UNIVERSITY OF GOTHENBURG
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# Chinese Foreign Direct Investments in the Zambian Mining Sector

*- Do the Chinese investments contribute to the social and economic development in Zambia?*

**Bachelor Thesis in Development Economics (15 credits)**

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## Abstract

**Title:** Chinese Foreign Direct Investments in the Zambian Mining Sector

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**Background and Problem:** China's presence and influence on the African continent is constantly growing and China tries to portray itself as Africa's true friend. Western media accuses the Chinese engagement and foreign direct investments in recourse rich African countries to be made only in self-interest. At the same time, Western aid and support have failed to create sustainable social and economic development in Africa. Currently, the copper rich country of Zambia is experiencing increasing Chinese foreign direct investments within the mining sector.

**Aim and Purpose:** The aim of the study is to investigate whether the effects of Chinese foreign direct investments in the Zambian mining sector make a positive contribution to social and economic development in Zambia.

**Method and Data Collection:** The study was performed as a minor field study in Zambia during June-August 2012. It consists of one quantitative part where a questionnaire was conducted with 213 mine workers in the Copperbelt, Zambia. There is also a qualitative part consisting of semi-structured in-depth interviews, which were conducted with eight mine workers and ten respondents representing governmental institutions and organisations.

**Result and Conclusion:** The results show statistically and economically significant results that mine workers employed with Chinese employers have a lower wage than mine workers with other foreign employers. The results indicate that most mine workers with Chinese employers are unsatisfied with their working conditions and that the wage is of great importance for whether mine workers are satisfied at work or not. The conclusion is that the Chinese FDIs in the Zambian mining sector contribute to the social and economic development in Zambia. Without the inflow of Chinese capital, minerals might have remained unexplored and the unemployment rate in the Copperbelt would have been significantly higher.



**Keywords:** China, Zambia, Foreign Direct Investments, Mining sector, Linkages, Employment

## Abbreviations

**BBC** - British Broadcasting Corporation

**CLM** - China Nonferrous Metal Mining Luanshya Copper Mine Plc.

**CNMC** - China Nonferrous Metal Mining (Group) Co., Ltd

**FDI** - Foreign Direct Investment

**FOCAC** - Forum on China-Africa Cooperation

**GDP** - Gross Domestic Product

**IMF** - International Monetary Fund

**JCHX** - JCHX Mining Management Co., Ltd

**MCTI** - Ministry of Commerce, Trade and Industry

**MFEZ** - Multi-Facility Economic Zone

**MMD** - Movement for Multi-party Democracy

**MUZ** - Mineworkers Union of Zambia

**NFCA** - Nonferrous China Africa Mining Plc.

**NGO** - Non-Governmental Organization

**NUMAW** - National Union of Miners and Allied Workers

**PF** - Patriotic Front

**UNIP** - United National Independence Party

**WB** - World Bank

**ZCCM** - Zambia Consolidated Copper Mines Ltd.

**ZCCZ** - Zambia-China Economic and Trade Cooperation Zone

**ZDA** - Zambian Development Agency

**15 MCC** - China Nonferrous Metal Mining No.15 Metallurgical Construction Group Co., Ltd

## Disposition

# 1. Introduction

The Chinese economic growth in recent years has been a phenomenon never previously seen in history. According to the International Monetary Fund, IMF, China is likely to surpass the US and be the world's largest economy in real terms by 2016 (RT News, 2011).

In 2009 and 2010, the lending to developing countries by IMF, was surpassed by the Chinese banks; China Development Bank and the China Exim Bank (The Guardian, 2012). Today, China has the world's largest reserves of foreign exchange, holding USD 3.2 trillion making the European leaders look east for Chinese support in the ongoing financial crises (Reuters, 2011).

On the other hand, Africa is the world's most capital scarce continent. The scarcity of capital is not just due to the lack of capital inflows but also due to the fact that 39 percent of the African private wealth is held abroad (Collier, Hoeffler, and Pattillo, 1999).

The Chinese presence in Africa has been subject of recent Western critique but the question remains to be answered: What is true about the Chinese presence in Africa and its impact on the economic and social development in African countries?

## 1.1 Aim and Research Questions

The aim of the study is to investigate whether the effects of Chinese Foreign Direct Investments in the Zambian mining sector contribute positively to social and economic development in Zambia. The questions will be addressed from a macro as well a micro perspective. The following three research questions will be responded to:

*1. What differences, regarding salaries, are there between employees of Chinese companies compared to employees of other foreign investors and what factors affect if they are satisfied with their working conditions?*

*2. How do the mine workers employed by Chinese employers perceive the companies contribution to their households' living conditions?*

*3. Do Chinese FDIs in the mining sector create backward and forward linkages in the Zambian economy?*

In order to answer the research questions, primary data has been collected. For research question number one, questionnaires were distributed to mine workers and for research question two eight in-depth interviews with mine workers were carried out. In order to be able to answer research question number

three, interviews with current as well as former ministers, government officials and chairmen were carried out.

After the introductory chapter, the theoretical framework is presented in chapter two. Thereafter, a chapter regarding the methodology and data collection, and then the empirical results. First, the econometric analysis is presented with the regression results and a comparison between the expected outcomes and the actual outcome. Thereafter, the qualitative interviews are presented. Analysis, results and discussion is presented in chapter six where the results are analyzed in accordance with the theoretical framework. The main findings and conclusion follow in chapter seven.

## 1.2 Chinese Foreign Direct Investments[1]

The Chinese engagement in Africa is often carried out through bilateral relations between the African host government and the Chinese Ministries of Foreign Affairs and Trade. In 2010, the Chinese FDIs in Africa equalled USD 2112 million compared to USD 317 million in 2004 (Ministry of Commerce People's Republic of China, 2011). Other characteristics of the Chinese FDIs in Africa is that most investments are made in countries that are rich in natural resources and that the typical Chinese investor is a state owned enterprise financing its investments through grants or loans from the large state owned banks (African Development Bank Group, 2011).

The Sino-African relationship[2] and China's growing engagement in Africa is under suspicions and critically inspected in the West. During the forum of aid effectiveness in Busan in November 2011, Hillary Clinton, the US secretary of state, told aid recipient countries to;

*"Be aware of donors who are more interested in extracting your resources than in building your capacity..."*

The most distinctive difference between Chinese and the Western approach in Africa is the Chinese "no-strings-attached" consensus. The Chinese FDIs, which are closely linked to trade and development assistance, are not conditional on good governance in the same way as the engagement from more traditional Western partners. China makes a clear distinction between its economic and political relations

[1] Foreign direct investment are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. (http://data.worldbank.org/indicator/BX.KLT.DINV.CD.WD)

[2] The relationship between China and Africa

with Africa and imposes no political conditions on the recipient country. The lack of transparency as well as the Chinese "no-strings-attached" approach to its recipient countries of investments and aid has been a target of recent criticism (The Guardian, 2011)

The critique against Chinese investors in Zambia has primarily been regarding low wages, unfair competition, working conditions, extraction of natural resources, bringing own employees from China and safety violations. The leading business consultant, Bob Sichinga, argues that the Chinese are investing in Zambia in order to help themselves leaving no lasting benefit (BBC, 2010). A comprehensive report from Human Rights Watch is also presenting evidence of bad safety conditions and labor abuse in the Chinese state owned mines in Zambia (Human Rights Watch, 2011).

Professor Deborah Brautigam might be one of the most recognized proponents of the view that the Chinese presence in Africa is playing a positive role on the continent. In her book, *The Dragon's Gift: The Real Story of China in Africa*, she presents facts against some of most the most common misconceptions of the Chinese presence and impact in Africa stressed in Western media (Brautigam, 2009).

During the last decade, the inflow of FDIs has been increasing. There was a drop in 2009, but since the trend has continued with an increasing inflow of FDIs. (World Bank, 2012). According to the UNCTAD Investment Policy Report in 2006, almost 45 percent of the total amount of investments approved in 2000-2002 is of Chinese origin. They are playing a prominent role, especially in the manufacturing and construction sector (UNCTAD, 2006). In 2007, Zambia was the third largest recipient of Chinese outward FDIs in Sub-Saharan Africa. Zambia received FDIs equivalent to USD 119 million, compared to South Africa's USD 454 million and Nigeria's USD 390 million (IMF, 2011).

### 1.3 Presentation of Zambia and the Zambian Mining Sector

Zambia is a landlocked country with an area of 752 614 $km^2$ located in Sub-Saharan Africa. As a landlocked country, Zambia is reliant on the relations with its neighbouring countries (ZDA, 2012c). In 1924, it was brought under British colonial rule. The Republic of Zambia became independent in October 1964. The decade after independence, Zambia's economy was very strong. The large revenues received from the copper exports enabled huge investments and increased the consumption in the country. However, the price of copper fell in the 70's and so did the Zambian economy. In 1991, Zambia was the world's most indebted country in relation to GDP. In order to qualify for a debt relief, the IMF and the World Bank put pressure on the Zambian government to privatize the mining sector (Copper Investing News, 2012). When the privatization was carried out in the end of the 1990s, it resulted in improved

efficiency and a rapid increase in production, but also a decreased rate of employment in the sector (The Journal of The Southern African Institute of Mining and Metallurgy, 2011). Since 2005, the country has had a strong economic growth at around 5-7 percent per year. Zambia is the largest copper producer in Africa and its economy is reliant on the copper industry and therefore the price of the copper. In order to diversify the economy and to reduce the dependence of the copper industry, the government is promoting the agricultural sector, tourism, manufacturing and the energy sector (ZDA, 2012a). In 2011, the GDP was equivalent to USD 16 193 million and GDP per capita was equivalent to USD 1405 (World Bank, 2012). In the year of 2010, the contribution of the mining sector to the economy was estimated to be 11 percent of GDP and the indirect contribution was estimated to be approximately 50 percent (Swedish Trade Council, 2011). The high unemployment rate is one of the largest macroeconomic challenges in Zambia. The unemployment rate in 2006 was about 14 percent (Central Intelligence Agency, 2012), if including the informal sector the unemployment rate would be significantly higher.

### 1.4 Chambishi Multi-Facility Economic zone[3]

During the FOCAC meeting in 2006, the Chinese government announced that they planned to implement a number of Multi-Facility Economic Zones, MFEZs, in selected countries on the African continent. Zambia was one of the suggested countries (Lagerkvist & Jonsson, 2011). Today, Zambia hosts six areas that fall under the concept of MFEZ. China Nonferrus Metal Mining Co-operation limited, CNMC, is in charge of the development of the Chambishi MFEZ located in the Copperbelt and Lusaka East (MCTI, 2012 ). The Zambian Development Agency describes the purpose of the implementation of the Multi-Facility Economic Zones as follows;

*"The main objective of the Multi facility Economic Zones program in Zambia is to catalyze industrial and economic development through increased activity in the manufacturing sector where value addition to the numerous natural and agricultural raw materials hitherto exported in raw form will be processed for purposes of enhancing both domestic and export oriented business."* (ZDA, 2012b)

What has yet been achieved in the Chambishi MFEZ seems to be unclear. Referring to a study undertaken by Johan Lagerkvist and Gabriel Jonsson, their respondents from the governmental as well as the NGO sector are not really sure of what is happening inside of the Chambishi MFEZ. Their respondents express a disappointment as they perceive the Chambishi MFEZ to be a tax haven for the Chinese companies

[3] Chambishi Multi-Facility Economic Zone is an area, licensed by China Nonferrous Metal Mining (Group) Co., Ltd, which is responsible for building up the required infrastructure within the zone. The most important investment incentive in the Chambishi MFEZ is a generous tax incentive package (CNMC, 2007).

rather than an engine for the Zambian development, and the creation of employment (Lagerkvist & Jonsson, 2011).

# 2. Theoretical Framework

This chapter introduces relevant theories regarding effects of foreign direct investment inflows to the host economy. The chosen theories will ease the interpretations and the analysis of the empirical results in this study, and determine whether Chinese FDIs make a positive contribution to social and economic development in Zambia.

## 2.1 The Natural Resource Trap

In 2007, the economist Paul Collier presented four development traps holding back development in the bottom billion countries[4]. Collier presents the paradoxical trap of being endowed with natural resources. Most natural resource rich countries have natural resources enough to take them to middle-income status. However, many countries fail to go beyond and fully develop. Collier presents a number of channels through which natural resource abundance can harm economic growth and gives an explanation to how resource abundance lowers a country's chances of diversifying into manufacturing and service exports (Collier, 2008).

Whether there is a natural resource curse present or not has been target for a large amount of literature. David N. Weil found natural resources to be positively correlated with the GDP level (Weil, 2008). On the contrary, Sachs and Warner present evidence of a "natural resource trap", they found a negative correlation between natural resources and economic performance in terms of GDP growth. They also found that resource abundant countries have a smaller contribution to GDP in terms of export of manufacturing goods (Sachs & Warner, 1999).

Weil presented four key explanations to why a natural resource curse occurs; culture, overconsumption, dynamics of industrialization and politics. The further focus here is to examine the dynamics of industrialization and why resource abundance lowers a country´s prospects to diversify into manufacturing and service exports.

Resource endowment creates less incentive for an economy to engage in a long-run economic strategy as the economy easily can make short-run revenues by exporting its natural resources. This explains why

[4] Collier found that about one billion people lived in the poorest countries where he found that the economic failure could be explained by four distinct traps.

resource abundant countries tend to import manufacturing goods rather than developing their own manufacturing industry (Weil, 2008). Development of its own manufacturing industry is beneficial for an economy as the manufacturing sector is more labor abundant than capital abundant. Extraction and export of natural resources are likely to benefit the large landowners or extraction companies rather than the host economy (Collier, 2008). In a country without a manufacturing industry there is no opportunity to take advantage of the rapid technological progress and productivity growth as these channels are linked with the manufacturing industry (Weil, 2008). Historically, manufacturing has been the major driver of development in the world (Collier, 2008). During the last decade, labor intensive manufacturing growth has been the key to China's economic performance.

Whether natural resource abundance will have a negative impact on a country's economic growth or not will depend on to what extent the exploitation of a natural resource stimulates other sectors in the economy through backward and forward linkages. If backward and forward linkages are present, the exploitation of the natural resources can stimulate the development of the economy (Weil, 2008).

## 2.2 Linkages and Technological Transfer

A backward linkage is the situation in which production in an industry (such as resource extraction) stimulates the growth of other industries in a country by demanding their outputs" (Weil, 2008). A forward linkage is "the situation in which production in an industry (such a resource extraction) stimulates the growth of other industries in a country by supplying inputs into production" (Weil, 2008).

