Lisbon School of Economics & Management
Universidade de Lisboa

MASTER OF SCIENCE IN
FINANCE

MASTER´S FINAL WORK
PROJECT

EQUITY RESEARCH JERONIMO MARTINS SGPS, SA:
PRICING DISCOUNT FOR LIMITED LIQUIDITY IN THE FOOD RETAIL INDUSTRY

DAVID FILIPE DE SOUSA TITA

JUNE 2023

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SUPERVISION:
VICTOR MAURÍLIO SILVA BARROS

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ABSTRACT

The present document consists of an Equity Research report on Jerónimo Martins SGPS, S.A. (JMT.LS). This report was used for the local Portuguese CFA Institute Research Challenge in which the team obtained the 1st place. Please note that this report contains solely public information until the 13/01/2023.

Beyond the research presented during the competition, this report contains an additional analysis into the implied upside of the forecasted price of the company's stock. That chapter intends to understand whether the difference between the forecasted price and the actual price of the stock is due to a possible lack of trading liquidity. The analysis is conducted by replicating the paper *The pricing discount for limited liquidity: evidence from SWX Swiss Exchange and the Nasdaq*, (Loderer and Roth 2005). The model of the paper is applied to historical data ranging for 10 years, with a data set comprised of Food Retail and Distribution Companies. The results indicate that liquidity is not a significant variable to estimate the valuation of these companies. Nonetheless, the calculated liquidity discount for Jerónimo Martins is far from the forecasted price discount, standing at 0.798%.

JMT is a family-owned Portuguese Food Retailer, present in Portugal, Poland, and Colombia, mainly focused on discount-format stores.

To value this retailer, a Sum-of-the-Parts approach was employed, where a discounted cash flow analysis was developed for each of the geographical segments, accounting for the supplemental segment.

The valuation generated a buy recommendation with a price target of €24.9/sh for 2023YE, with an upside potential of 22% from the January 13th 2022 closing price of €20.4/sh, with a medium to low risk. To support the base case of the report, other methods such as Relative Valuation were applied.

The company's expansion plan to Romania was also considered as a real option.

JEL Classification: G10, G15, G17. G32, G34

Keywords: Equity Research, Valuation, Retail, Liquidity Discount

DISCLOSURES:

A significant portion of this report was submitted by a group of students from ISEG, including the candidate, for the 2023 CFA Institute Research Challenge Portuguese Local Final. Upon winning the local final, the same report advanced as the representative report for CFA Society Portugal in the 2023 Southern Europe Sub-Regional Final.

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The student is not registered with Comissão de Mercado de Valores Mobiliários (CMVM) as a financial analyst, financial intermediary or entity/person offering any service of financial intermediation, to which Regulamento (Regulation) 3º/2010 of CMVM would be applicable.

This report was prepared by a Master's student in Finance at ISEG – Lisbon School of Economics and Management, exclusively for the Master's Final Work. The opinions expressed, and estimates contained herein reflect the personal views of the author about the subject company, for which he is the sole responsible. Neither ISEG, nor its faculty accepts responsibility whatsoever for the content of this report or any consequences of its use.

The report was supervised by Prof. Victor Barros, who revised the valuation methodologies and the financial model. The information set forth herein has been obtained or derived from sources generally available to the public and believed by the author to be reliable, but the author does not make any representation or warranty, express or implied, as to its accuracy or completeness. The information is not intended to be used as the basis of any investment decisions by any person or entity.

ACKNOWLEDGEMENTS

Throughout all the hard work, commitment, failures, and teachings in these two most challenging years, I am compelled to thank so many of my family and friends. From people who stuck around and showed kindness in unexpected ways and moments, to those who moved forward but left hard-learned lessons, to those who inspired and supported me. Thank you to all of you. I see the actions of those around me, and I do not forget.

To my Mother, my most trusted counsellor and teacher, who has never failed to push me forward and pull me from the ground.

To my Father, whose values of resilience, compassion and stoicism defined my character, even if sometimes that's hard to see

To my Grandparents, who give and love so much, leaving me with a debt I'll work my life to repay.

To my mentor Guilherme, for his patience and teachings, for proving that we Portuguese can go as high as we work for. I would not be studying Finance if not for you.

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To Professor Tiago Gonçalves, who saw and helped me evolve and mature in this Institution, and who is a remarkable pillar for growth and knowledge.

To Professor Victor Barros, who tirelessly taught both Finance and humility, and who never lost his pose throughout our multiples and lengthy discussions.

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To my friend Margarida, who continues being a shinning presence in my life and who keeps showing me new grounds to break.

To my friends and colleagues at Lisbon Investment Society, that rose this project from the ground up, and keep it up and running. I will always be proud and grateful that we are able to impact others around us, as I was impacted before.

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To my successors Pedro and Adriana, in whose hands I leave the governance of LIS, people who I admire and respect, even if they sometimes do not feel it. As I was mentored by those who came before, I strive to be able to do the same for you.

You all helped shape me into the person I am today, and as I keep reaching new heights, I will keep my gratitude close to my heart. Thank you.

"Stay hard" – David Goggins

GLOSSARY

APV – Adjusted Present Value
CAGR – Compound Annual Growth Rate
COP – Colombian Peso
DCF – Discounted Cash Flow
DDM – Dividend Discount Model
EVA – Economic Value Added
FCFF – Free Cash Flow to the Firm
HORECA – Hotels, Restaurants, Cafes
JMT – Jerónimo Martins
KNN – K-Nearest Neighbours
MFW – Master's Final Work.
ML – Machine Learning
NN – Neural Networks
OLS – Ordinary Least Squares
PLN – Polish Zloty
ROU – Right of Use
RSE – Robust Standard Errors
SARD – Sum of Absolute Rank Differences
SOP – Sum of Parts
SVR – Support Vector Regression
TRBC – The Refinitiv Business Classification
VIF – Variance Inflation Factor

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JMT: Food Retail is at a discount

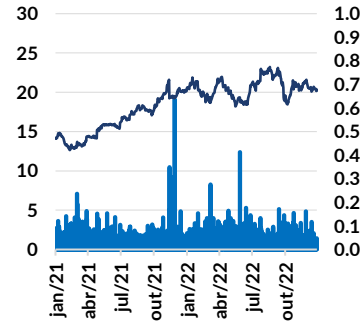
Jeronimo Martins (JMT) is positioning itself for long-term success. The company has a strong market leadership position in Poland and Portugal and is continuously expanding its operations in Colombia with steady growth in store openings. With sound financials, the company is ready to take the next step.

Table 1: Investment Summary

Investment Summary	
Price target (2023YE)	€24.9
Upside	+22.0%
Price Close (13/Jan/23)	€20.4
Stock Exchange	Euronext Lisbon
Industry	Food Retail
Ticker (Refinitiv)	JMT.LS
52w Price Range	€17.7 - €23.3
Forward Div. yield	3.7%
Shares Outstanding	629.3 M
Market Cap (13/Jan/23)	€12.8 Bn
Free Float	43.7%

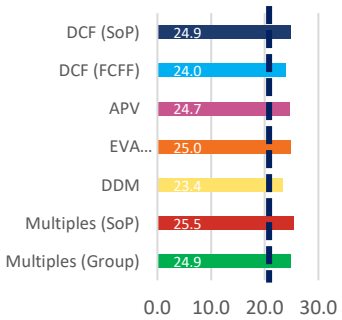
***Source*:** Refinitiv, Team Estimates

Figure 1: Stock evolution (€/sh and volume in milions)



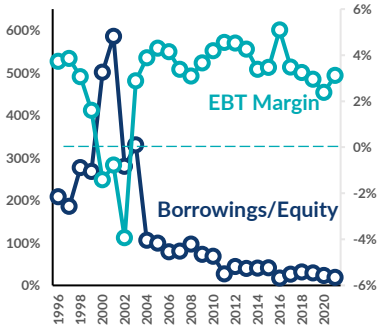
***Source*:** Refinitiv

Figure 2: Valuation methods



Note: average multiples include EV/EBITDA and EV/EBIT
Source: Team estimates

Figure 3: Learning from experience



Source: Company's reports

Investment Summary

We issue a **BUY** recommendation for Jerónimo Martins S.G.P.S., SA (JMT) with a price target of **€24.9/sh** for 2023YE using a DCF sum-of-parts (SoP) approach. The forecasted price implies a 22% upside potential from **January 13th, 2023**, closing price of €20.4/sh (Figure 1). Assessing it as a medium-low risk, this recommendation is based on **(1)** resilient business model, **(2)** strong presence in growing markets, and **(3)** family management with long-term perspectives.

SOLID BUSINESS MODEL

JMT understands the food retail industry unlike any other. Its business model has demonstrated longevity, effectively implemented across multiple generations and international markets.

The company operates through a cost leadership strategy that enables a competitively priced, high-value proposition to consumers, in markets characterized by strong price sensitivity. This is further supported by the flexible supply chain, which delivers a selection of high-quality, fresh products through an extensive network of local suppliers. This strategy is especially visible in Poland and Colombia (c. 71% and 7% of group revenues 2022YE), where >95% and 80% (respectively) of perishables are locally sourced. This flexibility in the supply chain is a core competitive advantage for the group, fundamental for the above-average ROIC, derived from superior capital turnover.

Also, the company has a deep understanding of their consumers, as per its motto "We're locals, wherever we are".

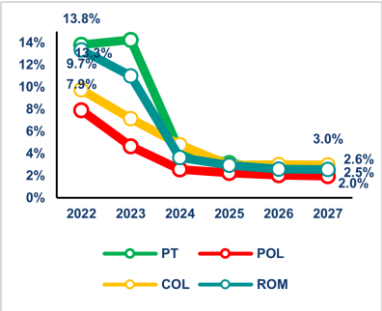
STRONG PRESENCE IN GROWING MARKETS

Biedronka is the dominant player in Poland, with c.27% market share. In Portugal, the group holds a significant market share of c.23% with *Pingo Doce* and is experiencing growth with *Ara*, in Colombia (with c.8% market share). *Biedronka* is the group's main revenue source (69% 2022YE), and the upward trend in growth is supported by opening stores in city centres to attain their proximity strategy. The increase in population through refugees' movements from Ukraine is mainly in regions where *Biedronka* has a strong presence, with revenues expected to increase c.5% CAGR (2022YE-2030YE).

HoReCa in Portugal has recovered to pre-pandemic levels, and strong branding has led to an increase in 2022Q3 LFL growth, both in *Recheio* (+28%) and *Pingo Doce* (+12%).

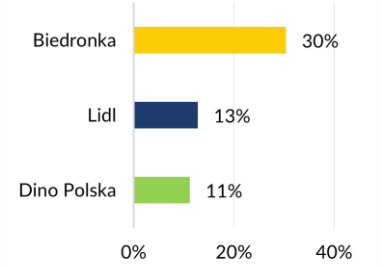
In Colombia, a market still dominated by traditional retailers (c. 68% of market share 2021), consumer trends are shifting towards discounter formats. Supermarket Leader Grupo Exito has lost circa 10% market share to discounters Ara and D1. Food inflation and larger scale of retailers are putting pressure on the small traditional retailers (*tiendas de barrio*), providing a growth opportunity for *Ara*, which increased its store count by c. 33% in 2022YE.

Figure 4: Inflation per business segment JMT (%)



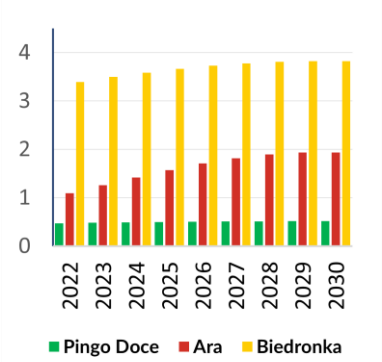
Source: IMF

Figure 5: Brand Loyalty for Polish consumers



Source: Statista

Figure 6: Total store evolution (thousands)



Source: Company's Reports

Table 2: Peer List for JMT (SARD approach)

Poland
Lidl
Carrefour
Netto
Eurocash
Dino Polska
Auchan
Portugal
Continente
Auchan
Lidl
Aldi
Mercadona
Colombia
Tiendas D1
Almacenes Exito
Olímpica
Cencosud

Source: Team Estimates

FAMILY MANAGEMENT WITH LONG TERM PERSPECTIVE

JMT is a family-owned company (Sociedade Francisco Manuel dos Santos, B.V. owns c.56%) and shown a clear effort to assert their position and reputation in the market. The Board has made ESG a priority, focusing on sustainability and social impact. The company ranks 4th best in ESG companies out of 146 companies in the food retailers' segment (Refinitv) and has an A score (highest would be 'AAA') by MSCI. Learning from the group's past failed expansion endeavours and risky leveraged financial position, JMT upheld a conservative financial position, even during the pandemic period. While presenting a similar gearing ratio, JMT is above peers regarding its ability to repay debt (Net Debt/EBITDA of 1.0 vs 2.1 of competitors, 2021YE).

VALUATION METHODS

The application of a DCF model, based on the FCFF sum of parts (SoP) of business segments, resulted in a price target of €24.9/sh. With a Relative Valuation per geographical segment, employing the SARD approach for selecting peers, the price target is €25.5/sh. Additional valuation methods listed in Fig. 2 were considered to triangulate valuations (FCFF for the whole firm; APV, Residual Income/EVA®; DDM; and multiples, by business segment and for the whole group). The capital structure is expected to progress from at 80-20% to 70-30% E/D 2022-30F. A comfortable dividend payout ratio (c. 85%) is assumed.

RISKS TO ACHIEVE THE PRICE TARGET

Macro-economic factors affect food retailers, despite its non-cyclical nature. Inflation, GDP growth, energy prices, or exchange rates impact JMT's margins. The group estimates energy costs to represent 1.5% of sales in 2023, up from the pre-war 1%. Also, the group has an international scope, with segments in different functional currencies. The exchange rate risk is particularly accentuated in Poland, as JMT highly depends on Biedronka's performance.

The food retail industry is broadly characterized by monopolistic competition environments, where companies fight for market share, and often engage in price wars. Additionally, it faces political risks regarding tax laws, as Portugal and Poland have implemented new specific taxes on retailers.

Business Description

Jerónimo Martins, SGPS, S.A. (JM) is a Portuguese-based company that operates in food distribution, specialized retail and agribusiness sectors in Portugal, Poland, and Colombia. The main business activity is in Poland, with their Biedronka banner representing c.69% of sales and c.85% of EBITDA 2022e.

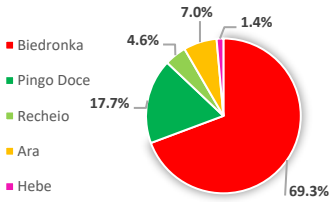
Group History

The group was founded in 1792, but the Portuguese supermarket business started in 1980. The Dos Santos family became shareholders in 1921. In 1949, the group established a joint venture with the multinational Unilever, guaranteeing a presence in manufacturing. The change in management in 1968, and the ambition to be noticed in the modern distribution segment, contributed to an international recognition. Following this vision, the Group expanded to Poland in 1995 and to Colombia in 2013. JMT also diversified operations into specialized retail and agribusiness in Portugal.

Operational segments

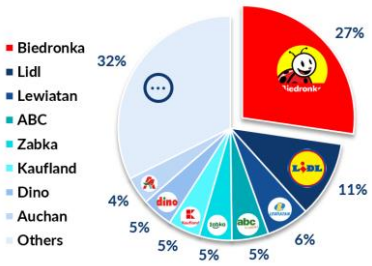
Poland | *Biedronka* (Discount Format) represents the main operation of the group with c.27.3% market share. The brand operates t Deloitte. (2022). Future of Food 2022: Consumerhrough 3.395 stores (2022YE). By 2025, we estimate it reaches about 3.664 stores (+7.9% 2022YE), in line with their proximity strategy. The Polish banner registered +22.7% LFL growth (2022Q3). *Biedronka*'s major mission is to offer selected high-quality products and merchandise at low prices. The focus on perishables and recent consumer trends in Poland (e-commerce is still inexistent, with 1.5% of the market in 2021, by McKinsey) provide the rationale for the proximity stores strategy.

Figure 7: Sales Distribution 2022e



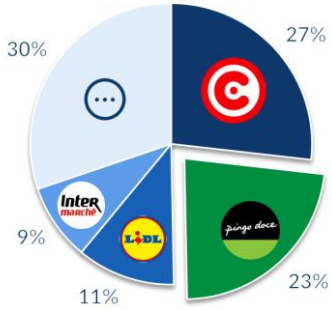
Source: 2022 preliminary results

Figure 8: Market Share Poland (2021YE)



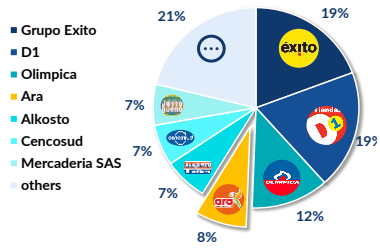
Source: Euromonitor

Figure 9: Market share – Food Retail (Portugal 2021YE)



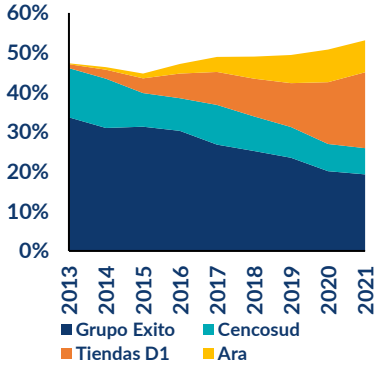
Source: Euromonitor, Team Estimates

Figure 10: Market share – Food Retail (Colombia 2021YE)



Source: Euromonitor

Figure 11: Colombia – discounters gaining market share.



Source: Euromonitor

Portugal | Major business segments include *Pingo Doce* (supermarket discounter chain) and *Recheio* (Cash & Carry). Currently at its maturity stage, *Pingo Doce* has registered +11.2% LFL growth (2022YE) to €4.5Bn. The company operates through proximity and neighbourhood stores, with a strong emphasis on perishables. With a total of 472 stores (2022YE), it is the leading supermarket chain in a market with oligopolistic characteristics. *Pingo Doce* and *Continente* (Sonae MC's branch) sum together more than 50% of the market. *Pingo Doce* presents EBITDA margin of 6.0% (2021YE), amounting to €244M. In the group, this figure equates to 15.4% EBITDA contribution.

Recheio is the market leader in the Cash & Carry segment (HoReCa), with an operation of 43 stores, registering a 11.2% LFL (2022YE) to €1.2Bn, recovering to pre-pandemic levels. The Cash & Carry nature yielded a lower EBITDA margin at c.4.7%.

Colombia | JMT's greenfield investment, *ARA*, presents a small store food retailing business, with a major focus on delivering quality local products at lower prices. The banner follows a proximity strategy, with 1093 stores in Colombia (2022YE). In 2021, after a change in management and considering changes in reporting due to IFRS 16, EBITDA was positive for the first time. Still, it was the group's lowest EBITDA margin (2.3%). These results are mainly driven by store expansion and food inflation (27.8% YoY 2022). As for market integration, *ARA* became the 4th biggest player in the Colombian modern food retail market in 2021 (within 8 years of operations). Competition is fierce. The competitor *D1* was the fastest grower in the industry, as it reaped first-mover benefits.

Specialized Retail | The group also owns *Hebe* (Health and Beauty) in Poland, *Jeronymo* (Coffee Shops), *Hussel* (Chocolate and Confectionery), and the Agribusiness in Portugal. The Agribusiness' purpose is to support the food distribution operation in Portugal, by ensuring direct access to the supply sources of strategic products. It operates in four distinct areas: fruits and vegetables, dairy products, livestock farming (angus beef and lamb meat) and aquaculture (sea bass and sea bream). The integration in the value chain has allowed margins in the Portuguese segment of JMT to grow from 5.2% 2017 to 5.7% by 2022YE.

Key Drivers of Profitability

Proximity stores | The pandemic has resulted in a shift in consumer behaviour, with a preference for proximity, as people spend more time working from home.

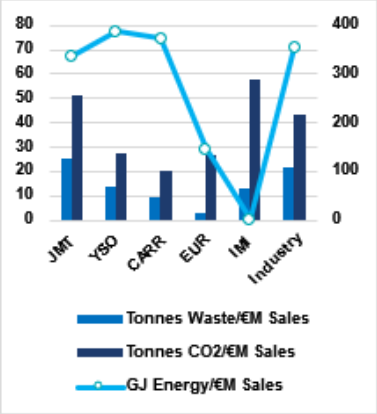
While consumer behaviour shifts, it is crucial to consider a holistic view moving forward. Online and offline are no longer competition, but complementary. JMT's expansion plans, with a major focus on the development of new proximity and convenience formats, are in line with this shift. The unbeatable price-quality ratio, particularly in the Polish market, supports the group's positioning in the market.

The group also promotes a proximity experience through their fast delivery service implemented in Poland (*Biek*), available in the major cities. The policy in place targets less than 15 minutes of delivery.

Demographics | According to the UN Department of Economic and Social Affairs, the Portuguese population is expected to decrease at a -0.3% CAGR in the 2024-2030 period. This contrasts with the remaining geographic areas. Particularly in Poland, until 2023YE, a 3.2M increase is expected due to the war's refugee crisis (+8.5% YoY). This leads to an increase in the consumer base, and the industry's total revenues.

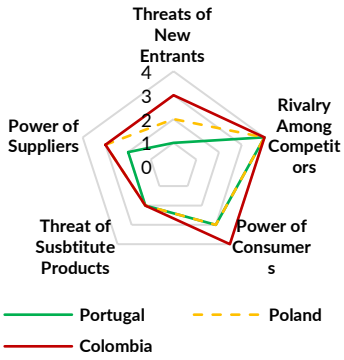
Focus on Supply Chain | JMT relies heavily on local suppliers. About 90% of suppliers of private labels are locally based. This focus on private brands is driven by consumer preferences, increasing in recent years. By working closely with local suppliers, JMT also aims to minimize inventory risk and support surrounding communities. This approach has allowed Biedronka to keep prices 15-20% lower than competitors during inflationary times, thanks to strategic sourcing and bulk purchasing. Additionally, the supply chain in Portugal is well-established, with the support of the Agribusiness, which enables to source products internally and reduce dependence on external suppliers.

