Analysis of the Feasibility of Opening a Domino's in Different Locations on CUHKSZ (Group 24)

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12/01/2021





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Abstract

Through a survey of students at CUHKSZ, we found that students were not satisfied with the existing canteens and fast food restaurants on campus and opening a pizzeria might be a choice to improve students' satisfaction with campus food and make a profit. After comparing 5 suitable brands, Domino's Pizza was chosen mainly due to its high popularity among students. After collecting some key data and analyzing the cash flows of opening Domino's Pizza in the lower and upper campus, we believed that opening Domino's Pizza in the lower campus could bring higher profits. In terms of risk analysis, we analyzed market risk, operated risk and industry risk, and drew a conclusion that the risk was controllable through sensitivity analysis.

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1 Introduction About CUHKSZ

1.1 Brief Campus Infomation

CUHKSZ, short for "The Chinese University of Hong Kong, Shenzhen", has taken in more and more students in recent years. There are more than 7,000 students on campus this year. It is an increase of more than 48% from last year's enrollment of about 5,400 students. It is reported that the trend of expanding enrollment will not stop in recent years. Expanding the enrollment range will help the school to enhance its popularity and grow the audience of education. However, Students are already feeling inadequate infrastructure duo to the expansion, which is concretely reflected by the severe shortage of the number of school buses, the restaurant is full of people and other problems. Among them, overcrowding at mealtimes is the most urgent problem.

CUHKSZ's campus is mainly divided into the upper campus and the lower campus. The upper campus is the living region. It has 7-ELEVEN and three canteens. Approximately two thirds students live in the upper campus, and the remained students mainly live in the lower campus. In the lower campus, all the teaching activities are held here and it has Family Mart, Starbucks, Symposium Coffee, A cup of tea, Subway and three canteens. In conclusion, the flow of people in the lower campus is far greater than that in the upper campus during the weekdays' daytime.

1.2 Current Pizza Market in CUHKSZ

In CUHKSZ, 7-ELEVEN, Family Mart, Starbucks and Subway are choices for students getting tired of canteens or meeting the overcrowding problem in canteens. They sell most of fast foods except pizzas. However, pizza is an integral part of students' choice of campus group dinners. After a complex group project or presentation, students in the same group usually seek for having dinners togerther. It is not possible for 7-ELEVEN, Family Mart or Starbucks to satisfy them. Most people also wouldn't consider eating a sandwich together at Subway as a fantastic group dinner option. Hotpots and pizzas are two best choices for group dinners. However, the former is not fast food and will not alleviate the problem of overcrowding in campus canteens. Thus, given the high demand for students to have group dinners, a pizzeria is sure to be very popular.

2 Competitive Pizza Brands

2.1 Selection of Suitable Pizza Brands

There are more than five kinds of pizza brand around the campus of CUHKSZ. We compared five typical brands in prices, taste, brand recognition and popularity degree among CUHKSZ's students. They were Champion Pizza, King's Pizza, Pizza Hut, Domino's Pizza and Lacésar Pizzaria.



Figure 1: Famous Pizza Brands Around CUHKSZ

We evaluated the competitive of these pizza brands by the following 4 indicators.

a. Prices

Table 1: Average Prices of Five Pizza Brands

Pizza Brand	Average Price (¥)	
Champion Pizza	35	
King's Pizza	23	
Pizza Hut	65	
Domino's Pizza	59	
Lacésar Pizzaria	67	

b. Tastes

Table 2: Average Taste Scores of Five Pizza Brands

Pizza Brand	Average Taste Score*
Champion Pizza	4.35
King's Pizza	3.93
Pizza Hut	4.89
Domino's Pizza	4.93
Lacésar Pizzaria	4.68

^{*5} refers to very satisfied, while 0 refers to very dissatisfied.

c. Brand Recognition

From higher degree to lower degree:

Pizza Hut > Domino's Pizza > Champion Pizza > King's Pizza > Lacésar Pizzaria

d. Popularity Degree Among CUHKSZ's Students

From higher degree to lower degree:

Domino's Pizza > Champion Pizza > Pizza Hut > Lacésar Pizzaria > King's Pizza

According to the above data, Domino's Pizza and Pizza Hut were two most competitive pizza brands, as we gave priority to student popularity.

