

## 4.SAMPLES, SCALES AND RESEARCH METHODS

### 4.1Samples

In this study, Asian companies were the main survey subjects: different types of companies such as Asia, Singapore, Thailand, and Vietnam, 400 questionnaires were distributed and 376 were recovered. The recovery rate was 94%, of which 334 were valid, and the effective recovery rate was 88.5%. Most of the questionnaires were obtained on the spot and the details of the samples were as follows:

Table 1 Study sample

| Demographic characteristics |                    | Number of people | Percentage |
|-----------------------------|--------------------|------------------|------------|
| Gender                      | male               | 220              | 65.8       |
|                             | Female             | 114              | 34.2       |
| Marital status              | married            | 148              |            |
|                             | unmarried          | 186              |            |
| Age                         | Under 25           | 152              |            |
|                             | 26-35              | 148              |            |
|                             | 36-45              | 29               |            |
|                             | More than 46       | 5                |            |
| Education                   | Undergraduate      | 154              |            |
|                             | College            | 101              |            |
|                             | Undergraduate      | 73               |            |
|                             | Master and above   | 6                |            |
| Working years               | Less than 3 years  | 164              |            |
|                             | 3-6 years          | 82               |            |
|                             | 6-15 years         | 66               |            |
|                             | More than 15 years | 22               |            |
| Position                    | General staff      | 207              |            |
|                             | General managers   | 79               |            |
|                             | Middle management  | 40               |            |
|                             | Senior management  | 8                |            |

### 4.2Definition and measurement of major variables

#### 4.2.1The definition and measurement of employee loyalty

Employee loyalty to employees refers to employees' psychological recognition of the organization and is the organizational commitment put forward. Numerous studies

have shown that loyalty is the most important influencing factor in organizational commitment. Using it as an alternative to employees' identification with companies is not only feasible but also more accurate. In employee loyalty measurement, (Mowday & Porter,1979) developed the "organizational commitment questionnaire" (QCA scale), although its original intention is to measure organizational commitment, but Mowday and Allen's research results show that the QCQ scale The main measure is employee loyalty. The QCQ scale is the most comprehensive and most characteristic measure of employee loyalty to date.Developed the Emotional Commitment Scale based mainly on the revision of the Mowday scales, and the exclusion of the questionnaire on turnover intentions resulted in the formation of an 8-question scale for emotional commitment.

This paper uses the Emotion Commitment Scale proposed (Meyer et al.,1993). The scale includes six items. The measurement was selected using the Likert 5 scale (1=very disagree; 5=strongly agree).

Table 2 The Emotional Commitment Scale used in this paper

TABLE 2

| NO.                                     | content   |
|---|---|
| c1                                      | I am happy to develop my career in this company for life  |
| c2                                      | I think the company's business is my personal business    |
| c3                                      | The company gives me a strong sense of belonging          |
| c4                                      | I have deep feelings for people and things in the company |
| c5                                      | I feel like a member of an extended family in the company |
| c6                                      | I think the company is extraordinary for me               |
| Cumulative variation interpretation (%) |   |
| Gauge consistency coefficient (α)       |   |

#### 4.2.2The definition and measurement of Hofstede's cultural dimension theory

Hofstede's cultural dimensions theory is a framework for cross-cultural communication, developed by Geert Hofstede. It describes the effects of a society's culture on the values of its members, and how these values relate to behavior, using a structure derived from factor analysis.

Based on Hofstede's cultural dimension theory, Chen developed a dimension scale of Hofstede's cultural dimension theory in the context of Asia, with 22 items in total. Measurements using LIKERT five scales (1=very disagree; 5=strongly agree)

Table 3 The Hofstede Cultural Dimension Theory Relationship Scale used in this paper