Figure 12: Waste, CO2 production and Energy consumption by JMT Peers 2022



Source: Refinitiv

Figure 13: Porter's 5 Forces



Source: Team Estimates

Table 3: JMT's Shareholder Structure

Shareholder	Ownership
Soc. Francisco dos Santos, B.V.	56%
Comgest Global Investors, S.A.S.	2%
Black Rock, Inc.	2%
T.Rowe Price Group, Inc.	2%
Others	38%

Source: Company's Reports

ESG - Environment, Social and Governance

ESG ratings are proliferating, yet applications of these scores in valuation are mostly from a risk perspective. According to Refinitiv, JMT's ESG score is 85 out of 100. Among 146 companies under the Food and Drug Retailing Companies category, JMT ranks with a solid 4th place. We view ESG as a risk factor that can fluctuate both cash flows, the discount rate and the company's growth potential. However, JMT is well positioned towards future regulation, considering its positioning across the food retail industry.

Environmental

JMT's Environmental Protection Policy targets are restructured every 3-4 years, with several institutional standards implemented in the process. Since 2020 Jeronimo Martins Group began implementing the Task Force on Climate Related Financial Disclosures (TCFD) recommendations. JMT has both in climate and water security an A score (the highest score possible) and with their most recent pledge, the Porto Climate Pact, they improve their Green House Emission by reducing energy consumption by 10% per thousand Sales until 2023YE. So far, they have largely reduced their carbon footprint (scopes 1 and 2) by 11.7% in 2021 (compared to 2020), with the most considerable effect from *Biedronka* at c.-82%. Regarding, the new Green Taxonomy under the new Corporate Sustainability Reporting Directive, JMT is at the forefront in ESG and will allow the group to not to be penalized in credit spreads for financing purposes.

Social

Following the SDG (Sustainable Development Goals), number 3 (ensuring healthy lives and promote well-being for all at all ages), reformulations in the group's private brands are constantly made in fast-moving consumer goods to fight diet-related diseases that are prioritized by the local public health institutions. The group has lowered the levels of salt, fat, saturated fat, and sugars in their most sold products. Since 2015, JMT has been making food donations and in 2021 alone, 21 thousand tonnes of food were donated, primarily for humanitarian aid in Colombia.

JMT is very well positioned regarding Gender Equity. The group employs over 123 thousand people, of which 76% are women. Additionally, 68% of management positions are held by women, 71% of promotions involve women, 30% of the BoD is female, and the group's gender pay equity ratio is 96.5%. Workplace training hours have grown by about 80% since 2019 and 50% since 2020 (337,079 hours provided).

Governance

Board structure and Model | This is a family firm. The main shareholder is Soc. Francisco Manuel dos Santos, B.V., is controlled by the Soares dos Santos family (56.1% of share capital) and with stable ownership since 2012 (Table **1**). The group adopted the Anglo-Saxon governance model, including an Audit Committee and a Statutory Auditor as oversight parties.

Board of Directors | Represented by eleven members (Executive: CEO/Chairman Mr Soares dos Santos), elected for a 3-year term. Since 2018, the company has made an active effort and the percentage of women on the board has increased from 14% to 36%. Currently, it is just above the minimum 1/3 threshold defined by the Portuguese Law on Gender Equality in Boards. Expertise in food retail and background diversity are characteristics of JMT BoD.

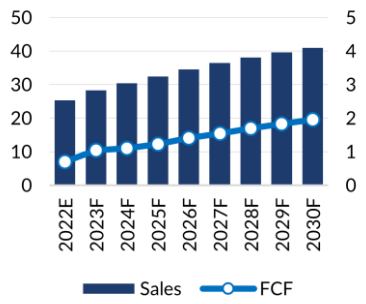
Executive Management | The group's C-level executives are all Portuguese nationals with an average tenure in the company of 21 years, of which 40% are female.

Committee on Corporate Governance and Corporate Responsibility (CCGCR) | In collaboration with BoD, the CCGCR focuses on monitoring matters related to the sustainability of the business and ESG. All matters related to the Agribusiness segment, environmental initiatives, employee support programs, and more are considered.

Remuneration policy | The remuneration of directors consists of a fixed component (80k, in 2021) and a variable component linked to performance.

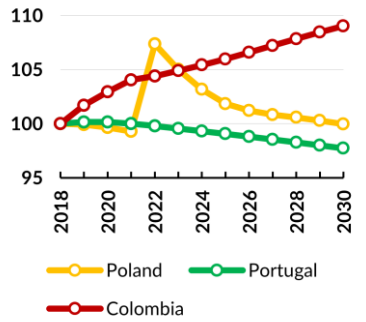
Controversies | In 2022, Pingo Doce was fined for a fixing prices campaign in the amount of €91M, and Biedronka was accused of misleading campaigns, and was threatened with

Figure 14: FCF & Revenue forecast JMT (billion)



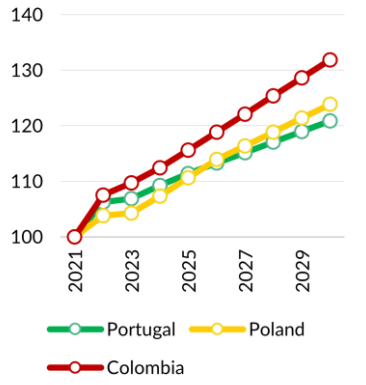
Source: Team estimates

Figure 15: Population growth rate per country (2018: base 100)



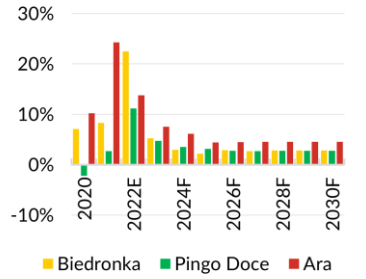
Source: UN

Figure 6: GDP growth per country



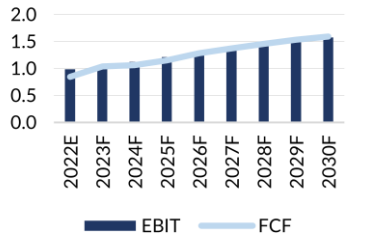
Source: IMF 2022

Figure 17: Forecasted LFL



Source: Team estimates

Figure 18: EBIT margin & FCF Poland



Source: Team estimates

€1.5 billion fine. In our valuation, this is a contingent liability with a 5% likelihood despite not having any formality, yet.

Industry Overview and Competitive Positioning

The Food & Grocery segment is one of the highest-selling categories within the retail industry. Considering a market segmentation of Food, Drinks, Tobacco, and Household consumption, the Food segment accounts for about 73% worldwide. The industry has been showing flexibility regarding consumers preferences, which have been changing since 2019. During the pandemic period, consumers preferences considered product availability, proximity stores and e-commerce.

The war continues to impact the global economy, contributing to the fragmentation of international trade and investment. Sanctions on Russia after its invasion of Ukraine (Feb.24) pushed energy prices across Europe, increasing costs with a noticeable impact on margins.

Costs of agriculture production, metal extraction and refining, and of renewable energy technologies will be affected the most. As of October 2022, about 70% of European ammonia (an important input for nitrogen fertilizers) production capacity had been reduced or shut down (per World Bank).

Demand drivers

Disposable Income | Food products are a core need of households, though disposable income drives spending. In 2021, the disposable income of households in Portugal increased by 1.4% (2021 YE) and 4.0% compared to 2020, while in Poland, there was a decrease of 1.6% in 2020-2021YE (Eurostat). The result is explained by the 1.5% growth in compensation of employees from the previous quarter and a 5.6% increase in annual terms.

Promotional Sales | Pricing is an important strategy in the business, especially in Poland, as *Biedronka*'s performance can majorly be explained by its discount format. In Portugal, consumers are characterized as discount seekers (in 2019, sales increased 7.5%, where a particular care for discount campaigns was conducted). Still, *Pingo Doce* and *Recheio* have operations in different formats and don't pose a significant weight in the global company's performance.

Consumer Experience | Private labels stand in high demand, as consumers seek a more personal and high-quality experience. Consumers are now more sensitive not only to prices, but also to transparent information and new products aligned with market trends. Related to brand recognition, the Group also considers Retail media as an important incentive to increase profitability. JMT applies about 0.5% of its other operating costs into advertising. Customer loyalty is high in Poland, as the *Biedronka* banner leads by 3.6 times over the second player Lidl (32.4% Q1 2022 vs 9.0%), according to a satisfaction index by Statista.

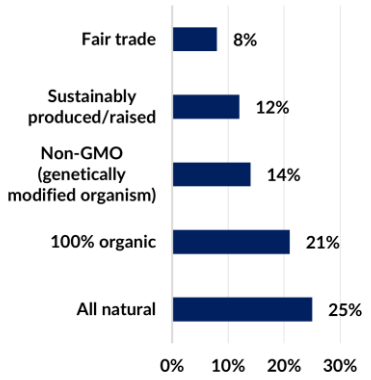
Supply drivers

Change in Market Dynamics | The European food retail market particularly considers three main trends: inflation, lower volumes, and polarization of the consumer. Labour costs have also increased, affecting the supply chain resilience. 83% of retailers considered investment in recruiting and employee retention, and 74% expect shortages in customer-facing positions in 2022. (Deloitte 2022).

Supply chain | In line with the Group's strategic vision of business independence, JMT considers not only its own production and distribution units, but also complementary business acquisitions (acquisition of a 10.1% stake in a Norwegian sustainable salmon production company, acquisition of two-thirds of the share capital of Moroccan company Mediterranean Aquafarm, etc.). Control over the supply chain goes in line with JMT's environmental care principle, and several marks regarding carbon footprint, energy and plastic consumption and local supplier policy are deemed.

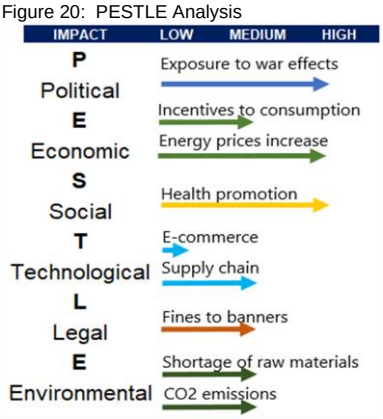
Freshness meets proximity | Biedronka and Pingo Doce are the chains with most store counts in their respective markets, with Ara expecting to double their store count by 2030YE. The groups deep rooted presence in neighbourhoods and city centres allows

Figure 19: European markets' willingness to pay premium prices



Source: Euromonitor | Survey

Figure 20: PESTLE Analysis



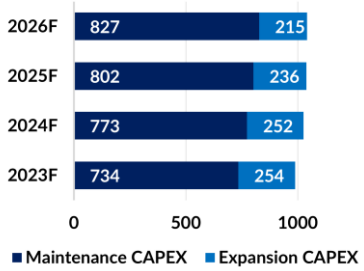
Source: Team Estimates

Table 3: JMT SoP's Price Target

EV to P	Value	(%) EV
Poland	€16,298	84.7%
Portugal	€3,382	17.6%
Pingo Doce	€2,546	13.2%
Recheio	€835	4.3%
Colombia	€1,391	7.2%
Others, adjustments	€-1,838	-9.6%
Total Enterprise Value	€19,233	100.0%
Non-op assets*	€1,337	7.0%
Debt**	€-3,333	-17.3%
Contingent Liabilities***	-€340	-1.8%
Non-Controlling (49% EV of PD)****	-€1,248	-6.5%
Equity Value	€15,649	81.4%
Price Target	€24.9	

*Cash + Investments
**All Financial Debt including Lease Liabilities
***Includes all contingent liabilities with 50% likelihood, except for the possible litigation with the Polish Office of Consumer Protection that applies over 10% of Biedronka's sales
**** Using the intrinsic value of Pingo Doce
Source: Team Estimates

Figure 21: CAPEX composition JMT (€)



Source: Team Estimates

consumers to have everyday access to a fresh variety of products, supplied by the group's extensive local suppliers' network.

Peers

In Poland, German discounter Lidl has been the historic competitor given its financial power and similar discounter business model. However, Dino Polska (the banner with the second highest store count) had a relevant revenue growth of 133% CAGR between 2018YE - 2022YE becoming with Eurocash, owner of retail chains ABC (5% market share) and Lewiatan (6% respectively), Biedronka's second biggest competitors.

In Portugal, *Sonae MC* poses as the main competitor to *Pingo Doce*, through the *Continente* chain. Both brands have over 50% market share, and all other food retail brands stand for a significantly lower percentage. Continente presents higher revenues and number of stores when compared to Pingo Doce. Moreover, Sonae considers a diversification strategy at a national level, with a current focus on e-commerce, representing a threat for JMT's future market share.

As for Colombia, D1, a private hard discount retailer, competes both in proximity (neighbourhood stores) and in price, being ARA's its biggest competitor. The current market leader is Grupo Exito, a multi-format retailer supported by the French multinational Casino-Guichard Perrachon, also present in Brazil, but losing market share since 2013. However, Colombia is still dominated by the disorganized traditional format where the "Tiendas de Barrio" represented 68% as of 2021 of the grocery retailer industry, being a big growth opportunity.

Trends

Health concern | The quality of products has become an increasingly important factor for consumers when purchasing. When considering experiences, consumers tend to prefer products and services related to quality (63%), sustainability (37%), health (33%), privacy (26%) and time (20%) (Euromonitor, 2021b; EY, 2020). The trend causes a problem for middle tier products, as those with less disposable income are pushed by inflation to cheaper products (McKinsey, 2022).

Green initiatives | There is a net intent of 9% of Polish consumer willing to pay higher prices for environmentally friendly products. Responsible practices within the Food and Agribusiness sector will be needed, as there is an expected global population growth of almost 10 billion people in 2050, and an increase of food demand of over 50% (Deloitte, 2020).

The upcoming category for retailers is alternative proteins, aligned with healthier consumption patterns. Food system makes up for about 34% of the total greenhouse-gas emissions globally, most of it coming from meat and dairy, areas that can still be affected in the JMT Agribusiness.

Energy influence over consumption | According to the Dutch bank estimates, the share of energy in the total cost of food manufacturers in the EU has risen from 2% (2019YE) to 7.5-10% (2022YE). Energy intensive sectors considered a rise of up to 30% of their production costs (in the expense segment of energy bills). Suppliers will increase prices due to higher energy costs. Furthermore, the Food Retail segment is highly competitive, in which companies present lower profit margins due to price negotiations (typically 1-3%, according to EuroCommerce), and company's absorption capacity is low

Competitive Positioning – Porter's 5 Forces Framework

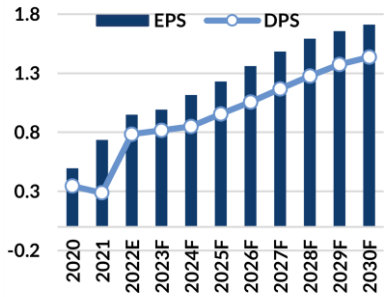
Threat of New Entrants – LOW | The discount format is a highly capital-intensive industry that requires high levels of investments to enter the market. The companies operating in this segment have acquired economies of scale by developing and controlling efficient supply chains, increasing the barriers of entry. Newcomers would have to develop their own supply chains, enter at a grand scale, and compete in price with existing players. Upfront investments like marketing, inventory and physical assets are key to enter and gain market share, putting even more pressure to the thin margins.

Rivalry Among Competitors – HIGH | Rivalry among existing players is intense and applied in the form of price competition, marketing, and physical proximity to cluster of clients. In Portugal, market maturity and low growth forces companies to compete against each other for market share. Given the capital intensity of the industry, exit barriers are

Figure 22: HoReCa evolution vs Recheio revenues

Source: Team estimates

Figure 23: EPS and DPS forecast (€)

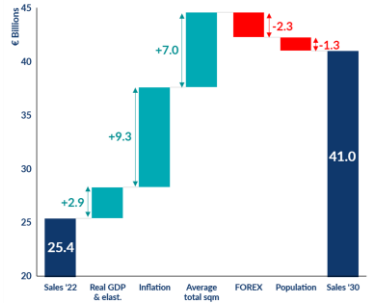


Source: Team estimates

Figure 24: Colombia's market evolution

Source: Euromonitor

Figure 25: Revenue evolution



Source: Team estimates

high, forcing companies to stay and compete through price and accept losses in periods of high inflation. The industry's lack of differentiation in their products, and customers' low switching costs makes marketing expenses a necessity to not lose market share. For JMT, peers in Poland, Portugal and Colombia are strong players with a solid financial capacity.

Power of Consumers – MODERATE | Recent macroeconomic conditions have increased the already high price sensitivity in the consumers, given the high fraction food represents in their budget. Low switching costs and recent changes in consumer behaviour, including a tendency towards healthier food habits, discounts, and proximity preference have increased the power of buyers, forcing prices down, increasing the companies' fixed costs, directly affecting the industry's overall profit.

Threat of Substitute Products – LOW | The threat of substitute products in the Food Retail business is very low. However, companies must stay attentive and have flexible supply chains to shift to new consumer trends like organic and healthy food. Food retailers should be service oriented and prepared to get through to costumers through multiple channels including the new growing online trend.

Power of Suppliers – LOW Food Retailers are in need of constant and diversified stock keeping units, therefore the relationship between supplier's is key to properly mitigate logistics costs. However, given the scale of food retailers, the bargaining power against suppliers is extremely high. JMT was able to secure its business supply in Portugal by inserting an Agribusiness sector. In Poland and Portugal, the company has a long-term perspective with its suppliers, helping them with technology, quality control and financing to develop a profitable and mutually beneficial relationship.

Macroeconomic Snapshot for the Valuation

Poland | The economy is characterized by a steady growth in recent years (4.3% GDP growth 2013-2019YE), being the 37th country on parity adjusted GDP per capita, with an expected growth on real GDP by 2.4% CAGR 2022-2030YE. It is feeling the effects of the war, in both energy prices and refugee influx (3.5M Ukrainians expected to have entered Poland). Population will vary in the short term but remain in current values in 2030. The country is energetically independent, with local coal production (71% 2022YE). Polish consumers are becoming more price sensitive, with low adherence to e-commerce (1.5% in 2021YE), justifying the increase in market share of proximity discounter formats.

Portugal | The economy with the 3rd highest Debt to GDP ratios in Europe (119% 2022YE), Portugal has experienced a slow growth in the past decade (1.2% real GDP growth 2014-2021YE). The population of c.10M is expected to decrease at a -0.3% CAGR 2022-2030YE. It is undergoing a period of higher inflation (7.8% 2022YE, 4.7% 2023YE), but is expected to stabilize between 2-2.5% 2024YE. Portugal is dependent on imported energy, with 74% of total consumption coming from imports, and 31% coming from renewable sources. Consumers have become price-sensitive since the sovereign debt crisis and pay attention to promotional campaigns, with 74% being more cautious with spending (EY, 2022)

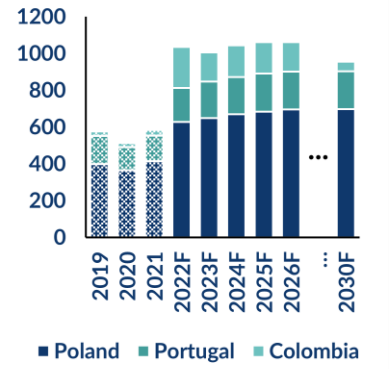
Colombia | Being one of the fastest-growing countries (3% CAGR 2013-2022YE, 2.3% more than the region) in Latin America, with still high expectations. (3% real GDP CAGR 2022-2030YE). The country is dealing with high inflation rates (13.2% 2022YE, 7.1% 2023YE), driven by exchange rates (-7% CAGR COP/EUR growth 2018-2022YE) and high growth, with consequences further increased by the country's inequality level (most unequal in Latin America by Gini Index, 2022). Colombia is characterized by the diversity of cultures and consumer preferences between its 5 regions, and its social disparity within cities and rural areas. The basket of goods in each region is quite diverse, and some areas are lacking infrastructure, lowering the benefits of scale of large retailers, in a country still dominated by mom-and-pop stores (c. 68% of market share 2021).

Valuation

DCF: A Sum-of-Parts Approach (SoP)

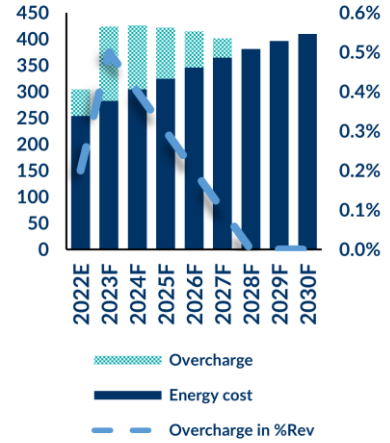
Jeronimo Martins is valued using the Discounted Cash Flow (DCF) method, focusing on separating its presence by business units and using a FCFF sum-of-parts (SoP) approach as a regional aggregate. The Weighted Average Cost of Capital (WACC) was calculated using a hybrid approach, considering the specific risks of each geographical segment. This

Figure 26: CAPEX evolution per segment (millions €)



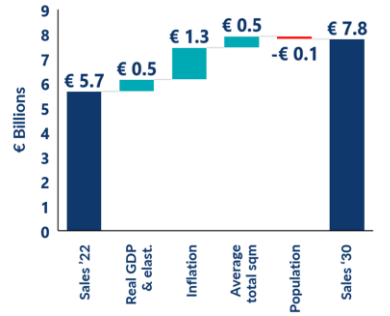
Source: Team estimates

Figure 27: Energy costs evolution breakdown (M€, %)



Source: Team estimates, JMT's Investor relations

Figure 28: Portuguese segment's revenue evolution and components



Source: Team estimates

method reveals a 2023YE target of €24.9/sh, excluding the potential side effects of a likely expansion. Romania is the probable expansion direction, and viable targets are *Mega Image* and *Profi*. Through a real options valuation approach to deal with uncertainty, a successful deal is estimated to add up to €0.3/sh or €0.1/sh to our base price target, respectively, yet with relevant uncertainty. Additional methods are used to triangulate our base-case valuation, including the FCFF for the whole company, APV, DDM, EVA, and multiples.

Forecasts of financial statements are sensitive to the economic dynamics of each geographical location. Revenue forecasts were constructed using a hybrid, top-down approach, that mainly depends on the macroeconomic forecasts specific to each country the company operates in. The main variables affecting revenue growth are inflation (*infl*), real GDP growth (*GDP*), the elasticity of demand to income (θ), population growth (*pop*), forex changes (ΔFx), the forecasted number of stores and average m^2 per store (*sqm*), for each business unit. The main formulation is:

$$(1) \qquad LFL_n = (1 + infl) \times (1 + GDP \times \theta) \times (1 + pop) \times (1 + \Delta Fx)$$

$$(2) \qquad Sales_n = Sales\ p/sqm_{n-1} \times (1 + LFL_n) \times average\ total\ sqm$$

Appendix 5 expands on the micro-forecasting of revenues per segment.