2.2 Comparision Between Domino's Pizza and Pizza Hut

To better analyze CUHKSZ's students' attitude towards Domino's Pizza, we sent questionaires to random students and recieved 274 pieces. The proportion of answers to the question "which one do you prefer, Domino's Pizza or Pizza Hut?" in our questionnaire is presented as *Figure 2*.

Most students prefer to eat Domino's Pizza rather than Pizza Hut. Therefore, opening a Domino's could be a wonderful choice.

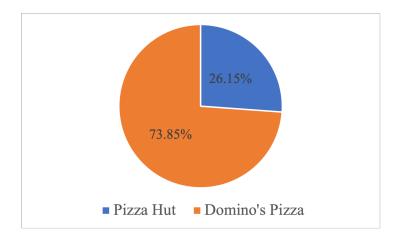


Figure 2: Proportion of Choices Between Domino's Pizza and Pizza Hut

2.3 Students' Ratings of Various Aspects

To further study Domino's Pizza's and Pizza Hut's specific aspects liked or disliked by CUHKEZ's students, We added a five-point scoring question to the questionnaire about the satisfaction of the two pizzerias in terms of taste, cost performance, freshness of ingredients and service attitude. The specific outcomes are in Table 3 and 4.

Table 3: Domino's Pizza's Performance in These Four Aspects

Indicator	Average Score*
Taste	4.93
Cost Performance	4.32
Freshness of Ingredients	3.03
Service Attitude	2.12
Dislike	0.17
Answers in "Other"	It can DIY pizzas.
Allsweis III Oulei	Multiple options of the pizza's bottom.

Table 4: Pizza Hut's Performance in These Four Aspects

Indicator	Average Score*
Taste	3.53
Cost Performance	2.58
Freshness of Ingredients	2.39
Service Attitude	2.41
Dislike	1.06
Answers in "Other"	Expensive but not very fresh.

^{*5} is the full score and means it performs well in this aspect, while 0 means it is terriable.

According to the tables above, Domino's Pizza is a better choice than Pizza Hut for us to invest.

3 Background Information of Domino's Pizza

3.1 Company Profile

Domino's Pizza is a multinational pizza delivery chain, which headquartered in Ann Arbor, Michigan, USA, and founded by Tom Monaghan in 1960. In February 2018, it became the world's largest pizza seller by sales. Domino's Pizza has more than 17,000 stores in 90 countries and regions worldwide today. In January 2020, the 2020 World's 500 Most Valuable Brands list was released, and Domino's Pizza ranked 368th. On May 13, 2020, Domino's Pizza ranked 1693th on the 2020 Forbes Global 2000 list.

3.2 Competitive Analysis

3.2.1 Location

The nearest Domino's Pizza is about 3 kilometers from CUHKSZ. Long distance and high delivery fees make it rather inconvenient for students to buy pizzas. Meanwhile, with the increasing numbers of students in CUHKSZ every year, the demand for pizzas increases as well. In addition, school canteens and convenience stores do not sell pizza. It means that there is a huge potential market for Domino's Pizza in CUHKSZ. Therefore, opening a Domino's in CUHKSZ can be a nice choice.

3.2.2 Brand Awareness

Domino's Pizza is one of the most famous pizza brands in the world. According to our survey, over 70% of interviewees like to eat at Domino's Pizza when they have opportunities. This showed the popularity of Domino's among students. Therefore, there is a stable customer base for Domino's Pizza in CUHKSZ.

