The Role of Copper in Zambia

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Abstract. Natural resources stand high on the agenda of a number of Regional Economic Communities (RECs) in Africa (AfDB, 2013). Resource-rich countries usually depend on single main export product. Zambia being a member of both COMESA and SADC as two RECs in Africa has copper reserves of roughly 20 million tons and is the second largest copper producer in Africa. 70% of country's foreign exchange revenue is coming from copper. When copper prices fall on world markets, this means lower convertible currency earnings for Zambia. Zambia's dependence on copper makes the country vulnerable to commodity price fluctuation and external shocks. Diversification of the Zambian economy from dependency of copper and development of other industrial sectors could bring economic growth, more stability and create new opportunities for the economy in the future. The objective of this paper is to map and analyse the current relevant export-related status quo of Zambia as a member of COMESA and SADC based on the raw material basis of Zambia, with an emphasis on its current and potential future extraction of copper, and diversification on mind.

Keywords: Common Market for Eastern and Southern Africa (COMESA), Southern African Development Community (SADC), Zambia, International Trade.

JEL classification: *F 14, O 55, O 57*

1 Introduction

In line with the so-called enthusiasm for resource-based growth, exports from Africa to the rest of the world have narrowed down primarily to certain commodities, mainly oil, minerals and copper ores. Exports from Africa are limited by low diversification and high dependence on primary products depending on the region (Čerňák, 2017).

The universal belief that mineral production and export led to economic growth and economic welfare was not confirmed in Zambia (UNCTAD, 2017).
The Central African Copperbelt is the largest copper and cobalt resource in the world (Prosper Africa Factsheets, 2022) and copper mining transformed the Copperbelt industrial zone into one of the most developed areas of Zambia and Africa in general. But in the 1970s the mining industry experienced serious troubles as the price of copper fell drastically (Čerňák, 2018). Zambia (as member of both COMESA and SADC) has copper reserves of roughly 20 million tons and is the second largest copper producer in Africa. When copper prices fall on world markets, this means lower convertible currency earnings for Zambia. The country had to deal with huge problems every time there was a significant fall in copper prices on world markets (Čerňák, 2021). This situation was repeated in 1990, 2000, 2008, 2009 (see **Fig. 1**).

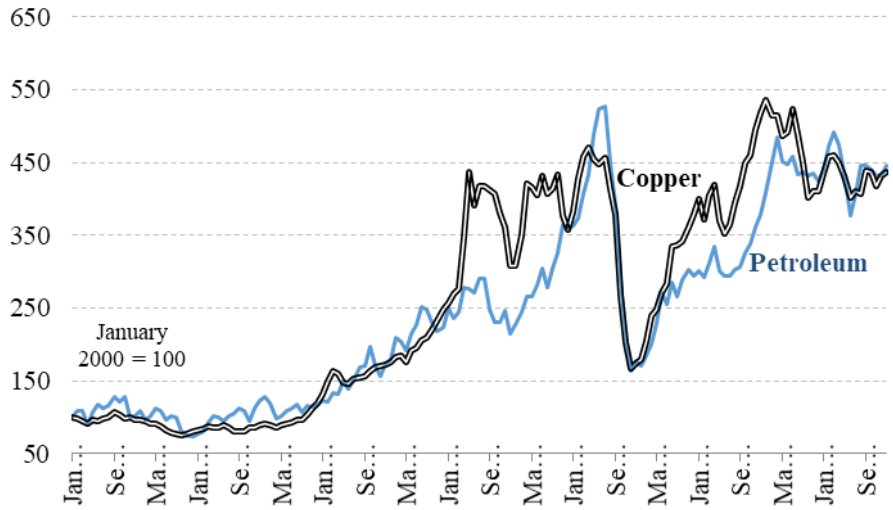

Fig. 1. Copper price index and petroleum price index (January 2000 = 100). Source: AfDB (2013).