CAPEX is split between maintenance and expansion. It is estimated to increase from €584M in 2021YE to €1035M in 2022YE. This is primarily due to increased store openings (CAPEX for *ARA* stands at €205M 2022YE, up from €76M 2021YE) and refurbishment efforts in Portugal and Poland. Each banner's cost per revamp and cost per new store was computed considering inflation and forex changes. Also, the number of stores per banner was forecasted using each banner's growth estimates in each market, with the store count growth gradually decreasing to 0% in 2030YE. The number of revamps and store closures was calculated considering historical averages.

The NWC and its changes reflect the historical components of JMT's cash conversion cycle, and it's split per segment is according to each segment's share of revenues in the JMT.

Valuation by geographical segments

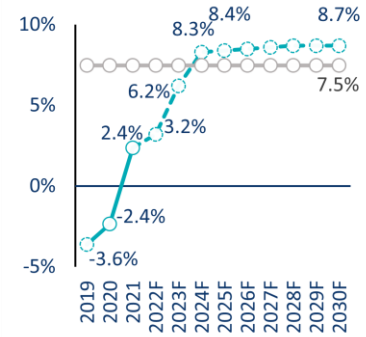
Riding the Polish Wave | Accounting for c.71% of revenues and 85% of EBITDA in 2022E, the Polish segment is the leading cash-generating powerhouse of the Group. It accounts for 84.7% of the group's EV.

Influenced by the war in Ukraine, LFL revenue growth in Poland for 2022E is expected to be +22.5%, mainly driven by the refugee crisis (3.5M Ukrainians expected to have entered Poland) and the inflation surge (expected CPI growth of 11% CAGR in 2020-2023YE). Notably, inflation benefits retailers that can sustain lower margins, particularly the discounter formats, by driving out their competition and consolidating their market share. *Biedronka*'s turnover per store is expected to grow at 4% CAGR 2022YE-2030YE, reaching €7.1M by 2030. We estimate a non-stop increase in store count for *Biedronka*. Despite the opening's slowdown in 2022 due to increased uncertainty, we estimate growth to start at +3% in 2023 and slowly decrease towards no growth in 2030 (reaching 3825 stores). With these assumptions, turnover is expected to increase at 5.6% CAGR 2022YE-2030YE, reaching €27.1B (2030 YE).

As coal accounts for 71% of Poland's energy production, it is one of the EU countries least affected by fluctuations in natural gas prices caused by Russian sanctions. Still, electricity price in Poland has been quite volatile, and the group is fully exposed to spot prices. It is a not negligible expense, growing from 1% in 2021 to 1.2% of sales in 2022, and partially responsible for the decrease in the EBITDA margin from 9.2% to 8.6%. In 2023, the energy costs forecast represents 1.5% of sales, and this effect fades in time, bouncing back in 2028 to 1% of sales (the pre-war level). Another notable item is the Polish Retail Tax, standing at 0.8% of sales between PLN 17M and PLN 170M, and 1.4% for sales above PLN 170M (c. EUR 35M). The impact of this tax is estimated to be c.€243M in 2022 alone (Appendix 2). The Retail Tax in Poland exerts a negative effect on JMT's equity value of -€3.1Bn, or -€4.9/sh (see **Appendix 12**).

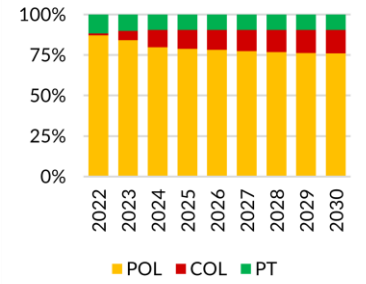
The health and beauty retailer Hebe's revenues were severely impacted by the pandemic (-€14M or -5.4% from 2019 to 2020YE), but has restored its growth path, selling €358M in 2022YE (+€80M YoY or +28.8%). We expect the banner to modestly increase its share in

Figure 29: Ara's EBITDA margins evolution vs. peers'



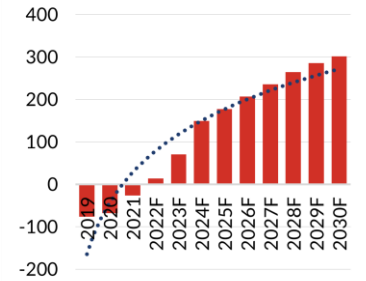
Source: Team estimates

Figure 30: EBIT per segment (%)



Source: Team estimates

Figure 31: Ara's EBITDA evolution



Source: Team estimates

the group's revenues from 1.4% in 2022 to 1.9% by 2030YE. Hebe benefits from synergies with Biedronka. EBITDA margin (9.0% 2021YE) is very similar to Biedronka (9.2% 2021YE), and we expect it to remain like this.

The Portuguese mature market | The Portuguese segment has been losing relevance in the group's revenues, dropping from 31% in 2015 to 24% in 2021. The impact of macroeconomic events was felt throughout JMT's operations, resulting in lower-than-anticipated sales growth for this geographical segment. Sales growth forecast is set to be 4% CAGR 2022-2030YE, lower by 160 bps than our estimates for Poland. The segment is mature yet yields less than half of Biedronka's EBIT margins throughout the forecasted period.

Pingo Doce remains the leader in the supermarket format, with c.23% market share of food retail, motivated by its strong distribution network. Store count growth is set to start at 2% in 2023, lower than pre-pandemic levels due to market saturation, and is expected to decrease towards zero growth by 2030YE. CAPEX will steadily increase at 1.5% CAGR for the 2022-2030YE period, considering essentially a few store openings and refurbishments. The average m2/store is forecasted to decrease at -0.4% per year until 2026YE, remaining stable until 2030YE, in line with recent trends and the proximity efforts. New stores are expected to be smaller and in neighbourhoods of large cities (like Lisbon and Porto).

Recheio, the Cash & Carry segment, is set to have a stable store count for the upcoming years. With 1 new store in 2022 in Cascais (one of the most touristic regions in the country), the segment may have reached its optimal capacity. Revenues are influenced by the HoReCa channel, which experienced a LFL drop of -15.8% in 2020. Yet, it is expected to surpass the 2019 levels in 2022e. LFL growth rates are forecasted to be like the ones for *Pingo Doce*, as tourism is expected to grow at a pace aligned with the country's GDP growth rate.

We estimate *Pingo Doce* and *Recheio* to contribute for 13.2% and 4.3% of group's EV, respectively (Table 4).

In Colombia, be Regional | Following its inception in 2013 and having learned from Colombian clientele, *ARA* developed a flexible supply chain to deliver different product mixes to its diverse customer base in each region.

Negative figures have been tormenting *ARA* since the start of the greenfield operation, though these are now fading away. The year 2021 brought the first positive EBITDA margin ever at 2.4%. In 2022Q3, it improved the EBITDA margin to 3.3% and it is estimated to reach the industry average of 8.7% by 2024YE (accounting for added energy costs, margin is set at 8.3% in 2024. The forecasts indicate that *ARA* will gradually reach the industry's EBIT margin of 5.7%, though no sooner than 2024. The convergence will be driven by achieving a larger scale and better brand recognition.

ARA stores skyrocketed until 2022. Stores count doubled in just 4 years, yet preserving suitable room to grow, as consumers increasingly shift towards discounter formats. Even with the group's heavy investments in store openings, we estimate that store growth will start at 15% in 2023, and gradually decrease to a portfolio of about 1936 stores by 2030. LFL top-line growth is expected to be at 5.2% CAGR 2022-2030YE, higher than Portugal and Poland due to higher GDP growth expectations and positive population growth. The population will increase along with purchasing power, both relevant drivers for revenue growth in our model.

According to our model, *ARA* contributes with 7.2% of group's EV (Table 4), 66% more than Recheio.

Others, Consolidation and Adjustments | This is a cost centre. Includes business with reduced materiality, holding companies and group's consolidation adjustments. Our estimate is to contribute negatively with -9.6% of the group's EV (Table 4).

Discount Rate and terminal growth | JMT operates in three main geographical segments where market risk, regulatory frameworks, and economic cycles vary significantly. Subsequently, a specific **cost of equity** (Ke) was calculated for each region using the standard CAPM approach. Betas were computed through the pure-play technique using data from more than 50 food retail companies, grouped into JMT geographical operations. The cost of equity for Portugal, Poland, and Colombia yields results at c.7.5%, 11.9% and 21.2%, respectively. Due to the limited information on the interest payment structure of the group, the cost of debt (Kd) was computed using the normalized Central Bank rates and

added an implied normalized credit risk spread using historical data to account for the country-specific credit spread of JMT. The cost of debt is expected to reach higher values in the mid-term period 2023-2025YE, and then to reduce to c.4% 2027-2030YE. **Capital structure** will evolve, and we estimate it reaching to 70%/30% Equity vs Debt ratio in 2030YE. Most debt is composed of capital leases (25% 2030YE of the capital structure), while the financial debt weight amounts to 5% 2030YE. **Terminal growth rate is** expected to be 2%, 1%, and 2.5% in Poland, Portugal and Colombia, respectively. The growth was defined considering the company's reinvestment and macroeconomic prospects in each geographical location.

Alternative Valuation Methodologies to Triangulate Results

FCFF for the whole company | The base approach considers a SoP of each EV. We also looked to consolidated figures and considered a FCFF and WACC (c. 10.6%) as a whole. This approach yields an estimated equity value of €15.1Bn or €24.0/sh, further supporting the base approach to valuing JMT.

Dividend Discount Model | JMT's dividend strategy is centred around 40-50% of net income, adjusted for lease liabilities and RoU effects. However, the company does not apply cash management strategies, as the main shareholder does that by itself. This implies extraordinary dividends throughout the years. As such, we establish a dividend payout ratio of 85%, leaving enough room for expansion, since the cash balance never goes below €1.3Bn. Given this strategy, we valued JMT through a standard DDM model, yielding a price target of €23.4/sh, in line with our buy recommendation justified in the FCFF SoP approach.

APV | To further support our recommendation, we performed the APV valuation method. The unlevered cost of equity was computed using EBIT-weighted figures, and the tax shields were obtained with the weighted cost of debt considering country specific risks. This alternative method also provides a buy recommendation at €24.7/sh.

Residual Income | We drawn the model from the EVA® approach using the forecasted difference between JMT's ROIC and WACC for 2024-2030YE, and the invested capital forecasts. WE estimated JMT price target of €25.0/sh, aligned with other valuation approaches.

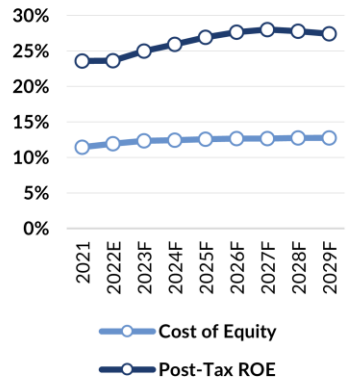
Relative Valuation | JMT profile makes it challenging and inaccurate to be priced against close competitors. Therefore, the relative valuation was based on a sum of parts (SoP) approach, considering different peers for different geographical segments. Peers were triaged considering geographical locations, size, and operating segments. A list of 58 peers was gathered, with companies from Europe, the Americas, and Oceania using the sum of absolute rank differences (SARD) approach. The approach used for performing the multiples analysis provided 6 publicly listed companies with similar risk-adjusted cash flow patterns and growth potential, for the Portuguese, Polish and Colombian segments (See Appendix 13). Employing an average of Enterprise Value multiples (EV/Revenues and EV/EBITDA) and JMT figures by geographic segments, and summing the resulting equity values, it is estimated a price target of €25.5/sh, which aligns with the buy recommendation under all previous models.

Alternatively, JMT was also valued as a whole, with the SARD approach yielding 6 different peers, using an average of EV/Sales, EV/EBITDA, EV/EBIT and EV/FCF, yielding a price target of €24.9/sh.

READY FOR EXPANSION

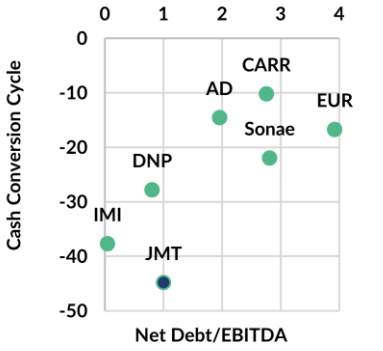
Management's ability to keep a healthy financial position puts the company in an offensive position for an expansion opportunity. A recent press release of JMT suggested an extension of the *Biedronka* banner to Romania. The market is fragmented, and growth prospects may unveil an opportunity to keep increasing and diversifying JMT's revenues. *Profi* and *Mega Image* have been analysts' leading opinions for an acquisition. *Mega Image*'s main shareholder, Ahold Delhaize, detains 49% ownership of JMT's *Pingo Doce*. As such, there is already a business partnership between both companies. The business format of *Mega Image* is aligned with *Biedronka*'s profile of medium-small discounter stores and their strategy of proximity and presence in city centres.

Figure 32: ROE & ROIC



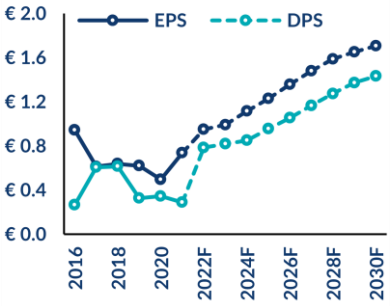
Source: Team estimates

Figure 33: Cash availability for debt repayment



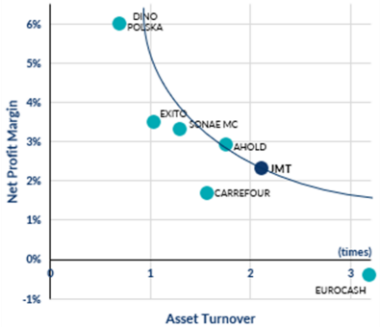
Source: Team estimates

Figure 34: EPS & DPS (€)



Source: Team estimates

Figure 35: Strategic Positioning



Source: Team Estimates, Companies' Reports

The Romanian Scenario

Romania, the 7th most populous nation within the EU, has had GDP levels growing consistently above 3.0% since 2013, except for the pandemic year of 2020 (-3.7%). Yet, GDP quickly recovered in 2021. Inflation is also a macro constraint in the country. The current war affects the forecasted inflation levels for Romania (expected 11.9% 2022YE and 8.5% 2023YE). As for the grocery market, traditional retail still accounts for about 45% of sales, and there is room for proximity chains to grow.

JMT's CEO already disclosed that expanding Poland's largest food retailer is seriously on the table. Moreover, Romania would be a potential new market, and the group is considering the purchase of a retail chain currently operating. We consider the acquisition of the banners *Mega Image* or *Profi* as possible targets, due to a business model focused on proximity and discounter format. There is also a common shareholder between *Pingo Doce* and *Mega Image* – the Dutch multinational Ahold Delhaize.

Mega Image | The banner is the largest supermarket chain in Romania, with over 800 stores and operations in the convenience format Shop & Go.

Profi | Operating units focus on standard, city, and local formats, to satisfy consumer's needs, with over 1600 stores.

Both targets were valued using the Real-option Expanded DCF method, with real options being valued both with Binomial models and the Black-Scholes model. **Real options valuation** was implemented to extract added value in the acquisition case, assuming an acquisition date in 2025, with Mega Image adding €0.3/sh and Profi €0.1/share to JMT's share price.

Financial Analysis

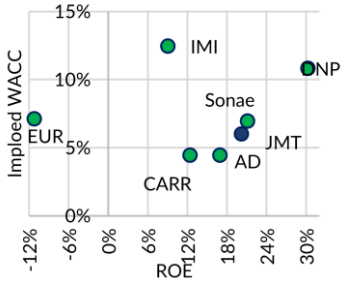
Strong Profitability and Solid Cash Flows | JMT's key strength is its proficiency in generating cash flow. Group's EBIT (4.0% margin 2022YE) has demonstrated a steady upward trend, with a +8.5% CAGR 2016-2021YE. This trend is anticipated to continue in the future with an expected +12% CAGR 2022-2030YE. Two main factors drive this effect: **1)** a consolidated position in the Polish market, with increasing revenues (+5.6% CAGR 2022-2030YE); **2)** *ARA* attaining scale benefits with its proximity strategy, with higher operational margins (from -2.4% 2021YE to +5.7% 2030YE) and more stores (from 1093 2022YE to 1936 stores 2030YE).

Biedronka presents an unbeatable price-quality ratio, allowing to increase an already high market share, from 24.1% in 2016YE to 27.3% in 2021YE. Combining turnover with stores expansion, the banner registered an EBIT increase of +10.3% CAGR 2016-2021 to an EBIT margin of 5.9% in 2021. This is above competitors like *Carrefour* and *Eurocash*, but below *Dino Polska* (respectively 2.6%, 0.4% and 7.7%, 2021YE). Yet, energy inflation and the retail tax should hamper margins shortly. The Polish segment's operating margin is expected to decrease -70 bps to 5.2% in 2023YE. This effect should gradually fade, reaching 5.7% in 2030YE.

The Portuguese segment booked +2% revenues CAGR 2016-2021YE, in line with the country's low growth and inflation during this period. Both *Recheio* and *Pingo Doce* managed the pressure of negative basket inflation in 2021, accompanied by a low food inflation rate (0.7%). EBIT is expected to reach €197M for *Pingo Doce* and €38M for *Recheio* by 2030YE (+5% CAGR 2022-2030YE), backed by the country's full tourism recovery. Operating margins are lower than *SONAE MC* (5.2% 2021YE), though the competitor operates mainly throughs hypermarkets and has lower turnover. The JMT's Agribusiness, which diminishes inventory and supply chain risk, will continue to grow and supply the Portuguese segment, providing another stabilization factor for its margins.

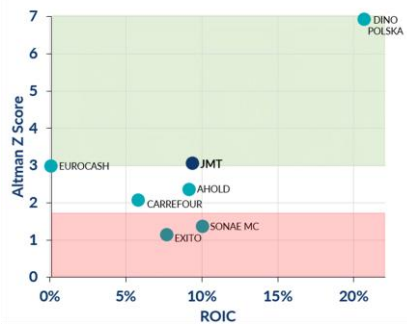
ARA just turned its first positive EBITDA in 2021. Also, the Colombian banner's Free Cash Flow (FCF) is estimated at €-148M in 2022, penalized by significant expansion CAPEX (€224M). We estimate FCF to reach €335M by 2030 (Appendix 10), further improving the group's cash generation capabilities. This is mainly due to CAPEX decreases (after the strong store count growth phase), and the expectation for margins to converge to the main competitors' average of 5.7% (*D1* and *Grupo Exito* 2021YE).

Figure 36: Value Creation for Shareholders



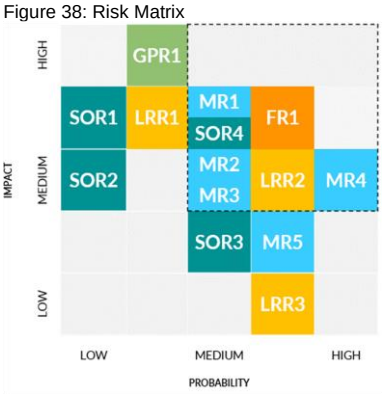
Source: Team estimates

Figure 37: Risk & Return (Altman Z-score)



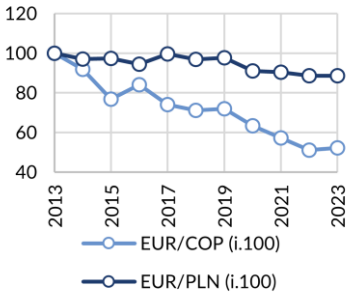
Source: Team estimates

Figure 38: Risk Matrix



Source: Team estimates

Figure 39: Exchange rate evolution



Source: Refinitiv

Outperforming ROIC and ROE Driven by Higher Efficiency | JMT's operates through lower operating margins than competitors (JMT 3.9% vs 4.7% 2021YE). Yet, ROE (23.7% 2022YE) is among the highest when compared to close competitors (15.6%) and the industry average (11.8%). ROE is highly influenced by asset turnover, and less so by financial leverage. The group's solid business knowledge and supply chain focus enable it to achieve an invested capital turnover of 4.4x 2022YE. This is higher than the larger Portuguese competitor *SONAE MC* (2.1x 2021YE), relevant competitors in Poland, such as *Carrefour* (2.7x 2021YE) and *Dino Polska* (3.2x 2021YE), and relatively higher than the industry average (3.0x 2021YE). The capital turnover is a clear characteristic of cost leadership, yet it is not at the expense of a relevant margin gap compared to competitors. All in all, ROIC is expected at 17.9% 2022YE, while competitors like SONAE and Carrefour lag behind at 8.3% and 9.8%. The strategy is paying-off.

Solid Financial Position | JMT has made the strategic decision to prioritize financial stability by maintaining a solid balance sheet. Net debt to EBITDA of 1.0x (2021YE) is half the industry average (2.4x) and JMT operates with excess cash holdings. The current ratio of 0.6x (2021YE), lower than the competitors' average of 0.8x, is driven by JMT's efficiency in managing its working capital. The company's average cash conversion cycle between 2019-2021 is negative at -45 days. Over the same period, the competitors' exhibit -22 days.

The ability to cover interest payments has increased from 4.4x in 2019YE to 5.5x in 2021YE (but lower than competitors' average of 7.5x 2021YE). The expectation is to reach 6.6x in 2030. More than 80% of interest charges are relative to capital leases, as it is the primary driver of leverage (2022YE leases account for c. 83% of total debt). This further emphasizes JMT's financial conservativeness in uncertain times, allowing the group to be well-positioned to tackle economic uncertainty, and expand. The Altman Z-score (below 1.8 suggests financial trouble, while above 3 financial stability, comparison proves JMT's strong financial stability with a 3.1 score. This is above competitors like *Carrefour, Ahold Delhaize,* and *SONAE MC,* while still achieving one of the highest ROE.

