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Non-Wage Benefits to Reduce the Labor Turnover in Swedish MNCs in China

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Abstract: Due to a deficit supply and excess demand of skilled labor in the Chinese labor market, Swedish MNCs have faced difficulties in attracting and retaining skilled labor. This study aims to investigate whether the provision of different types of non-wage benefits can reduce labor turnover in Swedish MNCs in China. By collecting and analyzing primary data from 107 facilities in Swedish subsidiaries in China, mainly in the manufacturing industry, we find that non-wage benefits in general helps to reduce labor turnover rates. Social benefits and in particular medical insurance have a significant negative effect on labor turnover. These effects are most significant for large employers. We argue that the high labor turnover in China is due to a structural shortage of skilled labor, caused by a large divide in social welfare and education between urban and rural labor, and that the most effective strategy response for MNCs in China is to be actively engaged in innovating the local institutions in order to accelerate reforms of the Chinese welfare and education system. This study contributes to the scarce research regarding the relationship between non-wage benefits and labor turnover in the Chinese context.

Keywords: Labor turnover, labor shortage, non-wage benefits, China

JEL: J32, J33, J63, M52

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1 Introduction and Purpose

There has been a high turnover of skilled labor in the Chinese labor market since the beginning of the 2000s. In 2013, the average labor turnover rate in China was 23.2 percent for the high-tech industry, 30.3 percent for retail companies, and 19 percent for consumer products (Aon Hewitt 2013). Due to the high labor turnover rate, Western multinational corporations (MNCs) in China have faced difficulties in hiring and retaining skilled staff (Aon Hewitt 2013). Turnover of skilled workers is costly for firms due to the resources required to search for and train new employees, and due to the high costs from knowledge spillover when firms lose employees to competitors (Sovich 2006). The high labor turnover in China has been prevalent in most industries, in particular for two groups: middle-level managers in general, and production line workers of the manufacturing plants located in the coastal provinces (Wong et al. 2001).

One reason for the high labor turnover rate is a shortage of skilled labor. This shortage is partly due to the insufficient supply of skilled labor, as the quality of higher education varies within the country (Taylor 2008). Another reason for the insufficient supply of skilled labor is demographic change, as the working age population in China is decreasing due to the one-child policy (Meng 2012). Meanwhile, the demand for skilled labor has increased significantly due to the number of national and foreign enterprises that have established in China since the liberalization reforms in the 1980s (Démurger et al. 2006).

One outcome of the high labor turnover is wage inflation, as the increased competition for skilled workers has led companies to raise salaries in order to attract and retain staff (The Economist 2015). However, monetary compensation is not a guarantee for retention as employees may value other factors, such as career development, life balance, and different types of social benefits (Taylor 2008). The importance for companies to retain skilled staff in China has made HR practices more strategic, as CEOs are looking at HR less as playing an administrative role and more as a strategic partner in helping companies to achieve their business objectives (Taylor 2008). Subsequently, human resource studies find that employers in China should increase long-term incentives and offer flexible benefits to effectuate a more individual approach to the preferences of Chinese employees (Aon Hewitt 2013). An alternative strategy is to move labor intensive production to other countries in the Asian region, as wage levels in China are increasing (The Economist 2015).

The purpose with this study is to provide new insight into whether the provision of non-wage benefits can reduce the employee turnover in Swedish MNCs in China, and if so, how this effect can be explained. We are also interested in investigating whether certain categories or types of benefits are more effective in reducing employee turnover than others, and if this effect varies between regions or industries. High employee turnover in China has mainly been regarded as an HR-related problem, and therefore research on the topic is foremost from the management field. Our aim with this thesis is to explain this managerial problem using theories in economics, and thereby gain

a more nuanced understanding of the issue and how it relates to other factors in society, such as labor market dynamics, institutional arrangement, and demographic changes in the population. Moreover, by focusing on Swedish MNCs in China, our ambition is to shed light on the institutional differences between the home country and the host country, and what implications these differences may have for MNCs business strategies when establishing in foreign countries. Furthermore, we are interested in investigating whether the relationship between non-wage benefits and employee turnover in China has changed since the beginning of 2000s, when many of the pre-existing empirical studies were conducted.

Our study contributes to the scarce research regarding comparisons of different types and categories of non-wage benefits, and their effect on labor turnover, in the Chinese context. First of all, our ambition is to find empirical evidence for what types of non-wage benefits that are most effective in reducing employee turnover in Swedish MNCs in China. Secondly, by using theories in economics, we intend to explain the differences in the effect of various types of non-wage benefits on labor turnover, from a perspective that differs from previous studies. In order to achieve these purposes, we have collected primary data on employee turnover and the provision of different types of non-wage benefits from Swedish MNCs in China. To our knowledge, such data has not previously been collected and analyzed to this extent.

The thesis is structured as following. In section 1 we describe the background to our research questions by providing an overview of the development of the Chinese labor market and social welfare system, as well as a short description of institutional differences between Sweden and China, and their implications for Swedish MNCs strategies. In section 2, we review definitions used in previous research, theories for labor turnover, as well as a summary of results from previous empirical studies. In section 3, we assemble a theoretical framework based on previous research and modified to the context of Swedish MNCs in the Chinese labor market. We then describe our method and collected data in section 4, followed by analysis and interpretation of results in section 5. We conclude with a discussion of implications and questions for future research.

1.1 Background

1.1.1 Labor market development in China

During the past 30 years, the Chinese labor market has transformed from a centrally planned system to a market-driven system with many reforms undertaken (Meng 2012). According to the author, the Chinese population was divided into two segregated economies, urban and rural, enforced by the household registration system *hukou* from 1949. Labor mobility was highly restricted between rural and urban population. According to Fleisher & Yang (2003), large mobility barriers, caused by the hukou system, resulted in labor misallocation and inefficiency. Meng (2012) states that collectively owned communes provided basic coverage for health, education and pensions in rural areas. On the contrary, urban inhabitants were assigned to working units named *danwei*. Moreover, they were provided with lifetime employment, named

the *iron rice bowl*, which was a system characterized by centrally determined wages and a cradle-to-grave welfare system (Meng 2012).

The one-child policy was initiated to control the population growth in the 1970s. According to Meng (2012), this policy was strictly enforced in many urban areas, and contributed to reducing the urban population. However, the author claims that the policy seems to have had a limited effect on the rural population since a second or a third child has been allowed if the previous births were female. The author also highlights that approximately 70 percent of the Chinese population today has rural hukou, and due to the demographic changes, the future labor force will mainly be constituted of the rural population.

Economic reforms in China opened up for private businesses and foreign investments for the first time in the 1980s (Démurger et al. 2006). From the mid to late 1990s, a state-sector restructuring took place due to a surplus of low productivity labor force. The authors describe that tens of millions of workers within the state sector were laid off, an occurrence called *xiagang*, that resulted in high unemployment rates in urban areas and a high share of laid-off workers entering the private sector.

Meng (2012) points out that labor intensive and export-led growth generated significant demand for unskilled labor from rural areas into urban cities, after China was approved membership of the World Trade Organization (WTO) in 2001. The author argues that one result of the increasing demand is the large inflow of labor from rural to urban areas, and that the number of rural migrants almost reached 145 million in 2009. However, due to the hukou system, the migration is strictly controlled, as well as the type of jobs that rural migrants are allowed to have and the social welfare to which migrants have access (Meng 2012). For example, migrants have little access to unemployment support, health care and retirement pensions. The author emphasizes that due to institutional discrimination, most migrants do not see their long-run future in cities. They leave their families behind and migrate to cities, hoping to earn as much as possible before returning home. They are named the *floating population* (Fleisher & Yang 2003).

Furthermore, a large rural-urban divide in education attainment has been found as a result of the institutional segmentation, according to Meng (2012). The author states that only one percent of rural hukou holders had three years of college education or above, and 12 percent had senior school or above in 2008. The corresponding ratios for urban hukou holders were 17 percent and 51 percent respectively.

Meng (2012) concludes that the future labor force in China will mainly come from the rural population with higher labor mobility, restricted access to social security, and less access to higher education, due to the labor market segmentation caused by the historical institutionalized discrimination between urban and rural areas. Thus, a shortage of high-skilled labor is likely to continue.

1.1.2 Social welfare system in China

The following section will provide a short description of the Chinese social welfare system today. According to Dong & Ye (2003), social security reforms have been undertaken simultaneously with the economic reforms since the mid-1980s. The authors state that both pension and medical insurance systems historically have been based on working units, *danwei*, in urban areas. Each unit was obligated to provide pension and medical insurances to their workers. However, individuals have been required to contribute to the funding pools since 2000 (Dong & Ye 2003). According to calculations in Gao et al. (2013), social benefits stood for 20 percent of household income for the urban population, but only 2 percent for the rural population in 2007. The authors conclude that the Chinese social welfare system is highly divided between the urban and rural population, in which the urban social welfare system is more comprehensive and generous while the rural system is minimal and residual. In 2011, a new Social Insurance Law was carried out, which enforced private firms to provide a social insurance package to their employees (China Briefing 2012b). The social insurance package consists of five social insurances, including pension, medical insurance, work-related injury insurance, unemployment insurance and maternity insurance, as well as one housing fund (China Briefing 2012b). Hereby we will use the term *insurance package* to refer to these five insurances and one housing fund. The insurance package is mandatory nationwide and both employers and employees have to contribute to the funding pools (China Briefing 2012a). However, the contribution rates vary across regions due to different regional economic conditions, as seen in table 1.

The new law clarifies that both pension funds and medical insurance funds are transferrable between administrative jurisdictions (China Briefing 2012b). For example, a worker is able to receive a pension based on the entire amount of the accumulated funds. However, the lack of transparency in the treatment of pensions often discourages workers from transferring to jobs outside their residential city or region (China Briefing 2012b). This in turn reduces the labor mobility across regions, which creates problem for cities that lack a sufficient amount of skilled workers, as described above. Moreover, the lack of public transparency regarding pensions has lead to a distrust for whether funds for mandatory pensions will still be available when workers retire (China Briefing 2012b). This may be one explanation for the high saving rates of Chinese employees.

Table 1: social insurance and housing fund (China Briefing 2012a)

China Social Insurance and Housing Fund						
Particulars	Pension	Medical	Unemployment	Maternity	Injury	Housing
Company contributions	12-22%	5-12%	0.2-2%	0.5-1%	0.5-2%	5-20%
Individual contributions	8%	0.5-2%	0-1%	N/A	N/A	5-20%

1.1.3 Swedish MNCs in a Chinese institutional context

The institutions theory framework Varieties of Capitalism (VoC) suggests that companies develop their competitive advantages in specific institutional contexts and therefore business strategies may not be successfully transferred to other political economies (Hall & Soskice 2001). In this framework, the Scandinavian countries are classified as Coordinated Market Economies (CME) as opposed to the Liberal Market Economies (LME) of the Anglo-Saxon countries. Compared to LMEs, the CMEs are characterized by long-term employment relations, high union density, a specialist rather than generalist workforce, and incremental rather than radical innovation.

The Chinese economy differs significantly from Western economies (Witt & Redding 2013), which according to the VoC framework implies that Scandinavian MNCs in China are required to incorporate the local Chinese institutional context into their business strategies. According to Xu (2011), the Chinese governance structure can be described as a Regionally Decentralized Authoritative (RDA) regime. The RDA regime is characterized by a centralized political system, consisting of the CCP, and decentralized economic subnational regions with autonomous jurisdictions. Economic policies are designed and implemented by subnational governments, which implies that there are regional differences within China, both in terms of legislation and policies.

According to Witt & Redding (2013), privately-owned companies and state-owned enterprises (SOEs) are subject to different rules within the Chinese political economy. For example, the authors find that employment tenure is long-term for SOEs but short-term for privately-owned companies, which suggests difficulties for Scandinavian firms from CMEs, as their business strategies to a larger extent rely on long-term employment relationships and specialized labor (Hall & Soskice 2001).

Regnér & Edman (2014), identify four strategic responses that MNCs use to engage with local institutions in the pursuit of competitive advantage: innovation, arbitrage, circumvention, and adaptation. Innovation responses seek to create or change the institutions in the host country, arbitrage responses exploit differences between host and home settings, circumvention responses aim to sidestep the demands from local institutions, and adaptation responses conform to the institutions in the host country. As stated above, many MNCs have established in China since the 1980s, largely due to the low relative price of labor that enabled a comparative advantage for labor intensive production. For Western MNCs, the Chinese labor market has offered low wages and low union density, which implies a type of arbitrage compared to the high labor costs in the home countries. However, the increasing number of enterprises entering the Chinese market, in combination with an increasingly capital intensive industry, has lead to an increased demand for skilled labor, causing labor shortage, wage inflation and high labor turnover costs for firms.

The institutional perspective reveals an interesting paradox: on the one side, many MNCs have established in China in order to take advantage of the local institutions that enable low labor costs. On the other hand, many of these companies have developed their business strategies in CME institutional contexts, where firms require long-term employment relationships with a specialized labor force. Subsequently, institutional theory suggests that the high

labor turnover in the Chinese labor market should be a problem for MNCs from CME countries, such as Scandinavian firms.

1.2 Research questions

Against the background of China's transition and institutional context, we are interested in whether the provision of non-wage benefits can reduce the employee turnover in Swedish MNCs in China. We are also interested in what types or categories of non-wage benefits that are most effective in reducing labor turnover, if there are significant differences in their effect, and if so, how these differences may be explained. Finally, we ask whether the effect of non-wage benefits on employee turnover differs depending on organizational factors. Subsequently, our primary research questions are:

1. Can the provision of non-wage benefits by Swedish MNCs reduce the labor turnover in their subsidiaries in China, and if so, how can this be explained?

2. Can the provision of certain types or categories of non-wage benefits by Swedish MNCs reduce the labor turnover in their subsidiaries in China? Are there significant differences between the effect of different types or categories of benefits, and if so, how can these differences be explained?

3. Does the effect of non-wage benefit provision on labor turnover differ depending on organizational factors, such as employer size, nature of industry, and length of operation in China? If so, how can these differences be explained?

These questions will be further analyzed and discussed throughout this thesis and our aim is to provide new insight and explanations by studying the issue empirically. We begin by providing an overview of definitions, theories, and empirical findings from previous research.

2 Current State of Knowledge

2.1 Definitions used in previous research

Labor turnover

Labor turnover is defined and measured in several ways throughout the research literature. The term defined as *turnover rate* can be measured as the outflow of workers divided by the average number of workers during the same period, where the outflow of workers is number of hirings plus the number of separations (Juurikkala & Lazareva 2012). Turnover rate can also be measured as the number of employees leaving a firm divided by the average number of employees during the same period, a measure referred to as the *crude labor turnover rate* (Orkan 1974), which can also be calculated using the number of employees at the beginning or at the end of the period. Moreover, some studies distinguish between the turnover rate and the *quit rate*, which focuses on the number of employees quitting the firm voluntarily, thus excluding layoffs (Frazis & Loewenstein 2013). The quit rate is defined as the number of employees quitting divided by the average number of employees during the same period (Juurikkala & Lazareva 2012). Another measure in use is *churning flows*, which refers to the numerical difference between worker flows and job flows, where worker flows are all workers in and out of jobs and job flows are the gross creation and destruction of jobs, thus reflecting the expansion and contraction of firms (Burgess et al. 2000). The choice of definition foremost depends on the main purpose of the study, and to what extent the required measurements are available in practice. For the purpose of our thesis, we use the term turnover rate to refer to the crude labor turnover rate (Orkan 1974), and our measurement is specified in section 4.2.

