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**Conference Paper**

## The emergence of iPhone and its impact on mobile carriers and handset manufacturers: The case of USA, Europe and Japan

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# **The 19th ITS Biennial Conference 2012**

## **“Moving Forward with Future Technologies: Opening a Platform for All”**

18 - 21 November 2012, Thailand

**The Emergence of iPhone and its Impact on Mobile Carriers and Handset  
Manufacturers**

**- The case of USA, Europe and Japan -**

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The Emergence of iPhone and its Impact on Mobile Carriers and Handset Manufacturers  
- The case of USA, Europe and Japan -

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Abstract

This paper investigates the impact of iPhone, a representative of smartphones, on telecommunications carriers and handset manufacturers in U.S.A, Europe, and Japan. We choose the “event study” methodology to evaluate the impact of iPhone emergence. We also look at the financial profit of the carriers and manufacturers in order to confirm the financial impact of iPhone emergence. Our research question is “How does the emergence of iPhone generate the impact on the telecommunications carriers and the handset manufactures in U.S.A, Europe and Japan?” The results show that the impacts of iPhone present differently on the telecommunications carriers and the handset manufacturers. Regarding the impact on telecommunications carriers, 1) the results of event study show that the iPhone-affiliated-carriers, such as AT&T, Telefonica and Soft Bank, are neutral by the iPhone emergence, but non iPhone-affiliated-carriers have negative impact by the iPhone emergence. 2) the results of financial profits show that almost of all telecommunications carriers in U.S.A and Japan grow their profits after the iPhone emergence, but many of the telecommunications carriers in Europe reduce their profits after the iPhone emergence regardless of iPhone affiliation. Regarding the impact on handset manufacturers, the results of event study and financial profits show that 1) Apple, iPhone manufacture, have positive impact and grow profit by the iPhone emergence, but 2) many of other handset manufacturers have negative impact and reduce profit by the iPhone emergence.

## 1. Introduction

On January 9<sup>th</sup>, 2007, Apple announced the launch of 1<sup>st</sup> iPhone in the U.S.A. After the announcement, many experts from the telecommunications industry expressed the idea that iPhone and smartphones would not have substantial impact on mobile carriers.<sup>123</sup> However, the iPhone have had huge success. iPhone and other smartphones seem to influence the mobile industry.

## 2. Research Questions

In order to determine the impact of iPhone on the mobile industry, we set the research question of “How does the emergence of iPhone generate the impact on the telecommunications carriers and the handset manufactures in U.S.A, Europe and Japan?”

## 3. Methodology

For measuring the impacts of iPhone emergence, we choose the ‘event study’ methodology.<sup>4</sup> Event study examines the behavior of firms’ stock prices when a certain event occurs. If a company has an impact by a certain event, there should be reactions, either positive or negative, on the company’s stock returns. Cinversely, the change of stock returns indicates the significance of the event’s impact on the company. This is the idea of this methodology. Although there are some previous studies using the event study methodology to measure the impact on the information companies<sup>567</sup>, there is no study investigating the impacts of smartphones.

We also use the five-year financial profit data for describing the impact on telecommunications carriers and handset manufacturers by the iPhone emergence.<sup>8</sup>

## 4. Data

First, we research the first iPhone services in U.S.A, Europe and Japan. Then we also research the event dates that the iPhone service were announced, the stock returns data of telecommunications carriers and handset manufacturers, and financial profit data of the

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<sup>1</sup> “I don’t think it(iPhone) changes the game plan.”(US Carrier, 2007)

<sup>2</sup> “....nothing to fear from the Apple’s iPhone/iTunes combination, Google’s Android, and even Nokia’s Ovi.”(Europe Carrier, 2007)

<sup>3</sup> “Japanese feature phones are much easier to use than smartphones.”(Japan Carrier, 2008)

<sup>4</sup> We employ the methodology from MacKinlay [1997], as presented in Appendix 1.

<sup>5</sup> Trillas [2002] investigates the change of shareholders’ value of 12 telecommunications firm acquisitions in Europe.

<sup>6</sup> Zhong, Cao, and Ning [2008] examines the impact of the Telecommunications Act of 1996 on the profitability and efficiency in the broadcasting industry.

<sup>7</sup> Rieck [2010] examines the transformation of the telecom industry through diversification.