3.3 Information About Investment of Domino's Pizza

3.3.1 The Opening Time and Business Hour

We will open the pizzeria at the beginning of 2022. The business hour is from 9:30 to 22:00.

3.3.2 Target Customer

The target customer of Domino's Pizza is all students in CUHKSZ.

3.3.3 Products

We will sell 31 different flavors of pizza in the pizzeria. Table 5 is the price table.

Table 5: Price Table

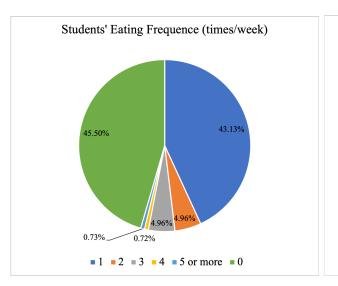
Name	Price (¥)	Name	Price (¥)	
Crab and Shrimp Pizza	78 for 9", 107 for 12"	Spanish Sausage Bolognese Pizza		
Wagyu and Mushroom Pizza	76 101 9 , 107 101 12	Black Truffle and Chicken Pizza		
Rib Eye Steak Pizza		BBQ Fried Chicken Pizza	59 for 9", 88 for 12"	
Crayfish and Fried Chicken Pizza	72 for 9", 101 for 12"	Cheese Pizza		
Scallop and Prawn Pizza		Salami Pizza		
Okonomiyaki Style Pizza		Fried Chicken and Pineapple Pizza	49 for 9", 78 for 12"	
Durian Pizza		Thuringian Sausage Pizza	49 101 9 , 76 101 12	
Potato and Bacon Pizza	69 for 9", 98 for 12"	American Potato and Bacon Pizza	46 for 9", 75 for 12"	
Japanese Style Grilled Eel Pizza	09 101 9 , 98 101 12	Hawaiian Pizza		
Ham Pizza		Coco Brownie Pizza		
Shrimp and Pineapple Pizza		Fruit Pizza		
Tuna Pizza		Taiwanese Sausage Pizza		
Teriyaki Beef and Potato Pizza		Assorted Vegetable Pizza	39 for 9", 68 for 12"	
Salted Egg Yolk and Fried Chicken Pizza	59 for 9", 88 for 12"	Italian Bolognese Pizza	39 101 9 , 06 101 12	
Ham and Mushroom Pizza		Korean Fried Chicken Pizza		
Roast Duck Leg Pizza		-		

4 Cash Flows

4.1 Sales

4.1.1 Analysis of Questionnaire Results

After sorting out the questionnaire results, we got the following data.



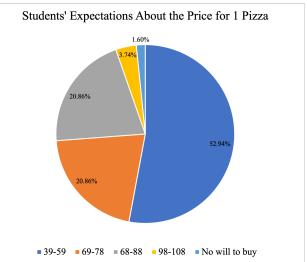


Figure 3: Students' Eating Frequence (times/week) and Expected Price (¥) for 1 Pizza.

By calculating, we had (f refers to the eating frequence, P_e refers to the expected price):

$$E(f) = 0 \times 45.05\% + 1 \times 43.13\% + 2 \times 4.96\% + 3 \times 4.96\% + 4 \times 0.72\% + 5 \times 0.73\% = 0.7446$$

$$E(P_e) = 0 \times 1.60\% + 49 \times 52.94\% + 74 \times 20.86\% + 78 \times 20.86\% + 103 \times 3.74\% \approx 61.50$$

Owing to the universality of the source of these questionnaires, we used E(f) and $E(P_e)$ as the average eating frequence and expected price for the whole students in CUHKSZ, respectively.

