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Financial flow management: from crisis to sustainable development

Annotation. The article examines the management of financial flows at PJSC ArcelorMittal Kryvyi Rih during the prolonged crisis in Ukraine's steel industry from 2022 to 2024, driven by war-related risks, transformations in logistics chains, and the introduction of the CBAM mechanism. Special attention is devoted to identifying pathways for the company's transition to a model of sustainable development.

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Problem statement. The central problem lies in ensuring liquidity, financial stability, and continuity of operations at a large steel enterprise under conditions of deep crisis, rising debt burden, and negative profitability, combined with the urgent need to adapt to new EU regulatory requirements and structural changes in external markets.

Unresolved aspects. The comprehensive influence of war-related shocks, logistical constraints, and CBAM on the cost of equity and financial resilience of Ukrainian steelmakers remains insufficiently studied. A notable gap concerns holistic assessments for PJSC «ArcelorMittal Kryvyi Rih» that integrate crisis financial management with long-term "green" transformation.

Purpose of the article. The purpose is to analyze financial flow dynamics and the financial condition of PJSC «ArcelorMittal Kryvyi Rih» in 2022–2024 and to formulate financial management priorities enabling the company's transition from a crisis phase toward a sustainable development trajectory.

Summary of the main matter. The study applies horizontal and vertical financial analysis, key ratio analysis (liquidity, solvency, activity, profitability), factor analysis, and comparative analysis. The cost of equity is assessed using CAPM with a β-coefficient derived from European steelmaking analogues.

Conclusions. It is shown that in 2022-2024, the enterprise went through a phase of deep crisis with a sharp decline in liquidity, increased debt burden, and negative profitability. However, in 2024, signs of cash flow stabilisation and a gradual recovery of production loading were recorded. Priorities for financial management on the path «from crisis to sustainable development» are formulated: restructuring short-term liabilities and replenishing working capital; reducing costs through energy-efficient and logistical solutions; developing a multi-channel sales model; preparing for the full-scale implementation of CBAM; and directing investments toward «green» projects. These findings have practical significance for shaping corporate financial policy under conditions of high uncertainty.

Keywords: *financial flows, liquidity, financial stability, profitability, β-coefficient, CAPM, sustainable development, metallurgy, PJSC «ArcelorMittal Kryvyi Rih»*

Formulas: –; Figures: 2; Tables: 7; References: 21.

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Introduction. The relevance of the topic is driven by the prolonged turbulence in Ukraine's steel sector in 2022-2024, combining war-related risks, logistical constraints, volatility in global steel and raw material prices, and tightened EU regulatory requirements (CBAM). Under such conditions, financial flow management transforms from a routine function into a strategic tool for ensuring survival and transition to a sustainable development model.

Literature review. Research on financial flow management under crisis conditions is rooted in classical corporate finance theory, where liquidity, solvency, and the cost of capital are considered key determinants of business resilience. Foreign studies emphasise the interconnection between the structure of financial flows, risk, and long-term firm value in capital-intensive industries (steel, energy, transport), highlighting the need to combine anti-crisis tools with modernisation and "green" investments.

A separate body of literature focuses on working capital management and its influence on financial performance. Studies by Shin and Soenen, Lazaridis and Tryfonidis, and subsequent analyses of UK and other markets show that effective control over the cash conversion cycle, accounts receivable, and inventories directly correlates with profitability and firm value, while both excessive and insufficient investment in working capital reduces efficiency and increases risks. These approaches form the methodological basis for analysing the liquidity and solvency of industrial enterprises during shocks.

Global steel industry research highlights demand cyclicality, vulnerability to macroeconomic and geopolitical shocks, and supply chain transformations under trade barriers and climate policies. Reports by international organisations analyse how energy crises, rising raw material and logistics costs affect competitiveness in the EU, Asia, and developing markets, and emphasise the role of decarbonization and energy efficiency in forming a sustainable industry model.

Another group of studies is dedicated to the impact of Russia's full-scale invasion on Ukrainian metallurgy. Analytical reports by KSE and GMK Centre document the dramatic decline in steel production after 2022, loss of capacity in Mariupol, destruction of logistics infrastructure, and gradual recovery via reorientation to Danube ports and new land corridors. These works form the macro-level context but only partially reveal enterprise-level financial flow management.

Contemporary literature also examines the EU Carbon Border Adjustment Mechanism (CBAM) and its implications for global steel trade. European and international research considers CBAM as a tool against carbon leakage and a factor reshaping trade geography, increasing competitive pressure on carbon-intensive exporters, and stimulating decarbonization investments. Model simulations for Ukraine show potential output reductions in carbon-intensive sectors and the need for financial and investment strategy adjustments.

