

Financial Markets Project

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– Introduction:

Group “13” is pleased to deliver this summary report, which precisely highlights the different steps and approaches adopted and used to achieve the construction of this trading strategy in the Tunis Stock Exchange, where the various learning outcomes of the FIN 350 Financial Markets course were applied and adjusted when needed, to the practicalities of the Tunisian market.

We aim through this report to share a part of our journey with the Financial Markets course that was concluded with this teamwork and comprehensive project that summarized all of our efforts and learning outcomes.

This report highlights our team's strategy for effectively conducting an efficient portfolio management strategy, which is a testament to our team's resilience, teamwork, and dedication to delivering this project.

We aim that our report offers both a conclusive and a detailed overview of our different approaches, decisions, and choices encountered throughout the work dedicated to this project.

Ahmed Rejeb

I- The logistics and General Phase

- Broker selection:

The first step in our financial markets project was initiating broker research that would coincide with our vision of minimizing transaction costs for the portfolio to only 20 Basis points of brokerage fees.

We chose to start the research by creating a small database containing all the financial institutions offering brokerage services in Tunisia.

Broker Name	Phone	Fax	Address	Notes / Website
Tunisie Valeurs	+216 71 189 600	+216 71 949 325	Immeuble Integra, Centre Urbain Nord, Tunis	www.tunisievaleurs.com
MAC SA	+216 71 137 600	+216 71 960 959	Green Center, Bloc C, Les Berges du Lac, Tunis	www.macsa.com.tn
Amen Invest	+216 71 965 400	+216 71 830 980	Avenue Mohamed V, Tunis	Amen Bank Group
Attijari Intermédiation	+216 71 861 461	+216 71 860 346	Les Berges du Lac, Tunis	Attijari Bank Group
BNA Capitaux	+216 71 139 500	+216 71 860 189	Les Berges du Lac, Tunis	BNA Group
Société de Bourse de Tunisie (SBT)	+216 71 125 500	+216 71 125 484	Place du 14 janvier 2011, Tunis	
BH Invest	+216 71 948 429	+216 71 948 512	Centre Urbain Nord, Tunis	BH Bank Group
BTK Conseil	+216 71 255 053	+216 71 255 047	Avenue Mohamed V, Tunis	BTK Bank Group
UIB Finance	+216 71 219 116	+216 71 219 478	Les Berges du Lac, Tunis	UIB Bank Group
Union Capital	+216 71 154 110	+216 71 155 009	Place Pasteur, Tunis	
Maxula Bourse	+216 71 960 530	+216 71 960 565	Les Berges du Lac, Tunis	
MENA Capital Partners	+216 71 862 328	+216 71 961 471	Les Berges du Lac, Tunis	
STB Finance	+216 71 717 510	+216 71 718 450	El Menzah IV, Tunis	STB Bank Group
Tuniso-Séoudienne d'Investissement (TSI)	+216 71 822 555	+216 71 822 418	Centre Urbain Nord, Tunis	
FINACORP	+216 71 656 122	+216 71 656 269	Les Berges du Lac, Tunis	
Arab Financial Consultants (AFC)	+216 70 020 260	+216 70 020 299	Jardins du Lac II, Tunis	

Our first contact brokers were both “Tunisie Valeurs” and “MAC SA”. Our main target from this research was to minimize the brokerage fees as much as possible, below 80 Basis points, and optimally obtain a target fee of 20 basis points.

Our first negotiation process with “Tunisie Valeurs” ended up lowering the fees from an initial 60 basis points, which was good, but not yet ideal for our target objective.

Our second negotiation process with “MAC SA” turned out more efficient, as they agreed to guarantee a brokerage fee of only 20 basis points, a decision that optimally aligned with our vision; therefore, we ended up sealing the deal contractually.

This entire step was nothing but beneficial as it helped minimize costs from one side, and from another, as it helped practice our negotiation skills and make them firmer and more effective.

Overall investment vision:

The objective of this project is to conduct a theoretical and applied analysis of the different key concepts learned throughout the Financial Markets course and then make the transition from theory to practice in a way that takes into account the differences that could exist in the Tunis Stock Market, with the main objectives being as follows:

- To construct and hold an investment portfolio over a short period of 2 to 4 weeks before December 31st, 2025.
- To allocate short-term opportunities capable of generating a high return over the holding period.
- To build a diversified Portfolio that is capable of generating short-term returns while managing risk.
- To generate a total return outperforming the market benchmark (Tunindex) throughout the portfolio holding period.

A total budget of 500 TND was allocated to be invested; therefore, this total budget would be taken into account in different steps during the investment process, for it to be perfectly aligned with budgetary constraints.

Investment approach and justification:

The Tunisian market's unique characteristics—particularly the concentrated growth in particular sectors (Food & Beverages, Banking, etc.), and inconsistent financial data availability across companies—render reliance on any single investment approach (whether purely top-down or bottom-up) problematic for portfolio construction.

Given the market's limited informational efficiency, fundamental analysis of securities, including ratio evaluation and financial statement analysis, does not consistently translate into price movements. A strictly bottom-up strategy, therefore, faces material challenges that may compromise performance.

Furthermore, sector performance in Tunisia remains highly concentrated, meaning a conventional top-down methodology risks overlooking high-potential firms within sectors that appear weak at the aggregate level.

We concluded that a middle ground between the two approaches was necessary to balance our objectives of return maximization and risk

minimization. This hybrid framework, often known as the diamond approach, as we will refer to it later on, to illustrate the intersection of top-down and bottom-up perspectives, formed the core strategy for security allocation in our investment portfolio.

In summary, the diamond investment approach will be executed through a macroeconomic study, which directly informs and is followed by a sectoral analysis to identify the currently top-performing sectors. Consequently, the strongest-performing sectors will be prioritized, while underperforming sectors or those with limited growth prospects will receive partial consideration; remaining sectors will be excluded. This step will then be supplemented by a fundamental analysis, which will help identify a primary list of selected securities for further evaluation in subsequent stages.

II- The Theoretical phase

Macroeconomic analysis:

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025e
PIB (en milliards de Dt)	84,7	90,4	97,4	105,6	113,8	119,4	130,9	143,8	149,5	166,3	178,5
Croissance du PIB	1,0%	1,1%	1,9%	2,7%	1,0%	-8,7%	4,5%	2,8%	0,0%	1,4%	1,4%
Taux d'investissement (% du PIB)	20,0%	18,4%	19,4%	21,1%	17,2%	7,0%	13,9%	12,3%	12,2%	11,9%	10,7%
Taux d'épargne (% du PIB)	10,3%	9,1%	8,9%	9,6%	9,4%	4,6%	8,0%	6,3%	9,7%	10,2%	8,0%
Taux d'inflation	4,9%	3,7%	5,3%	7,3%	7,0%	5,7%	5,7%	8,3%	9,3%	7,0%	5,3%
Budget de l'état (In Bn of TND)	26,9	29,2	34,3	37,8	42,3	49,7	55,5	60,6	71,2	77,9	78,2
Déficit budgétaire (% du PIB)	-4,8%	-6,1%	-6,1%	-4,8%	-3,5%	-10,5%	-7,9%	-7,6%	-8,2%	-6,6%	-5,4%
Dette publique (en milliards de Dt)	46,9	57,5	67,9	82,3	83,3	93,0	104,2	114,9	126,5	135,0	147,9
Dette publique (% du PIB)	55,4%	63,6%	69,7%	77,9%	73,2%	77,9%	79,6%	79,9%	84,6%	81,2%	80,5%

Sources: FMI, BCT et Ministère des finances

Source: IMF, Central Bank of Tunis, Tunisian Ministry of Finance.

