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Fiscal and Macroeconomic

Impacts of Privatization

The case of Zambia

Abstract

The main objective of this thesis is to analyze the fiscal and macroeconomic effects of privatization of the mining industry in Zambia. Moreover, the effects on a microeconomic level will be investigated through a case study of Chingola. The main part of the data used in this thesis was collected during a Minor Field Study in Zambia. In addition to the field study, the relevant literature has been studied.

The state-owned mining sector was making annual losses, hence privatization of the mining industry eventually became a necessity. When the privatization process started, the objectives were to improve economic efficiency, foster private sector development and strengthen economic growth. This study indicates that there exists a positive correlation between privatization and growth rates. In addition, there has been a significant increase in tax revenues from the mining sector. The privatization did not, at first, have a big impact on the economy of Zambia, but with inappropriate agreements removed, the Zambian economy will be able to profit from the prosperous mining industry.

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1. Introduction

Privatization is the shift of responsibility for a function from the government to the private sector. It has been an important element in structural reforms in developing countries during the 1990's. Poor economic performance of the public enterprises is one of many reasons for privatizing a sector and the effects on the efficiency have been reviewed in a large microeconomic literature. However, empirical studies on the fiscal and macroeconomic effects of privatization are not as common. The studies that do exist analyze the fiscal and macroeconomic issues for a set of developing countries. This thesis uses data from Zambia to examine the fiscal and macroeconomic effects of privatization of the mining industry. A deeper understanding of these impacts should facilitate effective policies in a continuous privatization process.

1.1 Objectives
The main objective of this thesis is to analyze the fiscal and macroeconomic effects of privatization of the mining industry in Zambia. Moreover, I want to investigate what effect the privatization has had on the microeconomic level in Chingola. This will be done by answering three main questions:

- Has the privatization contributed to growth of the national economy through increased profitability and tax revenues of the mining industry?
- What were the short-run macroeconomic effects of privatization?
- What effect has the privatization had on capital inflows?

1.2 Methodology
I conducted an eight week long Minor Field Study in the Copperbelt and Lusaka, Zambia. It was carried out from the middle of June to the middle of August 2011. During my field study I visited the Central Statistical Office (CSO), the Zambian Revenue Authority (ZRA), Zambia Extractive Industries Transparency Initiative (ZEITI), Chamber of Mines, Konkola Copper Mines (KCM), Ministry of Finance and Chingola City Council. In addition to the Minor Field Study, I studied the relevant literature and examined official data on the subject.

The thesis is structured as follows: In section two, a brief background on the Zambian economy and the mining industry is presented. Section three provides an overview of the macroeconomic effects of privatization and section four examines the fiscal impact of

privatization. In section five, the case study of Chingola is portrayed, and section six concludes the thesis.

2. Background

Zambia is a landlocked country in the southern part of Africa. It gained its independence from Great Britain in 1964 and was by then highly dependent on the copper mining industry. In the 1960's Zambia had a per capita income 75% higher than the African average (Bigsten, Tengstam 2008). Mining accounted for 49,6% of Zambia's total GDP at the time. Within the mining and quarrying sector, copper alone accounted for approximately 96.5% of total production in 1964. The importance of copper to the Zambian economy was reflected in the contribution to government revenue. In 1965, copper alone accounted for 71% of government revenue. However, as a result of the decreasing copper prices and high production costs, copper accounted for 13% of government budget in 1975, and it was expected to be non existent in 1979. During the 1980's this sector's contribution to government revenue has been insignificant.

Before the 1969 mining reforms in Zambia, the whole sector was owned and controlled by two foreign conglomerates. The Zambian government received approximately 73% of their profit. This is a relatively high tax rate by international standards. What was left of the profit was distributed as dividends, and not reinvested in the mining industry. Because of that, the government announced in 1969 that they would revert "all rights of ownership or partial ownership of minerals…to the state." (Saasa, Oliver S. 1987) The companies were forced to give 51% of the shares in the mining companies to the government. Apart from changes in the ownership, the government also reformed how the mining industry paid their taxes. After the reforms, the companies paid a Mineral Tax based on profit, rather than on production as earlier. This stimulated mining development since the foreign companies would now be encouraged to reinvest higher proportions of their dividends in order to expand their long-run profits and it also encouraged investment in the marginal mines. In 1982 the two mining companies merged into one big company, Zambia Consolidated Copper Mines Ltd (ZCCM). (Saasa, Oliver S. 1987) During the 1980s and 1990s, copper production declined because of lack of reinvestment into new and existing mines, and unsupportive policy and management practices. ZCCM was making annual losses, hence privatization of the mining industry

eventually became a necessity. In order to revive the mining sector, the government had to privatize the mining sector but it was politically very hard to privatize ZCCM. In 1996 the government accepted the privatization of the mines and the process was completed in 2000. When sold, ZCCM was split into many small companies. These companies operated under so called Development Agreements (DAs). By privatizing the mining industry, the government aimed to establish an attractive investment environment. (Frasier & Lungu 2006)

3. Privatization

2.2 Objectives of Privatization

When deciding to privatize an industry, governments have pursued different objectives. The prevalence of poor economic performance of public enterprises in many countries is incentive for some governments to privatize. The purpose of the privatization is, in this case, to achieve gains in economic efficiency. Some governments try to improve the fiscal position by privatization. This is common where the governments have been unwilling or unable to continue to subsidize deficits in the public company sector (Davis et al. 2000). In the case of Zambia, the objectives were to improve economic efficiency, foster private sector development and strengthen economic growth (Zambian Authorities et al. 1999).