<sup>8</sup> There is an alternative method to apply the “long-term event study” which examines the impact by the long-term financial data or stock returns data. However, academic literature explains that there are problems of robustness on the “long-term event study”. Therefore, we do not employ the “long-term event study” in this paper.

telecommunications carriers and the major handset manufactures.

Then, we measure the change of each company's stock returns around the event dates, by which we can estimate the impact of iPhone emergence on the telecommunications carriers and the handset manufacturers.

At last we examine the financial profit of the telecommunications carriers and the handset manufacturers for five years after the iPhone emergence.

## 5. Results

### 5-1. The Impact on telecommunications carriers measured by the Event Study methodology

#### 5-1-1. U.S.A.

On January 9<sup>th</sup>, 2007, Apple and Cingular Wireless, AT&T's subsidiary at the time, announced the first iPhone launch and the exclusivity of Cingular as its iPhone service provider. Figure 1 shows the event study results by 1<sup>st</sup> iPhone in U.S.A. AT&T, an iPhone-affiliated-carrier, is neutral by the iPhone emergence but each of Verizon and Sprint Nextel, a non iPhone-affiliated-carrier, has statistically negative impact by the event. We also see that Apple, iPhone manufacturer, has statistically positive impact by the event.

[Figure 1]

#### 5-1-2. Europe

On September 18<sup>th</sup>, 2007, Apple and O2, a subsidiary of Telefonica, announced the 1<sup>st</sup> iPhone service in UK and the O2's exclusivity as its iPhone service provider. This was the 1<sup>st</sup> iPhone service announcement in Europe. Figure 2 shows the event study results by 1<sup>st</sup> iPhone in Europe. Telefonica, an iPhone-affiliated-carrier, is neutral by the iPhone emergence but each of France Telecom and Vodafone, a non iPhone-affiliated-carrier, has statistically negative impact by the event. Deutsch Telecom, another non iPhone-affiliated-carrier, has neutral by the event.

[Figure 2]

#### 5-1-3. Japan

On June 4, 2008, Soft Bank announced their release of 1<sup>st</sup> iPhone in Japan. Figure 3 shows the event study results by 1<sup>st</sup> iPhone in Japan. All the Carriers have no statistically significant impact from the event.

[Figure 3]

#### 5-1-4. Summary

In summary, regardless of regional difference, iPhone-affiliated-carriers are statistically neutral by the announcement of iPhone emergence. However, almost of all Non-iPhone-affiliated-Carriers have negative impact by iPhone emergence.

## 5-2. The Impact on telecommunications carriers measured by the profit change

### 5-2-1. U.S.A.

Figure 4 shows the five year financial profit change after the iPhone emergence in U.S.A. All the telecommunications carriers increase their profit. Apple's profit has also increased hugely,

[Figure 4]

### 5-2-2. Europe

Figure 5 shows the five year financial profit change after the iPhone emergence in Europe. The profit of each telecommunications carriers seems stable. More specifically, profits of Vodafone and DT are almost unchanged but Telefonica and France Telecom decrease their profits in Five years.

[Figure 5]

### 5-2-3. Japan

Figure 6 shows the five year financial profit change after the iPhone emergence in Japan. Soft Bank, the iPhone affiliated Carrier, has increased its profit hugely. However the other two carriers' profits has been almost unchanged.

[Figure 6]

### 5-2-4. Summary

In summary, telecommunications carriers in U.S.A. and Japan grow their profits or maintain the profits at worst. Telecommunications carriers in Europe reduce their profits or maintain their profits at best.

## 5-3. The Impact on handset manufacturers measured by the Event Study methodology and profit change

### 5-3-1. Event study results

Figure 7 shows the event study results by 1<sup>st</sup> iPhone on handset manufacturers. Apple, an iPhone manufacturer, has statistically positive impact by the first iPhone announcement, whereas almost of all other manufacturers have statistically negative impact by the event.

[Figure 7]

### 5-3-2. Profit change results

Figure 8 shows the five year financial profit change on handset manufacturers after the 1<sup>st</sup> iPhone emergence. Apple increased its profit hugely. Samsung and Research in Motion, smartphone centered manufacturers, increased their profits, and other manufactures decreased their profits.

[Figure 8]

### 5-3-3. Summary

In summary, handset manufacturers are largely separated to two groups by the iPhone emergence. One is Apple, and two is the others. Apple has significantly positive returns by event study and has been growing its profit hugely. Other handset manufactures suffer the huge negative impact by iPhone emergence, although Samsung is pretty successful by profit measure.

