

ANALYSIS OF FACTORS INFLUENCING LABOR QUALITY IN THE HANDICRAFT SECTOR OF BAC NINH

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Received: January 31, 2018

Accepted: February 8, 2018

ABSTRACT

This research investigated the main factors that influence labor quality in the handicraft sector of Bac Ninh province. A total of 261 laborers in this sector were interviewed according to 48 various aspects of labor quality. Exploratory factor analysis was employed to group different variables and a regression model was used to predict the impact of the main factors on the quality of labor. Seven different factors were extracted from the factor analysis, including employee welfare policies, working conditions, career opportunities, education and training, remuneration, facilities and equipment, and health care system. The regression results showed the positive impact of these factors on the quality of handicraft laborers. In order to enhance the quality of handicraft laborers, the local government as well as the handicraft firms should improve the employee working conditions, provide more appropriate education and training programs, and pay more attention to employee welfare and career opportunities. Remuneration, facilities and equipment, and health care system were evaluated at acceptable levels by all respondents.

Keywords: Labor quality, handicraft, Bac Ninh.

1. INTRODUCTION

Accumulating a high level of human capital is important for developing countries to promote sustainable economic growth and improve the well - being of their people. Economic productivity depends on multiple domains of human capital including education, health, and numerous noncognitive skills and traits (Brunello and Schlotter, 2011; Glewwe and Kremer, 2006). At the micro level, effective business activity and high competitiveness are achieved by the optimal combination of all resources. Inefficient use of at least one resource leads to reduced production, lower quality and as a result, it reduces competitiveness (Nataliia Hunko, 2013). As technology has lost its inimitable properties and cannot act as a competitive advantage any longer due to the excessive expansion of

information and knowledge, labor quality as a form of capital is a pillar of the competitive advantage, superior labor quality facilitates the superiority of organizations or sectors over their leading competitors (Phipps *et al.*, 2013). Recently, research works have revolved around effective management of financial, material and non - material, and informational resources, but the problem of efficient use of labor quality has not been investigated enough. Effective functioning of human labor quality is the reason for optimal use of all other resources which in turn affects production, cost of production, and the basic economic performance.

The theoretical background of human capital stems from Becker (1964) and the importance of labor quality was also emphasized by him in 1992. Becker stated: "The outstanding economics records of Japan, Taiwan, and other Asian economies in recent

decades dramatically illustrate the importance of human capital to growth”, and “... these so called Asian tigers grew rapidly by relying on a well-trained, educated, hard - working, and conscientious labor force” (Becker, 1992). He also concluded that an economy needs to upgrade the overall quality of its labor force through policies such as significantly increasing the number of younger skilled workers, implementing a voucher plan, providing an extensive on-the-job training program, as well as a reorientation of a family aid program to improve the health and other types of human capital. Education and health are two crucial aspects in improving human capital quality (Schultz, 1961). High quality labor raises labor productivity. Productivity is improved when workers with high skills and knowledge, together with sound physical and mental health can perform their tasks with efficiency and effectiveness (Bong, 2009).

Bac Ninh is one of the important suppliers of handicrafts to both domestic and export markets. The Bac Ninh handicrafts sector is a highly labour intensive cottage-based industry and decentralized, being spread all over the province in rural areas. Numerous artisans are engaged in crafts work on a full-time basis. The industry provides employment to over 73 craft villages and more than 49,000 rural workers (accounting for nearly 7.4% of the total labor force in the province). However, besides the remarkable achievements, handicraft production and trade have been facing many problems and challenges which require medium and long-term orientation and solutions. The overall disadvantages of the sector can be seen as: (i) Non-competitiveness of the handicraft products; (ii) Small-scale and manual production; (iii) Product quality control and management; (iv) Low value-added product; (v) Severe environmental pollution in production areas; (vi) Inefficient resource use and management; (vii) Non synchronous manufacturing; and (viii) Limited trade promotion activities (Bac Ninh Bureau of Statistics, 2017). In addition, human resources,

the most valued asset, have not met the demands in the new development context of the sector. The current number of skilled and professional laborers is low. Most of them attain their skills through non-standardized training, have limited practice, and lack a professional working attitude and commitment. Being mostly uneducated, they remain unaware of the recent advancements and techniques in their field (Bac Ninh Department of Agriculture and Rural Development, 2017).

