

Fiscal Policy Reforms and Their Effects on the Economic Viability of Mineral Projects in Ghana

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Abstract

Mineral sector regulatory and fiscal policies in Ghana have undergone a lot of reforms over the past three decades in an effort to attract the much-needed Foreign Direct Investment (FDI) into the mineral sector and also to maximise the returns from the exploitation of mineral asset to the country. This paper puts in perspective the effect of changes in fiscal policies on the viability of mineral projects and assesses the general risk associated with investing in the mineral industry of Ghana, using the Sikaman Gold Mining (SGM) Project as a test case. Cash flow, sensitivity and risk analyses of the SGM Project under three fiscal regimes namely: PNDCL 153, Act 703, and amendments to Act 703, indicated the second regime as the most economically favourable as it gave the highest NPV and lowest risk. It is recommended that the government should involve the mineral industry players during such reviews to show all-inclusiveness. Furthermore, mineral investors are advised to explore stability and development agreements to protect their investments in the wake of changes in fiscal policies in the mineral industry of Ghana. Future research could consider comparing the current fiscal regime of Ghana with those of the competing countries within the Sub-Saharan African region to assess whether Ghana could continue to pride itself as a preferred investment destination within the sub-region.

Keywords: fiscal policies, corporate tax, royalty, capital allowance, loss carry forward, economic evaluation

1. Introduction

Ghana, formerly known as the Gold Coast, currently ranks second after South Africa as the largest gold producer in Africa (Focus Economics, 2018). Mineral sector regulatory and fiscal policies in the country have undergone a lot of reforms over the years. For the past three decades, Ghana has either replaced its mining laws or made several major amendments, all in an effort to attract the much-needed foreign direct investment into the mineral sector and also to have its quota from the exploitation of its mineral asset for the development of the country.

However, critics including policymakers, non-governmental agencies, trade unions and the general public have argued that the nation is not getting enough from its mineral resources in the area of government revenue (Agbesi, 2007; Amponsah-Tawiah & Dartey-Baah, 2011; Antwi-Boasiako, 2003; Appiah & Buaben, 2012; Awudi, 2002; Liu, 2012). On the contrary, industry players spearheaded by the Ghana Chamber of Mines have also put forth the argument that the increment in taxes discourage investment and the expansion of ongoing projects and thus some authors have advocated for other strategies to harness benefits from the mineral industry apart from taxes (Andrews-Speed & Rogers, 1999; Aryee, 2001; 2012; Smith, 2015; Songhai Advisory, 2011; Yirenkyi, 2008). This presents a dichotomous situation and can increase the risk of investing in the mineral sector of the country if not well handled. The import of this paper, therefore, is to give an academic insight on the effect of the changes in the fiscal policies of the country on mineral investments as a contribution to the discussion.

The paper is set out to study the fiscal policies governing the mineral investment climate of Ghana under three distinct policy regimes that reflect the three political dispensations for the past three decades: Minerals and Mining Law, 1986 (PNDC Law 153); Minerals and Mining Act 2006 (Act 703); and the revisions made to the Minerals and Mining Act 2006.

The paper utilises the various fiscal policies governing mining royalties, taxes and allowances within the three regimes to prepare cash flows and conduct sensitivity and risk analyses to assess the viability and risk associated

with the Sikaman Gold Mining (SGM) Project as a case study. Through this approach, the impact of changes in fiscal mineral policies on the viability of mineral projects in Ghana and generally the risk associated with investing in the mineral industry of Ghana could be pragmatically assessed.

1.1 Mineral Policy Reforms in Ghana in the Past Three Decades

The three distinct mineral policy reforms in Ghana for the past three decades reflect the three political dispensations in the country. After independence in 1957, foreign control of the mineral sector was tampered with by increased government involvement (Akabzaa & Darimani, 2001; Clark, 1994; Gbireh, Cobblah, & Suglo, 2007; Tsikata, 1997). Gold production began to decline in the late 1960s into the 1970s and early 1980s amid military takeovers of governance (see Figure 1). During the period, many mines began to hit poorer gold reefs, few investors were willing to invest due to investor uncertainty about the safety of their investment, and the government failed to provide the capital necessary to expand production as a result of general decline in the economy (Clark, 1994). The mining industry got rejuvenated after the adoption of reforms that enhanced the sector's appeal to investors from 1986 after the enactment of the Minerals and Mining Law, 1986, PNDCL 153 under the Provisional National Defence Council (PNCL) government led by His Excellency Flight Lieutenant Jerry John Rawlings.

