The effects of corporate income tax incentives on mining firms' investments in fixed assets: The case of Zimbabwe (2009-2011)

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ABSTRACT

This article evaluates the effects of corporate income tax incentives on individual mining firms' investments in fixed assets. The main objective was to assess whether corporate income tax incentives have improved Zimbabwe mining firms' investments in fixed assets for the period 2009 to 2011. Panel data econometrics methodology was employed, using firm level data that was obtained from a sample of thirty-seven mining firms. A positive relationship between capital redemption allowances and firms' investment in fixed assets was confirmed. It was also established that a positive relationship existed between assessed losses carried forward and investment in fixed assets. On the contrary, a negative and significant relationship was confirmed between corporate income taxes and the investment variable. Effective tax rates were found to have no effects on investment in fixed assets. The study recommends that the identified corporate income tax incentives are necessary, but should be granted with caps or sunset clauses in line with modern trends and best practice in the granting of tax incentives.

Key words: tax incentives, investments, fixed assets, mining, Zimbabwe

1. INTRODUCTION

The mining sector has become a key sector in Zimbabwe and in recent years, significant discussion has centred on taxation of that sector. Multilateral Organizations such as the World Bank and the International Monetary Fund have been engaged to offer technical advice on the mining taxation model that Zimbabwe should pursue. The seemingly general consensus from tax policy experts is that, the mining sector is receiving vast tax incentives which should be streamlined as they are eroding tax revenues. Towards the end of 2010, the Minister of Finance and Economic Development hinted on Government's intention to streamline capital redemption allowances in the mining sector as they were negatively impacting on corporate income taxes (Ministry of Finance and Economic Development, 2010). There is ongoing debate on whether the benefits derived from granting tax incentives outweigh the costs associated with them. This study intends to contribute to the ongoing debate on corporate income tax incentives, with particular reference to the mining sector in Zimbabwe.

1.1 STATEMENT OF THE PROBLEM

The mining sector has been one of the fastest growing sectors of the economy in recent years. However, this growth has not been matched by tax revenue contributions from the same sector. Corporate income tax revenue from the mining sector is paltry due to tax incentives which are peculiar to that sector. Policy makers in government have identified the need to review tax incentives, with particular reference to capital redemption allowances (Ministry of Finance and Economic Development, 2011). Despite this need, there is also another pressing need to recapitalize the sector and enhance productivity (ibid). Are the capital redemption allowances and other tax incentives serving their intended purposes? Are their benefits outweighing their costs?

1.2 Study Aims and Objectives

The main objective of the study was to explore the nature of tax incentives and their effects on investment in fixed assets in the mining sector of Zimbabwe. The sub objectives were as follows:

I.   To assess the nature of tax incentives in Zimbabwe's mining sector.

II. To establish if capital redemption allowances, reduced corporate income taxes, Effective Tax Rates (ETR) and assessed loss carryforwards improve mining firms' investments in fixed assets.

III. To evaluate the specific tax incentives to target for policy reform in the mining sector.

1.3 Research Questions
The key research questions were as follows:

I.   What is the nature of tax incentives in the mining sector of Zimbabwe?

II. What are the effects of corporate income tax incentives on mining firms' investments in fixed assets?

III. Which specific corporate income tax incentives can be targeted for policy reform in Zimbabwe?

1.4 Hypothesis
The null hypothesis was that, corporate income tax incentives in the mining sector have no effects on investment in fixed assets.

1.5 Justification of the Study
The study is most likely to have far reaching policy implications to tax administrators, policy makers and other stakeholders on whether the current tax incentives should be increased, maintained or streamlined for the case of Zimbabwe. There were also gaps that needed to be filled in the area of tax incentives in Zimbabwe. Most of the previous studies had covered a broad spectrum of tax incentives for a group of countries within a particular trading bloc, for example, Southern African Development Community (SADC) rather than concentrating on one specific country (Bolnick, 2004; Klemm, 2009). From these studies, it had not been possible to probe the intricacies of the tax system within a particular country. This study intended to be more specific. It concentrated on the essence of tax incentives to the Zimbabwean economy, which study had not been done to date.

This study was also a deviation from previous studies in that, it concentrated on the effects of tax incentives in a selected sector. The analysis was, therefore, more focused and illuminating. This was made possible by the fact that the researchers had to sift through the actual tax returns from firms in the mining sector. While many economists acknowledge that incentives in this sector ought to be streamlined, no empirical justification had been put forward to support that notion. This study, therefore, sought to provide recommendations based on scientific evidence.