4.1.2 CUHKSZ's Predicted Enrollment From 2022 to 2025

We found 2019, 2020, 2021's information on the total enrollment of students in the campus from the official website and annual reports. Because it is impossible for CUHKSZ's enrollment goes to infinity with a constant speed, the increasing function should not be linear. Also, it cannot be a quadratic polynomial function becasuse the increase in enrollment may slow, but never decrease. After that, we thought a logarithmic functions may be perfectly appropriate. We plugged enrollment data in 2019, 2020, and 2021 into $e(i) = c \log(ai + b)$, with c, a, and b unknown. We finally obtained an approximation function:

$$e(i) \approx 1157.41 \log(148.52i - 299735.61)$$

In this function, $e(2018) \approx 3591$, which perfectly fit the actual enrollment (about 3600). That showed this function could be trusted. We used this function to predict the enrollment in future 4 years. The results are shown in *Figure 4*.

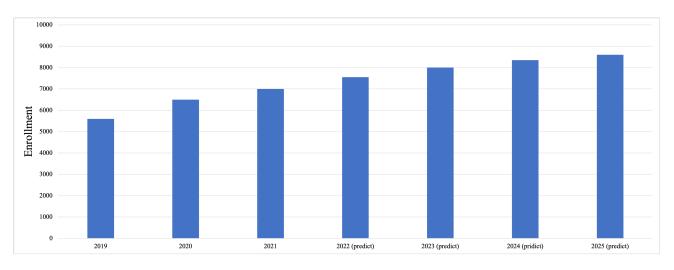


Figure 4: CUHKSZ's Enrollment (including prediction)

4.1.3 Reducting Sales from the Above Data

There are 16 weeks in a normal term in CUHKSZ and 8 weeks in summer term. We could calculate the total opening weeks as 40 weeks per year. The sales in year i (Sale(i)) can be represented as:

$$Sale(i) = 40ke(i)E(f)E(P_e)$$

k is the constant about students' buying willing corresponding with the position of the pizzeria. We generated the value of k from the questionnaires. If the pizzeria opens in the upper campus, $k \approx \frac{3}{7}$. If it opens in the lower campus, $k \approx \frac{4}{7}$.

The specific sales are in Table 6:

Table 6: Sales in Each Year

Year i	2022	2023	2024	2025			
Sale(i) (Upper Campus)(¥)	5,926,534.29	6,279,711.43	6,554,511.43	6,750,754.29			
Sale(i) (Lower Campus)(¥)	7,902,045.71	8,373,028.57	8,739,348.57	9,001,005.71			

4.2 COGS

COGS mainly includes the cost of raw materials. Cost of materials contains several segments, such as meat, fruit and pizza base. We estimated COGS based on the data given by the current pizzeria around the campus. It could be represented as:

$$COGS(i) = 0.681Sale(i)$$

The detailed COGS for our pizzeria is:

Table 7: Sales in Each Year

Year i	2022	2023	2024	2025			
COGS(i) (Upper Campus)(¥)	4,035,969.85	4,276,524.34	4,463,622.28	4,597,263.67			
COGS(i) (Lower Campus)(¥)	5,381,293.13	5,702,032.46	5,951,496.38	6,129,684.89			

4.3 Research and Development (R&D)

In order to get exact data, we spent ¥100 to encourage enough students to fill the questionnaires and spent 0 on development part. Thus, we only spent 100 in the first year.

4.4 Capital Expenditures

a. Franchise Fee (League and Brand)

According the official website of the Domino's Pizza, the franchise fee is ¥50,000.

b. Decoration Cost

Due to the market price of decorations, the price of decoration is $\$1,500 \backslash m^2$. As we estimate the total area is $150m^2$ in the upper campus, $70m^2$ in the lower campus, so the total decoration in the upper campus is \$22,500, in the lower campus is \$12,500.

c. Equipment Cost

According the market price of tables, chairs and other equipments required for production, the equipment cost is \\$170,000 in the upper campus, \\$80,000 in the lower campus because of their areas.

4.5 Depreciation

We used the straight line depreciation over 4 years with no salvage value to calculate the depreciation.

The specific depreciation data is in following tables.

The depreciation of the upper campus is ¥111,250 per year, and the depreciation of the lower campus is ¥58,750 per year.