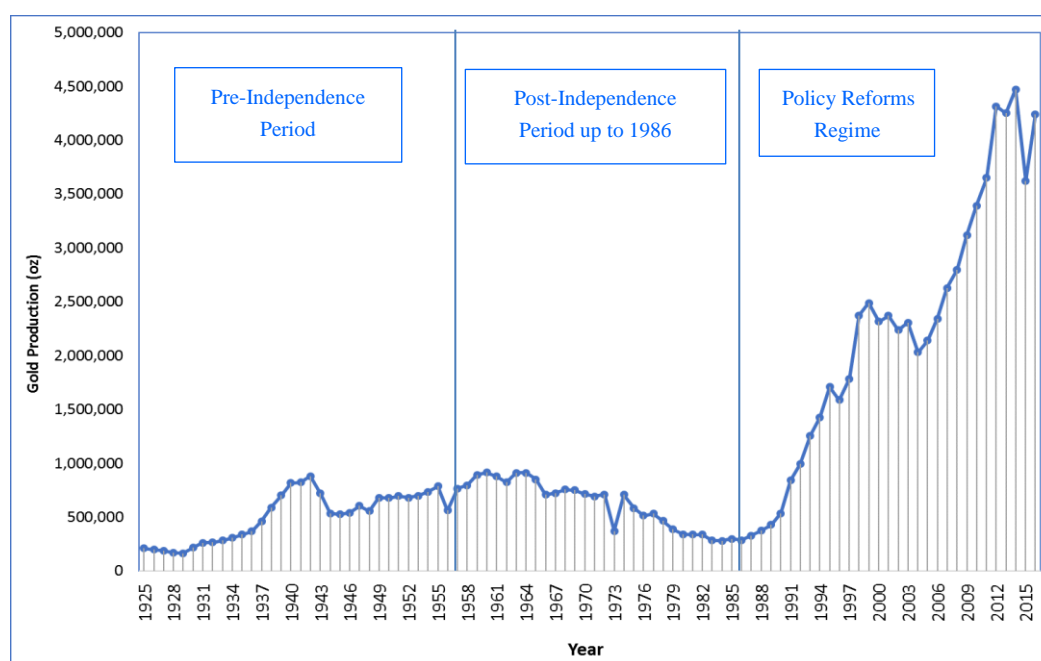


Figure 1. Gold production trend in Ghana

Note. Modified after: Kesse, 1985; Minerals Commission of Ghana.

The significance of the liberalisation in the Minerals and Mining Law, 1986, PNDCL 153 were the scaling down of corporate income tax liability and provision of more specific fiscal allowances with the aim to reduce the general tax liability of mineral investors. Corporate income tax was reduced from 50-55% in 1975, to 45% in 1986 and further scaled down to 35% in 1994. Initial capital allowance which enabled mineral investors to recoup their capital expenditure was increased from 20% in the first year of production and 15% for subsequent annual allowances in 1975 to 75% in first year of operation and 50% for subsequent annual allowances in 1986. Furthermore, financial losses less than capital allowance (depreciation) for the year were to be carried forward. The royalty rate of 6% of the total value of minerals won in 1975, was reduced to a lower bound of 3% in 1987 (Songsore, Yankson, & Tsikata, 1994).

Other duties such as mineral duty (5%), import duty (5 – 35%) and foreign exchange tax (33 – 75%) that prevailed and contributed significantly to government revenue from the sector until the reforms were all scrapped (Akabzaa & Darimani, 2001). In addition to these, mining companies were exempted from payment of customs import duties on plant, machinery equipment and accessories imported for use in mining. Their staff were also exempted from payment of income tax related to furnished accommodation at the mine site. Personal remittance quota for

expatriate personnel was freed from any tax imposed for the transfer of external currency out of the country. Apart from these, a holder of a mining lease was permitted by the Bank of Ghana to retain a minimum of 25% of the operators' foreign exchange earnings in an external account for the purpose of acquiring equipment, spare parts, raw materials and for dividend payment and remittance in respect of goods for expatriate personnel, among others (Awudi, 2002). The enactment of the Minerals and Mining Law, 1986, PNDCL 153 was regarded as a trailblazer in terms of mining legislation in sub-Saharan Africa (Hinde, 2010) and Ghana could pride itself as preferred destination for mineral investment.

Figure 2 shows that the revitalisation of the mineral industry through the reforms yielded a positive average growth rate of 18.9% in gold production from 1986 to 1999 although average growth of gold price was negative 1.6% within the period. But, between 2000 and 2005 there was negative average growth in gold production of 2.3% although there was positive average growth in gold price of 10.5% within the same period. The New Patriotic Party (NPP) government at the helms of leadership of the country (2001-2008) responded to the decline in gold production in the wake of increasing gold price by further making the fiscal policies more favourable to mineral investors.