## 6. Discussion

When we go back to our research question, “How does the emergence of iPhone generate the impact on the telecommunications carriers and the handset manufactures in U.S.A, Europe and Japan?”, we can summarize the research results as follows.

Regarding telecommunications carriers, the impact measured by the event study and the financial profits change are different. The event study results imply that the impact of iPhone emergence is neutral to the iPhone-affiliated-carriers. This does not mean that the iPhone has no impact on the iPhone-affiliated-carriers substantially. We may easily figure the positive features and negative features of iPhone’s impact on the iPhone-affiliated-carriers. We think those two features balance out each other. The event study results also imply that the iPhone emergence has negative impact on the non-iPhone-affiliated carriers.

The financial profit results show the very different picture of telecommunications carriers compared to the event study results. Regardless of iPhone affiliation, the telecommunications carriers in U.S.A. and Japan maintain or grow their profits, whereas many telecommunications carriers in Europe reduce their profit after the iPhone emergence in 2007. These results imply that the regional competition environment and policy basis have more influence on the profit of telecommunications carriers than the devices or services strategy developed by telecommunications carriers themselves.

Regarding handset manufactures, both the event study results and the profit change results show that the handset manufactures are largely separated to two groups after iPhone emergence. One is Apple, and two is the others. Apple has significant positive impact by iPhone measured by both event study and profit change. But almost of all other handset manufacturers suffer the huge negative impact by iPhone emergence. Samsung is the only exception that maintains its profit.

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[Appendix] Process of event study method

First, we describe the stock return and market index return as

$$R_{it} = (P_{it} - P_{it-1}) / P_{it-1}$$
$$R_{mt} = (I_t - I_{t-1}) / I_{t-1} ,$$

where  $P_{it}$  represents the stock price of the  $i$ th firm at time  $t$ ,  $R_{it}$  signifies its rate of return,  $I_t$  stands for market index at time  $t$ , and  $R_{mt}$  denotes its rate of return. Then we use the market model to specify the normal returns of the security  $i$  as

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it},$$

where  $\varepsilon_{it}$  presents the zero mean disturbance term. Based on the estimated parameters  $\alpha_i$  and  $\beta_i$ , the abnormal return for the security of firm  $i$  in period  $t$  is computed as

$$AR_{it} = R_{it} - (\alpha_i + \beta_i R_{mt}).$$

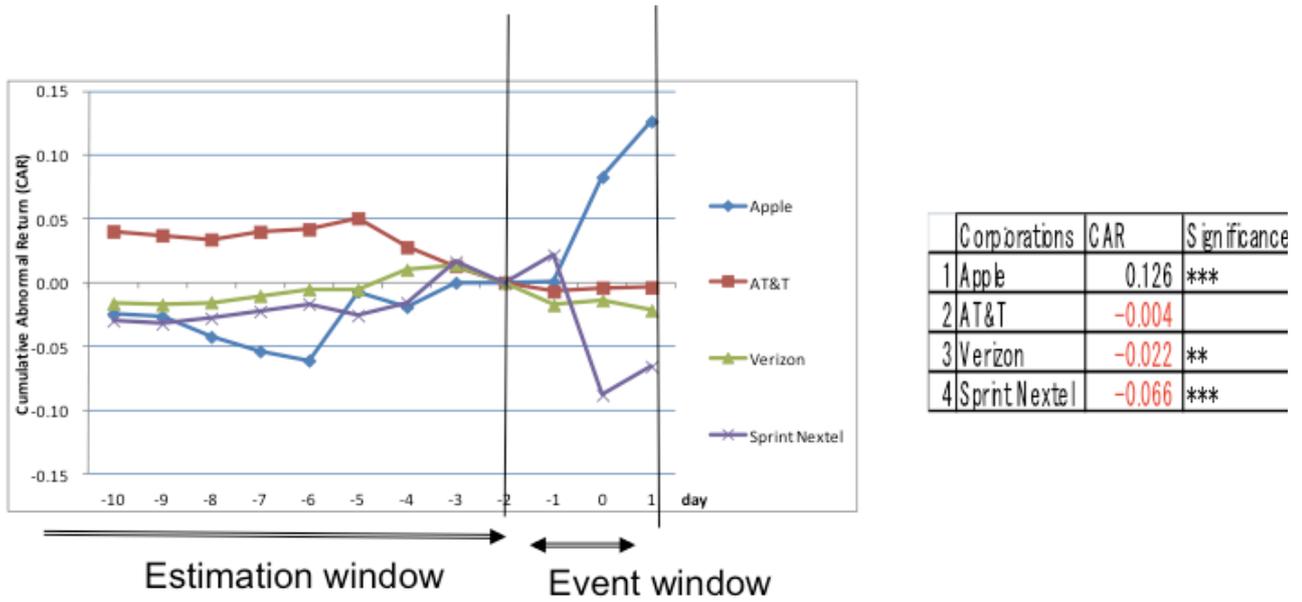
The cumulative abnormal return is calculated as shown below.