Non-wage benefits

In terms of non-wage benefits, definitions also vary throughout the literature. Smith (2000) defines benefits as a substantial element of the total compensation in non-cash form, provided from the employer to the employee. The author states that common terms in use are fringe benefits, perquisites (perks), allowances, subsidies, assistance, leave or discounts. Specifically, fringe benefits are a wide range of benefits in addition to cash payments, including for example cars, work-related equipment, accommodation, loans, childcare assistance, discounts, sick pay, and maternity leave. Moreover, family-friendly benefits include maternity or paternity leave, compassionate leave, holidays, and childcare provision (Baughman et al. 2003). In this thesis, we use the term non-wage benefits to refer to the wide range of benefits provided by Swedish MNCs in China, including various types of social benefits, monetary compensations, family-friendly benefits, and other goods and services.

Barron and Fraedrich (1994) raises two frequently used approaches for explaining the differences in provided benefits between firms. One approach focuses on heterogeneity in workforce and differences in preferences. The other approach concerns heterogeneity of types of non-wage benefits provided across employers. We will take the perspective of the employer in this thesis and focus on why employers provide different types of benefits.

2.2 Theories

There are various theoretical explanations to why the provision of non-wage benefits would lead to reduced labor turnover. Here, we focus on theories regarding labor market imperfections, human capital investments, and the employment contract relationship.

2.2.1 Labor market imperfections

According to Ehrenberg & Smith (2012), applying a neoclassical model in labor economics suggests that mechanisms behind labor markets are explained by the marginal productivity theory of demand, based on profit maximizing behavior of employers, and a supply theory based on the utility maximization of workers. When the supply meets the demand, an equilibrium is achieved in a perfectly competitive labor market. However, there are frictions and imperfections that disturb the labor market and lead to a mismatch between supply and demand of labor force. It is stated that in a well-functioning labor market, most types of internal shocks, for example due to wage disparity and human capital investment disparity, are self-regulating and the equilibrium is achieved eventually. However, there are frictions and imperfections that are caused by factors such as institutional discrimination and demographic change, that the labor market itself cannot adjust to. In such conditions, the mismatch between supply and demand of labor force is much more persistent.

As described in section 1.1.1, the Chinese labor market is segmented due to the institutional discrimination between the urban and rural population, enforced by the hukou household registration system. Labor mobility is less fluid due to the long-lasting impact of the segmentation, although the enforceability of the system has been lessened during the last decades. This, in combination with an ageing population and a varying quality of education between urban and rural areas, creates deficit supply of skilled labor (Meng 2012). According to Li & Qian (2011), the human capital level, which refers to the education level, working skills, and health level, of labor moving from the rural areas can no longer meet the rising demand of the industrial sector. This leads to so called structural shortage of technical labor as a result of excess demand for high-skilled workers. The authors also point out that the structural labor shortage first occurred in parts of the Pearl River Delta Region, Southeast of the Fujian Province, as well as in the Yangtze River Delta Region. Later, the structural labor shortage spread to labor-exporting interior provinces such as Jiangxi, Hunan and Anhui (Li & Qian 2011). Thus, deficit supply and excess demand of skilled workers imply that the shortage of skilled labor is high, which may cause high turnover rates.

Variations in labor turnover can partly be explained by the supply and demand theory within labor economics. However, there are other factors that affect labor turnover indirectly such as cyclical macroeconomic conditions and structural changes. Historically, structural changes have been for example globalization and technological development. Burgess & Nickell (1990) find that quits move pro-cyclical for the manufacturing industry in the UK. This implies that the labor turnover is high in boom and low in recession. The authors argue that various types of labor market legislation reduce labor market flexibility and generate lower turnover. One example is employment protection

legislation, such as regulation regarding minimum wage and unemployment benefits. These regulations improve the job security and generate higher turnover. Thus, quit rates vary with different types of legislation and the authors do not find strong evidence of consistent effect of legislation on turnover. Another recent study conducted by Bruneel et al. (2014) suggests that quits are associated with cyclical trends for most industries in the US, except for the manufacturing industry, that tends to be more affected by structural changes in the labor market.

Conclusively, labor turnover is directly affected by the supply and demand of certain labor force in the labor market. In the Chinese context, a shortage of skilled technical labor is associated with potential high turnover rates. Moreover, labor turnover is affected indirectly by the overall economic condition and structural changes. Turnover rates are high in boom and low in recession. Furthermore, turnover also depends on legislations that affect labor market flexibility and mobility, or, job security and employment benefits. If the restriction of labor market flexibility is extensive and employment protection legislation is widespread, the turnover rate is likely to be low. If the labor market is flexible and employment protection legislation is extensive, the turnover rate is likely to be high. If flexibility barriers in the labor market are large but there are few legislations of employment protection or no coverage of social security benefits, the turnover rate is likely to be low. If the labor market is flexible but there are neither employment protection nor social security coverage, it is difficult to determine whether the turnover rate is low or high. The Chinese labor market seems to be dominated by extensive mobility barriers, few employment protection legislations and partial coverage of social welfare. This implies a high turnover rate in the labor market in China.

2.2.2 Human capital investments

Becker (1962) described the relevance of employee turnover in the context of human capital investment. According to the author, turnover has been ignored in traditional theories of competitive firms, where wages are assumed to be equal to the marginal product of labor. In this framework, turnover would not matter since employees leaving one firm would do equally well elsewhere and employers would be able to replace staff at an unchanged profit level. Becker brings up different types of human capital investments that increase productivity of workers, mainly specific and general on-the-job training. Specific training raises the productivity of workers as well as the relative productivity of the firm against competitors. However, a firm suffers loss when a trained employee quits since an equally trained employee may not be obtained without additional costs.

Moreover, Becker argues that the probability of a quit is not fixed but depends on wage levels. By offering trained employees higher wages than competitors, firms can reduce the likelihood of quits. However, wages above market level would result in excess supply of trainees, and therefore Becker states that firms should shift some training costs and returns to employees, in order to bring supply in line with demand, sharing the human capital investment between the employer and the employee. Furthermore, it is stated that employees with specific training have less incentive to quit and firms have

less incentives to fire them. However, in order for firms to undertake human capital investments, employers require an insurance against quits. Likewise, in order for employees to share the human capital investment, the employee needs an insurance against lay-offs. Due to the risk imposed on both employer and employee, and in the absence of perfectly enforced long-term contracts, mechanisms to insure both parties against quits and layoffs are required. Becker describes pension plans with incomplete vesting privileges as such an insurance, where the firm is given the non-vested portion of payments as a lump sum whenever a worker quits. Additionally, whilst training is an on-the-job investment, other investments in human capital are made outside the firm, such as medical care, housing, food, and schooling for employees. These investments are paid for by a share of the wage of workers. If the firm gives a wage increase that raises the productivity of workers, outside investments are converted into on-the-job investments.

In this framework, non-wage benefits can be seen as a share of the worker's wage that is reserved for productivity enhancing activities such as training and medical care. Providing non-wage benefits, as opposed to a wage premium, ensures that outside investments are turned into on-the-job investments that increase the productivity of the firm. Other benefits, such as pension plans with incomplete vesting privileges, may function as a mutual insurance against quits, that enables employers to invest in employees in cases of high turnover costs and in the absence of perfectly enforced contracts.

2.2.3 Employment contract relationships

Employment contracts regulate the relationship between an employer and an employee, and state what obligations and rights each contracting party obtains. These obligations and rights may be formally written in an explicit contract, whereby penalties may be imposed on the non-complying party of the contract. However, this kind of explicit contracts may be infeasible due to information asymmetry between contract parties. Thus, implicit contracts and agreements are frequently formed and used in an employment relationship. Due to the lack of legal enforceability of such implicit agreements, the contracting parties are facing higher costs associated with higher risk followed by contract violation (Parsons 1986).

Another term used to describe an employment relationship is *psychological contracts*, established by Rousseau (1989). The term was defined as beliefs of an individual, regarding the mutual obligations between the employee and the employer. Rousseau distinguished between two types of psychological contracts: transactional and relational contracts (Rousseau 1995). According to the author, a *transactional contract* is characterized by a short-term employment relationship with low ambiguity of obligations, low member commitment, high turnover, little learning and weak integration. A typical example is a contract with a seasonal worker. On the contrary, the *relational contract* is characterized by a long-term employment relationship with high ambiguity of mutual obligations, stability, high member commitment and high integration (Rousseau 1995).

However, it is not easy to build this kind of long-term employment relationship. Simple game theory states the difficulty of obtaining long-term

cooperation as a trust issue, and suggests that one solution is to develop an open-end relation without an explicit exit (Parsons 1986). In such a relationship, the uncertainty in the expected behavior of the other party is reduced, which leads to more cooperation (Parsons 1986). In line with this reasoning, Gibbons & Henderson (2012) argue that many organizational capabilities rest on managerial practices, which in turn rely on relational contracts. Moreover, the authors state that relational contracts are hard to build and sustain, and that managers have to solve the problems of credibility and clarity in order to build such effective relational contracts.

2.3 Empirical studies

2.3.1 Non-wage benefits to reduce labor turnover

Few empirical studies of non-wage benefits and labor turnover in the Chinese context have been carried out previously. However, history shows that many Western economies have been subject to high labor turnover, in particular prior to the development of modern social institutions, such as employment protection legislation (Orkan 1974). Therefore, numerous empirical studies have been conducted in Europe and in the US since the beginning of the 1900s that investigate the relationship between different types of compensation schemes and labor turnover.

Previous empirical studies can be categorized according to different categories or types of non-wage benefits provided, and their effect on labor turnover. For instance, some studies focus on benefits as valued by tax authorities (Dale-Olsen 2006), whereas other studies focus on the marginal effect of a wage premium against a fringe benefit premium to reduce turnover (Frazis & Loewenstein 2013). Moreover, many researchers have studied the provision of social benefits (Juurikkala & Lazareva 2012), and even more specifically on pensions (Mitchell 1982) or medical insurance (Mandrian 1994). Following is a summary of the empirical studies that we find are most relevant for our research purpose.

In a study of the Norwegian private sector, Dale-Olsen (2006) finds that providing higher wages and more fringe benefits in general reduces labor turnover rates. Using linked employer-employee data, the study tests how labor turnover is affected by a fringe benefit measure, composed of several types of benefits as valued by tax authorities. According to the study, employers that pay 10 percent more fringe benefits than expected generate nearly the same reduction in labor turnover as firms that pay a 10 percent wage premium. In a similar study, Frazis & Loewenstein (2013) find that quit rates in the US are more responsive to benefits than to wages, which implies that every additional dollar of fringe benefit is more strongly associated with lower quits than wages. The benefits included are sick-leave, vacation, life insurance, health insurance, pension, and other benefits. The authors identify a positive relationship between fringe benefits and turnover costs, implying that employers with higher turnover costs offer more benefits. However, they do not find strong evidence for the negative relationship between an individual benefit and quits, due to the high correlations among benefits in the data.

On a different note, Juurikkala & Lazareva (2012) find that Russian industrial firms are able to reduce labor turnover by providing social benefits, including housing, medical care, daycare, and recreation. The authors argue that to what extend the provision of social benefits is valued by employees depends on the local tightness of the labor market and the access to local social services. Evidence is found that the provision of social benefits by firms depends both on the local access to social services and on the local labor market tightness. It is stated that firms provide more social benefits when the local access to social services is poor and when the local labor market has a high level of tightness. Moreover, it is argued that the labor attachment effect from social benefits depends on the level of locally developed social infrastructure, and that this effect is emphasized in Russia, where the social sector is heavily regulated and subsidized with significant barriers to entry.

Other empirical studies have focused on the provision of pension plans and health insurance, and the penalty that these benefits impose on workers if they quit. For example, Mitchell (1982) finds that job mobility in the US is lower for workers with fringe benefits, and that in particular, employer-sponsored pensions deter the probability of job change. The study uses individual data to test a microeconomic model for how fringe benefits affect labor mobility. The author concludes that other benefits, such as employer-provided medical insurance, life insurance, profit-sharing, and stock-ownership plans have a significantly smaller effect on mobility, compared to employer-sponsored pensions.

In terms of health insurance, a number of studies have been conducted in the US during the 1990s and early 2000s. Mandrian (1994) argues that the provision of private health insurance by US employers may affect job mobility through *job-lock*, a retention mechanism that occurs when health insurance affects individual labor market decisions. For instance, if employees fear losing their health coverage it may affect their decisions to keep jobs that they would rather leave. The author estimates that job-lock reduces the voluntary turnover rate by 25 percent for employers that provide private health insurance. Moreover, it is argued that this effect is prevalent as long as health insurance is not broadly provided by the state or by competitors. A later study by Buchmueller et al. (1996) also tests the causal relationship between employer-provided health insurance and worker mobility. Unlike Madrian, this study includes variables such as pension receipt, job tenure and job change of spouses, that are arguably omitted in previous studies. Foremost, the authors find strong evidence of job-lock among dual earner married women. On the other hand, Berger et al. (2004) test job-lock among those employees with and without employer-provided health insurance, as well as including family members with and without health problems. Using a differences in differences approach, the authors find no statistically significant evidence of job-lock on employment duration or wages.

In addition to pension schemes and health insurance, another category of benefits that has drawn considerable attention in several studies is family-friendly benefits. Baughman et al. (2003) find that employers in upstate New York County who offer flexible sick-leave and childcare assistance experience measurable reductions in labor turnover. The authors also find evidence that employers who offer flexible scheduling policies and childcare were able to offset

part of the costs of benefits by paying lower wages. It is argued that the results can be explained by the preferences of an increasing number of women in the workforce and a consequent need to balance work and family life.

Other factors that have been studied as determinants of employee turnover include performance-related pay (PRP), profit sharing, and corporate image. According to O'Halloran (2012), the impact of PRP on turnover depends on what type of PRP is provided to the employees. The author finds that employees who receive some forms of PRP have lower turnover rates than those who do not. Moreover, this negative relationship is particularly robust for profit sharing and turnover. In terms of corporate image, Vitaliano (2010) finds evidence that firms with high CSR rankings reduce the annual turnover rate by 3 percent to 3.5 percent, which amounts to a 25-30 percent reduction compared to companies that are not ranked as socially responsible. Moreover, the author estimates that half the impact of CSR on turnover is due to labor-specific policies, such as flextime, profit sharing, and involving employees in decision making.

To summarize, previous empirical studies of non-wage benefits' effect on labor turnover are divergent, both in terms of the different categories of benefits provided, as well as the theoretical explanations to why these effects occur. Whereas some studies focus on the marginal effect of incremental benefits compared to a wage premium, other studies emphasize the effect of the provision of social benefits by firms, or even more specifically, pensions or medical insurance. Overall, it seems that previous studies have been highly context-dependent, both in terms of the choice of benefits that are studied, as well as the explanation for the discovered effects. For example, studies of labor turnover in the US in the 1990s tend to focus on the provision of private pensions and health insurances, and the job-lock effect that may occur when employees risk losing their coverage if quitting from their current employer. On the other hand, the Norwegian study from 2006 focuses on the tax value of fringe benefits relative to a wage premium, and the marginal effect of compensation on labor turnover. This study does not focus specifically on social benefits, which can be explained by the well-developed social welfare system in the country that mitigates potential job-lock effects from employer-provided social benefits, as all citizens for instance have access to public health care. On the contrary, the study by Juurikkala & Lazareva was conducted in the Russian context and focuses specifically on the provision of social benefits by firms. The authors include other economic factors in the analysis, such as the labor market tightness and the local access to social services. The stated reason for this approach is the transition of the Russian economy from a socialist economy to a developing economy, and the impact of this transition on the social infrastructure in the country.

Since China is also an economy in transition, we believe that the results of Juurikkala & Lazareva are of high relevance to our study. To our knowledge, such a study has not been conducted within the Chinese context before. Therefore, we now turn to the management field, where empirical studies of Chinese firms have been more frequent.