Weaker economic growth in the first quarter of the year:

According to estimates from the national accounts, the seasonally adjusted Gross Domestic Product (GDP) at the end of the first quarter of 2025 recorded growth of 1.6% year-on-year. Quarterly, the volume of GDP contracted by -0.2%. Except for the positive performance of the agriculture sector (good rainfall allowed the sector to post growth of 7% year-on-year and 2.8% quarter-on-quarter) and the construction sector (which posted appreciable growth for the second consecutive quarter, at 3.3% year-on-year and 4.5% quarter-on-quarter), economic growth was hampered by the slowdown in industry and the services sector. The industrial sector, already in recession, is now facing the negative impact on Europe of the trade war triggered by Donald Trump. At the end of the first quarter of 2025, manufacturing industries contracted by -1.7% quarter-on-quarter and showed only a slight improvement of +0.5% year-on-year. Non-manufacturing industries (energy,

mining, water, and waste treatment) showed timid growth of 0.6% year-on-year and a decline of -3.9% quarter-on-quarter, due to the continued slowdown in oil and gas production (+4.2% year-on-year), despite the 12.3% annual improvement in the energy sector. The value added of the services sector eroded by -0.2% quarter-on-quarter, while it showed modest growth of 1.1% year-on-year.

The American rating agency, FITCH RATINGS, reduced its growth forecast for Tunisia for 2025 from 1.6% in October 2024 to 1.4%, aligning with the IMF's projection. However, the European Bank for Reconstruction and Development revised its growth forecast downwards by 0.1% from its February forecast to 1.7%.

A widening trade deficit at the end of the first four months of the year:

Weighed down by falling exports (-2.4% to 20.7 billion dinars) and rising imports (+7.8% to 28 billion dinars), the trade deficit widened to -7,294.1 million dinars compared to -4,734.8 million dinars during the first four months of 2024. The coverage ratio deteriorated to 74% compared to 81.8% during the same period in 2024, reflecting continued external sector pressures.

Inflation continues its gradual easing:

The gradual easing of inflation, which began in March 2023, continues. The inflation rate for April 2025 reached 5.6% compared to 5.9% in March. This decline is mainly explained by the slowdown in the price evolution of the food products group (7.3% in April 2025 vs. 7.8% in March 2025) as well as the clothing products group (9.4% in April 2025 vs. 11.7% in March 2025). In April 2025, the core inflation rate excluding food and energy products fell to 5.5% from 5.7% the previous month. Prices of unregulated products increased by 6.8% year-on-year, while prices of regulated products increased by only 1.7%. The Central Bank of Tunisia (BCT) maintains a cautious monetary policy and is aiming for an average inflation rate of 5.3% for the 2025–2026 period, balancing inflation containment with support for modest economic growth.

Decline in foreign currency reserves at the start of the year:

According to the Central Bank of Tunisia, as of April 29, 2025, net foreign currency assets stood at 22.5 billion dinars (equivalent to 99 days of imports) compared to 27.3 billion (or 121 days) at the end of December 2024. This sharp decline is explained by the full repayment, in January 2025, of an international debt of \$1 billion contracted in 2015. Meanwhile, the exchange rate has

Tourism shows continued resilience:

Monetary and fiscal stance:

Sectoral Analysis:

Source: Tunisie Valeurs

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The quantitative study aimed to identify the sectors with consistently growing and high performance since the beginning of 2025, alongside a benchmark comparison with each sector's performance in 2024.

The Qualitative phase was executed by applying Porter's Five Forces framework, which aided in determining the degree of competitiveness, buyer and supplier bargaining power, threat of substitutes, and entry barriers for each industry. This enabled the selection of more robust industries less sensitive to margin squeeze, inflationary pressures, and over-competition, which are more relevant considerations given the Tunisian market environment. Sectors that are more prone to strong competitive forces and insufficient pricing power were deemed less attractive, even with attractive short-term operating conditions.

General macroeconomic insights were also taken into account. With relatively high inflation and unemployment rates, and despite the country entering the stage of gradual economic recovery, Tunisia still faces a lot of economic hurdles that limit households and firms from investing more in the non-essential sectors (Building projects) and push households to invest more commonly in day-to-day commodities, which was ultimately confirmed by the high growth rates in the sectors to be mentioned later on.

The Study, combining both qualitative and quantitative conclusions, ended up with the following selections:

Held sectors:

- Food & beverages
- Household & personal care products
- Distribution
- Banking
- Insurance
- Financial services

Selectively held sectors:

- Basic materials
- Building and construction materials
- Industrial goods and services

We have chosen to classify sectors into these two categories to align with our investment approach (The diamond approach), where the held sectors are to

be considered directly for investment opportunities, and where the selectively held will help identify hidden performers that are within underperforming sectors.

Stocks Financial Data Collection:

After determining the most performing sectors and narrowing our selection to the most efficient industries, our next step involved extracting, analyzing, and ultimately concluding the financial data, specifically, the various ratios and multiples, for each firm, as well as for entire sectors where necessary.

To maintain our work both as efficient and as precise, we leveraged the publicly listed information available in the weekly stock guide posted by the financial institution “Tunisie Valeurs.”

Each dataset included the following metrics and ratios:

- | | |
|---------------------------------------|---|
| - Market capitalization | - Earnings per Share (EPS) |
| - Enterprise Value | - Price-to-Book ratio (P/B) |
| - EV/Equity | - Dividend Yield |
| - EV/EBITDA | - 1 week performance |
| - ROE | - Performance since the beginning of 2025 |
| - Price-to-earnings ratio (P/E ratio) | - Number of shares outstanding |

Our process began with a confirmation check of the financial statements listed in the Financial Market Council (CMF). We then narrowed down the available data to a curated list of key metrics essential for our subsequent analysis.

Primary stock overview and selection:

In this initial phase of securities allocation, we managed to create a preliminary list of 23 stocks as the first filter step using observable performance metrics like Price/ Earnings, Returns, and Sectoral Placement, primarily to satisfy our vision of following the “diamond” investment approach we chose, as this filter list occupies a position between a top-down and bottom-up analysis; this allows us to consider individual company signals while looking at the sectoral issues and usage of a broader market. The list will be built on the core

diamonds and will ultimately be restricted to 20 companies based on a scoring system and in-depth fundamental analysis to ensure that the portfolio reflects both the strongest possible company analysis at the company level and the sector-adjusted considerations.