TABLE 3

| NO. | content  |
|-----|--|
| a1  | Company's distribution has rules to follow   |
| a2  | The company's distribution is open and transparent   |
| a3  | The company's distribution system can be well implemented  |
| a4  | The company's employees can participate in the development of the distribution system                |
| a5  | All people are equal before the distribution system  |
| a6  | The company's distribution system can represent the wishes of the majority                           |
| a7  | Remuneration reflects my efforts to work   |
| a8  | Compared with other colleagues, my compensation is reasonable  |
| a9  | My reward reflects my efforts to work  |
| a10 | Compared with colleagues with the same job and duties, my compensation is reasonable                 |
| a11 | In terms of my workload and responsibilities, my compensation is reasonable                          |
| a12 | In terms of my job performance, my compensation is reasonable  |
| a13 | The leader has no prejudice against me   |
| a14 | My work has been recognized by leaders   |
| a15 | Leadership is right for me   |
| a16 | At work, leaders can give me support and help  |
| a17 | I think I got enough respect from the leaders  |
| a18 | The leadership's assessment of me is just  |
| a19 | There are opinions on the results of the distribution, and the leaders will interpret patiently      |
| a20 | Have opinions on the assigned procedures and processes, and the leaders will give me a comprehensive |
| a21 | I think leadership makes sense in explaining the distribution process and results.                   |
| a22 | Leaders are very concerned about my thoughts on distribution and can communicate with me in a timely |

#### 4.2.3 Definition and measurement of organizational commitment

It can be seen from the above literature review: In organizational behavior and industrial and organizational psychology, organizational commitment is an individual's psychological attachment to the organization. The basis behind many of these studies was to find ways to improve how workers feel about their jobs so that these workers would become more committed to their organizations. Organizational commitment predicts work variables such as turnover, organizational citizenship behavior, and job performance. Some of the factors such as role stress, empowerment, job

insecurity and employability, and distribution of leadership have been shown to be connected to a worker's sense of organizational commitment.

Organizational scientists have also developed many nuanced definitions of organizational commitment, and numerous scales to measure them. Exemplary of this work is Meyer and Allen's model of commitment, which was developed to integrate numerous definitions of commitment that had been proliferated in the literature. Meyer and Allen's model has also been critiqued because the model is not consistent with empirical findings. It may also not be fully applicable in domains such as customer behavior. There has also been debate surrounding what Meyers and Allen's model was trying to achieve.

The original project of this organization's commitment to the fairness scale came from the Asian scholar , which collated the results of an open survey of 207 subjects. Through an exploratory factor analysis of the data of 446 subjects from five companies, the Cronbach Alpha coefficients of all factors were all above 0.8, and the Cronbach Alpha coefficient of the entire questionnaire was 0.925, indicating that the same organization promised fairness. The scale has a good degree of homogeneity. The results of the confirmatory factor analysis on the data of 346 subjects from four other companies show that the four-factor model has the best fit to the data, indicating that the organizational fairness scale has a good structural validity. This paper will use this scale to measure the organizational commitment fairness scale, a total of 12 items in the scale. The measurement was made using Likert's five scales (1=strongly disagrees; 5=strongly agrees).

Table 4 Organization Promise Fairness Scale used in this paper

TABLE 4

| NO. | content   |
|-----|---|
| b1  | I often work with and lead the work of educating and winning ideas      |
| b2  | When I communicate with leaders I feel very relaxed                     |
| b3  | If leaders decide to leave the company, I will feel lost                |
| b4  | If the leader encounters difficulties, I will help him                  |
| b5  | I am will to obey the leader  |
| b6  | Even if I do not agree with leadership, I will support his decision     |
| b7  | I will to give up my personal goals to achieve leadership goals         |
| b8  | I will to sacrifice personal interests to meet the interests of leaders |
| b9  | The leader will let me help with his family affairs                     |
| b10 | I and leaders will exchange phone calls during the holidays             |
| b11 | In my spare time, I will participate in social activities with leaders  |
| b12 | I am familiar with the family of the leader                             |

### 4.3 Survey design

The questionnaire used in this article is mainly composed of two parts (see Appendix A), a total of 40 items:

Part I: The main components of the questionnaire, including the Hofstede Cultural Dimensional Theory Scale (22 items), the Organizational Commitment Scale (12 items) and the Staff Loyalty Scale (6 items) In the broad category, this part of the questionnaire measures the variables studied.

Part II: demographic characteristics of the surveyed subjects, such as gender, marriage, age, education, length of service, company nature, current position, etc. (8 items). Through this scale, understand the basic situation of the respondents and provide the basis for further analysis.