2.3 The Copper Price

A significant feature of the international copper industry is that the price of its finished product on the world metal markets has tended to be highly unstable. This is caused by imbalances between supply and demand that sends the price up or down. In a country like Zambia, where the copper mining industry accounts for 81% of the country's exports (World Bank 2011), competence in the adoption of production, processing and marketing strategies that have the potential influence on world copper prices, given their instability, is very crucial for the economy as a whole (Saasa Oliver S. 1987). After the first oil crisis in 1974, the price of copper collapsed and Zambia had to borrow money to maintain social provision. Between 1974 and 1994, Zambia's per capita GDP declined by 50% (Frasier & Lungu 2006).

Copper Price (£/t)
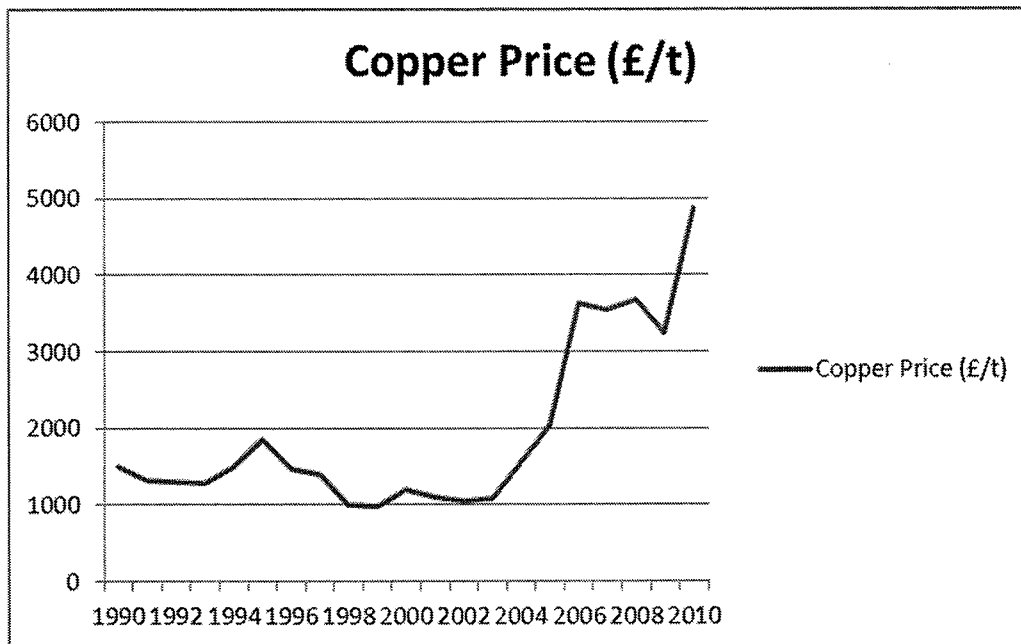
Source: LME 2011

3.3 Production Volume

Copper production fell steadily during the 1990s due to lack of re-investment in the industry. It was as low as 257 000 tons before starting to increase in 2000. Copper production has increased since privatization of the mining industry and in 2010 it was at 767 000 tons (CSO 2011). However, one cannot be certain that the privatization alone is responsible for the increasing copper production. The increased price of copper on the world market could be equally as important (Frasier & Lungu 2006).

3.3.1 Production Volume and Copper Price

The hypothesis that the copper price is correlated with the copper production in Zambia is tested using data from CSO and LME for the time period 2000-2010. The estimated equation aims to find an association between the copper price in year t, to copper production corresponding to the same year.

The estimated model has the following form:

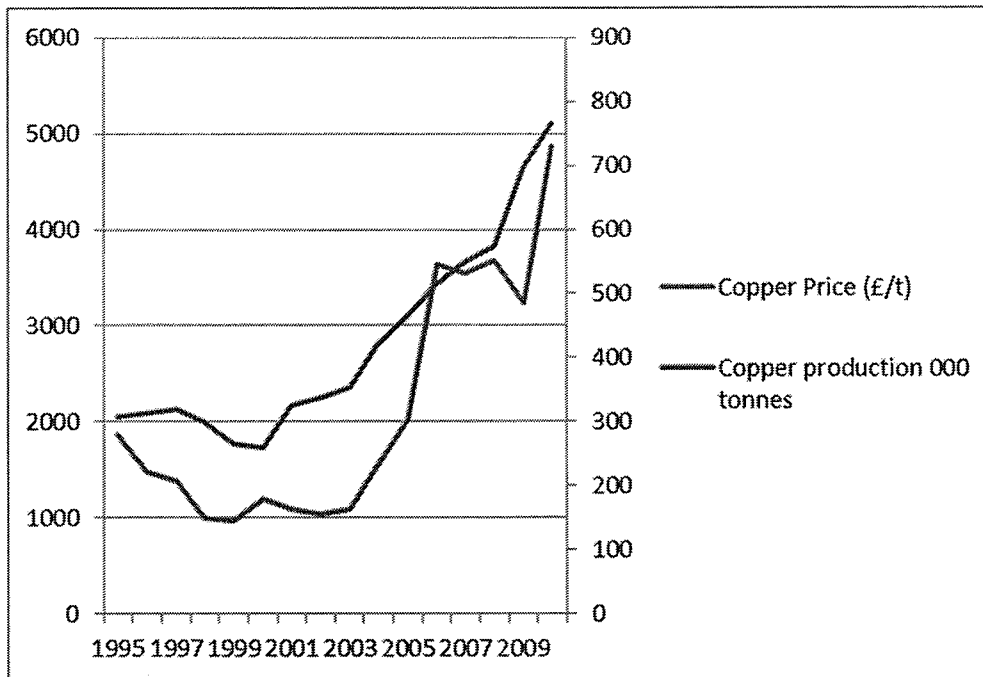$PRODUCTION_t = a + bPRICE_t + e_t$

$t = 1, ..., T,$

where e_t is the error term, PRODUCTION$_t$ is the copper production in Zambia and PRICE$_t$ is the copper price on the LME. We assume that $e_t \sim (0, \sigma^2)$.