In a resource abundant country as Zambia, backward linkages can be created when locally produced goods are used as inputs when extracting natural resources. For a developing country, backward linkages are mainly the development of transportation systems to enable exportation of the resources and the employment that is created by the investments. The development of the transportation systems is important for the rest of the economy as well since it eases the export of other commodities (McGillivray, 2010). Backward linkages between foreign subsidiaries and domestic enterprises are important for technological progress and to raise the domestic technological capabilities in the developing country. In order to reach technological progress in developing countries, it is important with policies to encourage the diffusion of technology. The policy should encourage the domestic as well as the foreign enterprise to create productive and adaptive capacities by fostering business linkages, enhancing spillover effects and promoting technological advances (UNCTAD, 2010).

The forward linkages are created when the natural resources are processed or used as inputs when producing other goods and when the value-addition occurs prior export (McGillivray, 2010). The

promotion and the facilitation of the domestic market to encourage investments to move into higher value added activities are important issues in order to reach technological progress (UNCTAD, 2010).

The linkages creating industrial development might stimulate growth in other economic sectors as well. If backward- and forward linkages are created domestically and in other sectors than these related to natural resources, developing countries could get the opportunity to participate in global supply chains (McGillivray, 2010). The technological progress is also one of the key factors to increased living standards and it is of great importance to the development process. The foreign direct investments from developed countries to developing countries could bridge the current gap in technology between these countries, which is an important issue in order to create sustainable development and to reduce poverty (UNCTAD, 2010).

## 2.3 Human Capital

The human capital formation has a significant role in the development of a country. The human capital includes the health factor and the educational factor. Improved human capital will contribute to improvements at microeconomic level as well as at macroeconomic level. For example, an individual might receive higher income and it will also contribute to the long-term development of the country (IIASA, 2008).

### 2.3.1 Education

In poor developing countries, universal primary education and secondary education will play a key factor of bringing people out of poverty (IIASA, 2008). It is important to keep in mind that the quality of schooling and the extent of received externalities differ among countries, and therefore, so does the impact of educational differences among countries (Weil, 2008).

Katharina Michaelowa argues that education has economic impact on both micro- and macro level. Her focus is mainly on the economic returns to education and on the consequences of microeconomic results on macroeconomic outcomes. On a microlevel, there is a direct effect in increased salary due to higher productivity as well as increased salary for neighbours and an increased participation rate in the labor force. There are also external and indirect effects like better health, lower mortality of children and lower rate of births. These indirect effects at a microlevel will result in lower population growth and better health of the population. The increased salaries and the increased labor force participation will result in growth at a macroeconomic level (Michaelowa, 2000).

### 2.3.2 Health Care

Alok Bargava, Dean T. Jamison, Lawrence Lau and Christoper JL Murray have examined the effects of health on economic growth. Their results showed a significant effect of health on economic growth, indicated by adult survival rate especially for low income countries (Bargave, et.al., 2001).

It is suggested that there are three channels through which improved health is affecting economic growth; (1) Improved productivity due to a wealthier workforce and less morbidity-related absenteeism, (2) the increased incentives for individuals and firms to invest in human and physical capital due to the higher life-expectancy rate, and (3) the increase in savings rate that working-aged individuals save for their retirement years (Merson, Black and Mills, 2012).

From the individual based micro perspective, good health has a value of its own and is an important parameter for economic and social development[5]. Healthier people do not have to suffer from illness and tend to live longer and more fulfilling lives. With reference to the three suggested channels above, good health is also likely to be important from the individuals' own perspective. If an individual reports less morbidity-related absenteeism, the individual does not need to suffer from income-loss. A more productive individual is likely to earn a higher salary and is attractive for firms to invest in. Healthy children are likely to have higher school attendance, be more efficient and effective learners, and hence they will enjoy higher income as adults.

## 2.4 Employment

There is considerable divergence in views about how foreign direct investments affect employment. Baldwin argues that it encompasses three issues; (i) the extent to which FDIs substitutes for domestic investments, (ii) the extent to which FDIs stimulates increases of exports of intermediates goods and capital goods, and (iii)whether FDIs involves the construction of new plants or simply the acquisition of existing facilities. FDIs can also preserve employment by acquiring and assisting ailing enterprises. However, the foreign investments can also reduce employment if the investments result in divestment and closure of firms and production plants in the host country (Baldwin, 1995). Tambunlertchai evaluated the contribution of the foreign investments to the host countries by four criteria, whereof one is the creation of employment. Thus, because of the high capital-intensity and the import dependency the empirical evidence could not significantly conclude contributions to the host country regarding these criteria (Imad, 2002).

[5] Health (indicated by life-expectancy at birth) is one of three components (Health, Education and Living Conditions) of UNDP's Human Development Index. http://hdr.undp.org/en/statistics/hdi/

An essential part for achieving poverty reduction, and to create sustainable economic- and social development, is to create opportunities to productive employment. Unemployment and underemployment is a core issue for poverty reduction. It is of huge importance to not only consider the economic growth. One also has to assist the poor to enter the labor market and to be a part of the labor force in the more productive categories of employment. Therefore, decent work is a key factor to social development, poverty reduction and personal well-being. To achieve this, investments in labor-intensive industries could raise the employment ratio by productive employment that will result in social development (UN, 2012).

# 3. Methodology and Data Collection

## 3.1 The Methodology of the Study

The study was performed as a Minor Field Study in Zambia during June- August 2012. It consists of two parts; one quantitative and one qualitative part.

### 3.1.1 Quantitative Study

The quantitative part of the study consists of a questionnaire conducted with 213 respondents. The questionnaire is found in *Appendix A*. The structured, standardized questionnaire will ease the interpretation and the analysis of the outcome (Patel and Davidsson, 2003). Another reason for using structured questions is that the respondents might not be used to responding to questionnaires and therefore it is important to distinctly present the questions. There were no language difficulties, which has enabled the respondents to perform the questionnaire in English without any need of an interpreter.

The 84 respondents employed by foreign investors, other than Chinese, are working within three different enterprises. The 129 respondents representing a sample of employees working for Chinese owned enterprises are employed by five different Chinese companies; Nonferrous China Africa Mining Plc. (NFCA), JCHX Mining Management Co., Ltd (JCHX), Jinchuan Group Co., Ltd, China Nonferrous Metal Mining Luanshya Copper Mine Plc. (CLM) and China Nonferrous Metal Mining Luanshya Copper Mine Plc. (15MCC). A visit at CLM or 15 MCC were not allowed, therefore these respondents were contacted through the Mineworkers Union of Zambia, MUZ. The questionnaire has been performed at the operations with NFCA, JCHX and Jinchuan Group Co., Ltd. At Jinchuan Group Co. Ltd and JCHX, the authors were allowed to distribute the questionnaire on their own and the samples were not chosen by the company. Due to safety regulations, the distribution was supervised by a representative from the company and this might have biased the outcome of the responses. On the third company, NFCA, the managers

selected a sample to respond the questionnaire, but when the sample was selected the distribution of the questionnaire took place without supervision. MUZ allowed the authors to visit three of their union meetings to perform the questionnaire with some of their members employed by Chinese owned enterprises outside the employers' premises. Out of 129 respondents, 50 were respondents via MUZ. At the non-Chinese companies, the distribution of the questionnaires was handled by the companies. The fact that most questionnaires were distributed with assistance from the management of the companies themselves, or under supervision when distribution was performed by the authors is a shortcoming of the study. This might have biased the results since some of the respondents might not have been comfortable with answering the questionnaires honestly. The safety guidelines and safety hazards did not allow further access to the operation plants, especially not with the underground workers. In order to avoid the most sensitive information being shared, the case might have been that the supervisors chose a sample they expected to be satisfied with their working conditions, which might have further biased the results.

The questionnaire was composed to motivate the respondent to answer as honestly as possible, and to feel comfortable by answering it by ensuring them that their answers are strictly anonymous. The first questions are very basic questions about their background. After those initial questions there are questions related to their work and their working conditions. These questions are asked in order to run a regression on what variables affect the wage and to compare the wages received by employees at Chinese owned enterprises with the wages received by employees at enterprises of other foreign origin. There are also questions about whether an employee is satisfied with its working conditions and its employer. The last six questions, are about the perception of access to health care, education and transportation infrastructure as well as if the living conditions have changed in their households over the last five years. Since these questions might be sensitive to some people they are asked in the end of the questionnaire. To avoid missing values, we asked for the respondents' permission to quickly look through the questionnaire when it was handed in to make sure no questions were left blank, or that any misunderstandings had occurred.

The descriptive of all variables (dependent as well as independent variables) in the regressions are presented in *Appendix B and C.*

### 3.1.2 Qualitative Study

The aim with the qualitative part of the study is to answer the second and the third research question. As in the quantitative part of the study, the respondents remained anonymous to make sure the respondents were confident in answering the questions.

Eight semi-structured in-depth interviews were arranged with individuals working for the Chinese owned enterprises. A semi-structured interview enables the interviewer to adjust the interview to make the

respondent as comfortable as possible. Thus, an interview guide, *Appendix D*, was used to ensure that certain topics were considered. The respondents got the opportunity to choose where they wanted to be interviewed. Four of them asked us to come to their houses to perform the interview, whereas the other four decided to meet us in a neutral place, like in a restaurant. The interviewees are living in different towns and they are employed by three different Chinese owned companies. Since the questions regarded access to health care, education, transportation infrastructure and opportunities to employment, the place of living might have been of some concern for these issues. Therefore, the place of living has been considered when selecting respondents. The qualitative interviews were based on the questions regarding 'access' in the questionnaires and made it possible to further extend the understanding of the answers to these questions in the questionnaire and a deeper understanding for the underlying factors to these answers.

The third research question is answered by qualitative semi-structured in-depth interviews. These interviews were performed with relevant representatives from the government and different organizations. The purpose of these interviews was to discuss the macroeconomic effects of the Chinese FDIs in the Zambian mining sector. In order to ease the evaluation of reliability and validity of these interviews the respondents are presented by name. In order to enable the respondent to make the preparations that eventually were required for the interview, an interview-guide was sent to the respondent in advance.

## 3.2 Sample and Respondents

### 3.2.1 Presentation of the Respondents in the Questionnaire

The questionnaires were performed with underground- and surface mine workers in the Copperbelt, Zambia. A mine worker is here defined as; *an employee in the mining industry in the Copperbelt that is working within a stage included in the copper production. Common tasks are drilling, operating machinery, maintaining machinery and driving the dump truck.* The authors' internal endeavour was to get 200 respondents. The final result is 213 completed questionnaires whereof 129 are employed by Chinese owned enterprises and 84 are employed by other foreign owned enterprises. The non-Chinese companies are representing three nationalities; Swedish, South African and Indian. There are five companies among the Chinese ones'; NFCA, JCHX, Jinchuan Group Co., Ltd, CLM and 15 MCC[6]. However, the operation operated by Jinchuan Group Co., Ltd., where we got 34 respondents, was owned

[6] NFCA, JCHX, CLM and 15MCC are state owned enterprises owned by China Nonferrous Metal Mining (Group) Co., Ltd (CNMC). Jinchuan Group Co., Ltd. is a large state-owned business with holding by Gansu Provincial Government.

by a South African company until December 2011. After discussion with the management at Jinchuan's operation in Kalulushi, Zambia, the authors were informed that no changes have been done since the change of ownership. Hence, the study includes regressions where the respondents from Jinchuan Group Co. Ltd are included and when they are excluded. It will be noted when the respondents from Jinchuan Group Co., Ltd are excluded. The Chinese companies represented in the study are state-owned.

One needs to be aware of that the sample of respondents representing eight different companies in total. This could be considered a small sample order to generalise the outcome. However, the study is limited to the Copperbelt where the operating companies are large and rather few.

Two respondents were dropped from the sample, because their positions are not covered by the definition of mine workers previously presented. Therefore, a maximum of 211 respondents are from here on presented.

### 3.2.2 Presentation of Respondents in the In Depth Interviews

Out of the 129 respondents employed by Chinese owned enterprises, eight respondents were randomly selected from three different Chinese owned enterprises to participate in a semi-structured in-depth interview. Due to the confidentiality and the safety of the employees, the companies they are employed by will not be presented. Hence, they will be presented as Company 1, Company 2 and Company 3. From Company 1, there are four respondents; Mine worker 1 from Kitwe, Mine worker 2 from Mufilera and Mine workers 3 and 4, which are both from Chambishi. From company 2, there are two respondents; Mine worker 5 from Chambishi and Mine worker 6 from Kitwe. From company 3, there are two respondents; Mine worker 7 and 8, both from Luanshya. This is distinctly presented in table 3.3.2. In *Appendix E* map is presented indicating the location of the different towns.

**Table 3.3.2 Respondents; In-depth interviews**

| **Respondents** | Employer | Town of Living | Household Size |
|---|---|---|---|
| Mine worker 1 | Company 1 | Kitwe | 7 |
| Mine worker 2 | Company 1 | Mufilera | 5 |
| Mine worker 3 | Company 1 | Chambishi | 2 |
| Mine worker 4 | Company 1 | Chambishi | 10 |
| Mine worker 5 | Company 2 | Chambishi | 3 |
| Mine worker 6 | Company 2 | Kitwe | 5 |
| Mine worker 7 | Company 3 | Luanshya | 5 |
| Mine worker 8 | Company 3 | Luanshya | 8 |

The respondents were randomly selected. The individuals participating in the quantitative part of the study got the opportunity to sign up for an in-depth interview. Information was shared about the aim of the research, that their participation should be handled with strict confidentiality, the information should be used for scientific purpose and that it was their own choice to participate or not when they were asked to sign up if they were interested in an in depth interview. Of those who signed up, we contacted people living in different locations since the location of living might be of great importance to the questions the interview should focus on. When the second contact was established with the respondent, the respondent once again had the opportunity to consider if there was an interest in participating.

### 3.2.3 Presentation of Respondents Representing Governmental Institutions and Organizations

The respondents in these interviews are presented by name and title in *Appendix F*.

## 3.3 Method of Data Collection

### 3.3.1 Interview Technique and the Processing of the In Depth Interviews (Mine workers)

In advance the respondents were informed about the four topics; access to health care, access to education, opportunities for employment and access to transportation infrastructure. During the interviews, both authors were participating and were responsible for two topics each. All interviews were recorded and partly transcribed on the same day as the interview was performed. Meaning that the most important parts were transcribed and nonsense discussions were not transcribed. For the empirical part,

the most important issues discussed during these interviews were used to summarize the perceptions received by the respondents.

The interviews were scheduled on a location suggested by the respondent. The interviews varied in length from 60-90 minutes.

### 3.3.2 Interview Technique and the Processing of the In Depth Interviews (Gov. & Org.)

After arrangement of these interviews was done, an interview guide was sent to the respondent to enable preparation eventually required to be able to respond correctly to the questions. During the interviews, both authors were actively participating in the discussions and everyone was free to ask questions clarifying the answers of the respondent. The interviews were recorded with allowance from the respondent and then fully transcribed on the same day as the interview. The respondent was asked if his/her name was allowed to be referred to in the thesis. Within this category of respondents everyone allowed us to refer to their names and therefore no one is anonymous in this part of the study.

