American University Kyiv

A Capstone Project

ANALYSIS OF INVESTMENT STRATEGIES FOR DRONE MANUFACTURING ON EXAMPLE OF AILAND SYSTEMS

АНАЛІЗ СТРАТЕГІЙ ІНВЕСТУВАННЯ В ІНДУСТРІЇ ДРОНІВ НА ПРИКЛАДІ КОМПАНІЇ AILAND SYSTEMS

by Daria Tyshchenko

Presented in Partial Fulfillment of the Requirements
for the Master Degree

APPROVED BY:

2025

ABSTRACT

This capstone project analyzes investment strategies for drone manufacturing, with a particular focus on the Ukrainian market. Implementing a comprehensive PESTEL analysis and case study evaluation of Ailand Systems, this research identifies key investment opportunities, risks, and strategic pathways. The analysis highlights the critical role of government grants, venture capital, and acceleration programs in driving investments in technological innovation and operational scaling. Key challenges, including reliance on imported components from China, regulatory bottlenecks, and export restrictions, are also examined. Recommendations are provided to enhance investment strategies, focusing on technological development, supply chain diversification, access to international funding, and market reach expansion.

TABLE OF CONTENTS

INTRODUCTION

The drone manufacturing industry is one of the most dynamic and rapidly evolving sectors worldwide. It plays a vital role in defense, agriculture, logistics, and construction, with growing demand fueled by advances in technologies and AI. The full-scale war in Ukraine, along with these technological shifts, accelerated the need for enhanced drone capabilities.

Ukraine's drone sector has demonstrated rapid growth since the start of the full-scale war in 2022, driving innovation and local production. International and local investors, venture capital firms, business acceleration, and government programs have increasingly supported this growth. However, the industry faces challenges, including supply chain reliance on China, regulatory hurdles, war-time risks, and export limitations.

This capstone explores strategic investment opportunities in drone manufacturing, focusing on Ukraine. Through a financial analysis of Ailand Systems as a case study and risk and opportunities analysis using the PESTEL model, it provides insights into investment potential and strategic directions. The report is structured to first review the global market, then analyze investment opportunities, analyze a case study of Ailand Systems, identify industry challenges, and offer actionable recommendations for drone manufacturers on the example of Ailand Systems.

CHAPTER 1. OVERVIEW OF THE DRONE MARKET

1.1. Current trends and forecasts of the drone market

The overall UAV market, including OEM and aftermarket, is expected to grow in value from USD 30.2 bln in 2024 to USD 48.5 bln in 2029 at a CAGR of 9.9%. In volumes, the projected growth is 5.42 units mln in 2024 to 7.51 mln units in 2029. The development of the industry is highly impacted by such technological advancements as lightweight composite materials evolvement that improves flight duration and efficiency, and evolvements in high-resolution imaging sensors that give wider application possibilities. Integrating AI, machine learning algorithms, and advanced data analytics significantly enhanced UAVs intelligence, leading to more sophisticated autonomous operations. What is more, enhancements in communication systems and battery technologies are essential for improvements in command and control capabilities, as well as flight range. [1]

1.2. Key segments of the drone market

The market is divided into drones for commercial, civil, and military use.

The Commercial drone market is estimated to grow from 5.32 bln USD in 2024 to 9.34 bln USD by 2030, at an expected CAGR of 11.2%. [2]

Commercial UAVs are classified into remotely piloted, optionally piloted, and fully autonomous aerial vehicles and play a significant role in commercial sectors due to such functions as Surveying & Mapping, Inspection & Monitoring, etc. Commercial UAVs are also considered to be the future of commercial delivery to customers, as they shorten the cost of delivery, as well as the delivery time.

By End-user, the commercial UAV market is divided into logistics & transportation, agriculture, energy & power, construction & mining, media & entertainment, insurance, wildlife & forestry, and academics & research. Logistics & transportation is projected to grow at the highest CAGR by 2030.

Based on function, the market is classified into passenger drones, inspection & monitoring drones, surveying and mapping drones, spraying and seeding drones, cargo air vehicles, and others. Passenger drones are expected to show the highest increase by 2030.

By the operational mode, the commercial UAV market is segmented into remotely piloted, optionally piloted, and fully autonomous drones, with remotely piloted UAVs projected to record the highest growth by 2030. [2]

The global civil drone market is growing exponentially due to rising demand for non-military applications. This growth is driven by intensive technological advancement, increasing demand for

automation, and growing regulatory support globally for UAV usage in civil airspace. The application industries of civil drones include:

- Agriculture: help farmers make digital-driven decisions to monitor crop health, manage irrigation, and detect weeds.
- Infrastructure and Construction: help save time and increase safety by removing the need for human presence during inspections in hazardous areas.
- Logistics and Delivery: help to deliver goods and medicines to remote and inaccessible areas.
- Public Safety and Emergency Services: support disaster response, search and rescue operations, and law enforcement by delivering real-time imagery, detecting hazards, and transporting emergency supplies. [43]

Key players in the civil drone market include SZ DJI Technology Co. Ltd (China), The Boeing Company (USA), Israel Aerospace Industry Ltd. (Israel), AeroVironment Inc. (USA), and Lockheed Martin Corporation (USA). [43]

The military drone market is also projected to experience significant growth, from 13.0 bln USD in 2023 to 18.2 bln USD in 2028, at an expected CAGR of 7.0%. [3]

Military UAVs operate remotely, autonomously, or through a combination of both, and are equipped with sensors, electronic receivers, and transmitters, as well as offensive weaponry. These drones are essential for strategic and combat zone reconnaissance, engaging on the front lines by marking targets for precision-guided weapons or directly deploying these munitions. The increasing demand for military drones is driven by the changing dynamics of conflicts, where unconventional adversaries and asymmetric warfare tactics present new challenges. Drones provide a strategic edge through precise strikes and real-time intelligence, making them vital for addressing these contemporary threats. This need for advanced drone capabilities is a major factor fueling the growth of the military drone market. [3]

In terms of market segmentation, fixed-wing UAVs are anticipated to dominate the market due to their benefits, including extended flight range, economy consumption, and payload capacity. That makes them effective in long-distance reconnaissance, mapping, surveillance, and targeting enemy positions if required. At the same time, the market of rotary UAVs has also its own potential, due to enhancements of the wing design, vertical take-off and landing capabilities, and payload capacity, which makes this drone type a universal tool at the tactical level for reconnaissance, combat management, and striking the enemy. [4]

By range, the UAVs are classified into unmanned aerial vehicles with extended line of sight (EVLOS), visual line of sight (VLOS), and beyond line of sight (BLOS). EVLOS segment is expected to grow the fastest, compared to other types, due to their long-range capabilities for combat control, as

well as gathering critical information in electronic warfare environments and potential use for electronic jamming. [4]

UAVs are divided into semi-autonomous, remotely controlled, and autonomous by the degree of autonomy. While remotely controlled drones are anticipated to lead the market, the autonomous type is expected to show the highest growth rate. [4]

Major players in the UAV market include General Atomics Aeronautical Systems (GA-ASI)(US), Teledyne FLIR LLC (US), Northrop Grumman Corporation (US), EHang (China), Parrot (France), Teledyne FLIR LLC (US), SZ DJI Technology Co., Ltd (China), Israel Aerospace Industries Ltd. (IAI) (Israel), AeroVironment, Inc. (US), Lockheed Martin Corporation (US). [3]

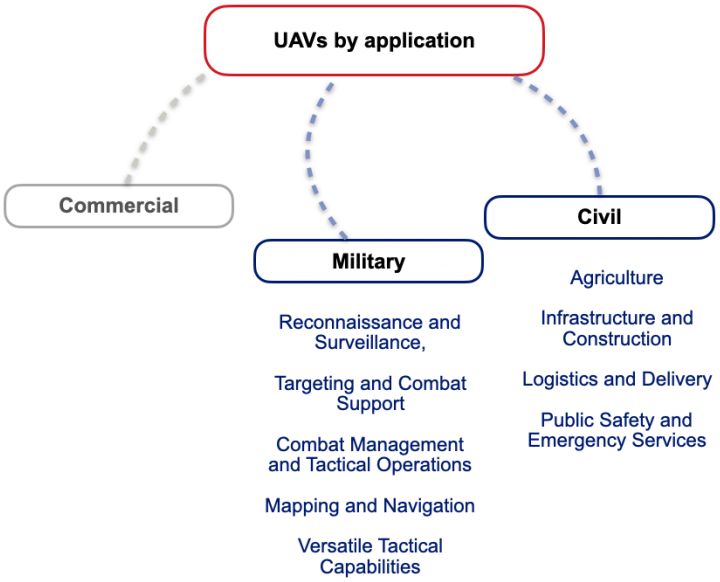

Illustration 1.1. UAVs by applications. Prepared by the author based on the sources: [2], [43], [3], [4].