Parameter b is expected to be statistically insignificant if the copper price is not correlated with the copper production. The empirical results are displayed in Table 1.
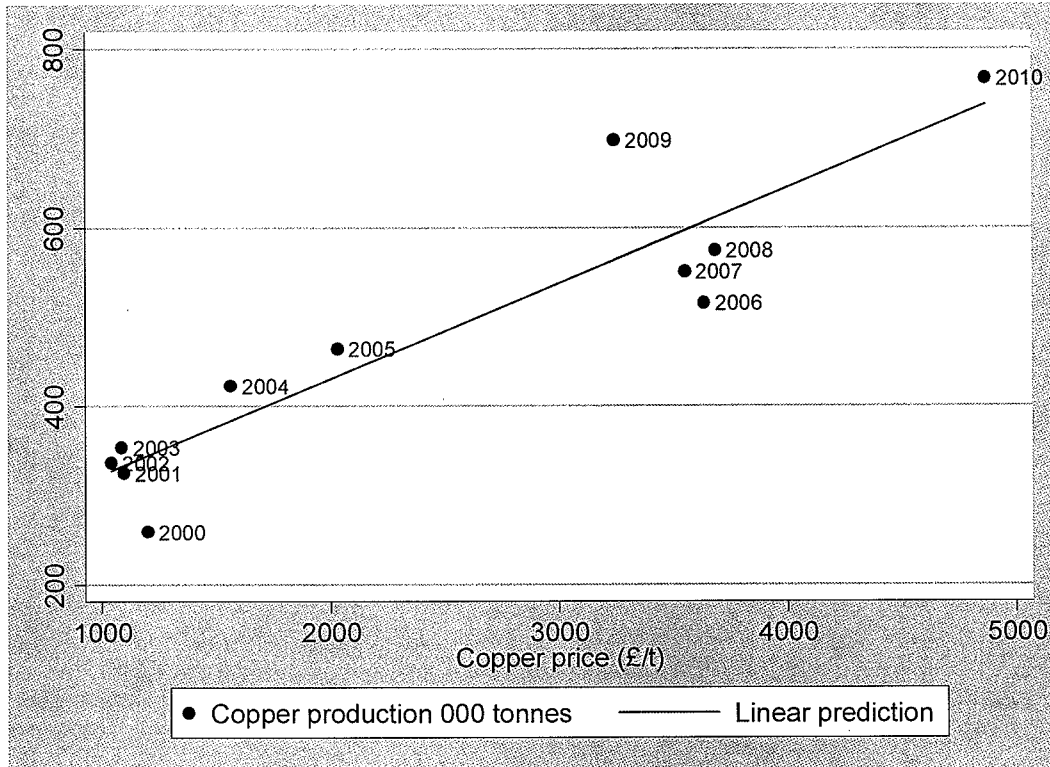
Table 1
Number of observations = 11
b = 0.107 R^2 = 0.841
SE(b) = 0.016

At first, this seems to be a very good model with parameter b highly significant and R^2=0.84. However, a high R^2 and a large t-statistic are two results indicating a spurious regression. The fact that both the copper price and the production volume are trending will make them appear related.

Source: LME & CSO 2011

To first-difference the series eliminates the spurious regression phenomenon. The new regression has the following form:

$\Delta PRODUCTION_t = a + b\Delta PRICE_t + e_t$

$t = 1, \ldots, T,$

where e_t is the error term, $\Delta PRODUCTION_t$ is the first difference in copper production in Zambia and $\Delta PRICE_t$ is the first difference in copper price on the LME. We assume that $e_t \sim (0, \sigma^2)$.

The corresponding regression in first differences is reported in Table 2. The parameter b is now insignificant and R^2 is close to zero. Thus, after accounting for the spurious regression problem, the production volume and copper price are basically independent.

Figure: Scatter plot of First Difference in Copper Production vs First Difference in Copper Price, with data points labeled by year (2001–2010) and a Linear prediction line.

X-axis: First Difference in Copper Price (-500, 0, 500, 1000, 1500)