Returning Value to Shareholders | In the current market uncertainty, JMT has increased cash holdings (173% increase between 2018-2021 to €1.5B) and still is able to return value to investors in the form of high dividend pay-outs. The 5Y average trailing dividend yield was 3.1%, with an average payout of 70.2%. Apart from exceptional dividends, the company's dividend policy is 40-50% of net income, lower than the industry average of 62% (2021YE). This is done to maintain a financial buffer, following JMT's conservative approach to the balance sheet. Considering regular and extraordinary dividends, an 85% payout ratio is forecasted, allowing the group to maintain cash holdings of at least €1.3B throughout the forecasted period. Further assurance of returning value is evidenced by the EVA® model, as ROIC (c.14%) is larger than and WACC (c.11%) throughout the period. Also, JMT's ROE of 24% 2022YE contrasts with the implied Ke of c.12%, weighted by the EBIT of each business.

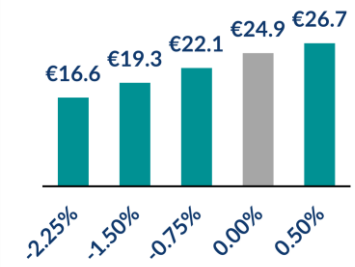
***Biedronka's* banner dependence |** JMT is highly dependent and sensitive to *Biedronka*'s performance. The Polish banner represents 84% (€1.5Bn 2022YE) of the group's EBITDA, and any unfavourable macroeconomic indicators (e.g., exchange rate and GDP decline) can greatly affect the JMT's EBTIDA margins and price target. According to our estimates, a negative parallel shift of -0.75% in Polish real GDP decreases the price target by 3.5% or €0.9/sh. Moreover, the inflationary period and the willingness to gain, or at least keep market leadership by absorbing part of the costs, will negatively impact *Biedronka*'s operating margin in 2023 (-30 bps from 2022 level, -75 bps vs. 2021).

Investment Risks

Financial Risk | Earnings diversification (FR1)

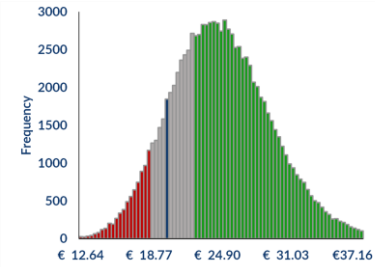
The company relies heavily on Biedronka, which generates 69% of its revenues and 86% of EBITDA (2021YE), with the highest operating margin at 5.9%. The Portuguese market is mature, and the Colombian segment has yet to reach scale, making the company's profitability highly sensitive to changes in the Polish economy. **Mitigation**: In response to the current crisis, the company has decided to absorb inflation costs to maintain market share and consumer loyalty, causing EBIT margins to decrease by 46 basis points to 5.5% (2022YE). To diversify revenue sources, the company is focusing on rapidly growing markets such as Colombia (+1000 stores) and possibly Romania in the future.

Figure 40: Polish EBIT Margin Shift



Source: Team estimates

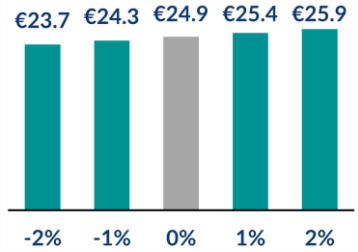
Figure 41: Monte Carlo (MC) Simulation



Mean	€25.22
Median	€24.98
St. Deviation	€4.55
% Buys	69%
% Holds	24%
% Sells	7%
# Iterations	100,000

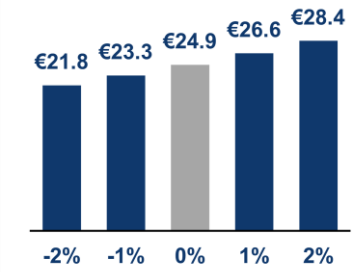
Source: Team estimates

Figure 42: Inflation Shifts



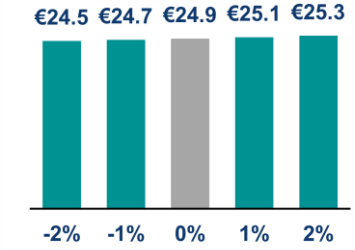
Source: Team estimates

Figure 43: PLN/EUR Shifts



Source: Team Estimates

Figure 44: COP/EUR Shifts



Source: Team Estimates

Market Risk | Exchange Rates (MR4)

Given its international profile, JMT receives 77.7% of its total revenues in foreign currency (70.7% in Zlotys and 7% in Colombia Peso), exposing the company to the constant depreciations against euro (-1.4% CAGR EUR/PLN, -8.2% CAGR EUR/COL, 2013-2022YE). Overall, currency translation losses for JMT accounted for - €79M between 2016-2021YE and we expect PLN and COL to continue depreciating (-1.8% CAGR, -1.4% CAGR, 2022-2030YE, respectively). **Mitigation**: To mitigate the risk of currency fluctuations, JMT has implemented two key strategies: using currency derivatives and obtaining funding that corresponds to the currencies of the projects it invests in, effectively acting as a natural hedge.

Market Risk | Inflation and Decrease in Purchasing Power (MR1)

All the markets where JMT operates are going through high inflationary periods, and in Poland, the biggest market, salary increases (13.9% 2021YE) did not match the soaring inflation rates (16.6% 2022YE). Food inflation in Poland, Portugal and Colombia all surpassed 20%. Colombia recorded the highest increased with 27.1% 2022YE, followed by Poland 21.5% 2022YE. Food and beverages represent around 20% of total expenditure of the average polish household expenditure and 17.4% 2021YE in Portugal. These increased prices affect gravely consumers' budgets. Given the high competition in the food retail market, and customers low switching costs, JMT cannot pass all the costs to consumers without risking losing market share, obliging the group to absorb costs. **Mitigation**: Across markets and all the group's banners JMT has decided to reduce margins to keep market shares, maintaining its position as price leader and relying on turnover as a driver for ROE and ROIC.

Strategic & Operational Risk | Supply Chain Disruptions (SOR4)

Discounters rely heavily on supply chain efficiency to achieve scale and consequently lower prices. Any disruption along the chain increases costs and the damages the group's profitability, which is highly dependent on turnover. The pandemic, the conflict in Ukraine, and the following economic fallout, contributor for national strikes, have all constrained the supply chain environment. **Mitigation**: The Group focuses on having state of the art Transportation Management Systems, that enables fast and efficient routes, and JMT's Private brands represent around 40% of the group's sales. In Portugal, Agro-Alimentar was created to secure the assortment of diaries, livestock farming and fish. These strategies allow for better control and assurance of product availability and quality.

Risks to Price Target | Key assumptions were tested using scenario analysis, sensitivity analysis and Monte Carlo simulation. A further robustness test to our price recommendation.

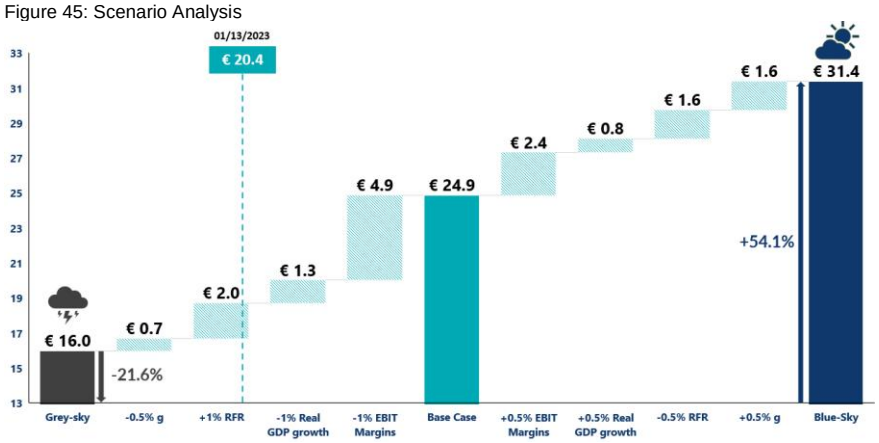
Scenario analysis

To better grasp the effects of each input in the valuation, we performed scenario and sensitivity analysis, and a Monte-Carlo simulation.

In the Blue/Grey-Sky scenario, we stressed EBIT margins' variations, along with the RFR, terminal growth rates, and Real GDP shifts.

We conclude that a -1% (-19.7% or -€4.9/sh) or +0.5% (-9.6% or -€2.4/sh) variation of consolidated EBIT margins impacts valuation more than the other stressed variables. The Blue-Sky scenario (+26.1% or +€6.5) implies a combination of several positive impacts like a +0.5% shift in EBIT margins, real GDP and g, and -0.5% RFR. The Grey-Sky scenario (-35.7% or -€8.9) represents a shift of -1% of EBIT margins and of real GDP, of +1% of the RFR, and of -0.5% of g.

Figure 45: Scenario Analysis



Source: Team Estimates

Monte Carlo simulation

With the use of a 10,000 trials Monte Carlo simulation to further support our risk analysis, in 65% of cases a buy recommendation (price target > €22.93/sh), with a mean of €26.2/sh and median of €25.31/sh.

Sensitivity analysis

With the following sensitivity analysis, we can understand the effects of shifts in the terminal growth rate, the GER 10Y yield, which is the base for all countries' RFRs (can be understood as WACC variations too), and the EBIT margins off the group. We can understand that the price target is more sensitive to EBIT margins. A decrease in EBIT margin of -0.75% impacts the price target in -€7.3/sh (or -29.3%).

We conclude that the most sensitive variable to the price target is margins, and specially the Poland's EBIT margin, which by itself can cause a -22.3% change in price target with a -1.5% shift in margin. This compares to a -4.8% variation in the price target if only the Portuguese EBIT margin shifts -1.5%.

Table 5: Sensitivity Analysis

	EBIT margins shift							RFR (GER 10Y yield)					
	€ -	-1.5%	-0.75%	0%	0.75%	1.5%		1.0%	1.65%	2.15%	2.65%	3.15%	3.50%
g shift	-1.0%	€16.0	€19.3	€22.7	€26.1	€29.5		€25.7	€23.9	€22.7	€21.6	€20.6	€19.9
	-0.5%	€16.7	€20.2	€23.7	€27.2	€30.7		€27.0	€25.1	€23.7	€22.5	€21.4	€20.7
	0%	€17.6	€21.2	€24.9	€28.5	€32.2		€28.5	€26.3	€24.9	€23.5	€22.3	€21.5
	0.5%	€18.5	€22.3	€26.2	€30.0	€33.8		€30.2	€27.8	€26.2	€24.7	€23.3	€22.5
	1.0%	€19.7	€23.6	€27.6	€31.6	€35.6		€32.3	€29.5	€27.6	€26.0	€24.5	€23.5

Source: Team estimates

Pricing discount for limited liquidity in the Food Retail industry

This additional chapter serves as a complement to the above Equity Research on Jerónimo Martins SGPS S.A., and presents itself as an individual report, beyond the scope of the work of the CFA Equity Research Challenge team.

Introduction

The purpose of this research is to analyse if the implied discount of Jerónimo Martins' stock results from limited liquidity. This research is motivated by three primary factors: (1) JMT is family owned, with c.56% of its shares being owned by the Sociedade Francisco Manuel dos Santos; (2) the Portuguese Stock Market has few and fewer listed firms (OECD 2020); (3) Portuguese firms with high shareholder concentration have lower share liquidity (Alves et al. 2015).

Past studies on the liquidity levels of different assets have reported evidence of a liquidity discount (Damodaran 2005). The value of a firm is typically measured as the discounted value of future cash flows. However, in a less-than-perfect market, investors are not guaranteed to exit a position at the price that the investment, in theory, should have. As such, investors demand an additional return on the investment, increasing the cost of capital of such firms. More recent literature has measured the relationship between historical returns and liquidity proxies, suggesting that differences in liquidity levels of public-traded firms are also priced in, and less-liquid firms can yield higher returns, being suggested as an alternative investment strategy (Ibbotson et al. 2013).

We shall replicate the analysis of the paper *The pricing discount for limited liquidity: evidence from SWX Swiss Exchange and the Nasdaq*, (Loderer and Roth 2005), using a data set composed entirely of Food Retail and Distribution companies (TRBC classification), for comparability with Jerónimo Martins. We analyse the prices and liquidity levels of these companies in the year during the years 2013 and 2023. As proxies for liquidity, we will use the bid-ask spread over bid price and the stock turnover, in two different analyses.

The chapter starts with a literature review regarding illiquidity and liquidity proxies, then with a description of the methodology used and of the dataset of companies for the analysis. We move on to the empirical results of the regressions ran on the different models, and also use machine learning models to extend the original analysis of the paper. Finally, we interpret the results, and find that there is insufficient evidence to state that the implied discount on JMT's stock is due to a liquidity discount imposed by the market.

Literature Review

The present analysis is essentially based on two theories: limited liquidity affects asset prices; and costs of trading serve as proxy for liquidity.

Limited liquidity affects asset prices

The concept of liquidity interfering with asset prices was presented as early as 1988 by Grossman and Miller, and has since been further studied and analysed. On this paper, *Liquidity and Market Structure*, Grossman and Miller defined market illiquidity as "determined by the demand and supply of immediacy". The importance of immediacy is based on the balance between the risk and reward of acquiring, holding, or selling a specific asset at a given moment. A seller looking to liquidate a position requires a buyer, or a group of buyers, and looks for the best available offer that should, at minimum, meet the seller's perceived value of the asset. Practically, in the modern (more liquid) stock market, the seller posts an ask offer and waits for a buyer that meets that price. But in either a liquid or illiquid market, the seller faces the trade-off between selling the asset at the current equilibrium price, or waiting for a better offer at the risk of a fall in the price. By selling immediately, the risk is transferred to the buyer, and thus the demand for immediacy is the demand for the option to sell in the moment rather than in the next, and the opposite for supply of immediacy by the buyers. The lack of supply of immediacy leads to a decrease in the options of the seller, and thus pushes prices down. In other words, the costs of holding an asset increase for market makers (Damodaran 2005), and so the rates of return also increase due to inventory risk.

Empirical results prove the concept of liquidity as an investment style (Ibbotson et al. 2013), with stocks with lower liquidity showing consistent superior long-term returns when compared to those with higher liquidity.

Costs of trading serve as proxy for liquidity

Bid-ask spreads refer to the difference between the price at which the seller is willing to transact and the price the buyer is willing to pay for an asset. The bid-ask spread reflects the implied costs for market makers to engage continuously in the market. There are inherent costs in trading from processing orders, and the bid-ask spreads must be such that they cover these costs (Damodaran 2005). Additionally, there are costs related to trading with more informed traders, and opportunity costs of holding inventory.

This spread represents a cost for a market agent to engage in transactions, and effectively hampers trading activity. Amihud and Mendelson (1986) show that transaction costs related to the bid-ask spread have long-term effects on holding-period returns. As per Amihud (2002), the lack of liquidity reflects the impact of order flow on prices, and as such, assets with more volume traded, or with less hampered trading, will show a smaller impact of this effect on their price. Any friction detected in a market by the agents will put pressure on prices, and loosen the bid-ask spread.

Findings of the original paper

Loderer and Roth (2005), with their analysis on the SWX and NASDAQ stock exchanges, have identified a statistically and economically significant relationship between liquidity and the valuation of the constituent companies. With data ranging from 1995 to 2001, and using both the relative bid-ask spread and the annual stock turnover as liquidity proxies, their results suggest the presence of a liquidity discount on stock prices, meaning that investors will pay less for firms with lower liquidity, and thus putting downward pressure on prices and valuations.

Methodology

Over the course of this research, we will study the relationship between price and liquidity. The original authors use the dividend discount model with a constantly growing dividend as a basis for the regression models. The authors then formulated a more general relationship between the variables, for the model to better suit a regression analysis. Thus, they arrived at the following function:

- $P/E\ ratio_i = f(Growth_i, Payout_i, Risk_i, Size_i, Liquidity_i)$,

where Growth is the expected rate of earnings growth; Payout is the firm's payout ratio; Risk is the risk of the stock; Size is the market value of the firm's equity; Liquidity is the stock's liquidity.

Two different models will be used, with a cross-sectional regression approach. The regressions will initially be conducted using the ordinary least squares (OLS) approach, as per the original paper, to test linear relationships between the variables. To try and capture non-linear relationships, we also conduct three different machine learning models (Neural Networks, K-Nearest Neighbours, and Support Vector Regression), thus introducing new ways to analyse the model.

Model 1 (Eq.1):

- $(P/E)_i = \beta_0 + \beta_1 * EPSg_{t+1} + \beta_2 * EPSg_{t+2} + \beta_3 * BETA_i + \beta_4 * RESSIZE/RELSP_i + \beta_5 * RELSP_i + \beta_6 * PAYOUT_i + \varepsilon_i$

Model 2 (Eq.2):

- $(P/E)_i = \beta_0 + \beta_1 * EPSg_{t+1} + \beta_2 * EPSg_{t+2} + \beta_3 * BETA_i + \beta_4 * RESSIZE/STURN_i + \beta_5 * STURN_i + \beta_6 * PAYOUT_i + \varepsilon_i$

Additional regressions (Eq.1a, Eq.2a):

- $\mathrm{SIZE}_i = \mu_0 + \mu_1 * RELSP_i + \eta_i$
- $\mathrm{SIZE}_i = \mu_0 + \mu_1 * STURN_i + \eta_i$

With the respective results of the analysis, we will investigate whether JMT's price discount is justified by a lack of liquidity, by replacing the variables of the models with JMT's values and using the yielded coefficients.

Table 6: Description of variables

P/E	Price–earnings ratio
ln(P/E)	Natural logarithm of the Price–earnings ratio
EPSg t+1	Projected earnings growth between t and t+1, as of 13-01-20X(t). This variable is inferred from the predictions of financial analysts on Refinitiv Eikon.
EPSg t+2	Projected earnings growth between t+1 and t+2, as of 13-01-20X(t). This variable is inferred from the predictions of financial analysts on Refinitiv Eikon
BETA	The 5-year monthly Beta of the stock. This value is sourced from Refinitiv Eikon.
SIZE	Market capitalization of the stock under analysis. The variable SIZE is taken of the 13-01-20X(t).
LNSIZE	Natural logarithm of SIZE.
PAYOUT	The dividend payout ratio of the firm, sourced from Refinitiv Eikon
RESSIZE/RELSP	Residual of a regression of LNSIZE against RELSP.
RELSP	Relative bid–ask spread, defined as the ratio of the difference between ask and bid prices, divided by bid price.
RESSIZE/STURN	Residual of a regression of LNSIZE against STTURN.
STURN	Share turnover, defined as the number of shares traded divided by annual average number of shares outstanding.

Data Set

The set of companies used in this research has the TRBC classification of “Food Retail and Distribution” and are not filtered geographically. The set is comprised of 467 companies, with headquarters in 38 different countries. The following filters were applied, to improve the quality of the data:

1. Positive values for the P/E ratio;
2. Existing forecasts of EPS for the following two fiscal years;
3. Available data for the 3-year weekly Beta;
4. Positive values for the relative bid-ask spread (ask price higher than bid price).

Using data between 13-01-2022 and 13-01-2023, only 92 companies have data compatible with the applied filters. As such, we will conduct a pooled OLS, using 10 years of data from the original 467 companies, and use each year’s data of each company as a separate data point.

The data set will have values between the dates of 13-01-2013 and 13-01-2023. Each data point corresponds to the relevant information of one of the 467 companies that passed through the filter, with the data having the time span of one year (13-01-20X(t-1) to 13-01-20X(t)). As such, companies may be represented multiples times, if the necessary data is available throughout multiples years.

Of 4670 total data points, 1328 were dropped due to lack of Beta, 1445 due to a lack of forecasts, 1156 due to a lack of or negative P/E, 23 due to negative values of the relative bid-ask spread, and 1 due to a lack of available market capitalization data, yielding a total of 727 data points.

For the analysis using the share turnover ratio as a measure of liquidity, an additional 109 data points were excluded due to lack of information regarding the volume of shares traded, and 4 for the volume traded being less or equal to 0, yielding a total of 614 data points.

In both datasets we encounter extreme values of the variables P/E, EPSg t+1 and EPSg t+2.The P/E variable has a maximum of 12541.7, with a standard deviation of 510.28. The variable EPSg t+1 has a minimum of -1383.92 and a standard deviation of 62.18. The variable EPSg t+2 has a minimum of -115.25 and a standard deviation of 5.42. Running estimation models with a dataset with these extreme values will not output statistically significant results, as the datapoints themselves have little economical meaning.

As such, we will conduct a winsorizing process, to trim the sample of the extreme values of the variables P/E, EPSg t+1 and EPSg t+2. We will drop all data points of which any of these variables' values fall outside the quantiles 2 and 98. Thus, the original sample after winsorizing have the following characteristics:

Table 7: Description statistics of the sample with RELSP

Variables	Sample Size	Average	Median	Maximum	Minimum	St Dev
P/E	645	24.99	20.47	142.41	5.69	17.65
EPSg t+1	645	11.1%	7.1%	193.9%	-87.4%	34.7%
EPSg t+2	645	14.2%	11.5%	111.4%	-32.5%	17.1%
Beta 5Y	645	0.60	0.56	2.40	-0.09	0.38
Market Cap	645	€9.3 B	€2.3 B	€361.9 B	€24.9 M	€31.9 B
RELSP	645	0.44%	0.26%	5.77%	0.01%	0.65%

Table 8: Description statistics of the sample with STURN

Variables	Sample Size	Average	Median	Maximum	Minimum	St Dev
P/E	553	24.61	20.64	142.41	6.54	17.24
EPSg t+1	553	11.3%	7.4%	172.3%	-85.9%	32.9%
EPSg t+2	553	12.8%	10.9%	106.7%	-24.2%	15.1%
Beta 5Y	553	0.60	0.56	2.40	-0.09	0.38
Market Cap	553	€10.6 B	€3.1 B	€361.9 B	€24.9 M	€34.3 B
STURN	553	64.85%	49.95%	889.64%	0.46%	78.11%

Empirical results – Model 1

To run the OLS regression on the filtered sample, using Eq.1 (with the relative bid-ask spread as the proxy for liquidity), we first need to conduct the regression on SIZE, against the variable RELSP.

According to the authors, a firm's size has a twofold effect on the company's stock. Firstly, larger firms are less risky, and tend to have higher valuations (Fama and French, 1993); secondly, larger firms tend to have tighter bid ask spreads, meaning that size itself could be a proxy for liquidity.