All things considered, the global drone market is a key driver for innovation, with a transformative impact on such industries as logistics, agriculture, construction, and defense, increasing efficiency and providing new capabilities. In Ukraine, drones hold significant importance in strengthening national defense against a full-scale invasion of russia. While the military sector is a priority for Ukraine now, drones also have strategic importance in advancing agriculture practices, improving infrastructure monitoring, and emergency response. The discussed factors underscore the relevance of the drone market, especially in the civil and military sectors - key focuses of this capstone.

CHAPTER 2. METHODOLOGY OF ANALYSIS

2.1. Introduction

This chapter outlines the methodology used to assess investment strategies in Ukrainian drone manufacturing, analyzing Ailand Systems company as a case. Due to the sensitive nature of financial data from Ukrainian drone manufacturers, particularly during the ongoing war, access to detailed financial records remains highly restricted. Consequently, this research can only conduct its practical analysis at a topline level, focusing on broader trends, high-level metrics, and aggregated data rather than delving into specific financial details or granular insights.

2.2. Data collection and sources

To support the analysis of investment strategies in Ukrainian drone manufacturing, a comprehensive data collection was conducted. The objective was to obtain diverse, high-quality data that would facilitate industry analysis, financial analysis, and investment strategies.

The data collection process followed a mixed-method approach, utilizing both primary and secondary sources. Primary data included financial reports from Ailand Systems, data excerpts from the State Customs Service of Ukraine, and legal excerpts, while secondary data included publicly available market reports, academic papers, official government, and ministry publications, reports from Ukrainian defense and technology companies, interviews with industry experts in credible media, and business analyses.

Despite the comprehensive data collection strategy, some limitations were faced. For example, detailed financial statements for certain reporting periods were incomplete due to missing filings from Ailand Systems. In addition, industry reports from private intelligence firms were inaccessible due to subscription paywalls, which limited the scope of insights from global markets. To address this, publicly available reports and expert interviews were leveraged to fill the knowledge gaps.

2.3. Data analysis

Quantitative methods.

Several key financial metrics and performance indicators were calculated from the available financial statements to evaluate Ailand Systems' financial health and investment impact.

My research involved Assets analysis, specifically focusing on changes in Cash and Cash Equivalents during the first half-year of 2024, suggesting the reasons that might have played a role. What is more, an equity and liabilities analysis was conducted, with a key interest in metrics such as negative retained earnings and current liabilities.

Using the data from available financial statements of Ailand Systems, several financial ratios were calculated:

1) **Current Ratio:** the indicator was used to evaluate the company's short-term liquidity and its ability to cover current liabilities with current assets. A ratio below 1 indicates potential liquidity problems.

2) **Return on Assets (ROA):** this ratio was used to evaluate how effectively Ailand Systems was utilizing its assets to generate profits. Negative results signal inefficiencies.

3) **Return on Equity (ROE):** this metric was used to identify how efficiently the company's equity was used to generate income. Negative results reflect inefficiency and the company's lack of profitability during the reporting period.

The analysis also explored how the investments received by Ailand Systems in mid-2024 could help the company overcome challenges and improve operational effectiveness. Based on the financial and investment data available, the following areas were identified as the key ones for the potential investment strategy: technological development, operational efficiency, profitability focus, and risk mitigation.

Qualitative methods.

As part of evaluating the attractiveness of the Ukrainian drone industry for investment, a PESTEL analysis was conducted. This analysis helps to understand the broader macro-environmental factors that influence the industry, providing insights into potential risks and opportunities. The six key lenses—Political, Economic, Social, Technological, Environmental, and Legal—were applied to the Ukrainian drone market, particularly in the context of the ongoing war and the rapid evolution of the defense-tech sector.

CHAPTER 3. INVESTMENT OPPORTUNITIES IN DRONE MANUFACTURING

3.1. Definition of investment strategy

An investment strategy is a set of principles designed to guide an individual or organization in allocating resources to achieve strategic goals. Such guidelines typically include approaches to balance such factors as risks, time horizon for returns, financial goals, and market conjecture.

In the drone manufacturing industry context, the investment strategies mostly focus on technological areas (i.e. implementation of AI technologies), research (i.e. resistance to anti-drone technologies, higher battery, and payload capacity), and production directions (manufacturing of scale).

The primary types of investors are venture capitalists and angel investors.

Venture capital is a form of investment aimed at companies with significant growth potential, typically in the early stages of development with limited tangible assets. Venture capital firms provide financial support and business expertise, investing in privately owned companies by purchasing equity stakes. This investment helps the companies grow and succeed. In return, investee companies offer a part of their ownership to venture capital firms, gaining access to financial resources, and technical and management expertise. Venture capital firms often actively guide company management, supporting decision-making processes that foster growth. The primary objective of venture capital firms is to achieve high returns by investing in early-stage or start-up companies with innovative, high-growth business models. To fund these investments, venture capitalists raise capital from external investors, including institutional entities such as family offices, pension funds, and insurance companies. The funds raised are then deployed into selected enterprises. As the target companies expand and evolve, they progress through various stages of venture capital investment [40].

Angel investors are individuals or groups that provide private equity funding, typically using their own capital in exchange for shares in the companies they invest in. Unlike intermediaries such as small business investment firms, angel investors are often wealthy private individuals or collectives. They primarily focus on supporting companies in the early stages of development [40].

Early-stage startups often require substantial capital to drive business development and increase revenue through marketing. However, at this stage, the company's income may be insufficient to support its growth needs, potentially jeopardizing its long-term development prospects due to a lack of funds. Angel investors step in to provide small-scale financing, helping startups navigate this critical period when they are not yet appealing to venture capital firms. Unlike venture capital, angel investors do not

have fixed investment requirements for startups. Instead, the investment amount typically depends on the attractiveness of the startup's product, business model, and growth potential [40].

As the companies in Ukraine evolve, the investment landscape undergoes significant changes. [16]

- **Shift in Investor Role:** While angel investors were the main source of capital in 2023, venture capital funds are now playing a more prominent role.

- **Increased Foreign Investment:** Previously, most investments came from domestic sources, but there is now a steady rise in the number of foreign investors.

- **Larger Investment Rounds:** The size of investments has increased considerably. Seed rounds, which previously averaged up to $500,000, now typically range from $1 million to $3 million. [16]

According to Brave1 assessment and expectations, in 2023 defense startups managed to raise up to $5 million. As of 2024, $25 million has already been invested, with projections to reach $50 million by year-end. Investments in 2025 are expected to multiply, signaling a significant increase in interest and capital inflow into the industry. [16]

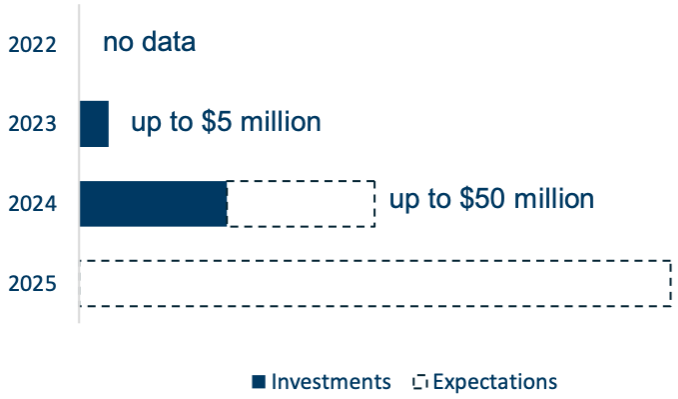

Illustration 3.1. Investments in Defense Startups. Source: [16]

The urgent need for rapid innovation and deployment of defense technologies requires investors to go beyond merely providing capital. They must play an active role in accelerating technological advancement and implementation by offering mentorship, infrastructure support, access to critical networks, and assistance in navigating regulatory challenges. This is why the acceleration model for raising investments has demonstrated remarkable effectiveness in Ukraine, with a substantial share of funding being secured following participation in boot camps. [16]