Legend: ● First Difference in Copper Production ——— Linear prediction
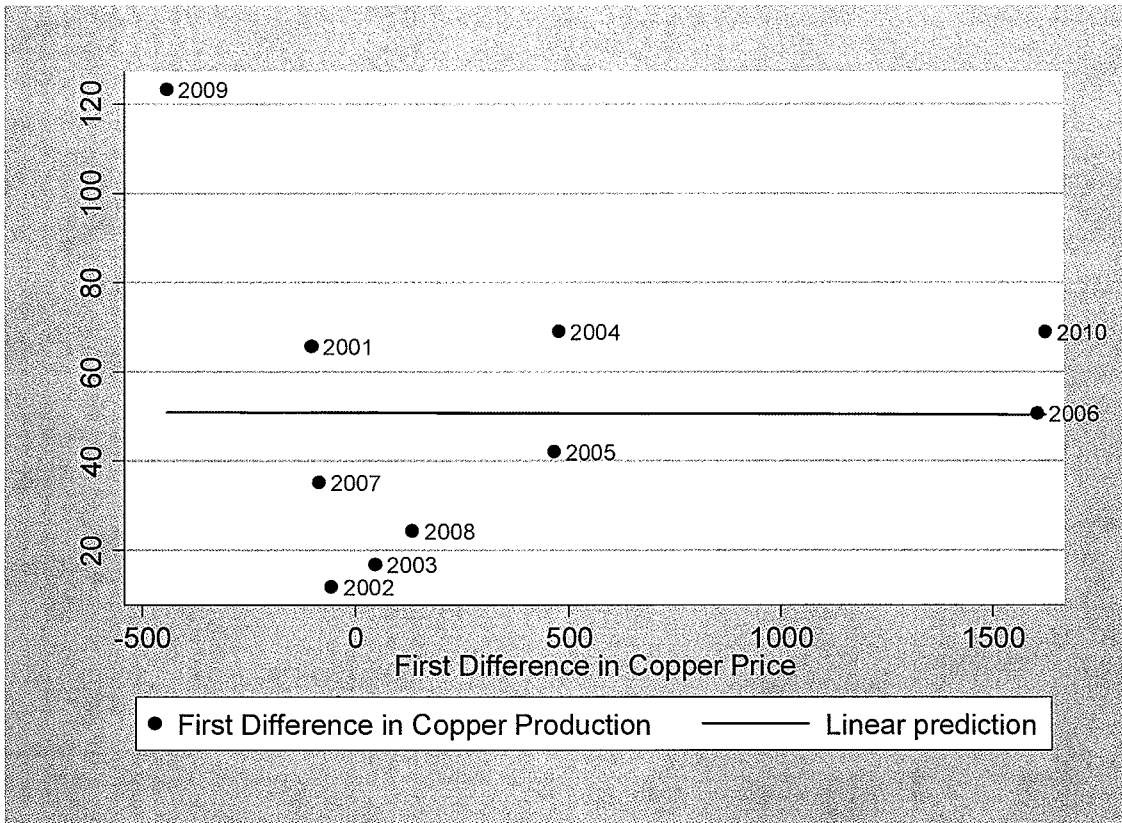
Table 2
Number of observations = 11
b = -0.0003 $R^2 = 0.000$
SE(b) = 0.016

4. Macroeconomic Effects of Privatization

4.1 Short-run macroeconomic effects of privatization

4.1.1 Privatization Proceeds

The privatization of government enterprises renders financial proceeds. These immediate incomes do not themselves indicate that the government is better off than earlier or that the government's spending is secured in the future. There are longer term implications regarding revenues forgone and/or expenditures no longer necessary. These are intertemporal effects that the government needs to have in mind when deciding on the use of privatization proceeds (Davies et al. 2000). In Zambia, the proceeds from the sale of public entities were supposed to be transferred to an extra budgetary fund in order to finance specific projects, such as settling liabilities or retrenchment costs. The privatization receipts were however completely

eliminated when settling liabilities and severance payments and therefor there were no net proceeds at all to be transferred to the privatization revenue fund (Buchs 2003).

4.1.2 Privatization Receipts and Budget Deficit

There is extensive literature on the relationship between privatization receipts and the government deficit. The authors analyze whether the privatization receipts have been used as a means to reduce the government deficit. The result in many of the studies indicates that there is a negative and statistical significant relationship between receipts from privatization and the budget deficit. To do an equivalent model I collected data from the Privatization Database and IMF for the time period 1994-2000. The estimated equation aims to find a connection between the budget deficit level (as a percentage of GDP) of Zambia in year t, to the value of privatization receipts corresponding to the same year.

The estimated model has the following form:

$$DEF/GDP_t = a + bPROC/GDP_t + e_t,$$
$$t = 1, ..., T,$$

where e_t is the error term, DEF/GDP_t is the budget deficit level as a percentage of GDP and $PROC/GDP_t$ is the privatization proceeds as a percentage of GDP. We assume that $e_t \sim (0, \sigma^2)$. The parameter b is expected to be statistically insignificant if the privatization receipts are not correlated with the budget deficit. Table 3 provides the empirical results of the model. The estimates indicate that there is no statistically significant correlation between privatization receipts and the budget deficit for the time period 1994-2000 (Katsoulakos & Likoyanni 2002).
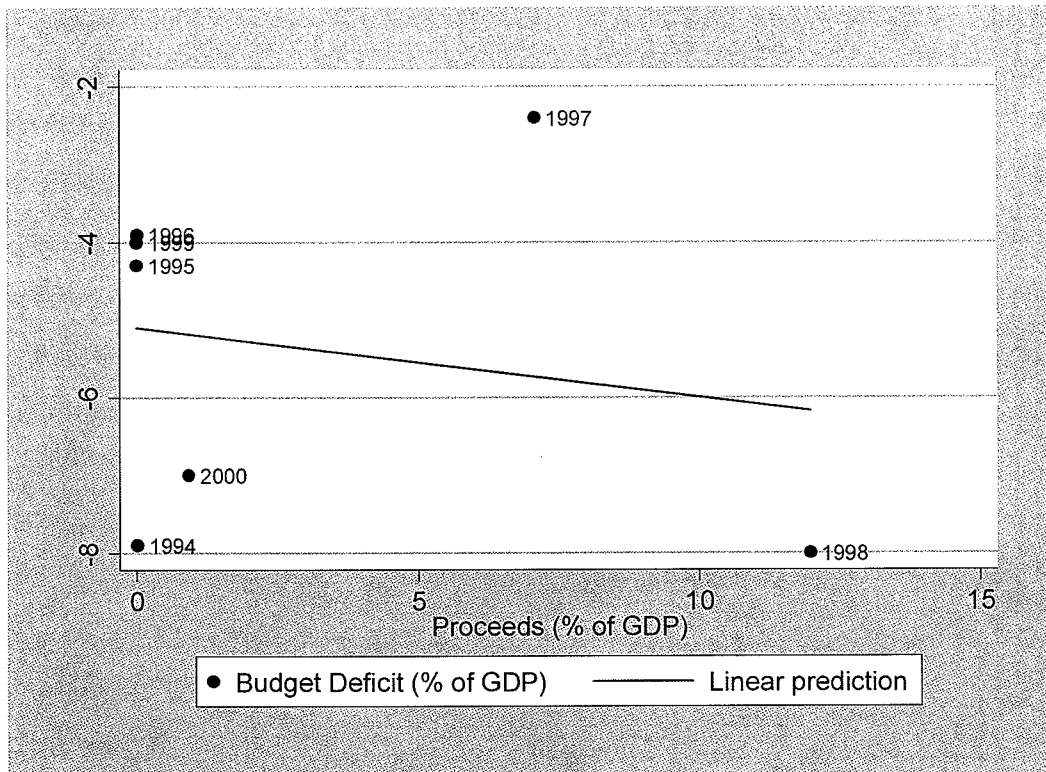
Table 3
Number of observations = 7
b = -0.089 R^2 = 0.036
SE(b) = 0.205