1.6 Limitations of the Study
Due to circumstances beyond the researchers' control, there were limitations on data availability for a few firms were included in the panel data regression analysis. Data for 2009 to 2011 was in the old Systems, Applications & Products (SAP) and was, therefore, readily available. Data for 2012, 2013 and 2014 was in the new SAP system which had recently been upgraded from the old system. The researchers had no access to some of the 2012 up to 2014 data as it was still being cleaned up by SAP experts. For that reason, the researchers decided to use panel data regression analysis, which provided more robust results for a shorter period of time.

1.7 Organisation of the Study
Section 2 critically reviews the nature of tax incentives in the mining sector. Section 3 provides a brief review of literature on the subject of tax incentives with specific reference to corporate income tax. Section 4 lays out the econometric model of tax incentives for the Zimbabwean case. Section 5 presents the results and analyses them. Section 6 concludes the study and offers recommendations.

2. NATURE OF CORPORATE INCOME TAX INCENTIVES IN THE MINING SECTOR

The mining sector in Zimbabwe has its own special tax regime, with its own tax incentives that are at variance with tax incentives in the other sectors. The following were some of the existing tax incentives in the mining sector which distinguished it from other sectors:

2.1 Capital Redemption Allowances

All capital expenditure on exploration, development and operating incurred wholly and exclusively for mining operations is allowed in full. In fact, instead of employing the concept of capital allowances, as in other sectors, the mining sector employs the concept of capital redemption allowances in line with Section 15 (2) (f) of the Income Tax Act Chapter 23:06 as read with the 5th Schedule. According to the 5th Schedule of the Income Tax Act Chapter 23:06, there is no limit on staff housing. Capital redemption allowances for shareholders' houses can also be claimed with no cap, unlike in other sectors where there is a cap on capital allowances. Only expenses incurred in the construction of hospitals and schools can be claimed up to a specified limit. Justifying the need to review the policy on capital redemption allowances, the Minister of Finance and Economic Development said:

> The current mining tax regime is highly preferential in recognition of the capital outlay related to the sector. As a result, the contribution of the mining sector to the fiscus is minimal compared to [other mining sectors in] other countries in the region (Ministry of Finance and Economic Development, 2010).

The intention to review capital redemption allowances was deferred in the National Budget Statement of 2010, paragraph 1013, when the Minister of Finance and Economic Development had this to say:

> Although the review of capital allowances has potential to significantly improve revenue inflows to the fiscus, there is, however, need to allow the mining sector to recapitalize in order to enhance productive capacity (Ministry of Finance and Economic Development, 2009).

From a sample of only 12 companies randomly selected from the mining sector, capital redemption allowances of US$680 million were allowed from the period 2009 to 2011. This amount was too big, when compared to capital allowances granted in other sectors such as agriculture and financial services.

2.2 Treatment of Tax Losses

There is no restriction on carrying forward of tax losses. While in other sectors of the economy tax losses can be carried forward up to a maximum period of six years, for the mining sector, tax losses can be carried forward for an indefinite period. This has had a negative impact on the performance of corporate income tax as most of the companies in the sector were always declaring losses and carrying them forward indefinitely.

2.3 Reduced Corporate Income Tax Rates

Taxable income of a holder of a special mining lease is set at a special rate of 15%, whereas the general corporate income tax rate is 25%. Mining companies that are under Build-Own-Operate-Transfer (BOOT) arrangements are levied corporate income tax at the rate of 0% for the first five years, 15% for the second five years and 25% thereafter.

2.4 Deductibility of Mining Royalties

Mining Royalties were previously allowed as a deduction for tax purposes. This was in line with Section 15 (2) (f) (iii) of the Income Tax Act Chapter 23:06. However, in the National Budget Statement of 2014, the Minister of Finance and Economic Development indicated his intention not to allow mining royalties as a deduction for tax purposes. This was repealed with effect from 1 January 2014.

2.5 Build-Own-Operate & Transfer (BOOT) Arrangements

Mining companies, like companies in other sectors of the economy, can enter into a Build-Own-Transfer (BOT) or Build-Own-Operate and Transfer (BOOT) arrangement with the government or statutory corporations. These are arrangements under which contractors undertake to construct infrastructure for the state or a statutory corporation. This will be in consideration of the right to operate or control operations for a specified period after which the contractor will transfer ownership or control of the item to the state or a statutory corporation. As mentioned earlier, the company enjoys a tax holiday for the first five years and is then taxed at 15% for the second five years.

2.6 Mining Claims

As a way of streamlining incentives in the mining sector, in 2010, the Minister of Finance and Economic Development repealed a section that allowed a taxpayer to elect to spread the taxable income that was derived from the sale of a mining claim over a period of four years. The effect of that provision had been to defer the taxation of such income, thereby negatively impacting on revenue inflows to the fiscus (Ministry of Finance and Economic Development, 2010).

