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South Africa's Export Edge: Uncovering Opportunities in Zimbabwe

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Abstract:

This study analyses South Africa's exports to Zimbabwe as explained by the exchange rates, distance, Gross Domestic Products and population. The two countries share strong economic, historic and social ties to the extent that in 1922 Zimbabwe (then Rhodesia) was invited to join the Union of South Africa as a 5th province which it refused through a referendum. The economic and general survival dependency of Zimbabwe on South Africa leaves the former a de facto province of the latter. It is against this background that this study is conducted with the aim of establishing potential levels of South Africa's exports to Zimbabwe and carrying out speed of convergence tests to identify product categories with untapped potential to the symbiotic benefit of both countries. The study is based on 21 product categories. Data on South Africa's exports to SADC countries in the product categories was used to estimate the gravity models that were simulated to establish the respective potential export flows to Zimbabwe. Panel data methods were applied to estimate the gravity models using the random effects procedure as guided by specification tests. The results of the gravity model estimations show that for the product categories under review, South Africa's exports are adequately explained by the independent variables in the models. The speed of convergence test also indicates that there is untapped potential for South Africa's exports in the Zimbabwean markets for many product categories.

Keywords:

Exports, South Africa, Zimbabwe, Gravity Model

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Introduction

The South African economic policy places substantial emphasis on export promotion activities, which focus on identifying new export opportunities in unexploited markets or opportunities for new products in existing markets. To this end, the Department of Trade and Industry (dti) launched the Integrated National Export Strategy (INES) with the aim of attaining the 6% per year export growth target by 2030 as enshrined in the National Development Plan (NDP) (National Planning Commission, 2012). The INES aims to increase South Africa's capacity for exporting diversified and value-added commodities by improving trade and business environment and the competitiveness of companies and sectors. The growth in exports will significantly contribute towards economic growth of the country which is one of the ultimate goals of economic policy of any country. Given the prevailing economic situation of Zimbabwe which leaves the country a net importer and its proximity to South Africa this study seeks to analyze the potential that the former presents to the latter's exporters. The complex, inter-solidarity, multi-dimensionality and inter-sectionality of the crises reflects a chronic polycrisis (Hening & Knight, 2023; Motala, 2023) in which context, imports become a major lifeline.

Zimbabwe has a population of 15 178 957 people (Zimbabwe National Statistics Agency (ZIMSTAT), 2024) and a surface area of approximately 390,000 square kilometers. Over the years Zimbabwe was considered the principal source of grain for Southern Africa as its agro-based economy boomed. However as from the late 1990s, the landlocked Southern Africa country experienced economic hardships characterized by negative growth rates, shrinking of the agricultural sector, and poverty (Hurungo, 2010). The Zimbabwean dollar also lost value so much that in 2008, Z$35 quadrillion (35,000,000,000,000,000) was equivalent to US$1. At around the same time, the country printed its highest bank note worth Z$100 trillion (100,000,000,000,000).

Zimbabwe then dollarized its economy into what the authorities called a multiple currency regime that same year thus loosing seigniorage revenue - profit made by a government by issuing currency, specifically the difference between the face value of notes and coins and their production costs. The protracted crises pushed the country close to being an isolated state with fewer partners as the International Monetary Fund (IMF) and the World Bank also shunned away citing high credit risk reasons. Currently the country relies on dollarization and new local currency called the Zimbabwe Gold Currency (ZiG) which was met with skepticism as it came undermined by such factors like policy inconsistency and selective usage (Nyathi & Mutale, 2025).

However, Zimbabwe remained among South Africa's top five trading partners on the continent and South Africa is the top investor in Zimbabwe (Trading Economics, 2024). Bilateral trade negotiations are also important in sustaining trade between nations. In the case of Zimbabwe and South Africa milestones in bilateral trade arrangements can be traced back to the Trade Agreement between the Government of

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the Republic of South Africa and the Government of Southern Rhodesia (now Zimbabwe) that was signed as early as 1964 and the subsequent Exchange of Notes in 1965, 1982 and 1986 to amend it (Department of International Relations and Cooperation, n.d). Then on the 8th of April 2015 the Memorandum of Understanding between the Government of the Republic of South Africa and the Government of Zimbabwe on Economic and Trade Cooperation was also signed.