### 4.4 The validity and reliability of the scale

The validity test is based on factor analysis. Whether the scale is suitable for factor analysis or not, Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) is used as the standard. KMO is the Kaiser-Meyer-Olkin sampling appropriateness measurement statistic. When the KMO value is larger, the more common factors between the variables, the more suitable for factor analysis. According to Kaiser, if  $KMO > 0.9$  (very good),

KMO > 0.8 (very good), KMO > 0.7 (medium), KMO > 0.6 (general), KMO > 0.5 (Coarse) Factor analysis is less appropriate when KMO < 0.5 (unacceptable). In addition, for univariate variables believes that the commonality of all items exceeds 0.35 and is acceptable, exceeding 0.50 is better. In this paper, the choice of common degree is more than 0.35 acceptable.

The test of reliability uses the Cronbach's  $\alpha$  test. It is generally believed that the reliability of the questionnaire can be accepted when the value of  $\alpha$  is greater than 0.6, and it is better when the value is greater than 0.7.

#### 4.4.1 Test reliability and validity test

After the collected questionnaires are entered into the excel form, a trial survey is conducted first to initially check the reliability and validity of each scale.

##### 4.4.1.1 Test the reliability and validity of the emotional commitment scale

Employee loyalty is due to the use of a one-dimensional scale. This study examines the reliability of this part of the scale. Thirty data were selected for reliability and validity tests. The test result of Cronbach's  $\alpha$  for test meter reliability was 0.928. The reliability was high and the questionnaire was credible. The commonness of the other 6 items was greater than 0.5, explaining a total of 74.261% of the variance. Therefore, the employee loyalty and emotional commitment scale is acceptable. The specific results are as follows:

Table 5 Factor Analysis Results of Investigating Employee Loyalty Scale

| TABLE 5                                    |   |            |
|--|---|------------|
| NO.  | content   | Commonalit |
| c1   | I am happy to develop my career in this company for life  | 0.764      |
| c2   | I think the company's business is my personal business    | 0.769      |
| c3   | The company gives me a strong sense of belonging          | 0.873      |
| c4   | I have deep feelings for people and things in the company | 0.836      |
| c5   | I feel like a member of an extended family in the company | 0.825      |
| c6   | I think the company is extraordinary for me               | 0.707      |
| Cumulative variation interpretation (%)    |   | 74.261     |
| Gauge consistency coefficient ( $\alpha$ ) |   | 0.928      |

#### **4.4.1.2 To Test the reliability and validity of scales of Hofstede's cultural dimension theory**

This article uses Chen to develop a dimension scale of Hofstede's cultural dimension theory in Asian context. A total of 12 items.

In the first stage of the study, the author conducted a test on the scale, that is, 30 data were selected for reliability and validity tests, and the results of the test reliability test using Cronbach's  $\alpha$  were used for the test measurement. The result of the degree test is 0.768. The reliability is high and the questionnaire is credible. The KMO and Bartlett test results showed that the KMO value was 0.775 and Bartlett value was 135.577,  $p < 0.0001$ . The questionnaire was suitable for factor analysis. The principal component analysis method was used to extract the factors for these 12 items, and the shaft was rotated according to Varimax. The result is as follows:

Table 6 Factor analysis results of Hofstede's cultural dimension theory table

TABLE 6

| NO  | comment  | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 |
|-----|--|---------|---------|---------|---------|---------|
| a1  | Company's distribution has rules to follow   | .408    |         | .673    |         |         |
| a2  | The company's distribution is open and transparent   |         |         | .750    |         |         |
| a3  | The company's distribution system can be well implemented  |         |         | .734    |         |         |
| a4  | The company's employees can participate in the development of the distribution system                            |         |         | .698    |         |         |
| a5  | All people are equal before the distribution system  |         |         | .704    |         |         |
| a6  | The company's distribution system can represent the wishes of the majority                                       |         |         | .681    |         |         |
| a7  | Remuneration reflects my efforts to work   |         | .700    |         |         |         |
| a8  | Compared with other colleagues, my compensation is reasonable  |         | .746    |         |         |         |
| a9  | My reward reflects my efforts to work  |         | .810    |         |         |         |
| a10 | Compared with colleagues with the same job and duties, my compensation is reasonable                             |         |         |         |         | .887    |
| a11 | In terms of my workload and responsibilities, my compensation is reasonable                                      |         | .822    |         |         |         |
| a12 | In terms of my job performance, my compensation is reasonable  |         | .828    |         |         |         |
| a13 | The leader has no prejudice against me   | .745    |         |         |         |         |
| a14 | My work has been recognized by leaders   | .807    |         |         |         |         |
| a15 | Leadership is right for me   | .818    |         |         |         |         |
| a16 | At work, leaders can give me support and help  | .639    |         |         | .495    |         |
| a17 | I think I got enough respect from the leaders  | .782    |         |         |         |         |
| a18 | The leadership's assessment of me is just  | .713    |         |         | .438    |         |
| a19 | There are opinions on the results of the distribution, and the leaders will interpret patiently                  |         |         |         | .748    |         |
| a20 | Have opinions on the assigned procedures and processes, and the leaders will give me a comprehensive explanation |         |         |         |         | .902    |
| a21 | I think leadership makes sense in explaining the distribution process and results.                               |         |         |         | .735    |         |
| a22 | Leaders are very concerned about my thoughts on distribution and can communicate with me in a timely manner      |         |         |         | .772    |         |

#### 4.4.1.3 To test the reliability and validity of the organizational commitment fairness scale

The scale refers to the organizational fairness scale designed. The questionnaire consists of 22 items.

In the first stage of this study, the author conducted a test on the scale, that is, 30 data were selected for reliability and validity test, and the test result of Cronbach's  $\alpha$  for test meter reliability was 0.953. High degree, the questionnaire is credible. The KMO and Bartlett test results showed that the KMO value was 0.876 and the Bartlett value was 582.045,  $p < 0.0001$ . The questionnaire was suitable for factor analysis. The principal component analysis method was used to extract the factors for these 22 projects, and the axis was rotated according to Varimax. The result is as follows:



Table 7 Factor Analysis Results of Investigating the Organizational Commitment Fairness Scale

TABLE 7

| NO. | content   | Factor1 | Factor2 | Factor3 |
|-----|---|---------|---------|---------|
| b1  | I often work with and lead the work of educating and winning ideas      |         | .796    |         |
| b2  | When I communicate with leaders I feel very relaxed                     |         | .772    |         |
| b3  | If leaders decide to leave the company, I will feel lost                |         | .522    |         |
| b4  | If the leader encounters difficulties, I will help him                  |         | .489    |         |
| b5  | I am will to obey the leader  | .667    |         |         |
| b6  | Even if I do not agree with leadership, I will support his decision     | .615    |         |         |
| b7  | I will to give up my personal goals to achieve leadership goals         | .793    |         |         |
| b8  | I will to sacrifice personal interests to meet the interests of leaders | .779    |         |         |
| b9  | The leader will let me help with his family affairs                     |         |         | .593    |
| b10 | I and leaders will exchange phone calls during the holidays             |         |         | .720    |
| b11 | In my spare time, I will participate in social activities with leaders  |         |         | .719    |
| b12 | I am familiar with the family of the leader                             |         |         | .684    |

#### 4.4.2 The reliability and validity of the formal survey scale

After preliminary investigation and inspection, the reliability and validity of each test scale are high. A formal survey is then conducted to test the overall reliability and validity of each scale. Only if the overall reliability and validity of the scales is high and the scales are acceptable, can the correlation analysis and regression analysis of the data be continued.

##### 4.4.2.1 Formally investigate the reliability and validity of the emotional commitment scale

All questionnaire data of the Emotion Commitment Scale was analyzed using Cronbach's  $\alpha$ . The specific results are as follows Table 8:

Table 8 Factor Analysis Results of Employee Loyalty Scale

TABLE 8

| NO.                                     | content   | Commonalit |
|---|---|------------|
| c1                                      | I am happy to develop my career in this company for life  | 0.664      |
| c2                                      | I think the company's business is my personal business    | 0.759      |
| c3                                      | The company gives me a strong sense of belonging          | 0.827      |
| c4                                      | I have deep feelings for people and things in the company | 0.762      |
| c5                                      | I feel like a member of an extended family in the company | 0.775      |
| c6                                      | I think the company is extraordinary for me               | 0.729      |
| Cumulative variation interpretation (%) |   | 69.525     |
| Gauge consistency coefficient (α)       |   | 0.910      |

From the table, it can be seen that the six items of loyalty metrics have a degree of commonality above 0.5, explaining a total of 69.525% of the variance, and the Cronbach's  $\alpha$  coefficient is greater than 0.8, so the employee loyalty scale can be accepted.

