
The effects of Covid-19 Pandemic on the Extractive Private Sector Firms in Tanzania

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Author's contribution

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ABSTRACT

Tanzania has abundant natural resources potential to provide means for inclusive and sustainable private sector development. This paper assesses levels of risks and impact of Covid-19 on the private sector production systems, employment and commodity prices in the extractive sectors. The assessment is founded on the small and open macro-economic production model that assumes production systems, employment and product prices are main policy targets, well behaved and endogenous variables; determined simultaneously in the complex domestic and global social economic systems. Both secondary and primary data and information are used for the empirical risk analysis. Data and policy analysis use visual data discovery, prescriptive and predictive analytics detect patterns or structures in data sets that seem at first sight impenetrable. The primary data analysis suggests that there is a high health risk and negative effects of the covid-19 pandemic on the private sector production systems, employment and commodity prices in the extractive sectors. Secondary data reveals that there have been significant risks and negative effects on the gold production and petroleum importation patterns during first and second Covid-19 pandemic in 2020/2021. There are also high level of risks and negative effects in the use of human resources. The domestic gold mining product price patterns were somehow stable since the domestic product prices were determined competitively by global extractive product prices with given domestic extractive production techniques. The levels of risks and effects on the domestic

prices of the oil and gas sector have been high and unstable. The patterns and rate of change of domestic gold production quantities and prices in percentage before and during the Covid-19 were observed to be similar and stable throughout the sample period.

The paper recommends that in order to minimize the risks and negative effects of Covid-19, Tanzania should particularly aim at maximizing private sector productions, effective use of workers; and ensuring that domestic extractive sector products and commodity price systems are efficient and stable. The specific objectives are; ensuring stable and increasing gold production activities; maintaining optimal petroleum importation and supplies; optimal uses of human resource, employment and labour productivity; stable domestic gold mining product and price patterns; stable, fair and competitive domestic prices of oil and gas sector and to ensure continuous price and quantity stabilities.

Keywords: Extractive sector Covid-19 pandemic.

1. INTRODUCTION

1.1 Background Information

The COVID-19 pandemic was having a significant negative impact on performances of extractive private sector production, employment and output market systems in African countries. The pandemic has evolved rapidly from a health emergency to national and global economic crisis, spreading through all social economic sectors, activities and actors. Notable sector-level impacts include market supply and demand-based shocks to private extractive productive sector investments, productions, trades, distributions, consumptions and global mineral value chains. COVID-19 pandemic continues to affect social economic systems negatively in almost all nations, even though many countries have reopened and recovered from the pandemic, [1].

Also, there are no appropriate and effective policies for maintaining lock-downs in developing economies, and their policies effects on businesses, market chains, and how quickly economies can permanently stabilize. These social economic consequences are particularly pertinent in this context because private sectors firms are operating under capacities, many workers already live close to subsistence and domestic commodity price systems are unstable. The impact of COVID-19 on different economies has been largely mediated by the time and pace at which the disease is reoccurring and the countries' own capacity to maintain their economy is limited and unstable.

1.2 Objectives of the Study

The paper conducts preliminary assessment on the level of risks and effects on the private sector production systems, employment and product

prices in the extractive sectors in Tanzania. The first research assessment was done by Haki Rasilimali, (HR), in 2020 with the overall objective of conducting a situational analysis of the extractive industry sector amid COVID-19 pandemic in Tanzania. HR is a platform of Civil Society Organizations working on strategic *policy issues around minerals, oil and gas extraction* in Tanzania.

1.3 Study Methodology, Approaches and Paper Outline

In conducting the assessment on the extractive industry sector amid COVID-19 in Tanzania, the HR research used different methodologies and approaches. These included [1] organized consultative workshop in Dar es Salaam in 2020, [2] literature reviews, [3] mini field research surveys; [4] data and policy analysis; [5] initial report writing and wider consultations; [6] now dissemination, advocacy and sensitization of preliminary findings.

This paper has four main sections. Section 1 is the introduction. The conceptual framework is articulated in section 2. Section 3 presents preliminary assessment. This consists of risk levels and effects of COVID-19 pandemic on [3.1], extractive sector production and supplies; [3.2] use of employment, *and* [3.3] on the product prices in the extractive sectors. Sub-section 3.4 presents extractive sector product quantities and prices comparative analysis. The conclusion which is consisting of main findings, policy implications and recommendations are in Section 4.

1.4 Conceptual Framework

The COVID-19 pandemic as a public health problem, (*H*), is considered to have a significant

negative impact on, private sector production, product prices and business systems via human resources in many economies, [2-4]. It has evolved rapidly from a health emergency to a global economic crisis, spreading through the productive sectors, markets and posing growing risks to utilization of all basic resources and domestic markets.

The assessment was conducted on the Small and Open macro-economic production model that assumes production systems, employment and product prices are main policy targets, well behaved and endogenous variables; determined simultaneously in the complex and global social economic systems, [5,6]. This is a simple macroeconomic model of three relation systems; the private sector producers, (Y) as operating productive entities always targeting at maximization of profits and is defined as a positive function of human resources utilization, (X), other factors of production, (Xj) and commodity prices, (P);

$$1 \quad Y = f(X_l, X_j; P)$$

Whereby the simple open economy production model considers that the other complementary and independent factors of production (Xj), include capital, equipment, machinery, technology (Xk), natural resources, (Xn), and others, (Xo);

$$X_j = (X_k, X_n, X_o)$$

Also we define employment as an inverse, complex and positive function of production performances, (Y), and health status (H);

$$2 \quad X_l = l(Y, H) \quad l_y > 0 \quad l_h < 0$$

The extractive sector product prices, (P) are determined competitively by global extractive product prices (Pw), domestic production, (Y) and domestic pricing systems, (β) given that the government of Tanzania regulates the domestic extractive sector prices;

$$3 \quad P = p(P_w, Y, \beta)$$

The above three relations (1, 2 and 3); model determines the values of the private sector productions, (Y); employment, (Xl) and product prices, (P) as endogenous and policy target variables; for the given exogenous values of

Covid-19 pandemic is a health risk, (H) domestic pricing systems, (β) and other factors of production, (Xj), [5,6]. Above relations 1, 2, and 3 consider that Covid-19 pandemic is a public health risk, (H) and thus effects of Covid-19 are through employment as human resources. That is, the Covid-19 risks are conceptualized as a public health threats or possibilities the pandemic (as events) which adversely affect social economic entities (individuals, families and communities), sectors, (extractive sector) and actors (workers) ability to achieve their desired objectives, [7-9].

The viruses that cause COVID-19 has health risks of infecting and affecting human resources (Xl) as individuals, families, investors, producers, traders, distributing agents, consumers and other human resources, [2,9]. The human resources in their different employment and engagement capacities may be active, older people and people with preexisting medical conditions such as asthma, diabetes, and heart disease appear to be more vulnerable to be infected with the virus and probably becoming severely ill.

The model suggests that *the first round Covid-19 transmission mechanism* and health risk is that effect on the employment capacities and status as producing extractive workers leading to changes in the private sector production systems and finally cause significant effects in the commodity price systems.

The *second round Covid-19 transmission mechanism* and effects reveal the fact that changes in the private sector production systems will induce changes in the human resource utilization, use of other factors and eventually changes in the product prices.

The other second round transmission mechanisms and effects indicate that effects in the product prices will induce changes in the private sector production systems and changes in the utilization of human resource. Factors that contribute and affect product price risks include; earnings volatility, poor business and financial management and other product price changes. In turn these effects have overall direct and indirect effects on the social economic activities and actors;

First, and perhaps most direct; are the social economic costs to the health system, both public and private, of medical treatment of the infected and of outbreak control. A sizable outbreak can

overwhelm the national health system, limiting the capacity to deal with routine health issues and compounding the problem, [2]. Beyond global shocks to the health sector, epidemics force both the ill and their caretakers to miss work or be less effective at their jobs, driving down and disrupting productivity.

Second, are fears of Covid-19 related infections resulting into stress, social distancing or closed schools, enterprises, commercial establishments, transportation, and public services—all of which limit freedom of movement, engagement, optimal utilization of human resource capacities and thus disrupting social economic activities and sectors.

Third, are consequences of outbreaks and pandemics are not distributed equally throughout the economy. Some socio-economic sectors, activities and actors may even benefit financially, while others will suffer disproportionately. For example pharmaceutical companies in developed nations that produce vaccines, antibiotics, or other products needed for outbreak response are potential beneficiaries. However, health and life insurance companies are likely to bear heavy costs, at least in the short term. Vulnerable populations, particularly the people with physical disabilities, are likely to suffer disproportionately, as they may have less access to incomes, health care and lower savings to protect against financial catastrophe.

2. DATA RESULTS AND ANALYSIS

2.1 Preliminary Assessment: Data and Policy Analysis

Data and policy analysis uses visual data discovery, *prescriptive and predictive analytic* to examine level of risks and effects on the private sector production systems, employment and commodity prices in the extractive sectors. The visual data discovery is used to detect patterns or structures in data sets that seem at first sight impenetrable. This method in discovering relationships between data elements across multiple data sets for subsequent data analysis. This involves assessing performances of main policy variables as stock, flows, indices and relative changes before and during the COVID-19 pandemic. The prescriptive analytic is used to examine data or content and in specific paper it use graphic analysis to track systems for extractive sector products, employment and product price movements.

2.2 Tanzanian Natural Resources

The Tanzanian natural resources (minerals, oil and gas) have potential to provide means for a country to social economic transformation and achieve inclusive and sustainable change if effectively managed from the stages of application and awarding of licenses/contracts through to revenue collections and spending. Applications and awards of licenses/contracts for mining, oil and gas resources are prone to inefficiencies hence adequate mechanisms such as laws, regulations and accountable institutions that allow for disclosure of beneficial owners of the companies awarded licenses and contracts are critical, [10].

2.3 Tanzanian Minerals

Tanzania is endowed with abundant, rich and diverse occurrences of mineral deposits due to its favourable geological setting with lithostratigraphic and tectonic units that includes the Archaean Tanzania Craton, the Palaeoproterozoic Ubendian and Usagaran mobile belts, the Mesoproterozoic Karagwe–Ankolean, the Neoproterozoic Mozambique belt, the Phanerozoic sediments of the Karoo, Coastal basin and Cenozoic volcanic rocks, [11]. These mineral deposits include metallic minerals such as gold, iron, silver, copper, platinum, nickel and tin; gemstones such as diamonds, tanzanite, ruby, garnet, emerald, spinel, tourmaline, alexandrite and sapphire; industrial minerals such as kaolin, phosphate, lime, gypsum, diatomite, bentonite, vermiculite, salt and beach sands; building materials such as stone aggregates and sand; and energy minerals such as coal and uranium, [11].

The Tanzania gold mining sector is the most important, strategic and continues to set the pace for the mineral industry growth in Tanzania with several prospects in advanced feasibility study stages. These include those at Nyakafuru (Resolute (Tanzania) and Mabangu Mining) and Buckreef and Nyarugusu prospects (I am Gold), Golden ridge (Barrick Tanzania Ltd). Several other advance exploration programmes are going on, e.g., those at Canuck, Matinje, Bumbiti and other locations all located within the Lake Victoria Goldfields. Exploration of gold is also ongoing in the traditional gold mining areas of Chunya and Mpanda mineral fields and in non-traditional gold mining areas that have recently been discovered following rushes by artisanal and small-scale miners. These include Morogoro (East of Dar-es-

Salaam), Tanga (north of Dar-es-Salaam) and Songea, southeast of Tanzania [12].