	Close price 28/11/2023	Number of Shares outstanding Thousands	weekly Volume Million TND	Market capitalization Million TND	Enterprise Value Million TND	EV/Equity 2023	EV/Equity 2024	EV/EBITDA 2023	EV/EBITDA 2024	ROE 2023	Earning per share 2023	Earning per share 2024	P/E 2023	P/E 2024	P/B 2023	Dividend per share 2023	Dividend per share 2024	Dividend yield 2023	Dividend yield 2024	Performance 1 week	Performance 1 week	Market cap % to sector				
	TND					(x)	(x)	(x)	(x)	(%)	TND	TND	(x)	(x)	(x)	TND	TND	(%)	(%)	(%)	(%)	(%)				
POULINA G H	17.99	180 004	6,261	3 238	4 720	1.4	1.4	8.6	7.7	15%	0.72	0.9	0.99	25	25	3	0.36	0.45	0.5	2.00%	0.025	0.028	1.60%	113.20%	35.83%	
SFBT	11.8	268 125	2,073	3 164	2 615	1.9	1.9	6.2	6.1	25%	1.051	1.055	1.074	11.2	11.2	11	2.8	0.74	0.8	6.30%	0.068	0.068	-0.80%	6.70%	35.01%	
DELICE HOLDING	12.09	109 815	2,474	1 328	1 385	1	1	7.8	7.9	22%	0.89	0.92	1.027	13.6	13.1	11.8	2.9	0.6	1	5.5%	0.083	0.045	0.80%	56.80%	14.69%	
LAND OR	14.6	13 784	0.81	201,00	245	1	0.9	11.4	7.5	12%	0.496	0.916	0.815	29.4	15.9	17.9	1.9	0	0.4	0.4	0.00%	0.027	0.027	-2.50%	46.60%	2.22%
SAH LILAS	13.5	84 016	1,525	1 134	1 685	1.9	1.7	11.9	9	19%	0.424	0.733	0.774	31.8	18.4	17.4	3.5	0.35	0.4	0.45	2.60%	0.03	0.033	0.00%	36.50%	58.33%
ASSAD	3.15	24 000	0.79	76,00	153	1.3	1	15.2	7.1	19%	-0.402	0.154	0.188	n.a	20.5	16.8	3.8	0	0	0	0.00%	0	0	3.70%	408.10%	31.66%
ENNAKIL AUTOMOBILES	15	30 000	0.121	450,00	420	0.6	0.6	5.3	5.6	22%	1.344	1.612	1.655	11.2	9.3	9.1	2	0.7	0.88	8.88	4.70%	0.059	0.059	-2.50%	52.20%	22.65%
MONOPRIX	6.3	25 346	0.01	160,00	230	0.3	0.3	5.8	5.3	9%	0.04	0.271	0.407	n.a	23.2	15.5	2	0	0	0	0.00%	0	0	-1.90%	81.90%	8.05%
SOTUMAG	9	13 200	0.079	119,00	89	5	4.8	11.4	11.1	25%	0.58	0.535	0.713	15.5	16.8	12.6	4.2	0.52	0.48	0.55	5.80%	0.053	0.061	-2.80%	71.50%	5.99%
TPR	10.39	50 000	0.269	520,00	476	1.7	1.6	7.7	7	20%	0.827	0.832	1.198	12.6	12.5	8.7	2.5	0.4	0.4	0.5	3.80%	0.038	0.048	0.20%	71.20%	86.52%
MPBS	7.8	20 669	0.165	161,00	192	1.5	1.1	17	9.4	13%	0.144	0.421	0.392	54.2	18.5	19.9	2.4	0.2	0.22	0.22	2.60%	0.028	0.028	0.00%	31.30%	15.54%
ONE TECH HOLDING	8.5	80 400	4.18	683,00	717	0.6	0.7	7.2	7.1	8%	0.477	0.376	0.584	17.8	22.6	14.6	1.8	0.25	0.26	0.33	2.90%	0.031	0.039	1.30%	46.00%	55.30%
SOTUVER	13.4	39 254	0.289	526,00	805	3.1	3.4	7	7.6	28%	1.188	1.065	1.297	11.3	12.6	10.3	3.5	0.55	0.25	0.6	4.10%	0.019	0.045	1.50%	8.30%	42.59%
BIAT	110.5	40 800	0.743	4 508	-	-	-	-	-	18%	8.789	9.299	9.776	12.6	11.9	11.3	2.2	6	6	5.57	5.40%	0.054	0.05	-8.90%	25.00%	29.31%
ATTIJARI BANK	64.95	50 000	1.109	3 248	-	-	-	-	-	25%	1.518	4.794	4.237	14.4	13.5	15.3	3.3	4.5	5	3.36	6.90%	0.077	0.052	0.00%	73.80%	21.12%
BT	6.94	270 000	0.971	1 674	-	-	-	-	-	15%	0.675	0.739	0.707	10.3	9.4	9.8	1.4	0.29	0.35	0.28	4.20%	0.05	0.04	-4.80%	43.10%	12.18%
AMEN BANK	47.5	34 920	12.04	1 659	-	-	-	-	-	15%	6.201	6.974	7.076	7.7	6.8	6.7	1	3.22	3.3	2.65	6.80%	0.069	0.056	-6.60%	39.80%	10.78%
STB	4.13	155 375	0.473	642,00	-	-	-	-	-	3%	0.505	0.231	0.339	8.2	17.9	12.2	0.5	0	0	0	0.00%	0	0	-3.50%	35.10%	4.11%
ASSURANCES MAGHREBIA	54	4 500	0.01	243,00	-	-	-	-	-	15%	7.436	7.24	7.453	7.3	7.5	7.2	1.1	3.1	3.54	5.70%	0.066	0.066	0.00%	11.70%	12.54%	
MAGHREBIA VIE	6.29	25 000	0.082	157,00	-	-	-	-	-	15%	0.712	0.807	0.888	8.8	7.8	7.1	1.1	0.321	0.363	0.363	5.10%	0.058	0.058	-0.20%	9.00%	6.75%
TUNISIE LEASING ET FACTORING	32.3	10 800	0.202	349,00	-	-	-	-	-	14%	2.613	3.469	4.484	12.4	9.3	7.2	1.3	1.1	1.15	2.2	3.40%	0.036	0.068	4.20%	91.10%	24.64%
ATTIJARI LEASING	29.48	2 750	0.038	81,00	-	-	-	-	-	14%	3.208	3.638	3.812	9.2	8.1	7.7	1.1	1.5	2	2	5.10%	0.068	0.068	0.00%	65.60%	5.72%
ARTES	12	38 250	0.145	459	223	1.2	0.7	8	4.4	13%	0.704	0.653	1.533	17.1	18.4	7.8	2.4	0.5	0.8	0.8	4.20%	0.067	0.067	0.80%	57.80%	4.07%

For instance, all Food & Beverages stocks were kept due to the strong performance of this sector. While other industries that were only partially chosen also showed high performers, like TPR, which had a moderate P/E ratio of 12x. In the banking sector, Amen Bank and BIAT offer scale and strong balance sheets. Insurance companies such as Assurances Maghrebria and Maghrebria Vie contribute to diversification with stable payout ratios and consistent ROEs. Meanwhile, Tunisie Leasing & Factoring and Attijari Leasing provide exposure to financial services with attractive yields and manageable P/E ratios. We also want to emphasize that this filter list is not a final portfolio, but a preliminary selection phase, which will be refined later through detailed fundamental analysis and a precise scoring system.

20-Stock Selection:

Following the initial selection filter phase, designed to narrow down the number of securities for more careful study, the next step is both more precise and more critical for the overall portfolio construction. This process further refines the set of securities to a final list of 20 stocks. The selection will be based on a detailed fundamental analysis of the 23 remaining stocks, applying a precise scoring system designed to identify the 20 final securities.

The analysis also made sure to account for the difference in the evaluation between financial institutions (Banks, Insurance, and financial services) and non-financial institutions.

Financial institutions' activities include the process of financial intermediation or leverage. Since financial institutions rely heavily upon these processes to generate income, a standard metric (for example, EV/EBITDA) used to evaluate

non-financial companies cannot be applied to financial institutions because interest expense is considered to be a normal part of the operations of a financial institution. However, in order to keep consistency with the rest of the companies and ensure a fair comparison, EV/EBITDA was not included in this study as a measure required to evaluate financial institutions, and the weightings of all other metrics used to evaluate all financial institutions were adjusted accordingly. This method continued to provide an equitable scoring method that was more representative of the characteristics associated with financial and non-financial companies.

PS: The next two sections are correlated. The fundamental analysis section will be dedicated to explaining the different metrics chosen, while the scoring system section will be dedicated to capturing the math behind the scoring and the different weights used and their justifications.

1st Fundamental Analysis:

This represents the first round of fundamental analysis, with a second analysis to be conducted later in subsequent phases. The analysis will be carried out using a weighted scoring system—detailed in the next section—which will yield a final score on a scale of 0 to 10.

The chosen metrics were selected specifically to align with our overall investment vision, which emphasizes maximizing short-term reward while minimizing risk. Therefore, we focused on metrics that best reflect firms' current standing and short-term growth potential.

The scoring will assess a range of metrics, drawing from various indicators of financial statement analysis and performance. The ratios and metrics analyzed are organized into the following categories:

Valuation; Profitability; Size & Dominance; Efficiency; And momentum.

Non-Financial institutions :

Valuation (P/E & P/B Ratios):

We included both the Price-to-Earnings (P/E) ratio and the Price-to-Book (P/B) ratio to measure and capture the different dimensions of the stock's value. The P/E ratio assesses a stock's price relative to its earnings; thus, it helps to identify stocks that are undervalued relative to earnings within their respective sectors. The P/B ratio serves as an additional anchor point by providing information regarding the depth and reliability of the stock's value.