#### 4.4.2.2 The reliability and validity test of the formal survey of Hofstede's cultural dimension theory scale

Using Cronbach's  $\alpha$  to analyze all the questionnaire data of the organizational fairness scale, the overall reliability of the scale was 0.925, high reliability and reliable questionnaire. The KMO and Bartlett test results showed that the KMO value was 0.906 and the Bartlett value was 5046.218,  $p < 0.0001$ . The questionnaire was suitable for factor analysis. After the first factor analysis, the second factor analysis was performed after deleting the items a1, a16, and a18 with a smaller load. The KMO and Bartlett test results show that the KMO value is 0.886 and the Bartlett value is 418750.75,  $p < 0.0001$ . The principal component analysis method is also used to extract the factors for these 19 items, and the pivot is performed according to Varimax. The result is as follows Table 9:

Table 9 Factor Analysis Results of Hofstede's Cultural Dimension Theory Scale 1

TABLE 9

| NO  | contact  | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 |
|-----|--|---------|---------|---------|---------|---------|
| a2  | The company's distribution is open and transparent   |         | .752    |         |         |         |
| a3  | The company's distribution system can be well implemented  |         | .718    |         |         |         |
| a4  | The company's employees can participate in the development of the distribution system                            |         | .743    |         |         |         |
| a5  | All people are equal before the distribution system  |         | .719    |         |         |         |
| a6  | The company's distribution system can represent the wishes of the majority                                       |         | .683    |         |         |         |
| a7  | Remuneration reflects my efforts to work   | .707    |         |         |         |         |
| a8  | Compared with other colleagues, my compensation is reasonable  | .743    |         |         |         |         |
| a9  | My reward reflects my efforts to work  | .814    |         |         |         |         |
| a10 | Compared with colleagues with the same job and duties, my compensation is reasonable                             |         |         |         |         | .889    |
| a11 | In terms of my workload and responsibilities, my compensation is reasonable                                      | .823    |         |         |         |         |
| a12 | In terms of my job performance, my compensation is reasonable  | .833    |         |         |         |         |
| a13 | The leader has no prejudice against me   |         |         | .778    |         |         |
| a14 | My work has been recognized by leaders   |         |         | .825    |         |         |
| a15 | Leadership is right for me   |         |         | .822    |         |         |
| a17 | I think I got enough respect from the leaders  |         |         | .757    |         |         |
| a19 | There are opinions on the results of the distribution, and the leaders will interpret patiently                  |         |         |         | .780    |         |
| a20 | Have opinions on the assigned procedures and processes, and the leaders will give me a comprehensive explanation |         |         |         |         | .903    |
| a21 | I think leadership makes sense in explaining the distribution process and results.                               |         |         |         | .755    |         |
| a22 | Leaders are very concerned about my thoughts on distribution and can communicate with me in a timely manner      |         |         |         | .784    |         |

After the second factor analysis, the third factor analysis was performed after deleting the items a10 and a20 that had a low load. The KMO and Bartlett test results show that the KMO value is 0.908, the Bartlett value is 3527.417,  $p < 0.0001$ , and the principal component analysis method is also used for factor extraction in these 19 items, and the pivot is performed according to Varimax. The result is as follows Table 10:

Table 10 Factor analysis results of the scale of Hofstede's cultural dimension theory