Table 8: Depreciation in the Upper Campus

	Decoration Cost	Franchise Fee	Equipment
Area		$150m^2$	
Unit Price	¥1,500 \m²	-	-
Total Price	¥225,000	¥50,000	¥170,000
Depreciation	¥56,250	¥12,500	¥42,500

Table 9: Depreciation in the Lower Campus

	Decoration Cost	Franchise Fee	Equipment
Area		$70m^{2}$	
Unit Price	¥1,500 \m²	-	-
Total Price	¥105,000	¥50,000	¥80,000
Depreciation	¥26,250	¥12,500	¥20,000

4.6 Change in Net Working Capital

Through our investigation, we knew that the closest Domino's Pizza to CUHKSZ, had a change in net working capital of ¥100,000. Therefore, we decided to take ¥100,000 as our change in net working capital.

4.7 Selling General and Administrative Expenses

As for the general cost, we considered the water and electricity costs. According to Shenzhen Water Affairs Bureau and Electric Power Bureau, if Domino's is opened on upper campus, the water and electricity costs are 5,000 per month. If Domino's is opened on lower campus, the water and electricity costs are about $\$5,000 \times \frac{70}{150} = 2,333$ per month.

The main cost for administrative was the salary of employees. If Domino's opens on the upper campus, then we need eight employees, the total amount is $\$5,000 \times 8 = 40,000$ per month. If Domino's opens on the lower campus, then we need six employees, the total amount is $\$5,000 \times 6 = 30,000$ per month.

According to the average price of commercial land lease in Longgang District, Shenzhen, we believed that ¥5.79 per square meter per day was a reasonable price.

Therefore, the total cost when we operated Domino's on the upper campus = $\$5,000 \times 12 + \$40,000 \times 12 + \$26,055 \times 12 = 852,600$; and when we operate Domino's on lower campus, the total cost = $\$2,333 \times 12 + \$12,159 \times 12 + \$30,000 \times 12 = 533,904$.

4.8 Rate

4.8.1 Discount Rate

Since the discount rate of the fast food industry roughly fluctuated around 11.4% from 2014 to 2019, and since domestic consumers' consumption habits are unlikely to have major changes in the short term, we believe that 11.4% should be used as our discount rate.

4.8.2 Tax Rate

According to the State Administration of Taxation:

Table 10: Individual Income Tax Rate for Business Income

Annual Taxable Income (¥)	Tax Rate (%)
\leq 30,000	5
$30,000 < Part \le 90,000$	10
90,000 <part≤ 300,000<="" td=""><td>20</td></part≤>	20
$300,000 < Part \le 500,000$	30
> 500,000	35

4.9 Cash Flow Tables

4.9.1 Cash Flow Table of Upper Campus Pizzeria

Table 11: Cash Flow Table of Upper Campus Pizzeria

Unit: ¥	Year	2021	2022	2023	2024	2025
Incremental Earnings Forecast						
	Sales		5,926,534.29	6,279,771.43	6,554,511.43	6,750,754.29
_	COGS		4,035,969.85	4,276,524.34	4,463,622.28	4,597,263.67
=	Grow Profit		1,890,564.44	2,003,247.09	2,090,889.15	2,153,490.62
_	SGA Expenses		852,660	852,660	852,660	852,660
_	R&D	100				
_	Depreciation		111,250	111,250	111,250	111,250
=	EBIT	(100)	926,654.44	1,039,337.09	1,126,979.15	1,189,580.62
_	Income Tax*	(5)	258,829.05	298,267.98	328,942.70	350,853.22
=	Unlevered Net Income	(95)	667,825.39	741,069.11	798,036.45	383,727.40
	Free Cash Flow					
+	Depreciation		111,250	111,250	111,250	111,250
_	Capital Expenditures	445,000				
+	Adjustment for Salvage Value					
_	Change in NWC	100,000				(100,000)
=	Free Cash Flow	545,300	779,075.39	852,319.11	909,286.45	1,049,977.40
	PV of Free Cash Flow @ 11.4%	545,300	699,349.54	686,802.46	657,726.20	681,772.04
	NPV	2,180,350.24				