As there is no universal rule of thumb about whether one of these ratios is to be valued positively or negatively, especially with the immense changes from one sector's average to another, we opted to compare each ratio to the industry's average in the first place; this equivalence will help interpret more information from our analysis of these ratios.

The equivalent ratio was calculated as follows:

$$\text{Equivalent } P/E = \frac{\text{firm } P/E \text{ ratio}}{\text{Industry average } P/E}$$

$$\text{Equivalent } P/B = \frac{\text{firm } P/B \text{ ratio}}{\text{Industry average } P/B}$$

Profitability (EPS & ROE):

Profitability ratios such as Earnings per share and return on equity are very important in the short-term investment analysis to assess the firms' absolute earnings capacity and comparative effectiveness as a measure of performance. EPS measures how much profit is generated per share, while ROE measures the effectiveness of management in utilizing shareholder equity and is an important indicator of operational success within the Market.

Size & Dominance:

The Size and Dominance Metric is used to measure the relative size of a firm within a particular industry (i.e., Sector). Sector leaders in Tunisia(S) often enjoy superior pricing power and liquidity than lesser-ranked firms. When we calculate Market Capitalization as a percentage of the total Sector Capitalization, we create an incentive for established firms and continue to monitor the Competitive Dynamics of Firms within each Sector.

$$\text{Market capitalization \%} = \frac{\text{Market Capitalization}}{\text{Industry Market Capitalization}}$$

Efficiency:

We chose the Enterprise Value-to-EBITDA ratio to evaluate the operational efficiency and the cash flow generation independent of the capital structure. This metric would assure to be useful to compare firms across different leverage profiles and sectors, offering a clearer view of business performance.

Momentum (Return since beginning of 2025)

Price Momentum was taken as a measure of Behavioural & Market Sentiment. Since many of the stock prices in Tunisia are influenced by investor sentiment, stock prices can have an upward price trend (i.e., increasing stock prices) and therefore have positive Momentum. As a result, stocks with positive price Momentum may indicate developing investor confidence, as well as improving company fundamentals. Price Momentum can also provide insight about the stocks that are drawing market attention, and thus increasing their liquidity and creating relative strength, all of which are factors that contribute to strong performance in a market where price movements tend to extend over time due to the slow dissemination of information.

Financial institutions:

For financial institutions, we adapted our scoring approach to account for their distinct structural characteristics compared to the non-financial firms previously outlined. While most of the core metrics were retained, several important adjustments were made. These changes, despite being reflected more in the change of scoring weights, are also captured in the removal of the EV/EBITDA ratio, which is a metric less relevant for banking and insurance models.

A detailed breakdown of these modifications will be provided in the Scoring System section that follows.

1st Scoring system:

This section is an extension of the fundamental analysis section, but it will delve further into the mathematical application of the analysis through this scoring system.

We have chosen to follow a weighted scoring system (i.e, attributing different weights to each method, summing all to 1)

Weights: In this section, an explanation of the different weights chosen is provided.

Non-Financial institutions:

P/E score: 15%. important for valuation

P/B score: 10%. useful as a valuation check, but less informative for non-asset-heavy firms

EPS score: 15%. reflects earnings strength

ROE score: 20%. key indicator of profitability and capital efficiency, hence the higher weight.

Market capitalization as a percentage of sector market cap: 10%. Size does not always reflect high performance

EV/EBITDA score (Efficiency): 15%. Good measure of operational efficiency

Momentum score: 15%. reflects recent market sentiment

Financial institutions:

P/E score (18%): remains relevant for valuation, especially for banks with stable earnings.

P/B score (10%): important due to balance-sheet-driven business models.

EPS score (20%): captures earnings generation, a key driver of bank performance.

ROE score (25%): critical metric for financial institutions, reflecting capital efficiency.

Market capitalization % (10%): Size does not always reflect performance.

Momentum score (17%): reflects short-term market confidence and trading dynamics.

Scores:

This section will carefully explain how the scoring system actually functioned and the mathematical explanation behind it.

This scoring system synthesizes different metrics that differ in units, payoffs, and interpretative meaning. Furthermore, they have different ranges, preventing the direct calculation of a final consistent score that ranges from 1 to 10.

For these different reasons, the system cannot function without normalizing each different metric to an ultimate score (on a scale from 1 to 10).

P/E score and P/B score:

To achieve consistency among firms in the same industry, ratios are normalized using a Max-Min transformation. Ratios have been inverted to allow greater preference for lower values of these metrics, as it is agreed by rule of thumb that a lower P/E or P/B ratio is a better indication. The method of normalization has been defined by the overall industry value of these metrics, which represents the inherent structural differences of the different industries being analyzed.

To avoid the difference between each sector's number of benchmark firms affecting the score (If a firm is benchmarked with only one or two companies, its score will be either extremely high or extremely low), therefore, 3 categories depending on each sector's number of benchmark firms were used.

When the number of benchmark firms in the sector is 6 or higher:

$$P/E \text{ score} = \left(\frac{\text{Max (Industry Equivalent } P/E) - \text{Firm Equivalent } P/E}{\text{Max (Industry Equivalent } P/E) - \text{Min (Industry Equivalent } P/E)} \times 9 \right) + 1$$

$$P/B \text{ score} = \left(\frac{\text{Max (Industry Equivalent } P/B) - \text{Firm Equivalent } P/B}{\text{Max (Industry Equivalent } P/B) - \text{Min (Industry Equivalent } P/B)} \times 9 \right) + 1$$

When the number of benchmark firms in the sector is between 4 and 5:

$$P/E \text{ score} = \left(\frac{\text{Max (Industry Equivalent } P/E) - \text{Firm Equivalent } P/E}{\text{Max (Industry Equivalent } P/E) - \text{Min (Industry Equivalent } P/E)} \times 5 \right) + 3$$

$$P/B \text{ score} = \left(\frac{\text{Max (Industry Equivalent } P/B) - \text{Firm Equivalent } P/B}{\text{Max (Industry Equivalent } P/B) - \text{Min (Industry Equivalent } P/B)} \times 5 \right) + 3$$

When the number of benchmark firms in the sector is 3 or lower:

$$P/E \text{ score} = \left(\frac{\text{Max (Industry Equivalent } P/E) - \text{Firm Equivalent } P/E}{\text{Max (Industry Equivalent } P/E) - \text{Min (Industry Equivalent } P/E)} \times 3 \right) + 4$$

$$P/B \text{ score} = \left(\frac{\text{Max (Industry Equivalent } P/B) - \text{Firm Equivalent } P/B}{\text{Max (Industry Equivalent } P/B) - \text{Min (Industry Equivalent } P/B)} \times 3 \right) + 4$$

EPS, ROE, Market cap%, EV/EBITDA, and Momentum scores:

For profitability, size, efficiency, and momentum indicators, higher values are assumed to reflect stronger firm performance. Therefore, all firms have been normalized through a min-max normalization process, such that a firm with a higher level of these indicators will have a corresponding higher score. Each score will be analysed with all 23 sectors used as a benchmark for the normalization this time, and not only from a sector perspective, as the optimal target is allocating the higher performing stocks as a whole.

$$EPS \text{ score} = \left(\frac{\text{Firm EPS} - \text{MIN (EPS)}}{\text{Min (EPS)} - \text{Max (EPS)}} \times 9 \right) + 1$$

$$ROE \text{ score} = \left(\frac{Firm \text{ ROE} - MIN (ROE)}{Min (ROE) - Max (ROE)} \times 9 \right) + 1$$

$$Market \text{ cap } \% \text{ score} = \left(\frac{Firm \text{ Market cap } \% - MIN (Market \text{ cap } \%)}{Min (Market \text{ cap } \%) - Max (Market \text{ cap } \%)} \times 9 \right) + 1$$

$$EV/EBITDA \text{ score} = \left(\frac{Firm \text{ EV/EBITDA} - MIN (EV/EBITDA)}{Min (EV/EBITDA) - Max (EV/EBITDA)} \times 9 \right) + 1$$

$$Momentum \text{ score} = \left(\frac{Firm \text{ Momentum} - MIN (Momentum)}{Min (Momentum) - Max (Momentum)} \times 9 \right) + 1$$