2.3.2 HRM affects turnover intention

Unlike the scarcity of economics research regarding the effect of non-wage benefit provision on labor turnover in China, a number of such empirical studies have been conducted in the management field. These studies focus on human resources management (HRM) practices, specifically for MNCs in China. However, the management literature typically studies *turnover intention*, which refers to the willingness of an employee to leave an employer, and is used as a proxy for the actual turnover rate.

As opposed to the empirical studies in the economics field, which study the effect of different types of benefits on labor turnover rates, the management research studies non-wage benefits as a determinant of either organizational commitment or job satisfaction, which in turn affect turnover intention. Thus, organizational commitment and job satisfaction are studied as intermediaries for turnover intention.

On the one side, it has been argued that job satisfaction is the main determinant of the turnover intention of employees in China. For example, Liu et al. (2007) find that job satisfaction significantly predicts the turnover intention of employees in China, where job satisfaction is determined by salary, job involvement and interpersonal support. Accordingly, Ma & Trigo (2008) find that job satisfaction is the main determinant of the turnover intention of Chinese managers, and that financial rewards such as compensation, fringe benefits, and other perks are the key determinants of the job satisfaction of Chinese managers. In this study, job satisfaction in general is determined by career development, rewards, intrinsic satisfaction, work relationships, corporate culture, and work environment. Moreover, the authors argue that due to the shortage of managerial talent in China, employers must increase their compensation packages to attract and retain managers. It is also stated that many MNCs are working hard to design competitive pay and benefits packages to attract, retain, and motivate the available managerial talent. Additionally, the authors argue that the high employee turnover intention by Chinese managers is mostly due to the dynamics of the labor market, and not due to culture, since the Chinese culture values loyalty and long-term work relationships.

On the other hand, Wong et al. (2001) find organizational commitment to be the main predictor of both job satisfaction and turnover intention in MNCs in China. In this study, organizational commitment is determined by rewards associated with employment. According to the authors, the determinants of turnover intention in China differs from previous studies of Western employees, in which job satisfaction is found to have a stronger effect on organizational commitment and turnover intention. Subsequently, due to the high importance of organizational commitment for turnover intention of Chinese employees, the authors argue that MNCs establishing in China should build up long-term relationships with their employees, cultivating the traditional Chinese cultural values of mutual commitment, *pao*. Accordingly, Gamble & Huang (2008) study how organizational commitment contributes to employee retention in China. In a comparison between firms in the UK and China, the authors find that job security, good relationships between management and employees, and the pride of employees contribute to employee retention in Chinese subsidiaries.

Conclusively, there are a number of management studies of the determinants of employee turnover intention in MNCs in China. The results can be divided into two categories, where either job satisfaction or organizational commitment are found to be the main determinants of the turnover intention of Chinese employees. However, rewards for employment, such as wages and benefits, are typically included as a determinant of the main explanatory factor, whether job satisfaction or organizational commitment. Moreover, most authors seem to agree that the high employee turnover in China is not due to cultural values, but rather due to the dynamics of the labor market. Another factor that is frequently emphasized is the importance of building long-term relationships with employees, especially in order to retain high-skilled employees.

2.3.3 Determinants of non-wage benefits

A number of empirical studies have investigated the determinants of the provision of non-wage benefits by firms. Barron & Fraedrich (1994) argue that larger employers are more likely to offer fringe benefits, since such employers face lower costs in providing such benefits. The authors analyze the effect of on-the-job training and employer size on the provision of fringe benefits by US firms, focusing on retiree health insurance and leave benefit. It is argued that employees that receive more training are more likely to be offered retiree health insurance, and that those positions attract workers with a lower propensity to quit. Another study that finds endogeneity in the provision of non-wage benefits by firms is Juurikkala & Lazareva (2012). As mentioned above, the authors find that labor market tightness and local access to social services are the main determinants of the provision of social benefits by Russian industrial firms.

Dale-Olsen (2006) argues that there are several reasons for treating benefits as non-wage job amenities. For instance, due to diminishing sensitivity and endowment effects, employees may value a fringe benefit component more than a similar wage increase, and some employees may even prefer fringe benefits to the equivalent in money. Moreover, it is stated that the evaluation of fringe benefits compared to wages by employees may depend on social aspects, such as the increased social status associated with a company car, and that judgement bias can make employees uncertain about the real value of provided fringe benefits. Based on the above literature and empirical findings, we proceed to section 3 where we develop a theoretical framework and hypotheses for our study.

3 Theoretical Framework

In this section, we develop a theoretical framework to analyze whether the provision of non-wage benefits can reduce employee turnover in Swedish MNCs subsidiaries in China. The framework is based on previous research findings and takes into account the development of the Chinese labor market and social security system.

3.1 Model for labor attachment

To assemble our theoretical framework, we have foremost used two previous studies: Juurikkala & Lazareva (2012) and Frazis & Loewenstein (2013). We have chosen to combine these models based on both contextual similarities and suitability for our research purpose.

As described in section 2.3.1, Juurikkala & Lazareva (2012) developed a theoretical framework describing a proposed mechanism of labor attachment in the Russian context, where local labor market tightness and varying access to social infrastructure within the country were found to be the main explanatory variables for non-wage benefits, which in turn affect labor turnover. The authors emphasize that most studies within this field have focused on developed economies, and that their study serves as a good example for investigating the role of non-wage benefits in a developing economy with imperfect labor markets and large regional heterogeneity. As described in section 1, these characteristics apply to China due to the urban-rural divide that causes imbalance in the labor market as well as the large institutional differences across regions. Moreover, the Russian and Chinese economies have been subject to similar transitions from planned economies to developing economies.

Although there are similarities between the transition economies in Russia and China, there are fundamental differences in the social security systems. In the Russian context, state-owned firms were obliged to provide social benefits to all employees, and following the deregulation, privatized firms continued to provide these benefits (Juurikkala & Lazareva 2012). In China, state-owned enterprises remained in state ownership, whilst the deregulation opened up for new private firms entering the market, gradually opening up for foreign investments (Démurger et al. 2006). Until the new Social Insurance Law was implemented in 2011, private firms in China were not obliged to provide social benefits to their employees, as discussed in section 1.1.2.

Against the background of the study by Juurikkala & Lazareva, we are interested in testing whether a similar relationship holds between labor market tightness, non-wage benefits and employee turnover in China. We argue that within the Chinese context, local labor market tightness is reflected by the local shortage of skilled labor, and that varying access to social services are better described as the local unit cost of alternative non-wage benefits. However, our primary ambition in this thesis is to identify what types of non-wage benefits are most effective in reducing the employee turnover rate for Swedish MNCs in China. For this purpose, we develop a simple theoretical framework as follows.

According to Juurikkala & Lazareva (2012) and Frazis & Loewenstein (2013), worker *i* maximizes utility, which depends on the provided monetary wage, *w,* and consumable non-wage benefits, *B.* In order to compare different types of benefits, we have constructed the variable B as a set of various types of benefits.

$$U_i = U(w,B,t) = U(B,t) + w \qquad \text{(Eq. 1)}$$

$$\text{where } B = b_1 + b_2 + \ldots + b_n$$

In line with Frazis & Loewenstein (2013), we assume that there are different types of workers, *t*, where some are more likely to remain in long-term employment relationships, *stayers*, and others are more likely to change jobs often, *quitters* (Salop & Salop 1976). A worker with a high *t* implies a more stable worker who would be more attracted to employers offering for example pensions, health insurance, or leave benefits (Barron & Fraedrich 1994). Meanwhile, a worker with a low *t* places less value on benefits in general and thus would be more attracted to work for an employer who offers a larger share of the compensation as wage.

Furthermore, we assume that in each period, a certain worker with a certain productivity receives an external job offer, which contains both wage and a combination of non-wage benefit $\widehat{w} + \widehat{B}$ (Juurikkala & Lazareva 2012). Switching jobs is associated with a cost, *d,* for the worker. Given this, the worker will decide to change jobs only if:

$$U(B,t) + w < U\left(\widehat{B},t\right) + \widehat{w} - d \qquad \text{(Eq. 2)}$$

Therefore, the worker's probability of quitting (or turnover rate) is:

$$\alpha = P\left(U(B, t) + w < U\left(\widehat{B},t\right) + \widehat{w} - d\right) \qquad \text{(Eq. 3)}$$

That is, the probability that the worker will quit depends on the type of worker, *t*, as well as the cost of switching jobs, *d*. Since a worker with a high *t* would place a high value on benefits in general, the turnover rate would be lower for firms that employ workers with high *t* and that offer a large share of the compensation as benefits, *B*. On the other hand, the turnover rate would be higher in firms with workers with low *t*. Thus, a firm would be more willing to invest in workers with high *t*, which is in line with the theories of human capital investments (Becker 1962).

For the worker, we argue that the cost of switching jobs, *d*, is mainly related to the demand of labor force. As described in section 2.2.1, if there is an excess demand for a certain labor force, the degree of labor market tightness is high. This implies that the probability of finding a new job for the worker is large and thereby the switching costs are low. Moreover, we argue that the switching cost is also related to the local cost of alternative benefits. The

switching cost is high if the local social security system does not cover the alternative benefits that are offered by the employer. For example, if the cost of local health care is high, and if the alternative employer does not offer health insurance, a worker who values health care more than additional wage or other benefits would be less willing to quit from a firm that offers health insurance. Other benefits such as pensions can be regarded as a deferred compensation (Mitchell 1982), and therefore we argue that if these benefits are non-transferable between firms the mobility cost of switching jobs, *d*, increases. It therefore follows that a high local cost of alternative benefits in combination with a high preference for those given benefits by the worker creates a job-lock effect as described in section 2.3.1.

Based on Juurikkala & Lazareva (2012) and Frazis & Loewenstein (2013), a firm's profit per employee is formulated as:

$$\pi_i = y_i - k_i - c_i \times \alpha_i \qquad \text{(Eq. 4)}$$

Where *y* is the produced output by worker *i*. The firm pays a total compensation *k* to each worker, which consists of wage *w* and non-wage benefit *B*. If a worker quits, the cost for the firm to find a new worker is $c_* \alpha$, where α is the probability that a worker will quit (also reflecting the turnover rate) and *c* is the turnover cost for the firm to replace a new employee. We argue that turnover cost includes searching costs, training costs, and sunk costs, where sunk costs are related to the type of worker *t*, since firms will invest in training of the workers that are expected to have a high t. We also argue that searching costs and training costs are associated with finding a new employee and therefore depends on the local supply of skilled labor. Subsequently, if there is a shortage of skilled labor, search costs and training costs will be higher.

Firms try to minimize total costs. We argue that the challenge for firms is to find the right combination of wage and benefits that fits the preferences of workers and that is cost efficient. We assume the following four cases. If the provision of benefits has no effect on turnover, the employer should chose a combination of wage and benefits that gives the same level of utility for the worker and at the same time minimizes the costs for the firm. On the other hand, if benefits reduce quits, the current compensation package is not optimal.

Table 2: firms' choice of non-wage benefits provided

	t higher or equal to 1 "stayer"	*t* lower than 1 "quitter"
Benefits have no effect on worker's propensity to quit	Firm should chose a compensation package to minimize cost whilst maintaining a constant utility level for the worker	Firm should chose a compensation package to minimize cost whilst maintaining a constant utility level for the worker
Benefits have effect on worker's propensity to quit	Firm should increase the amount of benefits to reduce the worker's propensity to quit until the worker's marginal utility of benefits equals the marginal utility of wage	Firm should increase the amount of benefits to the point where the firm's cost of increasing benefits is equal to the firm's utility of reduced turnover cost

If the worker values benefits more or the same as wage, the optimal choice for the employer is to increase benefits until the marginal utility of benefits for the worker equals the marginal utility of wage. Contrarily, if the worker values benefits less than wage the employer has to increase the amount of benefits to the point where the cost of increasing benefits for the firm is equal to the utility of reduced turnover cost.

The employer's choice between providing different types of benefits may depend on different reasons related to for example cost efficiency, productivity, and legislation. One reason could be tax benefits from providing benefits rather than wage. Another reason could be economies of scale for certain types of benefits. For example, if a firm operates within the food industry it would be more cost efficient to offer the products produced by the firm as benefits. Moreover, some benefits are regulated by law such as the provision of insurance package in China as described in section 1. In relation to productivity, the benefits provided may depend on the type of business operations, task force and work environment in general.

To summarize, we have assembled a framework based on previous research and with modifications for the purpose of our study. In our study we will take the perspective of the employer, who desires to reduce the cost of turnover. The worker maximizes utility which depends on the provided monetary wage, different types of consumable non-wage benefits, and the type of worker. Firms minimize total costs, which consist of search cost, training cost and sunk cost. Search cost and training cost are related to the local shortage of skilled labor. Our purpose with this framework has been to conceptualize the mechanism by which non-wage benefits may reduce turnover rate. The aim is to compare the retention effect of different types of benefits. We recognize that this framework is not the most suitable for our study, since it was developed by previous authors to capture the marginal effect from wage and benefits on turnover rate. However, at this point we are not aware of any other framework that would be more suitable. In the following section we develop our main hypotheses.

3.2 Hypotheses for non-wage benefits and labor turnover

We are primarily interested in testing the relationship between the provision of non-wage benefits and labor turnover rate. In order to do so we assume the following:

1. The total amount of compensation per employee is constant between firms. That is, firms provide market efficient compensation packages.

2. The turnover cost is high for Swedish MNCs in China, since they to a large extent rely on long-term employment relationships with specialized workers, as described in 1.1.3.

3. Switching costs are low for Chinese employees due to the high demand for skilled labor caused by the structural shortage of skilled labor, as described in section 2.2.1.

4. More stable Chinese workers have preference for benefits and are attracted to Swedish MNCs in China that offer more benefits in general, in line with the findings of Barron & Fraedrich (1994).

We recognize that these assumtions are strong. According to the framework described above, it is desirable to test for wage levels and the type of worker. However, in our analysis we will not test for these variables, which implies that the above framework is of limited relevance for our thesis. Against this background, our main hypothesis to be tested in section 5 is:

Hypothesis 1: The provision by firms of non-wage benefits has a negative effect on the labor turnover rate.

Based on previous research in section 2, we test for different categories of non-wage benefits related to social insurance, family-friendly benefits, monetary compensation, and perks. We also test for the effect of individual types of non-wage benefits. Thus our further hypotheses for labor turnover rates are:

Hypothesis 2a. The provision by firms of non-wage benefits related to social services has a negative effect on the labor turnover rate.

Hypothesis 2b. The provision by firms of non-wage benefits related to family-friendly benefits has a negative effect on the labor turnover rate.

Hypothesis 2c. The provision by firms of non-wage benefits related monetary compensation has a negative effect on the labor turnover rate.

Hypothesis 2d. The provision by firms of non-wage benefits related to perks has a negative effect on the labor turnover rate.

Hypothesis 3. The provision by firms of different types of non-wage benefits has a negative effect on the labor turnover rate.

We have reason to believe that the provision of non-wage benefits may depend on other external factors within the Chinese labor market. Therefore, we are interested in testing whether the relationship in the study by Juurikkala & Lazareva holds between local shortage of skilled labor, local cost of alternative benefits and the provision of non-wage benefits in the Chinese context. We expect to find the following outcomes:

Hypothesis 4a. High local shortage of skilled labor has a positive effect on firms' provision of non-wage benefits.

Hypothesis 4b. High local costs of alternative non-wage benefits has a positive effect on firms' provision of non-wage benefits.

These hypotheses will be tested in section 5.