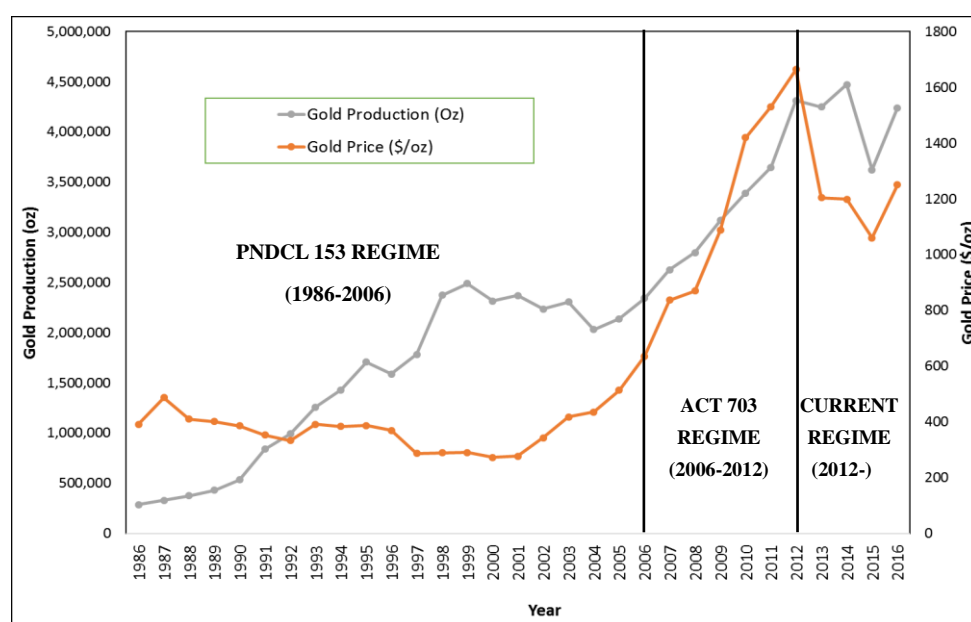


Figure 2. Gold production and price trend through different mineral policy regimes

Note. Modified after: Minerals Commission of Ghana; World Gold Council, 2017.

Thus, on December 15, 2005, the Ghanaian Parliament passed into law a new minerals and mining bill. The Minerals and Mining Act 2006 (Act 703) was enacted to further liberalise the fiscal regime by reducing the corporate income tax from 35% to 25%, royalty rate from 3 - 12% (depending on the operating ratio i.e. (revenue - operating cost)/revenue)) to 3 - 6%, and scrapped the additional profit tax, all in an effort to attract investment into the sector. From Figure 2, the institution of the Minerals and Mining Act 2006, Act 703 resulted in an increased average growth in gold production by 11% in the face of increased average growth in gold price by 18% from 2006 to 2012. The New Democratic Congress (NDC) government in power (2009-2016) then led by the late President Evans Fifi Atta-Mills responded to the positive wave of increased gold price and increased production by adjusting the fiscal mineral policies upward for the nation to benefit from the mineral industry.

The amendment of the royalty rate in 2010 to a standard 5% of the gross revenue, the 2012 increment in the corporate tax from 25% to 35%, and the re-introduction of windfall tax of 10% received mixed reactions from civil societies and industry players. The then Chief Executive Officer of the Chamber of Mines, Dr Anthony Aubynn, on the one hand was quoted by Reuters warning that *"this stance will likely discourage investment and the expansion of current projects"* (Songhai Advisory, 2011). The Executive Secretary of the Ghana Mine Workers Union on the other hand reiterated that *"the government should be bold to put its feet on the ground to maximise returns from the mineral industry"* (Liu, 2012). This presented a dichotomous situation, which prompted this paper to put in perspective the changes in the fiscal policies on the viability of mineral projects in the country. This paper

is therefore a neutral academic work to give an opinion on the dissenting views the public hold on the latest changes made to the mineral fiscal policies of the country.

The paper considers three fiscal policy regimes for the past three decades: PNDCL 153 of 1986; Act 703 of 2006; and the current amendments to Act 703. The salient fiscal policies within the three regimes that are pertinent to the economic evaluation of mineral projects in Ghana are tabulated in Table 1. It includes the fiscal policies before the enactment of PNDCL 153 to show the significance of the liberalisation in 1986. It should be noted that the windfall tax of 10% proposed under the current regime has still not been enforced by Parliament.

Table 1. Fiscal parameters pertinent to the economic evaluation of mineral projects

	SMCD 5 1975	DCL 153 Regime	Act 703 Regime	Current Regime
Corporate Income Tax	50-55%	35%	25%	35%
Royalty	6%	3 - 12%	3 - 6%	5%
Investment Allowance	5%	5%	5%	N/A
Capital Allowance	20% initial; 15% subsequent yrs	75% initial; 50% subsequent yrs	75% initial; 50% subsequent yrs	20% for 5 yrs
Additional Profit Tax/Windfall Tax	N/A	25%	N/A	10% (N/A)

Note. Modified after: Akabzaa and Darimani, 2001.

1.2 Cushioning against Fiscal Policy Changes Using Stability and Development Agreements

Mineral investors are able to protect their investment from changes in the fiscal policies through stability and development agreements as enshrined in Sections 48 and 49 of the Minerals and Mining Act 2006 (Act 703).

A stability agreement requires that existing laws and fiscal imposts (taxes) applicable to a mining project may be stabilised or frozen for up to fifteen years to protect a mining lease holder from adverse effects of new laws or imposts.

A development agreement is an opportunity for a mining lease holder to negotiate stability and other terms in exchange for a significant level of investment: i.e. investments exceeding US\$500 million. Typically, more favourable fiscal terms are granted under a development agreement, which are stabilised for the duration of the mining lease. Thus, while any mining lease holder may be granted a stability agreement, only holders who propose and show evidence of capacity to invest over US\$500 million are considered for a development agreement.