In fact, the Zimbabwean economy is currently relying largely on imported commodities as its own industry capacity utilization is quite low and falling – 53.2% in 2023 and 52.5 in 2024 (Confederation of Zimbabwe Industries, 2024) due to a plethora of economic challenges. Kwaramba and Mudzingiri (2016) estimated that 60% of Zimbabwe's imports originate from South Africa. It is this element of complementarity between the prevailing economic situations of the two countries that prompted this study to quantitatively determine and analyze South Africa's export potential to Zimbabwe. Analyzed on a product category level, it is envisaged that the results of this study will highlight potential products that can be successfully exported from South Africa to Zimbabwe. In addition, this study will also assist policy makers come up with effective policies to harness the untapped potential to the symbiotic benefit of South Africa and Zimbabwe.

Literature Review

Theoretical and empirical literature was overviewed briefly. The theoretical literature focused on the international trade theory that forms the bedrock for this. The empirical literature investigated the relevant observed studies that were carried out in the field of international trade to further analyze its patterns and welfare implications paying attention to methodologies followed and the results thereof. Benefits of international trade over autarky were underscored in the process.

Theoretical Literature

Classical Theory of International Trade include mercantilism, absolute advantage, comparative advantage and the Heckscher-Ohlin (H-O) model (Anderson, 2018). The basic feature of the classical theories being that they analyze international trade from the perspective of a country and were developed mainly by economists. Thus, reliance on economic concepts like surplus creation, efficiency and possible specialization at a national level, opportunity cost, the production possibility frontiers and factor endowments of the nations are prominent in the justification of international trade.

Mercantilism is a theory of international trade which postulates that nations should accumulate financial wealth in the form of gold by encouraging exports and discouraging imports. This is one of the oldest theories of international trade with origins dating back to as early as the sixteenth century (Ekelund & Herbet, 1975). Mercantilism assumes there is a finite amount of wealth in the world and that a nation can only grow rich at the expense of other nations. This theory which encourages protectionism was

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criticized because more money was associated with less production, inflation and lower standards of living.

This gave rise to the absolute advantage theory (Smith, 1776). This theory argues that trade between two countries should take place where there is capability of one country to produce more of a product with the same amount of input than the other country. A country should then only produce goods in which it is more efficient and trade for the other goods and this would lead to specialization and welfare benefits. This theory failed to explain and justify trade between two countries like South Africa and Zimbabwe where one country for example South Africa seems to have absolute advantage over the other (Zimbabwe) in many if not all product categories. This does not mean the two countries are better off in autarky which is an economic policy where countries are not open to international trade. This was further explained by David Ricardo in the theory of comparative advantage.

David Ricardo's theory of comparative advantage justifies international trade based on the concept of opportunity cost which is cost in terms of forgone alternatives. Here a country would produce and export a commodity in which it has a lower opportunity cost and import that in which the opportunity cost is higher. Thus, trade will, based on opportunity cost, be beneficial even between countries like South Africa and Zimbabwe where concept of absolute advantage may not provide enough justification.

The weaknesses of the Ricardo's theory were that it assumes an unrealistic degree of specialization and predicts that every country benefit from trade while failing to consider income distribution effects of international trade and the differences in resources among countries (Blaug, 1973). These shortcomings gave rise to the H-O model which explains international trade based on the factor endowments of the countries. The H-O model postulates that trade between any two countries should reflect the differences in factor endowments whereby countries export products that use their abundant factors of production intensively and import those products that use their scarce factors of production intensively. It is also known as the factor endowment theory. It asserts that trade does not necessarily lead to complete specialization and not all countries benefit from international trade all the times as international trade has strong income distribution effects. Here owners of the abundant factors benefit at the expense of owners of the scarce factors of production thus more of a reversal of the status quo in autarky.

The United States of America trade data was used to empirically test the Heckscher Ohlin theory of international trade (Leontief, 1953). Despite the H-O model's convincing explanation of international trade, results of the empirical test were paradoxical and rejected the H-O model resulting in the Leontief paradox. The USA with its abundant capital, exported commodities that were more labor-intensive than capital-intensive, in contradiction with Heckscher–Ohlin theory.