As the purpose of the analysis is to identify the impact of limited liquidity on the stock's price, this additional regression allows us to separate the two effects, by telling us which part of the cross-sectional variation in firm size is due to the cross-sectional variation in liquidity, and what part is not. Thus, the residuals of this regression are unrelated to liquidity, and will be used in the model instead of the variable SIZE.

However, conducting this regression leads to a problem of heteroskedasticity. Performing a White test on the results of the analysis, we attain a p-value of 0.021, meaning that we reject the null-hypothesis, and that homoskedasticity is not present. As such, and like the authors of the paper, we will restate the additional regression (Eq.3a), as well as Model 1 (Eq.3) as follows:

- $LNSIZE_i = \mu_0 + \mu_1 * RELSP_i + \eta_i$
- $ln(P/E)_i = \beta_0 + \beta_1 * EPSg_{t+1} + \beta_2 * EPSg_{t+2} + \beta_3 * BETA_i + \beta_4 * RESSIZE/RELSP_i + \beta_5 * RELSP_i + \beta_6 * PAYOUT_i + \varepsilon_i$

where LNSIZE is the natural logarithm of the variable SIZE.

This regression has an adjusted R-squared of 0.128, where the RELSP is a relevant variable with a p-value of 0. The coefficient of the relative bid-ask spread is -82.709, such that the relationship between firm size and the bid-ask spread is as expected, with larger firms having tighter bid-ask spreads. The White test for the regression yields a p-value of 0.051, meaning that we no longer reject the null hypothesis, and homoskedasticity is present.

Conducting now the regression of Model 1 (Eq.1), we face the same situation as before. After performing a White test, it yields a p-value of 6.832e-12, indicating the presence of heteroskedasticity, even after the reformulation as per the paper. As such, we will conduct the regression using the Robust Standard Errors approach, with the HAC (Heteroskedasticity and Autocorrelation Consistent) estimator.

The results of the regression (Eq.3) using the new approach are as follows:

Table 9: Eq,3 RSE Regression results

Independent variables	Regression coefficients	p-values
Intercept	2.8638	0.0000
EPSg t+1	0.0849	0.2850
EPSg t+2	1.5520	0.0000
Beta 5Y	-0.0465	0.3500
RESSIZE/RELSP	0.0852	0.0000
RELSP	-6.4260	0.0290
PAYOUT	0.0527	0.3640
Number of observations	645	
F-statistic	17.3700	
F-statistic p-value	0.0000	
Adjusted R-squared	0.2620	

Some of the results are similar to the ones in the original paper. The intercept is quite different from zero, earnings growth expectations have a positive relationship with the company's valuation, as well as the firm's size and payout ratio. Companies with higher betas tend to have lower valuations, and the looser the bid-ask spread, the higher the valuation. The interpretation of the relationships between the dependent and the independent variables remains the same. The F-statistic proves that the regression is significant, and suggests that at least some of the variables have a significant effect on the dependent variable. Additionally, the variable PAYOUT proves once again to not be significant.

We also tested multicollinearity in the model, using the Variance Inflation Factor (VIF), with every independent variable yielding values just above 1, showing that the variables are not highly correlated with one another, and thus they do not merit dropping.

However, and contrary to the results of the paper, the variable EPSg t+1 and Beta 5Y are not significant, both with p-values above 0.05. The adjusted R-squared is also much lower (0.262), when compared to the one of the paper (0.627). This suggests that the model is not capturing as much of the variation of the dependent variable (ln P/E) with the current data set, and the independent variables provide less explanatory power.

As such, we will drop the variables without statistical significance (EPSg t+1, Beta 5Y and PAYOUT), and rerun the regression only with the independent variables with p-values lower than 0.05.

The results of this new regression (Eq.4) with less variables, are as follows:

Table 10: Eq,3 RSE Regression results

Independent variables	Regression coefficients	p-values
Intercept	**2.8659**	**0.0000**
EPSg t+2	**1.4979**	**0.0000**
RESSIZE/RELSP	**0.0893**	**0.0000**
RELSP	**-4.7710**	**0.1110**

Number of observations	**645**	
F-statistic	**35.0900**	
F-statistic p-value	**0.0000**	
Adjusted R-squared	**0.2580**	

The adjusted R-squared is somewhat lower than in the regression of Eq.3, though an insignificant difference, as the model still does not explain much of the variations of the dependent variable. The relationships between the dependent and independent variables remain the same, with earnings growth expectations and firm size still contributing to higher valuations, and the opposite for the liquidity proxy. Furthermore, the results now show the relative bid-ask spread as an insignificant variable, and thus suggesting that liquidity is not a good explanatory variable for the valuation variations between companies, within the context of the current dataset.

As the ultimate goal of this research is to determine a possible liquidity discount on JMT's stock, we will re-run regressions on Eq.3 and 4 on a dataset of companies more similar to JMT. To achieve this, we will use "Country of Headquarters" as a filter, and splitting the dataset between "Western European and other States; Latin America and Caribbean States; Eastern European States" (from now on "Analysed States") and "Rest of the World" (from now on "RoW"). The countries included in the "Western States" subset will be chosen as per the classification of United Nations' Department for General Assembly and Conference Management.

We select the regions in the "Analysed States" subset based on the countries in which JMT has active operations (Portugal in "Western European and other States", Colombia in "Latin America and Caribbean States", and Poland in "Eastern European States").

The original sample has companies from 40 different countries, of which 22 will belong to the "Analysed States" subset, and 18 to the "RoW" subset. Regressions on Eq.3 and 4 will be run on subset "Analysed States", of which descriptive statistics are as follows:

Table 11: Descriptive statistics – "Analysed States"

Variables	Sample Size	Average	Median	Maximum	Minimum	St Dev
P/E	318	23.11	19.49	142.41	5.79	15.81
EPSg t+1	318	13.0%	7.3%	193.9%	-87.4%	38.0%
EPSg t+2	318	11.8%	8.8%	108.5%	-32.5%	17.5%
Beta 5Y	318	0.67	0.64	2.40	-0.09	0.42
Market Cap	318	€14.8 B	€4.9 B	€361.9 B	€52.7 M	€44.4 B
RELSP	318	0.37%	0.16%	2.79%	0.01%	0.49%

We can identify important differences between this subset and the original sample. Firms in the "Analysed States" subset have lower average valuations (23.11 against 24.99) with lower standard deviations (15.81 against 17.65). These firms also have higher expected growth in t+1, but lower expected growth in t+2. They are, on average, more volatile, with a higher Beta 5Y by 0.07. They have higher market capitalizations, but the respective standard deviation is also higher. The liquidity proxy (relative bid-ask spread) does have a lower average in the analysed subset, indicating higher levels of liquidity.

Running regressions on Eq.3 and 4 on the subset "Analysed States", we attain the following results:

Table 12: RSE Regression results – "Analysed States"

Independent variables	Eq.3		Eq.4	
	Regression coefficients	p-values	Regression coefficients	p-values

Intercept	**2.9465**	**0.0000**	**2.9264**	**0.0000**
EPSg t+1	**0.1343**	**0.1940**		
EPSg t+2	**1.3143**	**0.0000**	**1.2888**	**0.0000**
Beta 5T	**0.0286**	**0.6520**		
RESSIZE/RELSP	**0.0699**	**0.0030**	**0.0644**	**0.0030**
RELSP	**-25.0427**	**0.0000**	**-22.7061**	**0.0000**
PAYOUT	**-0.1327**	**0.0730**		
Number of observations	**318**		**318**	
F-statistic	**10.9100**		**14.4400**	
F-statistic p-value	**0.0000**		**0.0000**	
Adjusted R-squared	**0.2310**		**0.2180**	

Considering Eq.3, these results are similar to the ones of the original sample, with the variables EPSg t+1, Beta 5Y and PAYOUT being non-significant, with p-values above 0.05. The coefficient of RELSP is much higher (negatively), which might be explained by the lower average values of this variable. The Beta 5Y now has a positive relationship with the company's valuation, which is counterintuitive as it is a measure of risk, but the authors of the paper found a similar relationship in their NASDAQ sample as well. The PAYOUT variable now has a negative relationship with the dependent variable. The latter two facts might indicate a market preference for more growth stocks, which are more volatile and tend to not pay dividends, but since both variables are non-significant, no real conclusion may be extrapolated. The adjusted R-squared is lower than the one of the original sample's regression, with a lower F-statistic as well, indicating that the model performs even worse on the subset of companies that are more comparable to JMT, putting in question the trustworthiness of any conclusions on a company's valuation based on this model.

From the regression of Eq.4' results, we can extrapolate similar conclusions to Eq.3's results. Again, both the adjusted R-squared and the F-statistic values are lower to the respective regressions of the original sample. However, the relative bid-ask spread's p-value is now under 0.05, indicating that liquidity is a significant variable in estimating the valuation of companies more similar to JMT.

Machine Learning Models

With the results of the linear regressions, using both the OLS and the Robust Standard Errors approaches, showing a poor explanatory power of the model, with an R-squared constantly below 0.3 in all analyses, we shall implement different machine learning models to study possible non-linear relationships, and strive to achieve a model with greater accuracy and explanatory power. This analysis will serve as a complement to the ones in the original paper. Three different models will be implemented: K-Nearest Neighbours (KNN), Support Vector Regression (SVR) and Neural Networks (NN). In each machine learning model, we will run regression on both Eq.3 and Eq.4, with the respective variables, and will use the Mean Squared Error and the Adjusted R-squared metrics to assess the performance of each model.

K-Nearest Neighbours

The KNN model will look for data points with similar characteristics, and group them together in a node. It will yield a continuous output, by calculating the average target values of each data point in the node, and using that average as the predicted value for each new data point.

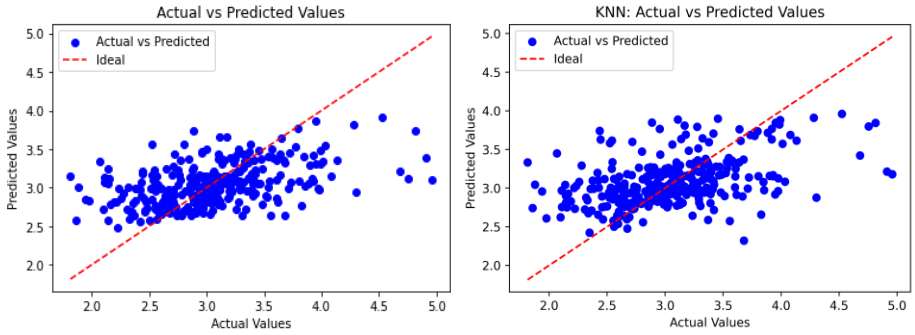
Running the KNN model, with nodes having 10 neighbours, and a test size of 0.5, we attain the following results:

Table 13: KNN Model results

Metrics	Eq.3	Eq.4
Mean Squared Error (MSE):	0.2162	0.2274

R-squared	0.2197	0.1792
Adjusted R-squared	0.2049	0.1715
Mean Error	0.0095	0.0344

Figure 46: KNN Model – Eq.3 and Eq.4 Actual vs Predicted



The results of the analysis indicate that the KNN model with both Eq.3 and Eq.4 has less explanatory power than the linear regressions. Eq.3 with the RSE model yields an adjusted R-squared of 0.262, higher than the one yielded by the KNN model of 0.205. A similar difference in adjusted R-squared values is found in the regression of Eq.4 (RSE and KNN models with 0.258 and 0.172, respectfully).

As such, the linear regression model using the Robust Standard Errors approach is a better estimation model for the dependent variable ln(P/E).

Support Vector Regression

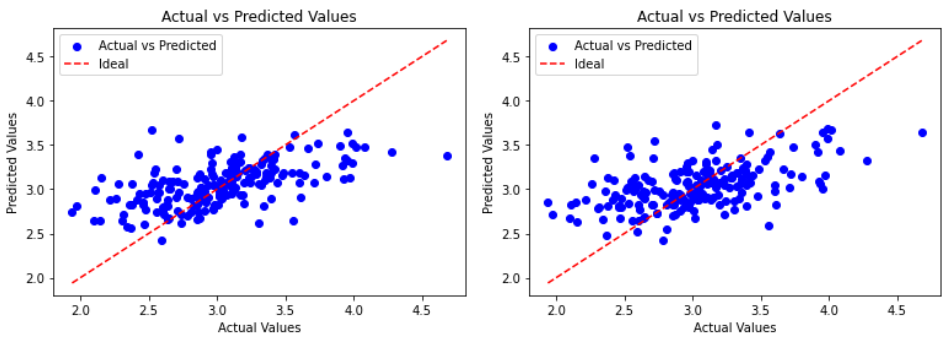
The SVR model yields a regression function which is applied to new data points, thus predicting continuous variables. The model handles data in a higher-dimensional plane, and seeks to include data points into the best-fit hyperplane, while amplifying as much as possible the distance between other data points.

Running the SVR model, with a C of 0.3, an epsilon of 0.01, and a test size of 0.3, we attain the following results:

Table 14: SVR Model results

Metrics	Eq.3	Eq.4
Mean Squared Error (MSE):	0.1462	0.1559
R-squared	0.3306	0.2861
Adjusted R-squared	0.3092	0.2748
Mean Error	-0.0333	-0.0152

Figure 47: SVR Model – Eq.3 and Eq.4 Actual vs Predicted



The SVR model yields higher adjusted R-squared values in both Eq.3 and Eq.4, when compared to those of the RSE model (0.309 and 0.275 against 0.262 and 0.258, respectfully). As such, we can interpret the SVR model as being superior to the RSE model at estimating ln(P/E), as the independent variables explain a higher portion of the variations of the dependent variable.

Neural Networks

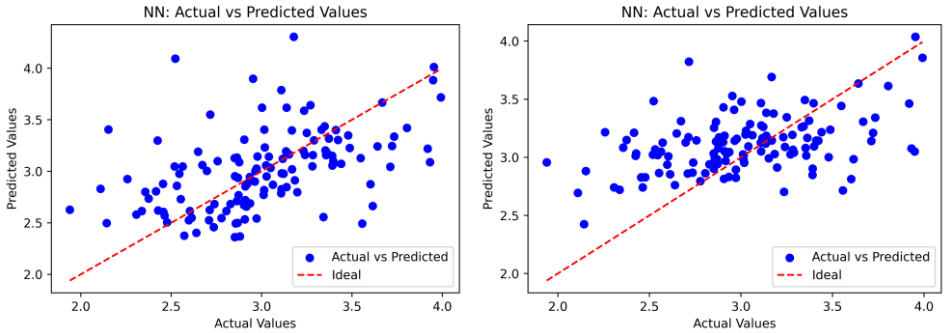
The Neural Networks model is based on a network of neurons, where each applies a function to the inputs, adapting for biases along the neuron chain. Each input goes along the neuron chain, through each respective function, reaching an output layer which finally yields the continuous estimation of the dependent variable.

Running the Neural Networks model, with 128 neurons, a learning rate of 0.001, 100 epochs, a batch size of 16, and a test size of 0.2, the results for both regressions are the following:

Table 15: NN Model results

Metrics	Eq.3	Eq.4
Mean Squared Error (MSE):	0.1750	0.1595
R-squared	0.0314	0.1173
Adjusted R-squared	-0.0162	0.0961
Mean Error	-0.0085	-0.1056

Figure 48: NN Model – Eq.3 and Eq.4 Actual vs Predicted



These results suggest that the model has poor predicting power of the dependent variable (ln (P/E)), both in Eq.3 and Eq.4, with an adjusted R-squared very close to zero. As such, we will not use the Neural Networks model to estimate JMT's valuation.

Empirical Results – Model 2

Model 2 takes the yearly stock turnover as a proxy for liquidity. Similarly to Model 1, we will also take the natural logarithm of the variables SIZE and P/E to deal with heteroskedasticity, and will replace RELSP with STURN in Eq.3 and Eq.4, thus having Eq.5 and Eq.6. Using the Robust Standard Errors approach, the results are as follows:

Table 16: Model 2 RSE regression results

Independent variables	Eq.5		Eq.6	
	Regression coefficients	p-values	Regression coefficients	p-values
Constant	2.8178	0.0000	2.8392	0.0000
EPSg t+1	0.1110	0.2540		
EPSg t+2	1.4080	0.0000	1.3955	0.0000
Beta 5Y	0.0321	0.5210		
RESSIZE/STURN	0.1029	0.0000	0.1031	0.0000
STURN	0.0572	0.1430	0.0569	0.0980

PAYOUT	-0.0329	0.6350		
Number of observations	553		553	
F-statistic	18.48		32.05	
F-statistic p-value	0.0000		0.0000	
Adjusted R-squared	0.2480		0.2450	

Similarly to Eq.3, in Eq.5 we see the same relationships between the dependent and independent variables. Regarding the STURN variable, the higher the value, the higher the liquidity of the stock, and as in Eq.3, the higher the ln(P/E). The variables EPSg t+1, Beta 5Y and PAYOUT still show p-values above 0.05, indicating that they are not significant to the model. However, the liquidity proxy variable STURN also shows a p-value above 0.05, and thus should be dropped in Eq.6. Stock turnover proves thus that it is not significant to estimate the valuation of a stock. The same conclusion of non-significance can be seen in the regression of Eq.4, where STURN also shows a p-value above 0.05.

To follow the same procedures as in Eq3 and Eq.4, we will still run the machine learning models for Model 2, Eq.5 and Eq.6. The results are as follows:

Table 17: ML Models results

Metrics	Eq.5			Eq.6		
	KNN	SVR	NN	KNN	SVR	NN
Mean Squared Error (MSE):	0.1938	0.1812	0.1863	0.1923	0.1772	0.1754
R-squared	0.2473	0.2449	0.1513	0.2533	0.2617	0.2009
Adjusted R-squared	0.2306	0.2164	0.1024	0.2451	0.2480	0.1785
Mean Error	0.0401	-0.0166	-0.0908	0.0052	-0.0348	-0.0446

As in Model 1, all models show poor estimation capability, with adjusted R-squared values below 0.3 across all machine learning models, in both Regressions.

Interpretation

The results of the RSE regressions of both Models 1 and 2 indicate that neither are good estimators of the valuation of companies within the industry of Food Retail and Distribution, as the adjusted R-squared values were below 0.3 across all regressions. Furthermore, neither variable RELSP nor STURN proved significant in the regression models, though the relative bid-ask spread had a slightly lower p-value.

Thus, any interpretation of either Model to estimate the P/E of a stock, and compute a respective liquidity discount, will have little economic significance, and should not be trusted for valuation purposes.

However, we will continue the replication of the paper, and achieve a discount attributable to liquidity for JMT's stock price. We will use Eq.4, as RELSP had better results as a variable than STURN, with Eq.6. The equation (Eq.4e) is modelled as follows:

- $(P/E)_{RELSP>0} = \exp(\hat{\beta}_0 + \hat{\beta}_1 * EPSg_{t+2} + \hat{\beta}_2 * RESSIZE/RELSP + \hat{\beta}_3 * RELSP)$

$\hat{\beta}$ denotes estimated coefficients, and this equation represents the general case of firms with limited liquidity (firms with a relative bid-ask spread higher than zero). For the case of firms with perfect liquidity (RELSP = 0), the equation (Eq.4p) for the estimated P/E ratio is as follows:

- $(P/E)_{RELSP=0} = \exp(\hat{\beta}_0 + \hat{\beta}_1 * EPSg_{t+2} + \hat{\beta}_2 * RESSIZE/RELSP)$

To estimate the limited liquidity induced discount, we compare the estimated P/E of a firm in a situation of perfect liquidity, with the estimated P/E with the actual liquidity proxy values, as follows (Eq.7):

- $\left(\frac{(P/E)_{RELSP=0} - (P/E)_{RELSP>0}}{(P/E)_{RELSP=0}}\right) = 1 - \exp(\hat{\beta}_3 * RELSP)$

As such, to estimate the pricing discount induced by illiquidity, we shall replace $\hat{\beta}_3$ with the coefficient value of RELSP in Eq.7, and insert JMT's relative bid-ask spread in 2023. Doing so results in the expression $1 - \exp(-4.7710 * 0.00168)$, yielding an estimated discount of 0.798%. This result as the liquidity premium that investors require because JMT is not in a situation of perfect liquidity.

This discount is far below the calculated stock discount of 22% on the Equity Research analysis on JMT. If the results of the model were significant, we would conclude that the discount on this stock is not due to a liquidity discount, and must then be explained by other variables not accounted for in this model.

Considering the Machine Learning models, the one with the highest adjusted R-squared value with Model 1 was the Support Vector Regression using Eq.3. We shall use this model to compare the P/E of JMT in a situation with perfect liquidity, with the current situation with its current bid-ask spread. To do so, we shall again use Eq.7, and insert two datapoints into the model: JMT's data with the current bid-ask spread; and JMT's data with RELSP = 0.

The estimated ln(P/E) of JMT with the current bid-ask spread is 29.61286522952274, and of 29.617410218350102 in a situation of perfect liquidity. Thus, the implied liquidity discount is of 4.52 x 10^{-5}, which can be interpreted as zero, and thus liquidity having no effect on the stock price of JMT.

Conclusions

In this additional chapter, we investigate whether the implied discount by the forecasted price of JMT is due to an illiquidity discount imposed by the market. We do so by replicating the models of the paper *The pricing discount for limited liquidity: evidence from SWX Swiss Exchange and the Nasdaq*, (Loderer and Roth 2005), which seeks to estimate the P/E multiple of companies based on several variables, one of which a liquidity proxy, and then estimate again the multiple in a situation of perfect liquidity, to understand the market-imposed discount on the stock based on illiquidity.

The paper found significant relationships between liquidity and stock prices, after controlling for earnings growth, risk, and firm size. We replicated the analysis on a dataset comprised solely of Food Retail and Distribution companies, which belong to the same industry as Jerónimo Martins.

However, the current analysis did not achieve the same results of the original paper, as some of the variables did not present statistically significance, including the liquidity variable, measured by the relative bid-ask spread of a stock. The models failed to account for more than 30% of the variations of the dependent variable, and any estimations of the P/E multiple are not statistically significant, and should not be trusted. We tried to capture possible non-linear relationships between the variables, using three different machine learning models, but the results were similarly poor.

Still, estimating the liquidity discount on JMT's stock, using the paper's model, we achieve a 0.798% discount, which is far from the implied 22% upside from the Equity Research's forecast. As such, we conclude that the model from the original paper does not accurately estimate the P/E multiple for this dataset, and liquidity has little impact on the capacity for the model to estimate this multiple.