Many previous studies have examined the problem of lower productivity growth in the handicraft sector of Bac Ninh. However, none of the previous research has explained the changes in labor quality related to education, health, job experience, firm-specific skills, technology, and fixed productive equipment. These factors are time-dependent and they accumulate or decrease over time. For this reason, this study aims to capture the main factors that influence the labor quality in the handicraft sector of Bac Ninh in order to stimulate its growth, sustain its multiple impacts regarding economic, social, and environmental aspects, and propose solutions for better quality labor management in the province.

2. METHODOLOGY

For this study, the data on total labor force, laborers in the handicraft sector, human resource program, and management were collected from statistical materials, research papers, and Bac Ninh official local government documents. The primary data were gathered from the semi-structured interview of 261 handicraft laborers in 5 different thriving handicraft sectors of Bac Ninh including ceramic handicrafts (Phu Lang and Que Vo), furniture handicrafts (Dong Ky and Tu Son), joss money paper and Dong Ho painting (Song Ho and Thuan Thanh), copper handicrafts (Dai Bai and Gia Binh), and paper production (Phong Khe and Bac Ninh city). Interviews contained a limited number of set, closed questions, designed to elicit basic quantitative data, and a range of open -

ended questions guided by a checklist of topics. To study the factors that influence the quality of labor, the respondents were asked to state their evaluation on 48 aspects (Table 4) regarding their working conditions, work benefits, education and training programs, the standardization of the production facilities and equipment, remuneration, welfare policies, and opportunities while being employed in handicraft sector. A Likert scale from 1 to 5 was used. According to this measure, the levels of scale from 1 to 5 as follows: 1 was very poor; 2 was poor; 3 was average; 4 was good; 5 was very good.

To achieve the objectives of this study, different data analysis techniques such as descriptive analysis, factor analysis, and multiple regressions were employed. Factor analysis with PCA (Principle Component Analysis as an extraction method) and Varimax rotation were used to group different variables that affect the labor quality in the handicraft sector of Bac Ninh. Before conducting factor analysis, the reliability of scales for each variable was tested. The reliability of each factor in this study achieved an acceptable Cronbach alpha of over 0.6 (Nunnally, Bernstein, and Berge, 1967). These factors were then rotated to create maximum similarity among the strongly correlated variables within each factor and maximum distance between each of the factors. The factorial reduction among the variables was chosen on the basis of the analysis of the correlation existing among the original variables (verified with Barlett's test for sphericity and KMO). The factors were chosen on the basis of eigenvalue (>1) criterion as well as consideration of the cumulative variance explained by the factors taken together. From the data analysis, 6 variables (PL₆: Death benefits, GD₅: Education and training conditions, MM₃: Imported facilities and equipment, SK₆: Food quality and safety, SK₄: Environmental sanitation program, and ML₆: Travel allowance) were extracted from the 48 individual statements reflecting the quality labor management of Bac Ninh handicraft industry.

To estimate the impacts of the main factors on the labor quality, the empirical model was developed based on the mean score of the extracted factors (X₁, X₂, X₃, X₄, X₅, X₆, and X₇) and the overall evaluation of labor quality (Y). The estimated model is as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + u_i(1)$$

Where: X₁ = Employee welfare policy (PL1, PL2, PL3, PL4, PL5, PL7, PL8)

X₂ = Working conditions (DK1, DK2, DK3, DK4, DK5, DK6, DK7)

X₃ = Career opportunities (TG1, TG2, TG3, TG4, TG5, TG6, TG7)

X₄ = Education and training (GD1, GD2, GD3, GD4, GD6)

X₅ = Remuneration (ML1, ML2, ML3, ML4, ML5, ML7, ML8)

X₆ = Facilities and equipment (MM1, MM2, MM4, MM5)

X₇ = Health care (SK1, SK2, SK3, SK5, SK7)

Y: Labor quality (DGC₁, DGC₂, DGC₃)

Specific names of symbols of each variable in each group of factors influence are explained in Table 4 in the next section.