$$CAR(t_1, t_2) = \sum AR_{it}$$

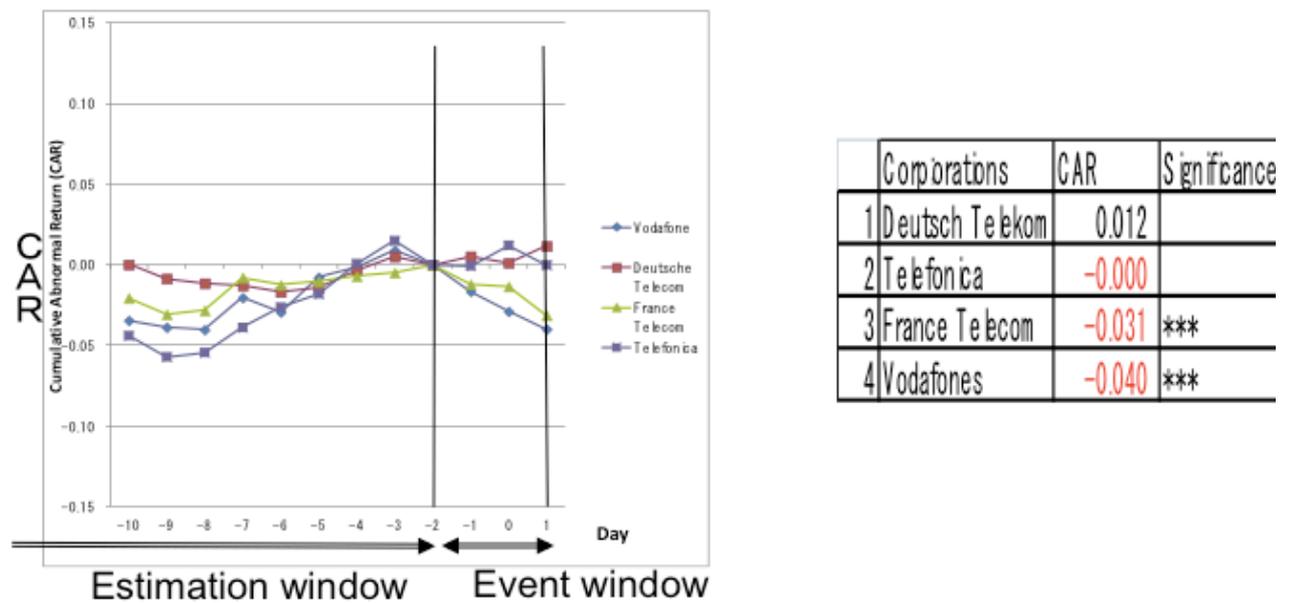
Assuming that each event does not affect the mean or variance of returns, we can test whether the average CAR is equivalent to zero using the following  $t$ -statistics.

