



Vaasan yliopisto
UNIVERSITY OF VAASA

Aaron Saira

Effects of currency derivatives on volatility

School of Accounting and Finance
Bachelor's Thesis
Finance

Vaasa 2025

UNIVERSITY OF VAASA**School of Accounting and Finance**

Author: Aaron Saira
Title of the thesis: Effects of currency derivatives on volatility
Degree: Bachelor of Science in Economics and Business Administration
Discipline: Finance
Supervisor: Anupam Dutta
Year: 2025 **Pages:** 37

ABSTRACT:

The purpose of this thesis is to examine how currency derivatives affect the stock return volatility of companies listed on the OMX Helsinki 25 index. Specifically, the study focuses on whether currency derivatives act as hedging instruments that stabilize or as speculative tools that increase volatility. There has been a wide discussion on the relationship between derivatives use and volatility in financial literature. Financial economic theories such as Efficient Market Hypothesis and Random Walk Theory suggest that asset price movements follow an unpredictable path and contain all available information, which leaves little room for financial instruments, like currency derivatives to affect volatility. However, empirical evidence from research studies shows varied outcomes. Studies on the subject have conclusions ranging from derivatives having both increased and decreased impact on volatility, while several studies remain inconclusive. By focusing on the Finnish large cap companies, this thesis extends the existing literature. The results of the study show that there is no significant correlation between the value of currency derivatives used and stock price volatility. Based on the literature review, the reason for companies' currency derivatives use is mainly hedging. What the literature review also shows is that there are varying results about the effects of derivatives use on firms' volatility. The findings of the study contribute to the debate of currency derivatives effects on volatility.

KEYWORDS: Currency derivatives, Stock return volatility, Volatility, Hedging, Speculation, Risk management,

Contents

1	Introduction.....	5
1.1	Research question.....	6
1.2	Purpose of the study	7
1.3	Research gap.....	7
1.4	Structure of the study.....	8
2	Key concepts.....	9
2.1	Derivatives.....	9
2.2	Volatility	10
2.3	Use of derivatives	10
3	Literature review	12
3.1	Effect of derivatives.....	12
3.1.1	Increase in volatility	12
3.1.2	Decrease in volatility	13
3.1.3	Inconclusive	15
4	Random Walk Theory & Efficient Market Hypothesis.....	17
5	Methods.....	18
5.1	Sample group	18
5.2	Time frame	18
5.3	Data collection	18
5.4	Volatility	19
5.5	Excel calculations	19
5.6	Different currency derivatives	20
5.7	Brackets.....	21

6 Results 22

6.1 Correlation results 22

6.2 Bracket results..... 23

7 Discussion..... 25

8 Conclusions..... 28

References..... 30

Tables

Table 1. Correlations..... 24

Table 2. Brackets..... 24

Table 2

1 Introduction

Since 2019, currency derivatives trading has seen a steady climb, which can be seen from charts provided by The World Federation of Exchanges Research Team (2021; 2023). This upward trend raises the question of why such growth is occurring and what benefits it brings to both companies and financial markets at large.

The increase in currency derivatives trading can be attributed to various factors, as can be seen in the following news articles.

During the time frame of the thesis (1.1.2023 – 31.12.2024) global foreign exchange markets have seen a rapid increase in notional value, reaching 130 trillion dollars in June of 2024, which means a growth of 10 % compared to 2023. This phenomenon can partly be explained by yen denominated derivatives, which grew 26 % in yen terms and 13 % in dollar terms. The surge in yen trading can be attributed to market preparations for changes in the Japanese negative interest rate policy. The increase in currency derivatives trading alludes to heightened concern about the currency markets (BIS, 2024; ISDA, 2024).

Recent reasons for the increase in currency derivatives use point to currency risk hedging. Reuters (2025) writes on how Chinese firms are hedging precisely against currency risk. Chinese markets have seen soaring numbers in dollar/yuan currency options in the start of 2025. Vora and Kalra (2025) report on similar activity as in Chinese markets where Indian companies have been hedging against currency risk. In this case the concern for Indian firms is the volatility of the rupee.

Another explanation for the increase in currency derivatives trading is macro risks according to Matthews (2024). Matthews writes how U.S. firms used foreign exchange options to hedge their cash flows. This was happening amidst the U.S. presidential election and interest rate changes from the U.S. Federal Reserve. In a more recent article Matthews (2025) explains currency derivatives usage increase because of trade tensions. As U.S. implemented

their tariff policies, the corporate sphere acted with currency hedges in case the policies had a volatile effect on exchange rates.

Geopolitical uncertainty has also had an impact on the behavior of firms' hedging strategies. Cooper (2025) writes that a large number of companies internationally are planning on either prolonging or adding to their currency hedge positions because of the heightened geopolitical tensions.

Most of the sample companies in this thesis operate internationally. Therefore, international developments in the currency markets influence the operations of the very companies in question. In addition, Finland is part of the eurozone which eliminates currency risk with large part of European countries. According to the Finnish Government (2025) in the year 2024 Finnish exports to EU countries was 58 % and outside of the EU was 42 %. This shows the significant quantity of Finnish exports possibly being impacted by currency risk.

These developments suggest that companies implement currency derivatives strategies for hedging reasons. From that a question arises whether this type of hedging has the wanted effect.

1.1 Research question

This thesis is built around the following research question:

“Is there correlation between firms' use of currency derivatives and their volatility?”

A secondary research question is:

“What is the primary reason for firms' to implement currency derivatives strategies?”

1.2 Purpose of the study

The purpose of the study was to see if there is an impact on firms' volatility from their currency derivatives use. If there was a noticeable change in volatility from currency derivatives use it could have implications for firms' risk management strategies and decision making.

Going into the thesis, an idea was formed about how the results might look like. What was anticipated was that there would be a slight decrease in volatility for the companies that used larger volumes of currency derivatives. The reasoning for the prediction was that most companies implement currency derivatives strategies for the sake of hedging, not speculation. Therefore, the impact of larger amount of hedging in the form of currency derivatives would correlate with decreased volatility. The decrease in volatility would be subtle as there are various other factors that play into a firm's stock price volatility. This view is represented in the first hypothesis.