2. Materials and Methods

Data was obtained from the feasibility report of Sikaman Gold Mining Project (name modified for confidentiality) and MS Excel software was used in the data analysis. Detailed method of estimation was employed in the capital cost, operating cost and revenue estimation. Discounted cash flow analysis was used to evaluate the economic viability of the project under the three fiscal policy regimes in Ghana. Additionally, sensitivity analysis was conducted to assess the level of independent changes in the economic parameters that the project could absorb and still be economically viable. Finally, risk analysis using Monte Carlo simulation was conducted to investigate the effect of simultaneous changes in the economic parameters on the viability of the project for the three fiscal policy regimes. The discounted cash flow method is used to evaluate the economic viability of mineral projects in Ghana because of its simplicity and wider acceptability (Ampofo, 2017; Banson & Eshun, 2010; Bhappu & Guzman, 1995; Cobblah, 2005; Eshun & Mireku-Gyimah, 2004; Mirakovski, Krstev, Krstev, & Petrovski, 2009; Mireku-Gyimah & Darko, 1996; Mireku-Gyimah & Owusu-Ansah, 2017). The fiscal parameters pertinent to the economic evaluation of mineral projects presented in Table 1 were employed in the analyses.

2.1 Economic Parameters for Evaluating the Viability of the SGM Project

Detailed cost estimation methods were employed in the capital and operating cost estimates and the summary results are presented in Tables 2 and 3 respectively. The following estimates and basic assumptions were employed in the economic evaluation of the Sikaman Gold Mining Project:

Table 2. Summary of capital cost estimates

Cost Centre	Amount (US\$ x 10 ³)
Pre-production Costs	
Acquisition, Exploration and Consultancy	3 000
Subtotal	3 000
Direct Capital Costs	
Mining	9 375
Processing Plant	28 470
Plant Treatment Services	2 045
Infrastructure & Site Works	1 310
Subtotal	41 200
Indirect Costs	
Commissioning	30
Compensations	350
Resettlement	4 500
Environmental Protection	350
Subtotal	5 230
Allowances	
Contingency (12%)	5 932
Subtotal	5 932
Total Capital Cost	55 362

Table 3. Summary of operating cost estimates

Costs Centre	Cost/t of Ore (US\$)	Annual Cost (US\$ x 10 ³)
Mining		
Equipment	5.260	5 681
Grade Control	1.400	1 512
Supervision and Labour	1.221	1 319
Motor Vehicles	0.083	90
Subtotal	7.964	8 602
Treatment		
Reagents and Consumable	3.730	4 028
Power	0.411	444
Labour and Supervision	0.572	618
Maintenance, Assaying and Vehicles	1.409	1 522
Subtotal	6.122	6 612
Overheads		
Supervision	1.365	1 474
Vehicles	0.106	115
Mine Office	0.111	120
Miscellaneous	0.093	100
Subtotal	1.675	1 809
Contingency (12%)	1.892	2 043
Total Operating Cost	13.253	19 066

- (i) Total capital investment = \$ 55 362 000
- (ii) Annual operating cost = \$19 066 000/yr
- (iii) Annual production = 1 080 000 t/yr
- (iv) Gold price = \$32.15/g (\$1000/oz)
- (v) Mill head grade = 2.4 g/t
- (vi) Recovery = 80%
- (vii) Ore dilution = 10%
- (viii) Ore loss = 10%

Less:										
Royalty (3-12%, 30%>Or>70%)	0.00	8,000.26	8,000.26	8,000.26	8,000.26	8,000.26	8,000.26	8,000.26	8,000.26	8,000.26
Annual Operating Cost (per yr)	0.00	19,066.00	19,066.00	19,066.00	19,066.00	19,066.00	19,066.00	19,066.00	19,066.00	19,066.00
<i>Net Revenue (Rn)</i>	0.00	39,602.55	39,602.55	39,602.55	39,602.55	39,602.55	39,602.55	39,602.55	39,602.55	39,602.55
Less:										
Inv Allowance (5% 1st yr only)	0.00	2,768.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cap Allowance (75%; then 50%)	0.00	41,521.50	5,536.20	2,768.10	1,384.05	692.02	346.01	173.01	86.50	43.25
Interest	0.00	2,657.38	2,362.11	2,066.85	1,771.58	1,476.32	1,181.06	885.79	590.53	295.26
Loss Carry Forward	0.00	0.00	7,344.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Taxable Income (Ti)</i>	0.00	-7,344.42	24,359.82	34,767.60	36,446.92	37,434.21	38,075.48	38,543.75	38,925.52	39,264.04
Less:										
Tax, T = (35% of Ti)	0.00	0.00	8,525.94	12,168.66	12,756.42	13,101.97	13,326.42	13,490.31	13,623.93	13,742.41
<i>Net Income</i>	0.00	-7,344.42	15,833.88	22,598.94	23,690.50	24,332.24	24,749.06	25,053.44	25,301.59	25,521.62
Add:										
Inv Allowance (5% 1st yr only)	0.00	2,768.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cap Allowance (75%; then 50%)	0.00	41,521.50	5,536.20	2,768.10	1,384.05	692.02	346.01	173.01	86.50	43.25
Loss Carry Forward	0.00	0.00	7,344.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Working Capital (Last yr only)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3,813.20
Less:										
Loan Principal Repayment	0.00	2,460.53	2,460.53	2,460.53	2,460.53	2,460.53	2,460.53	2,460.53	2,460.53	2,460.53
Equity Capital	33,217.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Working Capital (first yr only)	0.00	3,813.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Additional Profit Tax (25%)	0.00	0.00	7,154.02	6,243.34	6,096.40	6,010.01	5,953.90	5,912.93	5,879.52	5,849.90
CASH FLOW (CF)	-33,217.20	30,671.44	19,099.95	16,663.17	16,517.61	16,553.72	16,680.64	16,852.99	17,048.04	21,067.64
NPV @ 20% = \$48,205.02										
IRR = 68.71%										