3.2 Defense tech cluster and grants

Ukrainian defense tech cluster is represented by Brave1 - a unified coordination platform established by the Government of Ukraine to foster collaboration among all stakeholders in the defense technology sector, offering organizational, informational, and financial support for defense technology projects in Ukraine [25]. One of their key benefits is maintaining a database of over 150 venture funds. Brave1 also hosts events where companies can present their ideas directly to investors and keep investors updated on industry trends and the achievements of top-performing teams. [16]

Importantly, the platform offers grants for defense tech developers. According to the updated program, Ukrainian developers can receive UAH 4 million and UAH 8 million for the development of defense technologies. Ukrainian manufacturers whose projects have passed a defense evaluation, achieving a minimum overall score of 7 points and a development readiness level of at least 6 points, are eligible to apply for a grant of UAH 8 million. The received grant can be invested by the manufacturers in R&D, equipment and components purchase, and product development [26]. As of September 2024, Brave1 has awarded 329 grants totaling $5 million. [16]

3.3. Business accelerators and investors

The Ukrainian drone industry must secure a technological edge to meet internal security needs and succeed in the global market. Capturing technological advantage is possible by creating effective technological collaborations with international partners, universities, and research institutions.

One of the opportunities for emerging Ukrainian defense companies to collaborate with international partners and investors is the accelerators created to provide innovative start-ups in the Ukrainian defense industry with investment, mentorship, development support, and further access to creating new fruitful partnerships.

For example, a business accelerator MITS, created in partnership with American University Kyiv, provides a development program for Ukrainian companies to scale the production of innovative products in the security sector. [18] Mits is working on attracting foreign capital to the defense-industrial complex of Ukraine, prioritizing land, sea, and air unmanned systems, electronic warfare, software, AI, ammunition, etc. [19]

Among MITS's supervisory board members, it's important to highlight Perry Boyle (ex-Senior Director of Point72, one of the globally prominent companies of investment management), Dr. Phillip A. Karner (former strategic advisor of the US Secretary of Defense and former external advisor of Secretary General of NATO Manfred Worner, British Prime Minister Margret Thatcher, CEO of Ford

Motor, Red Poling), and Ernest Herold (ex-Deputy Assistant Secretary General-Defense Investment in NATO). [18]

Members of MITS's acceleration program are offered an investment of $ 200,000, from which 50% is a direct investment in the startup company and 50% in the acceleration form from MITS and the American University of Kyiv. [20]

Another example of the available business acceleration programs for the Ukrainian defense sector is D3 which supports UA innovative defense companies with early-stage funds ($125K is the initial investment in a start-up) and further investment development plan, access to the global community of leaders, investors, and potential partners in the security industry, accelerated cooperation with the Ukrainian authorities, mentorship by the global experts, and help with fundraising and sales. Start-ups receiving the initial investment need to pass a background check. If it's successful, D3 extends the term outline and may also be offered a follow-up investment.[21]

Among D3's successful projects, there's Ukrainian AI start-up Swarmer which specializes in software coordinating missions of drone swarms - when two or more UAVs are in the sky and have the same target [21], [22].

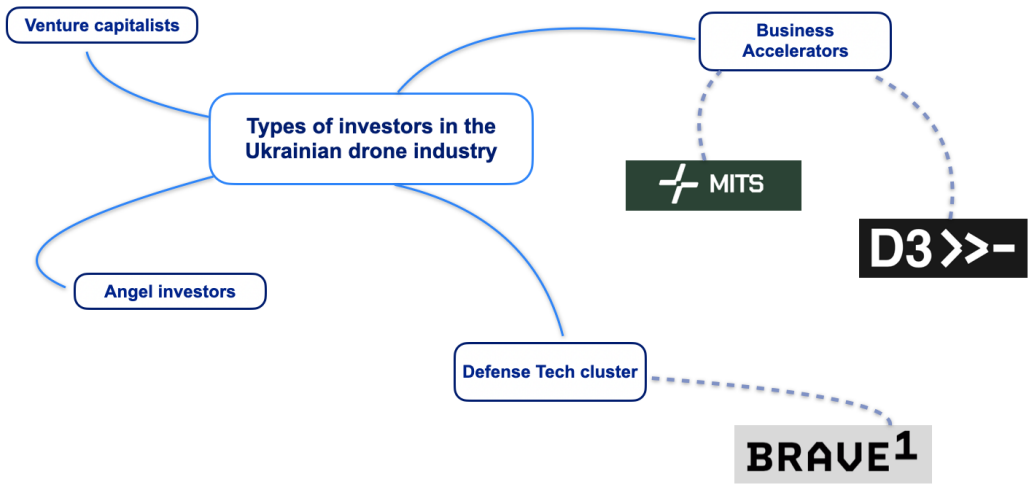

Illustration 3.2. Types of investors in the Ukrainian drone industry. Prepared by the author based on the sources: [16], [25], [18], [21]

Another way of attracting investments in technology development is taking part in international development programs, attracting investments from global funds, as well as collaborating with private investors.

To build a bridge between Ukraine with its developing expertise in asymmetric defense and related technology and Allies who are equipped with greater resources and can be partners for cutting-edge technology, the Ukrainian defense sector participates in various conferences and forums on the defense topic.

For example, in June 2024, the NATO—Ukraine Defense Innovators Forum brought together representatives of the Ukrainian military and government, military technology companies, as well as representatives of NATO countries and investors. Such meetings allow Ukrainian startups to network with business representatives and potential investors and show the potential of Ukrainian MilTech innovations (Kateryna Suprun, 2024).

In addition to that, NATO offers its own business accelerator - DIANA (Defence Innovation Accelerator for the North Atlantic). The program provides resources, networks, and mentorship to the innovations that are capable of solving critical security and defense challenges. DIANA represents a unique transatlantic ecosystem, uniting top talents from academia, industry, governments, and investors, supporting cutting-edge security innovations. [23]

Another opportunity is NIF - NATO Innovation Fund - an independent venture capital fund supported by 24 NATO allies, investing over 1 billion EUR in deep tech. The program participants are offered access to markets in both commercial and government sectors across 24 countries, an initial investment of up to 15 mln EUR, long-term support, an extensive network in the deep tech sector, including access possibility to around 90 NATO-affiliated test centers, and more than 6000 Allied scientists. [24]

However, both DIANA and NIF opportunities are now closed for Ukraine, as both programs require the potential participants to be registered in one of the countries of NATO, so nowadays, Ukraine can consider these programs as a part of a long-term development plan.

3.4. Risks and opportunities assessment - PESTEL analysis

Any investment strategy should optimize the balance of risks and benefits. One of the frameworks that can help us evaluate the Ukrainian drone industry for investment attractiveness is the PESTEL model.

PESTEL analysis is a tool marketers use to assess and monitor macro-environmental factors impacting an organization, company, or industry. It examines the external environment through six key lenses: Political, Economic, Social, Technological, Environmental, and Legal. [5]

Illustration 3.3: PESTEL analysis of the drone industry in Ukraine. Prepared by the author based on the sources: [6], [7], [8], [10], [11], [12], [13], [14], [15], [16], [17].

Political factors

The full-scale invasion of russia into Ukraine has driven significantly the adoption of military drones on the battlefield and its local manufacturing, supported by the Ukrainian government and international programs.

What government programs are available? During the full-scale war, Ukraine built and developed a UAV market from scratch. It all began with the Army of Drones initiative, which essentially kick-started the entire defense-tech sector. As manufacturers continue to expand their capacities, additional funding is needed to contract drones. [6]

In 2024, the Ministry of Economy of Ukraine introduced a program «Pererobka» («Processing»), according to which Ukrainian drone manufacturers can receive a preferential grant of up to 8 million UAH (but not more than 80% of the submitted business plan project). Funds may be provided for the implementation of projects aimed at creating new or expanding the capacities of existing enterprises for the production of aircraft, spacecraft, and related equipment, or for the acquisition of fixed production assets that are not subject to alienation, including their delivery and commissioning [7], [8].

After obtaining the grant, the manufacturer is obliged to:

1) Use the grant for its intended purpose within one year.

Create new jobs, with the number of positions depending on the grant amount. For example, at least 25 positions (one-third within the first six months and the rest within a year) must be created by the grant recipient ranging from 6.4 to 8 million UAH.