H1: An increase in the value of currency derivatives is associated with enhanced market stability, reflected in reduced volatility.

H2: Currency derivatives are utilized by firms as risk management instruments to lower volatility.

1.3 Research gap

When researching reference studies that align with the thesis subject, it occurred that there are a significant number of studies done that examine the effects of derivatives use on firm value rather than volatility. In addition, the studies that were found about the effects of

derivatives use on volatility were quite dated. This indicates a research gap, which this thesis seeks to address.

1.4 Structure of the study

The study continues from the introduction to the section where key concepts of the thesis are explained. This includes main forms of derivatives and how they function, definition of volatility that relates to this study and reasons for currency derivatives use. The official literature review consists of effects of derivatives. The research papers on effects of derivatives use have been divided based on their outcome. In the next section the study examines financial theories that connect to the thesis. The fifth chapter of the study comprises of methods used to collect and analyze the dataset. Next chapter presents results of the study. Chapter seven is discussion of what to consider about the study done. Lastly chapter eight concludes the thesis.

2 Key concepts

In the following chapter the focus is to explain key concepts of this study and reasoning behind currency derivatives use.

2.1 Derivatives

CME Group (2025) explains derivatives as financial instruments that derive their value from another asset. Derivatives contracts have two different settlement types, physical and monetary.

In his article Hopper (1995) presents three of the main currency derivatives. These derivative types are forward contracts, options and futures contracts. Forward contracts are described in the article as agreements to buy or sell a set amount of a given currency at a predetermined time. Next Hopper compares the similar futures contract with the forementioned forward-contract. The function of the derivative is similar with both futures and forwards where there is an agreement to buy or sell a set amount of a given currency at a predetermined time. The difference arises in the holding of the derivatives. In the case of holding futures, they are mark-to-market, where profits and losses are counted on daily basis and settled via a margin account. Forwards, on the other hand settle the transaction only at the maturity date of the contract. Lastly the article goes into detail about currency options. Options contracts give the user the right, not the obligation, to buy or sell a given currency at a predetermined strike price (Hopper 1995).

Like Hopper, Brummer and March (2012) discuss common forms of derivatives, which are options, futures and swaps. Options contracts offer the rights but not the obligation to buy or sell a specific instrument. In addition, options contracts allow the buyer to choose the specific time and price. When buying options instruments, it is called a call option and when

selling, it is called a put option. Futures contracts provide the ability to secure a set price for the underlying at an agreed time in the future. Swaps give an opportunity to trade cash-flows. Currency swaps can be explained where a payment in a specific currency is changed to a payment in another currency (Brummer & March 2012).

2.2 Volatility

The intensity of a security's price movement can be considered volatility (Hayes 2025). In his study Hayes also mentions three measurements for volatility. Standard deviation and variance tell how varied a given assets return is. Beta on the other hand measures the volatility of an assets returns compared to a benchmark index. These are the three measurements of volatility that have been used in this thesis.

2.3 Use of derivatives

Bartman et al. (2011) study suggest that companies that implement derivatives strategies show decreased total and systematic risk. This refers to derivatives being used for hedging, not speculation.

A study done by Allayannis & Ofek (2001) shows that in 1993 non-financial firms from the S&P 500 index use currency derivatives for hedging purposes. The authors explain the reason being to mitigate the firms' exchange rate exposure.

In their study "Why firms use currency derivatives" Géczy et al. (2012) show that foreign exchange exposure is one important reason for the use of currency derivatives. Other reasons for the use of currency derivatives by the study were foreign pretax income, use of foreign debt and imports related to sales. Géczy et al. suggest also that firms in the sample

group were hedging rather than speculating with currency derivatives. This is proven by their models of optimal hedging behavior results.

The reasons given for financial derivatives use by Ogundu (2025) were to decrease firms exposure to interest rate changes, foreign exchange risk and commodity price risk. The implementation of financial derivatives can ensure investment stability, financial predictability and a hedge against volatility from the markets (Ogundu, 2025).

Hopper (1995) addresses the misconception of derivatives being risky per say. This misguided view of the financial instrument stems from speculative use of the derivatives. While derivatives are used for speculative purposes, they are primarily deployed as hedges against financial risk.

Like Hopper, Nguyen and Faff (2010) address the misconception and concern amongst the general public about derivatives use. This concern is based on the view of derivatives adding risk to firms. Contrary to public concern there is proof that interest rate derivatives are used for hedging. The writer's analysis tested for nonlinearity between risk and derivatives implementation. This test showed that the reason for derivatives use is hedging. Based on their results Nguyen and Faff see public worry unjustified.

3 Literature review

The literature review consists of previous research done on the effects of currency derivatives.

3.1 Effect of derivatives

There has been extensive research done on the various effects derivatives have on companies. Substantial number of studies examine the effects derivatives have on returns. The research papers essential to this thesis were the ones where the examination was about effects of derivatives on volatility. In the following sub chapters this thesis presents different research papers on the matter. These studies have varied outcomes and have been divided accordingly.

3.1.1 Increase in volatility

Bae et al. (2017) show in their study that there is increased risk from sell transactions of currency derivatives.

There is evidence of a relationship between trading volume of currency derivatives and exchange rate volatility. The currency derivatives instrument that was examined was U.S. dollar/British pound options. The study also suggests that currency derivatives trading in British pounds is driven by information rather than hedging purposes (Sarwar, 2002).

Clifton (1985) found possible evidence of increased price volatility from futures trading. Clifton clarifies that the volume of trading is a factor. He explains that when there is a large

amount of volume in the futures markets in relation to the volume in the cash market this indicates increased volatility in the interbank market.

Fung and Patterson (1999) present findings pointing to trading volume being a contributing factor when it comes to return volatility. This volatility does not relate to open interest like it does to trading volume. The authors suggest that the connection between trading volume and volatility is overreaction.