Another research direction concerns estimating the cost of equity and applying the CAPM in emerging markets. Numerous studies show that classical CAPM requires modifications due to country risks, limited capital market liquidity, structural shocks, and high volatility. Adjustments include country risk premiums and industry β values derived from international peers—relevant for Ukrainian steelmakers during wartime.

Although Ukrainian literature includes studies on the financial condition of the steel sector, investment attractiveness of mining and metallurgical enterprises, and CAPM use in local markets, there are virtually no micro-level works that combine analysis of financial flows of a specific enterprise in 2022–2024 with war-related risks, logistical shifts, CBAM preparation, and sustainable development. This study addresses this gap for PJSC «*ArcelorMittal Kryvyi Rih»*, one of the key players in Ukrainian metallurgy.

Purpose, tasks and methods. The research aim is to assess the state and dynamics of financial flows at PJSC «ArcelorMittal Kryvyi Rih» during the period from crisis to stabilisation and to formulate practical recommendations for enhancing solvency, financial stability, and investment attractiveness. The object of study is PJSC «ArcelorMittal Kryvyi Rih»; the subject is the methods, indicators, and tools for managing the enterprise's financial flows in a volatile external environment

Chronological Scope and Data. The empirical base covers 2022-2024 and relies on the official financial statements of the enterprise (Forms No. 1, No. 2), as well as industry reviews concerning steel production, logistics, and the EU regulatory context (CBAM). To ensure representativeness, internal reporting indicators are combined with open sectoral metrics.

Methodology. Horizontal and vertical analysis of financial statements, calculation of key ratios (liquidity, financial stability, business activity, profitability), factor and comparative analysis, and estimation of the cost of equity using the CAPM model (considering industry β) were employed. To account for market risk, a $\beta \approx 1.4$ (based on European metallurgy peers) was adopted, yielding a cost of equity estimate of ≈21.8%.

Research Results. In 2022-2024, the enterprise went through a phase of deep crisis with subsequent signs of stabilisation: the current ratio declined to 0.66 (working capital deficit), financial dependency increased to 6.99 (high debt burden), and return on sales improved from -111.8% (2022) to -13.7% (2024) but remained negative. Against the backdrop of partial production recovery (improved sectoral indicators and logistical access to seaports), key constraints remain energy costs, logistical premiums, and EU «carbon» requirements.

Financial management priorities are proposed: restoring liquidity through the restructuring of short-term liabilities and optimisation of working capital; reducing costs via energy-efficient solutions and flexible loading of units; multi-channel logistics with fixed freight «windows»; preparing MRV systems and «green» CAPEX for CBAM requirements; enhancing investment attractiveness through KPI covenants and phased investment projects.

Public Joint Stock Company «ArcelorMittal Kryvyi Rih» (EDRPOU code 24432974) is one of the largest full-cycle metallurgical enterprises in Ukraine, located in Kryvyi Rih. Its main economic activity is 24.10 «Manufacture of basic iron, steel, and ferro-alloys». The enterprise is part of the international ArcelorMittal group and plays a systemic role in supply chains for metal products used in engineering, construction, and infrastructure projects.

The production structure includes primary stages of ferrous metallurgy (coke-chemical production, blast furnace, steelmaking, and rolling stages) and auxiliary services (energy, transport, repair complexes), ensuring the full technological cycle – from feedstock preparation to finished rolled products. The product range covers pig iron, steel, flat and long rolled products, and section steel; sales are conducted in the domestic market and for export through specialised traders and direct contracts with industrial consumers. The enterprise's logistics infrastructure is integrated with mainline railway and port connections, ensuring the continuity of material and financial flows.

Organisational management is carried out collegially in accordance with group corporate policies. The average headcount according to 2024 reporting is 13,273 people, reflecting the scale of production and the enterprise's significance for the regional labour market. The quality and occupational safety management system is implemented based on ArcelorMittal corporate standards; environmental programs are aimed at modernising gas cleaning systems, improving energy efficiency, and reducing emissions in compliance with national requirements.

Key financial indicators for 2024: Assets – UAH 51,725,655 thousand; Equity – UAH 7,396,436 thousand; Net Income – UAH 64,591,407 thousand; Financial Result – Loss of UAH 8,848,963 thousand. These figures characterise the scale of assets and the level of operational activity in the reporting period and serve as the basis for the subsequent analytical section on financial flow management, liquidity, profitability, and risks.

