mil)	Coupon Rate	YTW
007903AV9	AMD Inc	0,0	7,500%	1,84		007903AV9	AMD Inc	0,0	7,500%	1,41
007903AX5	AMD Inc	312,1	7,500%	1,84		007903AX5	AMD Inc	312,1	7,500%	1,41
			7,5%						**7,5%**	

		2022		
ID	Description	$ Outstdanding (mil)	Coupon Rate	YTW
983919AJ0	Xilinx Inc	750,0	2,950%	4,91
983919AK7	Xilinx Inc	750,0	2,375%	4,92
007903BF3	AMD Inc	500,0	3,924%	4,83
007903BG1	AMD Inc	500,0	4,393%	5,16
			3,411%	

	Av Coupon Rate	Variation
2016	7,188%	-
2017	7,188%	0,00%
2018	7,19%	0,00%
2019	7,5%	-0,31%
2020	7,5%	0,00%
2021	7,5%	0,00%
2022	3,411%	4,09%

Source: Own elaboration using data from FactSet

- **Annex VII.** AMD Trading Levels 2016 – 2022

Security	AMD US Equity
Start Date	19/2/16 0:00
End Date	20/2/24 0:00
Period	D
Currency	USD

Date	PX_LAST	Date	PX_LAST	Date	PX_LAST	Date	PX_LAST
19/02/2016	1,91	14/02/2018	12,2	12/02/2020	53,89	07/02/2022	123,67
22/02/2016	2,01	15/02/2018	12,19	13/02/2020	54,53	08/02/2022	128,23
23/02/2016	1,97	16/02/2018	11,82	14/02/2020	55,31	09/02/2022	132,85
24/02/2016	2,02	20/02/2018	12,02	18/02/2020	56,89	10/02/2022	125,77
25/02/2016	2,03	21/02/2018	11,72	19/02/2020	58,9	11/02/2022	113,18
26/02/2016	2,07	22/02/2018	11,84	20/02/2020	57,27	14/02/2022	114,27
29/02/2016	2,14	23/02/2018	12,07	21/02/2020	53,28	15/02/2022	121,47
01/03/2016	2,18	26/02/2018	12,42	24/02/2020	49,12	16/02/2022	117,69
02/03/2016	2,32	27/02/2018	12,53	25/02/2020	47,57	17/02/2022	112,37
03/03/2016	2,46	28/02/2018	12,11	26/02/2020	47,49	18/02/2022	113,83
04/03/2016	2,37	01/03/2018	11,9	27/02/2020	44,01	22/02/2022	115,65
07/03/2016	2,47	02/03/2018	11,81	28/02/2020	45,48	23/02/2022	109,76
08/03/2016	2,3	05/03/2018	11,91	02/03/2020	47,46	24/02/2022	116,61
09/03/2016	2,26	06/03/2018	11,76	03/03/2020	46,75	25/02/2022	121,06
10/03/2016	2,26	07/03/2018	12,24	04/03/2020	50,11	28/02/2022	123,34
11/03/2016	2,52	08/03/2018	11,97	05/03/2020	48,11	01/03/2022	113,83
14/03/2016	2,72	09/03/2018	11,7	06/03/2020	48,59	02/03/2022	118,28
15/03/2016	2,49	12/03/2018	11,52	09/03/2020	43,27	03/03/2022	111,98
16/03/2016	2,63	13/03/2018	11,64	10/03/2020	45,38	04/03/2022	108,41
17/03/2016	2,8	14/03/2018	11,36	11/03/2020	45,7	07/03/2022	102,95
18/03/2016	2,93	15/03/2018	11,46	12/03/2020	39,01	08/03/2022	105,53
21/03/2016	2,8	16/03/2018	11,47	13/03/2020	43,9	09/03/2022	111,05
22/03/2016	2,79	19/03/2018	11,43	16/03/2020	38,71	10/03/2022	106,46
23/03/2016	2,68	20/03/2018	11,11	17/03/2020	41,88	11/03/2022	104,29
24/03/2016	2,79	21/03/2018	11,26	18/03/2020	39,12	14/03/2022	102,25
28/03/2016	2,78	22/03/2018	10,91	19/03/2020	39,82	15/03/2022	109,33
29/03/2016	2,86	23/03/2018	10,63	20/03/2020	39,61	16/03/2022	115,37
30/03/2016	2,86	26/03/2018	10,44	23/03/2020	41,64	17/03/2022	111,69
31/03/2016	2,85	27/03/2018	10	24/03/2020	46,22	18/03/2022	113,46
01/04/2016	2,83	28/03/2018	9,81	25/03/2020	44,63	21/03/2022	115,92
04/04/2016	2,83	29/03/2018	10,05	26/03/2020	47,5	22/03/2022	114,78
05/04/2016	2,76	02/04/2018	9,53	27/03/2020	46,58	23/03/2022	113,92
06/04/2016	2,8	03/04/2018	9,55	30/03/2020	47,86	24/03/2022	120,53