4.2 GDP Growth

In the late 1990's, the mining sector had a negative effect on the overall economy of Zambia. The country has experienced positive growth since the turn of the century. The effect from the mining industry has, since privatization was completed, been positive. Real GDP growth is expected to be 6.8% in 2011. This growth is due to progress in the mining, construction and transport, storage and communication sectors (IMF 2011).
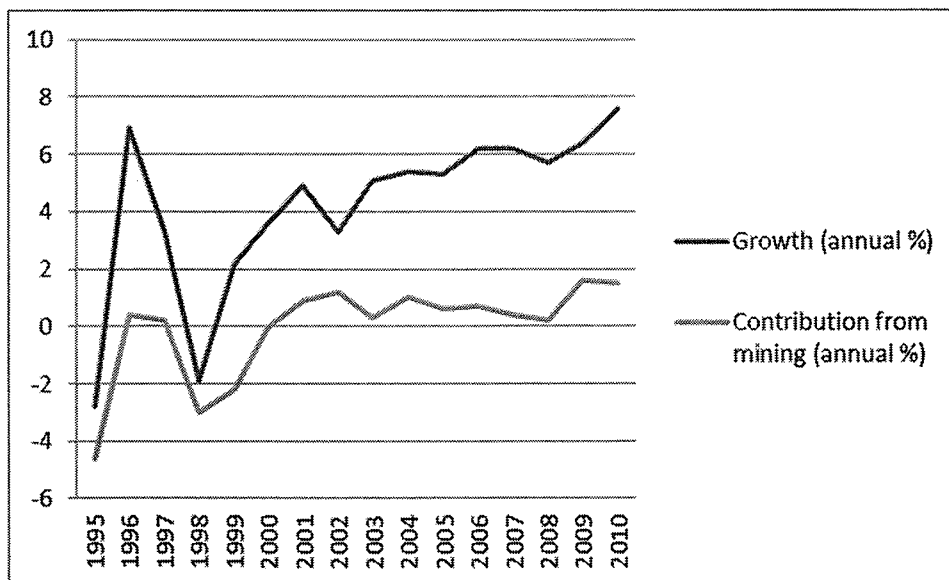
Source: CSO (2011)

There is extensive literature that supports the hypothesis that private firms operate more efficiently than those held by the state. This hypothesis seems to hold true when looking at the case of Zambia. The increased tax revenues collected from the mines indicates that the private companies are more profitable than ZCCM was. Policy variables including fiscal discipline, price and trade liberalization, deregulation, privatization and the protection of property rights are important variables in determining a developing country's growth. There may be important complementarity between these measures, meaning that individually they may only have a small effect on growth, while collectively they are strongly connected with growth in a country. Even so, I will present a model including only one variable representing privatization.

4.2.1 GDP Growth and Tax Revenues

To test the hypothesis that privatization have had an impact on GDP growth in Zambia I collected data from Zambia Revenue Authority and the World Bank for the time period 1995-2010. The estimated equation aims to find an association between the GDP growth of Zambia in year t, to the mining tax revenues corresponding to the same year.

The estimated model has the following form:

GDP GROWTH$_t$ = a+bTAXREV$_t$+e$_t$,

t = 1,…, T,

where e_t is the error term, GDP GROWTH$_t$ is the annual GDP growth of Zambia and TAXREV$_t$ is the tax revenues generated from the mining industry. We assume that $e_t \sim (0, \sigma^2)$. The parameter b is expected to be statistically insignificant if the tax revenues are not correlated with the GDP growth. Table 4 provides the empirical results of the model for the time period 1995-2010. The estimates indicate that there is a statistically significant correlation between the tax revenues generated from the mining industry and the GDP growth in Zambia.
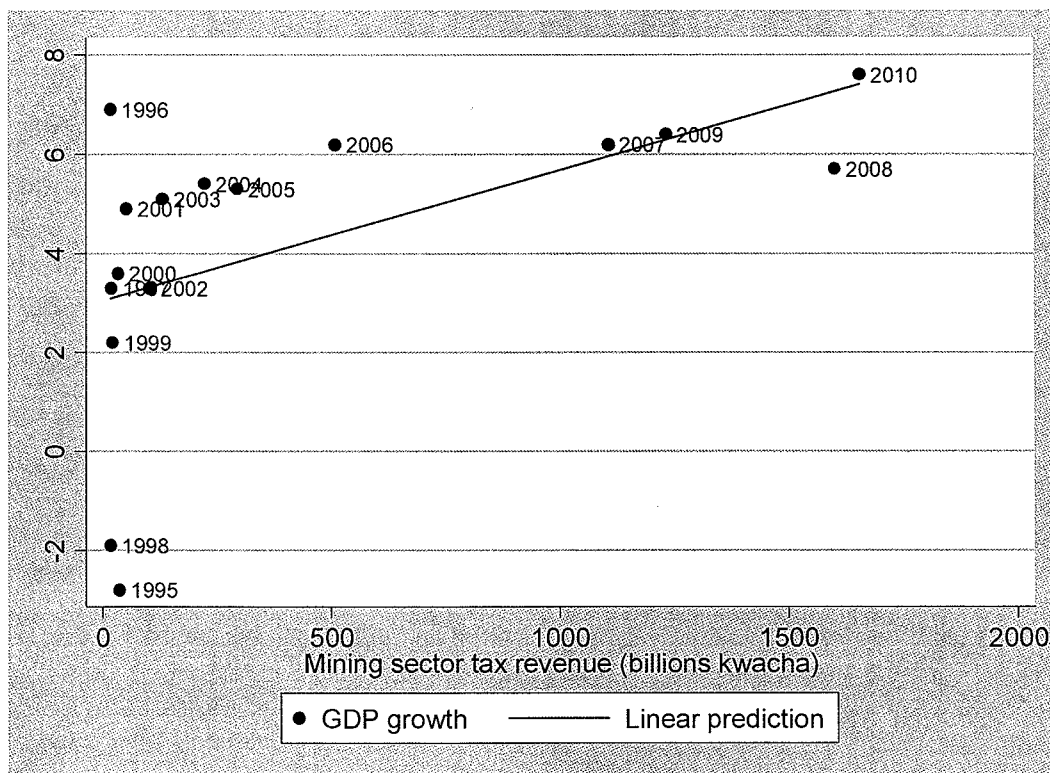

Table 4
Number of observations = 16
b = 0.003 $R^2 = 0.286$
SE(b) = 0.001

Case studies performed in other developing countries support the result of a significant and positive correlation between privatization and growth rates. It is however important to emphasize that privatization alone is not the suggested cause of the increase in growth rates in the regression. It is more likely that privatization serves as a proxy in this regression for a couple of structural measures being part of a larger change in economic regime. In other words, the conclusion is that causality does not necessarily run from tax revenue to GDP growth.

5. Fiscal Impact of Privatization

5.1 The Development Agreements

Before 2008 the mining companies operated under so called Development Agreements (DAs). The DA's established the terms under which the mines were sold. The terms were, according to international standards, very beneficial because the government wanted to attract new investors. Fiscal incentives are becoming very popular to attract investment in the mineral sector. The Mines and Minerals Act in Zambia specifies that mineral royalties should be set at 3% for those holding large-scale mining licenses, but the rate negotiated by most mining companies was 0.6% of the gross revenue of minerals produced in the mining areas. Under the DA's most of the mining companies could also avoid paying some of their corporate tax by carrying forward losses for periods between 15 and 20 years, which meant that losses made in year one of operations could be subtracted in subsequent years from taxable profits (Frasier & Lungu 2006). When mineral investors and governments have project negotiations, the government often gives up potential revenues because they want to attract companies to explore and develop mineral resources. The companies frequently argue that beneficial fiscal terms are necessary to compensate for the excessive risk or costs to operate in a particular country. Since a company may decide not to operate in the country without fiscal incentives, the government is better off collecting some revenue, rather than none. (Baunsgaard Thomas, 2001). A proper design of the fiscal regime is important if you want to ensure that the state as the resource-owner benefits from the mineral extraction, and therefore the DA's had to be abolished since the government needed larger revenues to be able to provide social services and economic infrastructure. It was a choice of either removing the DA's or make the new mine owners resume provision of community welfare services (Lungu John, 2008). Hence, even if the private companies were producing more efficiently than ZCCM, it did initially not have a significant impact on the tax revenues to the government. (IMF 2004)

5.1.1 Progressive Profit Tax

In some countries the government introduces a progressive profit tax to ensure that the government benefit when the mineral project become very profitable. Often this is achieved by having a stepped tax rate schedule linked to product prices, production volume, sales turnover or the profit-to-sales ratio. In the Development Agreements there was one financial instrument that aimed to bring benefits back to Zambia when companies started to earn major windfall benefits from high global copper prices. If the price of copper at the London Metal Exchange exceeded US$2700 per ton, the Government started to claim back a percentage of

each sales made. The benefits for the Government were however small since the payment to the Government was deductible by the companies for income tax purposes. This meant that while the government started to enjoy income from higher copper prices, the income tax paid from the companies was reduced (Alastair Frasier and John Lungu 2006). The Windfall Tax was however abolished in 2008 because the effective tax rate exceeded 100% for some companies (ZRA, 2011). The fact that higher product prices and the rate of return of a project are not correlated with each other is a common problem with the progressive profit tax. Other negative implications are increased administrative costs and increased incentives for mining companies to underreport income, which may deter investors. (Baunsgaard Thomas, 2001).

5.2 Tax Policy

It is recommended to have a separate fiscal regime for the mineral sector because mineral extraction is connected with a special role of economic rent. When extracted, the scarcity of the mineral leads to economic rent. Economic rent is the difference between the market price of the commodity and the opportunity cost of engaging in supplying the mineral. Pure rent is a surplus and could in theory be taxed without effecting production decisions.