In their research paper Adrangi and Chatrath (1998) show that the growth in futures trading has not affected volatility in the currency markets. However, there are actors in the market that have a volatile effect on the markets. These traders are speculators and traders of instruments like currency futures. An increase in currency market volatility can be attributed to heavy unexpected trading volumes. The writers conclude that information of trade commitments has no effect on volatility. Trading mechanisms on the other hand do have a link to volatility (Adrangi & Chatrath, 1998).

What Bhargava and Malhotra (2007) suggest as volatile actors in markets are speculators and day traders. However, when volatility in the markets is higher the demand for speculative action is smaller.

3.1.2 Decrease in volatility

Bartman et al. (2011) did a comprehensive study on the effects of different derivatives on cash flow volatility, standard deviation of stock returns, market betas and market values. What Bartman et al. found in the study was that companies that implement derivatives strategies benefited by having lower cash flow volatility, total risk and market risk.

Mebounou and Yilgor (2016) conducted a study that shows that introduction of futures contracts profoundly decreased the spot price volatility within Turkish stock market players.

Singh and Kansal (2010) concluded in their study that there is a substantial effect on stock return volatility from derivatives trading. This change in volatility was visible when observing the S&P CNX Nifty index before and after the introduction of derivatives trading. Singh and Kansal explain that when derivatives were introduced to the Indian market's volatility in the S&P CNX Nifty index decreased. What the writers propose as explanation for the decrease in volatility is that when the derivatives were introduced the markets became more effective by giving a new investment option. Singh and Kansal also propose that derivatives bring a more fluent exchange of information thus stabilizing the markets. Lastly the additional trading volume that comes from derivatives affects the underlying market in a stabilizing manner.

A study done by Nguyen and Faff (2010) found indication to individual derivative instruments such as interest rate derivatives and foreign currency derivatives to have a positive impact on overall risk. The writers acknowledge that their finding does not tell what type of risk (systematic risk or idiosyncratic risk) is being hedged with these financial derivatives. This is based on weak showing that interest rate derivatives use would decrease firms' idiosyncratic risk and foreign currency derivatives use show a decrease in systematic risk.

Ogundu's (2025) empirical evidence confirms derivatives based hedging strategies being effective. The results show that structural companies that implement hedging strategies see decrease in earnings volatility, increase in credit ratings and lower capital costs compared to firms that don't hedge.

3.1.3 Inconclusive

In a study written by Shenbagaraman (2003) on the topic of whether derivatives increase stock market volatility, the author comes up with the following findings. First, the use of derivatives does not have an excess negative effect on destabilizing the stock market. The writer mentions that derivatives offer more liquidity to the markets. Secondly Shenbagaraman shows that the use of derivatives has not had an impact on the given stock indices volatility. In addition, there is no connection between the activity of futures trading and spot market volatility. Shenbagaraman concludes that there has been a change in the nature of volatility after the introduction of futures. However, the introduction of derivatives has had no profound effect on the spot market volatility.

The study by Bae et al. (2017) examines currency derivatives use by Korean companies. The findings were inconclusive. On average currency derivatives did not affect volatility significantly. However, firms with high foreign exchange exposure saw reduction in risk when hedging with currency derivatives more frequently and in increased amounts. The writers explain the inconclusive results with mismanagement of hedging practice and hedging costs. In their study Nguyen and Faff (2010) concluded that at the aggregate level, firms saw no reduction in risk when derivatives were employed. In addition, the writers point out that there is no proof of increase in risk either.

Bali et al. (2007) conducted a study on whether firms can reduce market risk exposure by hedging with derivatives. First observation was that hedging with derivatives would not be of importance for the company's rate of return. Secondly, they concluded that there was only a weak relationship between a firm's actual risk exposure and derivatives use. This outcome came as a surprise to the writers because of the large size of the derivatives markets and because of the various tools for hedging. Bali et al. came to the conclusion that the likely explanation for the result is that the extent of derivatives used by firms is not large enough to make an economically notable difference for a company.

There is inconclusive evidence whether hedging has an increasing or decreasing effect on volatility. In addition, when there is heightened volatility in the markets there is no clear evidence of increased demand for hedging activity (Bhargava & Malhotra, 2007).

4 Random Walk Theory & Efficient Market Hypothesis

In 1965, Eugene Fama introduced the random walk theory. This hypothesis argues that stock price movements happen unpredictably, without influence from previous days, weeks, months or even years. This means that previous stock price actions cannot be a source for predicting future stock price movements. The factors affecting price movements according to the theory must be new and unpredictable information. Therefore, making stock price movements unpredictable. In addition, securities move independently from one another thus there is no connection between different securities price fluctuations. Random walk theory implies couple of scenarios. Firstly, that it's next to impossible to predict securities price movements. Secondly, that it's next to impossible to outperform the "market" (Fama, 1965).

The random walk theory is essentially connected with Fama's (1970) efficient market hypothesis (EMH). What EMH claims is that stock markets are highly efficient and that they represent all known information. New information is reflected in prices instantly. When efficient market conditions are met Fama implies that stock price movements must be random and unpredictable.

5 Methods

In the following chapter the methods of the study are explained. These methods include the sample group, timeline and how data has been collected and analyzed. There is also an explanation on the volatility metrics that have been used in the study. Methods compile the procedures and facts that form this thesis.

5.1 Sample group

The sample group for the study comprises of the companies from the OMX Helsinki 25 index. At the time of data collection, the index included the following companies in alphabetical order: Elisa, Fortum, Hiab, Huhtamäki, Kalmar, Kemira, Kesko, Kojamo, KONE, Konecranes, Mandatum, Metso, Neste, Nokia, Nokian Tyres, Nordea, Orion, Outokumpu, Qt Group, Sampo, Stora Enso, TietoEVRY, UPM-Kymmene, Valmet and Wärtsilä. The list of OMXH 25 index companies was retrieved from Kauppalehti (2025).

5.2 Time frame

Data period ranges from 1.1.2023- 31.12.2024.

5.3 Data collection

The core of this thesis was based on data from the sample group companies. Essential data collected included historical stock price data, which was retrieved from Kauppalehti (2025). Kauppalehti has historical data on stock prices for each company but not for the OMX Helsinki 25 index. Historical price data for the index, Investing.com (2025) was used. To make

sure the data was correct Yahoo Finance (2025) was used as cross reference. Next important data was each company's sales data, nominal or notional derivatives value data. This data was harvested from each company's annual reports. All the annual reports are listed in the references. The data mentioned was collected and transferred to an Excel spreadsheet for further analysis.