Sectoral context (2023-2025)**.** The Ukrainian metallurgical industry is undergoing a prolonged phase of adaptation to wartime risks, logistics restructuring, and new regulatory conditions in key external markets. Following a collapse in steel output in 2022, the sector is gradually recovering: by the end of 2024, crude steel production increased by approximately 21.6% y/y – to about 7.6 million tonnes, and rolled product output – by 15.8% y/y – to ≈6.22 million tonnes. In January-April 2025, a further +1% was recorded compared to the same period in 2024, confirming a slow but steady recovery trend. This turnaround formed despite asset losses in the south and east and the persistence of a high security premium in costs [2].

The key driver of change was the evolution of logistical routes. At the start of the full-scale aggression, transport flows were reoriented by rail to ports in Romania and Poland; in August 2023, a temporary sea corridor opened, which in 2024 allowed a sharp increase in sea transhipment to ≈97.2 million tonnes (+57% y/y), of which ≈79.9 million tonnes were exports. Concurrently, railways retain their role for ore cargo (e.g., Ferrexpo: ~35% of ore sales in H1 2025 went by rail to the EU). The Danube ports, which served as a «safety cushion» in 2023, lost some volume in 2025 as cargo returned to the Black Sea. For the mining and metallurgical complex, this means a more diversified sales channel mix with significant volatility in freight and insurance rates [3].

On the demand side, Ukrainian steel critically depends on the European market: according to industry reviews, approximately 40–50% of metal product exports go to the EU, heightening sensitivity to regulatory changes in Brussels. The implementation of the Carbon Border Adjustment Mechanism (CBAM) creates the need for steel exporters to report and gradually pay a «carbon component,» impacting price competitiveness in the long term; industry studies directly point to steel as the most vulnerable segment of Ukrainian exports under CBAM. Despite announced administrative simplifications for many EU importers, the coverage by import volume will remain, making a decarbonization and «green» modernisation strategy not an option but a condition for Ukrainian producers' market access [4].

Key sector indicators are summarised in Table 1.

Table 1. Key sector indicators

Indicator	2023	2024 (year-end)	2025 (as of Jan.-Apr./ latest data)
Crude Steel Production, mn t	6.0	7.57-7.58	2.43 (+1% y/y to 4 months)
Pig Iron Output, mn t	–	7.09	n/a
Rolled Product Output, mn t	–	6.22	n/a
Sea Corridor: Cargo Transhipment via Greater Odesa Ports, mn t	~62 (estimate, base for +57% in 2024)	97.2 (+57% y/y)	120 accumulated since corridor start (incl. 28 for 2025 by May)
AMKR (ArcelorMittal Kryvyi Rih): Steel Production, mn t	–	1.65	–
Export-Sector Contribution (for reference)	–	Iron & Steel: +30% of export value; sector contribution ~7.2% of GDP (incl. supply chains)	–
EU Regulation (CBAM) – Status	Transitional Phase (reporting)	Transitional Phase (reporting)	Definitive regime from 2026 (CBAM certificates; proposal to postpone certificate sales to 02.2027)

Source: compiled by the author based on [6; 9; 10; 11]

Against the backdrop of macro risks and regulatory changes, the corporate strategies of key players – ArcelorMittal Kryvyi Rih, Metinvest divisions, Interpipe, Ferrexpo – converge on several priorities. First, this is a flexible «flex-up» of capacities as energy supply and logistics stabilise. Second, a reallocation of the product portfolio toward higher value-added and more margin-rich products, while balancing between the domestic market (infrastructure recovery) and exports. Third, accelerating energy efficiency programs and planning decarbonization investments (from gas cleaning modernisation to a phased transition to «green» smelting technologies). As an example, PJSC «ArcelorMittal Kryvyi Rih» in 2024 raised the loading of metallurgical units to ~50% by mid-year, while its mining block operated at ~70–75% of pre-war levels. However, due to more expensive electricity (including imports), high logistics costs, and weaker market conditions, the company ended the year with a loss, expecting to reach break-even under more favourable conditions. This well illustrates the «weak spot» in cost structure – the energy and logistics components [5].

Structurally, 2024 can be considered the «peak of recovery» after the 2022–2023 lows: pig iron production rose to ≈7.09 million tonnes, steel to ≈7.57 million tonnes, and rolled products to ≈6.22 million tonnes. At the start of 2025, dynamics remained positive (plus 9–10% in the first months vs. 2024, according to relevant associations), although the global steel market overall showed only moderate growth, with margins dependent on the price cycle of ore, coking coal, and energy. For the Ukrainian sector, this «flat» global environment means intensified competition in EU and MENA markets and a tougher fight for freight and insurance. Logistics remains the defining constraint on supply and costs. The opening of the sea corridor in 2023 and its scaling in 2024 eased «bottlenecks» at western land borders but maintained asymmetry in insurance rates and risk premiums. In 2025, part of the cargo logically shifted back from the Danube to the Black Sea, which simultaneously reduces delivery costs to distant directions but increases sensitivity to security incidents. This dictates the need for «multi-channel» planning for metallurgical chain companies: having alternative routes in case of disruptions, contracting port windows and insurance coverage considering peak seasons [7; 6].