Based on the Leontief paradox and weaknesses of the theories of international trade discussed hitherto, the New Trade Theories (NTT) were put forward (Anderson, 2018). New trade theories emerged upon

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the realization that the classical theories of trade including Mercantilism, Absolute Advantage theory, Comparative Advantage theory and the H-O model concur that it is countries that are less similar which tend to trade more. However, big economies still trade with each other and similarly small economies still trade with each other thus showing that there is trade potential even between both similar and different economies. New trade theories which take a firm or industry-based approach to explaining trade put emphasis on returns to scale, product differentiation, network effects and monopolistic competition as the basis of international trade. Here the country similarity theorem and the product life cycle theory were discussed briefly although there more NTT like the global strategic rivalry theory and the national competitive advantage theory.

The country similarity theory also known as the Linder Hypothesis was developed by a Swedish economist Steffan Linder in 1961 (Linder, 1961). Focusing on the demand side to explain international trade, it states that consumers in countries that are at the same level of development would have similar preferences which determine trade between them more than more than their production costs differences (Akça & Bal, 2021). This firm-based theory explains that firms first produce for the domestic market and export the excess so markets that are like the domestic offer better potential for success. Thus, most trade in manufactured goods was between countries with similar per capita incomes. The theory also helps in understanding trade in products where factors like product differentiation, brand names and product reputation are important in buyers' decision-making process. While Zimbabwe and South Africa might be different in terms levels of income, the two countries are similar in terms of social, historical, political and cultural factor as outlined in the introduction.

The product life cycle theory, a concept with origins in the field of marketing, was developed by Raymond Vernon of the Harvard Business School in the 1960s. He identified three distinct stages in the product life cycle namely the new product stage, maturing product stage and the standardized product stage (Shenkar, Luo, & Chi, 2021). Basically, a new product was manufactured in its country of innovation then exported to other countries. However, as the product progresses to the standardized stage, the bulk of its production will take place in low-cost countries. As such South Africa can export new products to Zimbabwe, leveraging its relative technological and economic advantages. As these products mature and become standardized, production can be shifted to Zimbabwe, taking advantage of lower costs. This aligns with the theory's prediction that production shifts to low-cost countries in the standardized stage (Vernon, 1966). This way, the bilateral trade supports Zimbabwe's industrial recovery while promoting regional trade integration.

Based on the brief review of theories of international trade given above, a basis for international trade is established. The same can also be said about bilateral trade between Zimbabwe and South Africa as trade between the two countries is justified both due to their similarities (NTTs) and their differences (Classical trade theories). Thus, the theories of international trade justify trade between any two

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countries and make it clear that trade yields welfare benefits to both partners and makes them better off than in autarky. However, they cannot answer the question on the size of the potential trade flows between the trading partners which happens to be the subject of this study. The gravity model which was used to quantify South Africa's potential export flows to Zimbabwe empirically relates bilateral trade flows to countries' economic mass and distance between them. This study will apply the gravity model to measure this potential trade flow and then see how it compares with the actual trade. The gravity model is discussed further in the methods section.

Empirical Literature

Numerous studies have investigated bilateral trade, contributing valuable insights to the field. Researchers (Helmers & Pasteels, 2006), (Jordaan, 2015), and (Oguledo & McPhee, 1994) have explored various aspects of international trade, employing methodologies like the gravity model to analyze trade flows and potential. Institutions such as the South African Department of Trade and Industry, the IMF, and the World Bank have also conducted research in this area. This study builds on existing literature by focusing on South Africa's export potential to Zimbabwe, using the gravity model and speed of convergence tests to analyze 21 product categories. Unlike previous studies, this research examines export potential at a disaggregated product level, providing a more nuanced understanding of trade opportunities between South Africa and Zimbabwe.

The empirical literature on bilateral trade establishes a clear methodological foundation. Helmers and Pasteels (2006) and Oguledo and Macphee (1994) demonstrated that gravity models can quantify trade potential, a point reinforced by Jordaan (2015) who augmented the model to assess South Africa's export prospects in Australia and introduced speed-of-convergence tests to gauge how quickly actual flows approach potential levels.

Other studies extend this framework to different markets. The Trade and Industrial Policy Strategies used International Trade Centre (ITC) data to map South Africa's` opportunities in Finland (Trade and Industrial Policy Strategies , 2003). Another study contrasted gravity predictions with trade-intensity indices for Finland and Sweden vis-à-vis Association of South East Asian Nations (ASEAN), highlighting the sensitivity of results to methodological choice (Blomqvist, 1999). Panel-gravity techniques were applied to ASEAN-New Zealand trade, revealing sector-specific untapped potential and underscoring the value of disaggregated analysis (Bano , Takahashi, & Scrimgeour, 2013).