5.4 Volatility

Volatility measurements used in the study were standard deviation, variance and beta. Standard deviation and variance were derived from the daily stock returns of the sample group companies between the years 2023 and 2024. For measuring beta, stock price returns of a given company and OMXH 25 index were used. Daily standard deviation was calculated from the natural logarithm of the stock returns. Yearly standard deviation was calculated with the same premises as daily standard deviation, but the daily value was multiplied by the square root of trading days in a year, which is 252. Variance was calculated by raising the previously calculated standard deviation to the power of 2. Beta volatility was measured by calculating the slope of the linear regression of two datasets. These two datasets consist of stock returns of a given company from the sample group and of the benchmark index returns.

5.5 Excel calculations

All analysis and calculations were done in Microsoft Excel. Returns for each company and the benchmark index were calculated using the LN function which provides the natural logarithmic number. For the volatility calculations there were three different Excel functions used. Standard deviation was calculated using the sample group option where the function is STDEV.S. Variance can be calculated in Excel by using the VAR.S function, but in this

analysis power to the second was used which gives the same outcome. Last of the volatility measurements, the beta, was calculated using the SLOPE function. The SLOPE function gives a slope of linear regression of two data sets, which in this case refers to a given company's stock returns and the benchmark index's returns.

Correlations were calculated using excels data analysis toolpak. Excel data analysis correlation uses the Pearson r correlation. When calculating the results for the brackets averages were used. This was executed as follows, averages were calculated from standard deviation, variance and beta. The brackets divided the companies into four different groups. Each bracket had companies determined by their currency derivatives use in relation to their sales. As an example, bracket <20% had the same six companies both years (2023 and 2024), which were Tieto EVRY, Qt Group, Orion, Kojamo, Kesko and Elisa. From these six companies' averages were calculated of their standard deviation, variance and beta.

5.6 Different currency derivatives

The companies from the OMX Helsinki 25 index have used a variety of different currency derivatives. Currency derivatives that have been included in the study are currency forwards, forward contracts, forward exchange contracts, forward foreign exchange contracts, cross currency swaps, currency & interest rate swaps, currency options, foreign exchange derivatives, foreign currency derivatives, foreign exchange options, intra-group foreign exchange contracts, options and over-the-counter derivatives.

When there is reference to currency derivatives in this study, one or multiple of the previously mentioned currency derivatives are implied. The sample companies have presented their derivatives values either in notional values or nominal values. This can be found in each firm's annual report. I have used both notional and nominal values in my study interchangeably.

5.7 Brackets

To further see if there is a connection between the amount of currency derivatives use and stock price volatility, I divided the sample group companies into four “brackets”. The four groups were divided according to the companies’ currency derivatives use in relation to the companies’ sales.

The brackets are as follows:

<20% of sales

21%-40% of sales

41%-60% of sales

>60% of sales

For the year 2024 companies that slot into the bracket <20% are Elisa, Kesko B, Kojamo, Orion B, Qt Group and Tieto EVRY. The second bracket 21%-40% consists of Huhtamäki, Kone, Konecranes, Neste, Nokian Renkaat, Outokumpu, Sampo A, Stora Enso R, UPM-Kymmene and Wärtsilä B. There happens to be only one company with 41%-60% currency usage, that being Kemira. The last bracket >60% includes the remaining companies Fortum, Hiab, Kalmar B, Mandatum, Metso, Nokia, Nordea Bank and Valmet.

The composition of companies within the brackets in 2023 was very similar compared to 2024, but there were two changes. Kalmar B was in the 21%-40% of sales bracket and Konecranes in the 41%-60% of sales for the year 2023.

Derivatives use is determined by the value amount of companies’ nominal or notional currency derivatives.

6 Results

In this chapter, the results of the thesis are presented. The chapter also includes tables, to visualize the results.

6.1 Correlation results

The correlation results are shown in table 1. Correlations have been calculated between standard deviation, variance, beta and the percentage of currency derivatives used in relation to sales. The important correlations are highlighted in table 1, which are between the currency derivative percentage of sales and the different volatility measurements.

Correlation between the standard deviation and the currency derivative percentage of sales for the year 2024 was -0,182, for 2023 it was -0,145 and the years combined was -0,176.

Correlation between variance and the currency derivative percentage of sales for the year 2024 was -0,172, for 2023 it was -0,150 and the combined was -0,173. The similarity of results was to be expected between standard deviation and variance as variance is derived from our standard deviation.

Correlation between the beta and the currency derivative percentage of sales for the year 2024 was -0,002, in the year 2023 it was 0,056 and when combining the two years the beta was 0,028.

The correlations between the volatility metrics are higher by nature. Ranging from a high of 0,9884 between standard deviation and variance for the year 2024 to a low of 0,6664 between variance and beta in 2024.

The correlation results are unsatisfactory in finding a pattern between currency derivatives use and stock returns volatility. There is no significant correlation between the value used by the sample group companies and their volatility.

6.2 Bracket results

The results for the brackets are shown in table 2. The brackets divide the sample companies into four groups according to their currency derivatives usage in relation to their sales.

What we find is a slight pattern that the average standard deviation rises when currency derivatives usage increases. This phenomenon occurs in 2024 and when the two years are combined. Variance has the same miniscule pattern as standard deviation. This again being the result of variance being derived from standard deviation. When it comes to beta there is no clear pattern in any direction in any of the time frame cases.