3. RESULTS AND DISCUSSION

3.1. Main Theory of Labor quality

There are different ways of defining the quality of labor. Based on human capital approach, the levels of education for a given labor force is the simplest and easiest way to proxy changes or improvements in the quality of the labor force. Based on labor productivity approach, labor quality is formally defined as equal to labor input divided by man-hours (Victor R. Fuchs, 1964).

Education attainment and technical skills were foremost the only two proxies of the quality of the labor force in the theory of human capital. The concept of human capital was developed as the acquired and useful abilities of members of society. The acquisition of such

talents, through education, study, or apprenticeship always costs a real expense, which is a fixed capital and realized in each person (Adam Smith, 1776). In brief, he considered human capital as skills, dexterity (physical, intellectual, and psychological, etc.), and judgment.

In 1964, Gary Becker have brought out the most well-known concept of human capital as defining human capital similar to physical means of production as factories or machines. So one can invest in human capital through education, training, medical treatment and one's output depend partly on the rate of return on human capital one owns. Recently, the concept of human capital can be found in many studies. According to Hersch (1991), he claimed that human capital refers to work experience and education. Jacobson (1993) has followed this idea by emphasizing that anything translated into higher productivity, including education and training, physical fitness, and health, is considered human capital.

In general, most previous theories describe human capital in term of ability, qualifications, experience and knowledge acquired through education and skills, expertise acquired through on-the-job training, which were for a long time proxies of the quality of the labor force. However, the concept of labor quality has been developed continuously to reflect socioeconomic changes as Galenson and Pyatt (1964) stipulated that the quality of labor was measured by education, health, housing, and social security. In addition, there are some criteria suggested by the World Bank to assess labor quality such as: educational system and human resource training, the availability of labor as well as administrative managers who are of high quality and level of education, technique, and advanced technology (World Bank, 1995). Ward (1997) argued that personal skills and attitudes of workers are also important in today's business environment. Thus, terms such as "adaptability" and "ability to work in teams" are social aspects of labor,

began to use more in assessing labor quality of companies. San *et al.* (2006) incorporated 7 factors to compile labor quality index such as: education, training, productivity, changes in the structure of labor force, safety and health, work ethic and industrial relations, labor management model, and the quality of worker's livelihood.

Samuelson and Nordhaus defined labor productivity as total output divided by labor inputs (Koch and MacGrath, 1996). An effective firm's strategy is to achieve a high degree of labor productivity. The Organization for Economic Co-operation and Development (OECD, 2001) also defined labor productivity as the ratio of a volume measure of output to a volume measure of input. Volume measure of output is normally gross domestic product or gross value added. The three most common used measures of input are hours worked, workforce jobs, and number of people in employment. Beside, Horowitz and Sherman (1980) mentioned that is measured by contemporaneous earnings and the physical measure (e.g., the condition of equipment that the workers cared for). Thus, holding technology and other inputs constant, the effect of a given number of man-hours on output is likely to vary depending upon such factors as the knowledge, intelligence, and strength of the persons supplying the hours of work. All of the factors that contribute to such variation are subsumed under the term "labor quality" (Victor R. Fuchs, 1964). Labor productivity will vary as a function of input factors and the efficiency with which the factors of production are used (total factor productivity).

The advantage of the human capital approach is the ability to take into account various dimensions of labor quality; whereas the advantage of productivity approach (expressing as earning per worker hour) is the ability to produce a concise and comparable statistics. For this reason, earning can be used as proxy for labor quality because higher labor quality is associated with higher pay (Horowitz and Sherman, 1980). It can be logically and

practically assumed that as people have more income, they will invest more in factors of human capitals (e.g., education, training, and health care), therefore, leading to the improvement of labor quality. Although people with more income will not always invest more in factors of human capital, this is generally because they fail to recognize the benefits of increased earnings.