4 Method and Data

In the following section, we first present the econometric specifications for models used to test our stated hypotheses. We then proceed by defining the measurements used for our dependent variable, explanatory variables and control variables.

4.1 Econometric specification

To analyze how the provision of non-wage benefits affects employee turnover, we use the framework described in section 3. First, we investigate whether firms manage to reduce labor turnover by providing non-wage benefits and if so what categories and types of non-wage benefits that may effectively reduce the turnover rate. Secondly, we test whether a link can be established between the local shortage of labor, the local unit cost of alternative non-wage benefits, and the use of non-wage benefits.

<u>Non-wage benefits in general</u>

$$\text{Turnover rate} = \propto_0 + \propto_1 * \text{non wage benefits} + \propto_2 * \text{other factors} + u \quad (1)$$

<u>Sum of categories</u>

$$\text{Turnover rate} = \gamma_0 + \gamma_1 * \text{social benefits} + \gamma_2 * \text{family benefits} + \gamma_3 * \text{monetary benefits} + \gamma_4 * \text{goods benefits} + \propto_5 * \text{other factors} + u \quad (2)$$

<u>Sum of types</u>

$$\text{Turnover rate} = \delta_0 + \delta_1 * \text{insurance package} + \delta_2 * \text{pension} + \delta_3 * \text{medical insurance} + \delta_4 * \text{bonus} + \ldots + \delta_{18} * \text{other factors} + u \quad (3)$$

<u>Determinants of non-wage benefits</u>

$$\text{Non wage benefits} = \beta_0 + \beta_1 * \text{shortage of skilled labor} + \beta_2 * \text{local cost of alternative benefits} + \beta_3 * \text{other factors} + u \quad (4)$$

4.2 Variable measurements

In order to test the above relationships, suitable measurements for chosen variables are required, which will be discussed below. We will first state the ideal measures that we would like to use for each variable, and then describe what measurements we have chosen with regards to the various limitations to accessing the ideal measures.

Turnover rate

To measure the turnover rate, we refer to Orkan (1974) in which the author suggests to combine two separate measurements for employee mobility. The first measurement is the number of employees leaving during a certain period divided by the total number of employees at the beginning of the same period. The second measurement is the number of hired employees during a certain period divided by the total number of employees at the beginning of the same

period. By combining these measurements, it is possible to control for the expansion rate of the work force. However, Orkan states that in practice turnover rate is often measured as the crude labor turnover rate, which is defined as the number of leavers in a period divided by the total number of employees at the end of the period or the average number of employees during the same period. Subsequently, we chose to measure the turnover rate by the number of employees leaving in a period divided by the number of employees at the end of the same period.

Non-wage benefits

According to Juurikkala & Lazareva (2012), measuring the amount of non-wage benefits provided by firms is difficult as the benefits are heterogenous and employees value benefits differently. Therefore, they use both a cost-based and value-based approach. The cost-based approach measures the estimated share of costs of non-wage benefits provision in the wage bill. With the value-based approach, the authors asked general managers by what percentage they would need to raise wages to keep employees in the firm if they stopped providing non-wage benefits. Since we take the perspective of the employer, we chose the cost-based approach. We are interested in the average wage level and the average amount of benefits provided to different categories of employees such as white-collar and blue-collar workers. However, as many other researchers have stated, this type of data is difficult to access due to the confidentiality policies of firms (Mitchell 1982). Therefore, we chose to focus on the types of benefits provided and different combinations of these benefits between firms. In order to cover up the wide spectrum of benefits provided, we have selected following benefits which will be measured as dummy variables: pension, medical insurance, unemployment insurance, maternity leave, day care, occupational injury insurance, sick-leave, housing fund, subsidized house loans, profit sharing, coupons, paid days of vacation, vocational training, social investments, perks and other benefits. We have also included the insurance package regulated by law since 2011. Firstly, we will construct a measure that contains an aggregate of these benefits. Secondly, we create different measures based on categories of benefits as described below.

Categories of non-wage benefits

As described in section 2.3, different types of non-wage benefits have been studied in relation to employee turnover. Some studies use an aggregated measurement of non-wage benefits including various types of benefits valued by tax authorities. Other studies focus on one specific category of benefits such as social benefits which normally includes medical care, pension and sick leave. Moreover, there are many studies that only focus on for example health insurance or pension plans. As we can see, there are different ways of categorising non-wage benefits. Therefore, we chose to create several constellations as follows.

The first category is defined as *social benefits*, which contains insurance package, pension, medical insurance, unemployment insurance and occupational injury insurance. The second category is *family-friendly benefits*, which contains maternity leave, day care, housing fund, sick-leave and paid days of vacation. The third category is *monetary benefits*, which contains subsidized

house loans, bonus and profit sharing. The fourth category is *goods and services*, which contains coupons, perks and other benefits. We have selected these categories both based on previous research findings as described in section 2.3, and based on the wide variety of benefits that are provided by Swedish MNCs in China.

Shortage of skilled labor

Juurikkala & Lazareva (2012) use a measure for labor market tightness to explain the provision of non-wage benefits. The authors use a survey to construct a measure for the average time required for firms to search for a new employee. By comparing the average required search time for firms with the required time employees must notify their employers prior to resignation, they are able to measure labor market tightness. It is found that labor market tightness has a positive and significant effect on the amount of social benefits provided by firms. In the absence of such measurements, we construct a measure for local shortage of skilled labor using regional statistics (NBSC). As a measure of the supply of skilled labor, we use regional statistics for the population attaining a college education or higher education. To measure the demand for skilled labor we use regional statistics for the density of industrial enterprises above designated size, which consists of all state-owned and non-state owned enterprises with annual revenue above 20 million yuan. We then define the local shortage of skilled labor as the number of inhabitants with higher education divided by the density of industrial enterprises above a designated size in the region. For more description, see section 4.3.

$$\text{Shortage of skilled labor} = \frac{\text{Population with higher education}}{\text{Density of enterprises above designated size}}$$

Cost of alternative non-wage benefits

As a measure of local availability of the regional social infrastructure, Juurikkala & Lazareva (2012) construct a measure based on the residential area per capita, the number of places at pre-school institutions per child, the number of hospital beds per 1000 inhabitants, and the number of swimming pools per 1000 inhabitants. The authors chose these variables to reflect four dimensions of social infrastructure included in their study: housing, day care, health care, and recreational activities. The idea is that this measurement should reflect the costs for an employee to arrange new social services when quitting from the social service-providing firm. We have referred to these costs as the switching cost for workers in our framework. Since we have included many types of benefits in our study, we will use a general price index per region (NBSC) as a measurement for the local costs of alternative non-wage benefits. Other measurements that could have been used are differences in wealth between provinces such as minimum wage or GDP levels. We recognize the difficulty in finding a suitable measure for this variable, and we would like to point out that the price indices we have available contains very little variation which could affect the result.

$$\text{Cost of alternative non-wage benefits} = \text{General price index per region}$$

Control variables
According to Zheng & Lamond (2009), there are a number of organizational factors that determine the employee turnover for MNCs in Asia, such as organizational size, investments in vocational training, and the share of expatriate managers. In line with their results, we would like to control for these factors. Another factor that could affect employee turnover is the large regional differences in legislation and policies, as described in section 1.1.3.

In our study, employer size will be measured by number of employees at the local subsidiary, in line with Zheng & Lamond (2009). The nature of industry is divided into manufacturing and service, and we will measure it as a dummy variable. We will also control for the type of facility such as office, factory or store. The length of operation in local subsidiary will be measured by number of years from establishment in China. We would also like to measure the vocational training variable as the average training expenditure per employee used in Zheng & Lamond (2009). However, in line with our above reasoning about non-wage benefits, we will measure it as a dummy variable. Lastly, we will control for provinces. Other variables that we would ideally like to control for are wage levels, position within the company, and socioeconomic factors. We recognize that within the scope of this paper we will not be able to control for all these factors and we will discuss potentially omitted variables further in section 4.5.1.

4.3 Data from Swedish MNCs in China

Data collection
Based our econometric specifications and defined variables, we collected primary raw data from Swedish MNCs in China through an online survey directed to local HR-managers. Our ambition was to contact the entire population of Swedish companies in China. In order to do so we combined the lists of companies listed on the website of Swedish Chamber of Commerce in China and the website of Embassy of Sweden in China. The total number of companies on our list was 396. Over a period of five weeks, we contacted in total 259 companies by phone and e-mail. The other 137 companies on the list were not contacted for different reasons. Some companies had changed ownership, and others did not have contact information available on their websites. Moreover, some companies were start-ups or small enterprises that employed a very small number of staff. Out of the 259 companies we contacted, we received a total of 107 responses from HR-managers regarding their respective business units. This implies a 41.3 percent response rate.

Survey design
We constructed an online survey used to collect data from HR-managers regarding employee turnover rates and provision of different types of non-wage benefits. The survey was designed to be answered at the business unit level, so that each survey response would represent a certain factory, office, or plant etc. The survey contained 11 questions regarding the following information: parent company (name, year established in China, and number of subsidiaries), subsidiary (name, year established in China, and number of facilities), type of facility, number of employees, province, turnover rate, types of non-wage

benefits provided (17 alternatives including insurance package, additional medical insurance, additional pension etc.) See table 18 in appendix for a complete list of survey questions.

Overview of data

Below we provide an overview of the data collected from Swedish MNCs in China. First, we discuss some general observations in the data. We then present descriptive statistics for the dependent variable, turnover rate, and the independent variables, provided non-wage benefits. Moreover, we display an overview of the control variables number of employees, length of operation, nature of industry, type of facility and provinces represented in our sample.

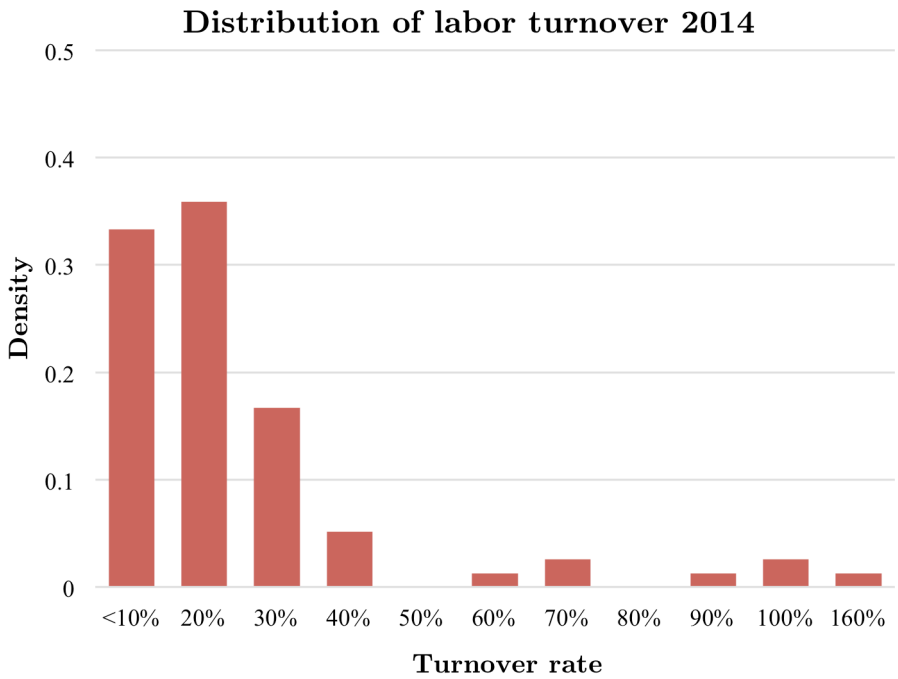
First, we would like to bring up that in general there is large variation in the data, in particular for the number of employees which varies between 1 and 8880. We therefore raise the question whether we should restrict the data set to a specific range of employer size or divide the sample into different groups based on the number of employees. Barth & Dale-Olsen (1999) found that there was no relationship between the compensation policy and turnover rate in companies with less than 25 employees. They reported one regression for only small employers, concluding that there was no relationship between compensation policy and turnover in the group, and then proceeded by excluding the small employers from their main analysis. The authors argue that there are both econometric and theoretical reasons for this. Econometrically, the uncertainty is larger in smaller establishments due to register errors and measurement errors from integer problems. Theoretically, firms require a certain size in order display credible wage policies in the market. The later explanation can be related to trust and the importance of psychological contracts between the employer and the employee as described in section 2.2.3.

In line with the findings of Barth & Dale-Olsen, we report a separate regression for employers with less than 25 employees (see table 9 in appendix) and we proceed by excluding these observations from our main analysis. Subsequently, we drop 23 observations from our sample and the total number of observations remaining is 84. After dropping these observations, we observe that 50 percent of the sample has more than 170 employees. Following is an overview of the 84 observations.

Table 3: descriptive statistics of labor turnover rate, employer size, and length of operation

Variable	Obs	Mean	Std. Dev.	Min	Max
Turnover rate	83	0.196	0.23	0	1.57
Number of employees	83	409	1033	26	8880
Length of operation	84	15.08	0.85	2	45

Figure 1: distribution of labor turnover rate



As described in table 3 above, the employee turnover rate in our sample varies between 0 percent and 157 percent. The mean turnover rate in the sample is 19.6 percent. Thus we can see that the sample average turnover rate is not far from the average turnover rate in the consumer products and high-tech industries in China in 2013 (Aon Hewitt 2013). As seen in figure 1, the distribution of the turnover rate in our sample is skewed towards the lower range with few observations in the higher range. Due to the uneven distribution of the variable, we raise the question whether there could be extreme values in the data, outliers, that should be dropped. However, against the background of the high average employee turnover rate in the Chinese labor market and since there are in fact multiple observations in the higher range of our sample we argue that the values are not extreme and therefore we chose to keep all observations. The interpretation of a turnover rate above 100 percent is that the number of employees leaving throughout the year was higher than the total number of employees at the end of the year.

Table 4 displays the frequency of responses for the various types of benefits. The most frequently provided benefits in the sample are insurance package, bonus and paid days of vacation. The least frequently provided benefits are subsidized house loans, profit sharing and unemployment benefits. Due to the binary character of the variables, and the large variation in frequency between provided benefits, we chose to construct a weighted average index variable for non-wage benefits, based on the frequency of provided benefits. Thus, the weighted average index variable of non-wage benefits is the mean of the sum of all weighted benefits provided, see appendix for calculations. Moreover, we observe that the correlation between benefits is relatively small (see table 19 in appendix)

Table 4: frequency of provided non-wage benefits in the sample

Type of benefit	Number of respondents providing specific benefit	% of total respondents
Insurance package	82	97.62%
Bonus	82	97.62%
Paid days of vacation	82	97.62%
Paid sick-leave	75	89.29%
Medical insurance	68	80.95%
Vocational training	65	77.38%
Injury insurance	45	53.57%
Perks and other benefits	41	48.81%
Maternity leave	32	38.10%
Pension	30	35.71%
Coupons	22	26.19%
Housing	21	25.00%
Social investment	18	21.43%
Daycare	7	8.33%
Unemployment benefits	5	5.95%
Profit sharing	5	5.95%
Subsidized loans	1	1.19%

As seen in table 10 in appendix, within our sample, 46 percent of the facilities are offices, 34 percent of the facilities are factories and 15 percent of the facilities are plants. Only 1 percent of the facilities are stores and 4 percent of the sample consists of other types of facilities, such as warehouses. Moreover, our sample consists mainly of facilities in the manufacturing industry with only one facility in the service industry (see table 11 in appendix). This can partly be explained by our decision to exclude the observations with less than 25 employees, which mostly consisted of facilities within the service industry. Another explanation could be that the problem of employee turnover may be more prevalent for MNCs in the manufacturing industry since they often require a larger workforce, and that these companies were more interested in participating in the study and are therefore over-represented in our sample. This implies that our results will mainly apply to facilities in the manufacturing industry, and it will be less relevant to control for the nature of industry in the regressions.