Final weighted score:

Non-Financial institutions:

$$\begin{aligned} \text{Score} = & (P/E \times 0.15) + (P/B \times 0.10) + (ROE \times 0.20) + (EPS \times 0.15) \\ & + (Market \text{ Cap}\% \times 0.10) + (EV/EBITDA \times 0.15) + (Momentum \times 0.15) \end{aligned}$$

Financial institutions:

$$\begin{aligned} \text{Score} = & (P/E \times 0.18) + (P/B \times 0.10) + (ROE \times 0.25) + (EPS \times 0.20) + \\ & (Market \text{ Cap}\% \times 0.10) + (Momentum \times 0.17) \end{aligned}$$

Final 20-Stock selection:

Following the fundamental analysis supported by the scoring system, we narrowed down the number to the following 20 stocks:

Non-Financial institutions:

POULINA G H

DELICE HOLDING

LAND'OR

SAH LILAS

ASSAD

ENNAKL AUTOMOBILES

SOTUMAG

TPR

MPBS

ONE TECH HOLDING

SOTUVER

Financial institutions:

BIAT

ATTIJARI BANK

BT

AMEN BANK

ASSURANCES MAGHREBIA

MAGHREBIA VIE

TUNISIE LEASING ET FACTORING

ATTIJARI LEASING

20-stock historical data importation and interpretation:

After the final selection of the 20 stocks, the next step was to gather and import the necessary historical data for each stock for the last 10 years. The information obtained was as follows: Date, Close, and Adjusted close for each stock. The data was later assembled altogether to start the interpretation process. The entirety of the data contained historical data for the last 10 years (from January 2015), with two exceptions: “Assurance Maghrebria” and “Assurance Maghrebria Vie”, as both were not publicly listed at that time. The interpretation process started with calculating the daily returns for each stock. The daily returns were later used to calculate each stock’s:

- Daily & yearly return
- Daily & yearly standard deviation
- Kurtosis

- Skewness
- Value at Risk ($\alpha=5\%$)
- Sharpe ratio ($\frac{R_x - R_f}{\sigma_x}$)

R_x = stock yearly return; R_f = Risk free rate; σ_x = stock yearly standard deviation

The risk-free rate:

The risk-free rate used to calculate the Sharpe ratio was the Money Market Rate (Taux Moyen du Marché Monétaire), referred to here as the TMM. While the TMM is not the conventional proxy for a risk-free rate—which is typically the yield on short-term government securities such as Treasury bills—we encountered significant data limitations in the Tunisian market.

Specifically, current information on short-term government bonds (BTCT – Bons de Trésor à Court Terme) was either unavailable or unclear, with the Central Bank of Tunisia’s most recent published rates often dating back to 2022. The only clearly available yield was that of 10-year Treasury bonds (8.66%), but using a 10-year maturity rate for a short-term investment horizon would be methodologically inconsistent.

Therefore, we opted to use the TMM rate of 7.49% as the most transparent, regularly updated, and practically relevant proxy for the risk-free rate in the Tunisian context during our analysis period.

These different data will be used in the following step to help choose the final 10 stocks to be held in our investment portfolio.

10-stock selection:

Just like the selection of the final 20 stocks, a similar process will occur to make the primary selection of the final 10 stocks. A 2nd fundamental analysis supported by another weighted scoring system was introduced in this step as well. Despite the similarities in the two systems, some major changes were introduced here, as this step is more crucial and more related to the practical phase of portfolio construction.

2nd fundamental analysis

Unlike the first fundamental analysis, this second one will be more precise when analysing different sectors, to guarantee diversification in the portfolio later on.

We decided to use some similar metrics from the first fundamental analysis, which were:

- valuation metrics (P/E and P/B ratios)
- Profitability metrics (EPS and ROE)
- Risk-adjusted metrics (VaR and Sharpe ratio)

The introduction of risk-adjusted metrics marks a pivotal element of this second analysis, as they directly evaluate each stock's risk profile and its corresponding reward-to-risk efficiency, mainly captured via the Sharpe ratio.

Selection will again be conducted through a weighted scoring system. However, a key distinction from the first analysis was introduced in this new fundamental analysis: we have categorized our securities into four domains: Non-Financial Institutions, Banks, Insurance, and Financial Services. Therefore, rather than arbitrarily selecting half of the current stocks, we opted to choose half from each domain to ensure greater diversification (i.e, we will select the top 50% stocks based on their scores for each domain)

2nd scoring system:

This second weighted scoring system will be executed following the same principle as the first one. The only differences will be observed in the level of weights that will vary from one domain to another.

Weights:

Non-Financial Institutions:

P/E score (15%): Moderate emphasis on valuation relative to earnings

P/B score (5%): Minor role as book value is less critical for non-financials

EPS score (20%): High focus on absolute earnings power

ROE score (20%): Strong emphasis on profitability and shareholder returns

VaR score (10%): Standard focus on downside risk

Sharpe score (30%): Highest weight, prioritizing risk-adjusted returns above all

Final Score = (P/E Score × 0.15) + (P/B Score × 0.05) + (EPS Score × 0.20) + (ROE Score × 0.20) + (VaR Score × 0.10) + (Sharpe Score × 0.30)

Banks:

P/E score (15%): Moderate valuation consideration despite earnings volatility

P/B score (15%): Increased weight reflecting capital adequacy importance

EPS score (15%): Balanced earnings focus given sector stability

ROE score (25%): High priority on return on equity as a key banking metric

VaR score (10%): Consistent downside risk emphasis

Sharpe ratio (20%): Important but secondary to core banking

Final Score = (P/E Score × 0.15) + (P/B Score × 0.15) + (EPS Score × 0.15) + (ROE Score × 0.25) + (VaR Score × 0.10) + (Sharpe Score × 0.20)

Insurances:

P/E score (15%): Standard valuation emphasis

P/B score (12%): Moderate focus on book value for asset-heavy firms

EPS score (16%): Slightly elevated earnings importance for policyholder confidence

ROE score (25%): High emphasis on profitable capital management

VaR score (10%): Standard risk management weighting

Sharpe ratio (25%): Strong focus on risk-adjusted performance given liability matching

Final Score = (P/E Score × 0.15) + (P/B Score × 0.15) + (EPS Score × 0.15) + (ROE Score × 0.25) + (VaR Score × 0.10) + (Sharpe Score × 0.20)

Financial services:

P/E score (12%): Slightly reduced valuation emphasis in diverse sectors

P/B score (8%): Lower weight as financial services are less asset-intensive

EPS score (20%): High focus on earnings consistency in fee-based models

ROE score (25%): Critical emphasis on efficient capital utilization

VaR score (10%): Consistent downside risk consideration

Sharpe score (25%): High priority on risk efficiency in intermediation activities

Final Score = (P/E Score × 0.12) + (P/B Score × 0.08) + (EPS Score × 0.20) + (ROE Score × 0.25) + (VaR Score × 0.10) + (Sharpe Score × 0.25)

Scores:

For the profitability and valuation section, the same scores from the 1st analysis were directly imported.

The newly calculated scores are for the risk-adjustment section.