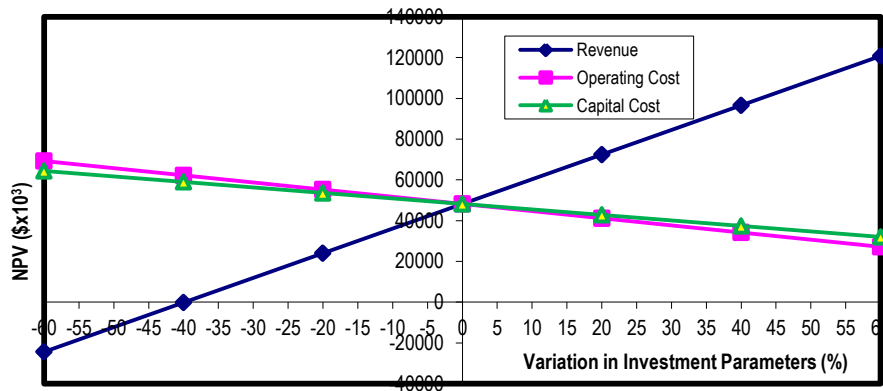


Figure 3. NPV vrs variation in investment parameters of the SGM project under PNDCL 153

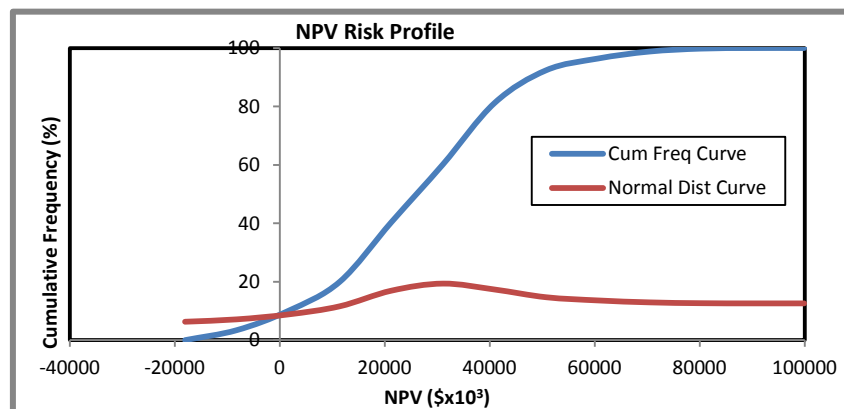


Figure 4. Risk profiles of NPV for SGM project under PNDC law 153

Table 5. Results of cash flow analysis of the SGM project under Act 703

Equity Capital =60%	= US\$ 33,217.20	Annual Production (T)	=1,080,000 t	Project Life = 9 yrs
Loan Capital =40%	= US\$ 22,144.80	Grade (G)	= 2.40 g/t	Interest Rate = 12%
Gold Price (P)	= US\$ 32.15/g	Recovery (R)	= 80%	Discount Rate = 20%
Total Capital Inv.	= US\$ 55,362.00	Dilution (D)	= 10%	
Working Capital	= US\$ 3,813.20	Ore Loss (L)	= 10%	
Operating Cost (per yr)	= US\$ 19,066.00	Percentage Loan	= 40%	(Cash Flow computed in \$'000)
Operating Ratio (Or = Gr-Oc)/Gr)	0.71	0.71	0.71	0.71
	0	1	2	3
	4	5	6	7
	8	9		
Gross Rev ($Gr=T(1-L+D)*G*R*P$)	0.00	66,668.81	66,668.81	66,668.81
	66,668.81	66,668.81	66,668.81	66,668.81
	66,668.81	66,668.81	66,668.81	66,668.81
Less:				
Royalty (3-6%, 30%>Or>70%)	0.00	4,000.13	4,000.13	4,000.13
	4,000.13	4,000.13	4,000.13	4,000.13
Operating Cost (per yr)	0.00	19,066.00	19,066.00	19,066.00
	19,066.00	19,066.00	19,066.00	19,066.00
Net Revenue (Rn)	0.00	43,602.68	43,602.68	43,602.68
	43,602.68	43,602.68	43,602.68	43,602.68
Less:				
Inv Allow. (5% 1st yr only)	0.00	2,768.10	0.00	0.00
	2,768.10	0.00	0.00	0.00
Cap Allow. (75%; then 50%)	0.00	41,521.50	5,536.20	2,768.10
	41,521.50	5,536.20	2,768.10	1,384.05
Interest	0.00	2,657.38	2,362.11	2,066.85
	2,657.38	2,362.11	2,066.85	1,771.58
Loss Carry Forward	0.00	0.00	3,344.29	0.00
	0.00	0.00	0.00	0.00
Taxable Income (Ti)	0.00	-3,344.29	32,360.07	38,767.73
	-3,344.29	32,360.07	38,767.73	40,447.05
Less:				
Tax, T = (35% of Ti)	0.00	0.00	8,090.02	9,691.93
	0.00	8,090.02	9,691.93	10,111.76
Net Income	0.00	-3,344.29	24,270.06	29,075.80
	-3,344.29	24,270.06	29,075.80	30,335.29
Add:				
Inv Allow. (5% 1st yr only)	0.00	2,768.10	0.00	0.00
	2,768.10	0.00	0.00	0.00
Cap Allow.e (75%; then 50%)	0.00	41,521.50	5,536.20	2,768.10
	41,521.50	5,536.20	2,768.10	1,384.05
Loss Carry Forward	0.00	0.00	3,344.29	0.00
	0.00	0.00	0.00	0.00
Working Capital (Last yr only)	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00
Less:				
Loan Principal Repayment	0.00	2,460.53	2,460.53	2,460.53
	2,460.53	2,460.53	2,460.53	2,460.53
Equity Capital	33,217.20	0.00	0.00	0.00
	0.00	0.00	0.00	0.00
Working Capital (first yr only)	0.00	3,813.20	0.00	0.00
	3,813.20	0.00	0.00	0.00
Additional Profit Tax (25%)	0.00			
CASH FLOW (CF)	-33,217.20	34,671.57	30,690.02	29,383.37
	34,671.57	30,690.02	29,383.37	29,258.80
	30,690.02	29,383.37	29,258.80	29,307.24
	29,307.24	29,442.19	29,620.39	29,820.21
	29,442.19	29,820.21	33,844.04	
NPV @ 20% = 91,501.69				
IRR = 97.10%				