APPENDICES

Appendix 1 | Statement of Financial Position

CONSOLIDATED BALANCE SHEET (€M)	2020	2021	2022YE	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F
Tangible assets	3817	3993	4506	4949	5384	5794	6168	6502	6786	7020	7195
Intangible assets	757	757	854	938	1021	1099	1169	1233	1287	1331	1364
Investment property	9	8	8	8	8	8	8	8	8	8	8
Right-of-use assets	2167	2248	2417	2617	2831	3054	3285	3520	3753	3983	4206
Biological assets	3	5	6	7	7	8	8	9	9	9	10
Investments in joint ventures and associates	6	13	13	13	13	13	13	13	13	13	13
Other financial investments (avaliable for sale)	1	2	19	19	19	19	19	19	19	19	19
Trade debtors, accrued income and deferred costs	70	57	136	152	163	174	185	195	204	213	220
Deferred tax assets	163	175	175	175	175	175	175	175	175	175	175
Total non-current assets	6994	7256	8134	8877	9622	10343	11031	11673	12255	12770	13209
Inventories	974	1108	1323	1472	1586	1689	1798	1894	1980	2058	2126
Biological assets	5	7	8	9	10	11	11	12	13	13	13
Income tax receivable	17	23	23	23	23	23	23	23	23	23	23
Trade debtors, accrued income and deferred costs	393	479	552	614	662	706	752	793	829	862	891
Cash and cash equivalents	1041	1493	1257	1294	1287	1289	1366	1467	1600	1762	1965
Total current assets	2434	3111	3164	3414	3569	3720	3951	4189	4446	4719	5019
Total assets	9428	10368	11298	12291	13191	14063	14982	15863	16700	17489	18228
Share capital	629	629	629	629	629	629	629	629	629	629	629
Share premium	22	22	22	22	22	22	22	22	22	22	22
Own shares	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6
Other reserves	-129	-140	-140	-140	-140	-140	-140	-140	-140	-140	-140
Retained earnings	1491	1773	1877	1987	2153	2325	2515	2712	2910	3085	3258
Non-controlling interests	249	254	263	268	276	283	292	301	310	318	326
Total shareholders' equity	2257	2532	2645	2760	2933	3113	3312	3518	3725	3908	4089
Borrowings	364	347	273	298	323	348	371	392	412	429	444
Lease liabilities	1897	1993	2141	2313	2496	2689	2890	3097	3306	3516	3725
Employee benefits	70	70	70	70	70	70	70	70	70	70	70
Provisions for risks and contingencies	33	34	34	34	34	34	34	34	34	34	34
Deferred tax liabilities	66	66	66	66	66	66	66	66	66	66	66
Total non-current liabilities	2430	2511	2585	2782	2991	3207	3432	3660	3889	4116	4340
Borrowings	160	113	242	265	287	308	329	348	365	381	394
Lease liabilities	377	394	423	457	494	532	571	612	654	695	736
Trade creditors, accrued costs and deferred income	4154	4771	5355	5981	6440	6856	7291	7678	8021	8342	8622
Income tax payable	50	47	47	47	47	47	47	47	47	47	47
Total current liabilities	4741	5325	6068	6750	7267	7743	8238	8685	9087	9465	9799
Total shareholders' equity and liabilities	9428	10368	11298	12291	13191	14063	14982	15863	16700	17489	18228

Appendix 2 | Income Statement

CONSOLIDATED INCOME STATEMENT (€M)	2020	2021	2022YE	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F
Sales	19293	20889	25365	28246	30451	32456	34562	36438	38112	39637	40972
Cost of Sales	-15047	-16366	-19974	-22226	-23945	-25503	-27139	-28592	-29885	-31059	-32083
Cost of goods sold ond materials consumed	-15025	-16156	-19720	-21945	-23644	-25184	-26800	-28237	-29515	-30676	-31689
Changes in inventories of finished goods and work in progress	3	7	9	10	11	11	12	13	13	14	14
Net cash discount and interest paid to suppliers	23	-17	30	33	36	38	40	43	45	46	48
Electronic payment commissions	-42	-47	-49	-55	-59	-63	-67	-71	-74	-77	-80
Other supplementary costs	-6	-153	-243	-269	-288	-305	-324	-340	-353	-366	-377
Gross Profit	4246	4523	5391	6019	6507	6953	7423	7846	8228	8579	8889
Distribution and Administrative Costs	-3559	-3682	-4329	-4899	-5263	-5594	-5934	-6236	-6501	-6777	-7020
Supplies and services	-751	-758	-992	-1190	-1252	-1302	-1352	-1389	-1414	-1471	-1521
Advertising and Rents costs	-113	-126	-172	-192	-207	-221	-235	-248	-259	-269	-279
Staff costs	-1751	-1864	-2162	-2407	-2595	-2766	-2945	-3105	-3248	-3378	-3492
Transportation costs	-201	-233	-271	-302	-325	-347	-369	-389	-407	-423	-437
Depreciation and amortization of tangibles and intangibles assets	-418	-425	-425	-479	-526	-573	-616	-656	-692	-722	-747
Depreciation of right-of-use assets	-316	-320	-318	-342	-370	-401	-432	-465	-498	-531	-564
Profit/loss tangible & intangible assets and others	-9	44	11	12	13	14	15	16	17	17	18
Other Operating Profits/Losses	-51	-34	-36	-41	-44	-47	-50	-52	-55	-57	-59
Losses from organizational restructuring programs	-16	-14	-13	-15	-16	-17	-18	-19	-20	-21	-22
Employees exceptional recognition	-19	-19	-23	-26	-28	-30	-31	-33	-35	-36	-37
Operating Profit (EBIT)	636	807	1026	1079	1200	1312	1439	1558	1672	1745	1810
Net Financial Costs	-180	-154	-171	-186	-196	-207	-216	-226	-242	-257	-273
Net loans interest expense	-23	-18	-36	-41	-39	-37	-33	-29	-31	-32	-34

Leases interest expense	-127	-130	-137	-148	-160	-172	-185	-199	-214	-228	-243
EBT	459	652	855	893	1004	1106	1222	1332	1430	1487	1537
Income Tax	-136	-168	-231	-241	-271	-299	-330	-360	-386	-402	-415
Net Income	323	484	624	652	733	807	892	972	1044	1086	1122

Appendix 3 | Cash Flow Statement

CONSOLIDATED CASH FLOW STATEMENT (€M)	2020	2021	2022YE	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F
Net results	312	463	597	624	701	772	854	930	999	1039	1073
Non-controlling interests	11	21	27	28	32	35	39	42	45	47	49
Income tax	136	168	231	241	271	299	330	360	386	402	415
Depreciations and amortisations	734	745	743	821	897	973	1048	1121	1190	1253	1310
Net financial costs	180	154	171	186	196	207	216	226	242	257	273
Operating cash flow before changes in working capital	1378	1555	1769	1901	2097	2286	2487	2679	2861	2997	3120
Inventories	14	-148	-217	-151	-115	-104	-110	-97	-87	-79	-69
Trade debtors, accrued income and deferred costs	23	-4	-152	-78	-60	-54	-57	-51	-45	-41	-36
Trade creditors, accrued costs and deferred income	205	527	583	625	459	417	435	386	343	321	280
Cash generated from operations	1623	1931	1983	2297	2381	2544	2756	2917	3073	3198	3295
Income taxes paid	-174	-174	-231	-241	-271	-299	-330	-360	-386	-402	-415
Cash flow from operating activities	1449	1756	1752	2056	2110	2245	2426	2557	2686	2796	2881
Acquisition of tangible and intangible assets	-514	-584	-1035	-1006	-1044	-1061	-1061	-1053	-1030	-999	-955
Others	25	-32	-16	1	1	1	1	1	1	2	2
Cash Flow from Investing	-488	-617	-1051	-1005	-1043	-1059	-1060	-1052	-1028	-998	-953
Loans interest paid	-28	-22	-35	-40	-38	-36	-32	-28	-29	-31	-32
Leases interest paid	-127	-130	-137	-148	-160	-172	-185	-199	-214	-228	-243
Net change in loans	-146	-40	56	47	47	46	44	41	37	33	28
Leases paid	-274	-286	-310	-337	-364	-393	-422	-452	-481	-509	-536
Dividends paid:	-232	-198	-511	-538	-559	-628	-693	-767	-837	-902	-942
To common shareholders	-217	-181	-493	-514	-535	-601	-663	-733	-801	-863	-901
Non Controlling Interests	-15	-17	-18	-23	-24	-27	-30	-33	-36	-39	-41
Cash flow from financing activities	-807	-676	-937	-1015	-1074	-1183	-1289	-1405	-1525	-1637	-1724
Net changes in cash and cash equivalents	153	463	-236	37	-7	3	77	101	133	161	203
Cash and cash equivalents at the end of period	1041	1493	1257	1294	1287	1289	1366	1467	1600	1762	1965

Appendix 4 | Key Financial Ratios

Financial Analysis	2020	2021	2022YE	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F
Activity											
Inventory turnover	15	16	16	16	15	15	15	15	15	15	15
DIO (Days of Inventory Outstanding)	24	24	22	23	24	24	24	24	24	24	24
DSO (Days Sales Outstanding)	9,22	8,73	8,81	9,39	9,54	9,59	9,60	9,64	9,68	9,71	9,74
DPO (Days Payable Outstanding)	101	100	93	93	95	95	95	96	96	96	97
DPO (short term)	80	77	72	74	75	75	75	76	76	76	76
WC	-3 165	-3 393	-3 757	-4 142	-4 532	-4 852	-5 165	-5 470	-5 746	-6 002	-6 240
Fixed asset turnover	3	3	3,4	3,5	3,4	3,4	3,4	3,3	3,3	3,3	3,3
Total asset turnover	2	2	2,3	2,4	2,4	2,4	2,4	2,4	2,3	2,3	2,3
Liquidity											
Current ratio	0,5	0,6	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5
Quick ratio	0,3	0,4	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3
Cash ratio	0,2	0,3	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2
CCC	-46	-45	-41	-41	-42	-42	-42	-42	-42	-42	-42
Solvency											
Debt											
Debt-to-IC	0,6	0,5	0,5	0,5	0,5	0,6	0,6	0,6	0,6	0,6	0,6
Debt-to-equity	1,3	1,2	1,1	1,2	1,2	1,2	1,3	1,3	1,3	1,3	1,3
Net Debt-to-EBITDA	1,4	1,0	0,9	1,0	1,0	1,1	1,1	1,1	1,1	1,1	1,1
Coverage											
Interest Coverage	4,3	5,5	6,0	5,8	6,1	6,3	6,6	6,9	6,9	6,7	6,6
Profitability											
Return on Sales											
Gross profit margin	22%	22%	21%	21%	21%	21%	21%	22%	22%	22%	22%
Operating profit margin	3%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Net profit margin	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%
Return on Investment											
ROA	6,6%	8,2%	9,5%	9,2%	9,4%	9,6%	9,9%	10,1%	10,3%	10,2%	10,1%
ROIC	6,2%	9,3%	11,2%	11,0%	11,6%	11,9%	12,3%	12,6%	12,7%	12,5%	12,2%
ROE	14,4%	20,2%	23,7%	23,4%	25,1%	26,1%	27,2%	28,0%	28,4%	28,0%	27,7%
Dividend related											
Div payout	72%	41%	82%	82%	76%	78%	78%	79%	80%	83%	84%

Appendix 5 | Financial Statements Assumptions

Balance Sheet Assumptions	Unit	2022YE	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F	Note
Operating Assets											

PP&E	%NFA	57,9%	58,1 %	58,2 %	58,2 %	58,0 %	57,7 %	57,3 %	56,9 %	56,3 %	PP&E computed per banner, split into maintenance and expansion.
Right-of-use Assets	%NFA	31,0%	30,7 %	30,6 %	30,7 %	30,9 %	31,3 %	31,7 %	32,3 %	32,9 %	RoU new contracts grow in accordance to rent expections, mainly affected by inflation
Intangible Asstes	%NFA	11,0%	11,0 %	11,0 %	11,0 %	11,0 %	10,9 %	10,9 %	10,8 %	10,7 %	Intangibles CAPEX grows at PP&E growth rate
Trade receivables	DSO	10	10	10	10	10	10	10	10	10	Average 2016-2021, Sales base
Inventories	DIO	24	24	24	24	24	24	24	24	24	Average 2016-2021, COGS base
Biological Assets	€M	14	16	17	18	19	21	21	22	23	Growing at the same rate as inventories
Income Tax Receivable	€M	23	23	23	23	23	23	23	23	23	Assumed constant due to lack of information needed
Non-Operating Assets											
Deferred tax assets	€M	175	175	175	175	175	175	175	175	175	Assumed constant due to lack of information needed
Investments + Assets available for sale + Derivatives	€M	33	33	33	33	33	33	33	33	33	Assumed constant due to lack of information needed
Operating Liabilities											
Payables	DPO	99	99	99	99	99	99	99	99	99	Average 2016-2021, COGS base
Income Tax Payable	€M	47	47	47	47	47	47	47	47	47	Assumed constant due to lack of information needed
Non-Operating Liabilities											
Lease Liabilities	€M	2 564	2 770	2 990	3 220	3 461	3 709	3 959	4 211	4 462	L. Liab.(n) = LL(n-1) - Lease amortization(n) + Lease renewal(n). The renewals grom in accordance with rent expectations, in line with RoU
Borrowings	%NCA	6,3%	6,3%	6,3%	6,3%	6,3%	6,3%	6,3%	6,3%	6,3%	2021 Percentage of Non-Current Assets, growing along with CAPEX
Current	%Total Borrowings	47%	47%	47%	47%	47%	47%	47%	47%	47%	2016-2021 average, in line with 2022Q3
Non-Current	%Total Borrowings	53%	53%	53%	53%	53%	53%	53%	53%	53%	2016-2021 average, in line with 2022Q3
Provisions	€M	34	34	34	34	34	34	34	34	34	Assumed constant due to lack of information needed
Employee Benefits	€M	70	70	70	70	70	70	70	70		Assumed constant due to lack of information needed

Income Statement Assumptions	Unit	2022E	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F	Note
Revenues											
Poland	€M	17 940	19 845	21 275	22 548	23 945	25 128	26 137	27 067	27 901	
Portugal	€M	5 657	6 057	6 352	6 622	6 862	7 097	7 337	7 567	7 785	
Colombia	€M	1768	2344	2824	3287	3755	4213	4639	5004	5286	
Operating Costs											
Cost of Goods Sold	% Revenue	-77,7%	-77,7%	-77,6%	-77,6%	-77,5%	-77,5%	-77,4%	-77,4%	-77,3%	Starting at 2021 level and reaching 2019-2021 average
Other cost of sales	€M	-254	-281	-301	-319	-338	-355	-369	-382	-394	2016-2021 average rate (excluding Retail tax); Includes the new Polish Retail tax for the different levels of Revenue.
Advertising costs	% Revenue	-0,6%	-0,6%	-0,6%	-0,6%	-0,6%	-0,6%	-0,6%	-0,6%	-0,6%	2016-2021 average rate
Staff costs	% Revenue	-8,5%	-8,5%	-8,5%	-8,5%	-8,5%	-8,5%	-8,5%	-8,5%	-8,5%	2016-2021 average rate
Transportation costs	% Revenue	-1,1%	-1,1%	-1,1%	-1,1%	-1,1%	-1,1%	-1,1%	-1,1%	-1,1%	2016-2021 average rate
Others	% Revenue	-0,04%	-0,04%	-0,04%	-0,04%	-0,04%	-0,04%	-0,04%	-0,04%	-0,04%	2016-2021 average rate. Includes short-term rents and Other profits/losses
Supplies and services	% Rev + overcharge	-3,9%	-4,2%	-4,1%	-4,0%	-3,9%	-3,8%	-3,7%	-3,7%	-3,7%	
Except Energy	% Revenue	-1,2%	-1,5%	-1,4%	-1,3%	-1,2%	-1,1%	-1,0%	-1,0%	-1,0%	2016-2021 average rate, plus a gradually fading overcharge reflecting the company's expectations
Energy	% Revenue	-2,7%	-2,7%	-2,7%	-2,7%	-2,7%	-2,7%	-2,7%	-2,7%	-2,7%	2016-2021 average rate
D&A of Tangibles and Intangibles	% PP&E(n-1)	-425	-479	-526	-573	-616	-656	-692	-722	-747	2019-2021 average depreciation rate (8.9%)
Depreciations of RoU Assets	% RoU(n-1)	-318	-342	-370	-401	-432	-465	-498	-531	-564	2020-2021 average depreciation rate (14.2%)
Net Financial Costs											
Loans interest expense	€M	-35	-40	-38	-36	-32	-28	-29	-31	-32	Forecasted Cost od Debt, see Appendix xx
Leases interest expense	€M	-137	-148	-160	-172	-185	-199	-214	-228	-243	5.8% (Incremental Borrowing rate used in 2019-2021)

Income Tax											
Income Tax	€M	-231	-241	-271	-299	-330	-360	-386	-402	-415	27% is the tax rate computed using the Tax Reconciliation method

Revenues, sqm and Stores	Unit	2022E	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F	Note
Poland											
Biedronka											
Real GDP Growth	%	3,8%	0,5%	3,1%	3,4%	3,3%	2,5%	2,5%	2,5%	2,5%	IMF world economic outlook Oct 2022, (database).
Elasticity of Demand to Income	#	0,52	0,52	0,52	0,52	0,52	0,52	0,52	0,52	0,52	"A meta-analysis of the price and income elasticities of food demand", Working Paper SMART – LERECO N°19-03, 2019
Inflation rate	%	13,8%	14,3%	4,3%	3,2%	2,5%	2,5%	2,5%	2,5%	2,5%	IMF world economic outlook Oct 2022 page 134, (database).
Population growth	%	8,1%	-2,2%	-1,8%	-1,3%	-0,6%	-0,4%	-0,3%	-0,3%	-0,3%	UN Projections, Department of Economic and Social Affairs, Jul/2022
LFL growth ecl. Forex	%	25,5%	12,0%	4,1%	3,6%	3,6%	3,4%	3,6%	3,6%	3,6%	(1+GDPgrowth*elast.)*(1+infl.)*(1+pop.growth)-1
EUR/ZLO	%	-2,4%	-6,0%	-1,1%	-1,4%	-0,7%	-0,7%	-0,7%	-0,7%	-0,7%	Futures market projections until 2024. From 2025, differences between expected inflation of currency and Eurozone inflation.
LFL growth incl. Forex	%	22,5%	5,2%	3,0%	2,2%	2,9%	2,7%	2,8%	2,8%	2,8%	(1+LFLexcl.Forex)*(1+EUR/ZLO)-1
Area per store	thousand SQM	0,70	0,71	0,72	0,72	0,73	0,73	0,73	0,73	0,73	Growing (or decreasing depending on each banner's historic, and aligned with market estimates) at the CAGR 2015-2022YE until 2026YE, stabilizing after.
Number of stores	#	3 395	3 497	3 587	3 664	3 727	3 775	3 808	3 825	3 825	2022 is having in mind Q3 2022 growth. From 2023 is CAGR 2017-2022.
Total area	thousand SQM	2 374	2 473	2 566	2 651	2 728	2 763	2 787	2 800	2 800	Area per store * Number of stores
Sales per thousand SQM	€M	7,6	8,0	8,3	8,4	8,7	8,9	9,2	9,4	9,7	Sales per thous. SQM(n)=Sales per thous. SQM(n-1) *(1+LFL growth inc. Forex)
Biedronka's Sales	€M	17 582	19 429	20 796	22 008	23 341	24 468	25 434	26 329	27 136	Sales(n)=Sales per thous. SQM(n) * Average Area (beginning and year end)
Hebe's Sales	€M	358	416	479	539	604	659	703	739	765	-
Portugal											
Pingo Doce	€M	4 499	4 820	5 071	5 301	5 504	5 702	5 904	6 095	6 273	Remark: SQM per store decreses until 2026 at the -0.39% CAGR 2015-2022, stabilizing after. In line with proximity strategy.
Recheio	€M	1 158	1 237	1 281	1 321	1 358	1 394	1 432	1 472	1 512	-
Colombia											
Ara	€M	1 768	2 344	2 824	3 287	3 755	4 213	4 639	5 004	5 286	Remark: SQM per store decreses until 2026 at the -0.28% CAGR 2015-2022, stabilizing after. In line with proximity strategy.

Appendix 6 | SWOT analysis

Strengths
Strong banners in each business segment (market leadership and economies of scale).
High focus in ESG: listed company in over 100 international sustainability indices
Strong cash flows solid position to seek financing for possible expansion projects.

Weaknesses
Group performance is highly dependence of Biedronka banner.
High competition and weakening of the Colombian peso have affecting Ara's profitability.
Lack of investment in e-commerce.
Old farms which are not generating as much energy as new ones are – less efficient equipment

Opportunities
Romania poses as a feasible and most likely expansion for the Group.
Strong presence in the Latin American region with big distribution centers opens the possibility to expand operations.
Possible synergies between business segments through web applicatios.

Threats
Entrance of Mercadona, the Spanish supermarket chain, in the Portuguese market.
Litigations in Poland namely fines of 10% of revenues accounting almost 1.4 billion euros).
War in Ukraine has made energy costs soar in Europe where JMT was hedged up until June.

Appendix 7 | Jerónimo Martins CAPEX

CAPEX (in '000 000)	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR 22-30
Poland										
Biedronka										
CAPEX Revamping	373	419	445	464	483	500	515	529	541	4,7%
# stores reburbished	307	320	330	338	346	352	356	359	361	2,1%
% stores refubished	9,4%	9,4%	9,4%	9,4%	9,4%	9,4%	9,4%	9,4%	9,4%	-
Cost per revamp	1,2	1,3	1,3	1,4	1,4	1,4	1,4	1,5	1,5	2,6%
CAPEX Expansion	93	75	71	65	58	49	41	31	20	-17,4%
# stores closed	26	27	28	28	29	29	30	30	30	2,1%

% store closings	0,8%	0,8%	0,8%	0,8%	0,8%	0,8%	0,8%	0,8%	0,8%	-
Stores beginning Year	3250	3395	3497	3587	3664	3727	3775	3808	3825	2,1%
# new stores	171	129	118	105	92	77	63	47	30	-19,5%
# stores	3395	3497	3587	3664	3727	3775	3808	3825	3825	1,5%
Capex per new store	0,5	0,6	0,6	0,6	0,6	0,6	0,6	0,7	0,7	2,6%
Intangibles and Inv.Property	144,2	135,4	133,2	133,7	132,6	130,4	126,4	122,0	116,0	
Total CAPEX	611	629	649	663	673	679	682	682	677	1,3%
Hebe Total CAPEX	17	19	20	21	22	22	22	21	20	2,0%
Pingo Doce Total CAPEX	155	170	173	177	177	178	177	177	174	1,4%
Recheio Total CAPEX	29	29	29	30	30	30	30	31	31	0,9%
Ara Total CAPEX	224	159	172	170	160	143	119	88	53	-16,6%
Total Group CAPEX	1035	1006	1044	1061	1061	1053	1030	999	955	-1,0%

CAPEX is computed per banner. In each banner, we look at historical rates of store closures, and store refurbishments to forecast the future closures and number of refurbishments. The number of new stores is calculated having in mind historical store count growth and future prospects for each banner within each market. The cost per revamp and per opening is forecasted adjusting the latest average costs* per revamp and new store, according to forecasted inflation and the FOREX differences per country.