VaR score: We used A Bounded Linear Normalization technique to transform To Value at Risk figures into a standard score from 1 to 10 for inclusion in the scoring system. The formula used to accomplish this is provided below. The formula also focused on rewarding a lower VaR with a higher score.

$$VaR\ score = Max(1; Min(10 ; 10 + (VaR \times 20))$$

Sharpe ratio score: The Sharpe ratio score was calculated by normalizing it in the same Max-Min normalization method used in the first fundamental scoring system

$$Sharpe\ Ratio\ score = \left(\frac{Stock\ sharpe\ ratio\ \% - MIN\ (sharpe\ ratio)}{Min\ (sharpe\ ratio) - Max\ (sharpe\ ratio)} \times 9 \right) + 1$$

Primary 10 stock list:

Banks:

- BIAT
- Amen Bank

Insurance:

- Assurance Maghreb

Financial Services:

- Tunisie Leasing & Factoring

Non-financial institutions:

- SFBT
- Délice Holding
- Sotuver
- Sotumag
- Ennakl
- TPR

Reconfirmation with technical analysis:

Given that our investment horizon is short-term, we cannot rely solely on fundamentals to select the final 10 stocks. While fundamental analysis helps identify undervalued securities and assess intrinsic value, momentum can be decisive over brief periods. Consequently, we established a system that respects the preceding fundamental analysis while also taking into account current performance and its short-term trajectory.

The approach we adopted functions as a reconfirmation mechanism, validated by technical indicators. This process operates similarly to a veto right: it does not contradict the results of the fundamental analysis, but rather makes targeted adjustments to ensure optimal portfolio performance. Indicators such as the Relative Strength Indicator, moving averages, and Moving Average Convergence Divergence were used during the process. The technical methodology will be detailed further in the “Technical Analysis” section.

The reconfirmation process led to the following adjustments:

Two stocks, “Ennakl” and “TPR” were removed and replaced with “SAH” and “MPBS.”

Final 10-stock selected:

The final 10-stock list after the reconfirmation is as follows:

Banks:

- BIAT
- Amen Bank

Insurance:

- Assurance Maghreb

Financial Services:

- Tunisie Leasing & Factoring

Non-financial institutions:

- SFBT
- Délice Holding
- Sotuver
- Sotumag
- SAH
- MPBS

III- The Practical phase

Portfolio Optimization:

Our next and crucial step was the portfolio optimization, where Markowitz's model was applied, maximizing the Sharpe Ratio to achieve the best allocation of assets based on risk-to-return ratios.

$$\text{Sharpe ratio} = \frac{R_p - R_f}{\sigma_p}; \quad R_p: \text{Portfolio return}; R_f: \text{Risk-free rate};$$

σ_p : Portfolio standard deviation

PS: Given that not all stock data were homogeneous, specifically, Assurance Maghreb was only listed in late 2020, while the rest had 10 years of historical data—we standardized the time period for covariance calculation by using data from 28 December 2020 onward for all stocks. This ensured a consistent and comparable historical window, eliminating distortions that would arise from mismatched time frames in the covariance matrix. The process was constrained to a maximum budget of 500 TND.

The next step was also to make constraints to avoid that the solved Markowitz model would concentrate the weights into some particular stocks and neglect the rest; however, determining the limit of the constraints could not be assigned randomly. Therefore, we conducted a simulation of 5000 different portfolios using random simulated weights, where, after the analysis of the efficient frontier of the simulation, we defined limits of minimum and maximum weight for each stock between 3% to 20% to be set as additional constraints.



The minimum limit of 3% was established to provide each stock with equal opportunity for inclusion, while the maximum limit of 20% was established to lessen the dominance of a single stock on the overall portfolio composition. After solving for the optimal weights (The process was used by maximizing the value of the Sharpe ratio using Microsoft Excel's solver), we ended up with the following weights:

Stock	BIAT	AB	MAG	TLS	DH	STMG	MPBS	SFBT	SAH	SOTUV
Average yearly return	17,2982%	16,0100%	4,4992%	13,5207%	9,8256%	24,5216%	20,4159%	12,0015%	12,7073%	20,3915%
Annual Standard deviation	16,8826%	16,6968%	20,1611%	24,0598%	20,0675%	23,6307%	31,7385%	22,2124%	22,0019%	22,4510%
weight	17,827%	15,729%	3,000%	5,046%	3,000%	20,000%	6,074%	5,132%	6,564%	17,628%

The optimal portfolio obtained following Markowitz's model showed the following summary:

- Expected return: 17,903%

- Expected standard deviation: 6,965%
- Sharpe ratio: 1,495

The next step was to determine the actual number of shares starting from the optimal weights suggested by the model, into an integer number of shares

The transformation was according to the following formula:

$$\text{Number of shares} = \text{Rounded} \left(\frac{\text{Total budget} \times \text{weight}}{\text{Share price}} \right).$$

Some changes would occur due to the budget limitations; therefore, some minor variation between the suggested weights and the actual weights could occur.

Assurance Maghreb's stock was eliminated from the final stocks due to budget constraints, as the stock's price was very high compared to the stock's weight. As a result, the number of shares obtained for the equivalent stock was equal to 0,26, rounded up to 0.

Technical analysis:

We opted for the use of multiple technical indicators, which were calculated from the daily price action data for the final stock selection from March 28, 2025, to December 9, 2025, sourced from the MAC SA trading platform. The analytical tools used in this analysis were three equally weighted tools: Moving Average Convergence Divergence (MACD), Relative Strength Index (RSI-14), and 10-Day Simple Moving Average (MA-10).

Relative Strength Index (RSI-14): Identifies overbought (>70) and oversold conditions (<30) by measuring how fast and how far price movements are moving upwards or downwards in relation to other stocks.

Moving Average Convergence Divergence (MACD): A momentum-based trend following indicator that helps determine direction, momentum, and strength of the trend.

10-Day Simple Moving Average (MA-10): Used to identify short-term trends. When the price is above the MA-10, it indicates an uptrend.

Interpretation of Technical Data:

MACD Analysis.

We calculated MACD by using Exponential Moving Averages (EMAs), which respond more rapidly to less-is-more price changes and best represent short-term momentum changes relative to past price changes. We created multiple MACD period configurations and have used the "Standard MACD Setting" of 12, 26, and 9 as our base configuration.

Reason for using EMAs instead of SMAs: Using EMAs means that we can get more responsive signals based on the most recent prices.

Identifying the trend through MACD:

- The EMA moving upwards means that the trend is up for as long as the price remains above the EMA moving average.
- The EMA moving downwards means that the trend is down for as long as the price is below the EMA moving average

Crossovers:

Golden Cross (bullish): Shorter-term moving average crosses above a longer-term moving average.

Death Cross (bearish): Shorter-term moving average crosses below a longer-term moving average.

RSI 14 Analysis

A 14-period RSI was utilized as an indicator of overbought/oversold conditions. This study looked at the correlation between 14-period RSI readings and price action to provide signals for potential trend reversals based on short-term momentum movement.

Price Action Analysis: For selected stocks

Breakout and Retest: Significant breakouts above important resistance levels (e.g., BIAT, MPBS, and SFBT) where a shift from a bearish to a bullish trend occurred; subsequent retests confirmed these breakouts and provided lower-risk entry points.

Liquidity Sweep: Large order executions at specific price levels (e.g., SAH and SOTUVER) often occurred before directional moves.

Consolidation Phase - A time of accumulation or postponement after the breakouts occur, before resuming upward.

RSI To Confirm Momentum - Stocks in bullish trends with RSI above 50 and Stoch RSI rising.

MA - 10 Analysis

The 10-day Simple Moving Average is a filter to derive short-term trends by smoothing noise while illustrating the most recent price movement.

Trend Direction: Price will generally be above MA-10 if the price has increased somewhat over a period of time, or below MA-10 for downward pricing.

Dynamic Support and Resistance: The MA-10 acts as both dynamic support in an uptrend and dynamic resistance in a downtrend. Pullbacks and breaks of the MA-10 are tactical indicators.

Graphical Technical Analysis:

To complement the quantitative indicator table, graphical analysis was performed for each selected stock. All charts were generated programmatically using Python (with libraries including matplotlib, pandas), plotting price action alongside RSI-14, MACD, and moving averages (MA-10, MA-20, MA-50) over the period 01/01/2025 to 09/12/2025.