07/04/2016	2,64	04/04/2018	9,77	31/03/2020	45,48	25/03/2022	119,67
08/04/2016	2,74	05/04/2018	10,02	01/04/2020	43,66	28/03/2022	120,24
11/04/2016	2,76	06/04/2018	9,61	02/04/2020	44,49	29/03/2022	123,23
12/04/2016	2,81	09/04/2018	9,53	03/04/2020	42,59	30/03/2022	119,22
13/04/2016	2,8	10/04/2018	9,98	06/04/2020	47,52	31/03/2022	109,34
14/04/2016	2,72	11/04/2018	9,82	07/04/2020	47,56	01/04/2022	108,19
15/04/2016	2,7	12/04/2018	10,08	08/04/2020	48,79	04/04/2022	110,53
18/04/2016	2,76	13/04/2018	9,93	09/04/2020	48,38	05/04/2022	106,82
19/04/2016	2,62	16/04/2018	10,09	13/04/2020	50,94	06/04/2022	103,67
20/04/2016	2,7	17/04/2018	10,52	14/04/2020	54,93	07/04/2022	103,72
21/04/2016	2,62	18/04/2018	10,36	15/04/2020	54,99	08/04/2022	101
22/04/2016	3,99	19/04/2018	10,11	16/04/2020	56,95	11/04/2022	97,37
25/04/2016	3,45	20/04/2018	9,99	17/04/2020	56,6	12/04/2022	95,1
26/04/2016	3,66	23/04/2018	10,04	20/04/2020	56,97	13/04/2022	97,74
27/04/2016	3,73	24/04/2018	10,09	21/04/2020	52,92	14/04/2022	93,06
28/04/2016	3,61	25/04/2018	9,71	22/04/2020	55,92	18/04/2022	93,89
29/04/2016	3,55	26/04/2018	11,04	23/04/2020	55,9	19/04/2022	96,93
02/05/2016	3,74	27/04/2018	11,11	24/04/2020	56,18	20/04/2022	94,02
03/05/2016	3,6	30/04/2018	10,88	27/04/2020	56,49	21/04/2022	89,85
04/05/2016	3,6	01/05/2018	11,13	28/04/2020	55,51	22/04/2022	88,14
05/05/2016	3,66	02/05/2018	10,97	29/04/2020	53,66	25/04/2022	90,69
06/05/2016	3,68	03/05/2018	10,93	30/04/2020	52,39	26/04/2022	85,16
09/05/2016	3,65	04/05/2018	11,28	01/05/2020	49,88	27/04/2022	84,91
10/05/2016	3,64	07/05/2018	11,59	04/05/2020	52,56	28/04/2022	89,64
11/05/2016	3,65	08/05/2018	11,61	05/05/2020	52,19	29/04/2022	85,52
12/05/2016	3,59	09/05/2018	11,95	06/05/2020	52,16	02/05/2022	89,84
13/05/2016	3,67	10/05/2018	12,13	07/05/2020	51,95	03/05/2022	91,13
16/05/2016	3,79	11/05/2018	11,95	08/05/2020	53,19	04/05/2022	99,42
17/05/2016	3,79	14/05/2018	12,23	11/05/2020	55,74	05/05/2022	93,87
18/05/2016	3,84	15/05/2018	12,45	12/05/2020	53,76	06/05/2022	95,34
19/05/2016	3,77	16/05/2018	12,82	13/05/2020	52,18	09/05/2022	86,36
20/05/2016	3,87	17/05/2018	12,82	14/05/2020	54,51	10/05/2022	88,73
23/05/2016	4,04	18/05/2018	13	15/05/2020	54,2	11/05/2022	87,92
24/05/2016	4,2	21/05/2018	12,99	18/05/2020	54,59	12/05/2022	87,06
25/05/2016	4,18	22/05/2018	12,98	19/05/2020	55,47	13/05/2022	95,12
26/05/2016	4,35	23/05/2018	13,1	20/05/2020	56,39	16/05/2022	94,24
27/05/2016	4,6	24/05/2018	13,41	21/05/2020	54,65	17/05/2022	102,47
31/05/2016	4,57	25/05/2018	13,54	22/05/2020	55,17	18/05/2022	96,28
01/06/2016	4,43	29/05/2018	13,36	26/05/2020	53,19	19/05/2022	96,67
02/06/2016	4,24	30/05/2018	13,82	27/05/2020	52,74	20/05/2022	93,5
03/06/2016	4,16	31/05/2018	13,73	28/05/2020	51,74	23/05/2022	95,07
06/06/2016	4,47	01/06/2018	14,4	29/05/2020	53,8	24/05/2022	91,16
07/06/2016	4,51	04/06/2018	14,85	01/06/2020	53,63	25/05/2022	92,65
08/06/2016	4,46	05/06/2018	14,85	02/06/2020	53,54	26/05/2022	98,75