Jordaan, (2011) further refined the approach by employing panel gravity to uncover unexploited chemical-sector trade between South Africa and a range of partners—including Zimbabwe—showing that disaggregated product-level work can expose hidden export opportunities. Together, these contributions converge on a single insight: gravity models reliably estimate export potential, but their results are strengthened when complemented by convergence tests and contextual market analyses.

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Building on these contributions, the present study applies the gravity model and speed-of-convergence tests to 21 disaggregated product categories, aiming to map South Africa's actual and potential export flows to Zimbabwe with greater precision than prior macro- or sector-level assessments. This study departs from most of the previous literature in the sense that it analyses South Africa's export potential to Zimbabwe not in total, not in terms of the broad sectors of the economy but in terms of more disaggregated product categories.

Methods and Data

This section presents the methodological and analytical framework that underpins this study of South Africa's export potential to Zimbabwe. It outlines the gravity model, tracing its theoretical roots from Newtonian gravitation to its modern application in international trade, and highlights how extensions—such as those by Helmers & Pasteels, (2006) and Bergstrand (1985, 1989)—have reinforced its empirical credibility despite early criticisms. The section describes the data sources used to populate the model, including export figures from the Department of Trade and Industry, macroeconomic variables from the IMF and World Bank, exchange-rate series, and distance measures derived from Google Maps, together covering 21 disaggregated product categories. Finally, the section details the panel-data econometric approach adopted for the analysis, explaining the fixed-effects or random-effects specification, how specification tests guided model selection, and how the speed-of-convergence metric was employed to identify unexploited export opportunities. Together, these components provide an empirically grounded investigation of the factors shaping bilateral trade flows between South Africa and Zimbabwe in terms of measuring the former's export potential to the latter by product category.

The Gravity Model

Simply put, the gravity model is an analogy of the Newtonian theory of gravitation where just as planets are mutually attracted in proportion to their respective sizes and proximity, countries trade in proportion to their GDPs and population sizes. However, the resultant trade flows were partially offset by the distance which is analogous to the resistance factor in the Newtonian theory. This model of international trade analysis is known since the seminal work of Tinbergen, (1962).

Helmers and Pasteels (2006) demonstrated that the gravity model can also be used to estimate trade potentials. The gravity model, despite early criticism for its lack of a formal theoretical base, has been defended and extended since the 1970s. Bergstrand (1985, 1989) showed that the model can be derived from monopolistic-competition frameworks—precisely the New Trade Theory that explains why countries trade differentiated products even when they are similar in size. This gives the gravity equation a solid micro-economic foundation, allowing us to treat South Africa's exports to Zimbabwe as the result of firms offering a variety of goods that are valued for their origin.

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Armington's (1969) insight that products are distinguished not only by category but also by their place of origin further reinforces the relevance of the gravity model for South-African exports. Zimbabwean consumers and firms prefer South African goods because they are perceived as distinct from those sourced elsewhere, creating a "home-bias" that the gravity model captures through the size and proximity variables. Consequently, the model predicts that South Africa's relatively large economy and geographic closeness to Zimbabwe should generate a substantial trade flow, even after accounting for distance-related costs.

Together, these theoretical advances explain why South Africa remains Zimbabwe's dominant supplier: the gravity framework predicts strong trade ties when the exporting country offers a diverse, origin-valued product mix and is near the importing market. The empirical robustness added by Bergstrand and the product-differentiation logic of Armington provide justification for the application of the gravity model in this current study.

Data Sources

The data sources for the study are summarized in Table 1 below:

Variable	**Data source**
South Africa's exports	The DTI database
Exchange rates	World bank database
Gross Domestic Products	IMF database
Population	World bank database
Distances	Google Maps

Table 1: Data Sources

Classification of traded goods into product categories that was analyzed in this study is according to the Harmonized System (HS). The data is based on South Africa's export data HS8 (annual) category of the Department of Trade and Industry (DTI) database. The following product categories were analyzed in this study where henceforth C01 was used to represent Live animals and animal products; C02 for Vegetable products and so on.