*Company states that opening new stores or revamping existing one's costs practically the same. However, the number of refurbishments on the reports accounts for complete refurbishments, although the company also renovates other existing stores. This makes the cost per revamping appear significantly larger.

Appendix 8 | WACC assumptions

JMT's presence in several countries, with different risk levels and required returns, limits the estimation of the true consolidated WACC. Due to this, multiple approaches were applied: 1) **Estimating discount rates and WACC for each geographical segment**, 2) Estimating WACC on a Group level & 3) Estimating WACC as a SoP for the cost of equity and using group cost of debt and tax levels to come up with a reasonable WACC. The method used was the initial. The outputs for WACC per geographical operation is displayed in the figure below.

WACC, per geography	2022F	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F	TV
Portugal	7,0%	7,0%	6,9%	6,8%	6,8%	6,7%	6,7%	6,7%	6,6%	6,6%
Poland	10,8%	10,8%	10,6%	10,5%	10,4%	10,3%	10,2%	10,2%	10,2%	10,2%
Colombia	18,2%	18,1%	17,8%	17,6%	17,3%	17,2%	17,0%	16,8%	16,6%	16,6%
Consolidated WACC	10.4%	10.8%	11.1%	11.0%	11.0%	10.9%	10.8%	10.8%	10.8%	10.8%

Cost of Equity (Ke)| To calculate JMT's cost of equity, we used the Capital Asset Pricing Model (CAPM: Ke = RFR + ß * ERP). Specifically, we computed Ke for each geographical segment separately and included it in the segment specific WACC computations.

Betas | The Betas used to calculate the cost of equity were estimated using the **pure-play method** (sample of 6 peers per geographical segment using the SARD approach). Collecting levered betas for peers and estimating an average was the first approach. From there they were delevered using the sum of the capital structure, according to each peer's capital structure and statutory tax rates. Adjustment for cash were also made using peers book values. Lastly, re-levering was applied using the capital structure for each forecasted year. To conclude the computation, and using the Blume assumptions that betas with time converge towards the market (ß = 1), we **adjusted the results with the Blume method** (Adjusted beta = 2/3 * + 1/3 * (market beta))

Country specific beta	D/E	Cash/EV	5Y m. Beta	Tax Rate	Cash adj.	Unlevered	Relevered	Blume adj.
Portugal	1.39	0.13	0.65	0.23	0.75	0.36	0.47	0.65
Poland	0.26	0.04	0.52	0.19	0.54	0.45	0.59	0.73
Colombia	1.09	0.09	1.24	0.35	1.37	0.80	1.01	1.01

RFR and ERP | Equity risk premium rates were computed using the historical premium approach, where the actual returns on stocks earned over the long period is estimated and compared to the actual returns earned on a risk-free security. The difference between the values is the historical premiums on an annual basis for each country. The risk-free rate was computed by taking the 10Y Yields of the sovereign bonds (in respect to currency risk) in which JMT operates and the CDS for the country was added on top of the yields. Equity Risk premia was computed considering the German historical ERP and adding the country risk spread for Portugal, Poland, and Colombia to get separate ERP values per segment.

Cost of Debt (Kd) | Cost of debt was estimated by looking at the country specific RFR and adding the Implied Credit Default Spread (computed using the interest rate coverage ratio as a benchmark) for each geographical segment.

WACC, Hybrid approach	2022F	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F
Cost of Equity									
EBIT Weighted Ke	11,5%	12,0%	12,3%	12,5%	12,6%	12,7%	12,7%	12,8%	12,8%
Cost of Debt									
Cost of Debt	7,4%	7,7%	6,8%	5,7%	4,8%	3,9%	3,9%	3,9%	3,9%
Tax rate	25,3%	25,3%	25,3%	25,3%	25,3%	25,3%	25,3%	25,3%	25,3%
Lease rate	7,8%	8,2%	7,8%	7,3%	7,2%	7,2%	7,2%	7,2%	7,2%
Target Weights									
Equity Weight, mkt value	80,6%	79,4%	78,1%	76,8%	75,5%	74,2%	73,0%	71,9%	70,8%
Lease Liabilities	16,1%	17,1%	18,2%	19,3%	20,4%	21,5%	22,5%	23,6%	24,6%
Debt Weight	3,2%	3,5%	3,7%	3,9%	4,1%	4,3%	4,4%	4,5%	4,6%
WACC Output	10,3%	10,7%	10,8%	10,7%	10,7%	10,6%	10,5%	10,5%	10,4%

Appendix 9 | Terminal Growth Rate

Terminal growth rates	Portugal	Poland	Colombia	Group
g	1%	2%	2.5%	2%

Operating in three geographical segments, estimates show JMT will stabilize its growth in each segment. FCF is forecasted to grow perpetually at a constant rate for the terminal period. The Stable Growth Model and the PRAT Model were used as an initial approach. However, the values derived overestimated the terminal growth rate. JMT's revenues depend on macroeconomic variables, such as food consumption, which historically follows GDP growth, hence the forecasted real GDP **growth rate for each segment was used as a proxy of the terminal growth rate**.

PRAT model	2022F	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F
Net Income	624	652	733	807	892	972	1 044	1 086	1 122
Dividends	511	538	559	628	693	767	837	902	942
Avg. Equity	2 490	2 527	2 598	2 769	2 953	3 127	3 320	3 515	3 710
Sales	25 365	28 246	30 451	32 456	34 562	36 438	38 112	39 637	40 972
Avg. Assets	10 833	7 653	8 068	8 624	13 140	14 077	14 946	15 776	16 605
Ratios									
Div. Payout	81,9%	82,5%	76,3%	77,8%	77,6%	78,8%	80,2%	83,1%	83,9%
Retention	18,1%	17,5%	23,7%	22,2%	22,4%	21,2%	19,8%	16,9%	16,1%
ROE	0,25	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3
Profit margin	0,02	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Asset turnover	2,34	3,7	3,8	3,8	2,6	2,6	2,6	2,5	2,5
Equity multiplier	4,35	3,0	3,1	3,1	4,5	4,5	4,5	4,5	4,5
Growth	4,55%	4,5%	6,7%	6,5%	6,8%	6,6%	6,2%	5,2%	4,9%

Appendix 10 | FCFF Valuation per business segment

Portugal, €M	2022F	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F	TV
Revenues	5 657	6057	6352	6622	6862	7097	7337	7567	7785	
Pingo Doce	4 499	4820	5071	5301	5504	5702	5904	6095	6273	
Recheio	1 158	1237	1281	1321	1358	1394	1432	1472	1512	
EBITDA	322	328	351	372	393	413	434	448	461	
EBIT	132	123	135	148	160	173	186	192	197	
Pingo Doce	105	98	108	118	128	139	150	154	159	
Recheio	27	25	27	29	32	34	36	37	38	
Tax rate	22,5%	22,5%	22,5%	22,5%	22,5%	22,5%	22,5%	22,5%	22,5%	
Taxes	40	37	41	45	49	53	57	59	61	
Pingo Doce	31	29	32	36	39	42	45	47	48	
Recheio	7	7	7	8	9	9	10	10	10	
NOPAT	92	86	94	103	111	120	129	133	137	
(+) D&A and provisions	166	176	187	199	208	218	229	239	249	
(-) Changes in NWC	(48)	-85	-59	-53	-53	-46	-41	-38	-33	
(-) CAPEX	184	199	203	207	206	209	207	208	205	
FCFF	122	148	138	147	166	176	191	202	214	3480
Pingo Doce	88	107	99	107	123	131	144	153	164	2662
Recheio	35	43	40	42	45	47	49	51	52	848
WACC	7,1%	7,0%	6,9%	6,8%	6,8%	6,7%	6,7%	6,7%	6,6%	6,6%
Enterprise value	2 546 €	g = 1%								

Discounted Cash Flow – Pingo Doce			
Forecast Year	Free cash flow	WACC	Present Value
2024F	99	7.0%	92
2025F	107	6.9%	94
2026F	123	6.9%	101
2027F	131	6.8%	101

Discounted Cash Flow - Recheio			
Forecast Year	Free cash flow	WACC	Present Value
2024F	40	7.0%	38
2025F	42	6.9%	37
2026F	45	6.9%	37
2027F	47	6.8%	36

2028F	144	6.8%	104		2028F	49	6.8%	35
2029F	153	6.8%	104		2029F	51	6.8%	34
2030F	164	6.7%	104		2030F	52	6.7%	33
Terminal Value			1,847		Terminal Value			585
Present Value of Operations			2,546		Present Value of Operations			835
Outstanding Shares (Mn)			629		Outstanding Shares (Mn)			629
Price Target (€/Share)			€4.05*		Price Target (€/Share)			€1.33

Poland, €M	2022F	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F	TV
Revenues	17940	19845	21275	22548	23945	25128	26137	27067	27901	
EBITDA	1539	1746	1893	2029	2179	2312	2431	2517	2595	
EBIT	982	1027	1122	1212	1311	1401	1483	1536	1576	
Tax rate	19,0%	19,0%	19,0%	19,0%	19,0%	19,0%	19,0%	19,0%	19,0%	
Taxes	187	195	213	230	249	266	282	292	300	
NOPAT	795	832	909	981	1062	1134	1201	1244	1277	
(+) D&A and provisions	526	577	627	676	726	773	816	856	892	
(-) Changes in NWC	-152	-279	-198	-179	-186	-164	-145	-137	-120	
(-) CAPEX	628	648	669	684	695	701	704	703	697	
FCFF	845	1039	1064	1153	1280	1370	1458	1534	1592	17868
WACC	10,8%	10,8%	10,6%	10,5%	10,4%	10,3%	10,2%	10,2%	10,2%	10,2%
Enterprise value	16 298 €	g =2%								

DCF – Biedronka + Hebe			
Forecast Year	Free cash flow	WACC	Present Value
2024F	1,064	10.6%	962
2025F	1,153	10.5%	944
2026F	1,280	10.4%	950
2027F	1,370	10.3%	924
2028F	1,458	10.2%	895
2029F	1,534	10.2%	854
2030F	1,592	10.2%	806
Terminal Value			9,963
Present Value of Operations			16,298
Outstanding Shares (Mn)			629
Price Target (€/Share)			€25.90

Colombia, €M	2022F	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F	TV
Revenues	1 768	2344	2824	3287	3755	4213	4639	5004	5286	
EBITDA	55	141	234	276	319	362	404	435	460	
EBIT	14	70	150	177	207	236	264	285	301	
Tax rate	35,0%	35,0%	35,0%	35,0%	35,0%	35,0%	35,0%	35,0%	35,0%	
Taxes	5	25	52	62	72	83	93	100	105	
NOPAT	9	46	97	115	134	153	172	185	196	
(+) D&A and provisions	52	68	83	99	114	130	145	158	169	
(-) Changes in NWC	(15)	-33	-26	-26	-29	-28	-26	-25	-23	
(-) CAPEX	224	159	172	170	160	143	119	88	53	
FCFF	(148)	-12	34	70	117	167	224	280	335	2122
WACC	18,25%	18,1%	17,8%	17,6%	17,3%	17,2%	17,0%	16,8%	16,6%	16,6%
Enterprise value	1 391 €	g = 2.5%								

DCF - Ara			
Forecast Year	Free cash flow	WACC	Present Value
2024F	34	17.8%	29
2025F	70	17.6%	50
2026F	117	17.3%	73
2027F	167	17.2%	89
2028F	224	17.0%	102
2029F	280	16.8%	110
2030F	335	16.6%	114
Terminal Value			824
Present Value of Operations			1,391
Outstanding Shares (Mn)			629
Price Target (€/Share)			€2.21

Others, consolidation adjustments, €M	2022F	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F	TV
EBITDA	(112)	-124	-134	-143	-152	-160	-168	-175	-180	
EBIT	(156)	-173	-187	-199	-212	-224	-234	-243	-252	
Tax rate	27,0%	27,0%	27,0%	27,0%	27,0%	27,0%	27,0%	27,0%	27,0%	
Taxes	(39)	-44	-47	-50	-54	-57	-59	-61	-64	
NOPAT	(116)	-130	-140	-149	-159	-167	-175	-182	-188	
FCFF	(116)	-130	-140	-149	-159	-167	-175	-182	-188	-1961
WACC	10,4%	10,8%	11,1%	11,0%	11,0%	10,9%	10,8%	10,8%	10,8%	10,8%
Enterprise value	-1 838 €	g = 2%								

Appendix 11 | Windfall Tax Portugal

In accordance to Law n.º 24-B/2022, December 30th:

The Portuguese Government imposed a new tax law to be applied in 2022 and 2023 to big food retailers and energy suppliers operating in the country. The Government expects to get € 50M-100M from this tax in the 2-year span.

The following law presents applicability for Food Retailers operating in Portugal, with sales above € 100M and limited to the period of 2022 and 2023. In terms of incidence, there is a 33% tax rate over profits **that exceed the previous 4 years average, with a markup of 20%.**

	2018	2019	2020	2021	2022F	2023F
EBIT	128	154	84	116	132	123
Average EBIT previous 4 years					120.5	121.5
+ 20% markup					144.6	145.8
Does profit exceed the markup threshold?*					No	No

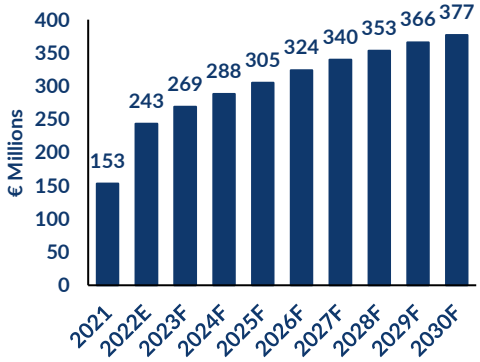
*the group has no debt in Euros. Thus, EBIT is a good proxy for EBT.

Appendix 12 | Retail Tax Poland

New Retail Tax entered into force on January 1st 2021.

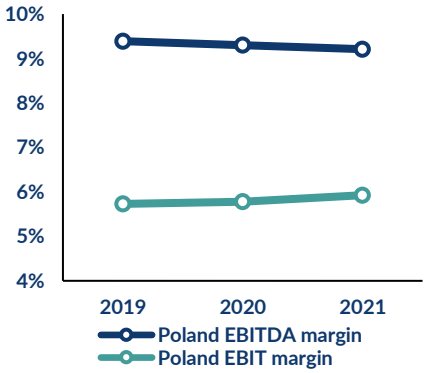
- 0.8% of revenues between PLN 17M and PLN 170M, per month (approx. € 3.6M and € 36M).
- 1.4% of revenues above PLN 170M per month.

Polish Retail Tax forecast



Effect on the Price Target (€ /sh.) forecasts

Did not affect Polish margins forecasts

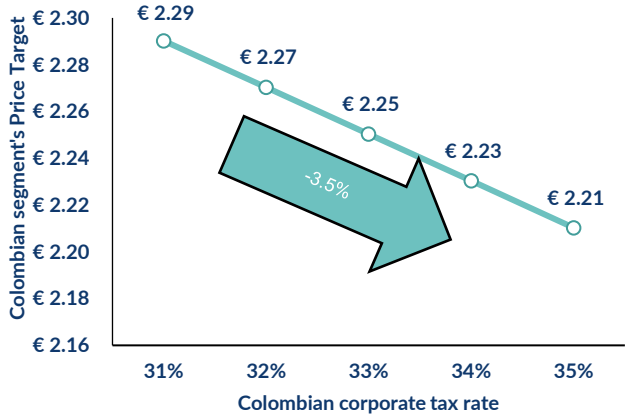


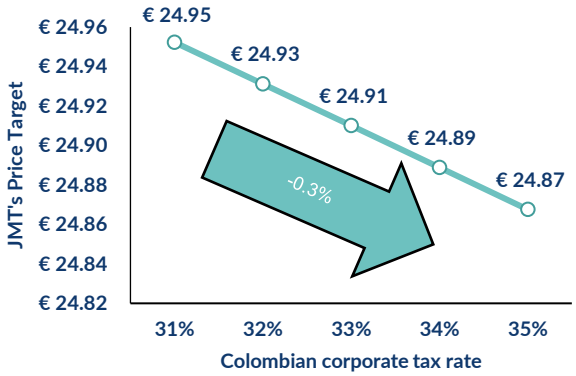
Appendix 13 | Income Tax Colombia

Colombian corporate tax rate increased from 31% to 35% in 2022, contributing for:

- Colombian segment and group's intrinsic value drops by € 0.08/sh.

- Respectively, -3.5% and -0.3%.





Appendix 14 | Income Tax Reconciliation

To capture tax management efficiency throughout the period, as well as to correctly use operating taxes in the DCF as a Group approach a tax reconciliation approach was implemented for the group's operations.

Operating taxes | Computation for forecasted operating tax rate was done by selecting specific recurring operating items from the reconciliation tables in the annual reports (3-year data). The selected recurring items are the different tax rates in foreign jurisdiction and the results subject to autonomous taxation. The 3-year average as a percentage of EBT was computed for both items and used for the forecasted period. The percentage was applied to the forecasted EBT values and added back to the operating taxes expressed as the statutory tax rate. The value obtained was then expressed in percentual terms to arrive at an operating tax rate of c.27% every year.

Operating cash taxes | To capture operating tax effects, we turned to the deferred tax assets which were forecasted item per item as an average percentage of their corresponding items in the balance sheet. The changes of the NDT was subtracted from the operating tax values and then expressed as a percentual rate. To obtain the tax rate for the DCF as a Group we computed the geometric mean of the forecasted operating cash taxes which yielded a result of 24.5%.

Operating cash taxes | To capture tax

In '000 EUR	2022	2023	2024	2025	2026	2027	2028	2029	2030
Profit before tax	855	893	1,004	1,106	1,222	1,332	1,430	1,487	1,537
EBIT	1,026	1,079	1,200	1,312	1,439	1,558	1,672	1,745	1,810
Statutory tax rate	22.50 %	22.50 %	22.50 %	22.50 %	22.50 %	22.50 %	22.50 %	22.50 %	22.50 %
Statutory taxes on EBIT	231	243	270	295	324	351	376	393	407
Recurring adjustments:									
(% of EBT) Different tax rates in foreign jurisdictions	6.70%	6.70%	6.70%	6.70%	6.70%	6.70%	6.70%	6.70%	6.70%
(% of EBT) Results subject to autonomous taxation and other forms of taxation	-1.20%	-1.20%	-1.20%	-1.20%	-1.20%	-1.20%	-1.20%	-1.20%	-1.20%
Cumulative adjustments	5.50%	5.50%	5.50%	5.50%	5.50%	5.50%	5.50%	5.50%	5.50%
Operating adjustments	47	49	55	61	67	73	79	82	85
OPERATING TAXES	278	292	325	356	391	424	455	474	492
Operating tax rate	27%	27%	27%	27%	27%	27%	27%	27%	27%

Deferred tax assets	2022	2023	2024	2025	2026	2027	2028	2029	2030
DTA	51	59	68	78	87	97	106	114	123
DTL	67	67	67	67	67	67	67	67	67
Net deferred taxes	-16	-8	1	10	20	30	39	47	56
Changes in DT	8	8	38	9	20	9	39	9	56
CASH TAXES	270		254		305		317		335
Cash tax rate	26%		23%		25%		24%		23%
Geo-mean	24.5%								

Appendix 15 | Residual Income Model

	2024F	2025F	2026F	2027F	2028F	2029F	2030F
NOPAT	876	958	1,050	1,137	1,220	1,273	1,321
Invested Capital	6,533	6,989	7,473	7,967	8,461	8,929	9,388
WACC	11.1%	11.0%	11.0%	10.9%	10.8%	10.8%	10.8%
EVA	154	188	232	269	304	305	307
EVA's Present Value	138	153	170	178	182	165	150

MVA's Present Value	1,749
Equity value	12,825
Price target (€/sh)	€ 25.0

Appendix 16 | Dividend Discount Model

	2024F	2025F	2026F	2027F	2028F	2029F	2030F
RFR, Portugal	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%
MRP, EBIT weighted average	7.3%	7.3%	7.3%	7.3%	7.3%	7.3%	7.3%
Beta, EBIT weighted average	75.0%	75.0%	75.0%	76.0%	76.0%	76.0%	76.0%
Ke, DDM	7.6%	7.6%	7.6%	7.7%	7.7%	7.7%	7.7%

Dividend Discount Model in '000 000			
Years	Dividends to Common Shareholders	Ke	PV Dividends
2024F	535	7.6%	497
2025F	601	7.6%	519
2026F	663	7.6%	531
2027F	733	7.7%	546
2028F	801	7.7%	554
2029F	863	7.7%	553
2030F	901	7.7%	536
Terminal value			9,677
(+) Excess Cash			1,294
Equity value			14,707
Outstanding shares			629
Price target			€ 23.4

Appendix 17 | Adjusted Present Value Model

APV Model in '000 000			
Years	FCF	Discount rate	PV FCF
2024F	1066	10.5%	965
2025F	1186	10.5%	971
2026F	1368	10.6%	1,011
2027F	1510	10.7%	1,006
2028F	1661	10.8%	997
2029F	1801	10.8%	973
2030F	1928	10.8%	938
Terminal value			10,895
Present Value of Operations			17755
(+) Interest Tax Shield			
2024F	53	7.6%	49
2025F	56	7.1%	49
2026F	58	6.8%	48
2027F	61	6.6%	47
2028F	65	6.6%	47
2029F	70	6.6%	47
2030F	74	6.6%	47
Terminal value			1,045
Present Value of ITS			1380
Total Non Operating Assets			1337
Enterprise value			20472
Total Debt and Debt equivalents			3673
Noncontrolling interests			1248
Equity Value			15551
Outstanding Shares			629
Price Target (€/Share)			€ 24.71

Appendix 18 | Peers Selection for Relative Valuation Purposes

The selection of the Peers was conducted through a Sum of Absolute Rank Differences (SARD) approach developed by Knudsen et al. (2017). The differential financial drivers selected, as recommended by the paper, were ROE (3y avg.), Debt/EBIT (3y avg), Current Market Cap, Revenue Growth 2019-2023 (Refinitiv Mean Estimate), EBIT margin (3y avg) and CFO/Revenues (3y avg). The pool of potential peers is comprised of companies in the Food Retail Industry (TRBC Name, Refinitiv), excluding those without physical retail stores or with Market Capitalization lower than €100M, and only including those with operations in Europe, Americas and/or Oceania.

