

**THE IMPACT OF ALIBABA'S AI CHIP DEVELOPMENT ON PRODUCTION
COSTS, INVESTMENT, AND THE COMPETITIVENESS OF THE
SEMICONDUCTOR INDUSTRY IN THE UNITED STATES AND CHINA**

THESIS

**Submitted to fulfill one of the requirements to obtain a Bachelor of Management (S.M.)
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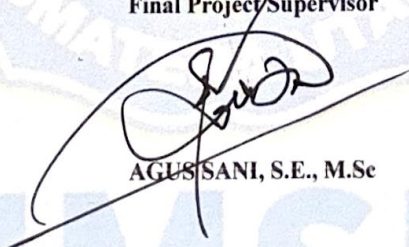
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Item	Evaluation Results	Date	Lecturer's Initials
Chapter 1			
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I hereby declare with truth that the final assignment that I wrote as a whole is the result of my own research/work except for the parts that the source refers to.

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THE IMPACT OF ALIBABA'S AI CHIP DEVELOPMENT ON PRODUCTION COSTS, INVESTMENT, AND THE COMPETITIVENESS OF THE SEMICONDUCTOR INDUSTRY IN THE UNITED STATES AND CHINA

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Abstract. *The development of artificial intelligence (AI) has significantly transformed the global semiconductor industry. This study aims to analyze the impact of Alibaba's AI chip development on production costs, investment, and competitiveness in the semiconductor industry in the United States and China. This research uses a qualitative descriptive approach with a literature review method. The findings show that the development of Alibaba's AI chips increases production costs in the short term due to high research and development (R&D) expenses and infrastructure investment. However, in the long term, it can reduce production costs through efficiency and economies of scale. In addition, this development encourages increased investment, particularly in China, supported by government policies. In terms of competitiveness, Alibaba's AI chips strengthen China's position in the global semiconductor industry, although the United States still maintains leadership in advanced technology.*

Keywords - AI Chips, Alibaba, Production Costs, Investment, Competitiveness, Semiconductor Industry

1. INTRODUCTION

The development of artificial intelligence (AI) technology has become a major driver of global economic transformation, particularly in the semiconductor industry. The increasing demand for high-performance chips is driven by the growth of AI applications such as machine learning, cloud computing, and big data analytics (Pasaribu, 2025).

However, geopolitical tensions between the United States and China have reshaped the semiconductor industry. Export restrictions imposed by the United States have limited China's access to advanced semiconductor technology, forcing Chinese companies to pursue technological independence (Wang et al., 2019).

In this context, Alibaba has developed its own AI chips to reduce dependence on foreign technology and strengthen domestic capabilities. This strategy not only affects production

costs but also influences investment patterns and global competitiveness. Therefore, this study aims to analyze the impact of Alibaba's AI chip development on production costs, investment, and competitiveness in the semiconductor industry in the United States and China.

2. LITERATURE REVIEW

2.1 Production Costs

Production costs refer to all expenses incurred in transforming raw materials into finished goods. These costs include raw materials, direct labor, and manufacturing overhead. Efficient cost management is essential to maintain product quality and competitiveness. Production cost is the cost incurred to process raw materials into finished products. It includes expenses spent to obtain raw materials from suppliers as well as to process them into finished goods that are ready to be marketed (Longdong, 2016).

Costs associated with the production process over a certain period are expenses incurred during the production period (Hidayat & Salim, 2013). Production costs refer to the expenditures incurred to transform raw materials into final products. Reducing production costs is an important step in controlling expenses, with the aim of maintaining product quality while avoiding waste (Maulana et al., 2023).

2.2 Investment

Investment is the allocation of funds or resources with the expectation of future returns. It includes indicators such as return, risk, liquidity, time horizon, security, and growth potential. Investment plays an important role in expanding production capacity and supporting technological development.

Investment is defined as the expenditure or outlay of funds made by a company to acquire fixed assets and production equipment in order to increase its capacity to produce goods and services within the economy. An alternative definition of investment is an asset utilized by a company to increase its wealth through returns on investment (such as interest income, royalties, dividends, rental income, and others), through an increase in investment value, or through other benefits for the investing company, such as gains obtained from business relationships (Kolibu et al., 2011).

According to Japlani et al., (2023), investment is the allocation of a certain amount of money or other resources made at present, with the expectation of obtaining a certain level

of profit in the future. Investment is an activity in which money is placed in one or more types of assets for a certain period, with the expectation of earning income or achieving growth in investment value in the future. Therefore, the basic idea of investment is to allocate funds at present for a specific period in order to obtain returns or profits in the future. This indicates that money which could otherwise be used for consumption is instead redirected through the investment process with the aim of generating future gains (Putri & Santoso, 2024).