3.2. Laborers situation in handicraft industries of Bac Ninh province

Bac Ninh province had 49,094 labors in different handicraft industries in 2016, and the average annual growth rate (AAGR) of the total number of handicraft laborers was 1.69%. The proportion of handicraft laborers compared to the provincial total labor force increased from 7.21% in 2014 to 7.36% in 2016. In all eight of the different small handicraft sectors, the number of handicraft laborers in paper

production increased at the highest AAGR of 2.13% (Table 1).

According to the Bac Ninh Department of Rural Development, the legal forms of handicraft production include household, cooperatives, and company (private and limited liability), of which, households dominate. The number of handicraft laborers in all three legal forms for the last three years has increased. Also, the proportion of handicraft laborers who were recruited to work for companies rose rapidly (the AAGR was 22.98% in 2016).

Laborers working in the furniture handicraft sector accounted for the highest percentage (30.41%) of the total number of handicraft workers in the province. The second highest group was the proportion of workers engaged in agro-product processing and preserving activities at 21.87%. Copper handicraft production took the second runner-up position with 10.03%. This sector has

Table 1. Labor in different handicraft sectors and legal form

| Categories | Number of laborers | | | AAGR (%) |
|--|--------------------|--------|--------|----------|
| | 2014 | 2015 | 2016 | |
| 1. Provincial total laborers | 658181 | 661656 | 667443 | 100.70 |
| 2. Total laborers in handicraft sector | 47473 | 48398 | 49094 | 101.69 |
| Business sector | | | | |
| - Agro product processing | 10387 | 10401 | 10738 | 101.68 |
| - Furniture | 14443 | 14695 | 14930 | 101.67 |
| - Bamboo and cane handicrafts | 4434 | 4498 | 4503 | 100.78 |
| - Copper handicrafts | 4743 | 4898 | 4925 | 101.90 |
| - Ceramics | 1195 | 1237 | 1244 | 102.03 |
| - Knit and weaving handicrafts | 2894 | 2983 | 2987 | 101.59 |
| - Shoes | 2534 | 2609 | 2643 | 102.13 |
| - Others | 6843 | 7077 | 7124 | 102.03 |
| Legal form | | | | |
| - Household | 42473 | 42798 | 43094 | 100.73 |
| - Cooperative | 3536 | 3672 | 3786 | 103.47 |
| - Company | 1464 | 1928 | 2214 | 122.98 |
| 3. Percentage in provincial total laborers | 7.21 | 7.31 | 7.36 | - |
| 4. Percentage in provincial industry | 15.85 | 15.73 | 15.47 | - |

Source: Bac Ninh Bureau of Statistics, 2017

received a lot of attention from the local government of Bac Ninh by its recent thriving development. Lastly, the ceramic sector only acquired 2.5% of the total labor force because the province's small ceramic industry is only embedded in the Phu Lang craft village.

Household handicraft labor accounts for a large proportion the total number of laborers, 87.78%. The number of handicraft laborers in cooperatives and companies has increased rapidly but only accounted for 7.71% and 4.51% of the total, respectively, in 2016. During the survey, we found out that household handicraft production has long been inherited from the previous generation and passed down to the next, while handicraft cooperatives and companies have only recently been formed. In 2016, there were 166 handicraft cooperatives and most of them were operating and functioning well in the local market. Bac Ninh has about 250 limited liability and private companies producing handicrafts at both a small and medium economic scale. Despite the small number, their production scale is still larger than household production since capital investment requires approximate 10 billion VND and their labor force engages about 200 laborers.

Handicraft laborers from the age of 15 to 64 have gradually increased over the last 3 years, of which, the groups ranging in age from 15 to 24 and from 25 to 34 increased faster than the older age groups, meaning the sector has become more and more attractive to younger workers. The number of workers aged from 15 to 24 increased by 3.08% per year and by 3.46% in the group aged from 25 to 34. Workers in the over 65 age group were all considered artisans in the craft village, and number of workers in this group tended to decrease (only 4 in 2016). This creates a challenge of maintaining and preserving special handicraft skills and knowledge to repeatedly transfer them to the next generation (Table 2).