The term "spillover" varies in spelling and meanings. In contrast with a different study applying the term "(fundamentals-based) contagion" as the "one where the immediate cause of the spread of contagion is real fundamental connections among countries based on economic links", the study by Mukerji (2018) replicates the definition with the use of the term "spillover" instead of the term "contagion" to indicate the "spread of trends from one country to the other. These trends do not necessarily lead to crises and could be either positive or negative.". For Mukerji (2018) trade and financial links are "potential transmitters of spillovers across countries": volatility spillovers (financial links) and growth spillovers (trade links). The vulnerability index and its two elements (international links and domestic economic fundamentals) for the 1980s, the 1990s and the 2000s calculated by Mukerji (2018) show "the importance of international linkages, as the source of vulnerability, rising steadily. In the 1980s only one-fourth of above average vulnerability countries

also had an above average international links component, compared to about half in the 1990s and, an overwhelming, two-thirds in the 2000s!". Zambia is one of the countries where the international link values in the vulnerability index were higher than the average values in the 1980s (Average: 15.7; Zambia: 163.3), the 1990s (Average: 32.9; Zambia: 183.6) and the 2000s (Average: 50.9; Zambia: 205.6).

The rapid run-up in metals prices through 2011 (see **Fig. 1**) led in southern Africa to both private and public investment in mining and petroleum. This related mainly to copper: "Soaring prices increased copper export earnings more than tenfold, from $518 million in 2003 to $6.5 billion in 2011," (UNCTAD, 2017) and Zambia's total FDI stock of FDI increased from $4.7 billion to $8.4 billion in that period (UNCTAD, 2017). "According to a study by the World Bank (2011), in 2010, when copper accounted for over 85% of the value of exports, royalties accounted for only 2.6% of government revenue and mining taxes accounted for only 3-5% of Zambia's export revenue, which is incomparably less than 25-40% in the rest of the world" (Čerňák and Čiderová (2022).

FDI flows into Zambia are highly concentrated in mining with very limited linkages to other sectors. Although the abundance of natural resources partly explains the high concentration of FDI in the extractive sector, it is also a reflection of the fact that government policies tend to strengthen the sector's comparative advantage (Čerňák, 2021). The objective of this paper is to map and analyse the current relevant export-related status quo of Zambia as a member of COMESA and SADC based on the raw material basis of Zambia, with an emphasis on its current and potential future extraction of copper, and diversification on mind.

This paper is an output of the research project VEGA No. 1/0777/20 and results from scientific research consultations at the University of Economics in Bratislava, Slovakia, and the Cape Peninsula University of Technology, South Africa, in the framework of Erasmus+ funding. After Part 1 Introduction, brief review of fundamental trade-related concepts (in line with the vulnerability index in Part 1 Introduction) follows in Part 2 Literature Review. Part 3 Methodology explains the methods, which were applied, and Part 4 presents the results. Discussion and conclusions follow next.

2 Literature Review

Foreign trade as a part of the sphere of circulation of goods, which represents exchange with foreign countries, consists of two components – export and import. It relates exclusively to one country or a group of countries and the rest of the world. International trade includes foreign trade of several countries and world trade is a summary of foreign trade of all countries participating in the global division of labor. The commodity structure of foreign trade reflects the economic structure, so exports are dominated by goods that are produced in the country, and imports are finished products, raw materials, or parts produced within the international specialization of production. The commodity structure of foreign trade plays a role in its territorial structure because countries are linked in their foreign trade to those countries with which they mutually satisfy their needs of certain goods (Lipková, 1998). "In general, as a result of an increase in exports a country's GDP grows, which in turn creates an

impulse for domestic consumption and higher imports, while a sharp growth of imports can occur due to insufficient capacity of domestic production to cover extraordinary demand, as we registered in the case of widespread massive demand for certain goods caused by the outbreak of the COVID-19 global pandemic." (Zábojník and Čiderová, 2020). Theories have been developed over the years to outline strategies for diversifying economies away from dependency on one or more natural resources (see **Table 1**).

Table 1. Membership in African Regional Economic Communities SADC and COMESA. Source: Čiderová, Repášová, Kovačević & Šimorová (2013), p. 49; COMESA; SADC; UNCTAD and FAO (2017).

Regional Economic Community	**Southern African Development Community (SADC)**	**Common Market for Eastern and Southern Africa (COMESA)**	**Commodity Import Dependence (1995-2014)**	**Commodity Export Dependence (1995-2014)**
Headquarters	Gaborone (Botswana)	Lusaka (Zambia)	UNCTAD and FAO (2017)	
Members	**16**	**21**		
Angola	yes	no	Low	High
Botswana	yes	no	Low	High
Burundi	no	yes	Low	High
Comoros	**yes**	**yes**	High	High
Djibouti	no	yes	High	High
DRC	**yes**	**yes**	High	High
Egypt	no	yes	Low	Low
Eritrea	no	yes	High	High
Eswatini	**yes**	**yes**	High	Low
Ethiopia	no	yes	Low	High
Kenya	no	yes	High	High
Lesotho	yes	no	Low	Low
Libya	no	yes	Low	High
Madagascar	**yes**	**yes**	Low	Low
Malawi	**yes**	**yes**	Low	High
Mauritius	**yes**	**yes**	High	Low
Mozambique	yes	no	High	High
Namibia	yes	no	Low	High
Rwanda	no	yes	Low	High
Seychelles	**yes**	**yes**	High	High
Somalia	no	yes	High	High
South Africa	yes	no	Low	Low
Sudan	no	yes	Low	High
Tanzania	yes	no	-	-