*Income Tax (According to Table 10):

```
2022: 30000 \times 5\% + 60000 \times 10\% + 210000 \times 20\% + 200000 \times 30\% + 426654.44 \times 35\% = 258829.05
2023: 30000 \times 5\% + 60000 \times 10\% + 210000 \times 20\% + 200000 \times 30\% + 539337.09 \times 35\% = 298267.98
2024: 30000 \times 5\% + 60000 \times 10\% + 210000 \times 20\% + 200000 \times 30\% + 626979.15 \times 35\% = 328942.70
2025: 30000 \times 5\% + 60000 \times 10\% + 210000 \times 20\% + 200000 \times 30\% + 689580.62 \times 35\% = 350853.21
```

4.9.2 Cash Flow Table of Lower Campus Pizzeria

Table 12: Cash Flow Table of Lower Campus Pizzeria

Unit: ¥	Year	2021	2022	2023	2024	2025
Inci	remental Earnings Forecast					
	Sales		7,902,045.71	8,373,028.57	8,739,348.57	9,001,005.71
_	COGS		5,381,293.13	5,702,032.46	5,951,496.38	6,129,684.89
=	Grow Profit		2,520,752.58	2,670,996.11	2,787,852.19	2,871,320.82
_	SGA Expenses		533,904	533,904	533,904	533,904
_	R&D	100				
_	Depreciation		58,750	58,750	58,750	58,750
=	EBIT	(100)	1,928,098.58	2,078,342.11	2,195,198.19	2,278,666.82
_	Income Tax*	(5)	609,334.50	661,919.77	702,819.37	732,033.39
=	Unlevered Net Income	(95)	1,318,764.08	1,416,422.34	1,492,378.82	1,546,633.43
	Free Cash Flow					
+	Depreciation		58,750	58,750	58,750	58,750
_	Capital Expenditures	235,000				
+	Adjustment for Salvage Value					
_	Change in NWC	100,000				(100,000)
=	Free Cash Flow	335,300	1377514.08	475172.34	1551128.82	1705383.43
	PV of Free Cash Flow @ 11.4%	335,300	1,236,547.65	1,188,700.32	1,121,998.55	1,107,340.74
	NPV	4,319,287.26				

^{*}Income Tax (According to Table 10):

```
2022:\ 30000\times5\%+60000\times10\%+210000\times20\%+200000\times30\%+1428098.58\times35\%=609334.50\\2023:\ 30000\times5\%+60000\times10\%+210000\times20\%+200000\times30\%+1578342.21\times35\%=661919.77\\2024:\ 30000\times5\%+60000\times10\%+210000\times20\%+200000\times30\%+1695198.19\times35\%=702819.37\\2025:\ 30000\times5\%+60000\times10\%+210000\times20\%+200000\times30\%+1778666.82\times35\%=732033.39
```

4.9.3 A Pizzeria in the Lower Campus Can Be the Most Profitable

NPV is higher when the pizzeria is in the lower campus than in the upper campus. Therefore, purely from the perspective of NPV, the pizzeria in the lower campus has higher profitability.

5 Risk Analysis

5.1 Market Risk

5.1.1 Risk of Raw Materials

The risk of raw materials includes the price fluctuation of the raw materials and the remained storage of the materials. As prices of raw materials may change from time to time, our purchase prices remain the same. Therefore, it will affect our profit.

It is essential that we shall not sell overnight food to customers. Therefore, the storage of materials is a big deal. If we cannot make accurate judgement about our sales in advance, then we may waste a lot of raw materials, which will lead to a huge loss. In addition, due to the humid and hot climate in Shenzhen, many foods cannot be stored in such an environment for too long. If the food deteriorates as a result, we will suffer huge losses.