In Tanzania, the diamond mining sector consists of artisanal, small, medium and large-scale firms. They all exert significant direct and indirect impacts on the district, regional and national economies. Tanzania has been a diamond producer for several decades, with the bulk of production coming from the Williamson Diamonds Mine at Mwadui where commercial production began in 1940. Over 300 kimberlites are known in Tanzania of which, 20% are diamondiferous. Some 600 dipolar magnetic anomalies with similar geophysical characteristics to known kimberlite pipes have been recorded during recent geophysical surveys [12].

Tanzanite is the blue vanadium-bearing variety of zoisite. The only known source of gem-quality tanzanite, to date, is the Mirerani area of northeastern Tanzania, a structurally complex region consisting of granulite facies metacarbonate and metasilicate rocks overprinted by amphibolite to greenschist facies retrogression. Gem-quality green grossular garnets, known as Tsavorite, are also found in the area, as well as a variety of other rare minerals and gemstones (such as axinite, dravite, fluorapatite, prehnite and tremolite), (Chris *et al*, 2014). In recent years, 2000-2020, tanzanite accounted for a majority of the value of domestic gemstone mining concerning local miners like who managed to obtain the highest value Tanzanite minerals since the origin of the production. Merelani, which is located near Arusha, was the world's only source of tanzanite. Artisanal and small-scale miners operated in Blocks B and D of the Merelani deposit. TanzaniteOne Mining Ltd. (Sky Associates Group Ltd., 50%, and STAMICO, 50%) mined tanzanite in Block C, [13].

2.4 Tanzania Oil and Gas Sector

Tanzania has potential oil and gas minerals. The upstream petroleum exploration activities are conducted in sedimentary basins located onshore, in shallow waters, in deep offshore and within inland rift valleys, [14]. The country's sedimentary basins cover an area of approximately 543,000 square meters. Over 172, 280 km of 2D seismic data and 25,631 square kilometres of 3D seismic data have been acquired. More than 70 exploration and development wells have been drilled, of which 53

wells are in onshore basins and 17 in the offshore basins. The well density is equivalent to 1 well per 7,870 square meters. This indicates that the country is still underexplored. The first natural gas discovery was made in 1974 at the Songo Songo Island in Lindi region with estimated gas reserves in place of 1 TCF, followed by a second discovery at the Mnazi Bay (Mtwara Region) in 1982 with estimated gas reserves in place of 4 TCF, [14].

The Songo Songo natural gas was commercialized in 2004 and that of the Mnazi Bay in 2006. Other discoveries onshore include Mkuranga (2007), Kiliwani North (2008) and Ntoria -1(2012). From 2010 - 2013, exploration efforts in the deep offshore basins resulted in discoveries of large quantities of natural gas in Block 1(Chaza, Jodari, Mzia and Mkizi), Block 2 (Zafarani, Lavan and Tangawizi, Mlonge-1 and Binzari - 1), Block 3 (Papa-1) and Block 4 (Pweza, Chewa and Ngisi). This has increased the total estimated gas reserves in place in Tanzania basins to more than 46.5 TCF, [14].

Tanzania has not yet discovered commercial oil and imports petroleum products for domestic consumption. The government liberalized the downstream operations since 2000. Oil marketing companies import petroleum products for local consumptions as well as transit business through bulk procurement arrangement coordinated by Petroleum Importation Coordinator (PIC). The country demand for petroleum products is estimated to be over 1.8 million metric tons per year. The deep sea discoveries have brought about new exploration targets for hydrocarbons in Tanzania and the whole of Western Indian Ocean Region. These positive developments are coupled with operational challenges facing the petroleum sub sector which include developing optimal petroleum infrastructures that will enhance the development of new resources and ensure the availability and reliability of petroleum supplies from producing fields, [14].

2.4.1 The high level of risk on the reduced company's production and supplies

Any production system related activity or event that has a range of possible outcomes is a production risk. The major sources of production risks are; [1] strategic risk – e.g., a strong competitor entering into the market, [2] compliance and regulatory risks – e.g., introduction of new rules or legislation; [3]

financial risks – e.g., inflation, changing foreign rate of exchange, interest rates rise in the business loans or a non-paying customer; and [4] operational risk – e.g., the breakdown or theft of key capital equipment, machinery, technologies and *health status and conditions of employees and employers*. Table 1 presents perceived views of the consulted stakeholders on the level of risks and effects of Covid-19 on the extractive company's production systems in Tanzania 2020 - 2021. All consulted stakeholders had the view of high health risk and negative effects of the COVID-19 pandemic on the company's production systems and performances.

The extractive industry sector has been always at risk, with worker occupational health and safety concerns representing as one of the current 2020 – 2022 global health challenges, [2]. Covid-19 is by definition new occupational health and safety, (OHS) concerns. Increasingly strict OHS regulations, the reliance on technology, inconsistent demand for raw materials and high commodity prices are current concerns that every mining company has grappled with during the Covid-19 pandemic. Under normal circumstances; most formal large scale extractive businesses are able to counteract this with effective risk and OHS management programs, [15]. Many extractive industry executives are already ahead of the game in terms of their ability to detect effectively, manage and prevent Covid-19 pandemic and related risks. They understand that big gains often come with managing OHS risks, and well-designed programs enable them to safely pursue those opportunities.

2.4.2 Trend of gold production in Tanzania during Covid-19 pandemic 2020 - 2021

We have argued that mining company's face different and many risks on a regular basis, which is why it is critical for them to have an effective risk, OHS management systems that can help them to deal with Covid-19 threats and capitalize on opportunities. There were already other prevalent health risks anticipated to have negative gold mining productions during

2021/2022 in Tanzania such a HIV/AIDS and malaria. While the environment in which large scale mining firms operate is always stable, changing and presenting new threats, it's crucial that business leaders in the industry are able to understand different risk trends so that they can develop more effective risk management programs. Many African countries are targeting at realizing the desirable values and benefits of the exported materials that stem from their countries and imposing higher taxes on mining companies, [15-18]. However, this complicates the cost of management operations significantly.

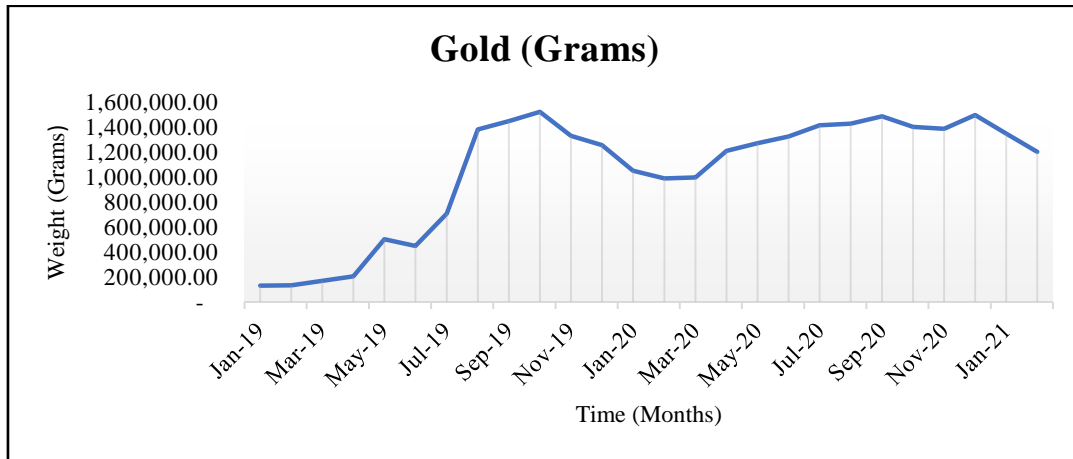
Graph 1 shows the trend of gold production in Tanzania before and during the Covid-19 pandemic 2019 – 2021. Graph 2 shows the rate of change of trend of gold production in percentage. Graph 2 is derived from Graph 3. These visual aids are used to detect if there were any significant changes in patterns, flows and disturbances during the Covid-10 pandemic.

Graph 3 suggests that production of gold minerals has been increasing during the sample time. However, Graph 3 has three different trend patterns; The first pattern is before the Covid-19 pandemic, when gold production increased from 447,861.84 grams in June 2019 to first highest peak at about 1,532,532.9 grams October 2019. The second pattern is when the production of gold started to decline from about 1,532,532.9 grams in October 2019 to about 997,201.64 grams in March 2020. This include the period before and when Covid-19 pandemic was announced and started spreading and negatively affecting all social economic activities, entities and sectors in December 2019. Following global, national government and firm measures aimed at countering the Covid-19 outbreak, total gold production fell during first quarter of 2020, while recycling activity fell 4% and operations at a small number of refineries and fabricators were also halted. Stringent global and national travel restrictions – border closures and a reduction in commercial flights – impeded the flow of gold along the chain, [15-17].

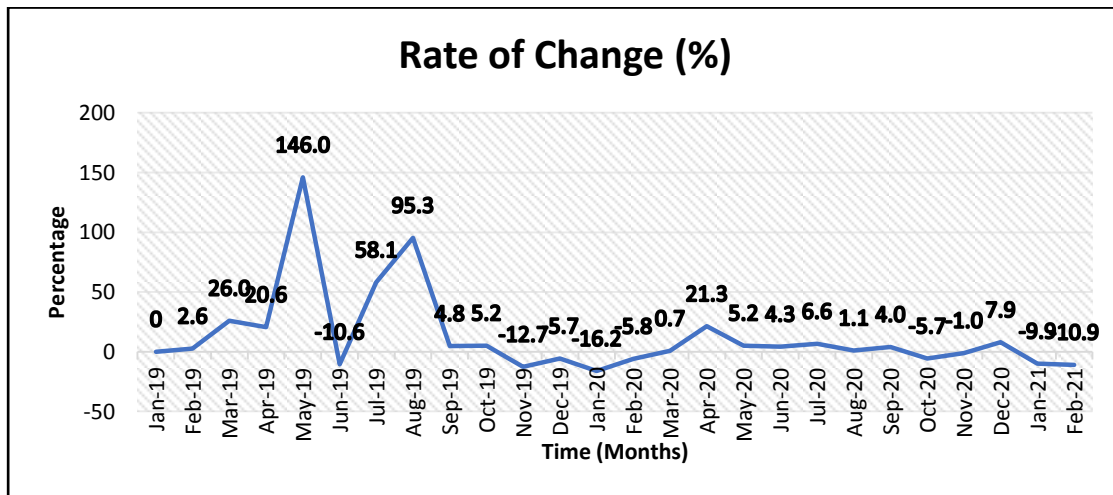
Table 1. The levels of risk on the extractive company's production given Covid-19

	Frequency	Percentages (%)
High	7	46.7
Very High	8	53.3
Total	15	100

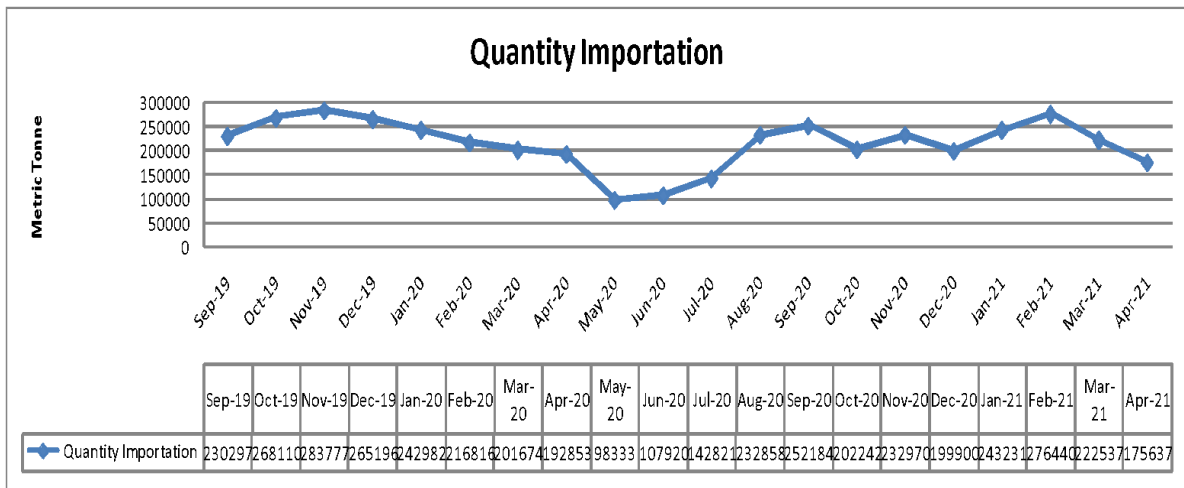
Source: HR Field Work Survey 2020



Graph 1. Trend of gold production in Tanzania DURING Covid-19 pandemic 2020 - 2021
 Data Source: Tanzania Mining Commission, 2021



Graph 2. Rate of change of trend of gold production in percentage
 Source: Tanzania Mining Commission, 2021



Graph 3 Trend of Tanzania petroleum importation from September/2019-April/2021
 Source: Petroleum Bulk Procurement Agency, 2021

The third pattern is the period of global social economic recoveries from the Covid-19. The gold production started to perform, that is, recovering, increasing and reaching highest peak in December 2020. Despite the fact there is still uncertainty about how 2021-2022 may evolve, it seems very likely that mines will experience fewer stoppages as the world recovers from the pandemic. This would remove a headwind that companies experienced in during the first quarter of 2020 but that is not commonly part of production drivers. Even if potential second and third waves impact producing countries, major companies have introduced protocols and procedures that should minimize the effect of stoppages compared to those seen in the early stages of the pandemic.