The EU regulatory environment in the coming years will be defined by CBAM implementation: from 2026-2027, the transition from pure reporting to actual payments for the «carbon footprint» of imported steel is expected. For Ukraine, this means that a «from crisis to

sustainable development» strategy requires integration into a decarbonization roadmap – from energy efficiency and reducing specific emissions to pilots with DRI technologies, hydrogen metallurgy, and «green» electrometallurgical conversion, where technologically and economically justified. Reducing the carbon intensity of production will directly convert into a smaller «CBAM discount» when selling to the EU, i.e., into restoring the price competitiveness of Ukrainian rolled products [8].

For the object of our study – PJSC «ArcelorMittal Kryvyi Rih» – the sectoral context translates into three operational imperatives. First, managing energy costs (balance between own generation, market purchases, and flexible unit loading schedules) as a central element of margin protection. Second, logistics optimisation (freight contracts, combination of sea, Danube, and railway routes, synchronisation of ore/coke/scrap supply and sales) to smooth «price waves» Third, gradual «decarbonization» transformation – modernisation of gas cleaning systems, energy-saving CAPEX, designing «green» conversion stages, implementing emission monitoring and data verification systems for CBAM reporting. These directions will shape the company's competitive position in the EU market in 2026–2030 and determine its ability to convert sectoral recovery into stable profitability.

Financial analysis of PJSC «ArcelorMittal Kryvyi Rih». The analysis of the enterprise's financial ratios reflects trends in liquidity, financial stability, and profitability during 2022-2024. The data indicate a deep crisis phase in 2022–2023 and a gradual mitigation of negative effects in 2024. Despite loss-making operations, the enterprise shows certain signs of cash flow stabilisation and adaptation of its financial structure to constrained production capacity. Key liquidity trends are summarised in Table 2.

Table 2. Liquidity Indicators of PJSC «ArcelorMittal Kryvyi Rih»

Indicator	2022	2023	2024	Normative
Current Ratio	1.61	0.88	0.66	1,0–2,0
Quick Ratio	0.85	0.44	0.26	>0,8
Absolute Liquidity Ratio	0.05	0.02	0.01	>0,2

Source: calculated by the author based on [12] and PJSC «ArcelorMittal Kryvyi Rih» financial statements

In 2022, the enterprise still had a satisfactory level of liquidity (current ratio 1.61), meeting normative bounds. However, in 2023–2024, a sharp decline in solvency occurred, to 0.88 and 0.66, respectively, meaning each hryvnia of current liabilities was covered by only 66 kopiykas of current assets.

The quick ratio decreased from 0.85 to 0.26, and the absolute ratio from 0.05 to 0.01, indicating a cash deficit and high dependence on short-term creditor financing. This is a typical consequence of wartime and energy constraints, rising receivables, and inflationary pressure on costs. The implications for financial stability are further reflected in the indicators presented in Table 3.

Table 3. Analysis of Financial Stability of PJSC «ArcelorMittal Kryvyi Rih»

Indicator	2022	2023	2024	Normative
Financial Autonomy Ratio	0.54	0.34	0.14	>0.5
Financial Dependency Ratio	1.87	2.94	6.99	<0.2
Financial Risk Ratio	0.87	1.94	5.99	<0.5
Equity Manoeuvrability Ratio	0.34	-0.31	-1.91	>0.5
Interest Coverage Ratio	-43.46	-6.77	-3.86	>1
Inventory Coverage Ratio	0.80	-0.27	-0.85	>0.6-0.8

Source: calculated by the author based on [13] and PJSC «ArcelorMittal Kryvyi Rih» financial statements

The financial autonomy ratio value decreased from 0.54 in 2022 to 0.14 in 2024, i.e., the share of equity in the asset structure fell threefold. This indicates a loss of financial independence and high dependence on external sources. The financial dependency ratio rose to 6.99, and the

financial risk ratio to 5.99, meaning borrowed funds exceed equity sixfold. Negative values of the manoeuvrability and inventory coverage ratios demonstrate exhausted internal reserves and the absence of working capital from own financing. The negative interest coverage ratio (–3.86 in 2024) means the enterprise cannot cover loan expenses from operating profit. Collectively, this confirms a crisis state of financial stability, requiring debt restructuring and the attraction of long-term financing sources.

In 2022, the enterprise incurred its greatest losses: return on sales was –111.8%, meaning each hryvnia of revenue brought over a hryvnia of loss. In 2023–2024, the scale of losses more than halved, indicating partial production stabilisation. Key profitability indicators and their dynamics are summarised in Table 4.