Table 1. Correlations

2024	Currency Derivatives % of Sales	Standard Deviation Yearly	Variance Yearly	Beta
Currency Derivatives % of Sales	1	-0,182065894	-0,171511113	-0,002103502
Standard Deviation Yearly	-0,182065894	1	0,988439479	0,705826226
Variance Yearly	-0,171511113	0,988439479	1	0,666439435
Beta	-0,002103502	0,705826226	0,666439435	1

2023	Currency Derivatives % of Sales	Standard Deviation Yearly	Variance Yearly	Beta
Currency Derivatives % of Sales	1	-0,145298848	-0,150206047	0,056257841
Standard Deviation Yearly	-0,145298848	1	0,985709207	0,770629242
Variance Yearly	-0,150206047	0,985709207	1	0,720363556
Beta	0,056257841	0,770629242	0,720363556	1

2023 & 2024	Currency Derivatives % of Sales	Standard Deviation Yearly	Variance Yearly	Beta
Currency Derivatives % of Sales	1	-0,17562206	-0,172640998	0,028224054
Standard Deviation Yearly	-0,17562206	1	0,988080081	0,76573249
Variance Yearly	-0,172640998	0,988080081	1	0,718181528
Beta	0,028224054	0,76573249	0,718181528	1

Table 2. Brackets

2024				
Currency Derivatives % of Sales	Number of Companies	Average Standard Deviation	Average Variance	Average Beta
<20%	6	24,81 %	0,06327	0,77
21-40%	10	26,72 %	0,07620	1,09
41-60%	1	29,54 %	0,08728	0,79
>60%	8	28,54 %	0,08429	1,08

2023				
Currency Derivatives % of Sales	Number of Companies	Average Standard Deviation	Average Variance	Average Beta
<20%	6	28,77 %	0,09421	0,91
21-40%	10	27,94 %	0,08248	1,04
41-60%	2	28,75 %	0,08267	0,92
>60%	7	27,90 %	0,07850	1,17

2023 & 2024				
Currency Derivatives % of Sales	Number of companies	Average Standard Deviation	Average Variance	Average Beta
<20%	12	26,79 %	0,07874	0,84
21-40%	20	27,33 %	0,07934	1,06
41-60%	3	29,15 %	0,08497	0,85
>60%	15	28,22 %	0,08139	1,13

7 Discussion

Finland joined the eurozone in 1999, which eliminated foreign exchange risk with the other European member states that had adopted the euro as their own currency as well. Being part of the eurozone also gives the European Central Bank (ECB) power to set monetary policy such as interest rates. However, the bank of Finland takes part in the preparation, decision making and implementation of monetary policy within the ECB (Suomen Pankki, 2025). This has a direct effect on the companies that are headquartered in Finland. This should be considered when analyzing the sample group companies' currency derivatives strategies.

The results of the study show that there is no significant correlation between currency derivatives use and volatility. This result might be attributed to the small sample size of the study or the short period of time considered. The sample size was determined by the chosen index (OMX Helsinki 25) which accounts for only 25 companies. This sample size can give misleading outcomes because of the lack of data volume. The time frame for the thesis was originally only 2024. This is because it was the last full financial year. There was a need to expand the study into comparing between years. Therefore, the financial year 2023 was included in the thesis. All the sample group firms annual reporting made collecting data seamless as the companies are required to provide both last year's financial statements along with the present year's financial statements.

The bracket between 41-60% has a small sample size, which could make it more unreliable compared to the other brackets. This is something that needs to be considered when analyzing the results.

Most of the studies that examine derivatives use and their effect, be it firm value or volatility, exclude financial firms from their studies. In this thesis financial firms have not been

excluded. The reason being that the sample group is too small to start with (25 companies), and for that reason all the companies from OMXH 25 index were desirable to include in the study. There is an understandable reason for excluding financial firms from similar studies. This was evident when gathering data that there was a substantial difference in currency derivatives use when comparing the two financial firms Nordea and Mandatum to the other companies in the study. Both Nordea and Mandatum had significantly larger value amounts of currency derivatives used. What must be considered with financial firms is that they use currency derivatives for speculative purposes as well as hedging purposes. For example, Mandatum (2024) has separate value amounts of derivatives held for trading purposes and derivative financial instruments related to unit-linked insurance.

What came across when harvesting data from the sample group companies was that Qt Group had no derivatives in their books. Secondly Kalmar didn't have stock data for the year 2023 and only partial data for the year 2024. Despite the missing data from Qt Group and Kalmar the decision was made not to exclude them from the sample group.

When it comes to the research papers used in chapters two and three some of them are outdated. Regardless of the reference studies being dated they still seem relevant. For example, there are recurring trends among the studies that examine the purpose of derivatives use regardless of the date.

When listing the different currency derivatives used by the sample group companies there are same derivatives instruments multiple times just in different names. This is due to the fact that different companies announce their currency derivatives in different ways even though they are the same instrument. A decision was made not to pick and choose one over the other, but to list all the derivatives instrument names announced by companies in the study.

The prediction of volatility decreasing as currency derivatives usage increases (H1) did not come to fruition. This outcome may be because of the numerous other factors that affect stock returns and companies' volatility. This can also be because of the sample size and timeline of this study. An equally plausible reason for this outcome might be the random walk of stock prices. As the lack of correlation suggests that currency derivatives do not change the unpredictable nature of stock price fluctuations, which aligns with the Random Walk Theory's view of efficient markets.

The literature review has research papers that have contradictory results. This appears in chapter three, where a given author can be cited in multiple subchapters. For example, Bae et al. (2017) is cited in both inconclusive and increased volatility outcome subchapters. This can be due to variety of reasons, for example it could stem from multiple different methods of examining data, different sample group combinations or different derivatives instruments.

8 Conclusions

This thesis examines the impact of currency derivatives on companies' volatility. The study includes theory where currency derivative types are explained and what the purpose for their use is. The theory section of the thesis also examines previous research papers on the subject and general theory of stock market returns. For answering the hypothesis of this thesis, relevant studies and data analysis was used.

When examining previous research done on the subject there is a divide in outcomes. There are research papers that show evidence of reduced volatility and increased volatility from using currency derivatives. However, there are also studies that are presented in the literature review where the results are inconclusive.