Examples chart (Using Python):

Figure 1 – MPBS Technical Chart

2025 Technical Analysis: MPBS

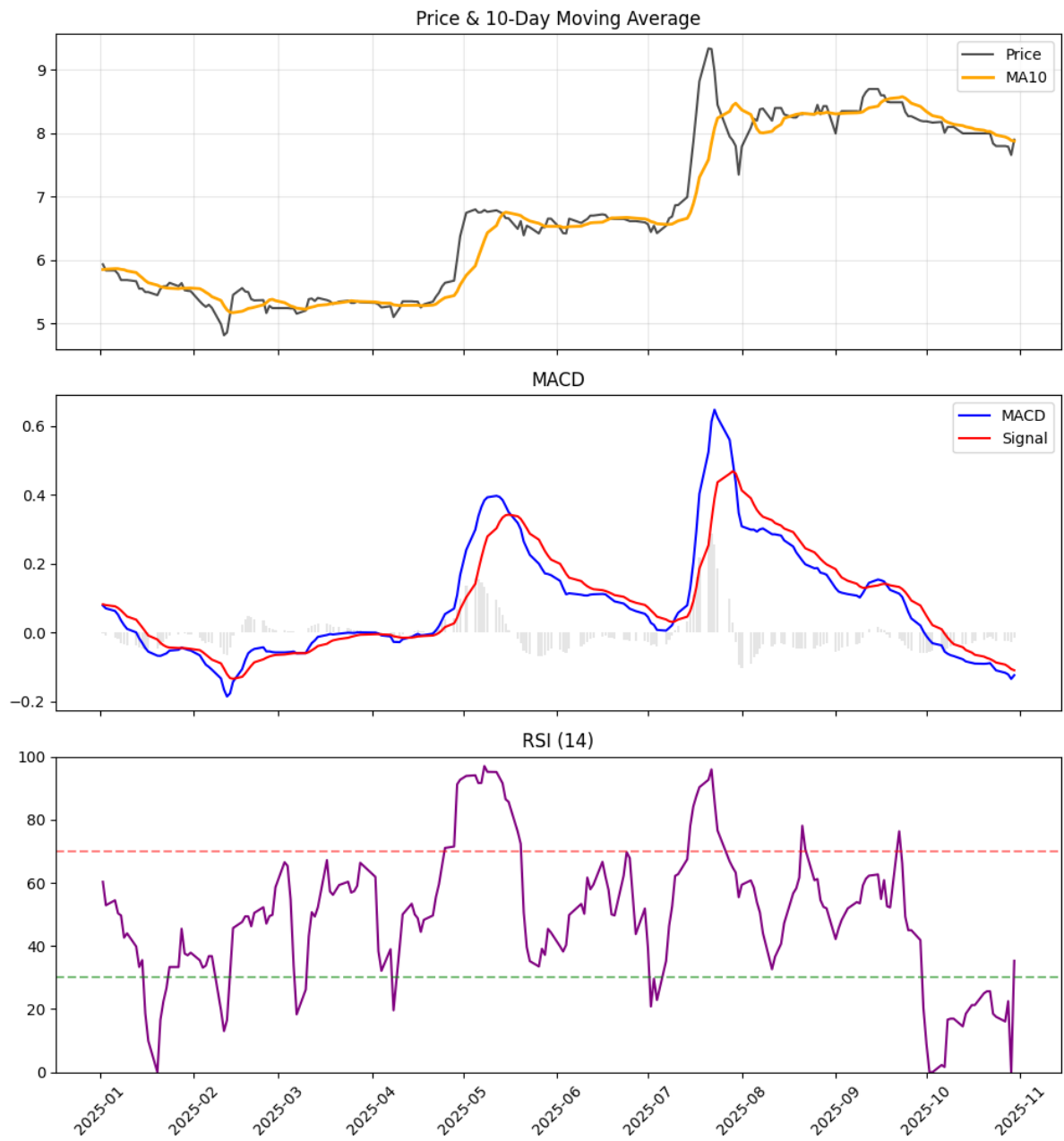
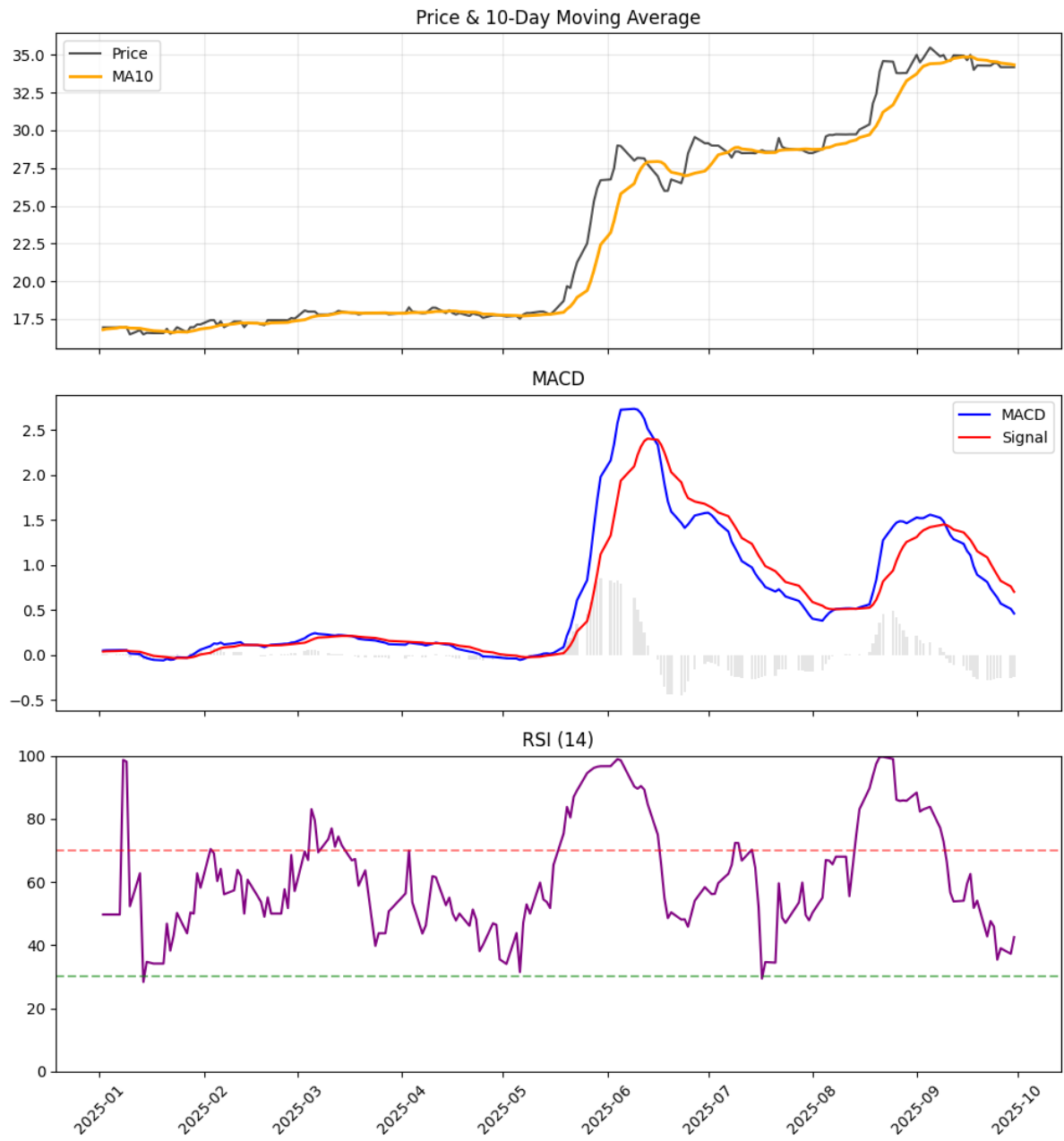


Figure 2 – TLF Technical Chart

2025 Technical Analysis: TLF



Portfolio Execution & Daily Management:

Our last portfolio was ultimately created on September 15, 2025, after the completion of the technical and fundamental phases. All trades were completed at the MAC SA brokerage platform, with a fee of 20 basis points, which was used to reduce trading costs.