2.7 Exemption from Acquired Immune Deficiency Syndrome (AIDS) Levy

Until January 2015, companies in the mining sector were exempted from paying the AIDS levy. This privilege was not extended to other sectors of the economy. AIDS levy on the other sectors was calculated as 3% of tax chargeable after deduction of credits in the case of individuals and 3% of tax chargeable in the case of companies.

3. A REVIEW OF LITERATURE ON CORPORATE INCOME TAX INCENTIVES

3.1 Introduction

According to Bohmer *et al* (2007), tax incentives are those special exclusions, exemptions, deductions or credits that provide special credits and preferential tax treatment or deferral of tax liability. Tax incentives are often structured through income tax systems, providing relief from corporate-level taxes on income from capital and in some cases, providing relief from personal income tax. Tax rate reductions, VAT zero rating and VAT exemptions are also classified as tax incentives (Calitz *et al*, 2013; Klemm, 2009).

The debate on the effectiveness of tax incentives on both economic growth and investment is still inconclusive. There are studies that claim that fiscal incentive effects are mixed (Hubbert and Pain, 2002), while other studies claim that they are insignificant (Shah, 1995). Other studies, on the contrary, claim that tax incentive effects are inexistent (Friedman *et al.*, 1992).

3.2 Theory behind Tax Incentives

Two fundamental premises underlie the justification for offering tax incentives in developing countries; firstly, that additional investment leads to faster economic growth; and secondly, that tax incentives stimulate additional investment (Bolnick, 2004). The advantages and disadvantages of the various tax incentives can be analysed in terms of four criteria. The criteria include effectiveness in stimulating investment, impact on revenue, economic efficiency and impact on tax administration (ibid).

Engen and Skinner (1996) suggested that tax reforms are sometimes taunted as having strong macro-economic growth effects. According to the two researchers, while many economists would agree with the proposition that high taxes are bad for economic growth, this proposition is not necessarily obvious, either in theory or in the data. Engen and Skinner traced the impact of taxation on economic growth to the Solow Growth Model. This theoretical framework allowed Engen and Skinner to catalogue five ways that taxes might affect output growth. Firstly, higher taxes can discourage the investment rate or net growth in the capital stock. Secondly, taxes may attenuate labour supply growth. Thirdly, tax policy also has the potential to discourage

productivity growth by attenuating research and development. Fourthly, tax policy can influence the marginal productivity of capital by distorting investment in heavily taxed sectors into more lightly taxed sectors. Finally, heavy taxation on labour supply can distort the effective use of human capital by discouraging workers from employment in sectors with high social productivity but a heavy tax burden.

Bolnick (2004) and Klemm (2009) presented congruent arguments against tax incentives. These include the fact that they can create economic distortions due to preferential treatment of investment. In addition, they also increase the cost of administration, as more resources are required in preventing fraudulent use of incentives. They also create social costs of rent-seeking behaviour. Calitz *et al* (2013) argued that export-oriented incentives such as VAT exemptions and zero rating are very prone to abuse since qualified purchases can easily be diverted to buyers not intended to receive the incentives

Bondonio (2003) postulated that the literature testing for the effects of taxes on long run economic growth has generally been motivated by two foundational endogenous growth models. Firstly, the Barro (1991) model established an 'Inverted-U' relationship between steady state growth and income tax rates in a model in which a distortionary proportional tax on income and a non-distortionary consumption tax financed a mixture of utility-enhancing public expenditures. Secondly, Devereux (1994) and Love (1995), cited in Bondonio (2003), established steady state growth effects of labour and capital income and consumption taxes in endogenous growth models with physical and human capital. According to Bondonio (2003), the key public finance features of these models are that, growth effects depend on the form of taxation, the type of public expenditure that is tax-financed and the technology of goods and human capital production.

Referring to earlier literature on the effect of tax incentives on economic growth, Gullen and Gordon (2007), cited by Harju and Kosonen (2012) assert ed that, "earlier literature has established that more progressive income taxation reduces the willingness to take risk, thus leading to less entrepreneurial activity and lower economic growth".

3.3 Empirical Literature Review on Effects of Corporate Income Tax Incentives
Orihara (2015) analysed the effects of corporate income tax loss carried forward using industry-year level tax return data for Japan. The study findings indicated that tax loss carried forward increased investments when the effective tax rates among the industry-year observations were considerably affected by these tax losses carried forward. According to the study, the findings suggested that incentives' effects of tax losses carried forward on corporate behaviour should be taken into consideration when implementing tax reforms.