5.1.2 Risk of COVID-19

Due to the impact of the COVID-19, we must consider the possible outbreak at any time and the consequent restrictions on the movement of people. Because there will be a large number of outsiders coming and going in the restaurant every day, this will cause a great risk of disease transmission. During the epidemic, the number of people dining at restaurants will be less than usual. Our case will be worse than the ordinary pizzerias due to the containment policy and even suspension policy of the university during the epidemic.

The prices of many materials may increase due to the increase of transportation expenses during the pandemic. The uncertainty brought by the virus will increase the fluctuation rate.

5.2 Operating Risk

5.2.1 Risk of Political Uncertainty

Since Domino's Pizza is an American company, its operations may be affected by Sino-US relations. Although the possibility of this risk is very low, we believe it is necessary to list it. Moreover, we cannot rule out that Domino's will not make or say something that is not conducive to its development in China. If such a situation occurs, Domino's will likely be boycotted by the Chinese, and its development in China will be greatly affected at that time. University officials are likely to ban Domino's from continuing to operate on campus.

5.2.2 Risk of Food Safety

CUHKSZ and its students pay great attention to food safety issues. Food hygiene is related to the health of thousands of teachers and students. If there occurs a food safety problem in a canteen in CUHKSZ, the canteen will be ordered to suspend business for rectification. During that time, the canteen will have zero solds for a long time. Therefore, if such situation occurs, we will suffer from great loss. Paying extra attention to food hygiene is very necessary to lower this risk.

5.3 Industry Risk

If we open a Domino's on CUHKSZ, it will face many competitors. There are three canteens in the upper campus and three canteens and a Subway in the lower campus. According to our survey, more than one third of students are not satisfied with these canteens. However, due to the large number of existing canteens, they may still seize a large portion of the market.

5.4 Sensitivity Analysis

According to our questionnaires, about 42.86% students in CUHKSZ would purchase the Domino's Pizza if it opens in the upper campus. Therefore, we estimated the 35% and 50% were the worst and best situations, respectively. About 57.14% students in CUHKSZ would purchase the Domino's Pizza if it opens in the lower campus. Therefore, we estimated the 50% and 65% were the worst and best situations, respectively.

Table 13: Change of NPV in the Worst and Best Situations

Upper Campus	Worst	Normal	Best	Lower Campus	Worst	Normal	Best
Sales PV (¥)	15,928,987.20	19,504,881.92	22,755,695.56	Sales PV	22,755,695.56	26,006,509.20	29,582,404.23
COGS PV (¥)	10,847,640.07	13,282,824.59	15,496,628.68	COGS PV	15,496,628.68	17,710,432.77	20,145,617.28
CAPEX PV (¥)	445,000	445,000	445,000	CAPEX PV	235,000	235,000	235,000
NWC (¥)	100,000	100,000	100,000	NWC	100,000	100,000	100,000
NPV (¥)	4,601,279.20	5,741,989.40	6,778,998.95	NPV	6,988,998.95	8,026,008.50	9,166,719.02
Changing Rate of NPV	-19.87%	-	18.06%	Changing Rate of NPV	12.92%	-	14.21%

According to the sensitive analysis in Table 13, opening in the upper campus is more sensitive than opening in the lower campus. The NPV increases 18.06% in the best situation comparing with the normal condition. It means we can get a substantial profit if the Domino get popular among students.

6 Conclusion

According to our analysis above, we strongly believed that the Domino's Pizza will make a big success in CUHKSZ. Through comprehensive analysis, we thought it would be a better option to open a Domino's in the lower campus as it would generate more revenue. Risks did exist, and some of them might be inevitable. However, most of risks were all in controllable ranges.

Domino's Pizza is a brand with good reputation. It must attract a large number of investors and customers. It must be a great choice to bring the Domino's Pizza to CUHKSZ.