The pool of companies was compared to each of JMT's geographical segments, and thus arriving at a final peer group of six companies, which minimized the SARD, for Portugal, Poland, and Colombia, as presented below.

Portugal				Poland				Colombia			
SARD Peers adjusted Rank	Ticker	Company Name	Country	SARD Peers adjusted Rank	Ticker	Company Name	Country	SARD Peers adjusted Rank	Ticker	Company Name	Country
1	B4B.DE	METRO AG	Germany	1	DNP.WA	Dino Polska SA	Poland	4	GENC.PA	Rallye SA	France
2	SBRY.L	J Sainsbury PLC	United Kingdom	2	AXFO.ST	Axfood AB	Sweden	7	EUR.WA	Eurocash SA	Poland
3	EUR.WA	Eurocash SA	Poland	5	KESKOB.HE	Kesko Oyj	Finland	7	USFD.N	US Foods Holding Corp	Poland
7	MTS.AX	Metcash Ltd	Australia	6	MRU.TO	Metro Inc	Canada	10	PFGC.N	Performance Food Group Co	United States of America
8	GENC.PA	Rallye SA	France	8	SFM.OQ	Sprouts Farmers Market Inc	United States of America	11	SMU.SN	SMU SA	Chile
9	CARR.PA	Carrefour SA	France	9	CRFB3.SA	Atacadao SA	Brazil	11	IMI.CN	Almacenes Exito SA	Colombia

Appendix 19 | Price Multiples for Relative Valuation Purposes

The relative valuation was conducted with a Sum of Parts (SoP) perspective, by addition of the equity value of each of JMT's geographical segments. The multiples were computed using Trailing Twelve Months (TTM) information, using the specific peer group for each segment as a result of the SARD approach. The calculation of the equity value was done for Price Multiples (P/E, P/B and P/S) and for Enterprise Value Multiples (EV/Sales, EV/EBITDA). Since the relative valuation is conducted by SoP, and the segments have individually attributable debt, EV Multiples are more appropriate for the estimation of the Price Target. As such, by means of an average of the EV Multiples' result of Equity Value, and by adding each segment, a price target of €25.02 was achieved.

	P/E	P/B	P/S	Average Equity Value	EV/Sales	EV/EBITDA	Average Equity Value
Portugal Peers	9,47	1,28	0,13	415 210 423,17 €	0,36	6,07	981 254 074,79 €
Poland Peers	17,68	3,18	0,77	9 306 675 743,58 €	0,91	10,88	15 217 036 616,87 €
Colombia Peers	20,61	1,23	0,19	98 067 847,33 €	0,38	8,29	77 050 613,34 €
			Price Target	15,60 €		Price Target	25,86 €

	P/E	P/B	P/S	Average Equity Value	EV/Sales	EV/EBITDA	Average Equity Value
Portugal Peers	9,47	1,3	0,1	€415,210,423	0,4	6,1	981,254,075
Poland Peers	17,68	3,2	0,8	€9,306,675,744	0,9	10,2	14,686,196,440
Colombia Peers	20,61	1,2	0,2	98,067,847	0,4	8,3	77,050,613
				Price Target	€ 15,60	Price Target	€ 25,02

Appendix 20 | Real Options Valuation

In order to compute the value-added optionality in case of an acquisition for possible targets in Romania we used a Real Option Valuation approach, excluding effects from synergies. An option to invest was considered with the **Binomial Model (American option)** and the **Black-Scholes Model** as valuation methods. The inputs for the models were the market volatility of the Romanian market, company specific WACC as discount rates, and the Romanian risk-free rate. Time steps (Δ t) for the binomial model were 1-time steps per year, and a forecast period of 5 years.

Market volatility (σ) | The Romanian market volatility was computed as the 3Y average annualized standard deviation of the RON index. The result yielded a standard deviation of 26%, which was included in both computing the time step value changes in the Binomial model, as well as the inputs for the Black Scholes model.

Company specific WACC | The discount rates used in the Real Option models as well as the DCF for Mega Image and Profi were computed based on their specific case. Cost of debt was computed the same way as the one for JMT's, as well as the Cost of equity using the CAPM approach. Both companies had an output of 13% for their WACC.

Romanian RFR | The Romanian risk-free rate was computed as the 10Y Yield of the Romanian Government Bond.

Appendix 21 | Risk Matrix

Market Risk | Energy Costs (MR2)

Energy prices spiked after the war, exacerbated by Europe's dependance on Russian energy sources. The increase was more notoriously in Poland, where Coal and Oil represent 70% 2021YE of total energy output. The Polish Government put a cap in electricity (693 zloty per MWh for up to 90% of average energy use), coal (2,000 zloty per tonne) and gas prices (200.17 zloty per MWh). Current prices were around 4 times higher in 2022. However, these measures applied only to households and special industries where Biedronka c.a 61% of the group's total energy consumption) do not qualify and is fully exposed. Energy costs will increase 50 basis points from 1% in 2021YE to 1.5% 2023YE of the total groups revenues amounting to €423M 2023YE. We expect energy costs to gradually decrease to the groups historic average of 1%. **Mitigation:** JMT had already planned implemented adaptation measures before the current energy cost increase. In Portugal long-term contracts hedged the group until June 2021 and in Poland with cost reduction strategies in place, energy consumption had been reduced by 11% for every €1,000 in revenues. Since 2016 the group has been investing €215M in water and energy consumption management to ensure maximum efficiency along the supply chain. JMT is also purchasing from renewable sources to power their banners in Portugal, by acquiring RECS certificates (Renewable Energy Certificate System).

Market Risk | Interest Rates (MR5)

The European Central bank has raised interest rates by 250 basis points since July 2022. Currently Interest rates are at Deposit facility 2%, Main Refinancing Options 2.5% and the marginal lending facility by 2.75%. ECB is expected to continue the steady increase until inflation returns in the medium-long term to the targeted 2%. Given the new debt incurred for expansion and the increase in the new 12- month EURIBOR to 3.37%, we expect the groups interest expenses to double to €32M by 2022YE. **Mitigation**: Following Jeronimo Martins financial stability policy, Debt to Assets (including financial leases) has remained at around 29%. Most of the company's financing source is equity-based and given market uncertainty cash holdings have increased from €0.6B to €1.5B from 2016YE-2021YE. Jeronimo Martins is prepared to weather the current crisis.

Legal & Regulatory Risk | Taxes on Retail (LRR2)

Governments have been increasing taxation on retailers. JMT has experienced an increase in retail taxes in the three core markets. The Polish Government has the lowest statutory tax rate of 19% of net income, however, they recently passed a legislation in 2021, standing at 0.8% of sales between PLN 17M and PLN 170M, and 1.4% for sales above PLN 170M per month. Additionally, the corporate tax rate in Colombia was adjusted in 2022 from 31% to 35%. In Portugal, the Government will tax by 33% the returns of companies higher than their four-year average by 20%, from big retailers and energy suppliers. **Mitigation**: Retail taxes are not expected to impact the Portuguese segment, as forecasts points to a profit growth below the threshold of 20% over the last 4 years average (only applies in 2022 and 2023). Part of the costs of the tax in Poland are shifted towards the consumers, albeit at expectedly lower rates than competitors.

Strategic and Operational Risk | Loss of Market Share (new competition) (SOR1)

The emergence of new competitors who have the ability to capture market share from JMT's banner may pose a threat to the group's market position. **Mitigation:** the company provides premium quality products at highly competitive prices and invests significantly in loyalty programs, specifically in Poland, in order to strengthen customer retention. Additionally, there are expansion plans to diversify the revenue streams and reduce reliance on a single brand.

Strategic and Operational Risk | Product Contamination (SOR2)

More than a margins risk, product contamination can have an impact on the company's reputation and consequence loss of market share. Mitigation: the company has a major focus on quality in their products, not only through they Distribution Centers, and well as their Agrobusiness segment, with proper metrics as to product delivery and standards.

Geo-Political Risk | War escalation (GPR1)

The ongoing conflict in Ukraine has had a significant impact on JMT's operations in Poland, exerting pressure on margins and creating uncertainty for future investments in the region. Despite a potential increase in sales stemming from an influx of Ukrainian immigrants, the rising costs of raw materials and services are likely to negatively impact JMT's profitability. **Mitigation**: Poland is currently fighting over the release of €35Bn with the European commission, but this will be a risk to consider while it lasts.

Legal & Regulatory Risk | Litigation (LRR1)

Jeronimo martins has been accused of price fixing and fined with around €Bn in 2022 in Portugal, and with €1.46B in 2021 in Poland (yet to be officialized), for a possible misleading advertisement to consumers, and others. If settled, the litigation will affect JMT's price target in about €0.6/sh. **Mitigation**: the management has expressed strong opposition to the fines, stating that the evidence used to support the decision was collected in a subjective and inadequate manner. As a result, the company plans to appeal the decision.

Strategic and Operational Risk | Cybersecurity (SOR3)

Ransomware attacks volume increased significantly in Big Companies during 2021, having slowed down in 2022. JMT database controls efficiently discounts, product mix, supplier output and needs. Any attack on JMT can affect the day-to-day operations in the whole supply chain

Legal & Regulatory Risk | ESG Regulation (LRR3)

ESG regulatory framework will change and affect the whole European area and the risks from the uncertainties regarding the ESG regulation may affect even well scored companies in ESG like JMT. **Mitigation**: the company is well positioned ESG wise, with presence in multiple indices related to sustainability and several initiatives related to social ventures.

Appendix 22 | Sensitivity Analysis

Portugal's EBIT margin Shifts	Poland's EBIT margin shifts				
	-1.5%	-0.75%	0%	0.75%	1.5%
-1.5%	€ 18.16	€ 20.91	€ 23.68	€ 26.45	€ 29.24
-0.75%	€ 18.74	€ 21.50	€ 24.27	€ 27.05	€ 29.84
0%	€ 19.32	€ 22.09	€ 24.87	€ 27.65	€ 30.44
0.75%	€ 19.90	€ 22.67	€ 25.45	€ 28.24	€ 31.04
1.5%	€ 20.48	€ 23.26	€ 26.04	€ 28.84	€ 31.63

Real GDP	Elasticity Shifts				
	-0.2	-0.1	0	0.1	0.2
-1.5%	€ 22.18	€ 22.43	€ 22.67	€ 22.92	€ 23.16
-0.75%	€ 22.84	€ 23.29	€ 23.75	€ 24.22	€ 24.69
0%	€ 23.51	€ 24.18	€ 24.87	€ 25.57	€ 26.28
0.75%	€ 24.20	€ 25.10	€ 26.02	€ 26.97	€ 27.94
1.5%	€ 24.90	€ 26.04	€ 27.21	€ 28.43	€ 29.68

Real GDP shift	All segment's EBIT margin shift				
	-1.5%	-0.75%	0%	0.75%	1.5%
-1.5%	€ 15.78	€ 19.22	€ 22.67	€ 26.12	€ 29.57
-0.75%	€ 16.66	€ 20.20	€ 23.75	€ 27.30	€ 30.84
0%	€ 17.58	€ 21.22	€ 24.87	€ 28.51	€ 32.16
0.75%	€ 18.52	€ 22.27	€ 26.02	€ 29.77	€ 33.53
1.5%	€ 19.50	€ 23.35	€ 27.21	€ 31.07	€ 34.93

Poland's Real GDP shift	Poland's EBIT margin Shift				
	-1.5%	-0.75%	0%	0.75%	1.5%
-1.5%	€ 17.90	€ 20.51	€ 23.14	€ 25.78	€ 28.42
-0.75%	€ 18.60	€ 21.29	€ 23.99	€ 26.70	€ 29.42
0%	€ 19.32	€ 22.09	€ 24.87	€ 27.65	€ 30.44
0.75%	€ 20.07	€ 22.91	€ 25.77	€ 28.63	€ 31.50
1.5%	€ 20.84	€ 23.76	€ 26.70	€ 29.64	€ 32.59

Real GDP shifts	Inflation Shifts				
	-2%	-1%	0	1%	2%
-2%	€ 21.01	€ 21.50	€ 21.97	€ 22.43	€ 22.88
-1.0%	€ 22.35	€ 22.87	€ 23.39	€ 23.89	€ 24.38
0	€ 23.75	€ 24.31	€ 24.87	€ 25.41	€ 25.94
1.0%	€ 25.21	€ 25.82	€ 26.41	€ 27.00	€ 27.58
2%	€ 26.73	€ 27.39	€ 28.03	€ 28.66	€ 29.28

Real GDP Shifts	Population Shifts				
	-0.5%	-0.25%	0%	0.25%	0.5%
-1.5%	€ 21.34	€ 22.00	€ 22.67	€ 23.36	€ 24.06
-0.75%	€ 22.37	€ 23.05	€ 23.75	€ 24.46	€ 25.19
0	€ 23.44	€ 24.15	€ 24.87	€ 25.60	€ 26.36
0.75%	€ 24.54	€ 25.27	€ 26.02	€ 26.79	€ 27.57
1.5%	€ 25.68	€ 26.44	€ 27.21	€ 28.00	€ 28.81

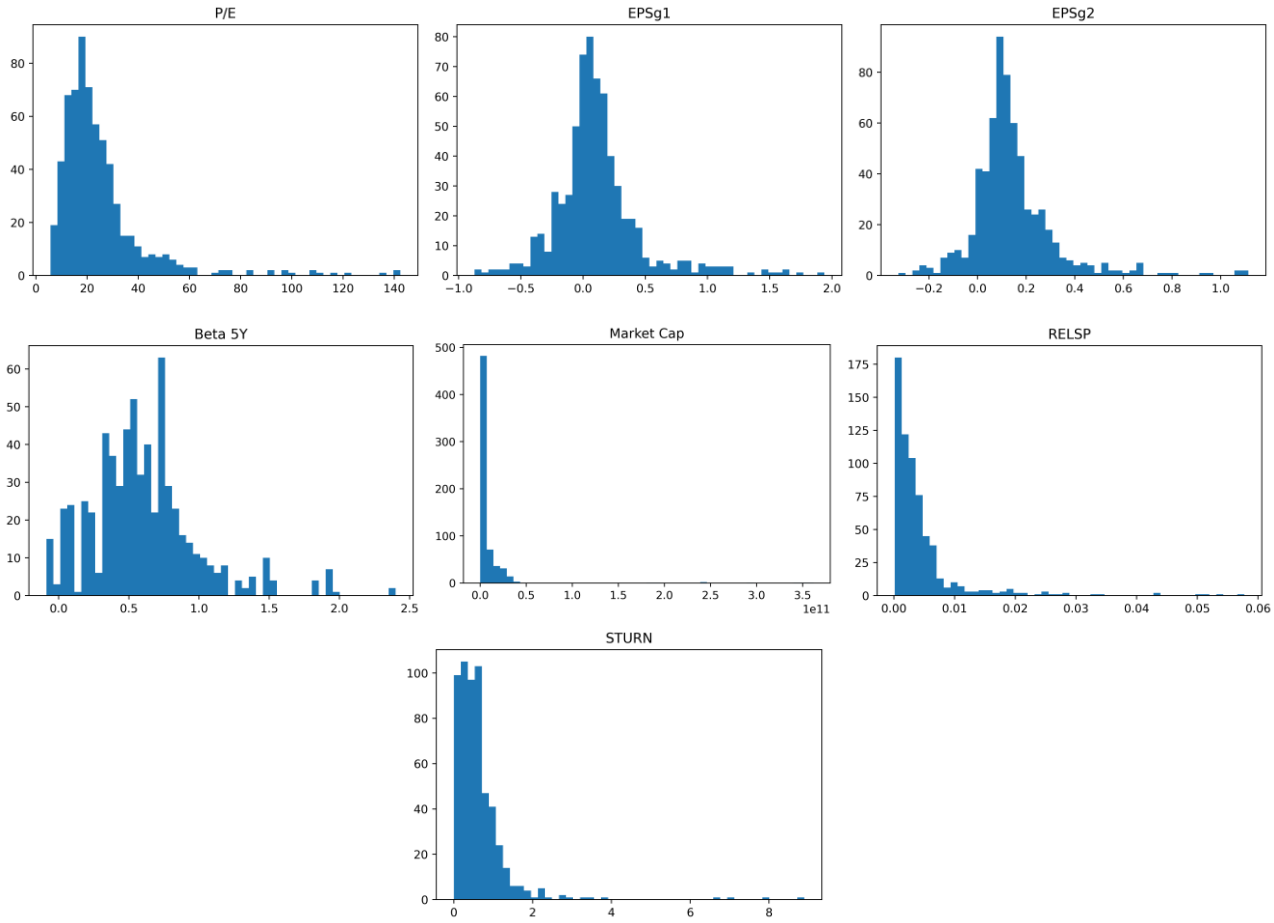
Energy Overcharge Shifts					
-0.1%	-0.05%	0%	0.15%	0.3%	
€ 25.02	€ 24.94	€ 24.87	€ 24.64	€ 24.42	

Forex shifts	Inflation Shifts				
	-2%	-1%	0%	1%	2%
-1%	€ 22.07	€ 22.59	€ 23.10	€ 23.60	€ 24.09
-0.5%	€ 22.89	€ 23.43	€ 23.97	€ 24.49	€ 25.00
0%	€ 23.75	€ 24.31	€ 24.87	€ 25.41	€ 25.94
0.5%	€ 24.64	€ 25.23	€ 25.81	€ 26.37	€ 26.92
1%	€ 25.57	€ 26.18	€ 26.78	€ 27.37	€ 27.95

RFR Shifts	Inflation Shifts				
	-2%	-1%	0%	1%	2%
-2%	€ 30.42	€ 31.13	€ 31.83	€ 32.51	€ 33.18
-1%	€ 26.73	€ 27.36	€ 27.97	€ 28.58	€ 29.17
0%	€ 23.75	€ 24.31	€ 24.87	€ 25.41	€ 25.94
1%	€ 21.29	€ 21.80	€ 22.30	€ 22.80	€ 23.28
2%	€ 19.22	€ 19.69	€ 20.15	€ 20.60	€ 21.04

EUR/COL Shifts	EUR/ZLO shifts				
	-2%	-1%	0%	1%	2%
-2%	€ 21.47	€ 22.94	€ 24.52	€ 26.23	€ 28.08
-1%	€ 21.63	€ 23.10	€ 24.69	€ 26.40	€ 28.25
0%	€ 21.81	€ 23.28	€ 24.87	€ 26.58	€ 28.44
1%	€ 22.00	€ 23.47	€ 25.06	€ 26.78	€ 28.64
2%	€ 22.21	€ 23.68	€ 25.28	€ 27.00	€ 28.86

Appendix 23 | Descriptive statistics for the original sample



Appendix 24 | List of Equations

Equations 1, 1a:

- $(P/E)_i = \beta_0 + \beta_1 * EPSg_{t+1} + \beta_2 * EPSg_{t+2} + \beta_3 * BETA_i + \beta_4 * RESSIZE/RELSP_i + \beta_5 * RELSP_i + \beta_6 * PAYOUT_i + \varepsilon_i$
- $\text{SIZE}_i = \mu_0 + \mu_1 * RELSP_i + \eta_i$

Equations 2, 2a:

- $(P/E)_i = \beta_0 + \beta_1 * EPSg_{t+1} + \beta_2 * EPSg_{t+2} + \beta_3 * BETA_i + \beta_4 * RESSIZE/STURN_i + \beta_5 * STURN_i + \beta_6 * PAYOUT_i + \varepsilon_i$
- $SIZE_i = \mu_0 + \mu_1 * STURN_i + \eta_i$

Equations 3, 3a:

- $ln(P/E)_i = \beta_0 + \beta_1 * EPSg_{t+1} + \beta_2 * EPSg_{t+2} + \beta_3 * BETA_i + \beta_4 * RESSIZE/RELSP_i + \beta_5 * RELSP_i + \beta_6 * PAYOUT_i + \varepsilon_i$
- $LNSIZE_i = \mu_0 + \mu_1 * RELSP_i + \eta_i$

Equations 4, 4e, 4p:

- $ln(P/E)_i = \beta_0 + \beta_1 * EPSg_{t+2} + \beta_2 * RESSIZE/RELSP_i + \beta_3 * RELSP_i + \varepsilon_i$
- $(P/E)_{RELSP>0} = exp(\hat{\beta}_0 + \hat{\beta}_1 * EPSg_{t+2} + \hat{\beta}_2 * RESSIZE/RELSP + \hat{\beta}_3 * RELSP)$
- $(P/E)_{RELSP=0} = exp(\hat{\beta}_0 + \hat{\beta}_1 * EPSg_{t+2} + \hat{\beta}_2 * RESSIZE/RELSP)$

Equations 5, 5a:

- $ln(P/E)_i = \beta_0 + \beta_1 * EPSg_{t+1} + \beta_2 * EPSg_{t+2} + \beta_3 * BETA_i + \beta_4 * RESSIZE/STURN_i + \beta_5 * STURN_i + \beta_6 * PAYOUT_i + \varepsilon_i$
- $LNSIZE_i = \mu_0 + \mu_1 * STURN_i + \eta_i$

Equation 6:

- $ln(P/E)_i = \beta_0 + \beta_1 * EPSg_{t+2} + \beta_2 * RESSIZE/STURN_i + \beta_3 * STURN_i + \varepsilon_i$

Equation 7:

- $\left(\frac{(P/E)_{RELSP=0} - (P/E)_{RELSP>0}}{(P/E)_{RELSP=0}}\right) = 1 - exp(\hat{\beta}_3 * RELSP)$

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