Handicraft laborers between the ages of 35 and 54 made up the largest proportion of the total provincial handicraft laborers. The proportion of the 35 to 44 age group accounts for 44.2% and the 45 to 54 age group accounts for 42.29%. Members of this group were born during the *Reform* and acquired much experience witnessing the ups and downs of the handicraft sector. This study suggests that the local government should pay more attention to this group in order to sustain not only the number of laborers in the handicraft sector but

Table 2. Labor classification by gender and age

| Categories | Number of laborers | | | AAGR |
|-------------------|--------------------|-------|-------|--------|
| | 2014 | 2015 | 2016 | |
| Total labor | 47473 | 48398 | 49094 | 101.69 |
| Gender | | | | |
| Male | 20137 | 20932 | 21139 | 102.46 |
| Female | 27336 | 27466 | 27955 | 101.13 |
| Age | | | | |
| From 15 to 24 | 2558 | 2657 | 2718 | 103.08 |
| From 25 to 34 | 2983 | 3108 | 3193 | 103.46 |
| From 35 to 44 | 20873 | 21483 | 21698 | 101.96 |
| From 45 to 54 | 20347 | 20431 | 20762 | 101.01 |
| From 55 to 64 | 697 | 712 | 719 | 101.57 |
| Above 65 | 15 | 7 | 4 | 51.64 |
| Average longevity | 70.4 | 70.9 | 71.3 | 100.64 |

Source: Bac Ninh Bureau of Statistics, 2017

also enhance the quality of the laborers in the context of new development. The average life expectancy of the handicraft industry is 71.3 years.

The number of trained laborers in all three levels of primary training courses, college, and university increased over the last three years. The number of laborers with job training program certificates increased by 4.89% per year. The AAGR of 6.02% accounted for the college group and 9.61% for the university group. However, the number of non-trained laborers was still high with proportion of 36.85% in 2014 and 32.74% in 2016. The number of laborers with a college or university education was low, accounting for only 0.57% to 0.66%, which is lower than 1% of the total labor force in this small industry. In fact, vocational training in general and professional training for traditional handicrafts in Bac Ninh have been neglected (Table 3).

The evaluation by mean score analysis of factors influencing the handicraft labor quality in Bac Ninh province is described in three criteria including: education, health, and income and productivity (Table 4). Most of the laborers assessed the level of employee’s health condition at medium score (3.107), while the level of education was considered a higher mean score (3.571), and the income and productivity was surprisingly the lowest (2.828). According to the individual 48 aspects of Bac Ninh handicraft labor quality, the lowest mean scores (1.690 and 1.686) referred to employee welfare

policies that not very many laborers reported that they benefited from, sick leave (PL1) and occupational accidents (PL5), respectively. The highest mean scores (3.977 and 3.946) were adequate facilities and equipment criteria (MM1), and appropriate daily work schedule (TG5), respectively.

3.3. Factors influencing the labor quality in handicraft sector of Bac Ninh province

- Selection influence factors

The principle component analysis (PCA) method was used to extract factors, the KMO test for sampling adequacy (Kaiser-Meyer-Olkin index = 0.81), and Bartlett’s test of sphericity was utilized to measure correlation between variables. Those variables with a lower communality, $h < 0.5$, were not considered in the factor analysis since this score designates that these variables were not sufficiently correlated with the new factor received. The factor corresponding to those eigenvalues > 1 were selected in order to gain better understanding of the factor received. Principle component analysis with a varimax rotation method revealed the existence of seven factors, which altogether explained 60.279% of the original variance. Table 5 presents the rotated component matrix. By using factor loading, the different aspects regarding labor quality were grouped into their respective factors and were named according to their collective representation.

