HKU BUSINESS SCHOOL
港大經管學院

MSBA7003 Quantitative Analysis Methods

Kjell & Company

Group Presentation – Team 16

Agenda

Section 1: Compensation Schemes

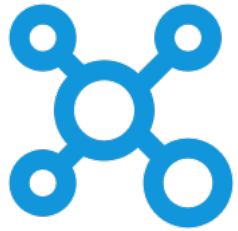
Section 2: Pilot Study

Section 3: Data Analysis

Section 4:Open Discussion Questions and Answers

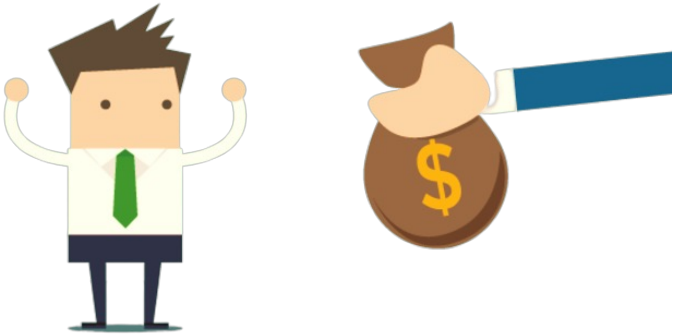
Section 1: Compensation Schemes

- Explain the component of compensation in terms of salary, commission, quota, bonus
- What is the compensation scheme of this company? Visualize the relation between a salesperson's sales and pay
- What is the problem with this scheme the company encountered?
- Pros and cons of daily quota scheme



1. Explain the component of compensation in terms of salary, commission, quota, bonus

- **Commission:** A variable amount whose rate is determined by sales performance
- **Salary:** Basic salary with fixed amount determined by tenure at the firm
- **Quota:** Quotas were calculated by sales performance
- **Bonus:** A bonus is an extra amount of money to those who perform outstanding
- **In summary:** Sales compensation is the **amount paid to salespeople in a certain period**. Compensation typically includes a base salary, variable sales commissions, and additional bonus to encourage salespeople to meet or exceed their quotas



Source: Company Documents

2. What is the compensation scheme of this company?

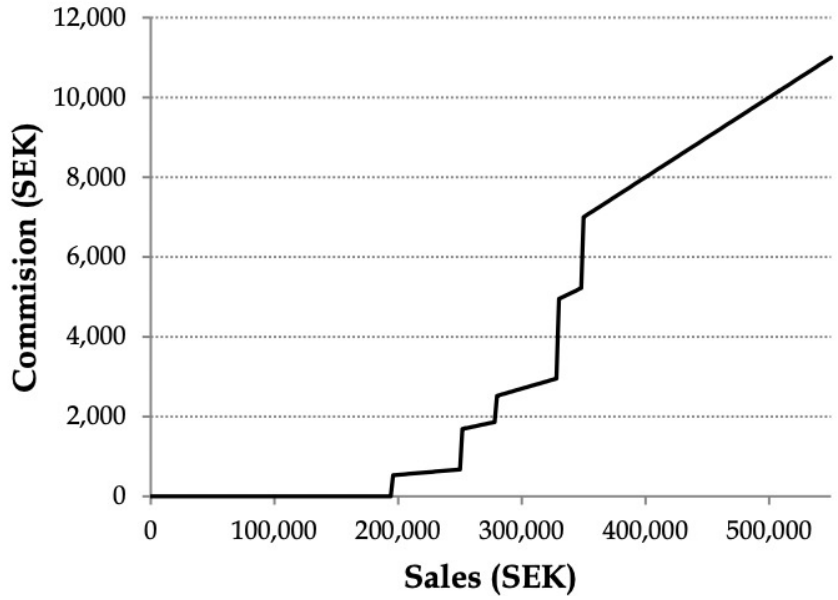
For this company, the compensation scheme consists of the following:

- **Commission:** Measured in average sales per hour(SPH) with five tiers from 0.27% to 2%
- **Salary:** Based on tenure in this company, with an average of SEK 21,000 or about $2300
- **Quota:** Quota refers to the monthly sales task of the salesperson. Calculated in average SPH rather than absolute amounts and it is a discrete value
- **Bonus:** Rewarded for outstanding salespeople with excellent performance
- **Quota-based commission-plus-lump-sum bonus scheme:** The final compensation of a salespeople is the sum of commission, salary and bonus, and it is **calculated each month**

Source: Company Documents

2. Visualize the relation between a salesperson's sales and pay

Graph 1[1]: Existing Relationship between Monthly Sales and Commission



The graph illustrates **monthly commission pay** for a salesperson assigned 140 hours a month, April 2015

Key points

- The **step jump** in pay due to discretely accelerating rates
- **Big jump** at tier 4 and tier 5

Calculating Logic

Average SPH[3] SEK 500000 → Tier 5 → Commission Rate 2%

Total amount of commission: 500000 * 2% = SEK 10000

Table 1[2]: Kjell's Variable Compensation Plan (Monthly)

Tier	1	2	3	4	5
Quota (SEK/hour)	1400	1800	2000	2350	2500
Commission %	0.27	0.67	0.9	1.5	2

1 & 2 Source : Company Documents, Kiell and company analysis paper
3: SPH: sales per hour

3. What is the problem with this scheme the company encountered?

- Salespeople who fell short early in a given month simply gave up because they had **no realistic chance of meeting the quota** -> Less motivation
- Might lead to a **tailing-off in sales** at the ends of months

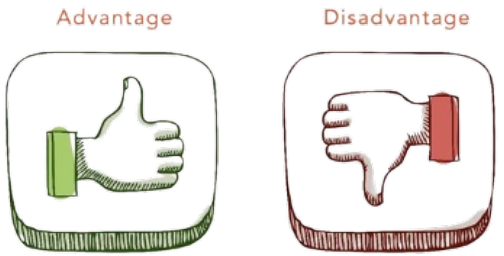
4. Pros and cons of daily quota scheme

Pros:

- **Avoid undermining** the current or future motivation of salespeople, and better stimulate those who may be temporarily behind under the initial monthly-quota plan
- **Mitigate the resigned attitude** of salesman with bad luck

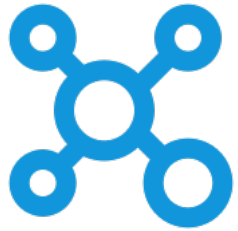
Cons:

- Increase salespeople's **anxiety and stress**, thus losing motivation
- Merely **provoke daily-income** targeting without increasing motivation
- **Reduce** salespeople's **flexibility** to vary their sales strategy



Section 2: Pilot Study

- The positive and negatives of conducting a pilot study
- Should the company conduct a pilot study or implement a full launch? Why?
- Detailed experiment design



1. The positive and negatives of conducting a pilot study

Positive:

- More precisely analyze the **plan's effectiveness**
- **Easily to correct** for potential problems before introducing a full-fledged transformation
- **Gain insight** into the potential results of their proposed experiment
- Better to estimate the time and costs required for the project

Negatives:

- Further **complicate the intricate implementation** of a new compensation plan
- May have **fairness problem**

2. Should the company conduct a pilot study or implement a full launch? Why?

If we use pilot study, it will:

- Precisely analyze the effectiveness of the plan
- Correct the potential problems before it is fully introduced
- Follow the principle of prudence
- Represent the company's sense of responsibility
- Avoid a massive sum of cost compared with full launch

3. Detailed experiment design

Design a better **compensation plan** for motivating the salespeople

3 Key factors:

- Group assignment
- Control Variables
- Result Analysis Method

Purpose → **Fundamental Method** → **Process**

Measure the effectiveness of the change in compensation through the **'difference in difference' method**, after taking into account common temporal changes in sales