2) Pay taxes, fees (mandatory payments), and social security contributions to Ukraine's consolidated budget in an amount equal to the grant received within three years from the date of receiving the grant. [7], [8]

Another political factor is the war-time risks. Regular massive missile and drone attacks by the enemy make it necessary to protect the manufacturing and employees from possible destruction.

What is more, due to russia’s attacks on Ukrainian energy infrastructure, the situation with energy supply is uncertain, affecting manufacturing capabilities. Despite significant energy instability, there are ways for manufacturers to anticipate and adapt to blackouts, as they can take proactive steps to adapt to blackouts by investing in generators, accumulators, and other energy storage solutions.

Economic factors

Ukraine prioritizes developing a strong local production of military drones to reduce reliance on the allies in terms of weapons supplies, as well as to enhance the cost-efficiency of its armaments. The war impacted Ukraine’s economy, focusing the main resources on military needs. That is why the military drone segment plays a key role in the industry, compared to the commercial segment.

An important economic factor is the reliance of the Ukrainian drone industry on Chinese components and related supply chains. That is especially critical after the new export restrictions

implemented by China starting from September 1, 2024, focused on essential components of UAVs, used by Ukrainian drone manufacturers for UAV local production [10].

Another important economic factor is that the AFU and the government, as the contractor, provide a constant demand for locally produced UAVs. However, being the only contractor with exports closed during the war, the Ukrainian government can't absorb the full volume of local production.

Legal factors

Due to a high and constant demand for UAVs, the Ukrainian government has implemented several policies that streamline and simplify the contracting of the UAVs.

For example, in 2023, the government updated Resolution No. 256 to include standardized technical requirements for UAVs, streamline commissioning to as few as 10 days, enable procurement and codification based on manufacturer-approved documents without additional Ministry of Defense (MoD) approval, and define standardized formats for technical and procurement documentation [11]

What is more, a new policy was introduced in 2023 that increased the profit margin in procurement prices to 25%, allowing manufacturers to invest more in their development and scaling. [12] Additionally, the government expanded the list of military and dual-use goods that can be imported without a permit from the State Export Control Service, accelerating the raw material imports for the production of ammunition and UAV warheads. [13]

Social factors

The main social factor is the drone industry has the potential to create highly skilled jobs in engineering, manufacturing, and software development. Because of massive migration, Ukraine is dealing with the need for more skilled human resources. In response to this problem, the Ministry of Education and Science of Ukraine implemented a grant system, according to which the applicants to universities can obtain a grant covering the education costs, based on their passing score. At the same time, additional coefficients to the grants are applied to the strategic disciplines for Ukraine, such as Mechanical engineering, Electric engineering, Chemistry engineering and Bioengineering, Electronics, automatization, and electronic communication, etc. [14] So, Ukraine has already started to develop a talent pool for the future of the drone industry.

Technological factors

The uniqueness of the drone industry in Ukraine is that the produced items are constantly tested in real combat situations, providing the Ukrainian defense sector with valuable knowledge and experience in their use. At the same time, the challenges of practical implementation are also unique: the war dynamically brings new changes and tendencies, evolving on at least a monthly basis. For example, in 2022–2023, almost all drones operated on the same control frequency. At the moment, there's a whole "zoo" of frequencies, ranging from low to very high, with both sides experimenting with different formats

for how they can be applied. A real example from a Ukrainian company illustrates this challenge: a drone ordered in February and delivered to the battlefield in June no longer meets operational needs because it lacks a newly introduced control frequency that didn't exist at the time of purchase. [15]

It's important to take into account new technological tendencies: AI and swarm technologies.

Traditionally, UAVs required constant remote piloting, which involved continuous communication with control centers. However, recent advancements in artificial intelligence (AI), machine learning (ML), and sensor technologies have made it possible for UAVs to operate in semi-autonomous or fully autonomous modes. This shift reduces the need for human intervention, improves mission efficiency, and enhances operational capabilities in complex combat situations. Autonomous UAVs can navigate difficult environments, perform surveillance, identify targets, and execute missions with minimal direct control, thus transforming military operations. [16]

A key advancement in UAV technology is the integration of computer vision and real-time data processing. AI-powered computer vision systems enable UAVs to analyze and interpret their surroundings in real time, which is crucial for tasks such as navigation, target identification, and obstacle avoidance. With the addition of high-resolution cameras and LiDAR sensors, these UAVs are capable of mapping terrain, detecting objects, and making quick decisions autonomously. Their ability to process large volumes of data instantaneously allows them to operate effectively in diverse environments, including urban areas and rugged terrains, even in the presence of electronic warfare (EW) conditions that seek to disrupt their operations. [16]

Swarm technology represents a cutting-edge trend, enabling AI-managed drones to collaborate and coordinate actions without requiring individual human operators [16]. Drone swarm technologies enable groups of drones to work together, often without direct human control. [17] These drones communicate and share data to achieve collective goals like comprehensive surveillance, target acquisition, and synchronized attacks. Deploying UAV swarms greatly enhances tactical flexibility, enabling large numbers of drones to break enemy defense, while ground-based UAVs can support maneuvering troops or clear minefields. This collaborative approach amplifies the effectiveness of UAV missions, making them a powerful asset in modern warfare. [16]

Environmental factors

While the war in Ukraine is in progress, the main resources are allocated to the military sector of drones. However, the evolution of this industry holds significant potential in the post-war reality for civil and commercial sectors such as agriculture, construction, logistics, energy, environmental monitoring, mining, media and entertainment, public security, healthcare, education, etc.

CHAPTER 4. CHALLENGES AND ISSUES

4.1 Export restriction

Because of information sensitivity, official data on the value and volume of weapons produced in Ukraine in 2023 is not available. However, based on anonymous comments of high-ranking officials given to Forbes, the approximate value of Ukraine-produced weapons in 2023 reached $3 bln, which was 3 times more compared to 2022 results [27].

In 2024, Ukrainian defense companies are capable of producing weapons valued at $20 bln, which is 6 times more than the previous year's output [29]. At the same time, the industrial defense complex is operating with a slim profit margin of around 3%, which significantly limits its ability to invest in production [28].

The national budget capacity to purchase locally produced weapons is around $6 bln in 2024, which doesn't cover even half of Ukraine's production capacity [29].

Ukrainian Industrial Defense Complex is facing a growth challenge: with exports closed during the war, the government, as the only contractor, can't absorb the full volume of local production.

Due to insufficient financing from the government, contracting the Ukrainian manufacturers is irregular, which leads to a lack of stable production plans for even a couple of years and underutilized production lines. As a result, local defense companies struggle with limited investment opportunities, must absorb the losses, and even suspend production sometimes [30].

Under these conditions, the demand on the battlefield for certain types of weapons may go unmet, the national industrial defense complex faces stagnation and Ukrainian GDP may fall short of its potential growth.

One way to address this issue is to involve the Allies in purchasing the Ukrainian-produced weapons for the AFU.

For example, in April 2024, Denmark became the first country to purchase Ukrainian-produced weapons for the AFU at its cost, having allocated 28.5 mln USD. The allocation is a part of the «Zbroyari: Manufacturing freedom» project the goal of which is to involve partner countries in acquiring weapons from Ukrainian manufacturers to the AFU and to raise 10 bln USD for weapons production in 2024 [29].

In addition to that, at the Munich Security Conference 2024, Minister of Strategic Industries of Ukraine Oleksandr Kamyshin proposed that NATO acquire drones from the Ukrainian manufacturers for the AFU - as a response to Jens Stoltenberg's earlier announcement about NATO's readiness to purchase 1 mln drones for Ukraine in 2024 [31].