The recovery during second quarter of 2020 and good performances of gold during first quarter of 2021 responds to the interaction of the various factors of demand and supply, which are, in turn, influenced by the interplay of four key drivers. These include; [1] economic expansion: periods of growth are very supportive of jewellery, technology and long-term savings; [2] risk and uncertainty: market downturns often boost investment demand for gold as a safe haven; [3] opportunity cost: interest rates and relative currency strength influence investor attitudes towards gold and momentum and, [4] capital flows, positioning and price trends can ignite or dampen gold's performance, [15-17].

Graph 4 suggests two major gold product patterns in Tanzania. The first pattern is the stable periods from January 2019 to April 2019 and from September 2019 to current February 2021. The second pattern is the unstable periods of significant huge upswings and downswings, between April 2019 and September 2019 suggesting potential effects of Covid-19 pandemic. Graphs 4 suggest that in the short run, the production of gold has been stable even during the Covid-19 pandemic.

Also, it is true that gold production slowed down during the first wave of Covid-19 but in a stable and controlled manner. But risks are obvious if these Covid-19 pandemic waves are repetitive and effect global mining value chains. The major global mining effects and risks included infective and inefficient utilization of human resources, changing product prices, capital equipment and machinery access, and issues related with natural resource management, investments, and processing, [15-17].

Graphs 3 and 4 suggest that gold mining firms were able to control and manage Covid-19 during May – June 2020 and these are related to occupational health risks at firm levels. All firms are aware, prepared and that since mines have desirable human engineering systems, they are exposed, knowledgeable and prepared to multifaceted risks. Often, the result of this health risk occurrence is the loss of human capacities, life and health of people. It is important to note that these effects may apply not only to employees of mines, but also to the environment i.e., communities of areas adjacent to the mine. For this reason, many mining sector firms in Tanzania have been focusing on the need to implement and develop various OHS risk assessment and management systems. With the integrating community social responsibility, (CSR), measures with strict OHS legislation and protocol, as well as advances in safety equipment, the industry has seen its fatality rate drop over time inside the extractive premises and in surrounding communities. Although the goal of zero harm has not yet been achieved, it remains the standard that mining companies continue to strive towards [2].

The likelihood of high risk of the reduced company's production implies that in the extractive companies, uncertainty about the work situation and lack of income replacement in case of sickness or lockdown may increase stress, anxiety and the risk of mental health disorders for workers in the companies, who also tend to have poor access to healthcare services. Moreover because of fear of losing their jobs and their incomes, workers may be reluctant to ask for support, raise OSH concerns, or may adopt unhealthy working practices with the aim of pleasing managers and supervisors (for example, long working hours and increased workload). They may also avoid taking leave if they are sick, with the risk of infecting coworkers. This problem is aggravated by those workers who are on short-term contracts or who are hired under freelancing arrangements.

The COVID-19 pandemic raised uncertainty by compounding existing and multiple risks. The foreign direct investors were likely also to be navigating potential portfolio risks including ballooning budget deficits, inflationary pressures and market corrections amid already high equity valuations [18]. However, continued different forms of lockdown measures couple with the roll out of new Covid-10 vaccines at the end of 2020 fueled optimism that the worst was under control

and perhaps over in certain parties of the world. Currently 2021-2022 investors are optimistic and experiencing low interest rate environment as an opportunity to invest risk assets with the hope that economic recovery is on the immediate horizon, [15-17].

2.4.3 Trend of Tanzania petroleum importation from september/2019-April/2021

Section 3.1.2 examines if Covid-19 pandemic was a risk and had any effect on the Tanzanian petroleum importation sector. Tanzania is a net importer of petroleum products; including transportation fuels, fuel oils for heating and electricity generation, asphalt and road oil, and feed stocks for making the chemicals, plastics, and synthetic materials that are in nearly everything used in Tanzania. Tanzania imports refined petroleum primarily from India, United Arab Emirates, Saudi Arabia, Switzerland, and Oman. The fastest growing import markets in Refined Petroleum for Tanzania were India, United Arab Emirate, and Saudi Arabia. Petroleum products supply in Tanzania is being managed and conducted through a Bulk Procurement System (BPS) since 2011. Under the BPS, purchases of petroleum products are made from a pool of imports obtained from suppliers selected through a competitive bidding process. At the moment, the BPS covers few grades of petroleum products, namely: Automotive Gas Oil (AGO), Unleaded Motor Spirit Premium (MSP), Jet A-1, and Illuminating Kerosene (IK).

Graph 5 shows the trend of Tanzania petroleum importation from September/2019-April/2021, that is, before and during the Covid-19 pandemic and Graph 6 presents the rate of change of Tanzania petroleum importation during the same time. These visual aids suggest that importations of petroleum products into Tanzania have been showing smoothly decreasing patterns from November 2019 to the minimum levels in May 2020 and thereafter started recoveries with unstable positive upswings and downward swings to April 2021. The stocks and changes in petroleum product imports have been complex functions of global petroleum product production and market systems, domestic energy policies, laws, regulations and institutional frameworks and infrastructure systems and facilities.

Our consultations suggest that the smoothly decreasing patterns were associated with control

use of infrastructure standards; maintained level of health, safety and environment compliance; monitoring of petroleum products pricing; consistent supplies of petroleum products; ensured competition and fair playing level and safeguarded number of licensed operators in the country. Also, the unstable positive upswings and downward swings during last part of 2020 and early 2021 are clear signals of lack of control and increasing dominance of market powers of the Energy and Water Utilities Regulatory Authority (EWURA)[19].

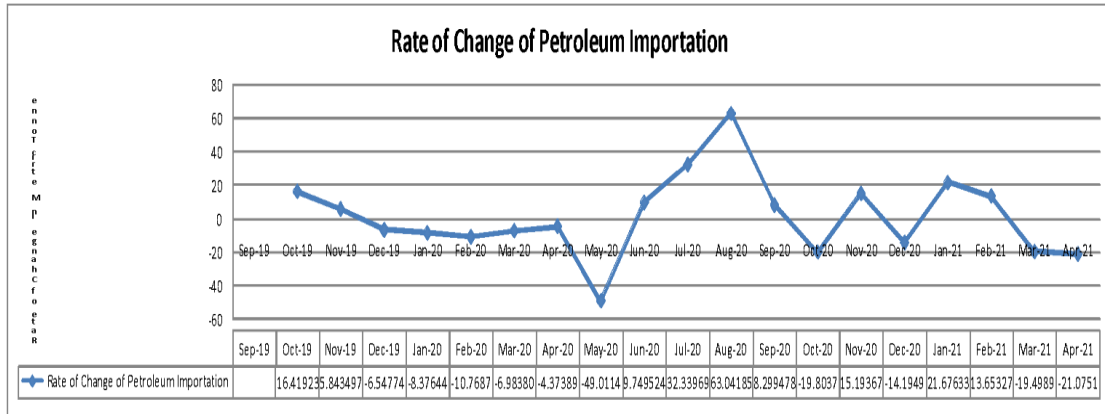
In Tanzania, fuel is imported, supplied and distributed by the profit making private companies. These private companies are regulated by EWURA. In discharging its duties and functions on petroleum sub-sector, EWURA is obliged to comply and enforce to the Petroleum Act, 2015, Cap 392 that is a sector's legislation. During the first four months in 2020 after the breakdown of Covid-19; EWURA managed to monitor and ensured stable quantities, security and quality of petroleum products supply in the country during the Covid-19 pandemic. All importing petroleum sector parties were eager at optimizing costs in respect of petroleum infrastructure systems; procurement, and distributions of petroleum products when things were seen to be falling apart. The Tanzania petroleum infrastructure consists of berthing facilities, petroleum storage terminals, transportation infrastructure, petrol stations and LPG Facilities have functional and stable during Covid-19 pandemic.

2.4.4The high level of risk of reduced formal employment

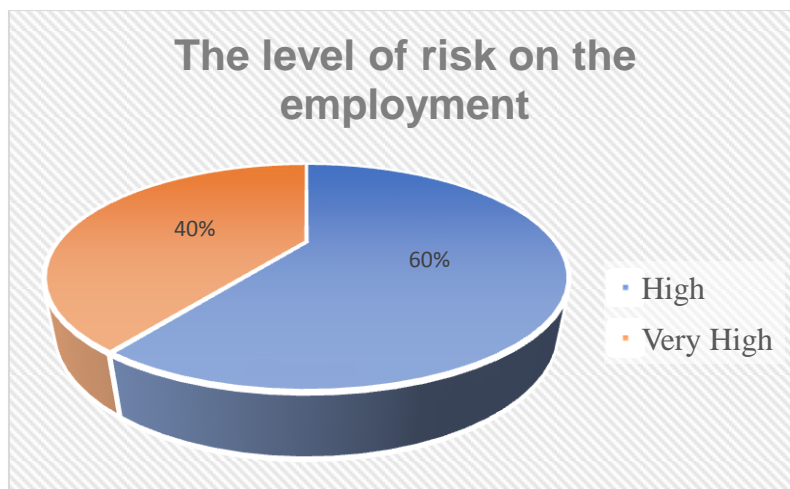
Most formal extractive Industry companies are large scale; corporate companies engaging in the processes and involve the optimal extraction of raw materials from the earth given available systems, resources and infrastructure systems to be used by consumers. Many of these companies have both good risk, human resource (HR) and occupational health and safety, (OHS) management systems. They all understand that the extractive industry risk includes potential exposure to corruption, social and human rights abuses or environmental, crime occupational health and safety systems. The types, levels and effects of direct and indirect health risks on companies resulted in the Covid-19 pandemic across the globe have been profound. The risk effects include fear for the future and the lack of guaranteed employment associated with

increased stress, anxiety, depression and burnout, [2,3]. Other important effects are high levels of job insecurity, safety, and health which

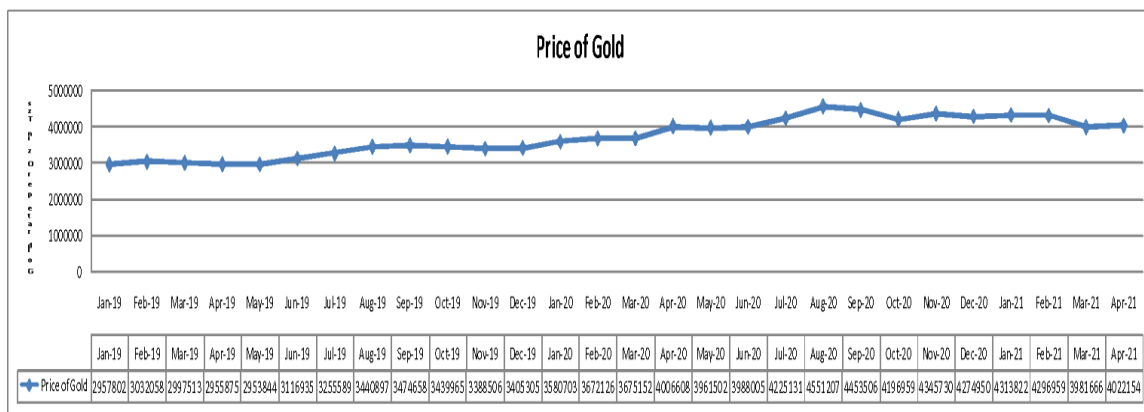
may also prompt low motivation and compliance with employment efforts, hence higher work-related injuries.