09/06/2016	4,52	06/06/2018	15,67	03/06/2020	52,73	27/05/2022	102,26
10/06/2016	4,32	07/06/2018	14,89	04/06/2020	52,63	31/05/2022	101,86
13/06/2016	4,4	08/06/2018	15,25	05/06/2020	53,1	01/06/2022	101,22
14/06/2016	4,39	11/06/2018	15,73	08/06/2020	52,97	02/06/2022	108,59
15/06/2016	4,42	12/06/2018	15,85	09/06/2020	56,39	03/06/2022	106,3
16/06/2016	4,75	13/06/2018	16,32	10/06/2020	57,44	06/06/2022	105,65
17/06/2016	5,26	14/06/2018	16,25	11/06/2020	52,83	07/06/2022	105,28
20/06/2016	5,1	15/06/2018	16,34	12/06/2020	53,5	08/06/2022	101,9
21/06/2016	5,45	18/06/2018	17,11	15/06/2020	54,68	09/06/2022	98,8
22/06/2016	5,02	19/06/2018	16,69	16/06/2020	54,46	10/06/2022	94,82
23/06/2016	5,21	20/06/2018	16,52	17/06/2020	54,55	13/06/2022	86,99
24/06/2016	4,88	21/06/2018	15,65	18/06/2020	54,04	14/06/2022	86,99
27/06/2016	4,72	22/06/2018	15,8	19/06/2020	54,23	15/06/2022	89,3
28/06/2016	5,12	25/06/2018	15,11	22/06/2020	54,76	16/06/2022	82,05
29/06/2016	5,13	26/06/2018	15,5	23/06/2020	53,99	17/06/2022	81,57
30/06/2016	5,14	27/06/2018	14,97	24/06/2020	52,39	21/06/2022	83,79
01/07/2016	5,07	28/06/2018	15,31	25/06/2020	51,93	22/06/2022	83,75
05/07/2016	4,96	29/06/2018	14,99	26/06/2020	50,1	23/06/2022	82,43
06/07/2016	5,04	02/07/2018	15,16	29/06/2020	50,28	24/06/2022	87,08
07/07/2016	5,02	03/07/2018	15	30/06/2020	52,61	27/06/2022	86,16
08/07/2016	5,1	05/07/2018	15,5	01/07/2020	52,58	28/06/2022	80,78
11/07/2016	5,01	06/07/2018	16,36	02/07/2020	52,34	29/06/2022	77,99
12/07/2016	5,14	09/07/2018	16,61	06/07/2020	53,4	30/06/2022	76,47
13/07/2016	5,09	10/07/2018	16,55	07/07/2020	52,93	01/07/2022	73,67
14/07/2016	5,17	11/07/2018	16,27	08/07/2020	53,43	05/07/2022	75,2
15/07/2016	5,14	12/07/2018	16,56	09/07/2020	57,255	06/07/2022	75,35
18/07/2016	5,51	13/07/2018	16,27	10/07/2020	55,88	07/07/2022	79,3
19/07/2016	5,41	16/07/2018	16,58	13/07/2020	53,59	08/07/2022	79,35
20/07/2016	5,41	17/07/2018	16,87	14/07/2020	54,72	11/07/2022	76,95
21/07/2016	5,22	18/07/2018	16,85	15/07/2020	55,34	12/07/2022	76,36
22/07/2016	5,84	19/07/2018	16,71	16/07/2020	54,92	13/07/2022	77,52
25/07/2016	6,7	20/07/2018	16,5	17/07/2020	55,04	14/07/2022	78,6
26/07/2016	6,98	23/07/2018	16,66	20/07/2020	57,46	15/07/2022	81,11
27/07/2016	6,85	24/07/2018	16,19	21/07/2020	57	18/07/2022	81,43
28/07/2016	6,82	25/07/2018	16,05	22/07/2020	61,79	19/07/2022	85,88
29/07/2016	6,86	26/07/2018	18,35	23/07/2020	59,57	20/07/2022	89,43
01/08/2016	6,64	27/07/2018	18,94	24/07/2020	69,4	21/07/2022	91,09
02/08/2016	6,26	30/07/2018	19,42	27/07/2020	68,97	22/07/2022	88,1
03/08/2016	6,3	31/07/2018	18,33	28/07/2020	67,61	25/07/2022	87,54
04/08/2016	6,47	01/08/2018	18,48	29/07/2020	76,09	26/07/2022	85,25
05/08/2016	6,61	02/08/2018	18,79	30/07/2020	78,2	27/07/2022	89,82
08/08/2016	6,68	03/08/2018	18,49	31/07/2020	77,43	28/07/2022	91,67
09/08/2016	6,6	06/08/2018	19,43	03/08/2020	77,67	29/07/2022	94,47
10/08/2016	6,49	07/08/2018	19,56	04/08/2020	85,04	01/08/2022	96,78

11/08/2016	6,58	08/08/2018	19,58	05/08/2020	85,31	02/08/2022	99,29
12/08/2016	6,73	09/08/2018	19,1	06/08/2020	86,71	03/08/2022	98,09
15/08/2016	6,95	10/08/2018	19,06	07/08/2020	84,85	04/08/2022	103,91
16/08/2016	6,78	13/08/2018	19,73	10/08/2020	82,24	05/08/2022	102,31
17/08/2016	6,68	14/08/2018	20,02	11/08/2020	76,88	08/08/2022	100,07
18/08/2016	7,04	15/08/2018	19,7	12/08/2020	82,61	09/08/2022	95,54
19/08/2016	7,62	16/08/2018	19,33	13/08/2020	81,84	10/08/2022	99,05
22/08/2016	7,58	17/08/2018	19,77	14/08/2020	81,3	11/08/2022	98,12
23/08/2016	7,67	20/08/2018	19,98	17/08/2020	82,42	12/08/2022	100,83
24/08/2016	7,43	21/08/2018	20,4	18/08/2020	81,66	15/08/2022	101,01
25/08/2016	7,465	22/08/2018	20,9	19/08/2020	81,09	16/08/2022	100,2
26/08/2016	7,67	23/08/2018	22,29	20/08/2020	82,77	17/08/2022	98,27
29/08/2016	7,59	24/08/2018	23,98	21/08/2020	83,81	18/08/2022	100,44
30/08/2016	7,49	27/08/2018	25,26	24/08/2020	83,08	19/08/2022	95,95
31/08/2016	7,4	28/08/2018	25,05	25/08/2020	86,35	22/08/2022	92,84
01/09/2016	7,35	29/08/2018	25,2	26/08/2020	86,02	23/08/2022	92,49
02/09/2016	7,51	30/08/2018	24,89	27/08/2020	83,8	24/08/2022	92,73
06/09/2016	7,34	31/08/2018	25,17	28/08/2020	85,55	25/08/2022	97,18
07/09/2016	6,84	04/09/2018	28,06	31/08/2020	90,82	26/08/2022	91,18
08/09/2016	6,225	05/09/2018	28,51	01/09/2020	92,18	29/08/2022	88,49
09/09/2016	5,9	06/09/2018	27,84	02/09/2020	90,22	30/08/2022	86,94
12/09/2016	5,94	07/09/2018	27,38	03/09/2020	82,54	31/08/2022	84,87
13/09/2016	5,74	10/09/2018	29,89	04/09/2020	82,01	01/09/2022	82,33
14/09/2016	6,04	11/09/2018	30,1	08/09/2020	78,69	02/09/2022	80,24
15/09/2016	6,02	12/09/2018	32,21	09/09/2020	81,91	06/09/2022	78,72
16/09/2016	6,05	13/09/2018	30,48	10/09/2020	78,98	07/09/2022	79,61
19/09/2016	6,16	14/09/2018	32,72	11/09/2020	76,34	08/09/2022	82,78
20/09/2016	6,17	17/09/2018	32,43	14/09/2020	77,9	09/09/2022	85,45
21/09/2016	6,29	18/09/2018	31,93	15/09/2020	78,93	12/09/2022	84,64
22/09/2016	6,37	19/09/2018	31,21	16/09/2020	76,66	13/09/2022	77,03
23/09/2016	6,55	20/09/2018	31,18	17/09/2020	76,55	14/09/2022	77,45
26/09/2016	6,32	21/09/2018	31,02	18/09/2020	74,93	15/09/2022	76,66
27/09/2016	6,54	24/09/2018	32,61	21/09/2020	77,94	16/09/2022	76,51
28/09/2016	6,59	25/09/2018	32,57	22/09/2020	77,7	19/09/2022	76,77
29/09/2016	6,67	26/09/2018	32,19	23/09/2020	74,73	20/09/2022	75,25
30/09/2016	6,91	27/09/2018	32,59	24/09/2020	75,82	21/09/2022	74,48
03/10/2016	6,95	28/09/2018	30,89	25/09/2020	78,055	22/09/2022	69,5
04/10/2016	6,97	01/10/2018	31,42	28/09/2020	79,48	23/09/2022	67,96
05/10/2016	6,78	02/10/2018	29,02	29/09/2020	81,77	26/09/2022	66,3
06/10/2016	6,96	03/10/2018	28,43	30/09/2020	81,99	27/09/2022	67,17
07/10/2016	6,75	04/10/2018	27,78	01/10/2020	84,86	28/09/2022	68,36
10/10/2016	6,84	05/10/2018	27,35	02/10/2020	81,8	29/09/2022	64,14
11/10/2016	6,5	08/10/2018	26,46	05/10/2020	86,15	30/09/2022	63,36
12/10/2016	6,62	09/10/2018	27,24	06/10/2020	84,48	03/10/2022	66,11