Alm and Khan (2008) assessed enterprise taxation and the investment climate in Pakistan. They calculated both the average effective tax rates (AETR) and the marginal effective tax rates (METR) to determine the effects of tax incentives on investment. The average effective tax rate was calculated as total taxes actually paid as a fraction of gross corporate income. If the measure differed across firms, then those differences gave an indication of the way in which corporate income tax created incentives for resources to move between firms and, therefore, creating distortions in the allocation of resources. The two researchers recommended a reduction of the statutory tax rate for corporate income tax.

Galindo and Melendez (2010) analysed the corporate income tax stimulus and investment in Columbia. Their article employed an annual data set of firm level investment in Columbian firms during the period 1997 to 2007 to assess the impact of tax incentives for firms that invest in fixed assets implemented in 2004. The investment variable was used as the dependent variable, whilst independent variables included the effective corporate income tax rate and tax benefit as a percentage of turnover. The study observed a positive correlation between investment and tax policy. However, this correlation was not sustainable when year-specific effects were controlled. The article concluded that the tax incentive was ineffective in promoting investment in Columbia.

Federici and Parisi (2012) analysed the relationship between corporate income taxes and exports at firm level. Their results suggested that export participation as well as export intensity increase with corporate income taxation. The data set was for the period 2004 to 2006. Federici and Parisi (2012)'s findings show that the probability of engaging in exports is positively affected by the effective average tax rate and higher export sales are associated with increases in the marginal tax rate.

Teraoui et al (2011) assessed the impact of tax incentives on corporate financial performance in the mechanical and electrical industries sector in Tunisia. The study tested the effects of tax incentives on the profitability of the exporting firms in Tunisia's mechanical and engineering industries. The study was conducted on a sample of sixty firms. Teraoui, et al (2011) concluded that an increase in taxation had a negative effect on benefit and output, which were the two selected criteria for financial performance.

Klemm and Van Parys (2010) produced empirical evidence on the effects of tax incentives on attracting foreign direct investment. The researchers prepared a panel data set of tax incentives in over forty Latin American, Caribbean and African countries for the period 1985 to 2004. Using dynamic panel data econometrics, they found evidence that lower corporate income tax rates and longer tax holidays were effective in attracting foreign direct investment in Latin America and the Caribbean, but not in Africa. None of the tax incentives were found to be significant in boosting gross private fixed capital formation.

3.4 Gaps Identified from Literature Reviewed

There are very few empirical studies on tax incentive effects in developing countries like Zimbabwe. Available empirical studies on tax incentives use national data at macroeconomic levels. Very few studies, were able to use firm level data for an African developing economy such as Zimbabwe. This is mainly due to data challenges in these countries.

4. METHODOLOGY
4.1 Model Specification

Our empirical analysis adopted an econometric model borrowed from previous studies but with some variations. The basic model for analysing tax incentives' effects used in this article followed the leads of Galindo and Melendez (2010). While the study employed some of the variables used in previous studies, it deviated from the previous studies by introducing panel data analysis at firm level and within a single specific sector. This approach made the study more focused when compared with previous studies.

The model analysed the effects of tax incentives (capital redemption allowances, corporate income taxes, effective tax rates and assessed loss carryforwards) on firms' investment in fixed assets. The econometric model is specified below:

$$i\alpha_{it} = a_0 + \beta_1 ca_{it} + \beta_2 gp_{it} + \beta_3 ct_{it} + \beta_4 al_{it} + \beta_5 etr1_{it} + U_i + V_{it}$$

where:

$i\alpha_{it}$ is the variable capturing investment in fixed assets; ∞_0 is the intercept; ca_{it} represents capital redemption allowances; gp_{it} is the individual firm's gross profit; ct_{it} is the individual firm's corporate income tax; al_{it} is the individual firm's assessed loss carried forward; $etr1_{it}$ is the effective tax rate; U_i is the individual firm specific effect; V_{it} is the orthogonal error term; it are the double subscripts were represents firms that benefited from tax incentives and t denotes the timeframe; $\beta1, \beta2,... \beta5$ are parameters to be estimated.

4.2 Data Collection

The study used firm level data that was extracted from the actual company returns. The data covered a period of three years from 2009 to 2011. A sample of thirty-seven companies in the mining sector was used and these companies belonged to the Large Clients Office (LCO). The company returns were submitted either manually or electronically but captured in SAP by ZIMRA data capturers. The SAP system was the one

that is used to capture, store and analyse domestic taxes data by the Zimbabwe Revenue Authority. This study had to use both the manual returns that were not yet in SAP and the information already captured in SAP to build an adequate data set pertaining to corporate income tax incentives and related statistics. The SAP system provided statistics on corporate income tax, gross profit, capital redemption allowances, turnover, investment in fixed assets and capital employed.