2.3 Competitiveness

Competitiveness refers to the ability of a company or country to compete effectively in the market. It is influenced by factors such as business environment, human resources, infrastructure, financial systems, and technological innovation.

Competitiveness can be defined as the capacity of a country to continuously improve itself. In this context, competitiveness ultimately refers to a society's ability to consistently adapt to changes in economic, political, and technological aspects. The state and the policies it produces should act as the main drivers in the process of change and adjustment, as markets cannot function effectively without state participation. A country must view issues such as market failure and regulations related to public goods as areas for study and innovation (Zaelani, 2019).

Competitiveness refers to the concept of comparing the capabilities and performance of a company, subsector, or country in offering and distributing products and/or services in the market. A country's competitive ability can be derived from the aggregation of the strategic competitiveness of individual firms. The process of creating added value lies within the domain of the firm (Fadhilah et al., 2023).

2.4 Alibaba AI Chips

Alibaba's AI chip development focuses on improving processing efficiency, reducing operational costs, and enhancing technological independence. This development supports China's strategy to reduce dependence on foreign semiconductor technology.

Alibaba is an online commerce platform that emphasizes a business-to-business (B2B) model, connecting suppliers with consumers around the world. Founded by Jack Ma in 1999, Alibaba has grown into a digital business ecosystem that includes wholesale trade, retail activities, and financial services through various platforms such as Taobao, Tmall,

and Alipay. Alibaba supports small and medium-sized enterprises in reaching global markets by providing digital infrastructure that facilitates international transactions more easily. In addition, Alibaba also contributes to technological innovation, including in the fields of artificial intelligence and data analytics, to enhance the effectiveness of e-commerce (Pasaribu, 2025).

3. METHODOLOGY

This study uses a qualitative descriptive approach with a literature review method. Data are collected from secondary sources such as academic journals, books, and relevant reports. The analysis focuses on the relationship between:

- Independent variable: Alibaba AI Chip Development (X)
- Dependent variables:
 - Production Costs (Y1)
 - Investment (Y2)
 - Competitiveness (Y3)

4. RESULT AND DISCUSSION

A. Impact on Production Costs

The development of Alibaba's AI chips increases production costs in the short term due to high R&D and infrastructure investment. However, in the long term, it improves efficiency and reduces costs through economies of scale.

B. Impact on Investment

Alibaba's AI chip development encourages significant investment growth, particularly in China, supported by government policies. Meanwhile, the United States focuses on domestic production, which increases costs but strengthens internal capacity.

C. Impact on Competitiveness

Alibaba's AI chips enhance China's competitiveness in the semiconductor industry. However, the United States still maintains a leading position in advanced semiconductor technology.

D. Overall Impact

This development contributes to a shift toward a multipolar global semiconductor industry, increases competition, and reshapes global supply chains.

5. CONCLUSION

This study concludes that the development of Alibaba's AI chips has a significant impact on production costs, investment, and the competitiveness of the semiconductor industry in both the United States and China. In terms of production costs, the development of AI chips leads to an increase in costs in the short term due to high research and development (R&D) expenditures, infrastructure investment, and technological complexity. However, in the long run, it provides efficiency gains through economies of scale, improved production processes, and reduced dependence on foreign technology.

Furthermore, the development of Alibaba's AI chips plays a crucial role in shaping investment patterns. China has experienced a substantial increase in investment driven by strong government support and industrial policies aimed at achieving technological self-sufficiency. On the other hand, the United States has focused on strengthening domestic production through policies such as reshoring, although this approach tends to increase production costs. This indicates a shift from a purely efficiency-driven investment model toward a strategy based on national security and technological independence.

In terms of competitiveness, Alibaba's AI chip development has strengthened China's position in the global semiconductor industry, particularly in the domestic market. Despite this progress, the United States continues to maintain a competitive advantage in advanced semiconductor technologies. As a result, the global semiconductor industry is transitioning toward a more multipolar structure, where competition is increasingly driven by innovation, policy intervention, and geopolitical dynamics.

Overall, this study highlights that Alibaba's AI chip development is not only a technological advancement but also a strategic economic and geopolitical factor that reshapes global industry dynamics. It affects cost structures, investment flows, and competitive positioning across countries. Therefore, companies and policymakers must carefully balance innovation, efficiency, and international collaboration to ensure sustainable growth in the semiconductor industry.

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