Table 4. Profitability Indicators of PJSC «ArcelorMittal Kryvyi Rih»

Indicator	2022	2023	2024
Return on Operations	-49.9%	–21.9%	–12.0%
Return on Sales (ROS)	-111.8%	–28.2%	–13.7%
Return on Assets (ROA)	-93.0%	–25.1%	–17.1%
Return on Equity (ROE)	-173.7%	–73.7%	–119.6%

Source: calculated by the author based on [14] and financial statements

Return on assets improved from –93.0% to –17.1%, meaning a gradual reduction of pressure on capital. However, the negative ROE value (–119.6%) indicates that owners are still incurring financial losses, and profitability recovery is only possible under conditions of production volume growth, energy efficiency, and cost reduction.

After the peak in 2021, average HRC quotations in Europe declined in 2022–2023 and stabilised in 2024 around ~USD 670–690/t (estimated based on After the peak in 2021, average HRC quotations in Europe declined in 2022–2023 and stabilized in 2024 around ~USD 670–690/t (estimated based on exchange/market indicator dynamics). The dynamics of global HRC prices in 2024 are illustrated in Figure 1.

Figure 1 – Dynamics of Global Hot-Rolled Coil (HRC) Steel Prices in 2024
Source: [15]

Throughout 2024, the price of hot-rolled coil steel exhibited pronounced volatility: after a decrease in Q1 to ≈700 USD/t, it surged sharply in the spring to over 950 USD/t, reflecting the market's reaction to a supply deficit and seasonal construction sector activity. In the summer-autumn period, quotations gradually declined under the influence of production stabilisation and reduced demand in the EU, holding within the range of 800–850 USD/t by year-end. This dynamic

indicates a gradual transition of the global steel market to a phase of equilibrium prices following a period of energy and logistical shocks.

Figure 2 illustrates trends for the European steel market, indicating the cyclical nature of price recovery. After an increase to around 780 USD/t in Q1 2024, a gradual decline in quotations to ≈590 USD/t occurred by Q4 2024, corresponding to a demand correction phase against the backdrop of a slowdown in EU industrial production. Subsequently, in 2025, a moderate price increase to ≈710 USD/t in Q2 2025 was observed under the influence of recovering investment activity in the construction and engineering sectors. This trajectory underscores market expectations for the stabilisation of the European steel industry after a prolonged period of volatility.

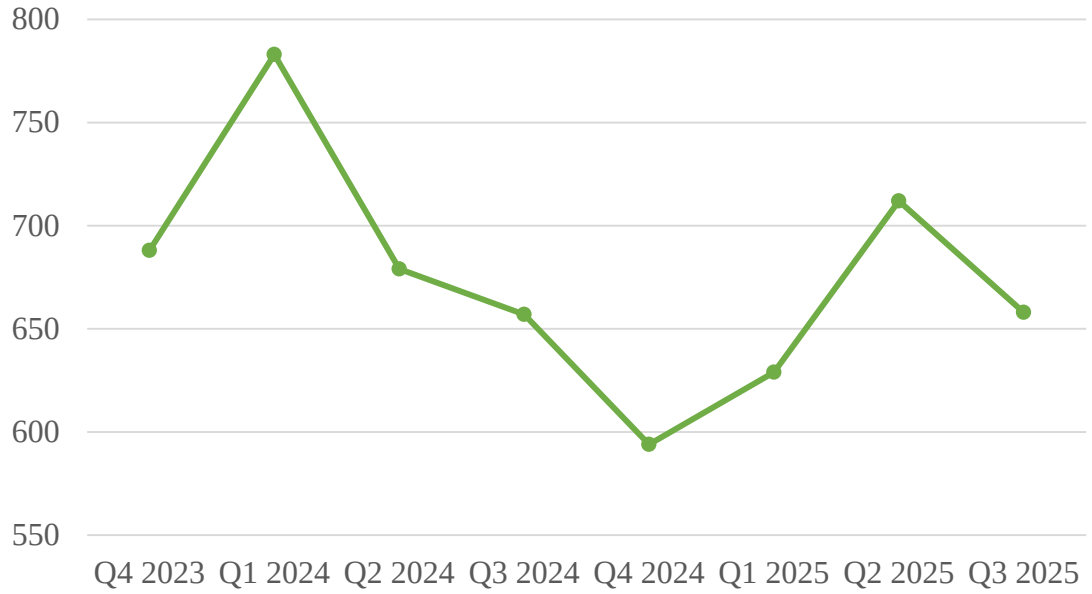

Figure 2 – Dynamics of Steel Prices in Europe, USD/mt
Source: [16]

For comparison with the industrial cycle, historical series of DAX, CAC 40, FTSE MIB, WIG20, and EURO STOXX 50 indices are available in open feeds (Yahoo Finance/Investing). The 2023–2024 rise is interpreted as a gradual improvement in EU industrial investment climate.