Some of the data for mining companies were sourced from the Ministry of Mines and Mining Development, Chamber of Mines of Zimbabwe and Minerals Marketing Corporation of Zimbabwe. Some of the data were obtained from the Zimbabwe National Statistics Agency (ZIMSTAT), the Internet, and the ZIMRA website.

4.3 Construction of Panel Data

The data obtained from the various sources cited above were used to construct a panel data set due to the fewer number of years (three) against the number of firms (thirty-seven) used in the data set. The resultant panel data was micro panel data set, which was balanced. A balanced panel data is one where there are the same time periods, (t = 1…T), for each cross section observation.

4.4 Justification for Using Panel Data Methodology

Panel data involves two dimensions, a cross-sectional dimension N, and a time series dimension T. It is normally expected that the computation of panel data estimates would be more complicated than the analysis of cross-sectional alone (where T = 1) or time-series data alone (where N = 1). However, in most cases, the availability of panel data actually simplifies the computation and inference.

Panel data gave the researchers a large number of data points (N*T), increasing the degrees of freedom and reducing the collinearity among explanatory variables. This, consequently, enhanced the efficiency of econometric estimates. It allowed control of heterogeneity of the cross-sectional units. It was to be expected that each cross-sectional unit had some intrinsic and immeasurable characteristics distinguishing it from others. However, panel data had the ability to control for individual fixed effects. Panel data also allowed better analysis of dynamic adjustments and it had increased precision of regression estimates (Wooldridge, 2002; Baum, 2006). Thus, longitudinal data allowed the researchers to analyse a number of important economic questions that could not be addressed using cross-sectional or time-series data.

For the case of the Zimbabwean data, the hyperinflationary environment that existed before 2009 made some of the statistics unsuitable for economic analysis. Zimbabwe adopted the multi-currency regime in 2009, and since then, the United States dollar was the main medium of exchange. The country is no longer using the Zimbabwean dollar which was made defunct in 2009. Thus, statistics as from February 2009 to date are more reliable due to the stability of the United States dollar. However, one cannot make serious econometric analysis using Ordinary Least Squares regression analysis due to the short period involved. The decision to employ panel data analysis in this study was, therefore, founded on the basis of the short time period (three years since 2009 to 2011) against a large sample size (thirty seven-firms).

4.5 Justification for the Choice of Variables

4.5.1 Capital Redemption Allowances (ca)

Capital redemption allowances are allowed in order to improve the capital outlay of mining companies since mining is a capital intensive venture. The period under study (2009-2011) was the time when many firms had just emerged from great financial distress and were characterised by obsolete machinery and hence the need to recapitalize. A positive relationship between capital redemption allowances and investment in fixed assets was therefore expected. This expectation was contrary to previous findings such as Galindo and Melendez (2010) although it was consistent with the findings of Teraoui *et al* (2011).

4.5.2 Gross profit (gp)

A profitable business venture is more likely to continue investing in fixed assets than one that is not profitable. This is because a firm that is making high profits is likely to be more liquid than a loss making firm. *Apriori*, a positive relationship between investments in fixed assets and profitability was expected. The turnover variable was used in prior studies like Teraoui *et al* (2011) and Devereux (1989), in place of the net profit or gross profit variable. Teraoui *et al* (2011) used the variable in place of net profit and argued that a substantial increase in output led to increased investment. On the other hand, Devereux (1989) used the variable to explain the investment behaviour of the United Kingdom firms. In this study, gross profit instead of turnover or other profitability indicators was used due to data availability and the fact that gross profit is also considered a better indicator of profitability when compared to turnover used in previous studies.

4.5.3 Corporate Income Tax (ct)

An increase in corporate income taxation reduces the levels of investment as indicated by Galindo and Melendez (2010). Even foreign firms would not want to locate their investments in jurisdictions which are heavily taxed (Klemm and Van Parys, 2010; Boadway and Shah, 1992). This is the reason why low tax jurisdictions like Mauritius and the Netherlands are regarded as tax havens for many multi-national companies. Taxation reduces the income levels of companies, and hence negatively affects their purchasing power. Income that was supposed to have been invested in fixed assets is forgone through paying corporate income tax. A negative relationship was therefore expected between the corporate income tax variable and the investment variable.