3. Detailed experiment design

Process

1. Group Assignment

- Control group: salespeople with a **monthly-quota** plan in both April and May
- Treatment group: salespeople with a **daily-quota** plan in both April and May

2. Control Variable

- **Stores:** Select 5 stores with 26 salespeople as control groups,79 stores in treatment groups
- **Location:** Select stores locate neighboring counterparts but are not geographically adjacent
- **Communication:** Avoid the flow of information among salespeople

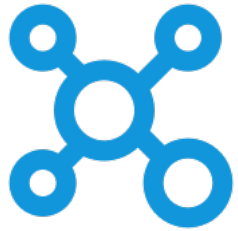
3. Result Analysis Method

- Compare the sales productivity by measuring the **difference of percentage change** in SPH of control group and treatment group (DID method)
- Display the **results of various metrics** across different types of salespeople:
  - Created 4 segments[1] in control and treatment groups
  - Measure the change in SPH by segment to show which types of salespeople were affected
  - Measure the change in RTS ratio by segment to investigate whether the number of returned products had changed
  - Measure the change in Product Quantity and Price by segment to examine whether the product quantities and/or types that salespeople sold had changed

1. Segment 1 presented the poorest past performers(bottom 25%), and segment 4 presented the best past performers(top 25%)

Section 3: Data Analyses

- Sales performance
  - The change for the treatment group
  - The change for the control group
  - The difference in the change between the treatment and the control groups
- Importance of having a control group
- Heterogeneous effects on different types of sales people
- Product returns
- Product mix



1. Sales Performance

The change for the treatment groups

9.99%

Advanced

Overall sales productivity/average SPH[1] in treatment group

From 1490.64(SEK) in April to 1639.61(SEK) in May

FACTs[2]

Sales productivity of the **poorest past performers** substantially increased

RTS Ratio **had actually decreased for a majority of salespeople**

The **number of products sold increased** substantially for the low-performing salespeople

More salespeople tend to sell **low-ticket and low-margin products**

1. SPH: Sales per hours
2. Facts part will be illustrated in detailed in next slide

1. Sales Performance

The change for the control groups

9.10%

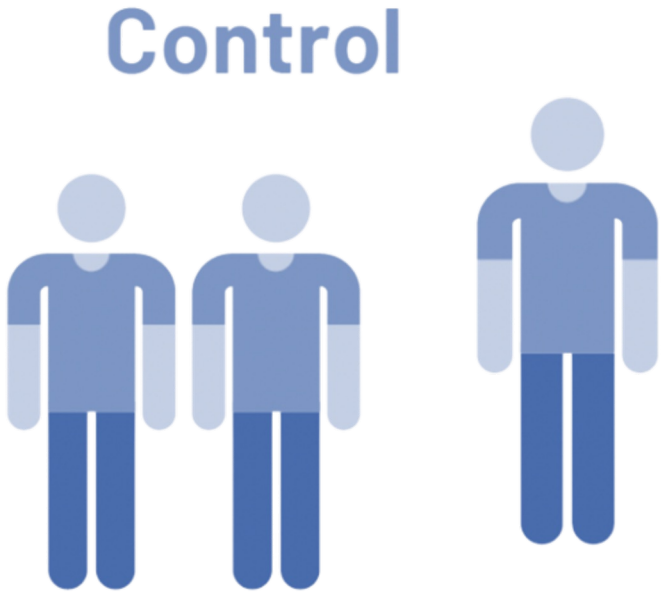
Standard

Overall sales productivity/average SPH[1] in treatment group

From 1491.72(SEK) in April to 1627.48(SEK) in May

FACTs[2]