Another way for the Ukrainian government to solve the growth challenge is to reconsider its decision to stop exports during the war. Nowadays, any production surplus that is not needed or cannot be acquired for the AFU, is forbidden to be exported. Opening exports for some defense companies would enable them to utilize and enhance the production lines to their fullest, increase their profitability, and invest in technology enhancement. These companies could contribute to the national budget by paying taxes for export sales and decreasing the cost of acquiring weapons by the national defense institutions as a result of large-scale production. [32]

According to the recent survey of defense manufacturers carried out by the Tech Force in UA in August 2024, 85% of companies are considering or already relocating their business abroad. 70% of manufacturers stated the closed export as the main reason for such a decision. Among the top 5 factors, the companies also highlighted low business profitability and lack of government orders. At the same time, as an answer to the question «What will keep you from relocating abroad», 80% of respondents brought up resuming the export, 72% - the government order increase, and 69% - the conclusion of multi-year contracts. The survey shows an urgent need to address the highlighted issues, as many defense companies are looking for growth and bypassing export restrictions opportunities abroad. Failure to address this problem could lead to Ukraine losing key industry players to foreign markets. [33]

One of the highest risks for the decision to resume the weapons export is political. Nowadays, Ukraine highly depends on the weapon support from its Allies. Opening the export of certain types of weapons may lead to difficulties in negotiation with the partners regarding further military help. What is more, the topic of export may be used by Russian propaganda as a part of the informational war, discrediting the role and needs of Ukraine in the war. To address these challenges, Ukraine should develop a communication strategy that emphasizes its ongoing need for certain weapons that can't be produced on a large scale locally. At the same time, Ukraine can become a competitive player in the international market, capable of exporting other weapons, where it has expertise and possibilities for mass production (unmanned systems can be a part of that).

Another risky factor is ensuring that export doesn't harm the military provision to the AFU. The needs of the Ukrainian army should remain a top priority of the industrial defense complex, even if Ukraine decides to resume exports at some point.

4.2 Heavy reliance on Chinese imported goods

As per the statistics of the State Customs Service of Ukraine, during the reporting period of January-October 2024, the share of Chinese UAVs in the import reached **93.31%,** while German and Polish UAVs have the shares of 3.43% and 1.67% respectively. Taking into account imported UAV components (parts of aircraft classified under commodity headings 8801, 8802, or 8806), the share of

China during January-October 2024 reached **85.32%,** while the share of France and Austria are much lower - 8.6% and 2.26% respectively [9]. Because of the dependence, any restrictions from the Chinese government regarding the export of UAVs and their components pose a significant risk to the drone industry of Ukraine and the fulfillment of the AFU battlefield needs.

Producing drones in Ukraine 100% locally is impossible, as the production of the basic electronics for drone components needs significant investment, manufacturing ecosystems, and full-scale ordering. However, Ukrainian manufacturers can purchase micro-schemes, electronics, and materials from partner countries, and produce local drone components, such as flight controllers, initiation boards, engines, frames, antennas, and communication systems — everything that falls under Chinese restrictions. For example, drones produced by the Ukrainian company VYRIY DRONE are already 70% composed of domestic components. Some parts are manufactured in-house, while others are outsourced to contractors. The components for producing parts are sourced worldwide, and it is not always China [10].

The Ukrainian government is increasingly prioritizing localization in UAV manufacturing, while a growing number of local producers of UAV components appear on the market [10]. At the same time, unequal conditions for Chinese and Ukrainian manufacturers of UAV components hinder the development of the local UAV sector and deepen the dependence on China. The VAT for imported UAV components is waived for Ukrainian UAV manufacturers, while the same privilege doesn't apply to purchases of locally produced components. [34]

4.3. Regulatory and Organizational Barriers

During the full-scale invasion, Ukraine simplified a lot of bureaucratic processes for drone manufacturers to get certified by the Ministry of Defense of Ukraine and conclude contracts for orders with the government. However, a lot of barriers are yet to be overcome.

One such barrier is closed information about the needs and budget priorities of the Ministry of Defense of Ukraine. The government doesn't disclose the characteristics of the UAVs that they are ready to contract. That creates a situation where many local manufacturers don't get certified by the government. As a result, these companies underutilize their production lines and lack financing.

The government can deal with this problem by opening the information about its budgeting priorities and defining a clear vector and criteria for the manufacturers. That will help the producers to focus on what is in high demand and will be definitely purchased by the government [35].

Another barrier is infrastructure. To test drones, manufacturers need to travel to testing grounds. However, the reservation system for these grounds is not optimized. This results in chaotic and ineffective testing, as well as tested drone damage. Nowadays, Ukraine has limited capabilities in terms

of testing grounds as they tend to be a target for russian attacks. Nevertheless, to reach a massive technological leap, the government needs to optimize the available infrastructure [35].

One more challenge is the absence of long-term contracting from the government's side which creates significant uncertainty for the Ukrainian drone manufacturers. Without certain future revenue, drone companies are hesitant to make heavy investments in R&D and operational expansion. This instability hinders their capacity to innovate and grow, limiting the industry's potential to meet both local and international market needs. [16]

Taking into account the potential expansion to the global market, the highlighted challenges and issues restrict the ability of the Ukrainian drone industry to achieve an economy of scale. This limitation could lead to a loss of market share to larger international players who leverage economies of scale to offer more competitive pricing and handle larger order volumes.

CHAPTER 5. INVESTMENT STRATEGY ANALYSIS

5.1. Case study: Ailand Systems

As a case study, we will analyze financial dynamics and investment impact on Ailand Systems - a Ukrainian manufacturer of de-mining UAVs. The main product of Ailand Systems is a UAV used for mine and explosives ST1 detection. When the source was published, the manufacturer was preparing the UAV for government certification [36].

Ailand Systems is a four-year-old startup by Ukrainian IT specialist Dmytro Titov. Before producing drones, the company was a part of the American startup Mettle, which developed plugins for Adobe's instruments. In June 2018, Adobe acquired the company and its SkyBox technology [36].

Initially, Ailand Systems focused on the agriculture industry. The goal of the first drone produced by the company - RT1 Debugger - was to catch insects and pests with the help of AI equipment. When the full-scale invasion happened, the company adjusted its products to the military needs of the war. Now they can detect landmines and artillery shells on the surface and underground mines using built-in sensors. The company claims that its ST1 UAV can estimate the location of the mine with an accuracy of up to 10 cm, create interactive minefield maps, and operate four times faster than the products of competitors with a similar accuracy [36].

Illustration 5.1. ST1 UAV by Ailand Systems. Source: [41]

In 2024, Ailand Systems announced two important investment projects in their company.

In June 2024, Ailand Systems became a recipient of the Google for Startups Support Ukraine fund. In partnership with 1991, Ukraine's first accelerator, the $10 million Ukraine Support Fund offers equity-free financial awards and Google support to Ukrainian-founded tech companies. Selected startups receive $100,000 in non-dilutive funding, along with Google Cloud credits, hands-on mentoring, and technical and product support from Google [37].

In July 2024, Ailand Systems secured a new investor, the Nezlamni Fund, which invested $200,000 in the company. The funds will be used to enhance technology and scale manufacturing operations [38].

«Nezlamni» is a venture fund created in 2024 by the co-founders of the Ukrainian company «Uklon» - Dmytro Dubrovskyi, Serhii Smus', Victoria Dubrovska, and Vitalii Diatlenko.(Ailand Systems, July 8, 2024) The fund amounts to $2 million - that's the dividends earned by the co-founders and invested in the fund. Essentially, investments from the fund are made in startups specifically in the military defense-tech sector. The main condition is that the «Nezlamni» fund invests in technologies that bring Ukraine's victory closer [39].

The public financial statement of Ailand Systems reflects half-yearly data about the company's Assets, Equity, and Liabilities in 2024 [42]. Although extended information and long-term financial trends of Ailand Systems are not available in open sources, this statement will give us a helicopter view of the financial performance and investment strategy of the company.

As a first step, we will explore the assets part.

Row name	Row code	At the beginning of the reporting period, thousand UAH	At the end of the reporting period, thousand UAH
I. Non-Current Assets, Fixed Assets:	1010	153.70	153.70
Original cost	1011	153.70	153.70
Total for section I	1095	153.70	153.70
Cash and Cash Equivalents	1165	50.70	679.10
Other current assets	1190	35.00	35.00
Total for section II (Current Assets)	1195	85.70	714.10
Total Assets	1300	239.40	867.80

Table 5.1. Assets of Ailand Systems, quarterly financial statement of 6 months of 2024. Source: [42]

The statement indicates that there was no significant investment in new assets or disposal of the current ones. At the same time, we observe a sharp increase in Cash and Cash Equivalents from 50.70 thousand UAH at the beginning of the year to 679.10 thousand UAH at the end first half of 2024. This change may indicate improved liquidity or funds raised - via financing or sales. Other current assets remained stable.