Graph 4. Rate of Change of Tanzania petroleum Importation from September/2019-April/2021
Source: Petroleum Bulk Procurement Agency, 2021



Graph 5. The level of risk on the employment
Source: HR Field Work Survey 2020



Graph 6. Price of Gold in term of Oz in Tanzania Shillings from January 2019-April 2021
Source: Bank of Tanzania website, 2021

Section 3.2 examines levels of risks and effects of Covid-19 on the use of labour force or human resource or employment in the extractive sector in Tanzania. Employee health risk is defined as high-risk behaviour, whether inadvertent, negligent or malicious, that can harm an individual, family and organization and employment risk is a risk that is inherent in an employee's job or work site. Health risks are all in places and at different time. A nearby sneeze may raise health risk for catching the flu or and covid-19. Employment health risk is the chance or likelihood that something will harm or otherwise affect employee health. The personal health risk factors include their ages, sex, family health histories, lifestyles, and more. There are other complicating risk factors such as smoking, high blood pressure, or diabetes—the greater employee risk. Health risks can be hard to grasp when especially emotions run high, such as when people are faced with a serious illness, [3,20].

Graph 7 presents perceived views of consulted stakeholders on the level of risk on employment. Graph 7 and consultations with stakeholders reveal that there are high level of risks and negative effects for both employers and employees with regard to existence of the Covid 19 pandemic. The corona virus (Covid-19) has caused the biggest social economic global crisis in generations, sending shock waves through health systems, (H) [2,3,20]. Even though the total number of registered employee Covid-19 cases is still unknown and perhaps lower in Tanzania than in the worst-hit regions of the world, the country has yet to feel the full implications of the second and third Covid-19 waves in 2021 and 2022. The known unemployment numbers in the extractive sectors might even understate the short term effect, given the increasing importance of artisan, small and medium scale mining firms in the country. Job losses, reduced incomes and lack of access to social protection have pushed Tanzanians back into abject poverty, with consequences for persistence in inequalities.

Some permanent and casual workers have got sick, few died and some have lost their jobs due to both the Covid-19 pandemic and corresponding lockdown measures. Some of them have lost their jobs mainly concentrated in the lower income segments in large scale mining companies and in the formal small and medium scale mining firms. In turn, given the uncertainties of whole economy, large scale mining companies hold back investment projects

even if social distancing measures would still allow the investments. Almost all labour categories and social status were affected; the number of cases is still unknown maybe stable and containment measures are in place. As a consequence of the efforts to slow the spread of the virus, the uses of human resources were containment measures, [2,3].

The resulting economic recession during first quarter of 2020 has dramatically increased the global rate of unemployment. Many businesses have closed as a result of lock downs and there are possibilities that some may not be able to reopen. Others downsized, restructured or merged to survive, with significant consequences for increasing unemployment. Furthermore, many enterprises have changed work practices and procedures to adapt to the new requirements to protect workers, clients and customers from contagion. Fear of job loss, pay cuts, layoffs and reduced benefits made workers question the future of the company they work for and their job. For others, job loss is already a reality. Also, in times of economic crisis, job prospects with other companies and institutions are often difficult to find.

Distancing measures and other lockdown measures depend largely on the knowledge, information, willingness, technologies and capacities of firms to maintain business processes from the homes of workers, [21,7]. The increasing risks of Covid-19 cases per thousand-individuals are also associated with a significant rise in the fraction of workers switching to remote work and the fall in the fraction of workers commuting to work, [22]. Moreover, the level of risk for mining companies at their head-offices in the capital cities having the supply of labor in industries with home-based work capabilities and low face to face interactions (e.g. professional, scientific and technical services) might be the least affected. Nevertheless, those industries and occupations with the low home-based work capabilities and high face to face interactions such as mining extraction activities, processing and beneficiation industries are likely to experience negative productivity shocks and slower recoveries. However, the risk of infection through physical proximity can be mitigated by wearing personal protective equipment and by taking other relevant precautionary measures.

From the firm's perspective, there are significant short-term, medium and long-term effects of

temporary closures, the (perhaps permanent) loss of productive workers, and declines in job postings characterized by strong heterogeneity across industries. On the other hand, some firms are expecting increased business opportunities amid the global disruption (e.g., firms which make medical supplies or others whose competitors are facing negative impression after the outbreak of Covid-19 pandemic, [23].

Faced with an unprecedented situation, global and local governments, private sector firms, and communities were forced to bring the disease under control and reviving their social economic activities, (Y) and performances. The immediate human resources challenges of the COVID-19 pandemic include coordinating a safe return to work, managing requests for leave, implementing teleworking programs, wage reductions, and more—employers are looking to the future to prepare for the next challenges to come. Other areas of employment-related risks arising out of the pandemic to consider and monitor in the months ahead include wage and hour challenges, vaccination-related requests; paid-leave protections and providing a safe workplace.

As the Covid-19 pandemic continues to spread across the world, one of the biggest challenges for businesses has undoubtedly been its response regarding employees. Similar to many other countries, Tanzania's employment and labor laws did not envisage a Covid-19 or similar situation. During the Covid-19 pandemic, signaling firms in trouble would not be very informative or helpful, given that most firms have suffered a sizeable and unexpected negative external shock. This is highly associated with the increase in unemployment rate. As companies develop and use their risk management plans, there are certain types of employee risk that should never be overlooked during any pandemic. Every company knows that human resources or people are its greatest assets, [18]. At any point in time the employment practices liabilities include wrongful termination; failure to promote; poor training and sexual harassment. These employment practices liabilities have been very complex during Covid-19 pandemic as these employment risks are high.

Many large scale and formal extractive sector firms have risk OHS management systems intended to handle risks related to health including the Covid-19. The OHS risk assessments have been used to protect both the safety of the employees and the security of the

business or organization. The occupational health and safety offices in collaborations with human resource offices have been careful in conducting risks assessment for their employees. These risk assessments of the employees' physical workspace and operations have been conducted to ensure that the organizations have the proper procedures in place to protect the safety of its employee.

Once risks have been identified and analyzed, all approaches, methods and techniques to manage the risk fall into one or more of these four major categories: [1] avoidance (*eliminate, withdraw from or not become involved*); [2] reduction (*optimize – mitigate*); [3] sharing (*transfer – outsource or insure*) and [4] retention (*accept and budget*). This is evidenced where businesses are no longer viable and alternative working arrangements including unpaid leave, salary reduction, working from home among others fail, an employer may consider terminating an employment agreement by way of operational requirements/retrenchment. These actions have negative consequences to employees and the firms as it must reduce production and operational capacity.

Employers have legal responsibilities to ensure a safe and healthy workplace. As employees they have rights and responsibilities for their own wellbeing and that of colleagues. The employees have the right to work in a safe and healthy environment. The most important of these rights are: as far as possible, to have any risks to their health and safety properly controlled and to be provided with any personal protective and safety equipment free of charge

Despite the fact that effects may be regarded the result as a reaction to rescue the firm from falling, the procedure for terminating an employment contract by operational requirements remained stringent even during the Covid-19 pandemic. The employers were highly encouraged to adhere with the retrenchment procedure as provided in the basic laws and other labor legislation in Tanzania. It was important for employers to carefully consider any decisions in respect of their employees in response to the issues caused by Covid-19 before it seeking to implement them.

2.4.5 The high level of risk on the price viability in the extractive products

The extractive sector products are traded, marketed, distributed and determined in the

global competitive market systems. Extractive product price risks are the event that product price changes that will cause production, business losses for any social economic participant in the global market. For example product price risk for sellers stems from unexpected decreases in product prices, which can reduce seller's profit margins and make costing difficult. There are different types of product price risks that extractive sector firm might face and needs to overcome. The product price risks are taken by enterprises themselves in order to maximize shareholder value and profits.

2.5 Higher Risk Levels for Gold Mineral Product Prices

Tanzania has rich gold mineral reserves, deposits and potentials and is an open, small and a net gold mineral product exporter. Gold mineral benefits from diverse global sources of demand: as an investment, a reserve asset, a luxury good and a technology component. It is highly liquid, no one's liability, carries no credit risk, and is scarce, historically preserving its value over time, [15-17]. The variations in the gold prices are crucial for stocks, flows and Tanzanian natural resource wealth. The country is a gold mineral product price taker and reduced mineral product price as the risk of decline in the value of mineral production and export values, national and firm specific incomes and investment portfolios excluding a downturn in the market, due to global and multiple socio-economic factors.

The extractive sector product prices are determined competitively by domestic and global extractive product price systems. The domestic pricing specific factors include corporate systems, financial resource capacities and price-risk management strategies, as well as extractive sector practices and methods at the operational level. The critical mineral market factors are costs of explorations, extractions, processing, beneficial, transporting, marketing and distribution. It is known that the global mineral product prices are subject to systematic and sudden risks of volatility over both; short and longer run – driving and fluctuating operating margins for mining companies over time. Such market dynamics influence mine operating investment decisions depending on the interplay of company-specific and mineral market factors, (Deloitte Touche, 2018).

Graph 8 presents movement of domestic prices of gold in term of Oz in Tanzania Shillings from January 2019- April 2021, i.e., before and during Covid-19 pandemic in Tanzania. Graph 9 shows that the domestic price of gold in Tanzania has been increasing before and during the Covid-19 pandemic. These visual aids determine if the current domestic extractive product prices were at risk, disturbed and affected during the Covid-19 pandemic in Tanzania. Graph 9 shows the rate of changes of trend of gold domestic prices in percentage before and during the Covid-19 pandemic in Tanzania. These graphs suggest that the rate of change gold mineral prices remained constant and stable during the sample time. That is, the graph shows that growth rate of prices of gold products were more or less stable but exceptionally during April 2019 and September 2019 whereby there were significant large upswings and downswings suggesting possible gold mining disturbances due to changes in management and mining operation systems.

Graphs 10, 11 and 12 suggest that both gold mineral production quantities and prices remained constant and stable during the Covid-19 pandemic in Tanzania. The current 2019-2021 presence and short run effects of the Covid-19 outbreak had limited effect on both domestic gold mining growth and all product pricing systems. Gold mineral productions in Tanzania are from the large scale production systems with fixed production technological systems and thus very difficult to change in a short run. However, there are medium and long term fears of reduced supplies of key mineral products growing due to measures to contain the virus at key mine operations across the global, (Jason *et al*, 2021). Several of the World's biggest mining consortiums have declared delays to investments, production and development projects because of travel, lockdowns and other restrictions imposed in response to the global pandemic, [15-17].