13/10/2016	6,49	10/10/2018	25	07/10/2020	86,69	04/10/2022	67,9
14/10/2016	6,75	11/10/2018	25,3	08/10/2020	86,51	05/10/2022	67,94
17/10/2016	6,67	12/10/2018	26,34	09/10/2020	83,1	06/10/2022	67,85
18/10/2016	6,73	15/10/2018	26,26	12/10/2020	84,29	07/10/2022	58,44
19/10/2016	6,77	16/10/2018	28,18	13/10/2020	85,28	10/10/2022	57,81
20/10/2016	6,96	17/10/2018	27,3	14/10/2020	84,21	11/10/2022	57,63
21/10/2016	6,52	18/10/2018	26,62	15/10/2020	83,13	12/10/2022	57,85
24/10/2016	7,005	19/10/2018	23,66	16/10/2020	83,17	13/10/2022	58,94
25/10/2016	7,5	22/10/2018	25,03	19/10/2020	82	14/10/2022	55,94
26/10/2016	7,29	23/10/2018	25,09	20/10/2020	81,56	17/10/2022	57,96
27/10/2016	7,11	24/10/2018	22,79	21/10/2020	79,2	18/10/2022	57,92
28/10/2016	7,2	25/10/2018	19,27	22/10/2020	79,42	19/10/2022	57,23
31/10/2016	7,23	26/10/2018	17,63	23/10/2020	81,96	20/10/2022	57,77
01/11/2016	7,09	29/10/2018	16,85	26/10/2020	82,23	21/10/2022	58,82
02/11/2016	6,76	30/10/2018	17,2	27/10/2020	78,88	24/10/2022	58,7
03/11/2016	6,7	31/10/2018	18,21	28/10/2020	76,4	25/10/2022	61,47
04/11/2016	6,56	01/11/2018	20,22	29/10/2020	78,02	26/10/2022	59,73
07/11/2016	6,96	02/11/2018	20,23	30/10/2020	75,29	27/10/2022	58,6
08/11/2016	7	05/11/2018	19,9	02/11/2020	74,7	28/10/2022	62,01
09/11/2016	6,94	06/11/2018	20,68	03/11/2020	76,58	31/10/2022	60,06
10/11/2016	6,295	07/11/2018	21,84	04/11/2020	81,35	01/11/2022	59,66
11/11/2016	6,685	08/11/2018	21,2	05/11/2020	83	02/11/2022	58,63
14/11/2016	6,79	09/11/2018	21,03	06/11/2020	85,88	03/11/2022	60,11
15/11/2016	6,97	12/11/2018	19,03	09/11/2020	83,12	04/11/2022	62,19
16/11/2016	7,67	13/11/2018	19,61	10/11/2020	77,99	07/11/2022	63,08
17/11/2016	8,46	14/11/2018	20,81	11/11/2020	81,28	08/11/2022	63,85
18/11/2016	8,71	15/11/2018	21,49	12/11/2020	81,84	09/11/2022	59,92
21/11/2016	8,94	16/11/2018	20,66	13/11/2020	81,43	10/11/2022	68,47
22/11/2016	8,69	19/11/2018	19,11	16/11/2020	83,73	11/11/2022	72,37
23/11/2016	8,8	20/11/2018	19,21	17/11/2020	83,36	14/11/2022	73,53
25/11/2016	8,77	21/11/2018	18,73	18/11/2020	82,54	15/11/2022	76,37
28/11/2016	8,83	23/11/2018	19,38	19/11/2020	85,54	16/11/2022	72,7
29/11/2016	8,93	26/11/2018	20,08	20/11/2020	84,64	17/11/2022	73,9
30/11/2016	8,91	27/11/2018	21,05	23/11/2020	85,31	18/11/2022	73,57
01/12/2016	8,39	28/11/2018	21,34	24/11/2020	85,07	21/11/2022	72,46
02/12/2016	8,53	29/11/2018	21,43	25/11/2020	86,71	22/11/2022	75,25
05/12/2016	8,68	30/11/2018	21,3	27/11/2020	87,19	23/11/2022	76,4
06/12/2016	9,45	03/12/2018	23,71	30/11/2020	92,66	25/11/2022	75,14
07/12/2016	9,56	04/12/2018	21,12	01/12/2020	92,63	28/11/2022	73,19
08/12/2016	10,34	06/12/2018	21,3	02/12/2020	93,74	29/11/2022	73,39
09/12/2016	10,34	07/12/2018	19,46	03/12/2020	92,31	30/11/2022	77,63
12/12/2016	10,68	10/12/2018	19,99	04/12/2020	94,04	01/12/2022	77,48
13/12/2016	10,54	11/12/2018	19,98	07/12/2020	94,07	02/12/2022	74,98
14/12/2016	10,55	12/12/2018	20,48	08/12/2020	92,92	05/12/2022	73,62