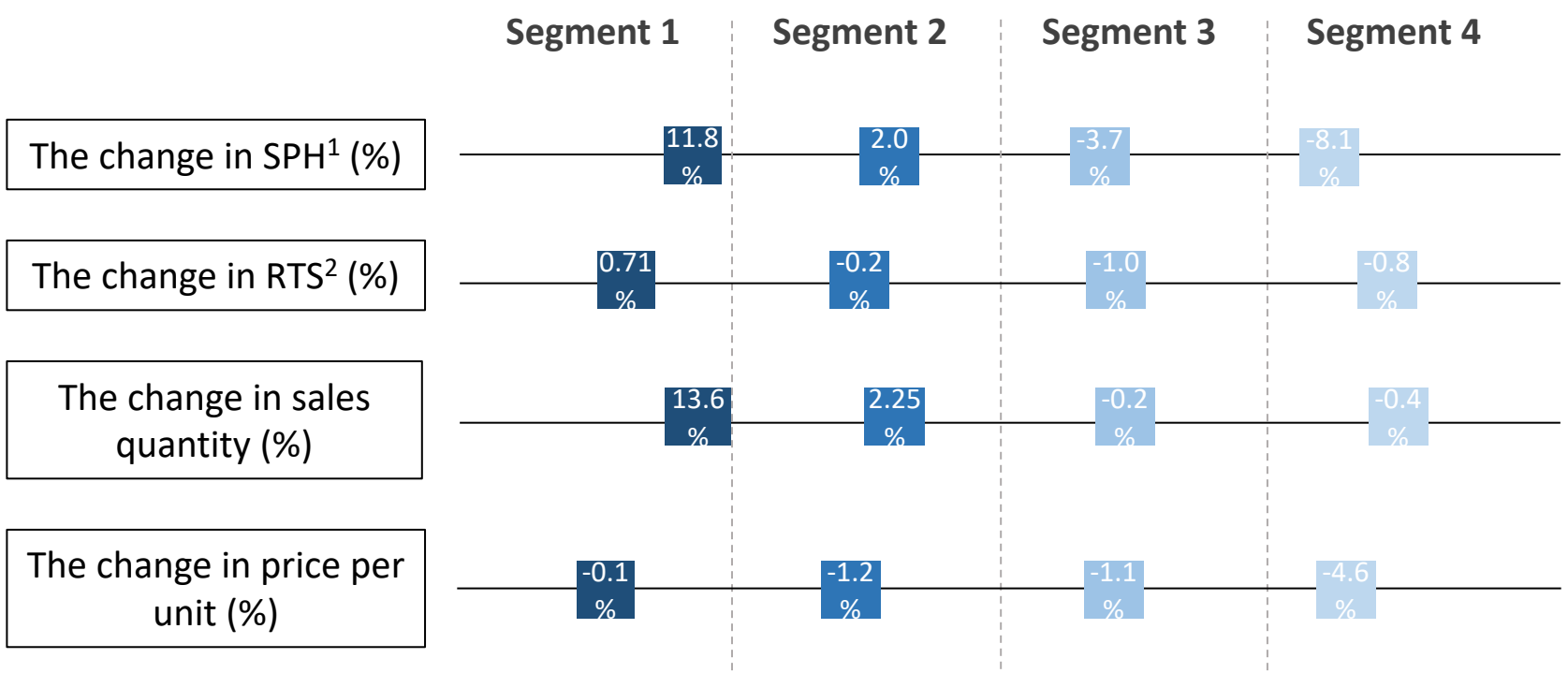
Control group is composed of participants who do not receive the experimental treatment and it is **managed based on designed processes**



1. SPH: Sales per hours
2. Facts: How a control group selected and evaluated is illustrated in previous experiment design slide

1. Sales Performance

The difference in the change between the treatment and the control groups



Summary

- Sales productivity of S1[4] and S2 in the treatment group are higher than that in the control group; but for **S3 and S4 are lower**
- RTS Ratio of the **S1** in the treatment group is **higher** than that in the control group; but for other segments are lower
- Sales quantity of S1 and S2 in the treatment group are higher than that in the control group; but for **S3 and S4 are lower**
- **Sales price per unit of all segments** salespeople in the treatment group is **lower** than that in the control group