Several studies cited in this thesis find no significant correlation between the notional value of currency derivatives used by the sample firms and volatility. This finding is supported by research papers presented in the literature review (Shenbagaraman, 2003; Bae et al., 2017; Nguyen & Faff, 2010; Bali et al., 2007). In contrast to studies that concluded no significant effect, other research papers referred to in this thesis find evidence that the use of currency derivatives by firms can lead to reduced volatility (Bali et al., 2007; Bartman et al., 2011; Mebounou and Yilgor, 2016; Singh and Kansal, 2010; Nguyen & Faff, 2010; Ogundu, 2025). In addition to studies reporting neutral and volatility reducing effects, the literature review also includes research papers that find increased volatility connected to firms' use of currency derivatives (Bae et al., 2017; Sarwar, 2002; Clifton, 1985; Fung & Patterson, 1999; Adrangi & Chatrath, 1998; Bhargava & Malhotra, 2007).

Based on the literature review, the reason for companies' currency derivatives use is mainly hedging (Hopper, 1995; Bartman et al., 2011; Allayannis & Ofek, 2001; Géczy et al., 2012; Ogundu, 2025; Nguyen and Faff, 2010). There are cases where speculation is the driving

factor for currency derivatives use, but this strategy is in the minority. Large number of studies done about the subject excludes financial companies. This action excludes companies that have a higher possibility of using currency derivatives for speculation.

What the study showed was that there is no significant correlation between the value of currency derivatives used and stock price volatility. What the literature review shows is that there are varying results about the effects of derivatives use on firms' volatility. This gives reason for further examination of the subject. Further research would be advantageous to do with a larger sample group and/or longer timeline.

References

- Adrangi, B., & Chatruth, A. (1998, April). Futures Commitments and Exchange Rate Volatility. *Journal of Business Finance & Accounting*, 25(3-4), 501-520. <https://doi-org.proxy.uwasa.fi/10.1111/1468-5957.00200>
- Allayannis, G., & Ofek, E. (2001, April). Exchange rate exposure, hedging, and the use of foreign currency derivatives. *Journal of International Money and Finance*, 20(2), 273-296. [https://doi.org/10.1016/S0261-5606\(00\)00050-4](https://doi.org/10.1016/S0261-5606(00)00050-4)
- Bae, S. C., Kim, H. S., & Kwon, T. H. (2017, December 1). Currency derivatives for hedging: New evidence on determinants, firm risk, and performance. *The Journal of Futures Markets*, 38(4), 446-467. <https://doi-org.proxy.uwasa.fi/10.1002/fut.21894>
- Bali, T. G., Hume S. R., & Martell, T. F. (2007). A new look at hedging with derivatives: Will firms reduce market risk exposure? *The Journal of Futures Markets*, 27(11), 1053-1083. DOI: 10.1002/fut.20286 <https://research-ebSCO-com.proxy.uwasa.fi/c/slwlh3/viewer/pdf/orudavz7ur?route=details>
- Bartman, S. M., Brown, G. W., & Conrad, J. (2011, August). The Effects of Derivatives on Firm Risk and Value. *The Journal of Financial and Quantitative Analysis*, 46(4), 967-999. doi:10.1017/S0022109011000275 <https://research-ebSCO-com.proxy.uwasa.fi/c/slwlh3/viewer/pdf/lium6q576z?route=details>
- Beers, B. (2024, October 16). *Hedging vs. Speculation: What's the Difference?* Investopedia. Retrieved 8.8.2025 from <https://www.investopedia.com/ask/answers/difference-between-hedging-and-speculation/>
- Bhargava, V., & Malhotra, D.K. (2007, April). The relationship between futures trading activity and exchange rate volatility, revisited. *Journal of Multinational Financial Management*, 17(2), 95-111. <https://doi-org.proxy.uwasa.fi/10.1016/j.mulfin.2006.05.001>
- BIS. (2024, November 21). *OTC derivatives statistics at end-June 2024*. BIS. Retrieved 11.9.2025 from https://www.bis.org/publ/otc_hy2411.htm

- Burns, W.E. (2024). *Efficient-market hypothesis (EMH)*. EBSCO. Retrieved 18.8.2025 from <https://www.ebsco.com/research-starters/social-sciences-and-humanities/efficient-market-hypothesis-emh>
- Brummer, C., & March, A. P. (2012). *Handbook of Key Global Financial Markets, Institutions, and Infrastructure (Chaper 37 – Exchanges)*. Elsevier. <https://doi.org/10.1016/B978-0-12-397873-8.00029-3>
- Cargotec (Hiab). (2024). *Cargotec Annual Report 2024*. Cargotec (Hiab). Retrieved 7.8.2025 from <https://www.cargotec.com/49307c/globalassets/files/investors/annual-reports/cargotec-annual-report-2024-en.pdf>
- Clifton, E.V. (1985, October). The currency futures market and interbank foreign exchange trading. *The Journal of Futures Markets*, 5(3), 375-384. Retrieved 27.8.2025 from <https://research-ebsco-com.proxy.uwasa.fi/c/slwlh3/viewer/pdf/n64qss4cfn?route=details>
- CME Group. (2025). *Understanding the FX Delivery & Settlement Process*. CME Group. Retrieved 7.8.2025 from <https://www.cmegroup.com/education/courses/introduction-to-fx/understanding-the-fx-delivery-and-settlement-process.html>
- Cooper, A. (2025, March 28). *Geopolitical angst prompts over 60% of companies to hedge FX for longer, survey shows*. Reuters. Retrieved 18.8.2025 from <https://www.reuters.com/markets/currencies/geopolitical-angst-prompts-over-60-companies-hedge-fx-longer-survey-shows-2025-03-28/>
- Elisa. (2024). *Elisa Annual Report 2024*. Elisa. Retrieved 7.8.2025 from https://static.elisa.com/v2/image/2tqybbhjs47b/1V94t8lZNR8wdpClnbdS02/Elisa_AnnualReport_2024.pdf
- Fama, E.F. (1970, May). Efficient Capital Markets: A Review of Theory and Empirical Work. *The Journal of Finance*, 25(2), 383-417. <https://doi.org/10.2307/2325486>
- Fama, E.F. (1965). Random Walks in Stock Market Prices. *Financial Analysts Journal*, 21(5), 55-59. <https://doi.org/10.2469/faj.v21.n5.55>