The total assets balance changed from 239.40 thousand UAH to 867.80 thousand UAH from January 2024 to June 2024, showing a growth of 262%. The overall increase in the company's assets is driven mostly by the improvement of liquidity. The significant improvement in Cash and Cash Equivalents shows that the company might be preparing for some investments, repaying debts, or improving operational processes. At the same time, a constant amount of non-current assets and fixed assets indicates that Ailand Systems didn't invest in its equipment (machinery or property).

In our next part, we will analyze the Equity & Liabilities statement of Ailand Systems, also concluded for the first half of 2024.

Row name	Row code	At the beginning of the reporting period, thousand UAH	At the end of the reporting year, thousand UAH
Equity	1400	314.20	314.20
Retained Earnings (Uncovered Loss)	1420	-713.10	-902.00
Total for section I	1495	-398.90	-587.80
Taxes Payable	1620	22.40	19.30
Insurance Liabilities	1625	7.40	12.30
Payroll Liabilities	1630	324.50	277.40
Other Current Liabilities	1690	284.00	1146.60
Total for Section II	1695	638.30	1455.60

Row name	Row code	At the beginning of the reporting period, thousand UAH	At the end of the reporting year, thousand UAH
Total Liabilities and Equities	1900	239.40	867.80

Table 5.2. Liabilities and Equities of Ailand Systems, quarterly financial statement of 6 months of 2024. Source: [42]

Equity remained constant, showing that nothing changed in equity contributions or withdrawals during January-June 2024.

The statement indicates that the company has a significant accumulated loss (negative Retained Earnings), increasing from -713,10 thousand UAH to -902.00 thousand UAH in June 2024 compared to January 2024. That shows that Ailand Systems has not achieved profitability yet, as its revenue doesn't cover its expenses.

A slight decrease in Taxes Payable suggests timely tax payments, while a slight increase in Insurance Liabilities shows us increased operational insurance or obligations for employees. Payroll Liabilities also indicate a decrease from 324.50 thousand UAH to 277.40 thousand UAH, suggesting decreased salaries payable.

Considering Other Current Liabilities, it is evident that they jumped sharply by 304%, from 284.00 thousand UAH to 1146.60 thousand UAH during the reporting period. Such a situation may bring potential liquidity risks, especially if not supported by strong profitability.

A sharp rise in Other Current Liabilities may indicate the use of short-term borrowing or funding classified as a liability. Other possible mechanisms for increasing current liabilities and liquidity may include advance payments from the clients or deferred payments.

A comparison of Assets and Equity & Liabilities accounts suggests that increased Liabilities are a primary reason for the growth of Cash and Cash Equivalents during the reporting period. While external funding can temporarily improve liquidity, it's important to remember that it doesn't ensure long-term sustainability if the business stays unprofitable. Moreover, high reliance on external funding could result in high-interest payment rates and financial pressure. Currently, the financial statement of Ailand Systems doesn't show strong current assets that can balance the increased liabilities. If the company doesn't secure additional funding or significant revenue growth, it risks depending on these liabilities, harming financial performance and strategic business development.

To analyze the financial health and efficiency of Ailand Systems, we will calculate several KPIs such as the Current Ratio, Return on Assets (ROA), and Return on Equity (ROE).

The first indicator of the Current Ratio will help us assess the company's short-term health and check if the company has enough current assets to cover its short-term liabilities:

Current Ratio = Current Assets / Current Liabilities

Current Ratio as of January 2024 = 85.70 / 638.30 = 0.13

Current Ratio as of June 2024 = 714.10 / 1 455.60 = 0.49

While we see positive dynamics in June 2024 compared to January 2024, a current ratio of < 1 may show liquidity problems, as the company may not be able to pay for its short-term debts.

As a next step, we will calculate ROA to analyze the effectiveness of asset utilization to generate revenue, using the formula:

ROA = Net Income / Average Total Assets

According to the company's financial statement, Net Income is negative and is equal to - 188.90 thousand UAH [42].

Average Total Assets = (239.40 + 867.80) / 2 =553.6 (thousand UAH)

ROA = - 188.90 / 553.60 =-0.341 (-34.1%)

At the ROA of - 34.1 %, the company's assets are generating a negative return due to significant uncovered losses.

As a final KPI, we will calculate ROE to analyze how well the equity is used to generate profits, using the formula:

ROE = Net Income / Equity

ROE= -188.90 / 314.2 =-0.601 (-60.1%)

The ROE of - 60.1% indicates poor profitability, as equity holders are experiencing losses related to their investments.

To conclude, the financial performance of Ailand Systems in the first half of 2024 shows a significant increase in Total Assets, driven primarily by the growth of Cash and Cash Equivalents. The liquidity improvement is based mainly on a significant growth in Liabilities, indicating the reliance on external funding or short-term debts rather than operational effectiveness. With negative ROE (-34.1%) and ROA (-60.1%), the company shows challenges in the effective utilization of assets and equity to generate profits. While short-term liquidity improved, to achieve long-term sustainability and strategic development, the company needs to address profitability challenges, reduce liabilities, and optimize asset management.

Given the fact that Ailand Systems announced the $200,000 investment from Nezlamni Fund in July 2024 [38] and the $100,000 grant from Google for Startups Support Ukraine fund - in June 2024

[37], it's likely that these investments were not reflected in the analyzed financial statement for the first half-year of 2024.

The investment of $300,000 could significantly enhance the financial health of Ailand Systems. That's the areas on which Ailand Systems can focus to maximize the impact of the investments:

1) Technological and product development: a portion of the investments could be allocated to developing new technologies or existing ones. This could include enhancing hardware, software, AI tools, and production processes.

2) Operational efficiency and cost reduction: for example, a portion of the invested amount could be used to cover some high-interest liabilities (as we know from our analysis, this account has increased significantly), improving the company's Current ratio and Liquidity. What is more, the company can use the investment to scale its production, thereby decreasing the cost per unit and improving its competitiveness in terms of value for price balance.

3) Competitive advantage: Ailand Systems can invest a portion of the amount in the technologies that give the company its unique competitive advantage, differentiating its products from competitors.

All things considered, Ailand Systems should develop a clear strategy to commercialize demining drones and their AI technology, invest in technology and production, and focus on profitability. The company should consider allocating the Google grant and Nezlamni Fund investment to projects with quick market entry potential. It's important to allocate cash to the priority projects and explore additional sustainable funding options in case liabilities remain high.

CHAPTER 6. RECOMMENDATIONS FOR IMPROVING INVESTMENT STRATEGIES

To enhance the investment strategy, the following actions are recommended to Ailand Systems, along with any other Ukrainian drone manufacturer.

To begin with, Ailand Systems should leverage the acceleration programs provided by organizations such as MITS and D3, which offer investment, mentorship, development support, and opportunities to establish new strategic partnerships. Moreover, the manufacturer can count on the support of a defense tech cluster represented by the Brave1 platform and its network of over 150 venture funds. Taking part in the events hosted by Brave1 can be extremely helpful in fostering strategic partnerships with investors and other industry players. Apart from organizational and information support, Brave1 offers grants of up to UAH 8 million that can be invested in R&D, equipment, component purchases, and product development. These opportunities hold great potential for Ailand Services, taking into account our previous recommendations to focus investment on technology and product development.

Additionally, Ailand Systems can leverage the industry network provided by MITS, D3, and Brave1 to develop R&D partnerships to co-develop next-generation drones. Such collaboration can not only maximize the technological advantage but also reduce the burden of R&D costs.

To continue, Ailand Systems can leverage the grant offered by the «Pererobka» program, introduced by the Ministry of Economy of Ukraine, of up to UAH 8 million to finance the scaling of production, as well as investments in new technologies and equipment.

It’s important to diversify the supply chain to maintain financial health and avoid any disruptions caused by recent export limitations introduced by China. It’s recommended to establish partnerships with suppliers in friendly countries and locally and build long-term contracts on essential electronic components to reduce dependence on China imports.

Ailand Systems also needs to build an export-oriented strategy. As of now, the export of military drones is restricted in Ukraine. However, in case the limitations are eased, the company should expand its market reach. That will help the manufacturer to increase profitability, invest more in technology advancement, and scale production. If export restrictions persist, Ailand Systems can build partnerships with allies. For example, a described case of Denmark’s purchase of Ukraine-produced weapons for 28.5 mln USD shows a potential model to involve the allies. Ailand Systems can seek similar deals that will help the company temporarily overcome the challenge of a closed export and increase its revenues.