Treatment group's pure gain in percentage for each segment[3]

Overall Performance —— Treatment Vs. Control

The average SPH for control group is 0.9% less than that for the treatment group, which implies **the daily-quota compensation plan will result in 9.99%-9.10%=0.9% increase in sales productivity**

0.9%

1. SPH: Sales per Hours 2. RTS: Returns to Sales
3. The treatment group's pure gain in percentage is calculated by the difference in the percentage of treatment group and the percentage of control group
4. S1,S2,S3,S4 represent Segment 1,2,3,4

2. Importance of having a control group

- The control group is the group that **has not been specifically treated**. It serves as a **benchmark to compare with the experimental group**, thus confirming the direct effect of the testing factor and excluding the interference of other factors
- Looking solely at the treatment group's performance, we would **overestimate the gain in productivity** caused by the change in compensation

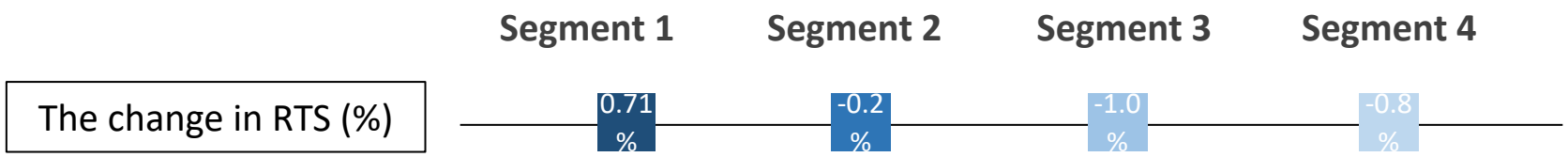
3. Heterogeneous effects on different types of salespeople

- Heterogeneous treatment effect (HTE) analysis focuses on **evaluating treatment effects** for individuals or subgroups in a population
- In this case, the high past performers and poor past performers have **various behaviors caused by the change** in the compensation plan. For example, poor past performers **sell more low-ticket and low-margin products** in order to reach the daily quotas. But the change in sales number for best past performers is negligible
- The average SPH for control group is **0.9% less** than that for the treatment group, which is hard to distinguish the huge difference between poorest and best salesmen. To evaluate the heterogeneous effects, **classifying total salespeople into 4 segment** could better examine the effectiveness of new policy

4. Product Returns

- Product returns had not changed much. In fact, under the daily-quota plan, **returns had actually decreased for a majority of salespeople**
  - For segment1, compare to the control group, the RTS has increased by 0.71%
  - For segment2, compare to the control group, the RTS has decreased by 0.24%
  - For segment3, compare to the control group, the RTS has decreased by 0.99%
  - For segment4, compare to the control group, the RTS has decreased by 0.77%

- However, the decreasing return rate **may not be related to the salespeople**, but to other factors. For example, the improvement of the company's product quality, etc.
- In addition, the **RTS may have a certain lag** and it is not accurate enough to look at the RTS only for the experimental time