- Finnish Government. (2025, February 6). *Value of exports of goods decreased by 5.5 per cent in 2024, volume of exports fell by 3.5 per cent*. Finnish Government. Retrieved 13.9.2025 from <https://valtioneuvosto.fi/en/-/179508185/value-of-exports-of-goods-decreased-by-5.5-per-cent-in-2024-volume-of-exports-fell-by-3.5-per-cent>
- Fortum. (2024). *Fortum Annual Financial 2024*. Fortum. Retrieved 7.8.2025 from <https://www.fortum.com/files/fortum-financials-2024>
- Fung, H., & Patterson, G.A. (1999, January). The dynamic relationship of volatility, volume, and market depth in currency futures markets. *Journal of International Financial Markets, Institutions & Money*, 9(1), 33-59. [https://doi-org.proxy.uwasa.fi/10.1016/S1042-4431\(98\)00035-3](https://doi-org.proxy.uwasa.fi/10.1016/S1042-4431(98)00035-3)
- Géczy, C., Minton, B. A., & Schrand, C. (2012, April 18). Why Firms Use Currency Derivatives. *The Journal of Finance*, 52(4), 1323-1354. <https://doi-org.proxy.uwasa.fi/10.1111/j.1540-6261.1997.tb01112.x>
- Hayes, A. (2025, May 11). *Volatility: Meaning in Finance and How It Works With Stocks*. Investopedia. Retrieved 8.8.2025 from <https://www.investopedia.com/terms/v/volatility.asp>
- Hopper, G. P. (1995). *A primer on currency derivatives*. Business Review (Federal Reserve Bank of Philadelphia). Retrieved 7.8.2025 from <https://research-ebSCO-com.proxy.uwasa.fi/c/slwlh3/viewer/html/nvy5lvdxbf>
- Huhtamäki. (2024). *Huhtamäki Annual Report 2024*. Huhtamäki. Retrieved 7.8.2025 from <https://www.huhtamaki.com/globalassets/global/investors/reports-and-presentations/en/2024/huhtamaki-annual-report-2024.pdf>
- Investing.com. (2025). *OMX Helsinki 25 Historical Data*. Investing.com. Retrieved 18.6.2025 from <https://www.investing.com/indices/omx-helsinki-25-historical-data>
- ISDA. (2024, December). *KEY TRENDS IN THE SIZE AND COMPOSITION OF OTC DERIVATIVES MARKETS IN THE FIRST HALF OF 2024*. ISDA. Retrieved 11.9.2025 from <https://www.isda.org/a/GpbgE/Key-Trends-in-the-Size-and-Composition-of-OTC-Derivatives-Markets-in-the-First-Half-of-2024.pdf>

- Kalmar. (2024). *Kalmar Annual Report 2024*. Kalmar. Retrieved 7.8.2025 from https://www.kalmarglobal.com/49329d/globalassets/ir/annual-reports/2024/en_kalmar_annual_report_2024.pdf
- Kauppalehti. 2025. *OMX Helsinki 25 (OMXH25) - Indeksi ja kurssikehitys*. Kauppalehti. Retrieved 18.6.2025 from <https://www.kauppalehti.fi/porssi/indeksit/OMXH25>
- Kemira. (2024). *Kemira Full Annual Report 2024*. Kemira. Retrieved 8.8.2025 from <https://www.kemira.com/app/uploads/2025/02/kemira-full-annual-report-2024.pdf>
- Kesko. (2024). *Kesko Annual Report 2024*. Kesko. Retrieved 8.8.2025 from https://www.kesko.fi/493454/globalassets/03-sijoittaja/raporttikeskus/2025/q1/vuosiraportti-2024/kesko_annual_report_2024.pdf
- Kojamo. (2024). *Board of Directors' Report and Financial Statements 2024*. Kojamo. Retrieved 8.8.2025 from <https://kojamo.fi/wp-content/uploads/2025/02/board-of-directors-report-and-financial-statements-2024.pdf>
- Kone. (2024). *KONE Annual Review 2024*. Kone. Retrieved 8.8.2025 from https://www.kone.com/en/Images/KONE_Annual%20Review_2024_tcm17-134328.pdf
- Konecranes. (2024). *Governance and Finance Review 2024*. Konecranes. Retrieved 8.8.2025 from https://investors.konecranes.com/sites/konecranes/files/Annual_report_2024/governance_and_financial_review_2024.pdf
- Mandatum. (2024). *Mandatum Group Annual Report 2024*. Mandatum. Retrieved 8.8.2025 from https://www.mandatum.fi/4957ec/globalassets/konserni/raportointi/vuosi-2024-raportit/mandatum_group_annual_report_2024.pdf
- Matthews, L. (2025, April 21). *US multinationals extend currency hedges to counter Trump's tariff volatility*. Reuters. Retrieved 18.8.2025 from

<https://www.reuters.com/business/us-multinationals-extend-currency-hedges-counter-trumps-tariff-volatility-2025-04-21/>

Matthews, L. (2024, August 28). *US companies return to currency options to hedge election, macro risks*. Reuters. Retrieved 18.8.2025 from <https://www.reuters.com/markets/us/us-companies-return-currency-options-hedge-election-macro-risks-2024-08-28/>

Mebounou, C. L. C., & Yilgor, A. G. (2016, September 30). THE EFFECT OF FUTURES CONTRACTS ON THE STOCK MARKET VOLATILITY: AN APPLICATION ON ISTANBUL STOCK EXCHANGE. *Journal of Business, Economics and Finance*, 5(3), 307-317. <https://doi.org/10.17261/Pressacademia.2016321974>

Metso. (2024). *Metso Annual Report 2024*. Metso. Retrieved 8.8.2025 from <https://www.metso.com/globalassets/investors/reports/2024/metso-financial-review-2024.pdf>

Neste. (2024). *Neste Annual Report 2024*. Neste. Retrieved 8.8.2025 from [https://www.neste.com/files/pdf/3kFaGuHcQk8hRDLS6tlvqF-Neste Annual Report 2024.pdf](https://www.neste.com/files/pdf/3kFaGuHcQk8hRDLS6tlvqF-Neste%20Annual%20Report%202024.pdf)