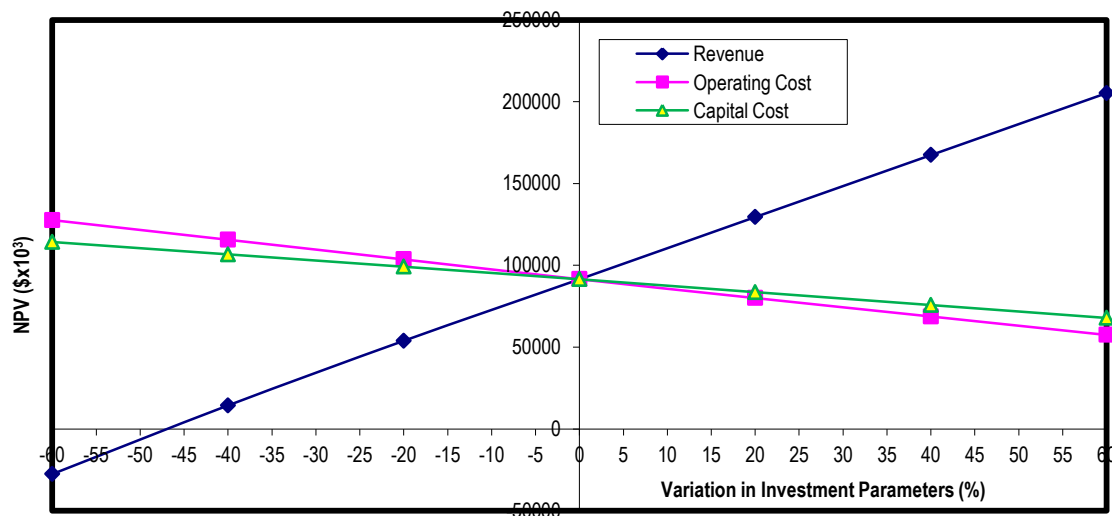


Figure 5. NPV vrs variation in investment parameters of the SGM project under Act 703