The opportunity cost of supplying a mineral is given by the supply price of investment. The supply price of investment is the return the investor requires to make the decision to invest. The return should cover the cost of exploration, development and production, the cost of capital, and a risk premium. The lower the supply price of investment, the higher the potential economic rent for a given total return on investment. How high a tax burden the government can impose depends on the allocation between these two determinants. If an investor perceives a project to be very risky, the tax that the government can impose will be smaller (Baunsgaard Thomas, 2001).

5.3 Tax in Zambia's Mining Industry

5.3.1 Company Tax

Most countries involved in extracting mineral recourses include these projects within the standard corporate income tax regime. Exporters of copper and cobalt are levied 35% of taxable income under Zambia's company tax. Companies listed on the Lusaka Stock Exchange and companies holding a large-scale mining license are levied at 30% of taxable income. It is allowed to carry forward losses that can be spread over 10 years and capital

expenditure can attract 100% in capital allowances. The company tax is the largest part of the total tax revenue generated from the mining industry in Zambia (ZEITI , 2011).

5.3.2 Mineral Royalty

Mineral royalty is a kind of compensation to the government for extracting minerals. Historically, mineral royalty has been the most important instrument for taxing mineral extraction. It is attractive for governments since they start to claim revenue as soon as production starts (Baunsgaard Thomas, 2001). Mineral royalty was an important source of revenue from the mining companies in the beginning of the private ownership era, and for some years it was the largest income source from the mining industry. The Mines and Minerals Act specifies that the mineral royalty for companies extracting copper in Zambia is set at 3% of norm value (ZEITI, 2011).

5.4 Effects of Privatization on the Fiscal Accounts over Time

To assess the effects of privatization requires an analysis of the impact on the income flows and on government net worth. The financial relationship between the government and the public enterprise includes taxes and dividends and other transfers including subsidies. After privatization, the change in government net worth would equal the sum of the privatization proceeds and the net present value of the taxes received from the privatized firms, minus the sum of the net present value of the subsidies to or from the state-owned company and the net present value of the lost taxes of the state-owned company. If the private sector runs the company more efficiently than would the state, government net worth is expected to increase. This would be true if the government could privatize and tax efficiently. Provided that they can, the government's intertemporal budget restraint would be loosened, and privatization would have a permanent positive effect on public finances (Davis et al. 2000).

5.4.1 Mining Sector Tax Revenue

Taxes paid by privatized companies will demonstrate changes in efficiency. The revenues to the national budget would benefit from increased corporate profitability. There are studies confirming that privatized firms paid more taxes compared to the period before privatization (Galal et al. 1994). In Zambia, there has been a significant increase in tax revenues from the mining sector to the government after privatization. Before privatization, the government had to subsidize ZCCM to sustain operations. Today, the mining company Kansanshi Mining PLC holds the title of being the Largest Tax Payer in Zambia. Last year, domestic revenues over

performed by 1.8%, much thanks to higher collection under income taxes from the mining companies (IMF 2011).

Mining Sector Tax Revenue
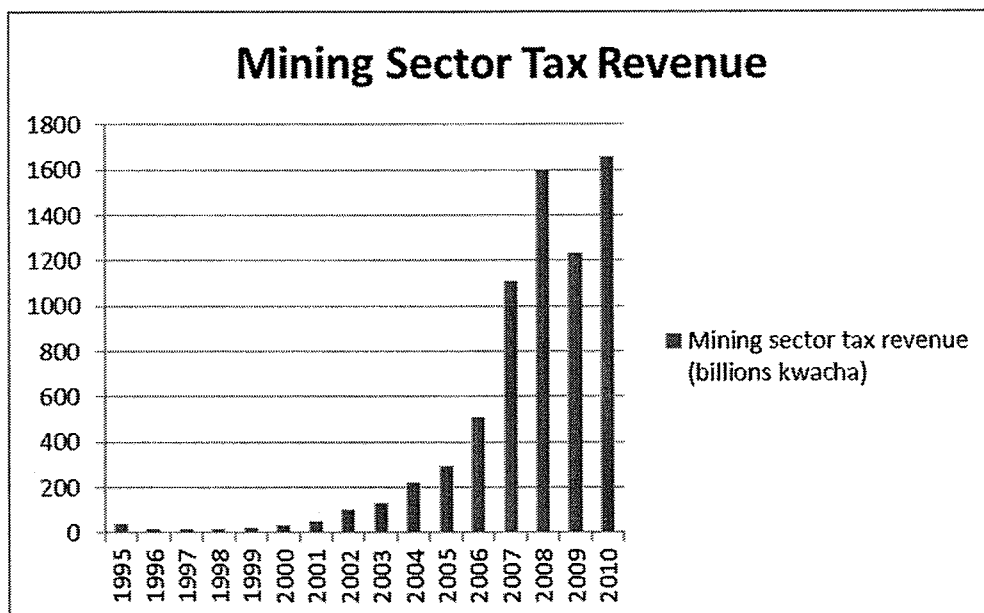
Source: ZRA 2011

6. The Impact of Privatization on Property Rates in Chingola

6.1 Property rates

Directly after privatization, the municipal revenue from the mining company operating in Chingola, KCM, was not generous. This was a result of the fact that the value of the properties was debased because of lack of reinvestment from ZCCM in the pre-privatization era. After privatization there has been an inflow of capital investment to the mining sector, since the private purchaser would need to invest significant sums to modernize the firm. These investments have increased the value of the properties, and therefore also the revenues for the municipality. In 2003, only 7% of the municipal revenue came from property rates from KCM. This number has increased steadily, and in 2008 it was as high as 60% of total revenue. Looking at Chingola's budget for 2011, about 70% of the revenues received from property rates come directly from the mining industry. The contribution from the mining sector is however bigger since many suppliers to the mines also pay property rates to the municipality (Chingola City Council 2011).