The length of these interviews varied from 30-60 minutes.

## 3.4 Limitations

### 3.4.1 Transportation Infrastructure

The intention was to examine four areas: access to health care, access to education, opportunities to employment and access to transportation infrastructure. However, it was realized that the topic regarding transportation infrastructure was not appropriate for this study. Most of the respondents in the in-depth interviews cannot afford to have their own car and therefore they are not aware of the conditions of the transportation infrastructure. The only time they are using these type of facilities are when they are going to work and most companies provide their employees with transportation between their place of living and their work. Secondly, the perception the authors have got from people they have been in contact with in the field is that the investors are not interested in financing these capital-intensive investments, since it is something that should be facilitated by the government. However, the government does not have the financial capacity to improve the transportation infrastructure so they are now seeking for support from the private sector to enable improvement and maintenance of the transportation infrastructure.

### 3.4.2 Loss of Respondents

#### 3.4.2.1 In the Questionnaire

In the quantitative part of the study, the total number of performed questionnaires was 224. Even with the allowance from respondents' to go through the questionnaire when they handed it in, 11 of the questionnaires had missing values and therefore these questionnaires are excluded from the sample.

#### 3.4.2.2 The Minister of Commerce, Trade and Industry and Minister of Mines and Mineral Development

The initial intension was to arrange interviews with the Minister of Commerce, Trade and Industry and the Minister of Mines and Mineral development. Mr. Robert Sichinga, Minister of Commerce, Trade and Industry judged himself to lack the proper knowledge about the topic in order to answer the questions correctly. Therefore, he did not agree on an interview. The rejection of the interview with the Minister of Mines and Mineral Development is found in *Appendix G*.

# 4. Econometric Analysis of Earnings and Working Conditions

## 4.1 Wage Regressions

In the first regression on wage (Regression 4.1.1), all respondents are included. However, in the second regression (Regression 4.1.2), the respondents are divided into three categories[7]. The reason for running regression 4.1.1 with the entire sample is to investigate if there is a significant difference on wage if respondents are employed by a Chinese employer compared to be employed by another foreign employer. Table 4.1.1 shows the ratio of respondents with Chinese employers.

**Table 4.1.1 Summary Statistics**

| **Are you working for a Chinese employer?** | Frequency | Percent |
|---|---|---|
| No | 84 | 39.81% |
| Yes | 127[1] | 60.19% |
| N | 211 | 100% |

[1]31 employed by Jinchuan Group Co., Ltd

[7] 1; Respondents with Chinese employers 2; Respondents with Chinese employers excl. Jinchuan Group Co., Ltd 3; Respondents with other foreign employers.

In order to ease the interpretation of the coefficient's outcome on wage, the dependent variable is log (wage) rather than wage. The same independent variables are used in both regression 4.1.1 and 4.1.2, except that regression 4.1.1 includes a binary variable for respondents with Chinese employers.

*Regression 4.1.1*

$$log(wage)_i = \beta_0 + \beta_1 age_i + \beta_2 age_i^2 + \beta_3 chinese_i + \beta_4 experience_i + \beta_5 tenure_i + \beta_6 secondary_i + \beta_7 tertiary_i + \beta_8 written_i + \varepsilon_i$$

*Regression 4.1.2*

$$log(wage)_i = \beta_0 + \beta_1 age_i + \beta_2 age_i^2 + \beta_3 experience_i + \beta_4 tenure_i + \beta_5 secondary_i + \beta_6 tertiary_i + \beta_7 written_i + \varepsilon_i$$

In table 4.1.3, all independent variables are defined and their expected outcome on wage is presented. The variables can be organized in six different categories including age, the origin of the employer, experience in the mining sector, tenure, level of completed education and whether the respondent has a written contract. Both age and age squared are included variables. Level of completed education among the respondents is divided into four levels; respondents without any completed education, primary education, secondary education and tertiary education. (Displayed in table 4.1.2)

**Table 4.1.2 Summary Statistics**

| **What is your highest level of completed education?** | Chinese employers | Chinese employers excl. Jinchuan Group Co., Ltd | Other foreign employers | All employers |
|---|---|---|---|---|
| None | - | - | - | - |
| Primary | 5.51% (7) | 6.25% (6) | 3.57% (3) | 4.74p% (10) |
| Secondary | 56.69% (72) | 55.21% (53) | 47.62% (40) | 53.08% (112) |
| Tertiary | 37.80% (48) | 38.54% (37) | 48.81% (41) | 42.18% (89) |
| N | 127 | 96 | 84 | 211 |

Respondents with no completed education were initially supposed to serve as the base group. However, as all respondents in the sample have completed primary education it serves as a base group for level of education.

**Table 4.1.3 The Independent Variables' Definition and Expected Outcome on Wage**

| *Variable* | *Definition* | *Expected outcome on wage* |
|---|---|---|
| **Age** | Years | + /- |
| **Age squared** | Years squared | - |
| **Chinese** | No or yes where yes is equal to 1 if the employer is Chinese | - |
| **Experience** | Years in the mining sector | + |
| **Tenure** | Years worked for the same employer | + |
| **Education** | Primary (grade 1-8), Secondary (grade 9-12), Tertiary ( College and University) | + |
| **Written contract** | No or yes where yes is equal to 1 | + |

The variable age is included in the regression as it seems reasonable that age could be an important determinant on wage. Thus, the expected outcome of the variable is difficult to predict. It is reasonable to expect that one receive a higher wage, the older one is. However, the work in the mines requires people with good physical health. A condition degraded by age. Age squared is included in the regression in order to correct for this and the expected outcome on wage is therefore negative. The expected outcome on wage is either positive or negative.

The variable Chinese is only included in regression 4.1.1. The purpose is, as introduced in the beginning of this chapter, to investigate if there is a significant difference of outcome on wage between Chinese employers and other foreign employers. The expected outcome of being employed with Chinese companies is negative and the variable is expected to be significant. If the variable is not significant there is no purpose to run regression 4.1.2 with different categories. It is fair to argue that experience and tenure

should affect the wage; the outcome is expected to be positive. Level of education is included, as one is expected to earn a return on education; therefore the expected outcome of secondary and tertiary education is positive. The expected outcome on wage if an employee has a written contract is expected to be positive as it seems reasonable to think that employees with written contract are more appreciated than an employee without a written contract.

**Table 4.1.4 Summary Statistics**

| **Do you have a written contract?** | All employers | Chinese employers | Chinese employers excl. Jinchuan Group Co., Ltd | Other foreign employers |
|---|---|---|---|---|
| No | 5.69% (12) | 3.94% (5) | 2.08% (2) | 8.33% (7) |
| Yes | 94.31% (199) | 96.06% (122) | 97.92% (94) | 91.67% (77) |
| N | 211 | 127 | 96 | 84 |

The intention was to specify the employees' type of contract in the regressions. However, the definition of limited and permanent contract was confusing to the respondents. Due to this, type of contract is not included in the regressions. Though, the distribution is reviewed in table 4.1.5.

**Table 4.1.5 Summary Statistics**

| **What type of contract do you have?** | All employers | Chinese employers | Chinese employers excl. Jinchuan Group Co., Ltd | Other foreign employers |
|---|---|---|---|---|
| No contract | 5.69% (12) | 3.94% (5) | 2.08% (2) | 8.33% (7) |
| Limited | 18.96% (40) | 30.71% (39) | 30.21% (29) | 1.19% (1) |
| Permanent | 75.36% (159) | 65.35% (83) | 67.71% (65) | 90.48% (76) |
| N | 211 | 127 | 96 | 84 |

It is common to include the independent variable gender in the wage regression. Though, as indicated in table 4.1.6 there is only 6 female respondents out of 211 in the sample. Since there are only a few females in the sample, it is not possible to make any conclusion of the independent variable gender and therefore the variable gender is excluded from the regressions.

**Table 4.1.6 Summary Statistics**

| **Gender** | All employers | Chinese employers | Chinese employers excl. Jinchuan Group Co., Ltd | Other foreign employers |
|---|---|---|---|---|
| Male | 97.16p% (205) | 97.64% (124) | 98.96% (95) | 96.43% (81) |
| Female | 2.84% (6) | 2.36% (3) | 1.04% (1) | 3.57% (3) |
| N | 211 | 127 | 96 | 84 |

**Table 4.1.7 Multiple Regressions on Log(wage)**

| **Log (wage)** | All employers[1] | Chinese employers[2] | Chinese employers excl. Jinchuan Group Co., Ltd[2] | Other foreign employers[2] |
|---|---|---|---|---|
| Age | 0.0430191 | 0.0281215 | 0.040666 | 0.0418006 |
| | (0.0225903)* | (0.0389241) | (0.0435303) | (0.0225397)* |
| Age squared | -0.0007157 | -0.0005096 | -0.0005988 | -0.0007395 |
| | (0.0002847)** | (0.0004802) | (0.0005394) | (0.0003462)** |
| Chinese employer | -0.4371537 | - | - | - |
| | (0.0539896)*** | | | |
| Experience | 0.0246564 | 0.0206833 | 0.0209134 | 0.0359894 |
| | (0.0054056)*** | (0.0055387)*** | (0.0053296)*** | (0.0122376)*** |
| Tenure | 0.0181117 | 0.0150654 | 0.0076398 | 0.0168085 |
| | (0.0048754)*** | (0.0075504)** | (0.0104424) | (0.0068781)** |
| Secondary Education | 0.1286722 | 0.0243593 | -0.0830705 | 0.3492813 |
| | (0.1340348) | (0.1557444) | (0.1317779) | (0.2205039) |
| Tertiary Education | 0.5300746 | 0.4002973 | 0.3941057 | 0.8259536 |
| | (0.1345067)*** | (0.1525165)*** | (0.1317966)*** | (0.2169564)*** |
| Written Contract | 0.2380532 | 0.1448488 | 0.5475235 | 0.2801936 |
| | (0.1367605)* | (0.1965147) | (0.0811788)*** | (0.1601644)* |
| Constant | 6.649324 | 6.719591 | 5.985069 | 6.328731 |
| | (0.4357201)*** | (0.7696361)*** | (0.864219)*** | (0.4876943)*** |
| R-squared | 0.5317 | 0.3164 | 0.4681 | 0.5522 |
| P-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| N | 211 | 127 | 96 | 84 |

Note: Standard errors robust to heteroskedasticity displayed in parenthesis
[1] Regression 1
[2] Regression 2
*** Significant at 1 percent
** Significant at 5 percent
* Significant at 10 percent

From the first column in table 4.1.7, it is investigated that the fact that someone is employed by a Chinese employer has a huge effect on wage. In ceteris paribus, an employee with a Chinese employer receives a wage approximately 44 percent lower than employees at other foreign employers. The variable is statistically significant at 1 percent level. According to this, it is legitimate to further investigate the effects of being employed by a Chinese employer through running regression 4.1.2 with the three different categories of respondents. The descriptive of wage is presented in table 4.1.8.

**Table 4.1.8: Summary Statistics of the Dependent Variable**

| **Wage**[1] | All employers | Chinese employers | Chinese employers excl. Jinchuan Group Co., Ltd | Other foreign employers |
|---|---|---|---|---|
| Mean | 2 784.64 | 2 210.70 | 2 028.68 | 3 652.39 |
| Median | 2 600.00 | 2 000.00 | 2 000.00 | 3 500.00 |
| Standard Deviation | 1 402.61 | 803.31 | 779.78 | 1 652.82 |
| Min | 660.00 | 660.00 | 660.00 | 680.00 |
| Max | 10 000.00 | 4 500.00 | 4 500.00 | 10 000.00 |
| N | 211 | 127 | 96 | 84 |

[1] Wage is presented in the unit 1000-Kwacha

Age and age squared have a negative outcome on wage as expected, but the variables are only significant (10 and 5 percent level respectively) in the category with foreign employers. Independent of employer, experience has a positive and significant effect on wage. Tenure is statistically significant and has a positive outcome on wage as expected, but it is not statistically significant for the category where Jinchuan Group Co., Ltd is excluded. Secondary education is statistically insignificant in all categories. When excluding Jinchuan Group Co., Ltd, the coefficient for secondary education is negative. This is an unexpected outcome, but due to the fact that the coefficient is not statistically significant at any level, it will therefore not be considered further. Tertiary education is statistically significant at 1 percent level in all categories. Interpreting the coefficient indicates that tertiary education has a huge effect on wage. In ceteris paribus, if one has completed tertiary education this is equivalent with approximately 40 percent higher wage if employed by a Chinese company and approximately 80 percent higher wage if employed by another foreign company compared with someone without tertiary education. The coefficient for written contract is positive as expected and statistically significant at 10 percent level for the employees with foreign employer. It is statistically significant at 1 percent level for the employees with Chinese employer when Jinchuan Group Co., Ltd is excluded, but statistically insignificant if looking at the sample when Jinchuan is included. The estimated coefficient changes its estimated value from approximately 0.14 to 0.55. According to this, it is not economically motivated to believe that any conclusions can be made about the variable when Jinchuan is included, even if the statistical significance

is 1 percent. A reason might be that the share of respondents without a written contract is very low in our sample (see table 4.1.5).

## 4.2 Binary Response Models: Satisfying Working Conditions

Three binary response models; the Linear Probability Model(LPM), the Logit model and the Probit model, are run on respondents employed by Chinese employers to investigate what makes an employee satisfied with its working conditions. The respondents from Jinchuan Group Co., Ltd are included in these models. Table 4.2.1 presents the proportion of respondents that is satisfied with their working conditions.

**Table 4.2.1: Summary Statistics of the Dependent Variable**

| **In general, are you satisfied with your working conditions?** | Frequency | Percent |
|---|---|---|
| No | 93 | 73.23% |
| Yes | 34 | 26.77% |
| N | 127 | 100% |

The same independent variables are included in the three binary response models. In table 4.2.2, all the independent variables are defined and the expected outcome is presented. The outcome of the independent variables in the LPM, the Logit Model and the Probit Model is expected to be similar in magnitude and the signs are expected to be the same.

**Table 4.2.2 The Independent Variables' Definition and Expected Outcome on Satisfying Working Conditions**

| *Variable* | *Definition* | *Expected outcome on satisfying working conditions* |
|---|---|---|
| **Age** | Years | +/- |
| **Education*** | Primary (grade 1-8), Secondary (grade 9-12), Tertiary (College and University) | - |
| **Member of a Union*** | No or Yes where yes is equal to 1 | + /- |
| **Written Contract*** | No or Yes where yes is equal to 1 | + |
| **Days** | Days worked on average per week | - |
| **Enough breaks** | No or yes where yes is equal to 1 if the employee reckons it has enough breaks during a day of work | + |
| **Personal Protective Equipment, PPE*** | No or yes where yes is equal to 1 if the employee reckons to be provided with proper PPE | + |
| **Access to Emergency Care*** | No or yes where yes is equal to 1 if the employee reckons the company provides emergency care on the operation | + |
| **Satisfied Life*** | No or yes where yes is equal to 1 if the employee is satisfied with life | + |
| **Log (wage)** | Monthly wage in 1000- Kwacha in logarithmic form | + |

* Binary variable

Age is included as perception changes over time, and this might affect the level of satisfaction positively as well as negatively. Variables for secondary education and tertiary education (primary education serves at the base group) are included in the regression as it is likely to think that level of education affects how satisfied one is with the working conditions. The effect is assumed to be negative, because higher level of education might correspond with higher awareness of labor rights, labor laws and safety aspects. If

acceptable standards are not present, more educated employees are more likely to respond negatively on these standards. Table 4.2.3 presents the ratio of the respondents that are members of one of the unions. The expected outcome on satisfaction is difficult to predict. It might be that a respondent choose to be a member of the union due to unsatisfying working conditions. If this is the case, the outcome is likely to be negative. However, the case might be reverse if the union has successfully negotiated with the company.