C01: Live animals, animal products

C02: Vegetable products

C03: Animal or vegetable fats & oils & their cleavage products; prepared edible fats; animal & vegetable waxes

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C04: Prepared foodstuffs; beverages, spirits & vinegar; tobacco & manufactured tobacco substitutes

C05: Mineral products

C06: Products of chemical and allied industries

C07: Plastic and articles thereof; rubber and articles thereof

C08: Raw hides & skins, leather, furskins & articles thereof; saddlery & harness; travel goods, handbags & similar containers; articles of animal gut (other than silkworm gut)

C09: Wood & articles of wood; wood charcoal; cork & articles of cork; manufactures of straw, of esparto or of other plaiting materials; basket ware & wickerwork

C10: Pulp of wood or of other fibrous cellulosic material; waste & scrap of paper or paperboard; paper & paperboard & articles thereof

C11: Textiles & textile articles

C12: Footwear, headgear, umbrellas, sun umbrellas, walking-sticks, seat-sticks, whips, riding-crops & parts thereof; prepared feathers & articles made therewith; artificial flowers; articles of human hair

C13: Articles of stone, plaster, cement, asbestos, mica or similar materials; ceramic products; glass & glassware

C14: Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad with precious metal & articles thereof; imitation jewelry; coin

C15: Base metals & articles of base metal

C16: Machinery & mechanical appliances; electrical equipment; parts thereof; sound and image recorders and reproducers

C17: Vehicles, aircraft, vessels & associated transport equipment

C18: Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments & apparatus; clocks & watches; musical instruments; parts & accessories thereof

C20: Miscellaneous manufactured articles

C21: Works of art, collectors' pieces & antiques

JOINT: This category is the totality of the above-mentioned product categories

Data Analysis

In this study a combination of time series and cross-sectional data econometrics (panel data), also known as cross-sectional time series, was used to analyze the data and estimate the gravity models.

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Various other estimation methods could have been used but for the compelling advantages of panel data as detailed in Greene, (2008) and in Hsiao, (1986), it was found appropriate to employ panel data modeling techniques.

If the same individuals (or entities) are observed for each period, as was done in this study, the panel data set is called a fixed panel (Greene 2008). Application of panel data can provide additional insight into trading patterns as it both avoids the risk of choosing an unrepresentative year and monitors unobservable individual effects in the data set (Hsiao, 1986). Panel data has two dimensions which are cross section dimension which looks at variations across individuals and time series dimension which seeks to capture over time variations.

The pooled regression, random effects and the fixed effects models are the major frameworks used in the panel data modeling process and specification tests were used choose most appropriate one. To test for the presence of individual effects, the Wald Chi-square Statistic was used. The study used the Hausman, (1978) test to choose between the random and the fixed effects model as the Wald test suggested the occurrence of individual effects in the data set.

A further step was taken to evaluate the potential for South Africa's exports to Zimbabwe. The speed of convergence tests between the actual trade and the potential trade between the two countries in the said product categories was used to analyze the envisaged unutilized potential. A method like the one that was applied by Dinh and Tran, (2010) was used where the speed of convergence was calculated as follows:

$$SpeedOfConvergence = \frac{AverageGrowthRateOfPontentialTrade}{AverageGrowthRateOfActualTrade} \times 100 - 100$$

This calculation was done for each individual product category as well as jointly. The method predicts convergence if the speed of convergence will carry a sign that is opposite that of Potential Trade minus Actual Trade (P-A). Convergence indicates the existence of expandable export opportunities (Dinh & Tran, 2010). Conversely, if for a given product category, the speed of convergence and P-A will carry the same sign, divergence was predicted. The argument for the higher efficiency of this method over the point estimated method is that the speed of convergence exploits the flexible structure of the data during estimation, which offers more reliable results than the analysis of point estimates (Sandeep, 2011).

This study, postulates the following economic model:

$X_{jit} = f\ (ER_{it};\ GDP_{it};\ SAGDP_{t};\ POP_{it};\ SAPOP_{t};\ D_{si})$

Where:

X_{jit} = South African Exports to country *i* at time *t* for product category *j* is the dependent variable

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ER_{it} = Exchange rate at time *t* in units of country *i* currency per SA rand. A higher exchange rate means appreciation of the South African rand meaning it becomes expensive for Zimbabwe to import from South Africa as it will take more units of foreign currency to obtain one rand. Conversely a lower exchange rate which is synonymous to depreciation of the rand pushes the prices of exports down in foreign currency terms thus leading to an increase in South African exports.