4.5.4 Corporate Income Tax Loss Carried Forward (al)

Tax losses carryforwards reduce the effective tax rate through the possibility of applying these losses carried forward from other financial periods (Sabaini and Velasco, 2010) and Orihara (2015). According to the study, assessed loss carryforwards also stimulate projects that mature slowly, in which a preliminary period of losses is anticipated before full integration into the market place can happen. Orihara (2015) found out that assessed loss carryforwards had an effect of boosting investment levels. A positive relationship between assessed loss carryforwards and investment in fixed assets was also anticipated in this study, taking a cue from economic theory.

4.5.5 Effective Tax Rates

The ETR variable was also used as a tax incentive variable in this study. Djankov, *et al* (2009) and Boadway and Shah (1992) used the effective tax rate variable to analyse investment behaviour. However, they did not find any effect of this variable. On the contrary, there are some studies that used the variable and found its coefficient statistically significant. These studies include Cummings and Hubbard (1995) cited in Devereux (2006) and Shah and Slemrod (1991).

5. MODEL ESTIMATION AND DISCUSSION OF RESULTS

5.1 Model Estimation

The results of the panel data econometrics regression analysis are presented in Table 1. The model was estimated in levels. In the first place, effective tax rates were included in the model, but when it was realized that they had no effect, the variable was dropped. The results of the estimation, including effective tax rates are presented in the first column, while the results of the estimation excluding effective tax rates are presented in the third column.

Table 1: Random Effects Model (REM) results with Dependent Variable Investments in Fixed Assets

Variables	Random Effects (Variables include ETR)	Random Effects (Variables exclude ETR) ia_{it}
Capital Redemption Allowances	9.2618 ***	9.5952 ***
	(1.1877)	(1.1567)
Gross Profit	1.1361***	1.3197***
	(0 .4732)	(0 .4481)
Corporate Income Tax	-13.1905***	-14.0585***
	(3.2704)	(3.1951)
Assessed Loss Carried Forward	6.2010***	6.4206***
	(0.8897)	(0.4481)
Effective Tax Rate	0.0041	
	(0.0034)	
R-squared	0.83	0.83
F-Statistic		
Wild Chi 2	377.38***	374.06***
No. of Obs	82	82

*Key: *** significant at 1%, ** significant at 5%, standard errors in parentheses*

5.2 Discussion of Results

All the explanatory variables in the estimation with ETR depicted statistical significance using the adopted random effects models, except the ETR variable. On the other hand, when ETR variable was dropped all explanatory variables' coefficients remained statistically significant using the adopted REM. The R-squared of the adopted REM was reasonably high in both cases at 0.83. This meant that about 83 percent of the variation in the dependent variables was explained by the variations in the explanatory variables.

5.2.1 Capital Redemption Allowances (ca)

This tax incentive variable was positively related to investment in fixed assets with a statistically significant coefficient at the 0.01 level for the chosen REM. Since the regression was run in levels, the interpretation is that a US$1 increase in capital redemption allowances results in a US$9.59 increase in the investment variable when ETR was dropped, and holding the other variables constant. This outcome is consistent with the results in Galindo and Melendez (2010)'s study. Their study also used firm level data to assess the impact of tax incentives for firms that invested in fixed assets in Columbia.

5.2.2 Gross Profit (gp)

This variable had a statistically significant coefficient at the 0.01 level and positively related to the investment variable. This finding is consistent with economic theory that a firm which is more profitable is likely to invest more in fixed assets. A profitable business venture is more liquid and hence can finance recapitalization from its own coffers. Even Teraoui, *et al* (2011) who used turnover in place of gross or net profit argued that a substantial increase in output led to increased investment. In this study, gross profit was preferred to turnover because data on gross profit was readily available. However, whether turnover or gross profit was used, the results were almost the same. The REM results indicate that a US$1 increase in gross profit increased investment in fixed assets by US$1.32, holding the other variables constant.

5.2.3 Corporate Income Tax (ct)

High corporate income tax is an indication of high firm profitability. This is usually the case where firms do not enjoy a number of tax privileges or deductions. Tax incentives result in a reduction in corporate income

taxation and consequently an increase in investment in fixed assets. The coefficient of this variable was statistically significant at the 0.01 level, and it was negatively related to the dependent variable. The result means that a US$1 increase in corporate income tax reduces investment in fixed assets by US$14.06, holding the other variables constant. This result is consistent with economic theory. Shah and Slemrod (1991) also found a negative correlation between corporate income taxation and inward foreign direct investment.