Tunisia	no	yes	Low	Low
Uganda	no	yes	Low	High
Zambia	**yes**	**yes**	Low	High
Zimbabwe	**yes**	**yes**	Low	High

Economic diversification has two dimensions – domestic and external, where the external dimension is the international trade (Papageorgiou and Spatafora, 2012). The difference between the value of exports and imports (trade balance) can be active if exports exceed imports, or passive if imports exceed exports. In order to quantify comparative advantages (in theory) in terms of exports and imports (in practice) it is possible to apply the analogy of the trade balance (in the form of a relative trade advantage, *Relative Trade Advantage* – RTA) as a difference of a relative export advantage (*Relative Export Advantage* – RXA) and a relative import advantage (*Relative Import Penetration Advantage* – RMA). The *RXA* indicator has been established in literature since 1965 as the *Revealed Comparative Advantage* (RCA) or the so-called *Balassa Index*, which compares representation of the i-th commodity in the j-th country's export (xij) in the j-th country's total export (Xj) on the one hand (i. e. in the numerator of the fraction) with the representation of the i-th commodity in world exports (xiw) in total world exports (Xw) on the other hand (i. e. in the denominator of the fraction):

$$RCA = (xij/Xj) / (xiw/Xw) \quad (1)$$

xij = export of the i-th commodity of the j-th country
Xj = total export of the jth country
xiw = world export of the i-th commodity
Xw = total world export

The page limit of this paper does not allow to examine the *RTA* indicator or the *RMA* indicator and the paper only refers to the RCA indicator in Part 2 Literature Review, Part 3 Methodology and Part 4 Results and discussion.

3 Methodology

The objective of this paper is to map and analyse the current relevant export-related status quo of Zambia as a member of COMESA and SADC based on the raw material basis of Zambia, with an emphasis on its current and potential future extraction of copper, and diversification on mind.

"Exporting countries should pay attention to the fact that from the perspective of the commodity structure of foreign trade exchange their focus on a limited range of commodities may expose them to turbulences on the demand side. From the perspective of the territorial structure of the foreign trade exchange of an exporting country its focus on a limited range of countries to which its exports are directed

could be subject to the economic cycle in these countries, which was also manifested during the COVID-19 global pandemic." (Zábojník and Čiderová, 2020). A suitable method of examining the effectiveness of foreign trade, according to Michník (1998) is to compare the results achieved on the basis of a suitable set of indicators, especially from the point of view of:
- individual types of goods (in this paper Harmonized System – HS commodity groups: 25, 27, 28, 72, 74 relevant to Zambia),
- individual territories (in this paper in the context of Zambia both COMESA and SADC are considered),
- in relation to the world level.

In Part 1 Introduction and in Part 2 Literature Review we mentioned comparative advantages. Zábojník, Čiderová and Krajčík (2020) state that measuring comparative advantages is not easy at all in practice and point out that a method measuring the comparative advantage based on ex-post international trade data in the form of the most common and well-known RCA index is used: A country with RCA>1 (a revealed comparative advantage) for product i is interpreted as a competitive producer and exporter of that product relative to any country producing and exporting the same product at or below the world average (UNCTAD).

The main methods in our scientific statistical data as well as scientific and professional studies of the WORLD BANK and the INTERNATIONAL research were analysis and synthesis of available MONETARY FUND, UNCTAD, FAO, official documents Republic of Zambia Vision 2030 and Speech of the Minister of Finance and National Planning of Zambia Dr. Musokotwane in the National Assembly of Zambia on 30 September 2022.

4 Results and discussion

Between 2020-2022:
- total exports of Zambia to the world as % of world exports;
- total exports of Zambia to COMESA as % of Zambia's exports;
- total exports of Zambia to SADC as % of Zambia's exports;
- total exports of COMESA to the world as % of world exports;
- total exports of SADC to the world as % of world exports remained stable (see **Table 2**).