Further and current delays to mineral investments and production around the world provided some support to product prices, choking off some of that excess supply seen reflected in exchange inventories, [15-17]. With number of operations announcing restrictions to production increasing, the risk to supplies for several key commodities will ratchet up. Supply developments aside, the main risk for commodities is the lack of foreign investor's confidences in some African countries such as

Tanzania. By April 2021, we observe temporary end to first panics of selling and buying in the global gold markets and at that moment we will be in the recovery period for mineral commodity markets. But other contributing risk factors to be considered included lack of accurate and timely knowledge, data and information about global products and production movements, (Deloitte Touche, 2018). Thus, at any given point in time, there were often widely different price forecasts available for both the relevant commodities and currencies.

2.6 High Oil and Gas Product Price Risks

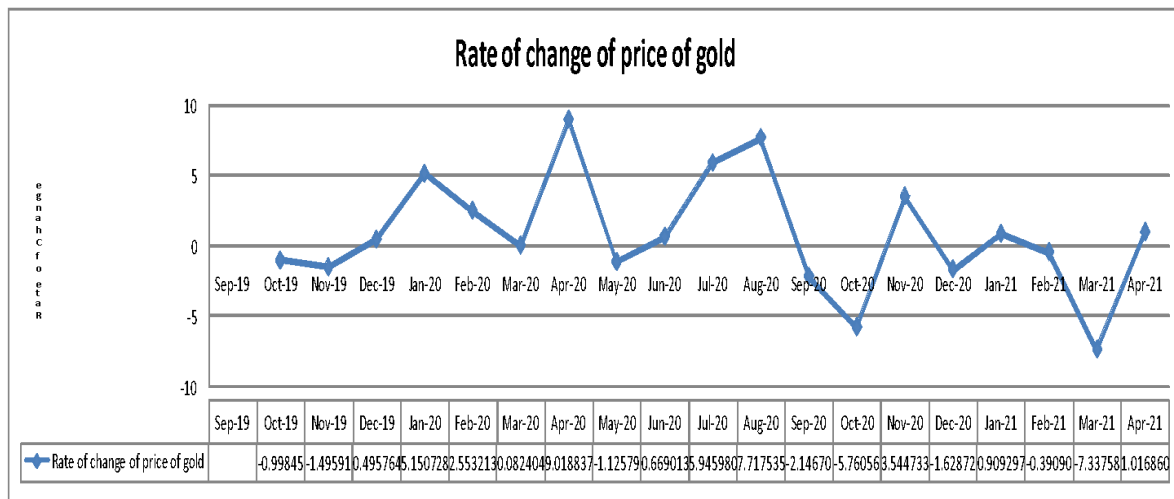
Tanzania is net oil and gas importer as well as a potential foreign direct investment destination because the country has vast oil and gas deposits. This suggests that any changes in oil and gas product prices must have both positive and negative risks and effects on the Tanzanian social economic sectors, activities and actors. The global oil and gas product price risks have effects and these petroleum products prices may change rapidly, substantially, and unpredictably, [24]. The domestic market participants bear this risk in two main ways; they could either lock-in the domestic prices of their future productions or consumption now or insure against large oil price moves, or both.

Graph 5 presents perceived views on the levels of risks and effects of the price of the domestic extractive products. The majority, that is, about 93.4 % had the view that the level of risks and effects on the domestic prices of the petroleum sector are high during Covid-19 pandemic. During the Covid-19 pandemic, all oil and gas

product markets across all countries have been simultaneously and negatively affected due to sudden depressed effective demand, [24]. Limited global, regional and national travel restrictions and other forms of lockdowns have led to decreases in investments, exploration, production and consumption activities, incomes and demand for petroleum products in many economies. The domestic petroleum product prices are affected global petroleum product price changes and changes in the domestic production systems, facilities and activities such as transport, energy consumption and domestic price setting systems, [24]. This means, the perceived views are reflection of observed reality of changing behaviour of domestic petroleum product price movements which is a complex function of a petroleum products price setting and regulatory controls in the country.

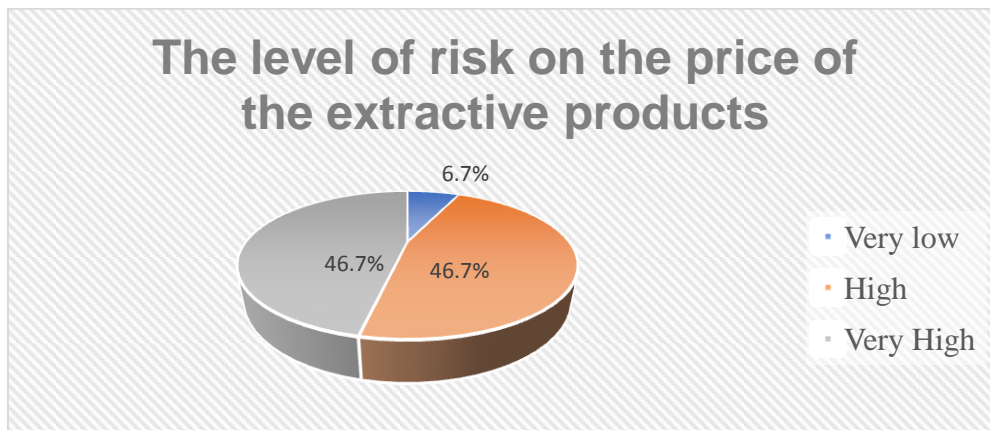
EWURA as a regulator has a good monitoring and control of the Tanzanian petroleum product price setting system. EWURA has developed a petroleum products price setting rules which provide a pricing formula for computing the petroleum products prices.

The formula is composed by: [1] FOB price, [2], the price of the products for each cargo is based on the monthly average price of the products as published by Platts. [3] Premiums, [4] Local charges fixed in the formula based on various legal provisions that impose a charge in importation or in doing business in the petroleum sub-sector. [5] Government taxes, i.e., including an excise duty, fuel levy, petroleum fees as provided in the Finance bill.

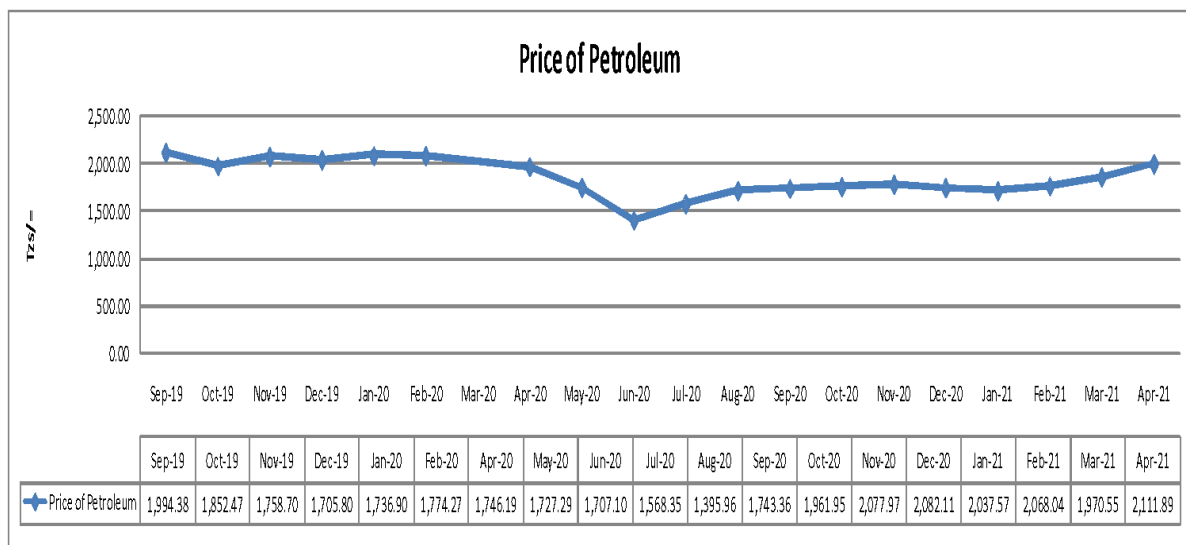


Graph 7. Trend of rate of change of price of gold from September 2019-April 2021

Source: Bank of Tanzania, Website, 2021



Graph 8. The level of risk on the product prices of the extractive sector
 Source. HR Field Work Survey 2020



Graph 9. Trend of Tanzania petroleum price from January/2019-April/2021
 Source: EWURA website

Graph 3 presents the trend of Tanzania petroleum price movements from September 2019 to April 2021, that is, the period before and during the Covid-19 pandemic. Graph 3 shows that the domestic Tanzania petroleum prices were declining from Tshs 1994.38 per litre in September 2019 to lowest at about Tshs 1568.35 per litre in June 2020. Thereafter, the Tanzanian petroleum prices increased reaching at about Tshs 2111.98 per litre in April 2021. After falling sharply during the early months 2020 of the pandemic, petroleum prices began advancing at the end of April 2020. Producer prices for crude petroleum partially recovered from April to June, and import prices recorded a similar recovery from April to July. The price upturn began with a supply decrease, with a positive shock to demand eventually contributing as well.

Graph 4 present flow variables, i.e., rate of change of Tanzania petroleum prices before and during the pandemic. The graph shows the speed and directions of the Tanzania petroleum prices movement. Graph 4 suggests that Tanzania experienced stable but negative rate of petroleum price changes from September 2019 to the minimum rate at negative rate of change at 20 percent in June 202. Thereafter, the domestic Tanzanian petroleum prices jumped and then started to increase and maintained low and positive rate of price changes.

Graphs 3 and 4 suggest that the global effects of the Covid-19 pandemic to oil and gas product prices in 2020-2021 were transitory and reformatory, i.e., first blowing to the already-disturbed oil and gas market prices and then

recovering with significant positive upswings, [25]. EWURA has significant and effective price regulatory powers when the global petroleum product prices are going down but when global prices are increasing domestic price automatically adjust and follow global prices.

The Covid-19 pandemic plunged the weak global oil price which was a direct consequence of an oversupply of fuel and a declining demand for fuel amidst travel restrictions and economic lock downs during the first half of 2020. Oil prices were dropping due to failed agreements on production cuts and the need for chemicals and refined products slowed from industrial slow-downs and travel restrictions in the wake of this global pandemic, [24]. At that bottom or minimum price levels, the global economies learnt that pure oil price risk was a category of price risk that cannot be controlled by market forces alone. Joint international market systems efforts and collaborations were needed and became important in halting negative trends i.e., low oil and gas prices. At that particular point, there were no opportunities for individual firms or organization gains or profits when pure risk was involved. In many cases, pure risks are generally prevalent in situations such as natural disasters, fires or death and humans have brains to survive, transform and return to normal life.

There are views that decreasing and lower domestic oil and gas prices led to increasing and high demand and shifts from use of traditional fuel wood to modern energy forms such as gas in many households during the last twenty months. Other factors that transformed energy demand included tastes and preferences, the composition or size of population, prices of related energy goods, and even expectations. There are other system factors that cause energy transformation, long-term trends and short-term fluctuations. These factors are government policies, laws, regulations, international transactions, speculation and expectation and supply and demand.

Tanzania is also a potential oil and gas producer and exporter. Exploration and production of oil and gas has started but at low levels, intensities and slow rates. Lower and increasing oil product price risks attract fewer investments; explorations; drillings and process activities because most of the new oil drillings the economic activities are unconventional and have higher costs per barrel than a conventional source of oil. Between job losses and capital

losses, dip in oil prices can trim the growth of the global economy. Many junior oil and gas exploration firms have been left the country with no obvious certain sources of financing, during a period in which access to finance might determine their survival in Tanzania. In 2020-2021, the oil and gas sub-sector was characterized by less foreign direct investments, no much emphasis from both governments and non-government agencies on caring and promoting the development of oil and natural gas industry were recorded.