5.2.4 Corporate Income Tax Loss Carried Forward (al)

The coefficient of this variable was statistically significant at the 0.01 level, indicating that the policy of allowing loss making firms to carry forward their assessed losses positively impacted on investment in fixed assets. This finding is consistent with the findings of Sabaini and Velasco (2010) and Orihara (2015). The two studies found that tax losses carried forward increased investments when the effective tax rates were considerably affected by these tax losses carried forward. In our study, the empirical investigation indicated that a US$1 increase in the assessed loss carryforwards, increased investment in fixed assets by US$6.42, holding the other variables constant.

5.2.5 Effective Tax Rate (etr)

A higher effective tax rate is an indication of higher corporate income tax to gross profit ratio. This is usually the case where firms do not enjoy a number of tax privileges or deductions. Tax incentives result in a reduction in taxation and consequently an increase in investment in fixed assets. The coefficient of this variable was not statistically significant, and it was negatively related to the dependent variable. This finding is consistent with economic theory. Shah and Slemrod (1991) also found negative correlation between effective tax rates and inward foreign direct investment. However, Fieldstein, cited in Boadway and Shah (1992) posited that net investment is dependent on the net-of-tax real return to capital, which also depends on the effective tax rate

6. FINDINGS, POLICY RECOMMENDATIONS AND CONCLUSION
6.1 Discussion of Findings and Recommendations

The results from panel data econometrics methodology showed that corporate income taxes had negative effects in boosting a firm's investment levels. In line with the recommendations from Boadway and Shah (1992), it is proposed that for the case of Zimbabwe, a further reduction in the rate of corporate income tax is necessary. In view of the principles of neutrality and equity, it is recommended that there be a gradual reduction of the general statutory rate of corporate income tax from the current 25 percent. This should be applied across all sectors of the economy, unlike the current policy which favours firms in a special mining lease agreement with government. This move is likely to encourage firms to comply, at the same time increasing their investments in fixed assets.

Capital redemption allowances were positively related to firms' investment in fixed assets. It is therefore recommended that this tax incentive remains in place. However, in order to compensate for sudden loss of corporate tax revenues, these capital redemption allowances for the mining businesses may not be wholly allowed within the same year. There is no credible justification to warrant capital allowances in full within the same year of capital expenditure. The principle of equity in taxation requires that tax policies be fair and equitable across sectors. It is, therefore, recommended that the same treatment of capital allowances in other sectors of the economy be applied to the mining sector.

Similar to Orihara (2015)'s finding, it was found out that an increase in loss carried forward, resulted in an increase in a firm's investment. As Boadway and Shah (1992) alluded, young firms are expected to face a period of negative taxable income while they are still establishing themselves in the market. During that time, they require such an incentive so that they do not die whilst in their infancy stages. However, there is no justification for continued granting of this incentive for unlimited time periods. It is therefore recommended that the incentive be granted with a time cap in the mining sector, like what is happening in

all other sectors. Currently, in other sectors of the economy tax losses are carried forward for a period of up to six years. This may be varied for the mining sector to say ten years as is happening in other jurisdictions like Zambia (Zambia Revenue Authority, 2016). This is due to the fact that mining is a capital intensive venture, which requires huge capital investments before realizing the benefits.

The current mining and taxation legislation are outdated, hence the need to amend them in line with current global trends. For instance, the current Income Tax Act Chapter 23:06 came into effect in 1967 and some of its legal provisions are now archaic in the modern economy. It is therefore recommended that mining and taxation legislation be updated in line with current global economic trends and international best practise.

6.2 Conclusion

Out of five explanatory variables analysed in this study, only one did not confirm a relationship between tax incentives and investment in fixed assets. The study concludes that in Zimbabwe's mining sector, tax incentives had an effect of boosting firms' investments in fixed assets. However, the study recommends that in granting tax incentives, policy makers should include sunset clauses unlike the current scenario where they are offered in perpetuity.

7. REFERENCES

Alm, J. & Khan, M., 2008. Assessing enterprise taxation and investment climate in Pakistan. *Andrew Young School of Policy Studies*, December.Issue Working Paper No.8.

Baum, C. F., 2006. *An introduction to modern econometrics using Stata.* s.l.:College Station, Texas.

Barro, R. 1991. Economic Growth in a Cross-Section of Countries. *Quarterly Journal of Economics* 106(2), pp.407-443.

Boadway, R. & Shah, A., 1992. How tax incentives affect decisions to invest in developing countries. *The World Bank Policy Research Working Paper Series,* Issue WPS1011.

Bohmer, A., Clark, S. & Cebreiro, A., 2007. *Tax incentives - a global perspective: experiences in MENA and non-MENA countries.* [Online] Available at: http://www.oecd.org/mena/investment [Accessed 26 March 2014].