$$t = CAR(t_1, t_2) / \sigma(t_1, t_2) \sim N(0, 1)$$

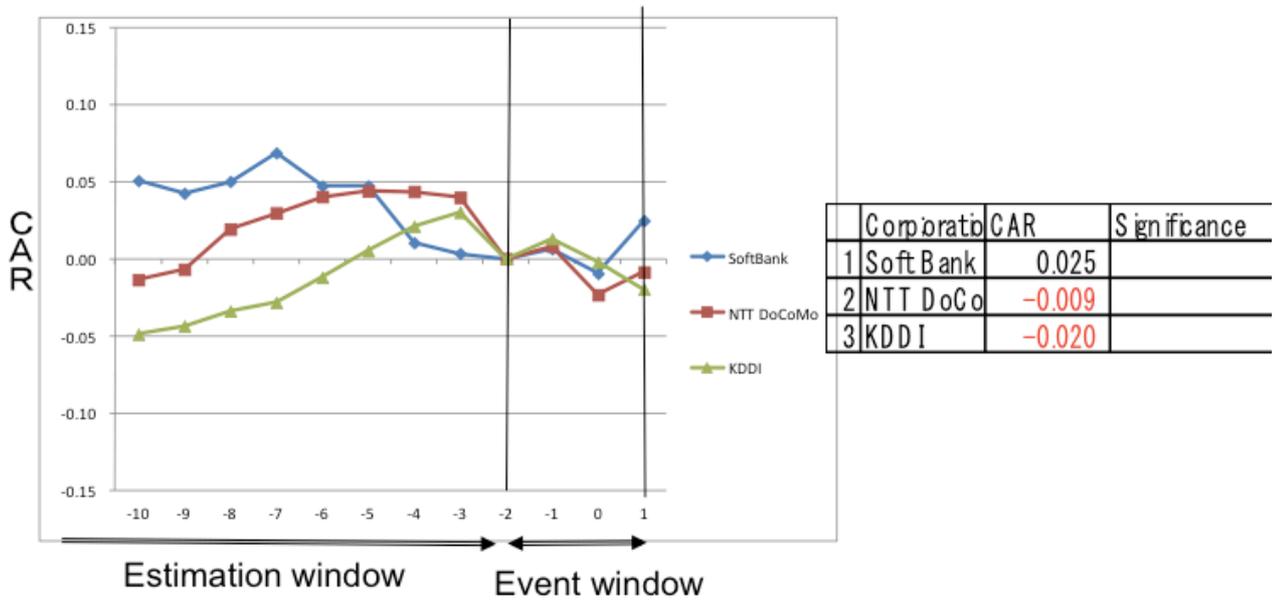
[Figure1] The event study results on telecommunications carriers by 1<sup>st</sup> iPhone in U.S.A.



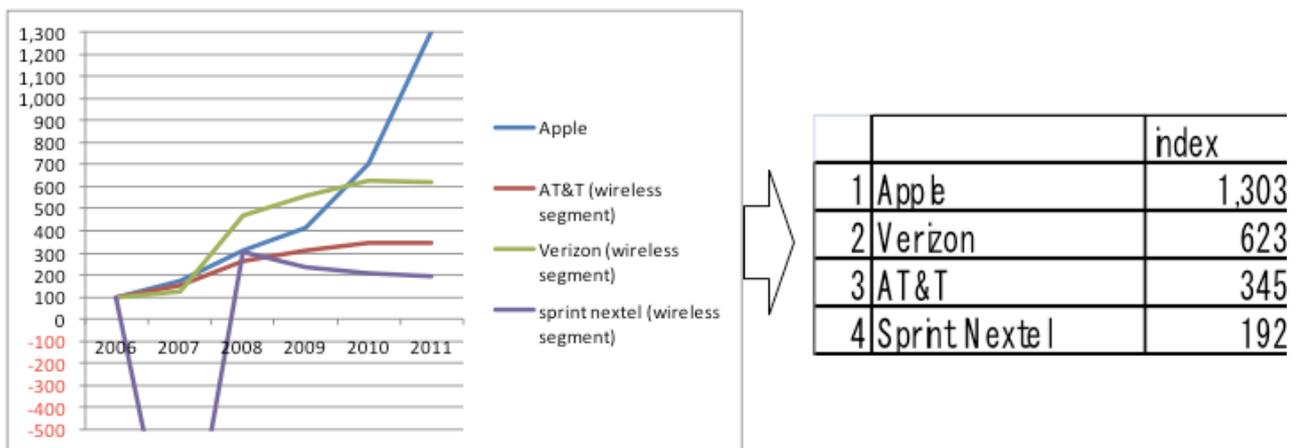
[Figure2] The event study results on telecommunications carriers by 1<sup>st</sup> iPhone in Europe