**Table 4.2.3 Summary Statistics**

| **Are you a member of a union?** | Frequency | Percent |
|---|---|---|
| No | 13 | 10.24% |
| Yes | 114 | 89.76% |
| N | 127 | 100% |

Written contract is expected to have positive outcome on satisfying working conditions as a contract is presumed to include the specifications regarding the employment, and serve as a guarantee against unexpected dismissal. Table 4.2.4 shows how many days the respondents work per week. The respondents work between five and seven days per week. Therefore, the variable days is expected to have negative impact on satisfying working conditions as it is reasonable to think that individuals prefer to have some leisure.

**Table 4.2.4 Summary Statistics**

| **How many days do you work per week?** | |
|---|---|
| Mean | 5.98 |
| Median | 6 |
| Standard Deviation | 0.55 |
| Min | 5 |
| Max | 7 |
| N | 127 |

The variable enough breaks refers to whether respondents think that they have enough breaks during a day of work. It is likely to have a positive outcome on satisfying working conditions if the respondents think there are enough breaks. If the company provides the required PPE, the expected outcome on satisfaction is positive, this is also expected if there is access to emergency care on the company operations. The correlation between the two variables, PPE and access to emergency care, is 0.4664.

**4.2.5 Summary Statistics**

| **Does the company provide the safety equipment you need in your work?**[8] | Frequency | Percent |
|---|---|---|
| No | 27 | 21.26% |
| Yes | 100 | 78.74% |
| N | 127 | 100% |

**Table 4.2.6 Summary Statistics**

| **If an accident occurs during a day of work is there access to emergency care?** | Frequency | Percent |
|---|---|---|
| No | 28 | 22.05% |
| Yes | 99 | 77.95% |
| N | 127 | 100% |

Although, there is a problem with causality which makes it difficult to interpret the coefficient, the variable satisfied life is included in the regression. Though, the reason to include it in the regression is that the variable controls for the type of personality that is more prone to complain. The variable is expected to have a positive outcome on satisfaction.

**Table 4.2.7 Summary Statistics**

| **At the moment are you satisfied with life in general?** | Frequency | Percent |
|---|---|---|
| No | 89 | 70.08% |
| Yes | 38 | 29.92% |
| N | 127 | 100% |

Wage is included in the regression as it is justified to argue that wage is of great importance to whether an individual is satisfied with the working conditions. Wage is included as the log wage. This means that the coefficient interprets the change in probability of success due to percentage changes in wage rather than changes in units. It is justified to assume that the wage has diminishing returns on satisfying working conditions. Log(wage) is expected to be statistically significant and be one of the most important variables of economic interest.

[8] "Safety equipment" is here used as the generic expression referring to the personal protective equipment. The reason for not specifying questions about specific required equipment( hard hat, gloves, boots, goggles etc) in the mines is that surface workers and underground workers require different types of safety equipment in their work.

Binary Response Model 4.2.1 is a Linear Probability Model, LPM, where the response probability is linear in its parameters. The purpose of the LPM is to investigate factors of importance among mine workers in order to be satisfied with working conditions. The estimated effect of the independent variables on the dependent variable is the predicted probability of success. In ceteris paribus, the slope coefficients for the continuous variables are the predicted change in probability of success when the variable increases by one unit. The slope coefficients for the binary variable are the predicted change in probability of success if the variables change from 0 to 1.

*Binary Response Model 4.2.1., Linear Probability Model*

$$satisfied\_work_i = \beta_0 + \beta_1 age_i + \beta_2 secondary_i + \beta_3 tertiary_i + \beta_4 union_i + \beta_5 written_i + \beta_6 days_i + \beta_7 enough\_breaks_i + \beta_8 ppe_i + \beta_9 access\_emergency\_care_i + \beta_{10} satisfied\_life_i + \beta_{11} \log(wage)_i + \varepsilon_i$$

The LPM has two major shortcomings as a binary response model;

- By definition, a predicted probability must be predicted between zero and one. The linear probability model sometimes fails to make predictions within this interval, which makes it difficult to interpret the coefficient.
- In the linear probability model, the marginal effect is linearly related to the independent variables for all their possible values, which is not likely to be the truth (Wooldridge, 2009).

In order to avoid these shortcomings of the Linear Probability Model, the Logit- and Probit Model will now be concerned.

The Logit- and Probit are more sophisticated binary response models compared to the Linear Probability Model. Since these models do not predict response probabilities outside the interval (between zero and one), and they imply diminishing magnitudes of the marginal effects.

The Logit- and Probit models predict the marginal effects of continuous variables by deriving the function with respect to the variable in question, when all the other independent variables are at their mean value in the sample.

For the binary variables, the marginal effect is predicted by a discrete change of the binary variable from 0 to 1 when the other independent variables in the sample obtain their mean value (Wooldridge, 2009).

*Binary Response Model 4.2.3.1; the Logit Model*

$$P(satisfied\_work_i = 1|\boldsymbol{x}) = \Lambda(\beta_0 + \beta_1 age_i + \beta_2 secondary_i + \beta_3 tertiary_i + \beta_4 union_i + \beta_5 written_i + \beta_6 days_i + \beta_7 enough\_breaks_i + \beta_8 ppe_i + \beta_9 access\_emergency\_care_i + \beta_{10} satisfied\_life_i + \beta_{11} \log(wage)_i)$$

*Binary Response Model 4.2.3.2; the Probit Model*

$$P(satisfied\_work_i = 1|\boldsymbol{x}) = \Phi(\beta_0 + \beta_1 age_i + \beta_2 secondary_i + \beta_3 tertiary_i + \beta_4 union_i + \beta_5 written_i + \beta_6 days_i + \beta_7 enough\_breaks_i + \beta_8 ppe_i + \beta_9 access\_emergency\_care_i + \beta_{10} satisfied\_life_i + \beta_{11} \log(wage)_i)$$

**Table 4.2.8 Marginal Effect of LPM, Logit and Probit Estimates of Satisfying Working Conditions**

| **Satisfied Work** | Linear Probability Model, LPM[1] | Logit Model[2] | Probit Model[2] |
|---|---|---|---|
| Age | -0.0052485 | -0.0035927 | -0.0036294 |
| | (0.0037522) | (0.0038) | (0.00396) |
| Secondary | -0.0455333 | 0.0021479 | 0.0018369 |
| | (0.125496) | (0.11525) | (0.13502) |
| Tertiary | -0.144025 | -0.0962267 | -0.1039027 |
| | (0.1431425) | (0.11973) | (0.13651) |
| Member of a Un ion | -0.3082552 | -0.3893278 | -0.4001138 |
| | (0.1298695)** | (0.17993)** | (0.16946)** |
| Written Contract | 0.1970635 | 0.1188063 | 0.1393629 |
| | (0.1901635) | (0.06497)* | (0.08125)** |
| Days | 0.1845352 | 0.187159 | 0.1915336 |
| | (0.0747403)** | (0.07977)** | (0.08125)** |
| Enough Breaks | 0.1926403 | 0.2449244 | 0.2739177 |
| | (0.0793212)** | (0.1225)** | (0.1127)** |
| PPE | 0.0614116 | 0.1362323 | 0.1505668 |
| | (0.0789033) | (0.09467) | (0.08647)* |
| Access Emergency Care | 0.1107978 | 0.0990738 | 0.1017825 |
| | (0.0855841) | (0.09288) | (0.09382) |
| Satisfied Life | 0.2805831 | 0.2892485 | 0.3012725 |
| | (0.090693)*** | (0.11563)** | (0.10421)*** |
| Log (wage) | 0.3656745 | 0.3712473 | 0.4069 |
| | (0.102749)*** | (0.12861)*** | (0.12616)*** |
| Constant | -3.531721 | - | - |
| | (0.9446243)*** | | |
| Percentage Correctly Predicted | 0.81889764 | 0.82677165 | 0.82677165 |
| Log-pseudolikelihood | - | -49.222489 | -48.887632 |
| Pseudo R-squared | 0.3371 (??????) | 0.3329 | 0.3374 |
| N | 127 | 127 | 127 |

[1] The estimates presented are the marginal effects( equivalent with the coefficient in the LPM), in the brackets are the robust standard errors to control for heteroskedasticity.
[2] The estimates presented are the marginal effects, dy/dx, for continuous variables and the discrete change from 0 to 1 for binary variables. Standard errors are presented in the brackets.
*** Significant at 1percent
** Significant at 5percent
* Significant at 10percent

In table 4.2.8, estimates from the three models are presented. The estimated response probabilities predict the probability of success. Success is equal to being satisfied with working conditions. Neither age nor education are statistically significant in any of the models, thus, the outcome is in line with the expectation except for the variable secondary education in the logit and the probit model. However, as it is statistically insignificant the variable will not be considered futher. Being a member of a union is statistically significant at 5 percent level, and has a negative effect on satisfying working conditions. It has a huge influence on whether there is success or not, it reduces the probability of being satisfied with the working conditions with roughly 31 percent in the LPM and about 40percent in the other two models. Due to the magnitude the variable is of economic interest, though it might be a problem with causality and therefore one should be careful if making causal conclusions. Written contract is not statistically significant in the LMP, but is statistically significant on 10 percent level in the logit model and on 5 percent level in the probit model. Though, it is not entirely appropriate to generalize the variable written as there are few respondents without a written contract in the sample. The impact of days and enough breaks are both statistically significant at 5 percent level, and increase the probability of success with approximately the same magnitudes in all models. The outcome of enough breaks was as expected. Though, days have a positive effect on satisfying working conditions, which is not as expected. The likely explanation is that the income effect is of greater concern than the substitution effect. The variables PPE and access to emergency care were expected to best statistically significant, and have a positive impact on the probability of success. As indicated in the table, PPE is only significant in the probit model and access to emergency care is statistically insignificant in all models, which is not as expected. One explanation to this unexpected result might be that the issue about safety record is more concerned in media than among the employees. The variable satisfied with life is statistically significant at 1 percent level in the LPM and the Probit model, and at 5 percent level in the Logit model. The variable has an impact of increasing the satisfaction, which is in line with the expectations. Being satisfied with life in general increases the probability of being satisfied with working conditions with approximately 30 percent. Though, once again it is important to take notice of the problem with causality. The last independent variable log (wage) is statistically significant at 1 percent level in all models. One percent increase in salary, increases the probability of success with approximately 40 percent.

## 4.3 Perceived Access to Education, Health Care and Employment

This is a presentation of the mine workers´ perceived access to education, health care and employment. As well as mine workers´ perceived change in living conditions. Only the answers from mine workers with Chinese employers are presented.

**Table 4.3.1: Summary Statistics of Access to Education, Health Care and Employment**

| Variable | Improved | Unchanged | Worsened | Total (%) | N |
|---|---|---|---|---|---|
| **Has access to education changed for yours household in the last five years?** | 42.64 (55) | 44.96 (58) | 12.40 (16) | 100 | 129 |
| **Has access to health care changed for your household in the last five years?** | 45.74 (59) | 43.41 (56) | 10.85 (14) | 100 | 129 |
| **Has access to employment changed for your household in the last five years?** | 41.09 (53) | 46.51 (60) | 12.40 (16) | 100 | 129 |

Note: All respondents with current Chinese employers are included as the question is not company orientated

**Table 4.3.2: Summary Statistics of Perceived Change In Living Conditions**

| Variable | Improved | Unchanged | Worsened | Total (%) | N |
|---|---|---|---|---|---|
| **How has your household's living conditions changed in the last five years?**[9] | 37.50 (36) | 52.08 (50) | 10.42 (10) | 100 | 96 |

Note: Respondents from Jinchuan Group Ltd are excluded in this table as the company has not been the employer for five years yet and the following-up question ( see table 4.3.3 ) is company oriented.

[9] If the respondents from Jinchuan Group Ltd are included 44.19 percent (57) answered improved, 47.29 percent (61) answered unchanged and 8.53 percent (8) answered worsened. The sample, when the respondents from Jinchuan Group Ltd are included, consists of 129 respondents.

**Table 4.3.3: Summary Statistics of the Perception Regarding the Company's Contribution to Changed Living Conditions**

| Variable | Improved | | | | Worsened | | | |
|---|---|---|---|---|---|---|---|---|
| **Do you think the company has contributed to the change?** [10] | Yes | No | Total (%) | N | Yes | No | Total (%) | N |
| | 83.33 (30) | 16.67 (6) | 100 | 36 | 80.00 (8) | 20.00 (2) | 100 | 10 |

The majority of the respondents in the questionnaire regard their living conditions as unchanged in the last five years. More than one third of the respondents find that their households' living conditions have improved, and out of those 83.33 per cent find that their employer has contributed to the change. 10.42 per cent of the respondents that find their living conditions have worsened, a distinct majority, 80.00 per cent, find that the changed living conditions are due to the employer.

# 5. Qualitative study

## 5.1 In-Depth Interviews with Mine workers

In order to get some understanding of whether the perceived improvement in access to health care , education, and employment is due to their employment at the Chinese company or a result of the domestic development in Zambia, eight in-depth interviews were conducted. The respondents are presented in table 5.1.1.

[10] If the respondents from Jinchuan Group Ltd are included, 84.21 percent (48) of those who think that the conditions are improved (57 respondents) reckon that it is due to contribution by the company and 15.79 percent (9) do not think it is due to contribution by the company. Of those who think that the conditions are worsened (11 respondents), 81.82 percent (9) think it is due the contribution of the company and 18.82 percent (2) do not think it is due to contribution by the company. The sample, when the respondents from Jinchuan Group Ltd are included, consists of 129 respondents.