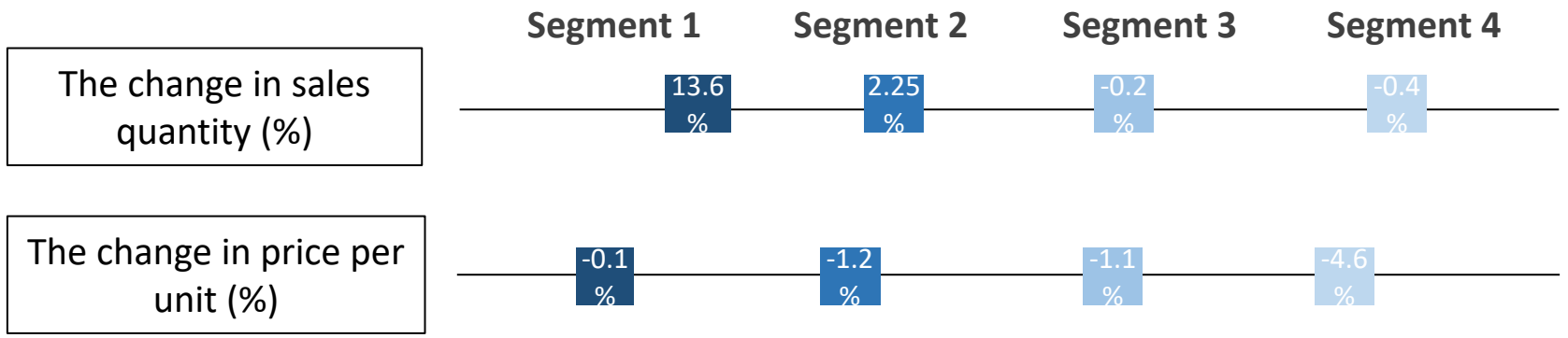


5. Product Mix

- Kjell pursues **product diversity** and excellent **customer service**
- Most salespeople sold **low-ticket** and thus, **low-margin** products under the daily-quota plan, this might **hurt Kjell's profits** in the long run
- The daily-quota plan had the **greatest positive effect** on sales incentives for salespeople who had previously performed **poorly**. However, the company's **concerns** about product mix do exist, and the average product price of sales was **down overall**

Treatment V.S. Control[1]

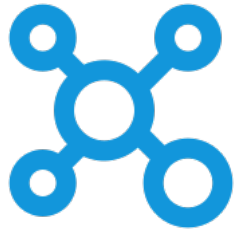
Type	Sales Quantity	Price Per Unit
Segment 1	13.64% higher	0.14% lower
Segment 2	2.25% higher	1.18% lower
Segment 3	0.17% lower	1.12% lower
Segment 4	0.40% lower	4.57% lower



1.Source: Company Documents

Section 4:
Open discussion questions and answers

- Is there any potential bias or problem with the result?
- Why do you think the high performers' sales productivity has decreased?
- Is there anything that the CEO should examine to understand the effectiveness of the daily-quota plan?



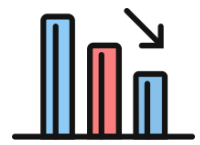
1. Is there any potential bias or problem with the result?

YES!

With 4 Reasons

Potential Problems	Potential Outcomes
Unavoidable flow of information	The rapid development of the Internet has provided mankind with a variety of communication methods, and **the flow of information is inevitable**. This may affect the direction and effects of the experimental treatment
Potential selection bias	The non-random nature of sample selection during the experiment can cause **selection bias** and cannot account for the fact that the results are caused by quota plan changes alone. For example, the selected control groups are all in big cities, such selection is not representative and may make the experiment have some errors
Experiment duration is short	The experiment **only observed data for one month**, and too short an observation duration may lead to results that are contingent and not convincing. The observation duration of the experiment should be extended appropriately to obtain more reliable results by comparing more months of data
Sample Size	The total number of salespeople in the control groups is only 26. And there were 5 stores in the control group, but 79 in the treatment group, which is **too large a difference between the two** to cause some calculation errors

2. Why do you think the high performers' sales productivity has decreased?



Performance Overview:

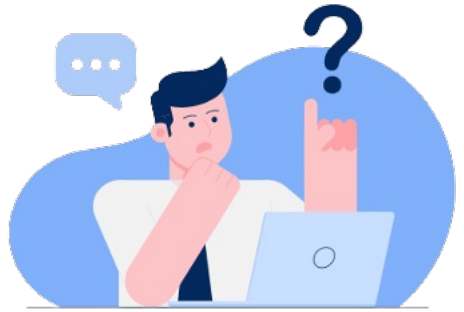
In Section 3 analysis, we noticed that for high past performers, the **percentage change in SPH and sales quantity have decreased** a lot compared to the control group

For segment 3 in treatment group, the SPH is **3.7%** and sales quantity **is 0.17% lower** than those in control group