Table 3. Labor classification according to education and training

| Categories | Number of laborers | | | AAGR |
|--|--------------------|-------|-------|--------|
| | 2014 | 2015 | 2016 | |
| Total laborers | 47473 | 48398 | 49094 | 101.69 |
| Job training course certificate | 29303 | 31102 | 32239 | 104.89 |
| College | 403 | 434 | 453 | 106.02 |
| University | 273 | 299 | 328 | 109.61 |
| None | 17494 | 16563 | 16074 | 95.86 |
| Years of education per capita | 9.77 | 9.89 | 9.89 | 100.64 |
| Percentage of no education or training | 36.85 | 34.22 | 32.74 | - |

Source: Bac Ninh Bureau of Statistics, 2017

Table 4. Definition of variables and mean values

| Variables | Definition | Mean | Standard Deviation |
|------------------|---|--------|--------------------|
| X1 | Employee welfare policies | | |
| PL ₁ | Sickness leave | 1.690 | .8455 |
| PL ₂ | Maternity and paternity | 1.805 | .8111 |
| PL ₃ | Pension benefits | 1.789 | .7478 |
| PL ₄ | Redundancy payment | 1.916 | .8597 |
| PL ₅ | Occupational accidents | 1.686 | .8372 |
| PL ₆ | Death benefits | 2.180 | 1.9773 |
| PL ₇ | Holiday entitlement | 1.851 | .8208 |
| PL ₈ | Medical examinations | 1.870 | .8217 |
| X ₂ | Working conditions | | |
| DK ₁ | Ventilation | 3.1494 | 1.04361 |
| DK ₂ | Fire and explosion protection | 3.0115 | 1.06873 |
| DK ₃ | Temperature | 2.9770 | .98423 |
| DK ₄ | Lighting | 2.9693 | 1.01859 |
| DK ₅ | Noise level | 2.9195 | 1.03275 |
| DK ₆ | Waste management | 3.0843 | 1.05274 |
| DK ₇ | Wastewater management | 3.1762 | 1.01506 |
| X3 | Career opportunities | | |
| TG ₁ | Regularity of job creation annually | 3.563 | .7701 |
| TG ₂ | Regularity of job creation monthly | 3.885 | .9084 |
| TG ₃ | Regularity of job creation weekly | 3.785 | .7844 |
| TG ₄ | Appropriate hours of work per day | 3.525 | .7418 |
| TG ₅ | Appropriate daily work schedule | 3.946 | .6772 |
| TG ₆ | Appropriate job assignment | 3.770 | .7850 |
| TG ₇ | Increase of income | 3.563 | .7550 |
| X4 | Education and training | | |
| GD ₁ | Objectives of education and training programs | 2.069 | .6927 |
| GD ₂ | Content of education and training programs | 2.153 | .7229 |
| GD ₃ | Education and training modes | 2.126 | .7094 |
| GD ₄ | Education and training methods | 2.065 | .6321 |
| GD ₅ | Education and training conditions | 2.215 | .8320 |
| GD ₆ | Local education and training policies | 1.946 | .7051 |
| X5 | Remuneration | | |
| ML ₁ | Wages | 3.556 | .7707 |
| ML ₂ | Payment method | 3.517 | .8019 |
| ML ₃ | Bonuses | 3.448 | .8379 |
| ML ₄ | Rewards | 3.483 | .8255 |
| ML ₅ | Food allowances | 3.464 | .7867 |
| ML ₆ | Travel allowances | 3.556 | .8603 |
| ML ₇ | Monitory benefits | 3.360 | .7599 |
| ML ₈ | Apprenticeships | 3.414 | .7372 |
| X6 | Facilities and equipment | | |
| MM ₁ | Adequacy of facilities and equipment | 3.977 | .6381 |
| MM ₂ | Number of modern facilities and equipment | 3.920 | .5453 |
| MM ₃ | Imported facilities and equipment | 3.851 | .9388 |
| MM ₄ | Mechanicalization level | 3.812 | .5540 |
| MM ₅ | Production technology | 3.766 | .5573 |
| X7 | Health care | | |
| SK ₁ | Health propaganda | 3.900 | .7270 |
| SK ₂ | Health care system | 3.724 | .6144 |
| SK ₃ | Injections | 3.943 | .7700 |
| SK ₄ | Environmental sanitation program | 3.395 | .8466 |
| SK ₅ | Physical education | 3.621 | .6122 |
| SK ₆ | Food quality and safety | 3.728 | .9955 |
| SK ₇ | Local attitude toward self - health care | 3.678 | .5980 |
| Y | Labor quality | | |
| DGC ₁ | Understanding level | 3.571 | .6011 |
| DGC ₂ | Health | 3.107 | .4160 |
| DGC ₃ | Income and productivity | 2.828 | .3885 |