**Table 5.1.1 Respondents; In-depth interviews**

| **Respondents** | Employer | Town of Living | Household Size |
|---|---|---|---|
| Mine worker 1 | Company 1 | Kitwe | 7 |
| Mine worker 2 | Company 1 | Mufilera | 5 |
| Mine worker 3 | Company 1 | Chambishi | 2 |
| Mine worker 4 | Company 1 | Chambishi | 10 |
| Mine worker 5 | Company 2 | Chambishi | 3 |
| Mine worker 6 | Company 2 | Kitwe | 5 |
| Mine worker 7 | Company 3 | Luanshya | 5 |
| Mine worker 8 | Company 3 | Luanshya | 8 |

### 5.1.1 Access to Education

Access to education is a major issue for the respondents with whom the topic is discussed with, and education is of huge importance to them. If receiving higher salary, most of the respondents would spend that money for expenses allowing their children to go to better schools, private schools. A respondent living in Kitwe explains that the payment he receives from the Chinese company has enabled his family to buy a plot of land and to build a house. In the garden, his wife is able to cultivate vegetables, which she can sell in the market. The extra income the family receives by the vegetables enables the family to send all their children to private schools (Mine worker 1). Another respondent (Mine worker 5) says that; *"The only thing that is working now is money",* and discusses how access to education, as well as health care, has worsened since the privatization due to the huge expenses related with its access. In summary, access to education is of great concern to the respondents. Since the public schools are for free, access to education is equivalent to access to private schools where they argue the quality is of a much higher level. The quality is higher because the teachers are much more committed compared than they are in public schools. Although, the teachers in the private schools are untrained because they are employed at temporary basis, Mine worker 8 prefers to send his children to private schools due to higher level of commitment. A respondent from Chambishi (Mine worker 3) indicates a lack of teaching English in the public school. His younger brother attend public school at the moment, and is unable to speak English. This is another issue making the concern of being able to send their children to private schools even more important.

Previously, Company 1 added an education allowance to the basic salary received by the employees. The education allowance is now removed and none of the companies, which the respondents are employed by, are paying any education allowance. Therefore, it is up to the employees to use their money wisely to enable their children to attend school. The respondents indicate that an education allowance would be of great value for them. The company Mine worker 6 is employed by has promised to start with the education allowances from next year. Company 3 received a proposal regarding an education allowance from one of the unions three years ago, but the proposal was rejected by the management at the mentioned company (Mine worker 7)

Further, the opportunities for the employees to go back to school were discussed. A respondent from Chambishi (Mine worker 4) expresses a huge wish to go back to school. He reckons education is of great importance, and he would like to encourage his children to attend school. Hence, he would also like to get a promotion and expects that a higher level of education is required to get an opportunity for promotion. Mine worker 5 thinks that the company is encouraging regarding education and supports the employees to go back to school and educate themselves further. Thus, it does not include financial support. The respondent has discussed the opportunities to get financial assistance with the company's accountant. He wished to get a loan to be able to afford the expenses of further education and purposed that the loan could be deducted from the salary, but his request was declined.
Mine worker 8 reckons that access to education has improved for his household. One of his daughters is now attending the company school. Access to the company school is limited and it is for everyone in the community, not only for the children to the company's employees. The children have to go through a selection system with written exams to be enrolled. Though, the fees are reduced for the children of the employees. However, there are no support for the transportation costs so he has to spend about K300 000 per month for his daughter's transportation to school.

At the moment, there are only two primary schools and one secondary school in Chambishi. Mine worker 3 expresses an urgent need for more schools in town. The company he is working for is providing buses to the schools in Kalulushi, where the government provides five secondary schools compared to one in Chambishi. The assistance with transportation is very well appreciated, since it enables a lot of children to attend school and he believes the company could ease the attendance by building schools in Chambishi. Mine worker 6 reckons the access to education will be improved from next year if the company starts paying an education allowance as promised. He further expresses how valuable it would be if the company could support community schools, formally for orphans and other unprivileged that have no access to education. Mine worker 1 refers to Konkola Copper Mines, KCM, and how they invest a lot of

money in CSR, for example in education and sports, but indicates that the Chinese do not do such investments.

### 5.1.2 Access to Health Care

89 percent of the respondents believe that access to health care for their household is unchanged or has improved during the last five years. Almost 46 percent of the respondents from Chinese companies answered that the access to health care has improved.

The three companies, represented in our in-depth interview have their own company hospitals. One in Kitwe, the Sino-Zam Friendship Hospital, which is the company hospital for mine workers from company 1 and 2, and one in Luanshya, Luanshya Hospital, which is the company hospital for mine workers from company 3. The respondents are allowed to go to the company hospitals in order to get consultation and medical treatment. All respondents have at least once visited the company hospital, but not all of them have been there recently.

There are some differences between our three companies regarding access to free health care at the company hospitals. The respondents from company 1 explain that they are allowed to visit Sino-Zam Friendship Hospital in Kitwe for free whenever they need medical treatment or consultancy. Thus, the company is deducting a small amount from their salary each month for this service independent on number of visits. Dependents are also allowed to visit the company hospital. The company allows their employees to bring their spouse as well as up to five children in the household, which is a recent increase in number of dependents. Earlier, only the employee at the company and one dependent were allowed to visit Sino-Zam. According to Mine worker 6, the respondents from company 2 are also allowed to visit Sino-Zam Friendship hospital for free. He is also allowed to take his wife there, but not his daughter. Mine worker 5, who lives with his dad and stepmother, is not allowed to take them to the company hospital. However, if he gets married his wife would be allowed to go to Sino-Zam. For the respondents from company 2, there is no deduction for health care from their salary. All respondents find that their access to health care has improved as they can go to the company hospitals, which offer free consultancy as well as free medical care for them and dependents in their household (Mine worker 1, 2, 3 and 4) . If one go to the government hospital, the doctors provide a diagnosis, but no medical treatment so you have to pay for the medicine by yourself (Mine worker 5). Though, one barrier to better access to health care for the respondent in Mufilera is the transportation cost , because transportation is not provided by the company if he or someone else get sick at home (Mine worker 2). Because of this, he rarely uses the company hospital

The respondents that live in Luanshya and are employed by company 3, are allowed to go to the company hospital in Luanshya. Individuals from the general society are allowed to visit the company hospital as well, but for a very high cost. The employee at the company and five dependents from the household are allowed to visit the hospital for free (Mine worker 8). The mine in Luanshya has been closed occasionally. Mine worker 8 explains that the access to health care is much better now when the Chinese company has started operating in the mine compared to when it was closed. At the time of closure, it was hard to get transportation to the hospital as well as medicine. At the moment, even if the transportation does not hold certain standards, and medicine is not always present, it is for free. If your medicine is not present, you can buy it yourself and the company refunds you (Mine worker 8). The perception of the other respondent living in Luanshya is that the access to health care has worsened for his household. He went to the company hospital earlier, but not anymore. The previous employer, before the Chinese, cared much more and always provided transportation to Luanshya hospital. Even for dependants. His current employer does not, and because of this his household visits the government hospital these days as they can walk there. He finds the company responsible for the worsened access to health care for his household (Mine worker 7). Mine worker 8 also points out the problem with transportation for dependents, but recon that the company has improved the access to health care as the access was much worse before the company started operating.

Respondents using Sino-Zam, regard this as a benefit as they are employees at the Chinese companies. All of them, except Mine worker 2, find the access to health care improved due to the free consultation and medical treatment at Sino-Zam. Mine worker 2 does not find that the access to health care has improved by his employer. Due to the high transportation cost of going to Mufilera, he and his family go to the government hospital in Mufilera most of the time, just as they did before. He believes his household's access to health care would improve if the company provided a clinic in Mufilera for their employees. In order to increase the benefit for their employees and improve the access to health care, mine workers from company 1 would like the company to stop deducting for health care every month. They also wish for better doctors and nurses at Sino-Zam (Mine worker 3 and 4). Another concern, is the problem with interpretation. There are a lot of misunderstandings between Chinese nurses, doctors and patients so the communication needs to be improved (Mine worker 6). One of the respondents explains that he has got bad eyes, which the company is aware of, but they do not provide glasses and in fear of losing his job, he does not dare to complain. He does not reckon that he would have been given the employment at the company from the beginning if it was not for that his brother is working within management at the company (Mine worker 4). Mine worker 5 from company 2 would like the company to

ease the access to health care for the employee's household through providing a children's allowance to the Sino-Zam hospital (Mine worker 5).

In Luanshya, the demand for health care is greater than the supply in the community. The company does a lot of profit so the respondent thinks they should bring back money to improve the health care in the community. The Luanshya hospital has only two doctors employed, and they need to work a lot of overtime since the other doctors have left Luanshya hospital due to the poor conditions (Mine worker 7). The other respondent from Luanshya reckons that there is a lack of doctors and nurses, and because of this patients may have to be transferred to another health care institution if they are very sick. He says that the company has admitted the lack of staff, and that the company wanted to bring in doctors and nurses from China. Though, this was impossible due to Zambian labor regulations and as the doctors could not speak English. To summarize, the respondent indicates that before privatization, under the ZCCM, access was very good. Since privatization the mine has been closed on and off and the access has become extremely bad. Now the Chinese have opened the mine again, access has become better but not close to what it was before though he is happy with the access he can get (Mine worker 8).

### 5.1.3 Access to Employment

The quantitative part of this study showed that 67 percent of the respondents, currently employed at a Chinese company, moved in order to get employment at their current company. Three out of eight respondents in the sample moved to the Copperbelt in order to get an employment. Two of them from the Northern province; where there are no industries and poor opportunities to get a job (Mine worker 6) and the third one from Lusaka, where he completed his tertiary education. The three of them got their employment at their respective Chinese employer with assistance from a relative or a friend. The common view among the respondents is that the level of education is not important in order to get employment . *" The Chinese just care about cheap labor, they don't care about education"* (Mine worker 3). Mine worker 3 further explains that the differences in salary for employees with different levels of education are minimal, he himself has completed tertiary education. The company also brings their own workforce from China to perform the work as the Zambians, but they receive better salaries. Most of the Chinese workers do not know English, but will end up as the Zambian workforce's managers. The union is negotiating this issue with the company, *"but the Chinese are corrupted, they like corruption"* (Mine worker 3) so the respondents find it is uncertain what effect the negotiation will have. Mine worker 8, representing another company, is also suspicious about his company's way of employing people, especially when it comes to the Chinese contractors. He gives an example when the company was employing drivers; *"They did not care to check the driver license. If the person knew how to drive that was simply enough"*.

When discussing the respondents' perception on access to better positions within the company, it is distinctly pronounced that their perception is that management positions are just for the Chinese. There are Zambians in the executives, but they are few and have less power than the Chinese (Mine worker 3). Mine worker 2 explains that if a Zambian gets a higher position within the company it would just be a formality as the Chinese continues to speak their own language, creating a barrier for Zambians to influence and participate in strategic decisions. Mine worker 8 explains that the Chinese and Zambian managers have their own structure; *"Everyone is pretending they are equal in influence but they are certainly not"*. Respondents from company 2 have the same perception. There are some Zambians in management in the company, but they do not have as much influence and power as their Chinese colleagues; *"If a Chinese say no, it is no!"* (Mine worker 6). Mine worker 5, from the same company, says he has never seen anyone get promoted. He does not think that hard work is the key to promotion for a Zambian.

Even though Mine worker 1 reckons that all in management at his company is Chinese his view is that the level of education is of increasing importance for his company recently, and he reckons that education is important in order to get a better position at the company. He says that the company is encouraging employees to go back to school, thus getting a sponsorship for education from the company is almost impossible (Mine worker 1).

According to the respondents, the biggest issue with their Chinese employers is the low salaries they receive. All respondents say that they do not receive enough salary to provide the basic needs of their families. They all think they would earn a better salary if they were employed at another company. Mine worker 7 and 8 say they earned a better salary earlier, when they were employed by ZCCM. Mine worker 8 says that other companies, not Chinese, pay more. Earlier he could manage to support his family with his salary, but now they need credits to manage their living. If he would receive a better salary, he would start investing in some other business for survival after retirement, but at the moment he cannot as his entire salary is spent on consumption to cover for their basic needs. To be able to earn some extra money for the needs of their households Mine worker 5, 6, 7 and 8 say that they are dependent on working overtime as well as on Sundays and holidays.

Asking the respondents if the opportunities for employment have changed for their households in recent years, we wanted to investigate whether our respondents' employments at the companies had improved the opportunity for direct or indirect employment for other family members. Mine worker 1 says that the opportunities for employment in Zambia today in general are very poor. He thinks that the Chinese companies that are expanding and investing create a lot of jobs and good opportunities for his children to

get employed in the future. Through an increase of his salary he could afford to buy a plot and build a house. This enabled the household to cultivate in the garden and his wife is now able to sell vegetables and contribute with an extra income to the household. Mine worker 2 is running a business selling rice with assistance from his wife. His employer made it possible for him to get a small loan from the bank so that he could start up his business. Mine worker 6 reckons that the opportunities to employment have improved, though not to his household and not for women. He says that the Chinese compounds need employees, but his siblings are yet too young to work and the Chinese do not like to employ women. In Luanshya, the whole community is dependent on the mine as mining is the only economic activity in the area. Since 1999, after the privatization of the mining sector the opportunities to employment have worsened substantially. Under ZCCM one person from almost every household was employed in the mine, presently there are just a few households where someone is working in the mine (Mine worker 8). Mine worker 8 conceives this drop in employment to be partly due to improvements in technology. Though, the main reason is the different objectives between the state owned ZCCM and the following foreign investors after privatization. For ZCCM, the objective was to make someone survive, but for foreigners the only objective is to make profit. However, he appreciates that the Chinese opened the mine after it was closed and reemployed a lot of locals.

The appreciation for opening up the Luanshya Mine is also expressed in the unstructured part of question 25 in the questionnaire, where respondents pointed out that the reopening of the Luanshya Mine has improved the access to employment for them. From the answers in the questionnaire it becomes clear though that many of the respondents are the only one employed in their household. Other opinions respondents mentioned when answering question 25, was that the Chinese companies do not employ people from the community and that in order to get an employment at those companies one need to be related to someone with influence in recruiting processes.

## 5.2 In-Depth Interviews with Officials

### 5.2.1 The Resource Trap and Diversifying into Manufacturing

Mr. Vice President, Guy Scott, is quite sceptical when elaborating on the current development of the mining sector and the Chinese as well as Zambian part of it, relating to the fact that the Chinese agenda is just business;

*"Zambians are virtually spectators in this development and the trouble with this is that the Chinese are not here forever, they will go away and you suddenly find there is nothing left....When the price of copper drops and then there is no money for, it is no interest in mining and then there is also no money in the government kitty for building roads and things, you know the mining is business for the Chinese when they go away what are we been left with I don't know."* ( Mr. Guy Scott, Vice president of Zambia)

Thus, Madam Florence Mumba, Director for Investment Promotion & Privatization at ZDA, reckons that the Chinese has been instrumental in the development of the Zambian mining industry concerning value additional activities. She says that Zambia has always been able to export raw copper, but value addition is what they are looking for. In 2011, the mining sector was the main target for Chinese FDIs in Zambia followed by the manufacturing sector, mainly due to the Chinese value addition within the country. In the Chambishi MFEZ the Chinese are setting up the infrastructure that the government has failed to do trying to attract investors to set up in the zone and contribute in these activities. In order to attract investors, Madam Mumba stresses the importance of investors being confident that suppliers of materials and services can be sourced locally to the industries. If not, she reckons that investors would prefer to relocate somewhere else. Concerning the ZCCZ she thinks that it is what they are trying to achieve in the zone and required facilities are already available. Mr. Robert Banda, managing Multi Facility Economic zones at ZDA, fortifies that the objective except job creation, when Chambishi MFEZ was implemented, was a resurgence of the Zambian manufacturing sector and production of for example copper wires instead of just exporting the raw copper. Referring to the Master Plan by CNMC, the zone has the potential to attract 60 enterprises. At the moment, there are 17 enterprises registered, 12 of them have started their operation and one of the enterprises is a Zambian company. At this time, the number of enterprises is less than what was initially expected. Mr. Banda reckons this have to do with uncertainty due to the change of government in Zambia.