Nguyen, H. & Faff, R. (2010, May). Are firms hedging or speculating? The relationship between financial derivatives and firm risk. *Applied Financial Economics*, 20(10), 827-843. <https://doi-org.proxy.uwasa.fi/10.1080/09603101003636204>

Nokia. (2024). *Nokia in 2024*. Nokia. Retrieved 8.8.2025 from https://www.nokia.com/system/files/2025-03/nokia-annual-report-2024_1.pdf

Nokian Tyres. (2024). *Nokian Tyres Annual Report 2024*. Nokian Tyres. Retrieved 8.8.2025 from <https://mb.cision.com/Main/10563/4113113/3295843.pdf>

Nordea Bank. (2024). *Nordea Annual Report 2024*. Nordea Bank. Retrieved 8.8.2025 from <https://www.nordea.com/en/doc/annual-report-nordea-bank-abp-2024-0.pdf>

Ogundu, P. G. (2025, February 13). The strategic implications of financial derivatives in hedging corporate exposure to global economic volatility. *World Journal of Advanced*

- Research and Reviews*, 25(2), 1218-1234.
<https://doi.org/10.30574/wjarr.2025.25.2.0482>
- Orion. (2024). *Q4 Orion Annual Report 2024*. Orion. Retrieved 8.8.2025 from
<https://www.orionpharma.com/493e39/globalassets/investors/reports-and-presentations/2024/orion-financial-statement-documents-2024.pdf>
- Outokumpu. (2024). *Outokumpu Annual Report 2024*. Retrieved 10.8.2025 from
<https://otke-cdn.outokumpu.com/-/media/files/investors/annual-reports/outokumpu-annual-report-2024.pdf?revision=84a3050e-ac7b-4dd0-9413-5714b2f0ab7e&modified=20250304071521>
- Qt Group. (2024). *Qt Annual Report 2024*. Qt Group. Retrieved 10.8.2025
https://www.qt.io/hubfs/_website/QtV2/QtV2%20Investors/2024/Annual%20Report/Qt-AnnualReport-2024-ENG.pdf?hsLang=en
- Reuters. (2025, August 7). *Chinese firms sell record amount of currency options in first half of 2025*. Reuters. Retrieved 18.8.2025 from
<https://www.reuters.com/world/china/chinese-firms-sell-record-amount-currency-options-first-half-2025-2025-08-07/>
- Sampo Group. (2024). *Sampo Board of Directors' Report and Financial Statement*. Sampo Group. Retrieved 10.8.2025 from
<https://www.sampo.com/contentassets/75342b118d894180ac28d054ea1667a8/sa-mpos-board-of-directors-report-and-financial-statments-2024.pdf>
- Sarwar, G. (2003, July). The interrelation of price volatility and trading volume of currency options. *The Journal of Futures Markets*, 23(7), 681-700. <https://doi-org.proxy.uwasa.fi/10.1002/fut.10078>
- Shenbagaraman, P. (2003). *Do Futures and Options Trading Increase Stock Market Volatility?* NSE Research Initiative Working Paper, 26. Retrieved 7.8.2025 from
<https://nsearchives.nseindia.com/content/research/Paper60.pdf>

- Signh, G., & Kansal, S. (2010, June). *Impact of Derivative Trading on Stock Market Volatility during Pre and Post F&O Period: A Case Study of NSE*. Management Convergence, 1(1), 1-10. https://mzu.edu.in/wp-content/uploads/2019/09/Vol_1_Issue_1.pdf
- Stora Enso. (2024). *Stora Enso Annual Report 2024*. Stora Enso. Retrieved 10.8.2025 from [https://www.storaenso.com/-/media/documents/download-center/documents/annual-reports/2024/storaenso annual report 2024.pdf](https://www.storaenso.com/-/media/documents/download-center/documents/annual-reports/2024/storaenso_annual_report_2024.pdf)
- Suomen Pankki. (2025). *Monetary Policy*. Suomen Pankki. Retrieved 13.9.2025 from <https://www.suomenpankki.fi/en/Monetary-policy/>
- The WFE Research Team. (2023). *Currency Derivatives Trends*. World Federation of Exchanges. Retrieved 13.8.2025 from <https://focus.world-exchanges.org/articles/currency-derivatives-trends>
- The WFE Research Team. (2021). *Currency Derivatives*. World Federation of Exchanges. Retrieved 13.8.2025 from <https://focus.world-exchanges.org/articles/currency-derivatives>
- TietoEVRY. (2024). *TietoEVRY Annual Report 2024*. TietoEVRY. Retrieved 10.8.2025 from [https://ar2024.tietoevry.com/siteassets/tietoevry annual report 2024.pdf](https://ar2024.tietoevry.com/siteassets/tietoevry_annual_report_2024.pdf)
- UPM. (2024). *UPM Annual Report 2024*. UPM. Retrieved 10.8.2025 from <https://www.upm.com/siteassets/asset/investors/2024/upm-annual-report-2024.pdf>
- Valmet. (2024). *Valmet Financial Statement 2024*. Valmet. Retrieved 10.8.2025 from <https://www.valmet.com/globalassets/investors/reports--presentations/annual-reports/2024/valmet-financial-statements-2024.pdf>
- Vora, N., & Kalra, J. (2025, March 7). *Indian firms ramp up long-term FX hedges on rupee swings, cheaper costs*. Reuters. Retrieved 18.8.2025 from <https://www.reuters.com/world/india/indian-firms-ramp-up-long-term-fx-hedges-rupee-swings-cheaper-costs-2025-03-07/>
- Wärtsilä. (2024). *Wärtsilä Annual Report 2024*. Wärtsilä. Retrieved 10.8.2025 from <https://www.wartsila.com/docs/default-source/investors/financial->

[materials/annual-reports/w%C3%A4rtsil%C3%A4%20annual-report%202024.pdf?sfvrsn=b1cd5042_3](#)

Yahoo Finance. (2025). *OMX Helsinki 25 (^OMXH25)*. Yahoo Finance. Retrieved 18.6.2025 from

[https://finance.yahoo.com/quote/%5EOMXH25/history/?period1=1672531200&period2=1735603200](#)