Statistics

To complement our collected data, we use regional statistic from the National Bureau of Statistics of China (NBSC). These statistics are used to construct measures for the local shortage of skilled labor and the cost of alternative non-wage benefits, as described in section 4.2. We use statistics from 2013 for the population attaining college education or above, the number of industrial enterprises above designated size, and general price index.

4.4 Statistical method

In our econometric specification, we define turnover rate as the dependent variable and non-wage benefits as the independent variable to test our main hypotheses. We are interested in testing whether there is a causal relationship between non-wage benefits and turnover rate. Since our dependent variable, turnover rate, is limited to positive values, our analysis requires a statistical model that is suitable for limited dependent variables. One appropriate model would be the Tobit model, which implies non-negative predicted values for turnover rate (Wooldridge 2013). However, this model is also based on the assumption of a latent variable that is unobservable and can take negative values. Since it is unlikely that the number of employees leaving the firm will be negative, we argue that the Tobit model is suitable, which is in line with previous studies. Therefore, we will test hypotheses 1-3 using the Tobit model. For hypothesis 4 when we test the causal relationship between local shortage of skilled labor, local cost of alternative non-wage benefits, and non-wage benefits, a regular OLS regression will be applied since the dependent variable is non-wage benefits and it can take continuous values.

4.5 Data issues

In general, a large proportion of Swedish MNCs in China are represented in our sample. In this sense, the sample could be considered as representative for the population. However, there are a number of issues in the data that we would like to bring up. First of all, the survey response rate was 41.3 percent and since the respondents have participated on a voluntary basis, there is a risk for self-selection bias. Moreover, the survey was designed to be answered per facility and the sample consists of several observations from certain subsidiaries and only one observation from other subsidiaries. This distribution of observations between subsidiaries may therefore imply a self-selection bias. Moreover, the data could contain measurement errors due to respondents misinterpreting the survey questions or if respondents have submitted information based on uncertain measurements or biased judgement. However, we have no reason to believe that there are systematic measurement errors in the data.

We consider the sample size to be the main problem with our data set. There are two main reasons to consider this problem. First of all, there are large differences in the variation between the variables in the data set. In particular, the variation in the employer size variable is very large compared to the other variables, which implies that it may be difficult to find significant relationships in the data. Secondly, the degrees of freedom are reduced by the large number of binary independent variables for different types of non-wage benefits included in our model. In combination with the small sample size, this could potentially undermine the relationships we expect to find. These problems would have been more moderate if the sample size had been sufficiently large.

Another problem that we have identified in the data is the uneven distribution of observations between provinces (see table 12 in appendix). Most observations are concentrated to a few provinces, and only 15 out of 32 provinces are represented in the sample. This implies that we may not be able

to draw conclusions about potential differences between regions. In the following sections we discuss the issue of omitted variables and we bring up potential problems with the measurement for non-wage benefits as weighted average of binary variables.

4.5.1 Omitted variables

As discussed in section 2.3, empirical findings suggest that benefits as a share of the total compensation provided by firms affects the employee turnover rate. Since we have not included wage levels in our study, there is a risk of omitted variable bias. However, we argue that if wages are efficient across the labor market it is reasonable to assume a constant compensation level for a given type of worker. Thus, our results for how different types of non-wage benefits affects turnover rate would not be severely affected by wage levels.

Other variables that may affect the labor turnover rate and that are not included in our analysis are the turnover costs for firms, the switching costs for employees, and the type of worker. We have assumed these factors to be fixed, as previously discussed in our theoretical framework. Moreover, we have not been able to include socioeconomic factors regarding employees, such as gender, social status, age, tenure, and education attainment, nor the share of expatriate managers which may affect the turnover rate according to Zheng & Lamond (2009).

4.5.2 Endogeneity

Juurikkala & Lazareva (2012) find endogeneity in firms' provision of non-wage benefits, which is determined by the local tightness of the labor market and the local access to social services. The authors handle this issue by using an instrumental variable approach. Due to the contextual similarity in our study, we have reason to suspect that the variable for non-wage benefits is endogenous. We will therefore test in hypothesis 4 whether the relationship found by Juurikkala & Lazareva holds in our sample. Moreover, we recognize the difficulty in finding a suitable instrument that affects non-wage benefits but is uncorrelated with the employee turnover rate. We will discuss this issue further in our analysis and interpretation of results from hypothesis 4.

4.5.3 Weighted average of binary variables

When constructing the variables for non-wage benefits and categories of benefits, we used a weighted average of the binary variables for different provided benefits. By using the weighted average, we account for the differences in frequency between the benefits. We recognize that there may be other ways to construct this variable, but we were not able to find a more suitable method. As will be showed in the analysis, using unweighted or weighted variables for different types of benefits affects the results significantly. This should not be surprising as for example, benefits that are provided by only one percent of the firms should not be equally important as benefits provided by 99 percent of the firms. We will therefore use the weighted variables and we argue that these are more representative for the real impact of the benefits than the unweighted variables suggest. Furthermore, since the constructed

variables for non-wage benefits and categories of benefits consist of binary variables, our results will be interpreted for binary variables.

5 Results and Analysis

In this section, we present statistical regressions of our hypotheses followed by descriptions of the regression results. We will then provide a short interpretation and discussion of the result for each hypothesis.

Since the frequency of provision may have impact on the result, we will test whether there are any differences in regression results when we use an unweighted or weighted non-wage benefits variable for all hypothesis. As Table 13 in appendix suggests, there are some slight differences between weighted and unweighted non-wage benefits variable when testing hypothesis 1. However, the results remains consistent regarding the statistical significance of the variable. The same result holds for hypothesis 2 and 3 (see table 14 and 15 in appendix). Hence, we chose to use the weighted variables for all hypothesis in the regressions as followed.

5.1 Test of hypothesis 1

Hypothesis 1 tests whether the provision of non-wage benefits have a negative effect on turnover. Table 5 contains the regression results of non-wage benefits and turnover in different models, from including none to one and to all control variables. We observe that none of the control variables are statistically significant. However, the main explanatory variable non-wage benefits gives consistent results in all models, regardless of control variables. Model 7 shows that the provision of non-wage benefits with all types of benefits included reduces the turnover rate by 1.27 percentage points compared to non-provision, when holding other variables constant. This negative effect is statistically significant at 1 percent level. Therefore, we conclude that the provision of non-wage benefits in general has a negative effect on turnover rate. The number of log likelihood is used to investigate whether the model is a good fit of the data. Minor differences of log likelihood between models in table 5 indicate that we cannot reject the null hypothesis that more restricted models are better fitted than less restricted models.

Table 5: Tobit regression of non-wage benefits in labor turnover rate

Dep. variable: turnover rate	Model 1 Tobit	Model 2 Tobit	Model 3 Tobit	Model 4 Tobit	Model 5 Tobit	Model 6 Tobit	Model 7 Tobit
Non-wage benefits	-1.299***	-1.304***	-1.390***	-1.249***	-1.260***	-1.270***	-1.271***
	(0.396)	(0.399)	(0.408)	(0.447)	(0.445)	(0.448)	(0.447)
Number of employees		1.51e-05	1.40e-05	1.48e-05	1.38e-05	1.42e-05	1.40e-05
		(2.28e-05)	(2.28e-05)	(2.27e-05)	(2.27e-05)	(2.27e-05)	(2.29e-05)
Nature of industry			-0.107	-0.0952	-0.109	-0.111	-0.111
			(0.217)	(0.217)	(0.216)	(0.216)	(0.216)
Length of operations				-0.00201	-0.00233	-0.00228	-0.00224
				(0.00263)	(0.00264)	(0.00265)	(0.00269)
Vocational training					0.0507	0.0492	0.0490
					(0.0565)	(0.0569)	(0.0569)
Province						-0.00135	-0.00135
						(0.00599)	(0.00599)
Type of facility							0.00160
							(0.0217)
Constant	0.626***	0.621***	0.761***	0.732**	0.716**	0.735**	0.732**
	(0.133)	(0.134)	(0.277)	(0.278)	(0.277)	(0.290)	(0.293)
Log likelihood	9.377	8.973	8.890	9.180	9.582	9.607	9.610
Observations	83	82	81	81	81	81	81

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5.2 Test of hypothesis 2

To test hypothesis 2, various types of benefits are divided into four different categories: social benefits, family-friendly benefits, monetary benefits, goods and services. Firstly, we test for each of the four categories separately, controlling for other factors. Then, we test a regression with the four categories together, controlling for other factors. The regressions results are presented in the table 6. Both in Model 1 and 6, the social benefits category is statistically significant at 1 percent level and indicates a strong relationship with turnover rate. Firms that provide social benefits reduce turnover rate by 0.729 percentage points compared to firms that do not provide social benefits, holding other variables fixed. Also, Model 6 suggests that turnover rate is affected by the provision of monetary benefits and goods and services. However, these effects should be interpreted cautiously since they are only significant at 10 percent level and none of them is statistically significant in the individual test in Model 3 and 4. The conclusion from testing hypothesis 2 is that social benefits have a negative effect on turnover rate. A causal relationship between the other three categories and turnover rate could not be pointed out with our models. The log likelihood of all models is presented in table 6. With some calculations, the null hypothesis that more restricted models (Model 1, 2, 3, 4, 5) are better fitted than the less restricted model (Model 6) can not be rejected.

Table 6: Tobit regression of social benefits, family-friendly benefits, monetary benefits, and goods and services on labor turnover rate

Dep. variable: turnover rate	Model 1 Tobit	Model 2 Tobit	Model 3 Tobit	Model 4 Tobit	Model 5 Tobit	Model 6 Tobit
Social benefits	-0.729***					-0.771***
	(0.227)					(0.233)
Family-friendly benefits		-0.317				0.160
		(0.303)				(0.298)
Monetary benefits			0.871			1.010**
			(0.547)			(0.488)
Goods and services				-0.291		-0.293*
				(0.182)		(0.170)
Social investments					-0.378	-0.304
					(0.290)	(0.271)
Number of employees	6.01e-06	1.32e-05	1.17e-05	2.10e-05	1.60e-05	1.27e-05
	(2.27e-05)	(2.39e-05)	(2.38e-05)	(2.41e-05)	(2.39e-05)	(2.22e-05)
Nature of industry	-0.140	-0.00896	-0.00814	-0.0478	-0.0226	-0.210
	(0.215)	(0.223)	(0.222)	(0.222)	(0.222)	(0.207)
Length of operations	-0.00159	-0.00422	-0.00605**	-0.00633**	-0.00556**	-0.00391
	(0.00270)	(0.00280)	(0.00260)	(0.00262)	(0.00256)	(0.00278)
Vocational training	0.0801	0.0386	0.0457	0.0408	0.0354	0.0667
	(0.0572)	(0.0601)	(0.0595)	(0.0590)	(0.0600)	(0.0566)
Province	0.00186	-0.000519	0.00127	-0.000797	-0.00201	0.000283
	(0.00591)	(0.00629)	(0.00622)	(0.00621)	(0.00647)	(0.00598)
Type of facility	-0.00209	0.00271	0.00445	0.00253	-7.65e-05	0.00343
	(0.0215)	(0.0229)	(0.0229)	(0.0226)	(0.0227)	(0.0209)
Constant	0.583**	0.358	-0.0424	0.349	0.308	0.393
	(0.257)	(0.273)	(0.301)	(0.254)	(0.251)	(0.307)
Log likelihood	10.610	6.337	7.113	7.041	6.637	14.641
Observations	81	81	81	81	81	81

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5.3 Test of hypothesis 3

According to hypothesis 3, we will now test the relationship between turnover rate and each type of benefits separately. The test results are presented in table 15 in appendix. We find that medical insurance within the social benefits category has a negative effect on turnover at 1 percent significance level. Holding other variables fixed, the provision of medical insurance is associated with a reduction of 0.234 percentage points in turnover rate compared to firms without medical insurance provision. We also find that there is a relationship between day care and turnover, with a statistically significance level at 5 percent. Moreover, bonus seems to have a positive effect on turnover at 5 percent significance level. Holding other factors fixed, the provision of bonus increases turnover rate by 0.358 percentage points compared to non-provision.

5.4 Test of hypothesis 4

As described in section 3.2, we are interested in testing whether the relationships between local shortage of skilled labor, local cost of alternative benefits and provision of non-wage benefits in China hold, as Juurikkala & Lazareva (2012) suggested in their study. The ratio of education to enterprises and general price index are used as proxies for local labor shortage and local cost of alternative benefits. As discussed in section 4.4, we will apply a regular OLS regression for this hypothesis. The test results are summarized in table 7. Model 1 tests the two variables together and Model 2 and 3 test them individually. We find that the local shortage of skilled labor has a positive effect on non-wage benefits and this effect is statistically significant at 1 percent level in Model 2. Holding other factors constant, one unit increase in the ratio of education to enterprises, raises the probability that provision of non-wage benefits occurs by 4.2 percentage points. Model 3 suggests that general price index also has a positive effect on the provision of non-wage benefits. One unit increase in the general price index raises the probability that provision of non-wage benefits occurs by 5.56 percentage points, holding other variables fixed. However, we notice that this effect is only statistically significant when the ratio of education to enterprises is omitted. Moreover, the control variable length of operation in the local subsidiary is statistically significant at 1 percent level for all three models. One additional year of operation in the local subsidiary increases the probability that provision of non-wage benefits occurs by 0.233 percentage points.

Table 7: OLS regression of local labor shortage, general price index, and non-wage benefits

Dep. variable: non-wage benefits	Model 1 OLS	Model 2 OLS	Model 3 OLS
Ratio of education to enterprises	0.0421**	0.0477***	
	(0.0199)	(0.0158)	
General price index	0.0150		0.0556**
	(0.0318)		(0.0259)
Number of employees	-1.50e-07	-2.04e-08	-2.64e-07
	(5.70e-06)	(5.66e-06)	(5.83e-06)
Length of operations	0.00233***	0.00233***	0.00241***
	(0.000611)	(0.000608)	(0.000624)
Vocational training	-0.00363	-0.00297	-0.00233
	(0.0143)	(0.0141)	(0.0146)
Province	0.00163	0.00113	0.00161
	(0.00200)	(0.00168)	(0.00204)
Type of facility	-0.000789	-0.000428	-0.00135
	(0.00548)	(0.00540)	(0.00560)
Constant	-1.270	0.268***	-5.411**
	(3.260)	(0.0265)	(2.663)
Observations	80	80	80
R-squared	0.278	0.276	0.233

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5.5 Test of medium sized and large sized facilities

Although 23 observations with employees less than 25 were dropped, a large variation of the number of employees in the data still exists and may affect the results significantly. Therefore, we will investigate whether the firm size, measured by number of employees, has any effect on the relationship between the provision of non-wage benefits and labor turnover rate. Observations are divided into medium sized facilities and large sized facilities, where facilities with less than 170 employees are defined as medium sized and facilities with more than 170 employees are defined as large sized. As discussed above, 50 percent of the observations have less or more than 170 employees. All four hypotheses will be tested for medium sized and large sized facilities separately.

Table 8 illustrates the test results for hypothesis 1 and 2. Model 3 and 4 show that the aggregated non-wage benefits variable is statistically significant at 1 percent level for large sized facilities, but not for medium sized at all. The provision of non-wage benefits is associated with a reduction of 3.841 percentage points in turnover rate compared to non-provision for large sized facilities, holding other factors constant. On the level of category, social benefits only has a negative effect on turnover for large sized facilities at 1 percent significance level as shown in Model 2. The provision of social benefits reduces turnover rate by 1.754 percentage points compared to non-provision for large sized facilities. Moreover, goods and services also have a negative effect on turnover for large sized facilities at 1 percent significance level. The provision of goods and services reduces turnover rate by 1.043 percentage points in comparison with non-provision for large sized facilities.