Wholesale/retail electricity prices in the EU rose sharply in 2022–H1'2023, then declined in H2'2023, partially easing metallurgists' costs in 2024 (Eurostat; also EU review report on energy carrier prices) [17].

Since PJSC «ArcelorMittal Kryvyi Rih» is not a public company, a comparative approach is used for β calculation – based on public metallurgical companies operating under similar risk and market conditions. The results of the beta estimation are presented in Table 5.

Table 5. β Calculation

Peer Company	Exchange	β Coefficient (5-year estimate)
ArcelorMittal S.A.	Euronext Amsterdam	1.71
Voestalpine AG	Vienna Stock Exchange	1.28
SSAB AB	Nasdaq Stockholm	1.33
Sector average β	–	1.44

Source: compiled by the author based on [18; 19; 20]

For PJSC «ArcelorMittal Kryvyi Rih», it is appropriate to adopt β = 1.4, corresponding to elevated market risk in the ferrous metallurgy industry under macroeconomic instability.

The input parameters used for the CAPM calculation are presented in Table 6.

Table 6. Input Parameters for CAPM Calculation

Indicator	Value	Source
Risk-free rate	15.5 %	Yield on Ukrainian domestic government bonds (OVDP), 2024
Average market return	20 %	Average expected return on investments in the CEE market, World Bank Data
Market risk premium	4.5 %	author's calculation
β Coefficient	1.4	see previous table

Source: compiled by the author based on [21]

Substituting values into the CAPM formula:

CAPM=15.5%+1.4×(20%−15.5%)=21.8%$CAPM$=15.5%+1.4×(20%−15.5%)=21.8%

Thus, the expected cost of equity for PJSC «ArcelorMittal Kryvyi Rih» is ≈ 21.8%.

The obtained value r_e=21.8% exceeds the average return in the Ukrainian capital market, reflecting a high level of systematic risk in metallurgy. The high β (1.4) is explained by the company's strong dependence on the global steel market, energy prices, and logistical routes. To attract investors, the enterprise must demonstrate strategic cash flow stabilization, an increase in the equity share, and ESG-oriented initiatives (energy efficiency, low-carbon metallurgy). The r_e value can be used in constructing WACC (Weighted Average Cost of Capital) and evaluating the feasibility of investment in modernization projects.

Discussion. The state of financial flows at PJSC «ArcelorMittal Kryvyi Rih» is formed under the combined influence of market, operational-logistical, regulatory, and financial risks. In 2022-2024, the enterprise operated under wartime constraints and global steel market volatility, which caused a decline in liquidity (current ratio 0.66 in 2024), excessive debt burden (financial dependency ratio 6.99), and negative profitability (ROS -13.7%; ROA -17.1%). For an investor, this means elevated systematic risk (β≈1.4) and a risk premium in the cost of capital (≈21.8% per CAPM). The integrated risk profile focuses on channels of impact on cash flows and capital.

Key drivers of profitability are the price of rolled products and semi-finished goods in the EU and MENA, as well as the cost of ore, coke, and electricity. After the 2023 correction, the steel market showed only partial recovery, and the price curve remained volatile. For AMKR, this means revenue sensitivity to export prices amid fixed or weakly controlled cost items. A downward HRC trend or «flat» conditions with high logistics and energy costs quickly shift EBITDA into negative territory.

Sales chains rely on the sea corridor of Greater Odesa ports, the Danube cluster, and overland routes to the EU. Any disruptions (insurance premiums, freight peaks, draft restrictions, border delays) directly increase costs, extend the collection cycle, and require additional working capital. The risk of reorienting cargo from sea to the Danube or railway creates «scissors» in margins even with stable global prices.

Metallurgy is energy-intensive; critical for the enterprise are tariffs for electricity and gas, as well as the availability of backup sources and unit loading schedules. Fluctuations in wholesale electricity prices and potential shortages during peak periods increase the variable part of costs and induce forced downtime, worsening fixed cost coverage and pressuring cash flow.

The EU's transition to mandatory CBAM certificate payments from 2026 can create a long-term discount differential for steel exporters with a high carbon footprint. Without accelerated decarbonization (energy-efficient CAPEX, gas cleaning modernization, data preparation for emission verification), the price of Ukrainian rolled products at the EU border will include an additional «carbon» surcharge, reducing competitiveness and potentially shrinking volumes.