At the global level, oil and gas are evolving and dynamic, [23]. The multinational large scale oil and gas firms are owned, managed and operated by corporate minded-people or institutions with intelligent people, innovative and proactive options. These socio-economic entities have different short, medium and long term plausible solutions given the Covid-19 pandemic. This paper notes that almost all product prices recovered in the third quarter of 2020 following steep declines earlier in the year due to the COVID-19 pandemic. Crude oil prices have doubled since their April low, supported by sharp oil supply cuts by OPEC+, but prices remain one-third lower than their pre-pandemic levels (World Bank, 2020b).

2.7 Extractive Sector Products and Prices Comparative Analysis

2.7.1 Stable rate of change of trend of gold production and price in percentage

The gold supply chain is truly global since gold products are extracted, processed, refined into bars and coins in numerous countries, markets, and distributed far, wide and continuous. The geographical, nationalities and economic dispersion not only bring stability to the gold market, these are also necessary to satisfy supply and demand. Graph 11 compares the rate of change of gold production with price in percentage before and during the Covid-19 pandemic, that is, from January 2019 to February 2021. Graph 12 shows the indexed trend of gold production (Gram) and prices (TZS per Troy Ounce) whereas January 2019=1.

Graphs 11 and 12 suggest that the patterns and rate of change of domestic gold productions and prices in percentage before and during the Covid-19 pandemic were similar or same and stable throughout the sample period. However, there were significant upswings and downswings between April 2019 and July 2019, that is, the

period before Covid-19. This suggests that the movements of production quantities and prices are independent and interrelated to each other. This means that the gold mining sector product prices are influenced by the type of production systems, distribution channels used, the type of market and trade promotion systems utilized used, and the qualities of these products. Wherever processing is risk and expensive, trade and distribution are exclusive, and the product is supported by extensive advertising and promotional campaigns, then prices are likely to be higher. In many cases mineral products can act as substitutes for other product qualities, effective promotions, or energetic selling efforts by distributors in certain markets.

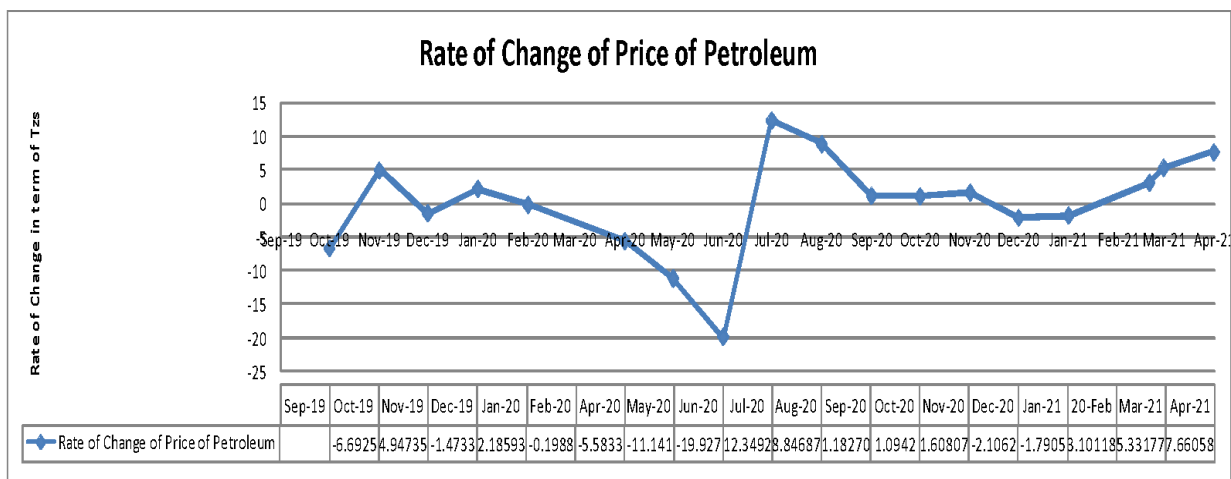
The mineral product quantities and price changes between 2019 and 2021 had the most similar stable quantity and price cyclical, upswings and downswings patterns. Influenced by complex global political, social and economic changes, it resulted to the notion that the world is undergoing a mineral commodity 'large super cycles'. In fact, the cycles were much like any others, only longer, larger and stronger ones were observed during 2010-2014 (Extractive Hub, 2014). Given the Covid-19 pandemic, cyclical downswings were observed, (during January 2020 to April 2020) and upswings (from May 2020 to August 2020) which had also displayed many of the same characteristics as previous cycles, including slower demand growth, squeezed producer margins, reduced exploration and investment and disillusion with the development potential of the resource sector, (World Bank 2020). The reasons for the current price cycles lie in the high volatility of demand for

mineral commodities and the low responsiveness of mines' productions and supplies. The most important interrelated factors included the following;

Firstly, demands for many mineral products are highly sensitive to changes in the rate of economic growth, technological changes and global socio-economic welfare and political systems, (Extractive Hub, 2014).

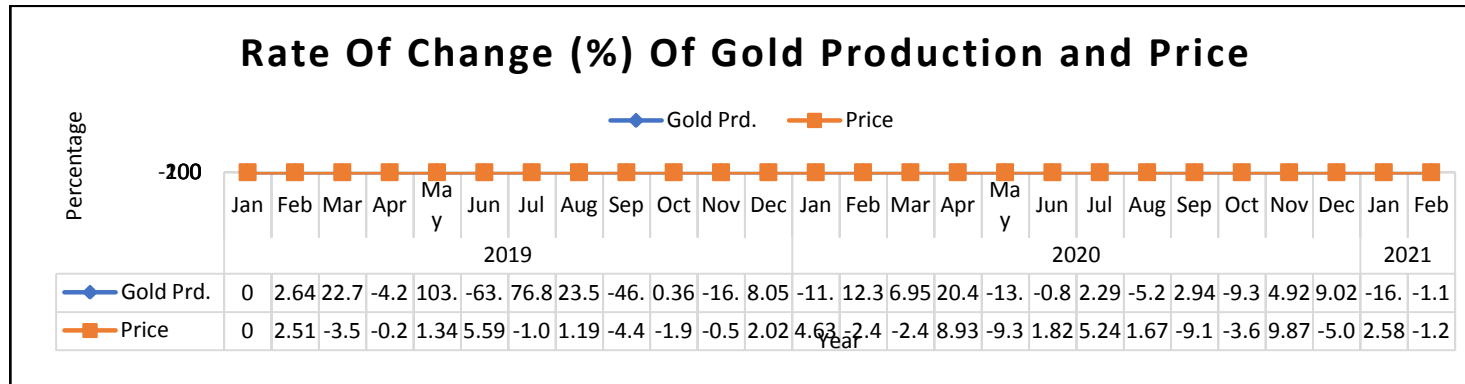
Secondly the reason for demand volatility was the stock-holding behaviour of manufacturers and users of mineral commodities as the major and strategic inputs, (Extractive Hub, 2014). As the global economies accelerate so manufacturers and users build up their stocks of raw materials or intermediate inputs in the anticipation of increased levels of production, adding to the demand for mineral commodities. When global economies slow, manufacturers reduce their stocks of raw materials, suppressing the demand for mineral commodities.

Productions and supplies of desired mineral commodities in many developing nations are typically uncertain, inflexible and producers find it hard to respond to fluctuations in global demands (Extractive Hub, 2014). This inflexibility arises from the fact that mineral commodities are commonly produced at formal large-scale, capital-intensive firms and operations. For the reasons of cost-effectiveness, producers like to run their operations at close to full capacity at all times. Even in the face of weakening demand and prices, the internal economics of their operations may result in producers continuing to produce flat out, weakening prices further.

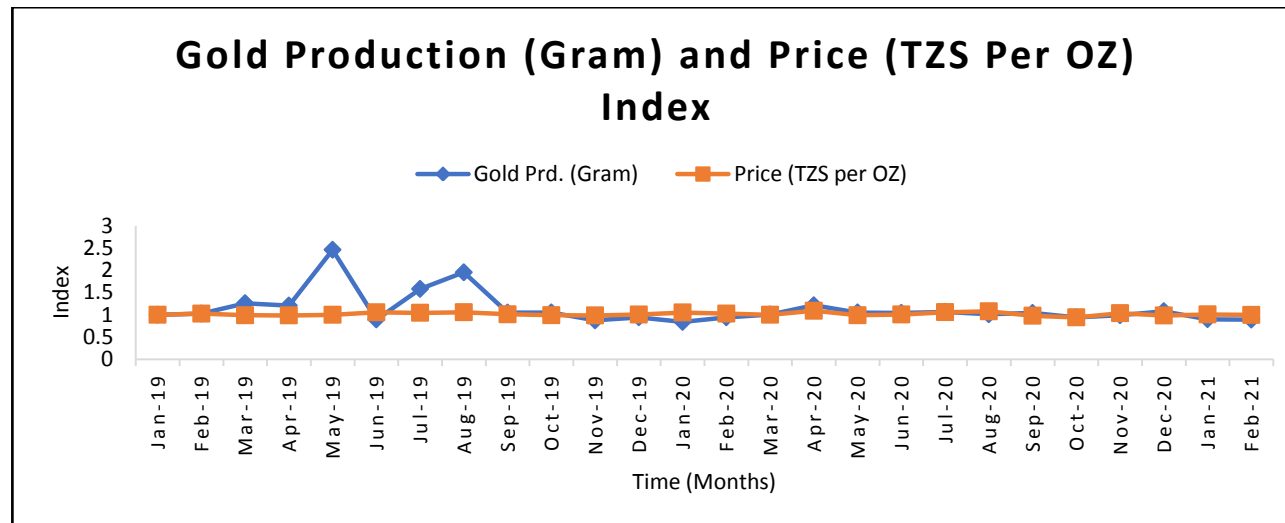


Graph 10. Rate of change of Tanzania petroleum price from September/2019-April/2021

Source: EWURA website, 2021



Graph 11. Rate of Change of Trend of Gold Production and Price in Percentage
 Source: Tanzania Mining Commission and Bank of Tanzania, 2021



Graph 12. Trend of Gold Production (Gram) and Price (TZS per Troy Ounce) in Indices
 Source: Tanzania Mining Commission and Bank of Tanzania, 2021.

Many formal large scale extractive firms are corporate entities and capital-intensive. The capital-intensive nature of mineral production explains another facet of investment, production and market supply inflexibilities – the difficulty in expanding production once all the existing capacity is used up. Most large, capital-intensive extractive projects take a long time to plan, arrange, develop, finance, construct and operationalize (Extractive Hub, 2014). It is common for the new major mines to take seven to ten years from conception to production.

When markets are under supplied and consumers are experiencing shortages, prices rise. This helps ration the available supply to consumers in line with their ability to pay. It also provides an incentive to producers to squeeze out as much production from their existing plants as they can and to invest in new production capacities. However, supply adjustments, both in cyclical downswings and upswings, can be slow and take several years to complete. It may not be an exaggeration to say that the normal condition of commodity markets is in imbalance, with prices most of the time either trending cyclically upwards or downwards.