Cumulative HS commodity groups 25, 27, 28, 72, 74 represent:
- between 12.8% and 20.8% of world exports;
- between 80.9% and 82.9% of total exports of Zambia to the world;
- between 36.5% and 57.3% of total exports of COMESA to the world;
- between 34.7% and 45.6% of total exports of SADC to the world.

Table 2. Exports of Zambia, COMESA and SADC in the global context.
Source: own calculations based on ITC TradeMap database (2023) data.

000 US$	**Territory**	**2020**	**2021**	**2022**
All products	**World**	17,499,876,321.00	22,138,761,100.00	24,487,201,641.00
Sum of HS: 25, 27, 28, 72, 74	**World**	2,247,006,260.00	3,549,307,164.00	5,101,151,628.00
% of HS: 25, 27, 28, 72, 74	**World**	12.8%	16.0%	20.8%
All products	**Zambia**	8,060,547.00	11,217,517.00	11,689,732.00
Sum of HS: 25, 27, 28, 72, 74	**Zambia**	6,518,759.00	9,303,235.00	9,519,901.00
% of HS: 25, 27, 28, 72, 74	**Zambia**	80.9%	82.9%	81.4%
Total exports of Zambia to the world as % of world exports		0.05%	0.05%	0.05%
Total exports of Zambia to COMESA as % of Zambia's exports		16.13%	14.11%	16.20%
Total exports of Zambia to SADC as % of Zambia's exports		19.79%	18.08%	19.88%
All products	**COMESA total**	98,757,139.00	154,692,740.00	176,794,829.00
Sum of HS: 25, 27, 28, 72, 74	**COMESA total**	36,027,376.00	82,650,684.00	101,291,792.00
% of HS: 25, 27, 28, 72, 74	**COMESA total**	36.5%	53.4%	57.3%
Total exports of COMESA to the world as % of world exports		0.6%	0.7%	0.7%
All products	**SADC total**	159,674,554.00	229,329,874.00	257,917,165.00
Sum of HS: 25, 27, 28, 72, 74	**SADC total**	55,419,351.00	84,707,307.00	117,495,615.00
% of HS: 25, 27, 28, 72, 74	**SADC total**	34.7%	36.9%	45.6%
Total exports of SADC to the world as % of world exports		0.9%	1.0%	1.1%

Individually, HS commodity group 74 (Copper) represents:

- between 0.9% and 1.0% of world exports;
- between 69.5% and 75.8% of total exports of Zambia to the world;
- between 14.6% and 15.8% of total exports of COMESA to the world;
- between 10.2% and 11.0% of total exports of SADC to the world.

The 2022 RCA value of the HS commodity group 74 (Copper) for Zambia is 77.22, which is competitive and the highest Zambia's RCA value when compared with HS commodity groups 25, 28 and 72 (for COMESA it is 16.22; for SADC 11.33). For comparison the 2022 RCA value:

- of the HS commodity group 25 (Salt; sulphur; earths and stone) for Zambia is 14.33 (for COMESA 4.33; for SADC 3.00);
- of the HS commodity group 72 (Iron and steel) for Zambia is 1.22 (for COMESA 0.82; for SADC 1.30);
- of the HS commodity group 27 (Mineral fuels, mineral oils) for Zambia is 0.16 for Zambia (for COMESA 2.04; for SADC 1.67);
- of the HS commodity group 28 (Inorganic chemicals) for Zambia is 2.33 for Zambia (for COMESA 6.67; for SADC 4.56).

Despite the share of the HS commodity group 74 (Copper) reaching from two-thirds to three-quarters of total exports of Zambia to the world, the Government of the Republic of Zambia "set out the goal of expanding Zambian copper production from 800,000 tonnes per year to 3 million, over a decade" (Baskaran and Pearson, 2023) as documented in the Speech of the Minister of Finance and National Planning of Zambia Dr. Musokotwane, National Assembly of Zambia, 30 September 2022:

"In 2022 […] prices of commodities such as copper weakened to an average of US$7,422 per metric tonne in September from US$9,550 per metric tonne in December 2021. …

Madam Speaker, the mining sector continues to be a major driver of the economy, accounting for 17.5% of the GDP and over 70% of foreign exchange earnings in 2021. Production has, however, stagnated at an annual average of 797,000 metric tonnes in the last five years.