GDP_{it} = Gross Domestic Product of country *i* at time *t.* It shows the economic mass of the importing country. Thus, a higher GDP in Zimbabwe indicates a higher level of potential Zimbabwean demand for South African exports. However, one can look at this variable from a different perspective. GDP in an open economy can be defined as follows which suggests a negative relationship between a country's GDP and its imports.

GDP = C + I + G + (X – M)

Where: C = Consumption; I = Investment; G = Government Expenditure; X = Exports and M = Imports

$SAGDP_t$ = Gross Domestic Product of South Africa at time *t.* This variable represents the economic mass of South Africa, the exporting country.

POP_{it} = Population of country *i* at time *t* is used to estimate the market size of the importing country.

$SAPOP_t$ = Population of South Africa at time *t.*

D_{si} = Distance from South Africa to country *i*. The distance coefficient in this study captures at least the cost of transportation of exported goods from South Africa to the respective export destinations in the SADC region, Zimbabwe included. However, the actual distance variable as opined by Arvas, (2008), can be considered not only as a proxy for transport costs and an indicator of the time elapsed during shipment; it can be even correlated with the cost of searching for trading opportunities and considered as a proxy for culture differences connected to different consumer patterns. Distance is the resistance term in the gravity analogy.

In this study variables were transformed by taking natural logarithms (Ln) as a way of smoothening them off and reducing skewness to yield in a log linear form, a gravity model with the following econometric specification:

$$LnX_{jit} = \alpha_i + \beta_1 LnER_{it} + \beta_2 LnGDP_{it} + \beta_3 LnSAGDP_t + \beta_4 LnPOP_{it} + \beta_5 LnSAPOP_t - \beta_6 LnD_{si} + \varepsilon_{it}$$

Results

Descriptive analysis focusing on measures of central tendency and dispersion was carried out, followed by a correlation matrix which measured association among explanatory variables as the data contains more than one variable. The correlation coefficient (r) measures the strength and direction of a linear

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relationship between two variables. The value of r is always between +1 (perfect positive linear relationship) and –1 (perfect negative linear relationship). Based on the correlation matrix there is negligible correlation to low positive (negative) correlation among most of the regressors, thus setting the stage for specification tests.

The Wald tests for individual effects were carried out for the product categories under study. The results had Wald test statistics with high Chi square values and correspondingly very low p-values of less than 0.05. As a result, pooling the data would yield distorted and inefficient estimates as it does not control for these individual effects. The only feasible way towards the achievement of a more consistent and efficient set of estimates is either to adopt the random effects or the fixed effects models. This then led to the consideration of the Hausman (1978) test to choose the more appropriate model between the random and the fixed effects models.

In the Hausman (1978) test, the null hypothesis says the random effects model is the appropriate one to use while the alternative hypothesis states that the fixed effects model is the appropriate model to apply. The p-values for the Hausman test by far exceeded 0.05 thus strongly suggesting that the study rejects the alternative hypothesis and go with the null hypothesis in all the product categories. The p-value gives the probability of rejecting a true null hypothesis (Greene, 2008). Hence in this study, the random effects model was used to estimate the coefficients that link South Africa's exports in the different product categories to distance, exchange rate, populations of receiving countries, their GDPs, SA population and SA GDP. Table 2 reports the results.

Pro. Cat.	Variable Coefficients and levels of significance							
	Constant	D_{si}	ER_{it}	GDP_{it}	POP_{it}	$SAGDP_t$	$SAPOP_t$	R^2
C01	-23.17216	-1.2793***	-0.16142	0.8926***	-0.3295	-1.3578***	4.0520***	0.51
C02	-42.1137	-1.0898***	-0.2972***	0.7800***	-0.0718	-1.2659**	4.8808***	0.78
C03	-116.2477	-1.2637***	-0.3590***	0.3381*	0.4631***	-0.3347	7.7349*	0.60
C04	-63.0764*	-0.9650***	-0.1342***	0.7271***	-0.0486	-0.6557	5.1807***	0.81
C05	-36.93798	-1.7526***	-0.0358	0.7684***	0.0766	-0.6563	3.8591	0.72
C06	-43.40034	-0.8796***	-0.1461***	0.7067***	0.0560	-0.4228	3.6319	0.64
C07	-65.16919	-0.7995***	-0.0721*	0.4838***	0.1377**	-0.1075	4.5323**	0.64
C08	-52.63986	-1.3797***	-0.1466**	0.8031***	-0.1921*	-1.0089	5.0816*	0.64
C09	-83.92062	-1.0672***	-0.1837***	0.7190***	-0.3096***	-0.6036	6.4227**	0.60
C10	12.25969	-1.3326***	0.1080***	0.7495***	-0.0672	-0.7866	1.1753	0.75
C11	-45.65704	-1.3167***	-0.1080***	0.7333***	-0.2116***	-0.4844	4.1390	0.69