6.1.1 Investment and Property Rates

To test the hypothesis that the foreign direct investments (FDI's) have had an impact on the property rates I collected data from Chingola City Council and the World Bank for the time period 2003-2010. The estimated equation aims to find an association between the net inflows of FDI in year t, to property rates income in Chingola corresponding to the same year. The estimated model has the following form:

PROPERTY RATES$_t$= a+bFDI$_t$+e$_t$,

t = 1,..., T,

where e$_t$ is the error term, PROPERTY RATES$_t$ is the income from property rates in Chingola and FDI$_t$ is the net inflow of foreign direct investments. We assume that e$_t$~(0,σ^2).
The parameter b is expected to be statistically insignificant if the FDI's are not correlated with the property rates income. The results from the model are presented in Table 6. The estimates indicate that there is a statistically significant correlation between the net inflows of foreign direct investments and the income from property rates in Chingola. The results are consistent with the fact that the municipality revalued the properties in Chingola after privatization because they recognized the investments would increase the value of the properties. At present, the properties are revalued every five years (Chingola City Council 2011).
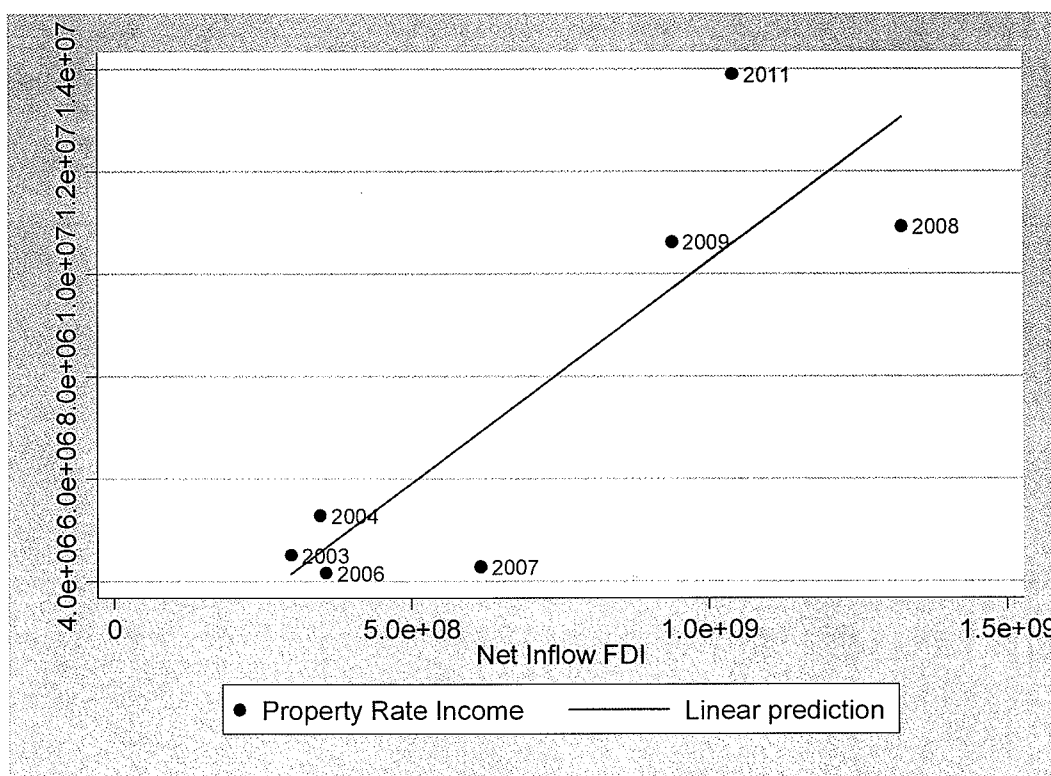
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Table 6
Number of observations = 7
b = 0.009                           R² = 0.754
SE(b) = 0.002
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7. Conclusion

Privatization has been a crucial ingredient in structural reforms in developing economies during the 1990's. In Zambia, the state controlled mining industry was making annual losses, hence the government decided to privatize the sector. Their aim was to revive the industry and establish an attractive investment environment. The objective of this thesis is to examine the fiscal and macroeconomic impacts of the privatization of the mining sector in Zambia. A deeper understanding of the effects may alleviate effective policies in an on-going privatization process.

The sale of the state-owned companies generated financial proceeds that were supposed to be transferred to an extra budgetary fund. There were however no receipts to be channeled to the fund. Therefore, the government deficit was not affected by the proceeds from the sale.

In determining a developing country's growth, privatization is one of the important variables included in the equation. The hypothesis that there exists a positive correlation between privatization and GDP growth seems to hold true for the case of Zambia. It is however important to emphasize that privatization alone is not the suggested cause of the increase in growth rates. It is more likely that privatization serves as a proxy for a couple of structural measures being part of a larger change in economic regime.

Although the private sector were producing more efficiently than the public enterprises, the privatization did initially not have a significant impact on the tax revenues generated from the mining industry. This owing to the generous agreements under which the mines operated. These agreements were abolished in 2008 and last year domestic revenue over performed much thanks to tax revenues rendered from the mining sector.

A lack of re-investment in the pre-privatization era made the properties in Chingola decline in value. After privatization, there has been an inflow of capital investment. These invesments

have increased the value of the properties and therefore also the revenues to the municipality in form of property rates.

The privatization did not, at first, have a big impact on the economy of Zambia. It took years for the mining sector to resuscitate. When it eventually did, the government did not profit from the prosperity because of inappropriate laws and agreements. With them removed and good policies put in place, the government and the zambian economy will be able to benefit from the succesful mining sector.

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