Table 16 in appendix presents the results from testing hypothesis 3, indicating mixed results for medium sized and large sized facilities. When testing the benefits individually, medical insurance, day care, and perks and other benefits have a negative effect on turnover rate for large sized facilities and these effects are statistically significant at 1 percent level. The provision of medical insurance is associated with a reduction of 0.570 percentage points in turnover compared to non-provision for large sized facilities. The provision of day care reduces turnover rate by 4.210 percentage points compared to non-provision. However, we should note that the standard deviation is large. For large sized facilities, the provision of perks and other benefits is also associated with a decrease of turnover rate by 0.529 percentage points in comparison with non-provision. Moreover, social investments affect turnover at a 5 percent significance level for large sized facilities. Firms that made social investments could reduce the turnover rate by 0.7 percentage points, compared to firms that did not invest. For medium sized facilities, social investments also have a negative effect on turnover with a 5 percent significance level. Social investments are associated with a decrease in turnover rate by 0.416 percentage points, compared to firms without these investments. Moreover, medical insurance, paid sick leave, subsidized loans, and bonus affect turnover rate positively, which indicates that provision of these benefits increases turnover rate.

Table 17 in appendix summarizes the test results of hypothesis 4 for medium sized and large sized facilities. The ratio of education to enterprises has a positive effect on the provision of non-wage benefits for both medium

sized and large sized facilities. However, these effects seems to be insufficient. Any relationship between general price index and the provision of non-wage benefits could not be found, for neither medium sized nor large sized facilities.

To summarize the test results of our hypotheses, we conclude that the provision of non-wage benefits in general has a negative effect on turnover rate. By dividing these benefits into four different categories, we find that only the social benefits category affects turnover negatively. The provision of medical insurance within the social benefits category contributes to the reduction of turnover rate, when testing the different types of non-wage benefits individually. These effects are considerable for large sized facilities. Additionally, it is notable that social investments and the provision of perks reduce turnover rate for large sized facilities. The local shortage of skilled labor seems to have a positive effect on the provision of non-wage benefits.

Table 8: Tobit regression of non-wage benefits and categories of non-wage benefits on labor turnover rate

Dep. variable: turnover rate	Model 1 Medium size facilities	Model 2 Large size facilities	Model 3 Medium size facilities	Model 4 Large size facilities
	Tobit	Tobit	Tobit	Tobit
Non-wage benefits			0.0699	-3.841***
			(0.297)	(0.780)
Social benefits	0.00395	-1.754***		
	(0.166)	(0.309)		
Family-friendly benefits	0.105	0.0802		
	(0.211)	(0.423)		
Monetary benefits	0.431*	2.691		
	(0.248)	(6.304)		
Goods and services	0.0556	-1.043***		
	(0.133)	(0.251)		
Social investments	-0.377*	-0.560		
	(0.217)	(0.341)		
Number of employees	0.000697	4.02e-06	0.000538	-3.86e-07
	(0.000427)	(2.32e-05)	(0.000389)	(2.64e-05)
Nature of industry	0.0205	-	0.0354	-
	(0.0970)		(0.0973)	
Operation length	-0.000127	-0.00354	0.000572	0.000707
	(0.00231)	(0.00365)	(0.00194)	(0.00393)
Vocational training	-0.0290	-0.0750	-0.0231	-0.0408
	(0.0442)	(0.0797)	(0.0432)	(0.0855)
Province	-0.00669*	-0.000416	-0.00620	-0.00684
	(0.00387)	(0.00869)	(0.00388)	(0.00946)
Type of facility	-0.0168	0.0398	-0.0256	0.0435
	(0.0181)	(0.0271)	(0.0181)	(0.0307)
Constant	0.0306	0.299	0.176	1.526***
	(0.177)	(2.053)	(0.167)	(0.292)
Log likelihood	39.023	7.659	36.399	1.302
Observations	40	41	40	41

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5.6 Interpretation of test results

Hypothesis 1

Can Swedish MNCs' provision of non-wage benefits reduce labor turnover in their subsidiaries in China and if so, how can this be explained? In support of our first hypothesis, we find evidence that the provision of non-wage benefits in general contributes to reducing the labor turnover in Swedish MNCs in China. One explanation for this result could be that more stable workers are attracted to employers that offer more benefits (Barron & Fraedrich 1994), as described in section 3.1. Thus, Swedish MNCs in China that offer more benefits may attract more stable workers with a lower propensity to quit, which lowers their labor turnover rate. Subsequently, the average employee's marginal utility of non-wage benefits exceeds the marginal utility of wage, which implies that providing more benefits raises the utility for workers and thereby reduces their propensity to quit (Frazis & Loewenstein 2013; Dale-Olsen 2006). A further implication of this argument is that Swedish MNCs that offer less benefits may attract less stable workers. Moreover, employers with less stable workers need to provide more benefits in addition to given wage, compared to firms with more stable workers, in order to raise the utility for workers enough to achieve an attachment effect. In this case, employer size would be of high importance since large firms are often able to achieve economies of scale and thereby offer more benefits than small firms. Moreover, the attachment effect may be affected by the partial coverage of social security as well as the difference in access to social benefits between rural and urban population. For example, Swedish MNCs that operate in regions with a high proportion of migrant workers may see larger attachment effects from providing non-wage benefits than firms in urban regions with a smaller proportion of migrant workers. Overall, we find evidence for our first hypothesis that Swedish MNCs in China can reduce their labor turnover by providing non-wage benefits, which can be explained by the more stable type of worker that is attracted to benefit-providing employers.

Hypothesis 2

Are there significant differences between the effect of different categories of benefits, and if so, how can these differences be explained? Based on our test results of hypothesis 2, we find that social benefits have a significant negative effect on turnover rate. Even though all firms are obligated to provide the insurance package, we find that social benefits are highly valued and still have effect on turnover. One explanation could be the lack of full coverage of social benefits in the Chinese society. Since the obligation for employers to provide the insurance package is newly introduced and only covers the basic needs at a minimum level, it might be insufficient. Another possible explanation could be the lack of public transparency in the use of the mandatory insurance funds, which results in a distrust for whether these funds are still available in need as discussed in section 1.1.2. Conclusively, we argue that the provision of social benefits can be used as an effective tool to reduce turnover for Swedish MNCs in China, unless extensive reforms regarding the social welfare system will be implemented and realized nationwide, which is unlikely to occur within a near future.

The provision of family-friendly benefits, for example maternity leave and daycare, may correspond to the increasing participation of women in the labor market, and their consequent need for a balanced work and family life (Baughman 2003). We are surprised by the fact that family-friendly benefits do not have any significant effect on turnover in our tests. One possible explanation could be that the share of women present in the Chinese labor market is not as high as in Western economies. Since there are few responses of family-friendly benefits in the sample, we suspect that female workers are underrepresented in Swedish MNCs within the manufacturing industry in China. In summary, for Swedish MNCs with a high share of female workers or firms with the intention to attract and retain more competent female workers, we believe that the provision of family-friendly benefits will be useful in obtaining attachment effect and reducing turnover.

Since Chinese workers in general have high saving rates and thus may prefer monetary payoffs, we expected a negative effect of monetary benefits on turnover. On the contrary, we find a positive relationship between bonus and turnover rate in our sample. One explanation might be that Swedish MNCs with a performance-based compensation system attract employees with preference of monetary payoffs and short-term incentives as discussed in section 3. If the compensation for an employee is only based on its productivity and generated profit, the employee might not be attached to the firm and therefore may have higher propensity to quit when the firm or the employee does not perform well. This relates to the importance of building relational contracts, which requires mutual obligations and high integration. We conclude that monetary benefits are not effective in reducing turnover for Swedish MNCs who seek to build long-term relationships with their employees. Regarding the provision of goods and services, we do not find a significant effect on turnover. An explanation could be the large variation in the types of goods and services provided by firms in our sample. The large variation may depend on what tax benefits and economies of scale the firms have access to. We believe that if Swedish MNCs intend to provide good and service, they should combine different types of these benefits that are cost efficient.

Hypothesis 3

Are there significant differences between the effect of different types of benefits, and if so, how can these differences be explained? According to our results for hypothesis 3, there are considerable differences in the effect on labor turnover between different types of non-wage benefits. We find evidence that the provision of medical insurance by Swedish MNCs has a negative effect on labor turnover. However, we can not draw any conclusions regarding the effect of the other types of benefits. One possible interpretation of the significant effect of medical insurance on turnover rate is that there might be job-lock in the Chinese labor market, in terms of health care. In the presence of job-lock, Swedish MNCs in China that provide medical insurance can create job mobility barriers to retain employees, as long as healthcare is not widely provided by competitors or by the state (Mandrian 1994). This explanation is in line with the above reasoning regarding partial social security coverage and nationwide reforms of the welfare system.

Hypothesis 4

Are Swedish MNCs' provision of non-wage benefits determined by the local shortage of skilled labor and local costs of alternative benefits in China? In the fourth hypothesis, we find evidence that higher local shortage of skilled labor increases the probability of the provision of benefits. That is, Swedish MNCs provide more non-wage benefits in general in regions with high shortage of skilled labor. In line with Juurikkala & Lazeva (2012), we argue that the local shortage of skilled labor in China raises the difficulties for Swedish MNCs to find and retain skilled employees. The shortage implies high turnover costs, such as search and training costs, which are already high by assumption for Swedish MNCs since they often require a specialist rather than generalist workforce (section 1.1.3). In order to reduce these costs, firms are required to offer more competitive compensation such as high wages or attractive non-wage benefits, that may increase the utility of workers and thus reduce their propensity to quit. We conclude that the local shortage of skilled labor has a significant effect on Swedish MNCs provision of benefits. However, we do not find evidence that the local cost of alternative benefits determines the provision of non-wage benefits. One reason could be that our measurement for alternative non-wage benefits, general price index by region, does not contain much variation and therefore relationships may not be drawn. Another reason could be that the shortage of skilled labor is a more central factor to the problem of high turnover rates in China compared to the situation in Russia, as studied by Juurikkala & Lazeva. For instance, the large number of MNCs entering the Chinese market after the liberalization reforms contributed to the expansion of a labor intensive manufacturing industry, which implied high demand for labor. Contrarily, the Russian industry has been more capital intensive. Thus, the high demand for labor in China may have been a more central issue to labor turnover, whereas underdeveloped social infrastructure may have been a more central issue in Russia.

In term of control variables, we conclude that the employer size has large impact on the result and that the effect of non-wage benefits on turnover is more significant for larger employers. Additionally, we are surprised about the large differences in the results between medium and large sized employers. In theory, this could be explained by economies of scale in provision of different types of non-wage benefits. Another reason is that firms may require a certain size in order to display a credible wage policy in the market (Barth & Dale-Olsen 1999). In practice, the difference in results may be due to the large variation of employer size in our sample.

5.7 Discussion of test results

Even though a large proportion of Swedish MNCs in China is represented in our sample, the sample size is still relatively small. This, in combination with the large variation in employer size, the large regional concentration in the data, as well as binary explanatory variables, may have affected our regression results. Moreover, since we have only been able to measure non-wage benefits as binary, and since the cost of these benefits as share of wages is not available, we can not estimate the effect different amounts of benefits has on turnover.

For example, we can not draw conclusions such as 10 percent increase in benefits expenditure reduces turnover by one percent.

We had expected to find difference in the attachment effect of non-wage benefits between provinces, but due to the large regional concentration in the data, we were not able to test for these differences. We have reason to believe that employees have different preferences depending on the type of business operation they work within. In turn, firms choose to establish in the most advantageous provinces. Overall, the geographic locations of firms are determined by the closeness to customers, natural resources, labor force, or market depending on the nature of their business operations. For example, firms within the high-tech industry establish in industrial zones with developed infrastructure and access to skilled labor. On the other hand, firms in the Paper and Pulp industry that are dependent on natural resources establish in remote areas with less developed infrastructure and lower access to skilled labor. Our sample mainly consists of firms in the manufacturing industries as opposed to the service sector. As mentioned previously, the labor shortage is significant within the manufacturing industries, in particular in the Yangtze River Delta Region and the Pearl River Delta Region. Even though the shortage of skilled labor is extensive overall, the reasons for the shortage may vary. For Swedish MNCs in industrial zones, the shortage may be due to high competition. On the contrary, labor shortage in remote areas is rather due to underdeveloped social infrastructure and community at large. Hence, these various reasons imply that different types of benefits should be provided in order to attract and retain employees. For example, firms in industrial zones are more dependent on adjusting to compensation offered by competitors, whereas firms in remote areas may be required to invest in local infrastructure, such as housing.

Omitted variables such as wage and socioeconomic factors may have affected our results, especially since the control variables in our regressions were not significant. We find that local shortage of skilled workers affects the provision of non-wage benefits in hypothesis 4. This implies that there is endogeneity in our explanatory variable, which may cause a biased result. As discussed in section 4.4.2, we have considered the possibility to use an IV approach. Ex-post, we believe that turnover cost would have been a suitable instrument for non-wage benefits as it is unlikely to be correlated with turnover rate. As described in section 3.1, turnover costs refer to sunk costs, training costs and search costs. It is unlikely that high training costs or sunk costs lead directly to high turnover rate. The reverse causality is also unlikely to hold. In order to use this instrument, we would require measurement such as the training and recruitment expenditure per employee. However, in the absence of such measurement we were not able to test this approach.

We evaluate whether our model is suitable for testing our hypotheses in this data. For hypothesis 1 to 3, we chose a Tobit model since our dependent variable is limited to positive values. Even though the best fitting models provide a log likelihood close to zero, they are still positive which implies that we have reasons to question the validity of our results. If we restrict the data to large sized facilities and test for the categories of non-wage benefits, our model is better fitted.

6 Conclusion and Implications

This paper contributes to the scarce research regarding the relationship between non-wage benefits and employee turnover rate. Our aim has been to study whether the provision of different types of non-wage benefits can reduce employee turnover in Swedish MNCs in China and if so, how this effect can be explained. We have collected primary data on employee turnover and provision of non-wage benefits from 107 facilities in Swedish subsidiaries in China in the manufacturing industry. We applied a Tobit regression model to test the effect on turnover rate from non-wage benefits on three levels, benefits in general, different categories of benefits and different types of benefits. We find that non-wage benefits in general helps to reduce turnover rate. Social benefits and in particular medical insurance have significant negative effect on turnover rate. These effects are most significant for large employers. Our main contribution with this thesis is to provide empirical evidence for what strategies are effective in reducing turnover in Swedish MNCs in China. Our main limitation is the sample size, which makes it difficult to draw inference to the entire population.

We would like to highlight some insights that we have gained from this study that may contribute to future research. We believe that wage levels and non-wage benefits as a share of total compensation should be included in the data, in order to draw conclusions regarding the marginal effect of different types of benefits on turnover rate, compared to increased wage. Moreover, a larger sample and a more even distribution of observations between provinces may enable conclusions regarding differences in the retention effect across regions. Furthermore, turnover costs measured as training and recruitment costs could be used as an instrument for non-wage benefits in order to handle the issue of endogeneity. We also believe that socioeconomic factors of employees such as age, sex, social status, education attainment, and positions within the firm would be more suitable control variables.