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C12	-80.73262	-1.5496***	-0.1351***	0.8023***	-0.1979*	-0.4221	5.9285*	0.67
C13	-10.08714	-0.9758***	-0.1405***	0.4605***	0.0501	-0.5906	2.2575	0.61
C14	-134.1833	-1.4391***	-0.0734	1.9143***	-1.3922***	-2.4316*	11.3721**	0.68
C15	27.13831	-0.8339***	-0.0718*	0.6680***	0.1547**	-0.5500	-0.2065	0.65
C16	-54.92017	-0.8630***	-0.0761*	0.6595***	0.1117	-0.1998	3.9766*	0.63
C17	-103.6***	-1.0491***	-0.0815*	0.7595***	-0.0267	-0.3118	6.9125***	0.67
C18	-75.7307*	-0.7906***	-0.0963**	0.7465***	0.0084	-0.4626	5.3451**	0.66
C20	-61.4452	-0.9710***	-0.1081**	0.7377***	-0.1732**	-0.6118	5.0339*	0.59
C21	113.51*	-0.2732	-0.1484	0.9041**	-0.6215**	-1.9759**	-3.1968	0.46
JOINT	-67.53***	-0.9932***	-0.0762	0.4075***	0.1643	-0.2516	5.1957***	0.81

Table 2: Summary of Random Effects Estimation Results
(Source: Gravity Model estimations using Eviews)

Notes: [***]; [**] and [*] coefficient significant at 1%; 5% and 10% respectively

R^2 values of between 0.46 and 0.81 were produced in the estimation process. This shows that between 46% and 81% of the variation in South Africa's exports in the various product categories is explained by variation in the explanatory variables. This is confirmed by the F statistic which tests for the significance of the whole regression equation which ranged from 3 up to 74 with a p-values of less than 0.05 for all the 21 estimated regression models. This F statistic which forms part of the Eviews output is a joint test of the H_0 that all slope coefficients are zero. It measures the reliability of the explanatory variables in predicting the dependent variable. This leads us to the conclusion that at all levels of significance we reject the null hypothesis that there is no model. There is statistical evidence that South Africa's exports for the product categories are significantly explained by distance, exchange rate, population of South Africa, GDP of South Africa, population of trading partners and the GDPs of the trading partners.

It is important to note that the panel data used to estimate the gravity model coefficients per product category as presented in the table above relates to a cross section of SADC states observed over the years 2009 to 2016. Beyond this point, the study zoomed in to the analysis South Africa's export potential to Zimbabwean markets by simulating the estimated models to establish the respective potential export levels. These were then compared to the actual export levels as per Department of Trade and Industry database to identify under- and over-utilized potential by product category.

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Discussion

Speed of convergence tests were carried out as detailed in the methods section to analyze the product categories in terms the potential for South Africa's exports to Zimbabwe. The results of which were combined with point estimated values for 2016 to evaluate potential as reported in Table 3.

Product category	Potential(P) 2016 (Rands)	Actual(A) 2016(Rands)	P-A 2016 (Rands)	Speed of Convergence	Condition
C01	577460153.7	384018006	193442147.7	-91.49	1
C02	2698359951	2962798210	-264438259	797	1
C03	792537197.9	957178067	-164640869	417.98	1
C04	3119722835	2458211771	661511064.8	87.03	0
C05	2652398070	3403601593	-751203523	50.17	1
C06	3383647139	4410262286	-1026615147	9.53	1
C07	1408766027	2301207909	-892441882	-16.80	0
C08	49808688.77	23919390.36	25889298.41	-22.23	1
C09	272399419.2	208907055.4	63492363.78	-12.81	1
C10	257203973.7	208907055.4	48296918.29	-81.61	1
C11	553371431.3	332949038.9	220422392.4	-113.93	1
C12	161903332.2	96205780.29	65697551.87	34.38	0
C13	368422155.4	534317078.1	-165894923	-57.49	0
C14	14194711.16	47048992.01	-32854280.8	-41.80	0
C15	2228267022	2826203137	-597936115	-32.99	0
C16	4514227893	4545938346	-31710452.4	38.50	1
C17	2678064047	2256994730	421069316.8	74.17	0
C18	389280219.2	244322589.9	144957629.2	26.16	0
C20	542706925.4	381529983.8	161176941.7	23.79	0
C21	872466.904	390311.3371	482155.5669	-104.01	1
JOINT	27311399061	29395281347	-2083882286	33.61	1