Madam Speaker, while our mining output has stagnated, our northern neighbour, the DRC has not only caught up with our production levels, but has gone significantly well ahead of us. Ten years ago, Zambia was producing about 800,000 metric tonnes of copper while that of the DRC was about 400,000 metric tonnes. While we are still at standstill of around 800,000 metric tonnes, DRC has expanded to 1.8 million metric tonnes, which is more than twice our production. All indicators are that it will not be long before they hit close to 2.5 million tonnes. So, when to talk about a target of 3 million metric tonnes ourselves, it is very possible."

Dependence on copper makes Zambia vulnerable to copper price fluctuation and external shocks. Diversification of the Zambian economy from dependence on copper and development of other industrial sectors can bring economic growth, more stability and create new opportunities for the economy in the future as outlined in Zambia's Vision 2030 (see **Table 3**).

Table 3. Republic of Zambia Vision 2030 diversification strategies.
Source: Republic of Zambia Vision 2030.

Sector	Sector Vision	Government Targets/ Goals
Agriculture	An efficient, competitive, sustainable and export-led agriculture sector that assures food security and increased income by 2030	i. Increase agricultural productivity and land under cultivation by 2030; ii. Increase exports of agricultural and agro processed products by 2030; iv. Increase land under cultivation to 900,000 hectares by 2030; v. increasing land under irrigation to 400,000 hectares by 2030; vi. Increase agricultural machinery, tractors per 100 hectares to 2 by 2030; vii. Increase livestock population to 6,000,000 by 2030; viii. Increase fish population to 300,000mt by 2030.
Tourism	Be a major tourism destination of choice with unique features by 2030	i. Develop, rehabilitate and maintain related infrastructure by 2030; ii. Diversify tourism products by 2030; and iii. Increase the participation of locals in the industry.
Manufacturing	Technology based and export focused manufacturing sector, which is dynamic and competitive with effective entities that add value to the locally abundant natural resources by 2030.	i. Develop a fully integrated rural based agro-based and light-manufacturing by 2030; ii. Increase the share of general manufacturing contribution to GDP to 36.12 by 2030; and iii. Increase Manufactures exports as a share of merchandise exports to 71 percent by 2030.
Infrastructure	A well developed and maintained socio-economic infrastructure by 2030	i. Develop and implement public private-partnerships; ii. Achieve affordable and efficient connectivity; iii. Increase GDP contribution.

5 Conclusion

The objective of this paper was to map and analyse the current relevant export-related status quo of Zambia as a member of COMESA and SADC based on the raw material basis of Zambia, with an emphasis on its current and potential future extraction of copper, and diversification on mind.

Economic diversification is a long and not easy process. It depends on several factors. Main factor is implementation of good and well balanced economic policies and their implementations. The policies should be based on investment infrastructure, human resource development and environment. The economic diversification is tightly connected with economic transformation.

Economic diversification can bring economic growth, development of new industrial sectors, introducing a new technologies, reduction of poverty, higher standard of living. It can bring better competitiveness for the products and stronger integration to global economy as well as in the context of regional integration – in the case of Zambia to COMESA and SADC.

Zambia for its own successful economic growth and elimination of the risk of external shocks (documented through the vulnerability index), should take some measures:

(a) Improve the investment climate needed to reduce the capital deficit;

(b) Ensure massive investment in infrastructure, energy and transport;

(c) To improve the competitiveness of their products and bring added value of products originating from the extraction industry;

(d) To maximize the diversification of its own industry, dependent on the extraction industry;

Zambia is a large country with many underdeveloped sectors with big potential to grow in the future.

It is clear that Zambia aims to gradually diversify its economy and focus onto other industrial sectors (energy, infrastructure, telecommunications, agriculture or tourism), which is related to its global approach, in order to dominate the other industries and ensure a more significant economic impact in the region. Based on all these factors we believe that Zambia can successfully accomplish the diversification process and move away from the dependence on the copper industry. In Zambia, the diversification process was gaining the priority more than ever.

It has been confirmed that FDI can play a positive role in the process of increasing Zambia's economic development as well as across the region. They can provide significant amount of financial resources which can be used for developing other sectors for the benefit of the regional value chain. This will depend on several factors of the economic reforms and the ability to pursue its long-term development strategies, in particular to accelerate its own economic growth, to industrialize the economy, to improve the education system and to introduce new technologies.

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