TABLE 10

| NO  | content   | Factor1 | Factor2 | Factor3 | Factor4 |
|---|---|---------|---------|---------|---------|
| a2  | The company's distribution is open and transparent  |         | .753    |         |         |
| a3  | The company's distribution system can be well implemented   |         | .722    |         |         |
| a4  | The company's employees can participate in the development of the distribution system                       |         | .746    |         |         |
| a5  | All people are equal before the distribution system   |         | .721    |         |         |
| a6  | The company's distribution system can represent the wishes of the majority                                  |         | .681    |         |         |
| a7  | Ramneration reflects my efforts to work   | .710    |         |         |         |
| a8  | Compared with other colleagues, my compensation is reasonable   | .755    |         |         |         |
| a9  | My reward reflects my efforts to work   | .819    |         |         |         |
| a11   | In terms of my workload and responsibilities, my compensation is reasonable                                 | .821    |         |         |         |
| a12   | In terms of my job performance, my compensation is reasonable   | .832    |         |         |         |
| a13   | The leader has no prejudice against me  |         |         | .777    |         |
| a14   | My work has been recognized by leaders  |         |         | .826    |         |
| a15   | Leadership is right for me  |         |         | .822    |         |
| a17   | I think I got enough respect from the leaders   |         |         | .756    |         |
| a19   | There are opinions on the results of the distribution, and the leaders will interpret patiently             |         |         |         | .785    |
| a21   | I think leadership makes sense in explaining the distribution process and results.                          |         |         |         | .790    |
| a22   | Leaders are very concerned about my thoughts on distribution and can communicate with me in a timely manner |         |         |         | .789    |
| Each factor variance interpretation(%)          |   | 21.428  | 18.540  | 17.720  | 14.295  |
| Cumulative variance interpretation(%)           |   | 21.428  | 39.968  | 57.687  | 71.982  |
| Intrinsic coefficient of continuity( $\alpha$ ) |   | .904    | .857    | .873    | .855    |
| Overall reliability of the scale                |   | .922    |         |         |         |

From the result of the factor analysis, this subscale satisfies the concept of Hofstede's cultural dimension theory. The factor load of each item of the scale in its indicator factor was above 0.5, and the four factors explained a total of 71.98% of variance, indicating that the scale has a higher structural validity. The internal consistency coefficient of each measurement index Cronbach's  $\alpha$  is also greater than 0.60, indicating that the reliability of the scale is acceptable.

#### 4.4.2.3 Formal survey of reliability and validity of the organizational commitment scale

Using Cronbach's  $\alpha$  to analyze the entire questionnaire of the Organizational Commitment Scale, the overall scale of the scale was 0.763. The reliability was high and the questionnaire was credible. The KMO and Bartlett test results showed that the KMO value was 0.775 and the Bartlett value was 938.361,  $p < 0.0001$ . The questionnaire was suitable for factor analysis. After the first factor analysis, the second factor analysis is performed after deleting the item a4 with a smaller load. KMO and Bartlett test results show that the KMO value is 0.754 and the Bartlett value is 838.850,  $p < 0.0001$ . The principal component analysis method is also used for the 11 items to extract the factors, and the axis is rotated according to Varimax. The result is as follows Table 11:

Table 11 Factor Analysis Results of the Organizational Commitment Scale

TABLE 11

| NO.   | content   | Factor1 | Factor2 | Factor3 |
|---|---|---------|---------|---------|
| b1  | I often work with and lead the work of educating and winning ideas      |         |         | .823    |
| b2  | When I communicate with leaders I feel very relaxed                     |         |         | .777    |
| b3  | If leaders decide to leave the company, I will feel lost                |         |         | .527    |
| b5  | I am will to obey the leader  | .671    |         |         |
| b6  | Even if I do not agree with leadership, I will support his decision     | .627    |         |         |
| b7  | I will to give up my personal goals to achieve leadership goals         | .799    |         |         |
| b8  | I will to sacrifice personal interests to meet the interests of leaders | .775    |         |         |
| b9  | The leader will let me help with his family affairs                     |         | .584    |         |
| b10   | I and leaders will exchange phone calls during the holidays             |         | .735    |         |
| b11   | In my spare time, I will participate in social activities with leaders  |         | .736    |         |
| b12   | I am familiar with the family of the leader                             |         | .687    |         |
| Each factor variance interpretation(%)          |   | 20.851  | 18.183  | 17.133  |
| Cumulative variance interpretation(%)           |   | 20.851  | 39.034  | 56.167  |
| Intrinsic coefficient of continuity( $\alpha$ ) |   | 0.733   | 0.670   | 0.646   |
| Overall reliability of the scale                |   | 0.763   |         |         |

From the results of factor analysis, this subscale is in line with the concept of organizational commitment. The factor load of each item of the scale was above 0.5, and the three factors explained a total of 56.17% of the variance, indicating that the scale has a high structural validity. The internal consistency coefficient of each measurement index Cronbach's  $\alpha$  is also greater than 0.60, indicating that the reliability of the scale is acceptable.