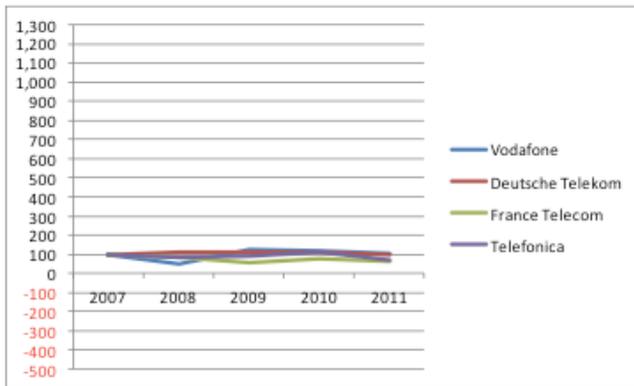
[Figure3] The event study results on telecommunications carriers by 1<sup>st</sup> iPhone in Japan



[Figure4] Five year financial profit change on telecommunications carriers after the iPhone emergence in U.S.A

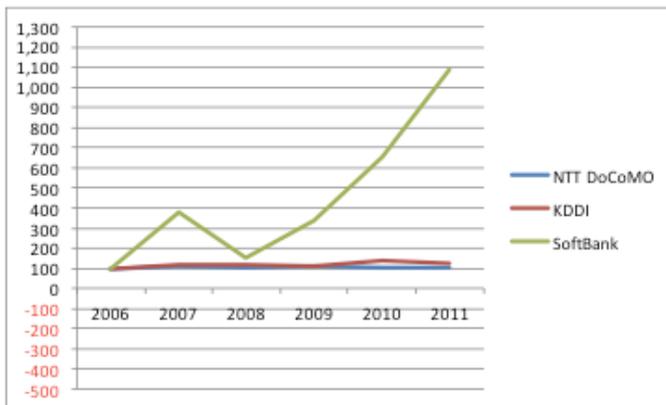


[Figure5] Five year financial profit change on telecommunications carriers after the iPhone emergence in Europe



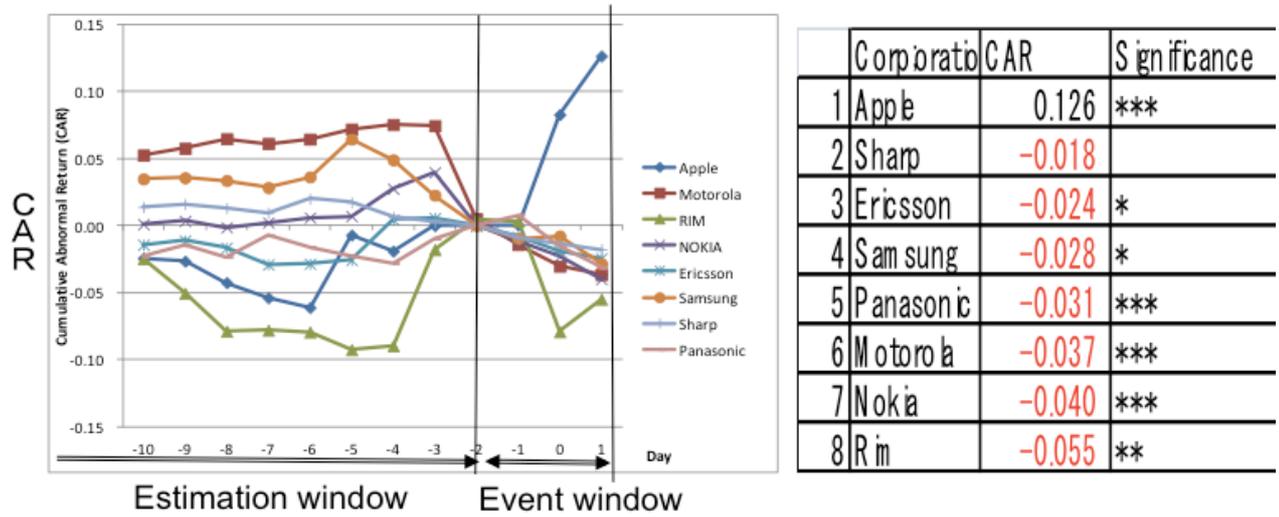
		指数
1	vodafone	104
2	deutsche Telekom	97
3	Telefonica	62
4	FranceTelecom	68

[Figure6] Five year financial profit change on telecommunications carriers after the iPhone emergence in Japan



		指数
1	SoftBank	1,088
2	KDDI	128
3	NTT DoCoMo	101

[Figure7] The event study results on handset manufacturers by 1<sup>st</sup> iPhone



[Figure8] Five year financial profit change on handset manufacturers after the 1<sup>st</sup> iPhone emergence