One interesting aspect is the time frame. We found that many management studies on the topic from China were conducted in the beginning of the 2000s. Over the last decades, dramatic changes have occurred in China, both in terms of economic growth and influences from globalization. During this period, institutional reforms were implemented that may have had large implications on the effect of non-wage benefits on turnover. For example, the new Social Insurance Law was carried out in 2011 and the provision of social benefits is thereby mandatory for all employers. Would the effect of providing pensions, housing and maternity insurance have been different if the study was conducted in the early 2000s? One explanation for some of our insignificant results could be that these benefits have become a norm that firms are expected to provide. If so, these benefits may no longer be used as strategies to retain skilled employees that are highly demanded in the competitive labor market. This shift indicates that MNCs have been actively involved in shaping the social welfare system, in line with what Regnér and Edman (2014) call institutional innovation. Other changes are increasing income levels and improvements in the national welfare system, which can be seen partly as a spillover effect from the strategies of MNCs. In order to account for these

structural change over time, we argue that future studies should use panel data.

Conclusively, we raise the question whether our results can be generalized for Scandinavian MNCs or even more broadly to MNCs from Coordinated Market Economies (CME) established in China or other countries in Asia. We argue that due to institutional similarities, the results are best generalized to Scandinavian companies. Firms from other CME countries, such as Germany, tend to bring their own organizational structures to the foreign country, which implies that our results may not apply from them. Moreover, we do not believe that our results can be generalized to all Asian countries since the Chinese context is very specific. However, we suggest that our results may apply to some low-income countries in Asia with a high presence of established MNCs within the manufacturing industry, such as Bangladesh. We also want to point out that even if our results may hold for Swedish MNCs in China today, it is notable that nothing is written in stone due to the rapid changes in the world, especially for developing economies. For example, even if we found a significant effect from medical insurance on labor turnover in China today, this relationship may not hold in the future if the welfare system develops and healthcare services become available for everyone, regardless of the urban-rural divide. We therefore believe, that the successful strategy response for these firms is to be actively engaged in innovating the institutional environment in which they establish, in order to be one step ahead.

On the other hand, the high labor turnover in the Chinese labor market is largely due to the structural shortage of skilled labor, which is caused by the large rural-urban divide in the access to and the quality of higher education. Therefore, in a more long-term perspective, this problem requires extensive reforms in centralizing the education system by the government, in which individual actors such as Swedish MNCs should be actively engaged in accelerating the process.

7 List of references

Aon Hewitt, 2013, Chinese Employees Witness Average Salary Increase of 8.5 Percent and Turnover 14.3 Percent in 2013. Available from <http://aon.mediaroom.com/Chinese-Employees-Witness-Average-Salary-Increase-of-8-5-and-14-3-Turnover-in-2013> [Accessed on 19 March, 17.53.]

Barron, J.M., & Fraedrich, A. 1994, "The Implications of Job Matching for Retirement Health Insurance and Leave Benefits," *Applied Economics,* vol. 26, no. 5, pp. 425-435.

Barth, E. & Dale-Olsen, H. 1999. "The Employer's Wage Policy and Worker Turnover," in eds. Haltiwanger, J.C., Lane, J.I., Spletzer, J.R., Theeuwes, J.J.M., & Troske, K.R. *The Creation and Analysis of Matched Employer–Employee Data.* Amsterdam: Elsevier, pp. 285-312.

Baughman, R., DiNardi, D. & Holtz-Eakin, D. 2003, "Productivity and Wage Effects of 'Family-Friendly' Fringe Benefits," *International Journal of Manpower,* vol. 24, no. 3, pp. 247-259.

Becker, G. 1962, "Investment in Human Capital - A Theoretical Analysis," *Journal of Political Economy*. vol. 70, no. 5, part 2: Investment in Human Beings, pp. 9-49.

Berger, M.C., Black, D.A. & Scott, F.A. 2004, "Is There Job Lock? Evidence from the Pre-HIPAA Era," *Southern Economic Journal,* vol. 70, no. 4, pp. 953-976.

Bruneel, D., Juneau, S. & Wang, S. 2014, "An Econometric Study of Quits Rate Trends in the United States since the Great Recession: Cyclical Movement or Structural Change?," *Business Economics,* vol. 49, no. 4, pp. 211-226.

Burgess, S.M. & Nickell, S. 1990, "Labour Turnover in UK Manufacturing," *Economica,* vol. 57, no. 227, pp. 295-317.

Burgess, S., Lane, J. & Stevens, D. 2000, "Job Flows, Worker Flows, and Churning," *Journal of Labor Economics,* vol. 18, no. 3, pp. 473-502.

Buchmueller, T. & Valletta, R. 1996, "The Effects of Employer-Provided Health Insurance on Worker Mobility," *Industrial and Labor Relations Review*, vol. 49, no. 3, pp. 439-455.

China Briefing, 2012a, Social insurance compliance in China. Available from <http://www.china-briefing.com/news/2014/02/24/social-insurance-compliance-in-china.html> [Accessed on 10 May, 2015, 10.25.]

China Briefing, 2012b, Mandatory social welfare for Chinese employees. Available from <http://www.china-briefing.com/news/2012/02/21/mandatory-

social-welfare-benefits-for-chinese-employees.html#sthash.YauRJXDh.dpuf> [Accessed on 12 May, 2015, 16.53.]

Dale-Olsen, H. 2006, "Wages, Fringe Benefits and Worker Turnover," *Labour Economics,* vol. 13, no. 1, pp. 87-105.

Démurger, S., Fournier, M., Shi, L. & Zhong, W. 2006, "Economic Liberalization with Rising Segmentation in China's Urban Labor Market," *Asian Economic Papers,* vol. 5, no. 3, pp. 58-101.

Dong, K. & Ye, X. 2003, "Social Security System Reform in China," *China Economics Review*, vol. 14, no. 4, pp. 417-425.

Ehrenberg, R.G. & Smith, R.S. 2012, *Modern Labor Economics: Theory and Public Policy*, Eleventh edition, Boston, MA: Pearson Education.

Fleisher, B.M. & Yang, D.T. 2003, "Labor Laws and Regulations in China," *China Economic Review,* vol. 14, no. 4, pp. 426-433.

Frazis, H. & Loewenstein, M.A. 2013, "How Responsive Are Quits to Benefits?," *Journal of Human Resources,* vol. 48, no. 4, pp. 969-997.

Gamble, J. & Huang, Q. 2008, "Organizational commitment of Chinese employees in foreign-invested firms," *International Journal of Human Resource Management,* vol. 19, no. 5, pp. 896-915.

Gao, Q., Yang, S. & Li, S. 2013, "The Chinese Welfare State in Transition: 1988-2007," *Journal of Social Policy,* vol. 42, Oct, pp. 743-762.

Gibbons, R. & Henderson, R. 2012, "Relational Contracts and Organizational Capabilities," *Organization Science,* vol. 23, no. 5, pp. 1350-1364.

Hall, P. A. & Gingerich, D. 2009, "Varieties of Capitalism and Institutional Complementarities in the Political Economy," *British Journal of Political Science,* vol. 39, no. 3, pp. 449–482.

Juurikkala, T. & Lazareva, O. 2012, "Non-Wage Benefits, Costs of Turnover and Labour Attachment: Evidence from Russian Firms," *Economics of Transition,* vol. 20, no. 1, pp. 113-136.

Kourula, A. 2010, "Corporate Engagement with Non-Governmental Organizations in Different Institutional Contexts - A Case Study of a Forest Products Company," *Journal of World Business,* vol. 45, no. 4, pp. 395-404.

Li, X. & Qian, X. 2011, "Economic Analysis on the Urban-Rural Disparity in Human Capital in China," *South African Journal of Economics,* vol. 79, no. 2, pp. 146-160.

Liu, B. & Peng, L. 2007, "Exploration and Test of a Model of Employees' Voluntary Turnover in China," *Frontiers of Business Research in China,* vol. 1, no. 3, pp. 378-384.

Livermore, A. 2012, Mandatory Social Welfare Benefits for Chinese Employees. Available from <http://www.china-briefing.com/news/2012/02/21/mandatory-social-welfare-benefits-for-chinese-employees.html> [Accessed 24 March, 2015, 23.20]

Ma, S. & Trigo, V. 2008, "Winning the War for Managerial Talent in China," *Chinese Economy,* vol. 41, no. 3, pp. 34-57.

Madrian, B.C. 1994, "Employment-Based Health Insurance and Job Mobility - Is There Evidence of Job-Lock?," *Quarterly Journal of Economics,* vol. 109, no. 1, pp. 27–51.

Maxelli Consulting, 2015, Social Welfare Benefits for Chinese Employees. Available from <http://www.maxxelli-consulting.com/social-welfare-benefits-for-chinese-employees/> [Accessed on March 23, 2015, 16.05]

Meng, X. 2012, "Labor Market Outcomes and Reforms in China," *Journal of Economic Perspectives,* vol. 26, no. 4, pp. 75-102.

Mitchell, O. 1982, "Fringe Benefits and Labor Mobility," *Journal of Human Resources,* vol. 17, no. 2, pp. 286-298.

NBSC, 2015, National Bureau of Statistics of China. Available from <http://data.stats.gov.cn/english/> [Accessed on 5 May, 2015, 14.07]

O'Halloran, P.L. 2012, "Performance Pay and Employee Turnover," *Journal of Economic Studies,* vol. 39, no. 6, pp. 653-674.

Orkan, L. 1974, *Personalomsättning - orsaker, konsekvenser och regional struktur.* Studier i företagsekonomi B 17, Umeå universitet, Umeå.

Parsons, D.O., 1986, "The Employment Relationship: Job Attachment, Work Effort, and the Nature of Contracts," in eds. Ashenfelter, O. & Layard, R. *Handbook of Labor Economics*. Amsterdam: Elsevier Science Publishers, vol. 2, pp. 789-848.

Regnér, P. & Edman, J. 2014, "MNE Institutional Advantage: How Subunits Shape, Transpose and Evade Host Country Institutions," *Journal of International Business Studies,* vol. 45. no. 3, pp. 275-302.

Rousseau, D.M. 1989, "Psychological and Implied Contracts in Organizations," *Employee Responsibilities and Rights Journal,* vol. 2, no. 2, pp. 121-139.

Rousseau, D.M. 1995, *Psychological Contracts in Organizations: Understanding Written and Unwritten Agreements.* Thousand Oaks, CA: Sage.

Salop, J. & & Salop, S. 1976, "Self-Selection and Turnover in the Labor Market," *Quarterly Journal of Economics*, vol. 90, no. 4, pp. 619-627.

Smith, I. 2000, "Benefits," in eds. White, G. & Drucker, J. *Reward Management: A Critical Text.* Florence, KY: Routledge.

Sovich, N. 2006, *Politics & Economics: Western Firms Find Hiring, Retention in China Surprisingly Tough*, Eastern edition edn, New York, N.Y.

Taylor, M. 2008, "China's Talent Retention Dilemma in the New Millennium," *China Staff,* vol. 14, no. 9, pp. 17-19.

The Economist, 2015, *A Tightening Grip; The Future of Factory Asia,* 2015. Available from <http://www.economist.com/news/briefing/21646180-rising-chinese-wages-will-only-strengthen-asias-hold-manufacturing-tightening-grip> [Accessed on 18 March, 14.51.]

Vitaliano, D.F. 2010, "Corporate Social Responsibility and Labor Turnover," *Corporate Governance,* vol. 10, no. 5, pp. 563-573.

Witt, M.A. & Redding, G. 2013, "Asian Business Systems - Institutional Comparison, Clusters and Implications for Varieties of Capitalism and Business Systems Theory," *Socio-Economic Review,* vol. 11, no. 2, pp. 265–300.

Wong, C., Wong, Y., Hui, C. & Law, K.S. 2001, "The Significant Role of Chinese Employees' Organizational Commitment: Implications for Managing e Employees in Chinese Societies," *Journal of World Business,* vol. 36, no. 3, pp. 326-340.

Wooldridge, J.M. 2013, *Introductory Econometrics: a Modern Approach.* Fifth edition, Mason, OH: South-Western, Cengage Learning.

Xu, C. 2011, "The Fundamental Institutions of China's Reforms and Development," *Journal of Economic Literature,* vol. 49, no. 4, pp. 1076-1151.

Zheng, C. & Lamond, D. 2010, "Organisational Determinants of Employee Turnover for Multinational Companies in Asia," *Asia Pacific Journal of Management,* vol. 27, no. 3, pp. 423-443.

8 Appendix

Equation A: weighted average of binary variables

Non wage benefits = 0.9762 * insurance package + 0.3571 * pension + 0.8095 * medical insurance + … + 0.4881 * perks / 17

Figure 2: distribution of labor turnover rate

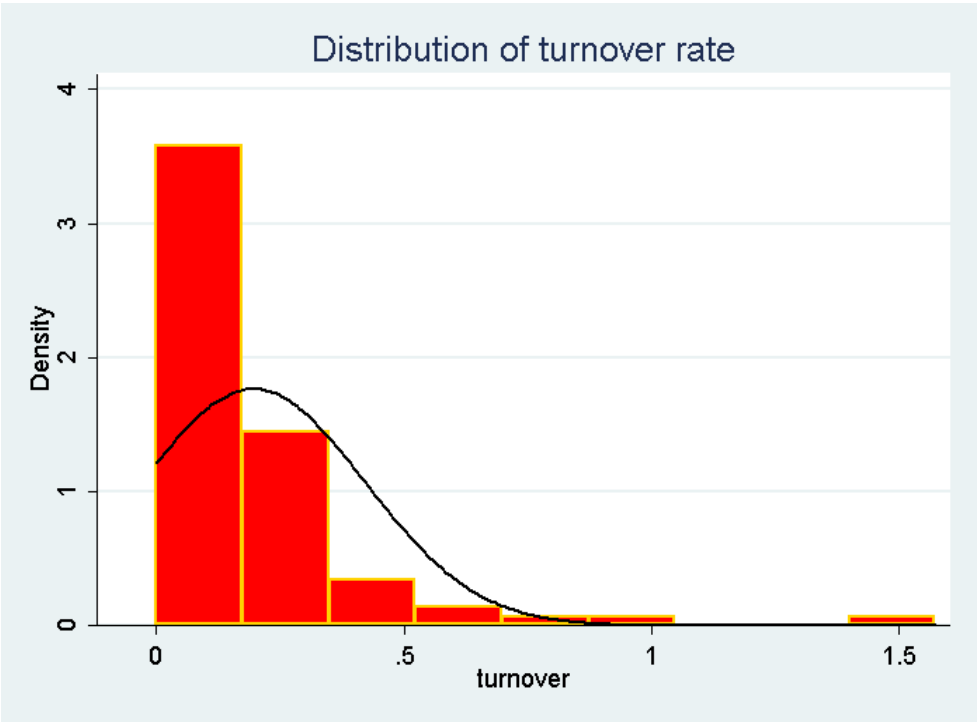


Table 9: Tobit regression of categories of non-wage benefits on turnover rate for facilities with less than 25 employees

	Model 1	Model 2	Model 3
	Tobit	Tobit	OLS
Dep. variable	Turnover	Turnover	Non-wage benefits
Non-wage benefits		-0.0264	
		(0.786)	
Social benefits	0.0709		
	(0.697)		
Family-friendly benefits	-0.429		
	(0.513)		
Monetary benefits	0.437		
	(0.412)		
Goods and services	0.313		
	(0.451)		
Social investments	-		
Ratio of education to enterprises			0.0122
			(0.105)
General price index			0.0294
			(0.229)
Number of employees	0.0297**	0.0263**	0.00360
	(0.0113)	(0.0108)	(0.00349)
Nature of industry	0.164	0.129	-0.0800
	(0.137)	(0.135)	(0.0492)
Operation length	0.00294	0.00288	0.00116
	(0.00659)	(0.00718)	(0.00274)
Vocational training	-0.222	-0.258	0.00233
	(0.144)	(0.152)	(0.0508)
Province	-0.00269	0.00251	0.00388
	(0.0127)	(0.0120)	(0.00915)
Type of facility	0.0491	0.0505	-0.0391
	(0.114)	(0.101)	(0.0367)
Constant	-0.573	-0.494	-2.653
	(0.423)	(0.450)	(23.55)
Observations	21	21	20
R-squared			0.452