Date	Value	Date	Value	Date	Value	Date	Value
15/12/2016	10,86	13/12/2018	19,86	09/12/2020	89,83	06/12/2022	70,27
16/12/2016	10,66	14/12/2018	19,9	10/12/2020	91,66	07/12/2022	70,14
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21/12/2016	11,47	19/12/2018	18,16	15/12/2020	97,12	12/12/2022	70,67
22/12/2016	11,6	20/12/2018	17,94	16/12/2020	96,85	13/12/2022	71,65
23/12/2016	11,58	21/12/2018	16,93	17/12/2020	96,84	14/12/2022	68,93
27/12/2016	12,07	24/12/2018	16,65	18/12/2020	95,92	15/12/2022	66,53
28/12/2016	11,55	26/12/2018	17,9	21/12/2020	93,23	16/12/2022	65,41
29/12/2016	11,59	27/12/2018	17,49	22/12/2020	93,16	19/12/2022	64,59
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03/01/2017	11,43	31/12/2018	18,46	24/12/2020	91,81	21/12/2022	67,68
04/01/2017	11,43	02/01/2019	18,83	28/12/2020	91,6	22/12/2022	63,86
05/01/2017	11,24	03/01/2019	17,05	29/12/2020	90,62	23/12/2022	64,52
06/01/2017	11,32	04/01/2019	19	30/12/2020	92,29	27/12/2022	63,27
09/01/2017	11,49	07/01/2019	20,57	31/12/2020	91,71	28/12/2022	62,57
10/01/2017	11,44	08/01/2019	20,75	04/01/2021	92,3	29/12/2022	64,82
11/01/2017	11,2	09/01/2019	20,19	05/01/2021	92,77	30/12/2022	64,77
12/01/2017	10,76	10/01/2019	19,74	06/01/2021	90,33		
13/01/2017	10,58	11/01/2019	20,27	07/01/2021	95,16		
17/01/2017	9,82	14/01/2019	20,23	08/01/2021	94,58		
18/01/2017	9,88	15/01/2019	20,38	11/01/2021	97,25		
19/01/2017	9,77	16/01/2019	19,73	12/01/2021	95,355		
20/01/2017	9,75	17/01/2019	20,25	13/01/2021	91,78		
23/01/2017	9,91	18/01/2019	20,77	14/01/2021	90,79		
24/01/2017	10,44	22/01/2019	19,76	15/01/2021	88,21		
25/01/2017	10,35	23/01/2019	19,8	19/01/2021	89,45		
26/01/2017	10,52	24/01/2019	20,85	20/01/2021	88,75		
27/01/2017	10,67	25/01/2019	21,93	21/01/2021	91,53		
30/01/2017	10,61	28/01/2019	20,18	22/01/2021	92,79		
31/01/2017	10,37	29/01/2019	19,25	25/01/2021	94,13		
01/02/2017	12,06	30/01/2019	23,09	26/01/2021	94,71		
02/02/2017	12,28	31/01/2019	24,41	27/01/2021	88,84		
03/02/2017	12,24	01/02/2019	24,51	28/01/2021	87,52		
06/02/2017	13,63	04/02/2019	24,13	29/01/2021	85,64		
07/02/2017	13,29	05/02/2019	23,31	01/02/2021	87,66		
08/02/2017	13,56	06/02/2019	23,26	02/02/2021	88,86		
09/02/2017	13,42	07/02/2019	22,67	03/02/2021	87,89		
10/02/2017	13,58	08/02/2019	23,05	04/02/2021	87,84		
13/02/2017	13,49	11/02/2019	22,96	05/02/2021	87,9		
14/02/2017	13,26	12/02/2019	22,82	08/02/2021	91,47		
15/02/2017	13,3	13/02/2019	22,85	09/02/2021	90,91		
16/02/2017	12,97	14/02/2019	23,13	10/02/2021	92,35		
17/02/2017	13,13	15/02/2019	23,68	11/02/2021	92,66		

21/02/2017	14	19/02/2019	23,95	12/02/2021	93,77
22/02/2017	14,28	20/02/2019	23,95	16/02/2021	91,46
23/02/2017	14,32	21/02/2019	23,92	17/02/2021	89,94
24/02/2017	14,12	22/02/2019	24,36	18/02/2021	88,64
27/02/2017	15,2	25/02/2019	24,71	19/02/2021	89,58
28/02/2017	14,46	26/02/2019	24,21	22/02/2021	85,37
01/03/2017	14,96	27/02/2019	23,48	23/02/2021	84,74
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07/03/2017	13,05	05/03/2019	23,5	01/03/2021	86,39
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09/03/2017	13,33	07/03/2019	22,08	03/03/2021	80,86
10/03/2017	13,91	08/03/2019	22,01	04/03/2021	77,75
13/03/2017	14,28	11/03/2019	22,96	05/03/2021	78,52
14/03/2017	14,1	12/03/2019	23,49	08/03/2021	73,96
15/03/2017	13,98	13/03/2019	23,38	09/03/2021	78,53
16/03/2017	13,65	14/03/2019	22,82	10/03/2021	77,52
17/03/2017	13,49	15/03/2019	23,29	11/03/2021	81,23
20/03/2017	14,4	18/03/2019	23,25	12/03/2021	81,05
21/03/2017	13,82	19/03/2019	26	15/03/2021	82,5
22/03/2017	14,1	20/03/2019	25,7	16/03/2021	82,75
23/03/2017	13,79	21/03/2019	27,89	17/03/2021	82,63
24/03/2017	13,7	22/03/2019	26,37	18/03/2021	78,12
27/03/2017	13,7	25/03/2019	25,97	19/03/2021	79,06
28/03/2017	13,69	26/03/2019	25,69	22/03/2021	80,3
29/03/2017	13,71	27/03/2019	24,89	23/03/2021	78,38
30/03/2017	14,05	28/03/2019	25,06	24/03/2021	76,48
31/03/2017	14,55	29/03/2019	25,52	25/03/2021	76,22
03/04/2017	14,64	01/04/2019	26,36	26/03/2021	77,41
04/04/2017	14,16	02/04/2019	26,75	29/03/2021	77,14
05/04/2017	14,17	03/04/2019	29,02	30/03/2021	76
06/04/2017	13,27	04/04/2019	29,09	31/03/2021	78,5
07/04/2017	13,52	05/04/2019	28,98	01/04/2021	81,09
10/04/2017	13,1	08/04/2019	28,53	05/04/2021	81,43
11/04/2017	13,1	09/04/2019	27,24	06/04/2021	81,44
12/04/2017	12,76	10/04/2019	27,83	07/04/2021	82,2
13/04/2017	12,31	11/04/2019	27,79	08/04/2021	83,35
17/04/2017	12,79	12/04/2019	27,85	09/04/2021	82,76
18/04/2017	12,95	15/04/2019	27,33	12/04/2021	78,58
19/04/2017	12,84	16/04/2019	27,93	13/04/2021	80,19
20/04/2017	13,11	17/04/2019	27,49	14/04/2021	78,55
21/04/2017	13	18/04/2019	27,68	15/04/2021	83,01
24/04/2017	13,13	22/04/2019	28,18	16/04/2021	82,15