Source: Survey, 2017

All of the variables loading highly on factor one were related to an employee's well-being in his/her company or organization can be termed as *Employee Welfare Policies*. Respondents with *Employee Welfare Policies* shared the benefits of being paid in case of sickness, pregnancy, retirement, designation, or occupational injuries. They also acquired other benefits, such as death benefits, holiday entitlement, and medical examinations. The first factor contains seven variables related to a company's welfare policies and explains 15.273% of the variance after a varimax rotation. However, mean scores (Table 4) from the results indicated that the main focus of this dimension was that benefiting from the welfare policies does not promote productivity or a higher quality of labor.

Working conditions corresponded to the second factor and was composed of seven variables which explained 10.321% of the variance. The factor describes the working conditions, including: ventilation; fire and explosion protection; temperature; lighting conditions; noise level; waste management; and waste water management. Mean score analysis emerged interesting aspects that all the statements in the second factor received mean scores of around 3 indicating acceptable working conditions regarding an employee's health and impact of the environment on handicraft production. By its turn, factor three explained 9.55% of the variance and the statements loading on this factor were designated by the term *Career Opportunities*. These statements specifically reflected the stability of labor income from the regular demands of work that secure labor participation in the handicraft sector.

The fourth factor included five statements regarding the education and training level acquired by handicraft laborers. This factor detailed the appropriate education and programs that related to labor skills in the sector, and the education and training policies of the handicraft companies and the local

government. This was termed *Education and Training* and explained 7.33% of the original variance. The next factor was termed *Numeration* which contained statements about wages, payment, bonuses, rewards, food allowances, travel allowances, monetary benefits, and apprenticeships. The *Numeration* factor explained 7.049% of the variance. Well-paid wages and salaries were confirmed by high mean scores leading to the conclusion the differences in handicraft labor opinions between poor inherent welfare policies and generous numeration.

The sixth factor consisted of four statements regarding the level of mechanicalization and modernization of the sector which was termed *Facilities and Equipment*. This factor explained 5.469% of the variance and was made up of four variables: adequacy of facilities and equipment, number of modern facilities and equipment, mechanicalization level, and production technology. The last factor was termed *Health Care* and included five statements about the structure of the health care system, health care programs, and services. It also discussed the health care benefits brought to the laborers as well as their attitude toward self-health care and other factors that contribute to the level of the laborer's well-being.

All of the above seven factors represented the quality of labor and elements that help to increase the growth of the sector as well as to secure the participation of laborers. The study results indicated that the labor quality in the handicraft sector is influenced by the employee welfare, working conditions, career opportunities, quality of the labor force, numeration, the characteristics of equipment and facilities, and health care provisions.

- Regression analysis of the factors influencing labor quality in the handicraft sector of Bac Ninh province

Exploratory factor analysis on the survey data of 261 employees revealed seven groups of factors that influence the labor quality in the