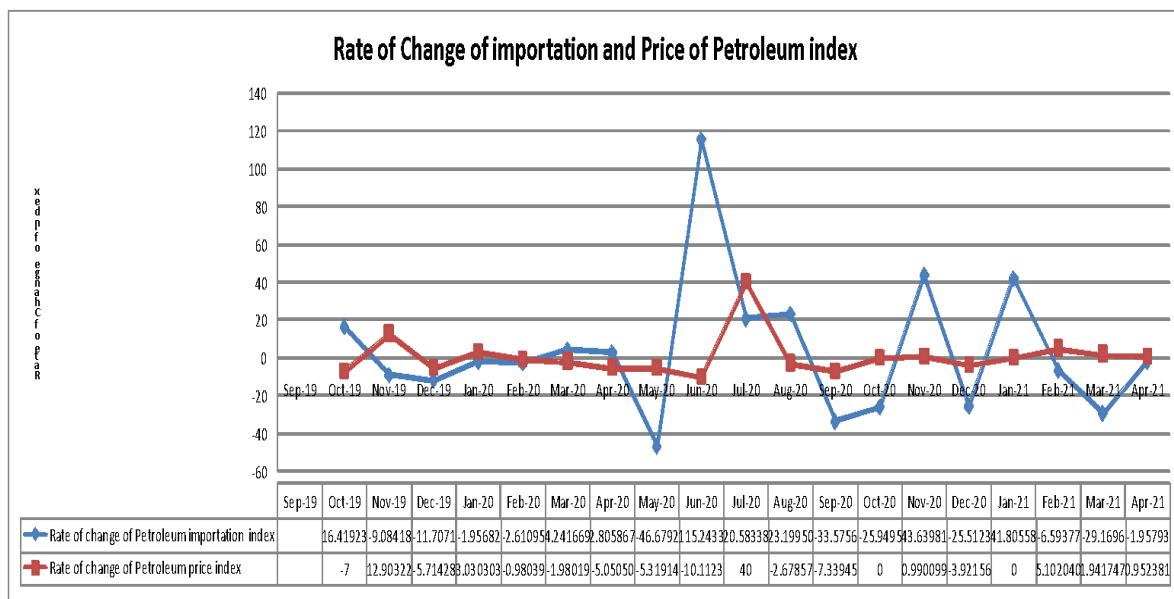
Most significantly, the cyclic nature of prices influences the industry’s attitude towards investing in explorations, extraction, processing, value addition and marketing. Oil and gas companies invest pro-cyclically, meaning that

investment takes place at higher levels when prices are high (Extractive Hub, 2014). But this is correct given only when other investment conditions are palatable and consistent in the long run perceptible.

2.7.2Rate of change of price and importation of petroleum from September/2019-April/2021

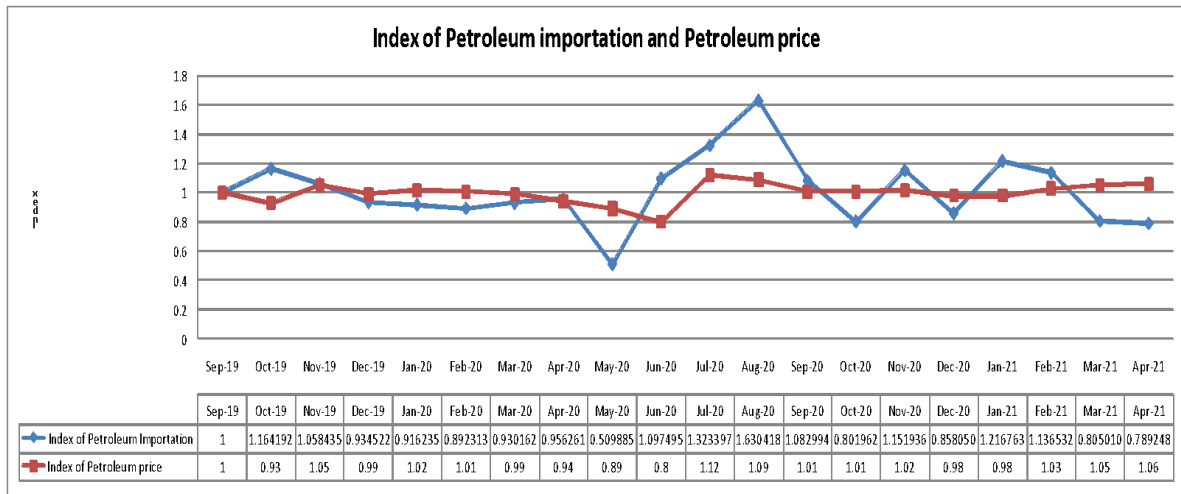
Graph 13 shows the rate of relative changes of prices and quantities imported of petroleum from September/2019 to April/2022, that is, the period before and during Covid-19. Graph 13 suggests that rate of relative changes of domestic prices of imported of petroleum products were relatively stable than the changes in the imported quantities. There were dramatic downswings and upswings during April 2020 and June 2020 of changes in the imported petroleum product quantities, [25].

Graph 14 compares the rate of changes of indexed prices with quantities imported of petroleum from September/2019 to April/2022, which means, the period before and during Covid-19. Graph 14 suggests that the rate of changes of indexed domestic prices of imported of petroleum products were relatively stable than the changes in the indexed imported quantities. There were dramatic downswings and upswings during April 2020 and June 2020 of changes in the imported petroleum product quantities.



Graph 13. Rate of change of price and importation of petroleum from September/2019-April/2021

Source: EWURA, 2021



Graph 14. Index of price and Importation of Petroleum from September/2019-April/2021

Source: EWURA, 2021

Currently, April 2020 –April 2021, price and quantity indices for petroleum products reflect the significant shifts in economic activities complicated by the COVID-19 pandemic in Tanzania. Temporary shocks of demand and then supply pushed prices for petroleum products downward. From April 2020 to April 2021, there were substantial fluctuations of import price indices for petroleum products.

The end of the OPEC–Russia price war coupled with economic re-openings in the United States and abroad, pushed petroleum prices upward from April 2020 to July, 2020. Notwithstanding the rebound, domestic price indices for petroleum products recorded lower levels than those prior to the pandemic. Globally, the period between April 2020 and April 2021 was the period when Covid-19 pandemic petroleum price fluctuations started from the barrel for importers and refiners and extending all the way to the pumps for end consumers, [25].

3. CONCLUSION

3.1 Main Findings

The Covid-19 pandemic has evolved rapidly from a health emergency to a global economic crisis, spreading through the productive sectors, markets and posing growing risks to utilization of resources, and domestic markets. This assessment is based on the small and open macro-economic production model that assumes production systems, employment and product prices are main policy targets, well behaved and endogenous variables; determined

simultaneously in the complex and global social economic systems.

3.2 Risk and Variation Gold Production Patterns

The secondary data analysis shows that the first gold production patterns started to decline during the first Covid-19 wave in 2020 and the pandemic complicated gold production systems and capacities. This started spreading and negatively affecting all other social economic activities, entities and sectors in Tanzania. The COVID-19 pandemic raised uncertainty by compounding existed and multiple risks.

The investors were also likely to be navigating potential portfolio risks including ballooning budget deficits, inflationary pressures and market corrections amid already high equity valuations, [24]. However, the continuation of different forms of lockdown measures couple with the roll out of new Covid-10 vaccines at the end of 2020 fueled optimism that the worst was under control and perhaps over in certain parties of the world.

The second pattern is the period of global social economic recoveries from the Covid-19. The gold mining production started to perform that is, recovering, increasing and reaching highest peak in December 2020. The recovery period during the second quarter of 2020 and good performances of gold during first quarter of 2021 responds to the interaction of the various sectors of demand and supply, which in turn, influenced by the interplay of four key drivers, economic

expansion: risk and uncertainty; opportunity cost and global chain momentum.

3.2.1 Tanzania petroleum importation and supplies have been at risk and affected

The paper found that the trend of Tanzania petroleum importation has been negatively affected with emerging Covid-19 pandemic. The importations of petroleum products into Tanzania have shown decreasing patterns and reaching minimum levels in May 2020 and thereafter it started recoveries with unstable positive huge upswings and downward swings up-to April 2021.

3.2.2 High level of risks and negative effects for human resource and employees

The paper found that there are high level of risks and negative effects for use of human resources i.e., employees with regard to existence of the Covid 19 pandemic. Some got sick, few died and some have lost their jobs due to both the Covid-19 pandemic and corresponding lockdown measures mainly concentrated in the lower income segments in large scale mining companies and in the formal small and medium scale mining firms. Despite the fact that the total number of registered employee Covid-19 cases is unknown and perhaps lower in Tanzania, the country has yet to feel the full implications of the second and third Covid-19 waves in 2021 and 2022.

3.2.3 Stable domestic gold mining product price patterns

The domestic extractive product prices were determined competitively by global extractive product prices, domestic production, and pricing systems, since the government of Tanzania regulates the extractive sector prices. The rate of change gold mineral prices remained constant and stable during the first wave of Covid-19 pandemic 2019/2020 – 2020/2021. The presence and impacts of the first and second Covid-19 wave have had limited effect on both domestic gold mining growth and all product pricing systems. Gold mineral productions in Tanzania are from the large scale production systems with fixed production technological systems

3.2.4 Unstable domestic prices of the oil and gas sector

The majority of consulted key informants and stakeholders expressed that the level of risks and effects on the domestic prices of the oil and

gas sector in Tanzania are high and unstable during the Covid-19 pandemic. The domestic petroleum product prices are affected global petroleum product price changes and changes in the domestic production activities i.e. transport, energy consumption and domestic price setting systems.

The global effects of the Covid-19 pandemic to oil and gas product prices in 2020-2021 were transitory and reformatory, i.e., first blowing to the already-disturbed oil and gas market prices and then changing with significant positive upswings. EWURA had significant and effective price regulatory powers when the global petroleum product prices were going down but when global prices were increasing domestic price automatically adjusted and followed global prices.

3.2.5 Stable, similar and predictable changes of domestic gold production quantities and prices

The patterns and rate of change of domestic gold production quantities and prices in percentage before and during the Covid-19 pandemic were interrelated or similar and stable throughout the sample period. This confirms the fact that gold mining sector product prices are influenced by the type of global production systems, distribution channels used, type of market and trade promotion systems utilized used, and the qualities of these products.

3.3 Policy Implications and Recommendations

COVID-19 continues to have potential negative social economic effects in almost all nations, activities, sectors and actors even though many countries are reopening and recovering from this pandemic. There are must be well-established, appropriate and effective policies for controlling lock-downs in all economies, and their policies effects on businesses, markets, and supply chains, and how effectively and efficiently economies can stabilize. The general objectives are maximization of private sector incomes, effective uses of many workers; and ensuring that domestic product price systems are efficient and stable.

The specific objectives are ensuring stable and increasing gold production activities; maintaining optimal petroleum importation and supplies; optimal uses of human resource, employment and labour productivity; stable domestic gold mining product and price patterns; stable, fair

and competitive domestic prices of the oil and gas sector; and ensure continued price and quantity stabilities. The specific objectives and strategies in combating negative effects and risks of the Covid-19 pandemic are as follows;

3.4 Ensured Stable and Increasing Gold Production Activities

Tanzania has to continue to attract and enable the foreign and local private sector firms to take the lead in exploration, extraction, processing, mineral beneficial and marketing. The specific objective is to increase the gold mineral sector's contribution to the GDP and stabilize and protect gold production systems and capacities, [26]. *This can be achieved by optimal human resources utilization* by [1] strengthening management of safety, occupational health and environment in mining activities, [2] ensuring that all stakeholders continue to provide education on occupational health and safety; in particular Covid-19 to all miners and their surrounding communities, *and* [3], embarking on economic expansion; risk and uncertainty management, minimize opportunity cost and integration of domestic gold chains into the global chain momentum.