The former Minister of Commerce, Trade and Industry, Mr Felix Mutati, was the government's person in charge of implementing the Chambishi MFEZ. According to him the principal driving objectives for the government was value addition, transforming the copper resources into finished products. They required an investor capable and resourceful enough to translate resources into finished products. The choice of investor had to be done carefully and given economic conditions in Europe, the Zambian government would not have been given the commitment that they required. He did not reckon this type of project would be interesting for America either so they turned to China. One distinct benefit with Special Economic Zones and value addition before export that Mr. Mutati emphasizes is the decrease in transportation costs per unit for Zambian exports.

*"Transporting 200 tons of raw copper worth 10 000 dollars compared to transporting copper cables worth 2 million dollars, per unit of weight you end up doing much better "*
( Mr. Felix Mutati, former minister of Commerce. Trade and Industry)

He also stresses the importance of enhancing the Zambian competitiveness through bringing in manufacturing companies in the zone rather than export the raw copper in order to end up importing the finished products. In a statement when implementing the zone, Mr. Mutati announced expected figures of output volume, exports and job creation. Mr. Mutati says that when the MMD left government after 2011 years election, the Chambishi MFEZ had not reach the target of output for export, about 4 000 locals had got employment which he reckons was a satisfying amount and in terms of investments the target was exceeded.

### 5.2.2 Linkages

During the discussions regarding whether the Chinese FDIs in the mining sector are beneficial for the Zambian economy in terms of creation of forward and backward linkages, a lot of different opinions were proposed. Mrs. Florence Mumba and Mr. Felix Mutati reckon that the investments are creating linkages, forward as well as backward, while Mr. Edward Lange, Coordinator of Southern Africa Resource Watch, and Mr. Guy Scott concluded there are no linkages created.

Mrs. Mumba says that; *"... they provide an avenue for other investments to happen"* and discusses how the Chinese investments in the mining sector contribute to development of other sectors. The contribution to other sectors is due to the demand for supplement of goods and services, which is boosting the Zambian economy. Previously, the areas where the mines are located were more or less unexplored, but due to the investments in the mines there is now economic activity and people are dependent on the mines. She suggests that the forward linkages are created since the Chinese investors are adding value to the copper, something that has not been done previously. Regarding the backward linkages, there is an issue of creating employment, which is mainly done in the mines, but also in other sectors providing supplements to the mining industry. Mr. Mutati reckons value addition creates a competitive edge that expands the original markets immensely. He also believes that diversity is an issue of value addition, which is of huge importance for a developing country as Zambia. According to Mr. Nathan Chishimba,;

*"The Chinese wants to be more self-contained, whereas the Western companies in certain aspects are happy to outsource. They are happy to support local suppliers, but it does not always happen. Though, in most cases, they are more prepared to do that than the Chinese"*
(Mr. Nathan Chishimba, Former President Chamber of Mines of Zambia)

He discusses the difficulty of local content due to the fact that Zambia has a very weak manufacturing sector and that there is a lack of technology as well as shortage of skills. All those challenges create a barrier to the ability of increasing local content. Western countries tend to put an effort in trying to increase the local input, though the Chinese investors seem to be more comfortable with their own. The Chinese used to bring their own labor to accomplish tasks Zambians would have been able to do. The fact that they bring their own labor creates weaker backward linkages, since employment is of huge importance regarding this type of linkages.
Mr. Scott and Mr. Lange do not think there are any linkages created out of the investments done by the Chinese investors, nor backward neither forward linkages. According to Mr. Lange, the main reason is that there is a lack of integration.

There has also been a discussion whether the Chambishi Multi-Facility Economic Zone has contributed to the creation of linkages. Mr. Mutati, who was one of the initiators of the zone and had the government's ultimate responsibility of the implementation of the zone, presents value addition as the main objective of the zone. Value addition would fulfill the need and importance of producing finished goods out of the exploited minerals and enable Zambia to competitively export copper instead of letting it pass through the region and then import it after processing. Mr. Mutati regards the creation of linkages to be a time consuming process and that only a few linkages are created as a result of the implementation of the zone. However, more linkages are expected to be created. Mr. Banda also presents that the incentive with the implementation of the zone was to create linkages, although the only linkage created so far is the processing of the copper in the Chambishi copper smelter. However, Guy Scott believes there are no linkages created by the Chinese investments and that the Chambishi MFEZ is just an opportunity for companies to avoid paying tax for smelting copper. Though, Mrs. Mumba hopes that the Chambishi Multi Facility Economic Zone will attract investors that can contribute to the objective of the zone; to add value to the raw materials. Essentially, the investors in the zone will be in need of more and more specialized equipment and that will create a need for specialized suppliers. If those complementary companies are attracted to invest in the zone, it will be self-sustaining and the companies investing will be able to support each other. Initially when the Chambishi MFEZ was introduced the perception in Zambia was that only Chinese companies were allowed to invest in the zone. Therefore, the government made some rearrangements to create opportunities for small and medium enterprises, which has created linkages between the foreign investors and the local enterprises.

### 5.2.3 Technology and Spillover Effects

During the in-depth interviews with government officials and representatives from different organizations, the technological spillover effects achieved by the Chinese Foreign Direct Investments were discussed.

Mrs. Mumba does not consider the fact that the Chinese companies bring their own equipment from China as a problem. She reckons it is obvious that the investors have to bring proper equipment, since Zambia does not produce the equipment required for the industries. Regarding the knowledge obtained by the employees at these foreign companies, the fact that most employees stay with the same employer for a long period of time reduces the spillover effect and the technological transfer. However, the locals employed by the foreign investors will be able to learn how to operate the equipment they use for processing. As long as the skills required for producing components are not very specific, she suggests that equipment could be supplied by local enterprises. Mr. Mutati, who had one of the initiators in establishing the Chambishi MFEZ, went to China before the MFEZ-establishment took place in Zambia to visit their Special Economic Zones. He notes that the level of technology generated in the zones in China were very satisfying. Hence, if creating a good mixture of investors in the Chambishi MFEZ, he proposes that spillover effects will occur and enable the local people to participate in the development and to benefit from the investments. In the zone, much more superior technology is used than the type of technology used for exploitation of raw materials. The employment of local people will uplift the skills of the local people. Thus, the local people will start to work much more effectively and be able to participate in the society in a greater extent.

### 5.2.5 Employment Effects

According to Mr. Guy Scott, Zambian labor is the only part of the Zambian economy that the Chinese are using. He says that there is a problem, among all foreign investors but in particular with the Chinese investors, with importing their own material and labor from the own country of origin. The Chinese do employ some Zambians as they have to employ some of their labor locally, but except for that all the contractors and suppliers are Chinese.

*"…you cannot come to this country pretending it is an asteroid with no people on it you have to use our materials, use our economy, boost our economy. But with the Chinese it is very difficult because all their contractors, all their suppliers, they are all Chinese"* (Mr. Guy Scott, Vice President of Zambia)

Respondents from the two largest unions for mine workers in Zambia, stress that the problems with using contractors instead of employing on permanent basis as well as bringing in their own labor force are

major problems. MUZs data analysis of salaries also shows that Chinese employers pay less, approximately half the salary compared to other foreign employers.

Mr. Mundia Sikufele, President National Union of Miners and Allied Workers, says that when the Chinese employers need labor, what they search for is cheap labor. According to him, it is common that Chinese employers "pick their people from the streets" regardless of skills and education and pay them a terribly low salary. This kind of procedure is not what the union wants from the Chinese employers; they need the investors to create skilled employment using qualified labor that knows the industry and their own labor rights. Mr. Sikufele stresses the problem that a labor force without education picked up from the street does not know their rights and are likely to be abused. Thus, he reckons that the Chinese are trying to improve themselves, but the process is slow. The Chinese are also bringing their own unskilled labor from China as well as their own machines. The Chinese machinery does not have instruction books in English meaning that Zambians have problems to operate them. Both MUZ and NUMAW say that this makes the employers bring even more Chinese labor to Zambia to operate the machinery.

Chinese investors bringing their own labor is one of Mr. Langes largest concerns about the Chinese companies. He says that they bring their own labor for all kinds of tasks, most of them are tasks that a Zambian could perfectly perform. Chinese labor displaces the Zambians from work they should do. He continues to say that even if they bring own labor they certainly do employ a lot of Zambians as well.

Though Mr. Lange is critical about the quality of employment regarding salaries and safety. He continues to emphasize the problem with the government, the current as well as the former that has not put any restrictions on the Chinese investors.

*"The government behaves like beggars. Because when the investors come we accept whatever they tell us... It is like the government is dancing to some song from the Chinese, they cannot sing their own song that they can dance to."* (Mr. Edward Lange, Coordinator of Southern Africa Resource Watch)

The HR manager at one of the other foreign companies informs us that the company receives a lot of applications from employees at Chinese companies. Though he thinks that the Chinese companies are trying to really improve wages and conditions for their workers even if the improvement is slow.

Madam Mumba thinks that the Chinese FDIs are important in terms of creating employment in Zambia. She is aware of the issue about investors bringing their own employees, and she does not think this is an issue just related to Chinese investors. She says that bringing their own labor has sometimes been justified due to the lack of skilled labor as well as tight timetable to meet targets. The Chinese are very hard working and do not mind work the extra hours sometimes required to meet targets for certain projects. In

order to bring these additional people the investors have to justify why they need to bring Chinese labor. In these cases, the expectation from ZDA is that Zambian labor will understudy them to transfer needed skills to Zambians, but unfortunately she is not aware of whether this transfer of skills happens at the moment.

Robert Banda, managing ZDA's work with the Chambishi MFEZ, showed the pledged investments in mining 2011. Chinese FDIs stands for approximately 19 percent of the inflows of FDIs in Zambian mining. Figures for the pledged employment in mining showed that Chinese investors were expected to create 1536 jobs in mining, roughly 30 percent of the total amount expected in 2011. Banda presented figures of the employment in Chambishi MFEZ. There are 7 373 workers employed in the zone today, 1 323 are Chinese nationals.

Mr. Mutati says that the MMD government was satisfied with the number of jobs created in the zone before they lost the election in 2011. If they would come back to government, he would like to increase the Chinese investments in Zambia. He is aware of the complaints from the workers employed by Chinese investors, but what is important for him is that the Zambians have a work. In his perception, China is vital for the Zambian development and he would like his countrymen to learn from the Chinese mentality and the commitment to their work.

*"…the time to drop China is not now. It is much further ahead. Between now and going forward lets tango and dance with China. That is my perception!"*

(Mr. Felix Mutati, former minister of Commerce, Trade and Industry)

## 6. Analysis; Results and Discussion

*The aim of the study was to investigate whether the Chinese Foreign Direct Investments in the Zambian mining sector have had a positive effect on social and economic development in Zambia. The discussion starts with the micro perspective concerning salaries and working conditions in the Chinese owned mines in the Copperbelt in Zambia. It is followed by a discussion of the employees' living conditions and their perception regarding access to education, health care and employment, and whether the access, better or worse, is a result of their Chinese employers. Finally, we will end up with a discussion about what macroeconomic benefits the Chinese Foreign Direct Investments bring to the Zambian economy*

From a micro perspective, the main finding in this thesis is the statistically and economically significant result indicating that there is a difference in wages between Chinese employers and other foreign employers. The result indicates that an individual employed by a Chinese employer has a wage approximately 44 percent lower than an individual employed by another foreign employer. This

estimation is in accordance with the Mineworkers Union of Zambia's statistics. Their statistics indicate that the Chinese employers pay approximately half the wage compared to other foreign employers, which is in line with our estimations. Comparing the lowest wages, the difference between the Chinese employers and the other foreign employers is negligible. However, excluding Jinchuan Group Co., Ltd, which is the Chinese owned company with the highest wages, the difference of the mean wage between the Chinese employers and the other foreign employers is equal to about 1600' Kwacha. This is equivalent to approximately two standard deviations lower wage for an employee at one of the Chinese companies (Jinchuan Group Co., Ltd excluded).

During the in-depth interviews with mine workers employed by Chinese employers, the issues of the low salaries paid by Chinese employers were discussed. All respondents found it impossible to provide the basic needs of their household with their salaries. Usually, there is only one person employed in each household, making the salary earned by this person vital for the wellbeing of the household.

According to human capital theory, individuals earn a return to education (Michaelowa, 2000). However, the perception of the miners is that there is no return to education with the Chinese employers. Most of the respondents have completed tertiary education, but do not find their salaries are particularly higher than the salaries received by their colleagues with lower level of education. Furthermore, the perception expressed by Mr. Sikufele and the miners is that Chinese employers do not care about level of education when employing. However, the empirical results show that their perceptions were wrong. The estimates on tertiary education in our regressions are statistically and economically significant, and affect the wage positively by approximately 40 percent compared to a person without tertiary education. Though, the results of this study indicate that secondary education has no significant impact on wage among Chinese employers. This is evidence that employees with Chinese employers actually earn a return on higher education, even if the estimates in the regressions indicate that employees with other foreign employers earn a higher return on education. Our respondents in the in-depth interviews are well aware of the fact that they would earn a lot more if they were employed by 'another foreign employer' and therefore they would prefer to be employed by one of these employers. Managers from the South African and Indian companies we have visited confirmed that they receive a lot of applications from miners currently employed by Chinese employers. A conclusion one can draw is that the salary is of great concern in order to be satisfied with one's working conditions.

As previously indicated, it is vital for an individual to have the opportunity to get employed, receive an income and to be a part of the labor force. There is also a qualitative aspect of employment. In order to achieve social development, poverty reduction and personal well-being, decent work is of great

importance (UN, 2012). In the binary response models on working conditions, we have investigated which factors are important for employees' satisfaction with their working conditions. The most statistically and economically significant variable is the wage-variable, indicating that if the wage increases by 10 percent the probability of being satisfied increases with approximately 4 percentages. Referring to the in-depth interviews and the findings from the regressions on wages, the significant outcome of wages on working conditions is not surprising.