Table 5. Rotated Component Matrix

| Variables | Factors | | | | | | | Cronbach alpha |
|------------------|---------|--------|--------|--------|--------|--------|--------|----------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| GD1 | .118 | .034 | .097 | .807 | -.037 | -.091 | .017 | 0,891 |
| GD2 | .109 | .107 | .102 | .785 | -.053 | -.007 | -.042 | |
| GD3 | .124 | -.011 | .047 | .867 | -.008 | -.047 | -.072 | |
| GD4 | .082 | .026 | .066 | .842 | .097 | -.067 | -.089 | |
| GD6 | .013 | .005 | .019 | .805 | -.004 | -.056 | .040 | 0,745 |
| SK1 | -.091 | .110 | -.060 | -.013 | -.125 | -.068 | .735 | |
| SK2 | -.105 | .088 | .033 | .152 | .106 | .048 | .688 | |
| SK3 | -.052 | .289 | -.032 | -.046 | -.112 | .040 | .665 | |
| SK5 | -.049 | -.182 | -.078 | -.047 | -.008 | .013 | .699 | 0,790 |
| SK7 | .040 | -.033 | .026 | -.170 | .025 | .030 | .695 | |
| MM1 | -.029 | .023 | -.067 | -.059 | -.147 | .801 | .068 | |
| MM2 | -.016 | -.005 | .032 | .004 | -.038 | .858 | .047 | |
| MM4 | -.053 | .004 | -.048 | -.094 | -.018 | .689 | -.049 | 0,872 |
| MM5 | -.027 | -.028 | -.134 | -.082 | -.102 | .724 | .003 | |
| TG1 | -.053 | .081 | .734 | .178 | -.130 | -.060 | -.038 | |
| TG2 | -.070 | -.030 | .704 | .109 | .046 | .114 | .080 | |
| TG3 | .123 | .028 | .708 | -.104 | -.002 | -.076 | -.116 | 0,777 |
| TG4 | .106 | .030 | .765 | .004 | -.045 | -.069 | .078 | |
| TG5 | .010 | .067 | .818 | .010 | -.051 | -.050 | .036 | |
| TG6 | .123 | -.006 | .774 | .119 | .026 | -.058 | -.081 | |
| TG7 | -.007 | -.007 | .760 | .048 | -.063 | -.054 | -.085 | 0,913 |
| ML1 | -.013 | .064 | -.092 | .048 | .656 | -.151 | -.033 | |
| ML2 | .036 | -.023 | -.011 | .025 | .636 | -.069 | -.071 | |
| ML3 | .037 | -.103 | .003 | -.016 | .590 | -.099 | .027 | |
| ML4 | .001 | -.016 | -.040 | .013 | .792 | -.018 | .046 | 0,892 |
| ML5 | -.065 | -.066 | -.026 | -.010 | .751 | -.089 | .076 | |
| ML7 | .110 | -.009 | .010 | -.033 | .573 | .035 | -.126 | |
| ML8 | -.003 | -.155 | -.040 | -.034 | .656 | .088 | .005 | |
| PL1 | .875 | .077 | -.015 | .083 | .086 | -.066 | -.047 | 0,913 |
| PL2 | .853 | .166 | -.011 | .044 | .022 | -.048 | -.075 | |
| PL3 | .848 | .161 | .038 | .068 | .033 | -.025 | .020 | |
| PL4 | .791 | .121 | .033 | .074 | .034 | .007 | -.020 | |
| PL5 | .668 | .081 | .124 | -.075 | .100 | .116 | -.050 | 0,892 |
| PL7 | .742 | .093 | .047 | .191 | -.056 | -.083 | -.099 | |
| PL8 | .796 | .118 | .019 | .121 | -.072 | -.084 | -.027 | |
| DK1 | .165 | .824 | -.016 | -.045 | -.096 | -.052 | .079 | |
| DK2 | .084 | .702 | -.030 | -.024 | -.067 | -.109 | .044 | 0,892 |
| DK3 | .155 | .758 | .033 | .003 | -.071 | -.035 | .005 | |
| DK4 | .176 | .734 | -.013 | .095 | -.009 | .044 | .033 | |
| DK5 | .070 | .682 | .129 | .154 | .031 | .112 | -.001 | |
| DK6 | .080 | .786 | .080 | .006 | -.055 | .011 | .030 | 0,892 |
| DK7 | .063 | .875 | -.017 | -.003 | -.085 | .024 | .022 | |
| Eigen value | 6.415 | 4.335 | 4.011 | 3.078 | 2.961 | 2.297 | 2.228 | |
| Variance % | 15.273 | 10.321 | 9.550 | 7.330 | 7.049 | 5.469 | 5.306 | |
| Total Variance % | 15.273 | 25.595 | 35.145 | 42.474 | 49.523 | 54.992 | 60.297 | |

Source: Survey 2017