Deteriorating liquidity and high creditor dependence (financial risk ratio 5.99; interest coverage -3.86) indicate a limited ability to service debt from operating cash flow. Rising rates, a reduction in trade credit, or demands for advances from suppliers lead to a working capital deficit, increased arrears, and the risk of contractual penalties. Currency risk manifests through the currency structure of revenue/expenses and the revaluation of liabilities.

Unplanned downtime of blast furnace/steelmaking units, deferred maintenance, a shortage of qualified personnel, and bottlenecks in the repair fund threaten to disrupt smelting rhythm and cause heat/metal losses. Additionally – risks of occupational safety incidents, environmental claims, cyber risks (IT systems, MES/SCADA), which can halt production and generate significant unplanned costs.

These include contractual disputes with counterparties, environmental requirements, sanctions regimes, and customs procedures in sales markets. Breach of contract terms due to force majeure or logistics can lead to fines and claims, accumulating in accounts payable and harming business reputation.

Hostilities create uncertainty regarding personnel and infrastructure safety, potential direct asset damage, and prolonged supply chain stoppages. This is a fundamental macro risk that is non-diversifiable and directly impacts revenue forecasts and CAPEX plans.

Market and regulatory shocks typically manifest through three channels:

- Revenue – price/volume decrease, payment deferrals;
- Cost of sales – energy/logistics/raw materials;
- Working capital – growth of accounts receivable and the need for additional inventory financing.

Combined with high financial dependency, this deepens the negative interest coverage and perpetuates loss-making even with production stabilization. Early warning signals and corresponding basic response measures for the key risk categories are summarised in Table 7.

Table 7. Early warning signals and basic response measures

Risk	Impact Channel on CFO	Early Warning Indicators (EWI)	Basic Response Actions
Decline in export Steel Price	↓Margin, ↓EBITDA	HRC indices/EU market premiums, price drop of 5-7% m/m	Flexible furnace loading; hedging; shift mix toward higher value-added products
Rising energy Costs	↑Cost of sales	Peak €/MWh, grid restrictions	Own generation/PPAs; energy-efficient CAPEX; shift to off-peak schedules
Logistical disruptions	↑Transport costs, ↑DIO/DSO	Vessel arrival delays; insurance premium hikes	Multi-channel routes (sea/Danube/rail); fix freight in «windows»
CBAM	↓Price Competitiveness	Changes in rules/coefficients	Prepare MRV emission system; «green» modernization; data validation
Liquidity shortage	↑Financial Expenses, Default Risk	Current ratio drop <0.8; ICR<0	Debt restructuring; factoring/forfaiting; inventory limits
Production downtime	Lost output, Unplanned expenses	Rise in accident rate/downtime	Risk-based maintenance; spare parts funds; business interruption insurance

For a portfolio investor, AMKR's current profile is marked by high systematic risk and low financial stability. This is reflected in the high cost of capital (about 21.8%). Investment attractiveness may increase significantly under several conditions: stable access to sea logistics with controlled insurance costs; electricity and gas contracts with predictable prices; a proven decarbonisation programme that meets CBAM requirements; agreements with banks and suppliers on debt restructuring and working capital financing; and a gradual return to a positive operating margin.

For a strategic investor, a suitable option is conditional investment. This includes stage-gated capital expenditure, covenant limits, and key performance indicators for liquidity and MRV readiness. Further investment tranches would depend on achieving operational and ESG targets.

Overall, the company's risk profile is gradually moving from the acute crisis of 2022-2023 to a more manageable position in 2024-2025. However, a full transition to sustainable development will require coordinated decisions in logistics, energy, finance, and decarbonisation.

Conclusions. The analysis of financial statements for 2022-2024 shows that the enterprise experienced a deep crisis of liquidity and profitability. This crisis was caused by the consequences of the war, logistical barriers, and falling prices for metal products. The current ratio fell from 1.61 in 2022 to 0.66 in 2024, which indicates a shortage of working capital. At the same time, the increase in the financial dependency ratio from 1.87 to 6.99 confirms a higher debt burden. The negative return on sales (-13.7% in 2024) shows that the enterprise is still operating at a loss, although the size of losses is gradually decreasing. Overall, the financial trends indicate a shift from crisis response to gradual stabilisation of cash flows.

Despite weak financial indicators, 2024 became a period of partial recovery in production. Steel output increased to 1.65 million tonnes, which is 70% higher than in 2023 (GMK Center, Reuters). However, the enterprise is still operating at less than 50% of its production capacity. The main constraints remain energy risks, labour shortages, high logistics costs, limited investment in modernisation, and the lack of full war risk insurance. In 2024, the level of automation and digital control of production processes increased, but this is still not enough for a full transition to green metallurgy.