CONCLUSIONS

The analysis of investment strategies in drone manufacturing highlights a rapidly growing industry driven by global security needs, technological advances, and strong demand. Ukraine's drone sector is at the heart of these advancements, with great potential for growth and development.

It's essential to invest in new-generation technology (including AI) that enhances functionality and, consequently, competitiveness and market reach. Manufacturers like Ailand Systems show how targeted investments in technology can attract investors.

Diversifying the supply chain is vital. Reducing reliance on imports from China through local production and partnerships with friendly countries will reduce supply risks and strengthen the industry's resilience.

Access to investments is a key to sustainable growth. Ukrainian manufacturers benefit from acceleration programs and government grants. Platforms like Brave1, the MITS and the D3 accelerators, along with «Pererobka» grant support business scaling, the industry's rapid growth, and technological progress.

At the same time, export restrictions limit the Ukrainian producers' growth. Revisiting these restrictions could boost their profitability, scaling, and investment in technology and production and, as a result, make the Ukrainian drone industry more competitive.

The financial analysis of Ailand Systems highlights a company at a pivotal stage, marked both by opportunities and challenges. In the first half of 2024, total assets growth was driven by a sharp increase in Cash and Cash Equivalents, signaling improved short-term liquidity. However, this growth was fueled by a rise in Liabilities, raising concerns about sustainability. The Current Ratio improved from 0.13 to 0.49 but stayed below 1, reflecting ongoing liquidity pressures. Profitability indicators, including a negative Return on Assets (ROA) of -34.1% and Return on Equity (ROE) of -60.1%, highlight the company's difficulty in generating profits.

The $300,000 in external funding from the Nezlamni Fund and Google for Startups Support Ukraine Fund, most likely not yet reflected in the financials, provides an opportunity for strategic growth. Prioritizing these funds for technological development, operational efficiency, and liability reduction could improve financial stability and ensure strategic growth. Reducing high-interest liabilities could strengthen financial health and mitigate financial risks while scaling production can help boost competitiveness. To achieve sustainable growth, Ailand Systems should focus on reaching profitability,

prioritizing high-return investments, and reducing reliance on short-term liabilities to enhance strategic positioning in the mil-tech sector.

In summary, Ukraine's drone sector offers substantial investment potential, especially in defense-related technologies. By reducing supply chain risks, fostering technological progress, and improving regulatory conditions, Ukraine's drone manufacturers can strengthen their global competitiveness. Strategic investments in these areas are vital for sustainable growth and operational success.

REFERENCES

1. Markets and Markets. (May 2024). *UAV (Drone) Market by Type (Fixed Wing, Rotary Wing, Hybrid), Platform (Civil & Commercial, and Defense & Government), Point of Sale, Systems, Function, Industry, Application, Mode of Operation, MTOW, Range and Region - Global Forecast to 2029.* MarketsandMarkets. Retrieved October 27, 2024, from https://www.marketsandmarkets.com/Market-Reports/unmanned-aerial-vehicles-uav-market-662.html
2. MarketsandMarkets. (n.d.). *Commercial drone market*. Retrieved December 3, 2024, from https://www.marketsandmarkets.com/Market-Reports/commercial-drone-market-66171414.html
3. MarketsandMarkets. (February 2024). *Military Drone Market by Platform (Small, Tactical, Strategic), Type (Fixed Wing, Rotary Wing, Hybrid), Application (UCAVs, ISR, Delivery), Propulsion (Fuel Powered & Battery Powered), MTOW, Operation Mode, Launching Mode, and Region - Global Forecast to 2028*. Retrieved December 3, 2024, from https://www.marketsandmarkets.com/Market-Reports/military-drone-market-221577711.html Market and Markets, 2024, Military drones
4. Mykola Tkach, Dmytro Drynyov, Igor Kulinich, Natalia Mykytiuk (2023). *Trends in the global arms market, development of the combat drone market: impact and consequences for Ukraine.* Political Science and Security Studies Journal, Vol.4, No.3. https://zenodo.org/records/10137916
5. Washington State University Libraries. (n.d.). *What is PESTEL analysis?* Retrieved December 3, 2024, from https://libguides.libraries.wsu.edu/c.php?g=294263&p=4358409
6. Ministry of Digital Transformation of Ukraine. (2024, August 8). *Держава законтрактувала 1 млн українських дронів.* Retrieved December 3, 2024, from https://thedigital.gov.ua/news/derzhava-zakontraktuvala-1-mln-ukrainskikh-droniv
7. Ministry of Economy of Ukraine. (2024, May 9). *«Зроблено в Україні». Пояснюємо, як виробнику дронів отримати пільговий грант від держави».* Міністерство економіки України. Retrieved December 3, 2024, from https://me.gov.ua/News/Detail?lang=uk-UA&id=c1d5053a-13db-43ea-813a-122acb53f0d8&title=VirobnikuDroniv-PilgoviiGrant
8. Militarnyi. (2024, May 9). *Українські виробники дронів можуть отримати пільговий грант від держави*. Мілітарний. Retrieved December 3, 2024, from https://mil.in.ua/uk/news/ukrayinski-vyrobnyky-droniv-mozhut-otrymaty-pilgovyj-grant-vid-derzhavy/
9. State Customs Service of Ukraine (2024). *"Ukraine's Foreign Trade with the Main Counterpart Countries (thousands of USD) for the period from January 1, 2024, to October 31, 2024.»*

Державна митна служба України. Retrieved December 3, 2024, from https://customs.gov.ua/statistika-ta-reiestri

10. Bohdan Miroshnychenko. (2024, September 4). *Китайські санкції. Чи залишиться Україна без дронів та РЕБу?* Економічна правда. Retrieved December 4, 2024, from https://epravda.com.ua/publications/2024/09/4/718868/
11. State Service of Special Communications and Information Protection. (2023, October 21). *The Government Streamlines the Procurement and Commissioning of UAVs and EW Devices.* State Service of Special Communications and Information Protection.. Retrieved December 3, 2024, from https://cip.gov.ua/en/news/uryad-sprostiv-proceduru-dopusku-do-ekspluataciyi-ta-zakupivli-bpla-i-zasobiv-radioelektronnoyi-borotbi
12. Cabinet of Ministers of Ukraine. (2023, March 25). *Masovyi start vyrobnytstva: uriad ukhvalyv postanovu, yaka stvoryuye krashchi umovy dlya vyrobnykiv BPLA v Ukraini.* Cabinet of Ministers of Ukraine. Retrieved December 3, 2024, from https://www.kmu.gov.ua/news/masovyi-start-vyrobnytstva-uriad-ukhvalyv-postanovu-iaka-stvoriuie-krashchi-umovy-dlia-vyrobnykiv-bpla-v-ukraini
13. Cabinet of Ministers of Ukraine. (2023, October 10). *Premyer-ministr: sproshchuiemo import syrovyny dlya vyrobnytstva boieprypasiv ta boiovykh chastyn BPLA.* Cabinet of Ministers of Ukraine. Retrieved December 3, 2024, from https://www.kmu.gov.ua/news/premier-ministr-sproshchuiemo-import-syrovyny-dlia-vyrobnytstva-boieprypasiv-ta-boiovykh-chastyn-bpla
14. Ministry of Education and Science of Ukraine. (2024, July 18). *Dodatkova finansova pidtrymka dlya vstupnykiv vid derzhavy: zaprovadzhuemo derzhavni hranty.* Ministry of Education and Science of Ukraine. Retrieved December 3, 2024, from https://mon.gov.ua/news/dodatkova-finansova-pidtrymka-dlia-vstupnykiv-vid-derzhavy-zaprovadzhuiemo-derzhavni-hranty
15. Vitaly Harnov. (2024, September 19). *Potreba frontu — tse desiatky tysyach FPV-droniv: somisne interv'yu z pidpryyemtsem pro vyrobnytstvo droniv.* Suspilne. Retrieved December 3, 2024, from https://suspilne.media/odesa/840145-potreba-frontu-ce-des-200-tisac-fpv-droniv-somisacno-intervu-z-pidpriemcem-pro-virobnictvo-droniv/
16. Olena Bilousova, Emir Omelchenko, Maksym Makarchuk, and Tymofiy Mylovanov. (2024, October). *Ukraine Drone Industry: Investments and Product Innovations.* Kyiv School of Economics. Retrieved December 3, 2024, from https://kse.ua/wp-content/uploads/2024/10/241004-Brave1-report-v.1.pdf
17. U.S. Government Accountability Office. (2023, September). *Science and Tech Spotlight: Drone Swarm Technologies*. U.S. Government Accountability Office. Retrieved December 3, 2024, from https://www.gao.gov/products/gao-23-106930