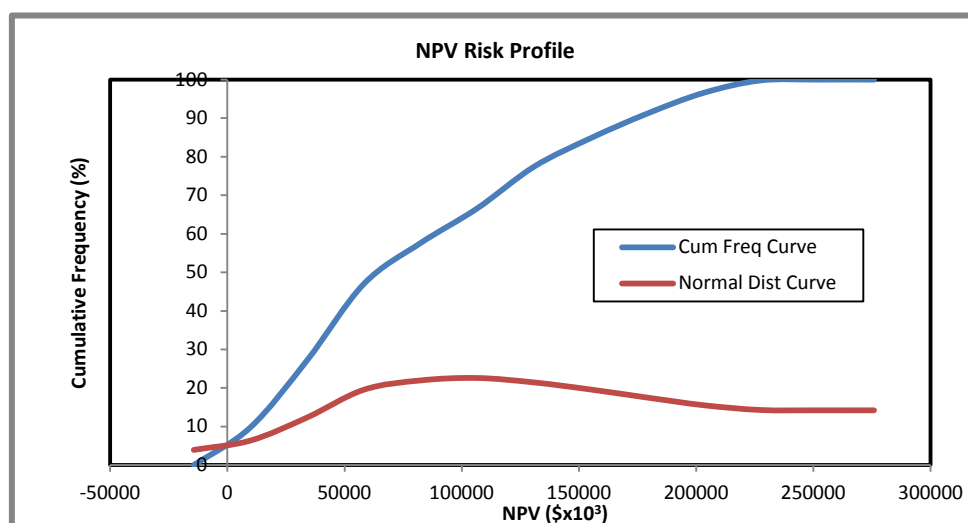


Figure 6. Risk profiles of NPV for SGM project under Act 703

Table 6. Results of cash flow analysis of the SGM project under current regime

Equity Capital =60%	= US\$ 33,217.20	Annual Production (T)	=1,080,000 t	Project Life	= 9 yrs					
Loan Capital =40%	= US\$ 22,144.80	Grade (G)	= 2.40 g/t	Interest Rate	= 12%					
Gold Price (P)	= US\$ 32.15/g	Recovery (R)	= 80%	Discount Rate	= 20%					
Total Capital Inv.	= US\$ 55,362.00	Dilution (D)	= 10%							
Working Capital	= US\$ 3,813.20	Ore Loss (L)	= 10%							
Operating Cost (per yr)	= US\$ 19,066.00	Percentage Loan	= 40%		(Cash Flow computed in \$'000)					
	0	1	2	3	4	5	6	7	8	9
<i>Gross Rev (Gr=T(I-L+D)*G*R*P)</i>	0.00	66,668.81	66,668.81	66,668.81	66,668.81	66,668.81	66,668.81	66,668.81	66,668.81	66,668.81
Less:										
Royalty (5%)	0.00	3,333.44	3,333.44	3,333.44	3,333.44	3,333.44	3,333.44	3,333.44	3,333.44	3,333.44
Operating Cost (per yr)	0.00	19,066.00	19,066.00	19,066.00	19,066.00	19,066.00	19,066.00	19,066.00	19,066.00	19,066.00
<i>Net Revenue (Rn)</i>	0.00	44,269.37	44,269.37	44,269.37	44,269.37	44,269.37	44,269.37	44,269.37	44,269.37	44,269.37
Less:										
Inv Allow. (N/A)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cap Allow. (20% for 5 yrs)	0.00	11,072.40	11,072.40	11,072.40	11,072.40	11,072.40	0.00	0.00	0.00	0.00
Interest	0.00	2,657.38	2,362.11	2,066.85	1,771.58	1,476.32	1,181.06	885.79	590.53	295.26
Loss Carry Forward	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Taxable Income (Ti)</i>	0.00	30,539.59	30,834.86	31,130.12	31,425.39	31,720.65	43,088.31	43,383.58	43,678.84	43,974.11
Less:										
Tax, T = (35% of Ti)	0.00	10,688.86	10,792.20	10,895.54	10,998.88	11,102.23	15,080.91	15,184.25	15,287.59	15,390.94
<i>Net Income</i>	0.00	19,850.74	20,042.66	20,234.58	20,426.50	20,618.42	28,007.40	28,199.33	28,391.25	28,583.17
Add:										
Inv Allow. (5% 1st yr only)	0.00	2,768.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cap Allow. (20% for 5 yrs)	0.00	41,521.50	5,536.20	2,768.10	1,384.05	692.02	346.01	173.01	86.50	43.25
Loss Carry Forward	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Working Capital (Last yr only)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3,813.20
Less:										
Loan Principal Repayment	0.00	2,460.53	2,460.53	2,460.53	2,460.53	2,460.53	2,460.53	2,460.53	2,460.53	2,460.53
Equity Capital	33,217.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Working Capital (1st yr only)	0.00	3,813.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Windfall Tax (10% N/A)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CASH FLOW (CF)	-33,217.20	24,649.40	28,654.52	28,846.45	29,038.37	29,230.29	25,546.87	25,738.79	25,930.71	29,935.84
NPV @ 20% = 77,238.57										
IRR = 80.33%										

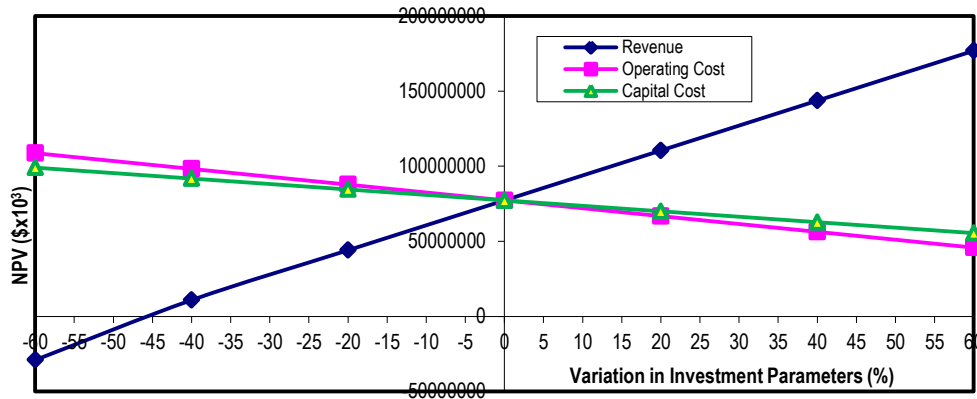


Figure 7. NPV vrs variation in investment parameters of the SGM project under current fiscal regime