25/04/2017	13,49	23/04/2019	27,97	19/04/2021	81,11
26/04/2017	13,41	24/04/2019	28,46	20/04/2021	79,27
27/04/2017	13,62	25/04/2019	27,66	21/04/2021	81,61
28/04/2017	13,3	26/04/2019	27,88	22/04/2021	79,06
01/05/2017	13,62	29/04/2019	27,69	23/04/2021	82,76
02/05/2017	10,32	30/04/2019	27,63	26/04/2021	85,41
03/05/2017	10,39	01/05/2019	26,81	27/04/2021	85,21
04/05/2017	10,1	02/05/2019	28,29	28/04/2021	84,02
05/05/2017	10,19	03/05/2019	28,22	29/04/2021	83,91
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10/05/2017	10,79	08/05/2019	27,09	04/05/2021	78,61
11/05/2017	11,07	09/05/2019	27,21	05/05/2021	77,83
12/05/2017	11,26	10/05/2019	27,96	06/05/2021	77,89
15/05/2017	11,42	13/05/2019	26,24	07/05/2021	78,81
16/05/2017	12,75	14/05/2019	27,32	10/05/2021	75,99
17/05/2017	11,2	15/05/2019	27,58	11/05/2021	76,83
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19/05/2017	11,41	17/05/2019	27,5	13/05/2021	73,09
22/05/2017	11,04	20/05/2019	26,68	14/05/2021	74,59
23/05/2017	10,89	21/05/2019	27,35	17/05/2021	74,65
24/05/2017	10,89	22/05/2019	27,41	18/05/2021	74,44
25/05/2017	10,98	23/05/2019	26,36	19/05/2021	76,23
26/05/2017	11	24/05/2019	26,44	20/05/2021	78,06
30/05/2017	11,12	28/05/2019	29,03	21/05/2021	77,17
31/05/2017	11,19	29/05/2019	28,09	24/05/2021	77,44
01/06/2017	10,93	30/05/2019	28,03	25/05/2021	77,86
02/06/2017	10,9	31/05/2019	27,41	26/05/2021	78,34
05/06/2017	11,24	03/06/2019	27,58	27/05/2021	78,42
06/06/2017	12,03	04/06/2019	29,57	28/05/2021	80,08
07/06/2017	12,38	05/06/2019	29,5	01/06/2021	80,81
08/06/2017	12,9	06/06/2019	31,82	02/06/2021	81,97
09/06/2017	12,28	07/06/2019	32,41	03/06/2021	80,28
12/06/2017	12,09	10/06/2019	33,23	04/06/2021	81,58
13/06/2017	11,96	11/06/2019	32,41	07/06/2021	81,35
14/06/2017	11,77	12/06/2019	32,18	08/06/2021	80,89
15/06/2017	11,5	13/06/2019	31,39	09/06/2021	79,96
16/06/2017	11,44	14/06/2019	30,36	10/06/2021	81,56
19/06/2017	11,93	17/06/2019	29,2	11/06/2021	81,31
20/06/2017	12,64	18/06/2019	30,45	14/06/2021	81,55
21/06/2017	13,98	19/06/2019	30,5	15/06/2021	80,47
22/06/2017	14,38	20/06/2019	30,01	16/06/2021	80,11
23/06/2017	14,17	21/06/2019	29,1	17/06/2021	84,56
26/06/2017	14,08	24/06/2019	29,26	18/06/2021	84,65