Another statistically significant variable is the variable for 'days'. Since we thought the respondent would value to have one or two days off per week, the outcome on satisfying working conditions was expected to be negative. However, the estimated marginal effects indicate a positive effect on satisfying working conditions. During the in-depth interviews with the miners, most of the respondents expressed that they prefer to work extra on their actual day/days off, in order to receive a higher salary. This indicates that the income effect might be greater than the substitution effect among mine workers employed with Chinese employers. This could be the explanation to why the marginal effect of the variable days is positive. Hence, they are more satisfied with their working conditions if there is an opportunity to work extra days.

The Human Rights Watch Report (Human Rights Watch, 2011) from Zambia indicates that the safety records are one of the major issues regarding working conditions in the Chinese owned mines. Therefore, we expected the estimated marginal effects for the variables PPE and Access to Emergency Care to be statistically and economically significant and to have a positive impact on the response probability. The estimates on PPE and Access to Emergency Care in the binary response probabilities are not statistically significant, except for PPE (10 percent level) in the Probit model, which was an unexpected outcome. We can conclude that there is a lack of empirical evidence that the issues concerning safety records are of major importance for whether employees with Chinese employers are satisfied with their working conditions or not.

Summary statistics indicate that out of 96 respondents answering the question about their households' living conditions during the last five years, about 38 percent answered that their living conditions have improved and about 10 percent answered that their living conditions have worsen. The interesting part of this is that more than 80 percent of these respondents think that their current Chinese employers have contributed to the change, for better or for worse. This finding indicates that the employers' commitments have a huge impact on the perceived living conditions for the mine workers. One explanation to why an unambiguously large majority can relate their living conditions to their current employer could be due to the fact that the whole household relies on the only one employed in the family. Three parameters linked to living conditions will be discussed; access to education, health care and employments.

Summary statistics show that 43 percent think that access to education has improved for their household 46 percent think that access to health care has improved, and 41 percent think that the access to employment for their household has improved during the last five years. In order to understand if this perceived improvement is due to the employment with their Chinese employer or due to the general development in Zambia, eight in-depth interviews was performed.

The mine workers think that the access to health care has improved during the last five years. The respondents identify that the company hospitals, providing both consultancy and treatment for the employees and their dependants, have improved their access to health care. Government hospitals also provide consultancy for free, but the difference is that treatment and medicine is not provided. It seems like the improved access to health care can be explained partly by the Chinese employers. In this aspect, Chinese investments contribute to the well-being of the employees, reduce income loss and contribute to the social and economic development in Zambia (Merson, Black & Mills, 2012).The main issue regarding access to health care seems to be the high transportation costs. For some of the mine workers distance and high transportation costs are a barrier to the access to health care, as they simply do not have enough money for transportation. Another barrier is the language. Some of the nurses and doctors at the company hospitals, imported labor from China, do not speak good English.

From the in-depth interviews, we can conclude that education is of great concern for our respondents. The ability to send their children to private schools is of great importance. Primary and secondary education in government schools is free, but the mine workers think that the level of educational standard is much higher in the private schools. Therefore, all of them have their children, or would like to have their children, in private schools rather than in government schools. A positive aspect discussed is that the employees are able to send their children to better schools, since they receive a salary from their Chinese employers. This is money that can be spent on education, a priority several respondents do.

Two of the respondents express a wish to go back to school. The Chinese employers seem supportive, but are uninterested to support financially. Their incapacity to support their employees financially makes it impossible for the employees to go back to school. If the company would lend the money to the employees for education, this would benefit and increase the productivity of the employee himself, but his higher level of education would also affect the productivity of his colleagues and neighbours (Michaelowa, 2000). Unfortunately, this link is not present today. At the moment, salary is the only factor that can improve access to education. We can conclude that the Chinese employers have not contributed in improving education.

Regarding access to employment, approximately 67 percent of the respondents moved to get their current employment. Also three of the eight respondents in the in-depth interviews moved from other provinces in order to find employment. We find that an astonishing amount of employees, far more than expected, have moved in order to get employment. Opportunities for productive employment are essential for economic and social development in a country and decent employment is key to personal well-being (UN, 2012).

The biggest issue with Chinese employers is the low salaries. The unions, the respondents in the in-depth interviews and the econometric empiric of this study all confirm this. Even though one receives employment, the salary is not enough to provide the basic needs of the household. Some of the respondents declare that they need to get credits, work overtime or run side businesses to support their households' economy. There is a serious concern about the quality and decency of employment with Chinese companies due to the low salaries and the low satisfaction. Other foreign employers confirm that they receive applications from many employees currently employed by Chinese companies. The balance is to determine what is most important; the right to have employment that enables one to provide the needs of the household or to be employed at all. One paradox is the fact that the actual employment with a Chinese employer seems to be an opportunity to get a credit or to raise enough money to be able to start a side business. The Chinese employers and their investments contribute to the improvement of living conditions and the economic and social development on the micro level as they are willing to undertake projects and investments no other investors are interested in. Compared to what could be with another employer, the conditions are poor and the work cannot be referred to as decent. Though, the problem is that the choice is not between good or bad for the Zambian miners, the choice is rather between bad or nothing. In the Copperbelt, the mining sector is more or less the only economic activity. Therefore, the opportunities are very limited for employment outside the mining sector, unless you want to work within the informal sector.

To a great extent, the Zambian economy has been reliant on the mining sector and the international price of copper since independence. For a resource rich country like Zambia, diversification into manufacturing is of great importance for the economic development in order to not get stuck in a natural resource trap (Collier, 2008). The Chinese investments in the Zambian mining sector will be of great advantage for the Zambian economy if the investments create backward and forward linkages in the Zambian economy. At the moment it is not possible for the Zambian economy to raise enough capital to create economic activity in the mining sector. Therefore, the Chinese FDIs are essential to create this kind of activity and are beneficial even if linkages are not present.

According to the interviewees, the backward linkage is created in terms of demand for goods and services. Through this demand, the Chinese FDIs create indirect employment and their investments result in economic activities in previously unexploited areas. The Chinese investments have been particularly important in the exploration phase as they have shown interest in mines other investors find uninteresting. If it was not for the Chinese interest some of the minerals would probably remained unexplored. All respondents are more or less critical to the fact that Chinese investors bring their own labor from China. It is clear that it is not just due to a lack of skills among Zambians that the Chinese bring their own labor force. Also unskilled labor is brought to do work that Zambians themselves are able to do. If the Chinese investors would not bring employees from China, the backward linkage could be even stronger. It is undoubtedly that the Chinese FDIs in the mining sector are creating employment. Though, according to figures for pledged creations of employment in the mining sector for 2011, the Chinese firms were expected to create 1536 jobs in mining, which is about 30 percent of the total number of jobs expected to be created that year in the mining sector. These figures show that the mining sector is not a labor intensive sector, it is rather capital intensive and not a lot of employments are created (Collier, 2008). From a macro perspective, the sector's importance for employment rate is therefore limited. According to Mr. Vice President, the backward linkage of employment is the one and only linkage between the Zambian economy and the Chinese FDIs. Backward linkages can also be created by the use of domestic suppliers instead of importing equipment from Chinese suppliers. If the Zambian policies would have been more restrictive regarding imports of goods as well as labor, the backward linkage created by Chinese foreign direct investments could have contributed even more beneficially to the Zambian economy.

Another way of stimulating the Zambian economic development through Chinese foreign direct investments is to create forward linkages. The principal aspect in creation of forward linkages is value-addition. According to our respondents, the Chines investors have been quite aggressive and interested in the value adding activities. The Chambishi MFEZ was established in order to create initiatives for the foreign companies to invest in value-adding activities, and therefore stimulate the creation of forward linkages and diversification into manufacturing industry. If investors within manufacturing are attracted, they might bring superior technology, which would result in technological spillover effects (UNCTAD, 2010). The Masterplan for Chambishi MFEZ is rather ambitious on paper (CNMC, 2007), but in reality there is no distinct answers substantiated with facts about what is yet achieved in the Chambishi MFEZ, or about its importance for the Zambian economy. Referring to Mr. Banda and ZDA, the development of the zone is slower than expected. The numbers of enterprises are few, and the value of output is lower than expected. To be honest, no one seems to really know what is happening within the Chambishi MFEZ except ZCCZ themselves. Today, the only distinct contribution from the zone to the Zambian economy

seems to be the Chambishi Copper Smelter, making it possible to process the raw material before export. This is one part in the value addition chain of copper, which is conceivable to count as a forward linkage. The linkages created by the Chinese FDIs are not as strong as they could have been, though the backward linkage of employment and a possible forward linkage due to the Chambishi MFEZ is present. Chambishi MFEZ is a platform creating linkages from mining activities to manufacturing, but the creation of linkages is a process developed over a period of time. Even though no distinct forward linkages are present today, there is no evidence that Zambia is stuck in a resource trap.

# 7. Main Findings and Conclusion

- The main finding of this study is that an employee with a Chinese employer receives a wage approximately 44 per cent lower than an employee with "another foreign employer". The estimate is statistically significant at 1 percent level.
- The importance of wage for whether an employee is satisfied with its working conditions was confirmed in the binary response models. If the wage increases with 10 percent, the probability of being satisfied with one's working conditions increases with approximately 4 percentages.
- In contradiction to our expectations, safety records do not seem to have any impact on satisfying working conditions.
- Even if wages are lower and working conditions worse with the Chinese employers, being employed with one of the companies is better than the alternative to not have an employment at all.
- Backward linkages are present. Employment is created, but since mining is not a labor intensive sector the opportunities are limited. Regarding forward linkages, there are none created so far. However, the Multi-Facility-Economic Zones that are recently established will hopefully ease the creation of forward linkages.

Chinese FDIs in the Zambian mining sector are important as China has the capital needed in the capital-intensive mining sector. And they make investments no other investor is interested in doing. The Chinese FDIs contribute to the economic and social development in Zambia, though the situation in the Sino-African relationship seems to be biased in Chinese favour. The negative Western media attention and the critique of Chinese engagement in Zambia are not always justified. There is a probability that there is self-interest among powerful Western countries to criticize Chinese FDIs in Zambia. The Chinese

investors are the main targets for the critics, but it is important to remember that it is the responsibility of the Zambian government to make sure that the Zambian economy and society benefit more from the Chinese FDIs as well. It seems like one generation of Zambians are sacrificed as they have no other choice than to take what employment is available due to the high unemployment rate. Though, it is our perception that the Chinese are listening to the critics trying to better themselves, even if the process is slow.

The question is whether the self-contained Chinese investors with accessible financial assets without restrictions are preferred in order to create social and economic development, or if the restrictive Western investors with a more open-minded view regarding outsourcing would be more preferable? We think this would be an interesting topic for further studies about the Chinese foreign direct investments in the Zambian mining sector.

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# 9. Appendices

## *Appendix A:* Questionnaire Mine workers

This questionnaire is confidential and will be handled with the strictest of confidentiality.

1. Age: ……... Years

2. Gender:

- ☐ Male
- ☐ Female

3. Are you a member of a union?

- ☐ Yes
- ☐ No

If yes, which one?.....

4. What is your job/ main task in the mines?
……
……
……

5. Is your current employer a Chinese company?

- ☐ Yes
- ☐ No

6. Highest completed level of education:

- ☐ None
- ☐ Primary education
- ☐ Secondary education
- ☐ Tertiary education

7. Did you have to move here to get your present job?

- ☐ Yes
- ☐ No

8. How many years have you been working in the mining sector? ..... Years

9. How many years have you been working for the company? …….. Years

10. Do you have a written contract?

- Yes
- No

11. What type of contract do you have?

- No contract
- Limited contract
- Permanent contract

12. How many hours do you work per day? …….. Hours

13. How many days do you work per week? ……. Days

14. How many minutes of break do you have during a day of work? ..... Minutes

15. Do you think you have enough breaks during a day of work?

- Yes
- No

16. Does the company provide the safety equipment you need in your work?

- Yes
- No

17. If an accident occurs during working hours, is there access to emergency care?

- Yes
- No

18. What is your basic salary? NB! YOU SHOULD ONLY ANSWER IN ONE TIME UNIT

…… Kwacha per hour

…… Kwacha per day

……... Kwacha per week

……... Kwacha per month

19. Would you recommend the company you are working for, for someone who is about to applying for a new job?

- Yes
- No

20. Do you think you will be working here in one year?

- Yes
- No

21. In general, are you satisfied with your working conditions?

- Yes
- No

22. At the moment, are you satisfied with life in general?

- Yes
- No

23. Has access to education changed for your household in the last five years?

- Improved access
- Unchanged access
- Worsened access

24. Has access to healthcare changed for your household in the last five years?

- Improved access
- Unchanged access
- Worsened access

25. Has access to employment changed for your household in the last five years?

- Improved access
- Unchanged access
- Worsened access

How has it changed?

……

……

26. Has access to transportation infrastructure been improved in the area in the last five years?

- Yes
- No

27. How has your household's living condition changed in the last five years?

- Improved living situation
- Unchanged living situation
- Worse living condition

28. Do you think the company has contributed to the change?

- Yes
- No

Thank you very much for participating and taking your time!