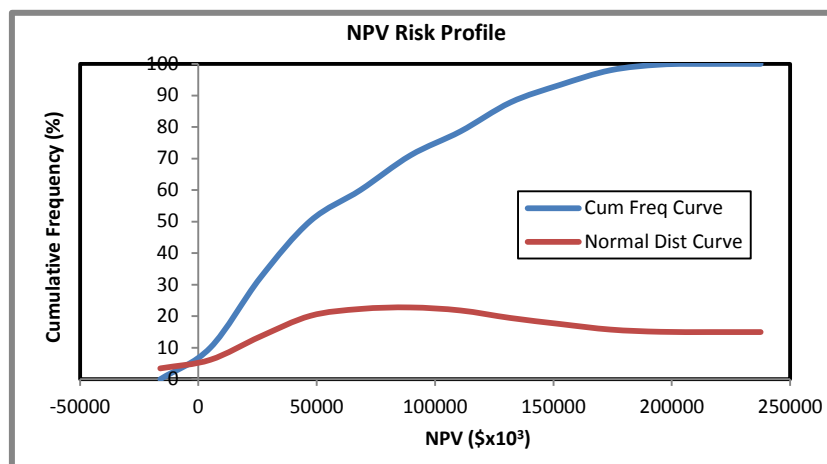


Figure 8. Risk profiles of NPV for SGM project under current fiscal regime

3.4 Comparative Analysis

Figure 9 shows the summary results of the cash flow and risk analyses of the Sikaman Gold Mining Project under the three policy regimes under consideration. It can be deduced that the Sikaman Gold Mining Project is most viable with least risk under the Mineral and Mining Act 2006 (Act 703) followed by the current policy regime.

It could be observed that some of the contributing factors that made Act 703 the most economically favourable are the reduced corporate tax of 25% instead of 35%, the lower royalty rate of 3% - 6%, and the scrapping of the additional profit tax.

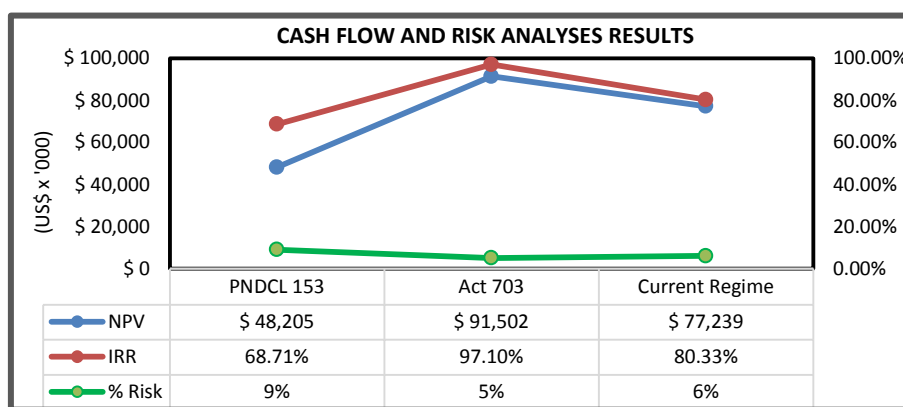


Figure 9. Summary results of cash flow and risk analyses of the SGM project under the three fiscal policy Regimes

4. Conclusions and Recommendations

The paper has studied the fiscal regimes that govern the economic evaluation of mineral projects within the Ghanaian investment climate. Three distinctions were made: fiscal policies that revitalized the mineral industry from 1986 with the enactment of the PNDCL 153 and its minor amendments; major amendment of the PNDCL 153 which gave way to the Minerals and Mining Act 2006, Act 703; and the current amendments of Act 703 in 2010, 2012 and 2015.

Economic analysis of the Sikaman Gold Mining Project under the three policy regimes revealed that the project is economically viable under the three regimes as the NPVs and IRRs were greater than zero and the minimum rate of return of 20% respectively.

Sensitivity analysis revealed that the project is most sensitive under the PNDCL 153 as the project ceases to be viable should the revenue decrease below 40% against 46% under the current policy regime and the least sensitive value of 47% under Act 703. In all the three regimes, the project was not sensitive to capital and operating costs within the variation of $\pm 60\%$ of the base case values.

Risk analysis conducted indicated that the probability of failure was highest under the PNDCL 153 (9%) and least under Act 703 (5%) with the current regime falling in-between (6%).

It could therefore be concluded from this study that the government was justified for amending its fiscal mineral policies to reflect modern trend in the mineral sector especially in the face of high gold prices and high production to maximise returns from the mineral industry.

It is recommended that the government should discuss such amendments with stakeholders especially the Chamber of Mines so as not to send wrong signal of being hostile to investors. Furthermore, taxes should be diversified to cover environmental remediation and corporate social responsibilities for the local mining communities instead of concentrating on corporate tax. Finally, mineral investors are encouraged to explore the stability and development agreements in order to stabilize their investments from fiscal policy changes.

The import of this research was to make an academic contribution to the dissenting views that the public hold for the latest changes in the mineral policies in Ghana. A limitation of this research could be the adoption of the traditional method of evaluating mineral projects which encompass discounted cash flow analysis, sensitivity analysis and risk analysis using Monte Carlo simulation technique instead of more advanced technique such as real options analysis. This is to make the results easily understandable to end-users as these are the prevailing techniques for economic evaluation of mineral projects in Ghana.

Future research could consider comparing the current fiscal regime of Ghana with those of the competing countries within the Sub-Saharan African region to assess whether Ghana could continue to pride itself as a preferred investment destination within the sub-region.

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