3.4.1 Maintained optimal petroleum importation and supplies

As net petroleum importing nation; Tanzania must have an objective of maintaining optimal petroleum importation and supplies into the country, [27]. This can be achieved through [1] enhancing availability of reliable and affordable supply of petroleum to the domestic market and its use in a sustainable manner, [2] promoting domestic use of petroleum resource to accelerate socio-economic transformation; [3] ensuring prudent management of petroleum resources and accrued revenue for the lasting benefits to the society and [4] ensuring a balance between domestic and export of petroleum supplies

3.4.2 Optimal use of human resource, employment and labour productivity

Optimal use of human resources is a strategic policy objective. These objectives can be attained by enhancing the capacity of the domestic private sector production in creating new and health employment opportunities. Tanzanians must have a priority of putting in

place conducive and enabling environment to promote growth of the private sector and transformation of the informal sector into formal extractive sector. The continuity of implementation of Occupational Health and Safety management systems at work places, leading to establishment of effective programs to mitigate OHS in the employment sector. Social distance and other lockdown measures suggest the need to enhance technical, information and communication skills and competencies for those in the extractive sector

3.4.3 Stable domestic gold mining product and price patterns

Stable domestic gold mining product and price patterns demand reliable, stable, and efficient production and marketing systems, [26]. In turn, reliable, stable, and efficient marketing system promotes the growth of both local and international markets, and increases foreign earnings and Government revenue. Tanzania has a liberalized mineral marketing arrangement and established formal marketing system. However, export and local mineral markets need to be further developed to facilitate minerals trading to meet global production and market conditions and standards. This paper suggests the need to promote and develop an efficient domestic marketing system of minerals so as to ensure that miners get right values of minerals traded in formal markets. This will be possible only if the government provides competitive and predictable fiscal regime for the mineral sector and the government harmonizes taxes and tariffs on minerals produced in the country to ensure that they are globally competitive

3.4.4 Stable, fair and competitive domestic prices of the oil and gas sector

The paper suggests the need for having stable, fair and competitive domestic prices of oil and gas sector, [27]. This can be achieved by ensuring that importation of petroleum products in the country is effectively and efficiently coordinated. Since Tanzania has vast energy resources, there is a need for developing these resources so as to adequately meet domestic energy demand and facilitation of energy trading with objectives of enhancing energy efficiency and conservation in all sectors; and optimizing benefits to the Government and the people of Tanzania through strategic participation, interventions and equitable benefit sharing;

3.4.5 Ensure continued price and quantity stabilities

Tanzania relies on oil, gas and mining to boost economic recovery and resilience and protect the poorest and most vulnerable, such as those working in artisan and small-scale mining during the Covid-19 pandemic, [26,27]. Extractive industries involve the extraction of metals, minerals, aggregates, oil and gas from the earth. Extractive processes include mining, dredging, quarrying and drilling. Extracted resources are processed and produced in different ways, and are used in various industrial and consumer products. Other activities in the extractive industry could include; trading, transport, storage and supply management.

The extractive industries have numerous economic, environmental and social responsibility challenges given Covid-19 pandemic, [26]. The paper considers the specific challenges to include maintaining optimal utilization of human resources and employment conditions in the country when faced with risks related with the Covid-19 pandemic. This paper suggests the need for ensuring continued prices and quantity stabilities in the extractive sectors in Tanzania. Given its position in the global context, Tanzania has to manage her natural resource wealth efficiently, effectively, equally and sustainably, in a way that contributes to sustainable social economic development and minimize abject poverty.

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

COMPETING INTERESTS

Author has declared that no competing interests exist.

REFERENCES

1. Chacha Peter, Kirui Bernard, Verena Wiedemann. The Short-term Impact of the

- COVID-19 Shock on Employment in Formal Firms in Kenya. C-19 Note ERG 7873 | Mar2021 in the Private Enterprise Development in Low Income Countries (PEDL) programme, a joint initiative by Centre for Economic Policy Research (CEPR) and the UK Foreign, Commonwealth & Development Office (FCDO). London, UK; 2020.
2. World Health Organization, (WHO) (2020a). Coping with stress during the 2019-nCoV outbreak, WHO, Geneva, https://www.who.int/docs/default-source/coronaviruse/coping-with-stress.pdf?sfvrsn=9845bc3a_2 (accessed on 23 March 2020). WHO Headquarters in Geneva; Avenue Appia 20, 1211 Geneva
 3. World Health Organization (WHO), (2020b). Mental Health and Psychosocial Considerations during the COVID-19 Outbreak, 18 March 2020. World Health Organization; WHO Headquarters in Geneva; Avenue Appia 20, 1211 Geneva
 4. International Financial Corporation. Impacts of COVID-19 on the Private Sector in Fragile and Conflict-Affected Situations"; World Bank Group, Washington, USA;2020.
 5. Edmund S. Phelps, ed. Microeconomic Foundations of Employment and Inflation Theory. New York, Norton and Co;1970.ISBN 0-393-09326-3
 6. Blanchard, Olivier. *Macroeconomics*, 2nd ed., Chap. 3.3. 2000;47. Prentice Hall, ISBN 0-13-013306-X.
 7. Papanikolaou D, Schmidt LDW. Working remotely and the Supply-side Impact of Covid-19 (Working Paper No. 27330; Working Paper Series).National Bureau of Economic Research. <https://doi.org/10.3386/w27330>; National Bureau of Economic Research, 1050, Massachusetts Avenue, Cambridge, Ma 02138;2020.
 8. Semboja Haji Hatibu Haji. Concept of risk and Risk Management". Lecture Notes for postgraduate masters in economics, monitoring and evaluation courses. University of Dar es Salaam. Dar es Salaam-Tanzania;2014.
 9. Semboja Haji Hatibu Haji (2020) "*Situation Analysis of the Extractive Industry Sector and Covid-19 in Tanzania*. A policy research report commissioned, financed and submitted to HakiRasilimali, (HR); Dar es Salaam, Tanzania.

10. Arvanitis Y, Weigert M. Turning resource curse into development dividends in Guinea-Bissau. *Resources Policy*. 2017;53:226-237.
11. The United Republic of Tanzania Ministry of Minerals Mining Commission, (URT, MC) (2020): Annual Report 2018/2019; The Mining Commission HQ; Kikuyu Avenue, P.O Box 2292, Dodoma, Tanzania.
12. United Nations, (UN). Promoting Mineral Clusters: The Case of Tanzania; United Nations, Economic Commission for Africa. Menelik II Ave. P.O. Box 3001, Addis Ababa, Ethiopia; Telephone: 251-11-544-5000;2008.
13. Thomas R. Yager. "2015 Minerals Yearbook"; The Mineral Industry of Tanzania: U.S. Department of the Interior, Geological Survey. Headquarters; 12201 Sunrise Valley Drive Reston, VA 20192, USA;2019.
14. United Republic of Tanzania, (URT). The National Petroleum Policy of Tanzania. Draft Policy, Ministry of Energy and Minerals Dar es Salaam, Tanzania; 2014.
15. World Gold Council. "*Investment Updates: Rates pose risks but also unlock opportunities for gold*", <https://www.gold.org/goldhub/about-goldhub>. World Gold Council - Head Office; 7th Floor, 15 Fetter Lane, London EC4A 1BW, United Kingdom; 2021a.
16. World Gold Council . Investment Update - Beyond CPI: Gold as a strategic inflation hedge. www.gold.org/goldhub/research/beyond-cpi-gold-as-a-strategic-inflation-hedge, World Gold Council - Head Office; 7th Floor, 15 Fetter Lane, London EC4A 1BW, United Kingdom;2021b.
17. World Gold Council. Gold Market Commentary" <https://www.gold.org/goldhub/research/gold-market-commentary-march-2021>; World Gold Council - Head Office; 7th Floor, 15 Fetter Lane, London EC4A 1BW, United Kingdom;2021c.
18. Simiso M. Covid-19: Challenges and Opportunities for the Diamond Mining Sector in Zimbabwe: Centre for Natural Resource Governance (CNRG); No. 10 Fenella Road; Monavale, Harare; 2020.
19. Energy and Water Utilities Regulatory Authority, (EWURA). *Annual Report for the Year Ended, 30th June 2020,* United Republic Of Tanzania Ministry Of Water; The Energy and Water Utilities Regulatory Authority (EWURA) Head Quarters are located in Dodoma City at EWURA House, Plot No 3, Block AD, Medeli West. P.O Box 2857, Dodoma;2020.
20. World Health Organization (WHO). COVID-19 strategic preparedness and response (SPRP). Monitoring and evaluation framework [updated 5 June 2020]. Geneva: WHO; 2020. Available from: <https://www.who.int/publications-detail/monitoring-and-evaluation-framework-2>; WHO Headquarters in Geneva; Avenue Appia 20, 1211 Geneva; 2020c.
21. Jean-Victor Alipour, Oliver Falck, Simone Schüller. "*Germany's Capacities to Work from Home*": CESifo Working Papers ISSN 2364-1428 (electronic version) Publisher and distributor: Munich Society for the Promotion of Economic Research - CESifo GmbH The international platform of Ludwigs-Maximilians University's Center for Economic Studies and the ifo Institute Poschingerstr; 5, 81679 Munich, German;2020.
22. Erik Brynjolfsson John J. Horton, Adam Ozimek, Daniel Rock, Garima Sharma, Hong-Yi Tu Ye..COVID-19 and Remote Work: An Early Look at US Data. Working Paper 27344, <http://www.nber.org/papers/w27344>, National Bureau of Economic Research, 1050, Massachusetts Avenue, Cambridge, Ma 02138; 2020.
23. Hassan TA, Hollander S, van Lent L, Tahoun A. Firm-level Exposure to Epidemic Diseases: Covid-19, SARS, and H1N1 (Working Paper No. 26971; Working Paper Series). National Bureau of Economic Research: <https://doi.org/10.3386/w26971>; National Bureau of Economic Research, 1050, Massachusetts Avenue, Cambridge, Ma 02138; 2020.
24. Baffes John, Kose M. Ayhan, Ohnsorge Franzisja. The great plunge in oil prices: causes, consequences, and policy responses. January 2015; SSRN Electronic Journal; 2020.SSRN; 1239 University Ave, Floor 2; Rochester, NY 14607; Office Phone: 212 448 2500
25. Kevin M. Camp, David Mead, Stephen B. Reed, Christopher Sitter, and Derek

- Wasilewski, "From the barrel to the pump: the impact of the COVID-19 pandemic on prices for petroleum products. Monthly Labor Review, U.S. Bureau of Labor Statistics;2020.
<https://doi.org/10.21916/mlr.2020.24>
26. The United Republic Of Tanzania. The Mineral Policy of Tanzania. Ministry of Energy and Minerals, Dar es Salaam, Tanzania;2009.
 27. The United Republic of Tanzania. National Energy Policy. Ministry of Energy and Minerals, Dar es Salaam, Tanzania; 2015.
 28. Brunnermeier M, Krishnamurthy A. Stick, Carrot, and Evergreen Loans: A Policy Proposal to Save Small and Medium-sized Firms." Pro-Market blog, University of Chicago Booth School Business and Economics for Inclusive Prosperity (Econfip). Chicago, USA;2020.
 29. International Energy Agency. Global Energy Review 2020: The impacts of the Covid-19 crisis on global energy demand and CO2 emissions. International Energy Agency, 9 rue de la Fédération, 75739 Paris Cedex 15, France;2021.
 30. Mark C, Tundu A. Lissu. A Golden Opportunity? How Tanzania is failing to Benefit from Gold Mining; Dar es Salaam, Tanzania;2008.
 31. United Republic of Tanzania, (URT). Speech by the Minister of Finance and Planning, Hon Dr Philip I. Mpango (MP), presenting to the National Assembly; the estimates of government revenue and expenditure for 2020/21: Ministry of Finance; Dodoma, Tanzania; 2020.

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