***Appendix B*: Summary Statistics Wage Regressions**

$$log(wage)_i = \beta_0 + \beta_1 age_i + \beta_2 age_i^2 + \beta_3 chinese_i + \beta_4 experience_i + \beta_5 tenure_i + \beta_6 secondary_i + \beta_7 tertiary_i + \beta_8 written_i + \varepsilon_i$$

$$log(wage)_i = \beta_0 + \beta_1 age_i + \beta_2 age_i^2 + \beta_3 experience_i + \beta_4 tenure_i + \beta_5 secondary_i + \beta_6 tertiary_i + \beta_7 written_i + \varepsilon_i$$

| **Wage** | Chinese employers | Chinese employers excl. Jinchuan Group Co., Ltd | Other foreign employers | All employers |
|---|---|---|---|---|
| Mean | 2 210.70 | 2 028.68 | 3 652.39 | 2 784.64 |
| Median | 2 000.00 | 2 000.00 | 3 500.00 | 2 600.00 |
| Standard Deviation | 803.31 | 779.78 | 1 652.82 | 1 402.61 |
| Min | 660.00 | 660.00 | 680.00 | 660.00 |
| Max | 4 500.00 | 4 500.00 | 10 000.00 | 10 000.00 |
| N | 127 | 96 | 84 | 211 |

| **Age** | Chinese employers | Chinese employers excl. Jinchuan Group Co., Ltd | Other foreign employers | All employers |
|---|---|---|---|---|
| Mean | 37.39 | 38.10 | 32.89 | 35.60 |
| Median | 34.00 | 34.50 | 31.00 | 33.00 |
| Standard Deviation | 9.54 | 9.58 | 7.97 | 9.20 |
| Min | 22.00 | 23.00 | 21.00 | 21.00 |
| Max | 57.00 | 57.00 | 59.00 | 59.00 |
| N | 127 | 96 | 84 | 211 |

| **Are you working for a Chinese employer?** | Frequency | Percent |
|---|---|---|
| No | 84 | 39.81% |
| Yes | 127 | 60.19% |
| N | 211 | 100% |

| **Experience** | Chinese employers | Chinese employers excl. Jinchuan Group Co., Ltd | Other foreign employers | All employers |
|---|---|---|---|---|
| Mean | 11.54 | 12.17 | 9.37 | 10.67 |
| Median | 7.00 | 8.00 | 7.00 | 7.00 |
| Standard Deviation | 9.96 | 10.04 | 8.06 | 9.29 |
| Min | 1.00 | 1.00 | 0.00 | 0.00 |
| Max | 35.00 | 33.00 | 39.00 | 39.00 |
| N | 127 | 96 | 84 | 211 |

| **Tenure** | Chinese employers | Chinese employers excl. Jinchuan Group Co., Ltd | Other foreign employers | All employers |
|---|---|---|---|---|
| Mean | 4.46 | 4.08 | 4.89 | 4.63 |
| Median | 3.00 | 3.00 | 2.50 | 3.00 |
| Standard Deviation | 97.00 | 2.86 | 6.63 | 5.18 |
| Min | 1.00 | 1.00 | 0.00 | 0.00 |
| Max | 24.00 | 20.00 | 32.00 | 32.00 |
| N | 127 | 96 | 84 | 211 |

| **What is your highest level of completed education?** | Chinese employers | Chinese employers excl. Jinchuan Group Co., Ltd | Other foreign employers | All employers |
|---|---|---|---|---|
| None | - | - | - | - |
| Primary | 5.51%<br>(7) | 6.25%<br>(6) | 3.57%<br>(3) | 4.74%<br>(10) |
| Secondary | 56.69%<br>(72) | 55.21%<br>(53) | 47.62%<br>(40) | 53.08%<br>(112) |
| Tertiary | 37.80%<br>(48) | 38.54%<br>(37) | 48.81%<br>(41) | 42.18%<br>(89) |
| N | 127 | 96 | 84 | 211 |

| **Do you have a written contract?** | Chinese employers | Chinese employers excl. Jinchuan Group Co., Ltd | Other foreign employers | All employers |
|---|---|---|---|---|
| No | 3.94%<br>(5) | 2.08%<br>(2) | 8.33%<br>(7) | 5.69%<br>(12) |
| Yes | 96.06%<br>(122) | 97.92&<br>(94) | 91.67%<br>(77) | 94.31%<br>(199) |
| N | 127 | 96 | 84 | 211 |

***Appendix C*: Summary Statistics Satisfying Working Conditions**

$$satisfied\_work_i = \beta_0 + \beta_1 age_i + \beta_2 secondary_i + \beta_3 tertiary_i + \beta_4 union_i + \beta_5 written_i + \beta_6 days_i + \beta_7 enough\_breaks_i + \beta_8 ppe_i + \beta_9 access\_emergency\_care_i + \beta_{10} satisfied\_life_i + \beta_{11} \log(wage)_i + \varepsilon_i$$

$$P(satisfied\_work_i = 1|\boldsymbol{x}) = \Lambda(\beta_0 + \beta_1 age_i + \beta_2 secondary_i + \beta_3 tertiary_i + \beta_4 union_i + \beta_5 written_i + \beta_6 days_i + \beta_7 enough\_breaks_i + \beta_8 ppe_i + \beta_9 access\_emergency\_care_i + \beta_{10} satisfied\_life_i + \beta_{11} \log(wage)_i)$$

$$P(satisfied\_work_i = 1|\boldsymbol{x}) = \Phi(\beta_0 + \beta_1 age_i + \beta_2 secondary_i + \beta_3 tertiary_i + \beta_4 union_i + \beta_5 written_i + \beta_6 days_i + \beta_7 enough\_breaks_i + \beta_8 ppe_i + \beta_9 access\_emergency\_care_i + \beta_{10} satisfied\_life_i + \beta_{11} \log(wage)_i)$$

| **In general, are you satisfied with your working conditions?** | Frequency | Percent |
|---|---|---|
| No | 93 | 73.23% |
| Yes | 34 | 26.77% |
| N | 127 | 100% |

| **Age** | Chinese employers |
|---|---|
| Mean | 37.39 |
| Median | 34.00 |
| Standard Deviation | 9.54 |
| Min | 22.00 |
| Max | 57.00 |
| N | 127 |

| **What is your highest level of completed education?** | Chinese employers |
|---|---|
| None | - |
| Primary | 5.51% (7) |
| Secondary | 56.69% (72) |
| Tertiary | 37.80% (48) |
| N | 127 |

| **Are you a member of a union?** | Frequency | Percent |
|---|---|---|
| No | 13 | 10.24% |
| Yes | 114 | 89.76% |
| N | 127 | 100% |

| **Do you have a written contract?** | Frequency | Percent |
|---|---|---|
| No | 5 | 3.94% |
| Yes | 122 | 96.06% |
| N | 127 | 100% |

| **How many days do you work per week?** | |
|---|---|
| Mean | 5.98 |
| Median | 6 |
| Standard Deviation | 0.55 |
| Min | 5 |
| Max | 6 |
| N | 127 |

| **Do you think you have enough breaks during a day of work?** | Frequency | Percent |
|---|---|---|
| No | 92 | 72.44% |
| Yes | 35 | 27.56% |
| N | 127 | 100% |

| **Does the company provide the safety equipment you need in your work?** | Frequency | Percent |
|---|---|---|
| No | 27 | 21.26% |
| Yes | 100 | 78.74% |
| N | 127 | 100% |

| **If an accident occurs during a day of work is there access to emergency care?** | Frequency | Percent |
|---|---|---|
| No | 28 | 22.05% |
| Yes | 99 | 77.95% |
| N | 127 | 100% |

| **At the moment are you satisfied with life in general?** | Frequency | Percent |
|---|---|---|
| No | 89 | 70.08% |
| Yes | 38 | 29.92% |
| N | 127 | 100% |

| **Log (wage)** | |
|---|---|
| Mean | 7.62 |
| Median | 7.60 |
| Standard Deviation | 0.42 |
| Min | 6.49 |
| Max | 8.41 |
| N | 127 |

## *Appendix D:* **Interview Guide**

Here is our interview guide for the qualitative part of our study. Every topic will be introduced by a discussion of the personal situation in the area.

- *Access to health care*

Have you or someone from your household recently visited a doctor or health care institution? When?

What is your perception on the current access to health care for you and your household?

Has access to health care changed for your household in the last five years?

*If improved/worsened,* Is your improved/worsened access a result of investments made by the Chinese investors/your company?

In recent years, what are the most obvious differences in access to health care?

Do you or your household get any benefits within health care as an employee at the Chinese company? (price reduction, shorter waiting times)

What part of the health sector do you reckon to be the most important part to be improved right now and how can the Chinese investors be a part of that improvement?

How far distance is it to the closest health care institution? And how far away was it before?

- *Access to education*

How many from your household is attending school at the moment?

What is your highest level of completed education?

What is the highest level of completed education in your household?

What is your perception on the current access to education for the children of your household?

Has access to education been changed for your household in the last five years?

*If improved/worsened*, Is the improved/worsened access a result of investments made by the Chinese investors/your company?

In recent years, what are the most obvious differences in access to education?

Has your household got better access to education as an employee at the Chinese company?

How many days per week/hours per day do your children attend school? Do you think the level of attendance is satisfying?

What do you reckon to be most important to be improved within access to education right now and how can the Chinese investors be a part of that improvement?

- *Access to transportation infrastructure*

What is your perception on the current access to transportation infrastructure in the society?

Has access to transportation infrastructure improved for your household in the last five years?

*If improved,* Is the improved access a result of investments made by the Chinese investors/ your company?

In recent years, what are the most obvious differences in access to transportation infrastructure?

Do you believe that the investments in transportation infrastructure made by Chinese companies benefit the company itself or the society the most?

What improvements in infrastructure can be done by the Chinese investors to benefit the society?

Have Chinese investments in infrastructure forced people to move? (Have they got any type of compensation?)

- *Opportunities for employment*

Did you move here in order to work for the Chinese company?

Are the opportunities to employment improved for your household? (Dependent of gender, vacancies in the society, what type of employment)

What qualifications and level of education seems to be required in order get an employment at your company?

Do you have a written contract? *If Yes*, Who was the initiator to write it?

How many hours are you working each day? (Do you reckon this as too much?)

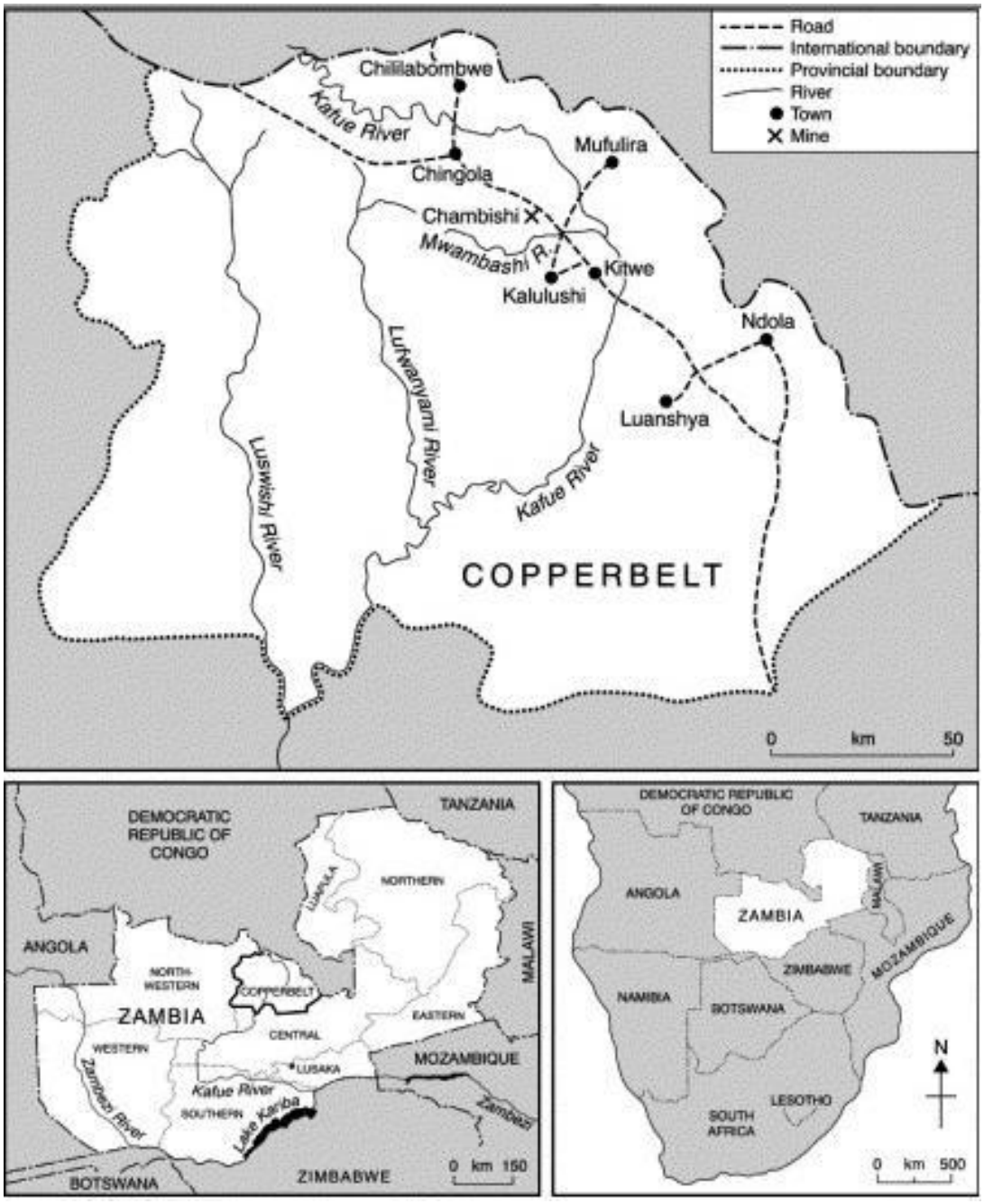
Are the directors of your company Chinese or are there any Zambian directors as well?

Are there any possibilities for you to get promoted?

Do you get enough wages to provide the basic needs of your household?

How much would you have earned if you were not working for the Chinese company (compared to alternative employers or earlier in the same sector)?

***Appendix E*: Map of Zambia**




(Reference:http://www.sciencedirect.com/science/article/pii/S0883292705000478)

## *Appendix F:* **Interviewees Lusaka**

- Mr. Robert Buzz Banda, *Manager for the Multi Facility Economic Zones, Zambian Development Agency (ZDA),* 2012-06-18
- Mr. Edward Lange, *Coordinator of Southern Africa Resource Watch, (SARW),* 2012-06-18
- Mr. Felix Mutati, *Former Minister of Commerce, Trade and Industry* (*2007-2011),* 2012-06-20
- Mr. Nathan Chishimba, *Former President Chamber of Mines of Zambia (2008-2011),* 2012-06-26
- Mr. Frederick Bantubonse, *General Manager Chamber of Mines of Zambia*, 2012-06-26
- Mr. Brighton Kateka, *Chief Inspector of Machinery, Mines Safety Department*, 2012-06-29
- Mr. Charles B. Muchimba, *Director of Research, Mineworkers Union of Zambia (MUZ),* 2012-07-06
- Mr. Mundia Sikufele, *President National Union of Miners and Allied Workers (NUMAW),* 2012-07-06
- Dr. Guy L. Scott, *Vice President of Zambia*, 2012-07-30
- Mrs. Florence Mumba, *Director for Investment Promotion & Privatisation, Zambian Development Agency*, (ZDA), 2012-08-01

***Appendix G*: Rejection Ministry of Mines**

*All communications should be addressed to the*
*Permanent Secretary*
*Telephone: 235329*
*Fax:230468*

*In reply please quote:*
*No.:.....*

REPUBLIC OF ZAMBIA

**MINISTRY OF MINES, ENERGY AND WATER DEVELOPMENT**

**OFFICE OF THE PERMANENT SECRETARY**
**P.O.BOX 31969**
**LUSAKA**

**MMEWD/101/1/8**

30th July, 2012

Louise Granath & Marika Larsson
School of Business, Economics and Law
University of Gothernburg
Box 640, SE 405 30 Gothernburg,
**Sweden**

**REQUEST FOR AN APPOINTMENT**

Reference is made to the above subject matter.

The sitting Hon. Minister has just been transferred to another ministry. The incoming Hon. Minister needs time to be briefed and therefore not available for interviews. However, Zambia Development Agency (ZDA) may be contacted.

Dr. Victor Mutambo
Permanent Secretary
**MINISTRY OF MINES , ENERGY AND WATER DEVELOPMENT**