18. MITS Capital. (2024). Company's website. https://mits.capital/index.html
19. Ukroboronprom. (2024). *Американський бізнес зацікавлений інвестувати в українську оборонку*. https://ukroboronprom.com.ua/news/amerikanskii-biznes-zacikavlenii-investuvati-v-ukrayinsku-oboronku
20. Taisa Melnyk. (2024, February 23). *В Україні запускається акселератор для українських оборонних стартапів з цільовим розміром 50 млн$. Яка сума інвестицій?* Forbes Ukraine. https://forbes.ua/news/v-ukraini-zapuskaetsya-akselerator-dlya-ukrainskikh-oboronnikh-startapiv-z-tsilovim-rozmirom-50-mln-yaka-suma-investitsiy-23022024-19415
21. D3 (2024). Company's website. https://d3.vc/
22. Getswarmer. (2024). Company's website. https://getswarmer.com/
23. DIANA. (2024). Accelerator program. https://www.diana.nato.int/accelerator-programme.html
24. NIF Fund. (2024). About. https://www.nif.fund/about/
25. Brave1. (n.d.). Brave1: Ukrainian defense innovations. Brave1. Retrieved December 3, 2024, from https://brave1.gov.ua/en/
26. Ministry of Digital Transformation of Ukraine. (2024, September 10). Проєкти у сфері виробництва дронів продовжують отримувати підтримку від держави [Facebook post]. Facebook. Retrieved December 3, 2024, from https://www.facebook.com/mintsyfra/posts/pfbid0JSVTBkUQJxXdpYkH3MXo6sBrB4mFyqH3ohf4SibmwFNN9CngMu7682D5jbzn1NTQl
27. Uliana Bukatiuk. (2023, December 27). *За рік виробник САУ Богдани стане єдинорогом. Українська оборонка у 2023-му зросла втричі та виготовила зброї на 3 млрд. Потенціал в п'ять разів більший. Що заважає?* Forbes Ukraine. https://forbes.ua/money/za-rik-virobnik-sau-bogdani-stane-edinorogom-ukrainska-oboronka-u-2023-mu-zrosla-vtrichi-ta-vigotovila-zbroi-na-3-mlrd-potentsial-vpyatero-bilshe-shcho-zavazhae-27122023-18107
28. Oleksii Vysotskyi in interview to Uliana Bukatiuk. (2023, December 27). *За рік виробник САУ Богдани стане єдинорогом. Українська оборонка у 2023-му зросла втричі та виготовила зброї на 3 млрд. Потенціал в п'ять разів більший. Що заважає?* Forbes Ukraine. https://forbes.ua/money/za-rik-virobnik-sau-bogdani-stane-edinorogom-ukrainska-oboronka-u-2023-mu-zrosla-vtrichi-ta-vigotovila-zbroi-na-3-mlrd-potentsial-vpyatero-bilshe-shcho-zavazhae-27122023-18107
29. Ministry for Strategic Industries of Ukraine. (April 18, 2024). *ZBROYARI project: Denmark becomes the first country to purchase Ukrainian weapons for the Armed Forces at its cost.* Cabinet of Ministers of Ukraine (website). https://www.kmu.gov.ua/en/news/proekt-zbroyari-daniia-stala-pershoiu-krainoiu-iaka-za-svii-kosht-zakupyt-ukrainske-ozbroiennia-dlia-zsu

30. Yulia Vysotska in interview to Uliana Bukatiuk. (2023, December 27). *За рік виробник САУ Богдани стане єдинорогом. Українська оборонка у 2023-му зросла втричі та виготовила зброї на 3 млрд. Потенціал в п'ять разів більший. Що заважає?* Forbes Ukraine. https://forbes.ua/money/za-rik-virobnik-sau-bogdani-stane-edinorogom-ukrainska-oboronka-u-2023-mu-zrosla-vtrichi-ta-vigotovila-zbroi-na-3-mlrd-potentsial-vpyatero-bilshe-shcho-zavazhae-27122023-18107

31. Oleksandr Kamyshin (February 16, 2024). *Telegram update. #залізні_зміни в МінСтратегПромі.* Telegram Channel of Minister for Strategic Industries of Ukraine. https://t.me/zalizni_zminy/2045

32. Bogdan Miroshnychenko (2024, March 8). *"Курку треба годувати". Чи може Україна відкрити експорт для виробників зброї?*. Ekonomichna Pravda. https://www.epravda.com.ua/publications/2024/03/8/710903/

33. TechForce. (August 20, 2024). *Вимушена релокація виробників зброї за кордон: опитування ТСУ*. TechForce Ukraine. Retrieved December 3, 2024, from https://techforce.in.ua/en/news/article/relocation-analytics-by-TFUA

34. LIGA.ZAKON. (June 22, 2023). *Набули чинності закони про скасування ПДВ та ввізного мита на комплектуючі для дронів.* Retrieved December 4, 2024, from https://jurliga.ligazakon.net/news/220431_nabuli-chinnost-zakoni-pro-skasuvannya-pdv-ta-vvznogo-mita-na-komplektuyuch-dlya-dronv

35. Bohdan Miroshnychenko. (2023, November 23). *Продай мені цей дрон. Як бюрократія гальмує розробку нової української зброї.* Економічна правда. Retrieved December 4, 2024, from https://epravda.com.ua/publications/2023/11/23/706904/

36. Valentyna Dudko. (2024, July 8). *Fond spivzasnovnykiv Uklon "Nezlamni" investuvav u rozrobnika droniv-saperiv Ailand Systems: Shcho tse za kompaniya? [The co-founders of Uklon's "Unbreakable" fund invested in the developer of sapper drones, Ailand Systems: What is this company?].* Forbes Ukraine. Retrieved from https://forbes.ua/news/fond-spivzasnovnikiv-uklon-nezlamni-investuvav-u-rozrobnika-droniv-saperiv-ailand-systems-shcho-tse-za-kompaniya-08072024-22238

37. Michał Kramarz (June 13, 2024). *Ukrainian startups building for post-war economic recovery.* Google. Retrieved from https://blog.google/outreach-initiatives/entrepreneurs/ukrainian-startups-building-for-post-war-economic-recovery/

38. Ailand Systems. (July 8, 2024). *Інвестиція від співзасновників Uklon.* Блог [Blog]. Retrieved from https://ailandsystems.com/ua/blog-ua/

39. Dmytro Dubrovskyi in an interview with Serhii Sgurets. (July 29, 2024). *Tekhnolohiyi: "Vkladayemosya v ti tekhnolohiyi, yaki nablyzhayut peremohu Ukrayiny" – zasnovnyk fondu "Nezlamni" Dmytro Dubrovs'kyy [Technologies: "We invest in technologies that bring Ukraine's victory closer" – founder of the "Unbreakable" fund, Dmytro Dubrovskyi].* Espreso. Retrieved from https://espreso.tv/tekhnologiyi-vkladaemosya-v-ti-tekhnologii-yaki-nablizhayut-peremogu-ukraini-zasnovnik-fondu-nezlamni-dmitro-dubrovskiy

40. Tianjiao Li. (2023). *A comparison between venture capitalists and angel investors in the startup funding.* BCP Business & Management, V.44. Retrieved from https://www.researchgate.net/publication/370578172_A_Comparison_between_Venture_Capitalists_and_Angel_Investors_in_the_Startup_Funding

41. Ailand Systems. (n.d.). *Ailand Systems – Офіційний сайт* [Ailand Systems – Official website]. Retrieved from https://ailandsystems.com/ua/

42. Clarity Project. (2024). *Quarterly finances: Ailand Systems [Data set]*. Retrieved from https://clarity-project.info/edr/45095993/quarterly-finances?current_year=2024&current_month=6

43. MarketsandMarkets. (November 2024). *Civil Drones Market: Transforming Industries and Driving Growth*. Retrieved January 12, 2025, from https://www.marketsandmarkets.com/ResearchInsight/civil-drones-market.asp