The global steel market in 2024 was highly volatile. The average HRC price in Europe was about USD 685 per tonne, which is below the profitability level for most Ukrainian exporters (Trading Economics, FocusEconomics). A positive development was the recovery of maritime exports: more than 97 million tonnes of cargo passed through the Greater Odesa ports corridor in 2024, which is 57% more than in 2023 (EBA, GMK Center). At the same time, the approaching full implementation of the EU CBAM creates regulatory pressure and will require AMKR to modernise technologies and reduce carbon emissions.

The CAPM model calculation shows that the cost of equity is about 21.8%, which reflects a high level of sector risk ($\beta = 1.4$). This level of return means that investors expect a significant risk premium compared to risk-free assets. Despite this, the presence of the global corporation ArcelorMittal S.A. provides access to international financial markets and increases confidence among creditors.

The company's investment attractiveness could increase under the following conditions: - stabilisation of logistics through seaports; - launch of energy efficiency and decarbonisation programmes; - restructuring of short-term debt; - return to a positive financial result.

PJSC ArcelorMittal Kryvyi Rih remains a key player in Ukrainian metallurgy. Despite the crisis of 2022-2023, the company has retained its production potential and capacity for recovery. By the end of 2024, the enterprise shows signs of stabilisation but still remains financially vulnerable. Its strategic priorities should focus on: - strengthening liquidity and reducing debt pressure; - improving operational efficiency; - integrating ESG approaches and decarbonising production; - diversifying sales markets and logistics routes.

Overall, the company's situation can be described as manageable financial instability, with a gradual move towards sustainable development. This creates the basis for a recovery in profitability and investment activity.

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Управління фінансовими потоками: від кризи до сталого розвитку

Анотація. Стаття присвячена дослідженню управління фінансовими потоками ПАТ «АрселорМіттал Кривий Ріг» у період затяжної кризи української металургії 2022–2024 рр., зумовленої воєнними ризиками, трансформацією логістичних ланцюгів та запровадженням механізму CBAM, із акцентом на пошук орієнтирів переходу підприємства до моделі сталого розвитку.

Постановка проблеми. Основною проблемою є забезпечення ліквідності, фінансової стійкості та безперервності операцій великого металургійного підприємства в умовах глибокої кризи, зростання боргового навантаження та від'ємної рентабельності, одночасно з необхідністю адаптації до нових регуляторних вимог ЄС і структурних змін на зовнішніх ринках.

Невирішені аспекти проблеми. Недостатньо дослідженим залишається комплексний вплив воєнних шоків, логістичних обмежень та CBAM на вартість власного капіталу й фінансову стійкість українських металургів, а також брак цілісних оцінок для ПАТ «АрселорМіттал Кривий Ріг», які б поєднували антикризове фінансове управління з довгостроковою «зеленою» трансформацією.

Мета статті. Метою статті є аналіз динаміки фінансових потоків і фінансового стану ПАТ «АрселорМіттал Кривий Ріг» у 2022–2024 рр. та формування пріоритетів фінансового менеджменту, спрямованих на перехід від фази кризи до траєкторії сталого розвитку підприємства.

Виклад основного матеріалу. На основі фінансової звітності підприємства та галузевих оглядів проаналізовано секторний контекст функціонування комбінату в умовах воєнних ризиків, логістичних трансформацій і запровадження CBAM; із використанням системи фінансових коефіцієнтів досліджено динаміку ліквідності, фінансової стійкості та рентабельності; оцінено вартість власного капіталу за моделлю CAPM із β, розрахованим за європейськими металургійними аналогами; простежено зміни грошових потоків і рівня виробничого завантаження.

Висновки. Показано, що у 2022–2024 рр. підприємство пройшло фазу глибокої кризи із різким падінням ліквідності, посиленням боргового навантаження та від'ємною рентабельністю, водночас у 2024 р. зафіксовано ознаки стабілізації грошових потоків і поступового відновлення виробничого завантаження. Сформовано пріоритети фінансового менеджменту на шляху «від кризи до сталого розвитку»: реструктуризація короткострокових зобов'язань і відновлення оборотного капіталу, зниження собівартості за рахунок енергоефективних та логістичних рішень, розбудова багатоканальної моделі збуту, підготовка до повномасштабної дії CBAM та орієнтація інвестицій на «зелені» проєкти, що має практичне значення для формування корпоративної фінансової політики в умовах високої невизначеності.

Ключові слова: *фінансові потоки, ліквідність, фінансова стійкість, рентабельність, β-коефіцієнт, CAPM, сталий розвиток, металургія, ПАТ «АрселорМіттал Кривий Ріг».*

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