For segment 4 in treatment group, the SPH is **8.1%** and sales quantity is **0.4% lower** than that in control group

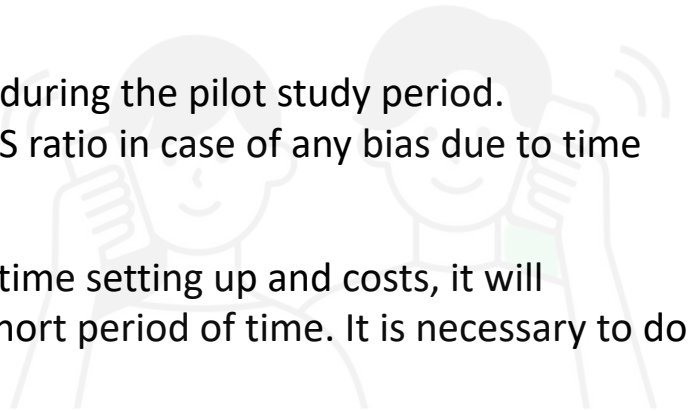
Potential Reasons:

- **The anxiety and stress increases:** High performers need to worry about daily whether they will be able to meet their quota and whether they will fall behind, which lead to **more intense peer competition, cumulative stress exposure, and losing their motivation**
- **Reduces the flexibility:** It may be **difficult** for them to **manage their sales strategy** after the change
- **Adaption Change:** High performers have been used to the monthly-quota plan for a long time, and it will take more time for them to adapt new manner. This may **cost them a lot of extra time and effort**, making it hard for them to devote themselves to sales



3. Is there anything that the CEO should examine to understand the effectiveness of the daily-quota plan?

- **Long-term changes in sales performance:** Monitoring the **long-term changes** in sales performance helps observe whether there is any bias or error during the pilot study
- **Fluctuation of sales performance : Observing the fluctuation** of sales performance of 4 segments with daily-quota plan in a month respectively and comparing these data with the monthly-quota plan. We could speculate whether the new compensation policy could mitigate the resigned attitude of salesmen with bad luck
- **Customer's evaluation and feedback:** Customers are in a better position to give service evaluation and feedback. By issuing **questionnaires**, the company could know whether customers have opinions on products and services under the new compensation policy
- **Long-term return rates:** There may exist a **time delay period** which may not include during the pilot study period. Continuously monitoring the RTS ratio could see whether there is a change in the RTS ratio in case of any bias due to time delays
- **Complexity and cost:** If the implementation of the daily-quota plan requires a lot of time setting up and costs, it will undoubtedly have an impact on the normal operation process of the company in a short period of time. It is necessary to do some **risk assessment** before experiment launch



4. Would daily-quota plan be more effective if we change sales-based daily quota plan into profit-based plan?

Source of the problem: The results of the data showed that under the daily-quota plan, most salespeople sold low-ticket and low-margin products. We want to know whether the product structure will be optimized after we change sales-based daily quota plan into profit-based plan

Redesign of experiments:

- **Group Assignment**
  - Control group: salespeople with a **profit-based-monthly-quota** plan in both April and May
  - Treatment group: salespeople with a **profit-based-daily-quota** plan in both April and May
- **Experiment design**
  - Use the **identical procedures** (i.e., Group assignment, Control Variables and Result Analysis Method) as sales-based quota plan
  - The only change is we will set up quota by using **average daily profit standard** for salesman
- **Result Analysis**
  - **Compared** the various experimental **results** obtained from the analysis with the previous experimental results to see if the product structure was optimized
  - In particular, we should pay attention to how the sales quantity and price per unit will change after the calculation method is changed. Is it still the same as before, only the sales quantity increases, but the profit shows a downward trend?

Thanks for your attention!!!!

Members :

3036008228	Ding Yu
3036010104	Wang Liangjiayi
3036020628	Wu Siying
3036021036	Wu Xinyi