Throughout the day, we made careful observations of the order book (Carnet des Ordres) to see the depth of the liquidity and how large the bid-ask spread was. Whenever we observe the spread narrowing, and due to the short holding period and time constraints, and given the fact that the Tunisian market generally has low volatility within a day, we would buy some shares at market price rather than wait for our limit orders to get filled. We wanted to balance our certainty of executing a trade against the deadline of our investment horizon. Trades were executed within the third hour of trading to take advantage of the strongest liquidity.

Limit orders were often used to maintain the price of shares and to avoid slippage. For TSL and SOTUMAG, however, we did not fill any of the limit orders we had set as the price did not move, so we purchased shares of both companies at market price (ATP) to ensure we received both of these allocations, but we stayed within the bounds of that day's prices. A total of 492,700 TND was invested according to the optimized weights derived from the application of the Markowitz model.

All trades were completed by 12:30 PM local time.

Daily Management Protocol:

From September 16 onward, the portfolio was actively monitored according to the following routine:

Intraday Monitoring (9:00 AM – 12:30 PM):

- Track real-time prices of all 9 stocks using the MAC SA trading terminal.
- Monitor key technical levels (support/resistance, MA-10, RSI updates).
- Observe volume activity for abnormal movements

Post-Market Analysis (2:00 PM – 3:00 PM):

- Record daily closing prices and update the portfolio-tracking spreadsheet.
- Recalculate portfolio value, daily return, and compare performance against the TUNINDEX benchmark.
- Review any changes in technical indicators.

Behavioural finance:

Although the daily analysis of market movements was constant throughout the process, we intentionally chose to adhere to a buy-and-hold strategy. Our reasoning was based on our belief that the combination of both fundamental and technical analyses, together with the application of the Markowitz model to derive portfolio weights, would maximise short-term risk-adjusted potential for return. Frequent trades would introduce extraneous transactional costs and the potential for psychological errors in judgment. A disciplined approach to holding positions would allow us to take full advantage of the results produced by our selection process.

Key Management Actions Taken:

During our daily observation of portfolio performance, the first trading days recorded a loss; however, we observed at the end of the first week the existence of an upward momentum trend as the loss was narrowed. This hypothesis was further confirmed since the start of the second trading week, when our portfolio recorded a gain for the first time by the end of the trading day on Monday, December 22nd. This trend continued throughout the week until reaching a peak on Friday, December 26th, at 10:05 AM, reaching a peak gain of + 10,15 TND. Although we could have extended our holding period until December 31st, we decided to hedge risk and start exiting the market progressively.

The selling process would be carried out via the following process:

December 26, 2025: Sold AMEN BANK (+2% gain), MPBS (+6.173% gain), and TLS (+1.543% gain) at market open after each reached its pre-defined profit threshold.

December 29, 2025: Liquidated the remaining holdings—BIAT (+1.581% gain), DELICE HOLDING (-4.618% loss), SAH (0.00% profit), SFBT (+0.327% gain), STMG (-0.445% loss), and SOTUVER (+2.435% gain)—at market prices, fully exiting the portfolio ahead of the December 31, 2025, deadline.

The screenshot displays the MAC SA financial platform interface. At the top, it shows the date and time as 26 déc. 2025, 10:05:26. The main header includes navigation tabs: MARCHÉ, PORTEFEUILLES, ANALYSE, and ACTUALITÉS. Below this, a section for 'PORTFEUILLE CHAOUCH HICHEM' shows a balance of 4,16 DISPONIBLE and a total value of 507,01. The interface also displays a list of positions with columns for CMP, PM, Part, Valorisation, +/- Value, and +/- Value %. On the right, there is a 'DÉTAILS VALEUR' section for the stock TLS, showing a current price of 32,900 and various order book details.

Documentation & Compliance:

All trades, decisions, and daily portfolio values were logged in a dedicated Excel workbook, with timestamps and rationale recorded to ensure transparency and reproducibility in accordance with academic project requirements.

Return analysis:

The portfolio was fully liquidated on December 29th, resulting in a 7.22 TND total gain, which equates to a 1.47% increase in the overall value of the portfolio throughout the holding period.

The detailed analysis of returns shows that the portfolio had an average daily return of 1.92%, which was annualized to a total of 62.224%. This performance significantly outperforms the reference market index, which recorded an average daily return of 0.04% and an annualized return of 11.16% over the same period. We also recorded a calculated Money-Weighted Rate of Return (MWRR) of 59.059% which incorporates the timing of and dollar amount of

cash flows to and from the portfolio. The difference between the annualized average return and the MWRR represents the timing of one inflow (inception) and the staggered exit of all other holdings at the end of December, which affected the time that capital has been exposed to market risk.

The portfolio's beta for the holding period is 1.119, meaning the portfolio has slightly more systematic risk than the overall market. The best-performing investment in the portfolio is MPBS, which realized a 6.173% gain; Delice Holding is the worst-performing investment, declining 4.618%.

KPIs & KRIs:

The Portfolio's Beta indicates its sensitivity to market movements, helping assess systematic risk.

$$\beta = \frac{\sigma_{im}}{\sigma_m^2}.$$

We recorded a beta of 1.119. A beta greater than 1.0 indicates that the portfolio has greater sensitivity to changes in the market than an average investment portfolio.

The annualized volatility of the portfolio is also relatively high at 29.69%, which means that if one invested in this portfolio over a set time period, the portfolio manager would expect to see significant fluctuations in the daily price of the portfolio.

The volatility of the portfolio should be considered in conjunction with the strong returns that the portfolio produces, as evidenced by the strong Sharpe and Sortino ratios. With Sharpe and Sortino ratios of 2.10 and 4.46, respectively, the portfolio provides high excess returns with low downside risk. The reason the Sortino ratio is substantially higher than the Sharpe ratio indicates that positive performance contributes significantly to the portfolio's volatility, thus confirming that the performance of the portfolio is driven by positive price movements.

Furthermore, the MWRR of 59.06% confirms that both asset allocation and timing of investment decisions were beneficial to the overall success of the portfolio.

Overall, the KPIs and KRIs demonstrate that the portfolio has a favourable risk-return profile, thus indicating the success of the stock selection and weighting strategy applied to the portfolio.

Conclusion:

Based on the overall performance, we can proudly say that we met our investment goal in a significant manner. Our performance has been driven primarily by maintaining our risk-minimizing discipline. We anticipate that we could have realized even stronger absolute returns had we held the portfolio for a longer period (as demonstrated by strong annualized returns and positive risk-adjusted performance), but we are nothing but fully satisfied by the results we have achieved, especially given that the portfolio consistently exceeded its market benchmark.

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<https://www.bct.gov.tn>

National Institute of Statistics of Tunisia (INS)

Official source for unemployment, inflation, and national accounts.

<https://www.ins.tn>

World Bank – Tunisia Country Data

Source for GDP (nominal and real growth), unemployment, and inflation indicators.

<https://data.worldbank.org/country/tunisia>

Trading Economics – Tunisia

<https://tradingeconomics.com/tunisia>

Macrotrends – Tunisia Economic Indicators

<https://www.macrotrends.net/countries/TUN/tunisia>

Worldometer – Tunisia GDP Data

INS – Industrial Production Index (IPI)

Manufacturing and non-manufacturing sector performance.

<https://www.ins.tn/en/statistiques/52>

European Commission – Economic Forecasts (EU)

Weak European demand is affecting Tunisian exports.

https://economy-finance.ec.europa.eu/economic-forecast-and-surveys_en

<https://www.worldometers.info/gdp/tunisia-gdp/>

Tunisie Valeur – stock guide

https://www.tunisievaleurs.com/fr/stockgfr.pdf?id_article=46