#### **4.5 Data analysis**

This study mainly uses Spss17.0 for windows professional statistical software to process and analyze all research data. The specific data processing methods are mainly correlation analysis and regression analysis.

##### **4.5.1 Correlation analysis**

Although correlation analysis cannot clearly identify the correlation between variables, correlation analysis can provide a preliminary analysis and understanding of the interrelationship between variables, which is of significance for subsequent statistical analysis.

Correlation analysis is the analysis of the signs that are indeed linked in the whole body, and its main body is the analysis of the causal relationship markers in the whole. It is a process that describes the close relationship between objective things and their relations with appropriate statistical indicators. In a period of time, the birth rate rises with the increase of economic level, which indicates that the two indicators are positive correlation, and in the other time, with the further development of the economic level, the decline of birth rate appears, and the two indicators are negative correlation.

In order to determine the relationship between variables, first of all, we should collect some data, which should be paired. For example, the height and weight of each person. These points are then described in the Cartesian coordinate system. This set of points is called "scatter plot".

According to the scatter graph, when the independent variable takes a value, the dependent variable is a probability distribution. If the probability distribution is the same for all the independent variables, it shows that there is no correlation between the

dependent variable and the independent variable. Conversely, if the value of the independent variable is different and the distribution of dependent variable is different, then there is a correlation between them.

The correlation between the two variables is expressed by correlation coefficient  $r$ . The correlation coefficient  $r$  is between -1 and 1, but it can be any value in this range. When the correlation is positive, the  $R$  value is between 0 and 1, the scatter plot is diagonally upward, then one variable increases and the other increases; when the correlation is negative, the  $R$  value is between -1 and 0, the scatter plot is downward, at this time one variable increases and the other variable will be reduced. The closer the absolute value of  $R$  is to 1, the stronger the degree of association of two variables, the closer the absolute value of  $R$  is to 0, and the lower the degree of correlation of two variables.

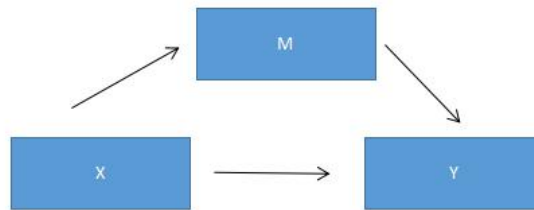
#### **4.5.2 Regression analysis**

Regression analysis is a commonly used statistical method to investigate the quantitative relationship between variables. It predicts and controls variables by establishing a mathematical model between variables. It is a statistical method that uses a certain model to express the correlation of variables. Regression analysis and correlation analysis are methods to study and measure the relationship between two or more variables. Broadly speaking, relevant analysis includes regression analysis, but strictly speaking, the two are different. Regression analysis is a mathematical representation of the relationship between variables, and correlation analysis is the test or measurement of the closeness of these relationships, and they complement each other. If correlations among variables are known through correlation analysis, regression analysis can be used to explain the patterns of mutual influence among variables and further analyze the correlations among variables (Dunham & Castaneda, 1994)

If the variable  $X$  affects the variable  $Y$  by influencing the variable  $M$ ,  $M$  is said to be a mediator variable. This model with mediator variables can generally be illustrated with Figure 3.

Figure 3 Model with mediator variable

Figure 3



This article draws on Baron and Kennyl's 986 conditions for assessing mediator variables. The four conditions are: (1) the independent variable is related to the dependent variable; (2) the independent variable is related to the intermediary variable; (3) the intermediate variable is related to the dependent variable; (4) when the intermediate variable is controlled as a constant, The independent variable has no influence on the dependent variable (in this case, a complete mediation) or only a minor effect (in this case, a partial mediation).