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 10: frequency of facility types in sample

Facility	Freq.	Percent	Cum.
Factory	35	41.67	41.67
Office	31	36.90	78.57
Other	3	3.57	82.14
Plant	14	16.67	98.81
Store	1	1.19	100.00
Total	64	100.00	

Table 11: nature of industry

Nature of industry	Freq.	Percent	Cum.
Manufacturing	82	98.80	98.80
Services	1	1.20	100.00
Total	83	100.00	

Table 12: frequency of provinces represented in sample

Province	Freq.	Percent	Cum.
Beijing	6	7.14	7.14
Chongqing	2	2.38	9.52
Fujian	1	1.19	10.71
Guangdong	4	4.76	15.48
Guangxi	1	1.19	16.67
Hebei	5	5.95	22.62
Heilongjiang	1	1.19	23.81
Hongkong	2	2.38	26.19
Jiangsu	29	34.52	60.71
Shaanxi	1	1.19	61.90
Shandong	1	1.19	63.10
Shanghai	26	30.95	94.05
Sichuan	1	1.19	95.24
Tianjin	1	1.19	96.43
Zhejiang	3	3.57	100.00
Total	84	100.00	

Table 13: Tobit regression of non-wage benefits (weighted and unweighted) on labor turnover rate

Dep. variable: turnover rate	Model 1 Unweighted non-wage benefits Tobit	Model 2 Weighted non-wage benefits Tobit	Model 3 Unweighted non-wage benefits Tobit	Model 4 Weighted non-wage benefits Tobit
Non-wage benefits	-0.633***	-1.271***	-0.644***	-1.299***
	(0.190)	(0.447)	(0.179)	(0.396)
Number of employees	1.42e-05	1.40e-05		
	(2.25e-05)	(2.29e-05)		
Nature of industry	-0.104	-0.111		
	(0.212)	(0.216)		
Length of operations	-0.00305	-0.00224		
	(0.00252)	(0.00269)		
Vocational training	0.0511	0.0490		
	(0.0560)	(0.0569)		
Province	-0.00238	-0.00135		
	(0.00591)	(0.00599)		
Type of facility	0.00203	0.00160		
	(0.0214)	(0.0217)		
Constant	0.614**	0.732**	0.491***	0.626***
	(0.258)	(0.293)	(0.0854)	(0.133)
Observations	81	81	83	83

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 14: Tobit regression of non-wage benefits (weighted and unweighted) on labor turnover rate

Dep. variable: turnover rate	Model 1 Unweighted non-wage benefits Tobit	Model 2 Weighted non-wage benefits Tobit	Model 3 Unweighted non-wage benefits Tobit	Model 4 Weighted non-wage benefits Tobit
Social benefits	-0.294**	-0.771***	-0.272**	-0.678***
	(0.135)	(0.233)	(0.120)	(0.205)
Family-friendly benefits	-0.0837	0.160	-0.151	-0.0958
	(0.160)	(0.298)	(0.153)	(0.283)
Monetary benefits	0.106	1.010**	0.0516	0.832*
	(0.233)	(0.488)	(0.231)	(0.486)
Goods and services	-0.0936	-0.293*	-0.0599	-0.177
	(0.0700)	(0.170)	(0.0662)	(0.162)
Social investments	-0.0552	-0.304	-0.0476	-0.263
	(0.0611)	(0.271)	(0.0592)	(0.265)
Number of employees	1.42e-05	1.27e-05		
	(2.27e-05)	(2.22e-05)		
Nature of industry	-0.112	-0.210		
	(0.210)	(0.207)		
Length of operations	-0.00336	-0.00391		
	(0.00271)	(0.00278)		
Vocational training	0.0644	0.0667		
	(0.0587)	(0.0566)		
Province	-0.00129	0.000283		
	(0.00618)	(0.00598)		
Type of facility	0.00125	0.00343		
	(0.0215)	(0.0209)		
Constant	0.532**	0.393	0.437***	0.282
	(0.266)	(0.307)	(0.110)	(0.192)
Observations	81	81	83	83

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 15: Tobit regression of non-wage benefit types (weighted and unweighted) on labor turnover

Dep. variable: turnover rate	Model 1 Unweighted non-wage benefits Tobit	Model 2 Weighted non-wage benefits Tobit	Model 3 Unweighted non-wage benefits Tobit	Model 4 Weighted non-wage benefits Tobit
Insurance package	0.0418	0.0429	0.0970	0.0994
	(0.204)	(0.209)	(0.146)	(0.150)
Pension	-0.0532	-0.149	-0.0344	-0.0964
	(0.0822)	(0.230)	(0.0675)	(0.189)
Medical insurance	-0.190***	-0.234***	-0.196***	-0.242***
	(0.0685)	(0.0847)	(0.0686)	(0.0847)
Unemployment insurance	-0.0243	-0.408	0.0354	0.596
	(0.129)	(2.163)	(0.118)	(1.976)
Maternity leave	0.00230	0.00604	-0.0538	-0.141
	(0.0746)	(0.196)	(0.0651)	(0.171)
Daycare	-0.170**	-2.044**	-0.170**	-2.038**
	(0.0851)	(1.021)	(0.0845)	(1.015)
Injury insurance	0.00180	0.00336	-0.0337	-0.0629
	(0.0613)	(0.114)	(0.0577)	(0.108)
Sick-leave	0.0977	0.109	0.105	0.118
	(0.0815)	(0.0913)	(0.0806)	(0.0903)
Housing	-0.0414	-0.166	-0.0191	-0.0762
	(0.0614)	(0.246)	(0.0582)	(0.233)
Subsidized loans	-0.234	-19.69	-0.0943	-7.926
	(0.234)	(19.70)	(0.220)	(18.46)
Bonus	0.349**	0.358**	0.299**	0.307**
	(0.155)	(0.159)	(0.149)	(0.153)
Profit sharing	-0.00446	-0.0750	-0.0525	-0.883
	(0.0972)	(1.633)	(0.0951)	(1.598)
Coupons	0.0150	0.0573	0.0228	0.0872
	(0.0618)	(0.236)	(0.0598)	(0.228)
Vacation	-0.0212	-0.0217	-0.119	-0.122
	(0.158)	(0.162)	(0.150)	(0.153)
Social investment	-0.101	-0.472	-0.0856	-0.400
	(0.0613)	(0.286)	(0.0581)	(0.271)
Perks and other benefits	-0.0770	-0.158	-0.0638	-0.131
	(0.0494)	(0.101)	(0.0490)	(0.100)
Number of employees	2.18e-05	2.18e-05		
	(2.33e-05)	(2.33e-05)		
Nature of industry	-	-		
Length of operations	-0.00516	-0.00516		
	(0.00321)	(0.00321)		
Vocational training	0.0461	0.0461		
	(0.0556)	(0.0556)		
Province	-0.00408	-0.00408		
	(0.00597)	(0.00597)		
Type of facility	0.0155	0.0155		
	(0.0210)	(0.0210)		
Constant	0.0481	0.0481	0.105	0.105
	(0.314)	(0.314)	(0.254)	(0.254)
Observations	81	81	83	83

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 16: Tobit regression of types of non-wage benefits (weighted and unweighted) on labor turnover rate for medium and large sized facilities

Dep. variable: turnover rate	Model 1 Medium sized facilities Tobit	Model 2 Large sized facilities Tobit
Insurance package	0.172	-
	(0.121)	
Pension	0.0797	-0.340
	(0.233)	(0.277)
Medical insurance	0.144***	-0.570***
	(0.0463)	(0.110)
Unemployment insurance	-1.164	1.475
	(1.348)	(3.092)
Maternity leave	-0.209	-0.194
	(0.152)	(0.268)
Daycare	-0.597	-4.210***
	(0.734)	(1.379)
Occupational injury insurance	-0.0791	-0.0558
	(0.0769)	(0.148)
Paid sick-leave	0.214***	0.0660
	(0.0518)	(0.134)
Housing	-0.195	-0.0589
	(0.135)	(0.413)
Subsidized loans	22.75**	-
	(10.52)	
Bonus	0.204*	-
	(0.110)	
Profit sharing	-0.353	0.435
	(1.233)	(1.931)
Coupons	-0.116	-0.174
	(0.130)	(0.276)
Paid days of vacation	-	0.138
		(0.152)
Social investment	-0.416**	-0.700**
	(0.190)	(0.323)
Perks and other benefits	-0.0790	-0.529***
	(0.0684)	(0.143)
Number of employees	0.00120***	7.95e-06
	(0.000390)	(2.48e-05)
Nature of industry	-	-
Length of operations	-0.00382	-0.00127
	(0.00258)	(0.00413)
Vocational training	0.00972	-0.0544
	(0.0384)	(0.0726)
Province	-0.00670	-0.00762
	(0.00405)	(0.00833)
Type of facility	-0.0650***	0.0714***
	(0.0199)	(0.0252)
Constant	-0.218	0.743***
	(0.209)	(0.201)
Observations	40	41

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 17: OLS regression of loca labor shortage and general price index on non-wage benefits for medium and large sized facilities

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Dep. variable: non-wage benefits	Medium size facilities	Large size facilities	Medium size facilities	Large size facilities	Medium size facilities	Large size facilities
	OLS	OLS	OLS	OLS	OLS	OLS
Ratio of edu/enterprises	0.0362	0.0468*	0.0470*	0.0446**		
	(0.0406)	(0.0237)	(0.0247)	(0.0198)		
General price index	0.0263	-0.00573			0.0808	0.0288
	(0.0777)	(0.0332)			(0.0478)	(0.0295)
Number of employees	-9.89e-05	-1.53e-06	-9.91e-05	-1.54e-06	-0.000125	-9.20e-07
	(0.000221)	(5.59e-06)	(0.000218)	(5.50e-06)	(0.000219)	(5.82e-06)
Length of operations	0.00193*	0.00220***	0.00203*	0.00221***	0.00171	0.00240***
	(0.00106)	(0.000740)	(0.00100)	(0.000725)	(0.00103)	(0.000764)
Vocational training	0.0317	-0.0269	0.0319	-0.0272	0.0336	-0.0237
	(0.0236)	(0.0181)	(0.0233)	(0.0177)	(0.0234)	(0.0188)
Province	0.00256	-0.000189	0.00155	-1.79e-05	0.00425	-0.00165
	(0.00376)	(0.00262)	(0.00225)	(0.00239)	(0.00323)	(0.00262)
Type of facility	-0.0229**	0.0101	-0.0232**	0.00989	-0.0222**	0.0100
	(0.00945)	(0.00633)	(0.00928)	(0.00614)	(0.00938)	(0.00661)
Constant	-2.411	0.874	0.286***	0.286***	-7.995	-2.635
	(7.976)	(3.406)	(0.0418)	(0.0348)	(4.919)	(3.031)
Observations	40	40	40	40	40	40
R-squared	0.411	0.392	0.408	0.391	0.396	0.318

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 18: list of survey questions

Survey questions

1. What's your name of your company?
2. When did your company establish in China?
3. How many facilities does your company or subsidiary have in China? Including factories, offices and other business units
4. Please specify the name of your facility in China?
5. What type of facility is it? Office, factory, plant, store or other. If other, please specify what other type of facility.
6. In what provinces is your facility located in China?
7. When was this facility established in China?
8. How many employees do you have in your facility?
9. What was your employee turnover rate (%) at your facility in 2014? Employee turnover rate is measured as number of employees leaving during 2014 divided by total number of employees at the end of 2014.
10. What types of non-wage benefits do you provide to your employees in general at this facility? (Yes or No)
    - ✓ Insurance package: "Five social insurances and one housing fund" (including pension, medical insurance, unemployment insurance, maternity leave, occupational injury insurance and housing fund)
    - ✓ Pension plans in addition to/instead of the insurance package
    - ✓ Medical insurance in addition to/instead of the insurance package
    - ✓ Unemployment insurance in addition to/instead of the insurance package
    - ✓ Maternity insurance in addition to/instead of the insurance package
    - ✓ Day care for children
    - ✓ Occupational injury insurance in addition to/instead of the insurance package
    - ✓ Paid sick-leave
    - ✓ Housing fund in addition to/instead of the insurance package
    - ✓ Subsidized loans
    - ✓ Bonus
    - ✓ Profit sharing for example company shares
    - ✓ Coupons for private consumption for example breakfast, lunch, dinner etc
    - ✓ Paid days of vacation in addition to public holidays
    - ✓ Vocational training
    - ✓ Perks for example take.home vehicles, hotel stays, free refreshment, leisure activities on work time etc
    - ✓ Social investments in the local community for example schools, local sports activities etc
    - ✓ Other benefits. If yes, please specify what type of other benefits it is.

Table 19: correlation between different types of non-wage benefits

	Insurance package	Pension	Medical insurance	Unemp-loyment insurance	Maternity leave	Day care	Injury insurance	Paid sick-leave	Housing	Loans	Bonus	Profit sharing	Coupons	Vacation	Training	Social invest	Perks
Insurance package	1.0000																
Pension	-0.0466	1.0000															
Medical insurance	-0.0758	0.3616	1.0000														
Unemployment insurance	0.0393	0.3375	0.1220	1.0000													
Maternity leave	-0.0383	0.6432	0.3805	0.3207	1.0000												
Daycare	0.0471	0.0449	-0.0731	0.2882	-0.0591	1.0000											
Occupational injury insurance	0.1678	0.3950	0.3387	0.2342	0.4354	0.0216	1.0000										
Paid sick-leave	-0.0541	0.1779	0.1260	-0.0755	0.1925	0.1044	0.0634	1.0000									
Housing	0.0902	0.1434	0.2100	0.3195	-0.0000	0.3233	0.2067	0.1111	1.0000								
Subsidized loans	0.0171	-0.0818	-0.2263	-0.0276	-0.0861	-0.0331	0.1022	-0.3169	-0.0634	1.0000							
Bonus	-0.0244	-0.0466	0.1231	0.0393	-0.0383	0.0471	0.1678	-0.0541	0.0902	0.0171	1.0000						
Profit sharing	0.0393	-0.0825	0.1220	-0.0633	0.0099	-0.0759	0.0324	0.0871	0.2033	-0.0276	0.0393	1.0000					
Coupons	0.0930	-0.2180	0.0821	0.3079	-0.0770	0.1143	0.1202	0.1188	0.1563	-0.0654	0.0930	0.0790	1.0000				
Paid days of vacation	-0.0244	-0.0466	0.1231	0.0393	-0.0383	-0.0471	-0.1454	0.1984	0.0902	0.0171	-0.0244	0.0393	0.0930	1.0000			
Vocational training	-0.0844	0.2842	0.1001	0.0157	0.1311	-0.0429	0.1814	-0.0953	-0.0164	0.0593	0.1022	-0.1045	-0.0015	-0.0844	1.0000		
Social investment	0.0816	-0.0259	0.0371	-0.0088	0.0085	-0.0525	-0.0374	0.1809	0.1675	-0.0573	0.0816	0.2365	0.2828	-0.1087	-0.1337	1.0000	
Perks and other benefits	0.1525	-0.2805	0.0491	-0.0443	-0.2756	-0.0359	-0.2371	-0.0468	0.0413	0.1124	-0.0037	-0.0443	0.1767	0.1525	-0.0983	0.1285	1.0000