27/06/2017	13,4	25/06/2019	28,86	21/06/2021	82,59
28/06/2017	13,23	26/06/2019	29,92	22/06/2021	83,58
29/06/2017	12,6	27/06/2019	30,74	23/06/2021	83,82
30/06/2017	12,48	28/06/2019	30,37	24/06/2021	86,1
03/07/2017	12,15	01/07/2019	31,2	25/06/2021	85,62
05/07/2017	13,19	02/07/2019	31,24	28/06/2021	87,08
06/07/2017	13,02	03/07/2019	31,19	29/06/2021	89,52
07/07/2017	13,36	05/07/2019	31,5	30/06/2021	93,93
10/07/2017	13,81	08/07/2019	32,04	01/07/2021	93,31
11/07/2017	13,89	09/07/2019	33,15	02/07/2021	94,7
12/07/2017	14,29	10/07/2019	33,79	06/07/2021	94,47
13/07/2017	13,53	11/07/2019	33,06	07/07/2021	90,54
14/07/2017	13,92	12/07/2019	33,21	08/07/2021	89,74
17/07/2017	13,8	15/07/2019	34,39	09/07/2021	90,9
18/07/2017	13,48	16/07/2019	33,85	12/07/2021	90,81
19/07/2017	13,55	17/07/2019	33,6	13/07/2021	90,26
20/07/2017	13,8	18/07/2019	33	14/07/2021	89,05
21/07/2017	13,88	19/07/2019	32,51	15/07/2021	86,93
24/07/2017	14,16	22/07/2019	32,85	16/07/2021	85,89
25/07/2017	14,11	23/07/2019	33,49	19/07/2021	86,58
26/07/2017	14,76	24/07/2019	34,11	20/07/2021	87,11
27/07/2017	14,12	25/07/2019	33,67	21/07/2021	89,41
28/07/2017	13,95	26/07/2019	34,02	22/07/2021	91,21
31/07/2017	13,61	29/07/2019	33,48	23/07/2021	92,15
01/08/2017	13,71	30/07/2019	33,87	26/07/2021	91,82
02/08/2017	13,37	31/07/2019	30,45	27/07/2021	91,03
03/08/2017	13,24	01/08/2019	29,86	28/07/2021	97,93
04/08/2017	13,12	02/08/2019	29,44	29/07/2021	102,95
07/08/2017	13,43	05/08/2019	27,99	30/07/2021	106,19
08/08/2017	13,11	06/08/2019	28,86	02/08/2021	108,63
09/08/2017	12,83	07/08/2019	29,19	03/08/2021	112,56
10/08/2017	12,12	08/08/2019	33,92	04/08/2021	118,77
11/08/2017	12,23	09/08/2019	34,19	05/08/2021	112,35
14/08/2017	12,76	12/08/2019	32,43	06/08/2021	110,11
15/08/2017	13,02	13/08/2019	32,11	09/08/2021	107,58
16/08/2017	12,63	14/08/2019	30,24	10/08/2021	106,48
17/08/2017	12,34	15/08/2019	29,67	11/08/2021	107,68
18/08/2017	12,37	16/08/2019	31,18	12/08/2021	106,5
21/08/2017	12,05	19/08/2019	31,48	13/08/2021	110,55
22/08/2017	12,17	20/08/2019	30,72	16/08/2021	107,48
23/08/2017	12,48	21/08/2019	31,7	17/08/2021	107,56
24/08/2017	12,5	22/08/2019	31,9	18/08/2021	103,44
25/08/2017	12,43	23/08/2019	29,54	19/08/2021	103,7
28/08/2017	12,23	26/08/2019	30,28	20/08/2021	104,65

29/08/2017	12,15	27/08/2019	30,2	23/08/2021	108,77
30/08/2017	12,67	28/08/2019	30,78	24/08/2021	107,65
31/08/2017	13	29/08/2019	31,45	25/08/2021	108,3
01/09/2017	13,19	30/08/2019	31,45	26/08/2021	107,27
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06/09/2017	12,86	04/09/2019	30,95	30/08/2021	111,32
07/09/2017	12,63	05/09/2019	31,5	31/08/2021	110,72
08/09/2017	12,25	06/09/2019	30,56	01/09/2021	109,99
11/09/2017	12,55	09/09/2019	30,5	02/09/2021	109,2
12/09/2017	12,3	10/09/2019	30,23	03/09/2021	109,92
13/09/2017	12,22	11/09/2019	29,76	07/09/2021	109,15
14/09/2017	12,26	12/09/2019	30,21	08/09/2021	106,17
15/09/2017	12,52	13/09/2019	30,69	09/09/2021	106,15
18/09/2017	13,08	16/09/2019	30,83	10/09/2021	105,2
19/09/2017	13,12	17/09/2019	30,99	13/09/2021	104,8
20/09/2017	13,74	18/09/2019	30,42	14/09/2021	105,73
21/09/2017	13,41	19/09/2019	30,29	15/09/2021	105,6
22/09/2017	13,3	20/09/2019	30,05	16/09/2021	106,22
25/09/2017	12,61	23/09/2019	30,64	17/09/2021	103,88
26/09/2017	12,45	24/09/2019	29,52	20/09/2021	101,55
27/09/2017	12,74	25/09/2019	29,54	21/09/2021	102,82
28/09/2017	12,74	26/09/2019	29,47	22/09/2021	104,38
29/09/2017	12,75	27/09/2019	28,72	23/09/2021	106,15
02/10/2017	12,71	30/09/2019	28,99	24/09/2021	105,8
03/10/2017	13,42	01/10/2019	28,76	27/09/2021	108,16
04/10/2017	13,31	02/10/2019	28,31	28/09/2021	101,52
05/10/2017	13,34	03/10/2019	28,68	29/09/2021	100,35
06/10/2017	13,23	04/10/2019	29,01	30/09/2021	102,9
09/10/2017	13,47	07/10/2019	28,93	01/10/2021	102,45
10/10/2017	13,7	08/10/2019	28,23	04/10/2021	100,34
11/10/2017	13,88	09/10/2019	28,46	05/10/2021	101,81
12/10/2017	14,2	10/10/2019	28,38	06/10/2021	103,64
13/10/2017	14,22	11/10/2019	29,75	07/10/2021	106,45
16/10/2017	14,26	14/10/2019	30,53	08/10/2021	105,06
17/10/2017	14,16	15/10/2019	30,72	11/10/2021	104,68
18/10/2017	14,07	16/10/2019	30,81	12/10/2021	105,04
19/10/2017	13,95	17/10/2019	31,14	13/10/2021	109,16
20/10/2017	13,81	18/10/2019	30,97	14/10/2021	111,99
23/10/2017	14,1	21/10/2019	32,03	15/10/2021	112,12
24/10/2017	14,25	22/10/2019	31,51	18/10/2021	116,43
25/10/2017	12,33	23/10/2019	31,36	19/10/2021	116,33
26/10/2017	12,005	24/10/2019	31,72	20/10/2021	116,39
27/10/2017	11,84	25/10/2019	32,71	21/10/2021	119,33
30/10/2017	10,89	28/10/2019	33,69	22/10/2021	119,82