Bolnick, B., 2004. *Effectiveness and economic impact of tax incentives in the SADC region,* Arlington Virginia, U.S.A: Nathan Associates Inc.

Bondonio, D., 2003. Do tax incentives affect local government economic growth? what mean impacts miss in the analysis of enterprise zone policies?. *Centre for Economic Studies.*

Calitz, E., Wallace, S. & Burrows, L., 2013. The impact of tax incentives to stimulate investment in South Africa. *International Centre for Public Policy,* 13(6).

Chamber of Mines of Zimbabwe, 2013. *Chamber of Mines of Zimbabwe.* [Online] Available at: http://www.chamberofminesofzimbabwe.com [Accessed March 28, 2013].

Devereaux, M. & Maffini, G., 2006. *The impact of taxation on the location of capital, firms and profits: a survey of emprical evidence.* s.l., s.n.

Devereux. M. (1989). A Positive Theory of Inflation and Inflation Variance. [Online] Available: http://ideas.repec.org/s/oup/ecinqu.htm l (August 22, 2010).

Engen, E. & Skinner, J., 1996. Taxation and economic growth. *National Tax Journal,* 49(4), pp. 617-642.

Federici, D. & Parisi, V., 2012. *Corporate taxation and exports.* [Online] Available at: http://mpra.ub.uni.muenchen.de/41012/ [Accessed 16 July 2014].

Friedman, J., Gerlowski, D. & Silberman, J., 1992. What attracts foreign multinational corporations? Evidence from branch plant location in the United States. *Journal of Regional Science,* 32(4), pp. 403-418.

Galindo, A. & Melendez, M., 2010. Corporate tax stimulus and investment in Columbia. *Inter American Development Bank,* April.Issue WP No. IDB-WP-173.

BIBLIOGRAPHY Government Printers, n.d. *Income Tax Act CAP 23:06.* [Online] Available at: http:www.zimra.co.zw [Accessed 2014].

Harju, J. & Kosonen, T., 2012. The impact of tax incentives on the economic activity of entrepreneurs. *Government Institute of Research,* Issue WP No. 42/2012.

Hubbert, F. & Pain, N., 2002. Fiscal incentives, European integration and the location of foreign direct investment. *The Manchester School,* June.Volume 3.

Klemm, A. & Van Parys, S., 2010. Emprical evidence on the effects of tax incentives. *IMF Working Papers*, Issue WP /09/136.

Klemm, A., 2009. Causes, benefits and risks of business tax incentives. *International Monetary Fund, Fiscal Affairs Department*, 9(21).

Ministry of Finance and Economic Development, 2012. *Budget Statement, 2013*. [Online] Available at: http://www.zimtreasury.gov.zw/budget-policy.statement> [Accessed 1 January 2014].

Ministry of Finance and Economic Development, 2011. *Budget Statement, 2012*. [Online] Available at: http://www.zimtreasury.gov.zw/budget-policy.statement> [Accessed 31 December 2014].

Ministry of Finance and Economic Development, 2010. *Budget Statetement, 2011*. [Online] Available at: http://www.zimtreasury.gov.zw/budget-policy.statement> [Accessed 5 January 2014].

Ministry of Finance and Economic Development, 2009. *Budget Statement, 2010*. [Online] Available at: http:www.zimtreasury.gov.zw/budget-policy.statement [Accessed 11 January 2014].

Ministry of Mines and Mining Development, n.d. *Ministry of Mines and Mining Development.* [Online] Available at: http://www.mines.gov.zw

Orihara, M., 2015. Tax loss carryforwards and corporate behaviour. *Policy Research Institute Discussion Paper*, Issue 15A-6.

Sabaini, G. J. & Velasco, P., 2010. Tax expenditures for promoting investment applied to corporate income tax. *Inter- American Development Bank*, October.Issue Technical Notes No. I.D.B-137.

Shah, A., 1995. *Fiscal Incentives for investment and innovation.* s.l.:Oxford.

Shah, A. and Slemrod, J. (1991), "Taxationa and Foreign Direct Investment," in Khalilzadeh-Shirazi J., and Shah, A., (eds.), *Tax Policy in Developing Countries* (Washington: The World Bank).

Teraoui, H., Ben Rejeb, J., Chichti, J. & Kaddour, 2011. Impact of tax incentives on corporate financial performance: the case of the mechanical and electrical industry sector in Tunisia. *International Journal of Economics and Finance,* November.3(6).

Wooldridge, J., 2002. *Econometric analysis of cross-section and panel data.* Cambridge: MIT Press.

Zimbabwe Revenue Authority, n.d. *Zimbabwe Revenue Authority.* [Online] Available at: http://www.zimra.co.zw