31/10/2017	10,985	29/10/2019	33,03	25/10/2021	122,36
01/11/2017	10,8	30/10/2019	33,13	26/10/2021	122,93
02/11/2017	10,85	31/10/2019	33,93	27/10/2021	122,28
03/11/2017	11,12	01/11/2019	34,89	28/10/2021	121,16
06/11/2017	11,93	04/11/2019	36,29	29/10/2021	120,23
07/11/2017	12,05	05/11/2019	36,15	01/11/2021	125,23
08/11/2017	11,71	06/11/2019	35,93	02/11/2021	127,63
09/11/2017	11,12	07/11/2019	36,28	03/11/2021	130,53
10/11/2017	11,26	08/11/2019	36,29	04/11/2021	137,5
13/11/2017	11,09	11/11/2019	36,31	05/11/2021	136,34
14/11/2017	11,12	12/11/2019	36,71	08/11/2021	150,16
15/11/2017	11,07	13/11/2019	37,52	09/11/2021	148,92
16/11/2017	11,25	14/11/2019	38,35	10/11/2021	139,87
17/11/2017	11,38	15/11/2019	38,56	11/11/2021	146,01
20/11/2017	11,34	18/11/2019	39,88	12/11/2021	147,89
21/11/2017	11,4	19/11/2019	41,29	15/11/2021	146,49
22/11/2017	11,37	20/11/2019	40,98	16/11/2021	152,45
24/11/2017	11,38	21/11/2019	39,52	17/11/2021	151,34
27/11/2017	11,55	22/11/2019	39,15	18/11/2021	155,02
28/11/2017	11,17	25/11/2019	39,79	19/11/2021	155,41
29/11/2017	10,83	26/11/2019	38,99	22/11/2021	152,52
30/11/2017	10,89	27/11/2019	39,41	23/11/2021	149,92
01/12/2017	10,73	29/11/2019	39,15	24/11/2021	157,8
04/12/2017	10,03	02/12/2019	38,73	26/11/2021	154,81
05/12/2017	9,91	03/12/2019	38,9	29/11/2021	161,91
06/12/2017	10	04/12/2019	39,69	30/11/2021	158,37
07/12/2017	10,04	05/12/2019	39,62	01/12/2021	149,11
08/12/2017	9,94	06/12/2019	39,63	02/12/2021	150,68
11/12/2017	10,16	09/12/2019	38,93	03/12/2021	144,01
12/12/2017	9,9	10/12/2019	39,44	06/12/2021	139,06
13/12/2017	10,11	11/12/2019	39,47	07/12/2021	144,85
14/12/2017	10,13	12/12/2019	42,59	08/12/2021	145,24
15/12/2017	10,29	13/12/2019	41,15	09/12/2021	138,1
18/12/2017	10,98	16/12/2019	42,35	10/12/2021	138,55
19/12/2017	10,95	17/12/2019	42,77	13/12/2021	133,8
20/12/2017	10,98	18/12/2019	42,3	14/12/2021	135,6
21/12/2017	10,89	19/12/2019	42,83	15/12/2021	146,5
22/12/2017	10,54	20/12/2019	44,15	16/12/2021	138,64
26/12/2017	10,46	23/12/2019	45,46	17/12/2021	137,75
27/12/2017	10,53	24/12/2019	46,54	20/12/2021	135,8
28/12/2017	10,55	26/12/2019	46,63	21/12/2021	144,25
29/12/2017	10,28	27/12/2019	46,18	22/12/2021	143,88
02/01/2018	10,98	30/12/2019	45,52	23/12/2021	146,14
03/01/2018	11,55	31/12/2019	45,86	27/12/2021	154,36

04/01/2018	12,12	02/01/2020	49,1	28/12/2021	153,15
05/01/2018	11,88	03/01/2020	48,6	29/12/2021	148,26
08/01/2018	12,28	06/01/2020	48,39	30/12/2021	145,15
09/01/2018	11,82	07/01/2020	48,25	31/12/2021	143,9
10/01/2018	11,96	08/01/2020	47,83	03/01/2022	150,24
11/01/2018	12,14	09/01/2020	48,97	04/01/2022	144,42
12/01/2018	12,02	10/01/2020	48,165	05/01/2022	136,15
16/01/2018	11,91	13/01/2020	48,745	06/01/2022	136,23
17/01/2018	12,18	14/01/2020	48,21	07/01/2022	132
18/01/2018	12,47	15/01/2020	48,545	10/01/2022	132
19/01/2018	12,59	16/01/2020	49,77	11/01/2022	137,31
22/01/2018	12,65	17/01/2020	50,93	12/01/2022	137,47
23/01/2018	12,94	21/01/2020	51,05	13/01/2022	132,74
24/01/2018	12,71	22/01/2020	51,43	14/01/2022	136,88
25/01/2018	12,41	23/01/2020	51,71	18/01/2022	131,93
26/01/2018	12,95	24/01/2020	50,35	19/01/2022	128,27
29/01/2018	13,32	27/01/2020	49,26	20/01/2022	121,89
30/01/2018	12,87	28/01/2020	50,53	21/01/2022	118,81
31/01/2018	13,74	29/01/2020	47,51	24/01/2022	116,53
01/02/2018	13,25	30/01/2020	48,78	25/01/2022	111,13
02/02/2018	12,45	31/01/2020	47	26/01/2022	110,71
05/02/2018	11,57	03/02/2020	48,02	27/01/2022	102,6
06/02/2018	11,65	04/02/2020	49,45	28/01/2022	105,24
07/02/2018	11,6	05/02/2020	49,84	31/01/2022	114,25
08/02/2018	11,22	06/02/2020	49,32	01/02/2022	116,78
09/02/2018	11,31	07/02/2020	49,73	02/02/2022	122,76
12/02/2018	11,68	10/02/2020	52,26	03/02/2022	120,08
13/02/2018	11,78	11/02/2020	53,8	04/02/2022	123,6

Source: Bloomberg (BVAL)