Table 3: Evaluation of potential (Source: Author Calculations Based on Estimation Results)

Notes: 1= convergence; 0=divergence

In the table above convergence indicates the existence of expandable opportunities and product categories with untapped potential for South Africa's exports in the Zimbabwean market. This is

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according to the method used by Dinh & Tran, (2010) where convergence is predicted when the speed of convergence and the P-A (the difference between the potential and the actual trade) carry opposite signs. Thus, the results show unexploited potential in 57% (12 out of 21) of the product categories under review namely C01; C02; C03; C05; C06; C08; C09; C10; C11; C16; C21 and jointly.

That there is still unutilized potential for South Africa's exports in Zimbabwe is an important empirical finding of this study as it bodes well with the INES which has a long-term vision of improving South Africa's export performance through a basket of macro and micro interventions aimed at enhancing the export enabling environment and improving the competitiveness of firms and sectors. The existence of unrealized potential for South Africa's exports to Zimbabwe is not a finding that is peculiar to this study. A study of South Africa's exports of leather products for the period 1997 to 2004 also found that there was unrealized export trade potential to such trading partners as South Korea, UK, USA, as well as in Zimbabwe (Jordaan & Eita, 2012).

Conclusion

This study applied the gravity model to estimate South Africa's export potential to Zimbabwe across 21 product categories. The results show that distance and exchange rates hinder exports, while South Africa's population and Zimbabwe's GDP boost them. The gravity model, a widely used tool in international trade analysis, provides insights into the factors influencing bilateral trade flows. In this context, the model reveals that South Africa's exports to Zimbabwe are significantly affected by the distance between the two countries and exchange rate fluctuations.

The study's findings align with the principles of the gravity model, which suggests that trade between two countries is positively related to their economic sizes and negatively related to the distance between them. The results also indicate that Zimbabwe's GDP has a positive impact on South Africa's exports, highlighting the importance of the Zimbabwean market for South African exporters. Furthermore, the study identifies untapped potential in 57% of the product categories, suggesting opportunities for South Africa's export growth and symbiotic economic development for both nations.

The implications of this study are significant for policymakers and exporters in both countries. By understanding the factors influencing trade flows, policymakers can develop targeted strategies to promote exports and enhance economic cooperation. Exporters can also use this information to identify new market opportunities and tailor their products to meet the needs of Zimbabwean consumers.

In conclusion, this study demonstrates the applicability of the gravity model in analyzing bilateral trade flows and identifying export potential. The findings provide valuable insights for policymakers and exporters seeking to enhance trade relations between South Africa and Zimbabwe.

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The results of this study have important implications for trade policy and export promotion strategies. By leveraging the identified opportunities, South Africa and Zimbabwe can strengthen their trade relations and promote economic growth. Further research is needed to explore the specific product categories with untapped potential and to identify the barriers to export growth in these areas.

Referecnes

Akça, E. E., & Bal, H. (2021). An Empirical Investigation on the Validity of Linder Hypothesis for Manufacturing Exports from Turkey to Eurozone Countries. *On Eurasian Economies*.

Anderson, J. E. (2018). International Trade Theory. *The New Pelgrave Dictionary of Economics*.

Arvas, A. M. (2008). Does Real Exchange Rate Matter for Emerging Markets' International Trade? A Gravity Model Approach for Turkey. *Proceedings of the First International Conference on management and Economics* (S. 77-96). Tirana: Epoka University Research and Application Centre.

Bano, S., Takahashi, Y., & Scrimgeour, F. (2013). ASEAN-New Zealand Trade Relations and Trade Potential: Evidence and Analysis. *Journal of Economic Integration*, 144-182.

Bergstrand, J. H. (1985). The Gravity Equation in International Trade: Some Micro-economic Foundations and Empirical Evidence. *The Review of Economics and Staistics*, 174-181.

Bergstrand, J. H. (1989). The Generalized Gravity, Monopolistic Competition and the Factor Proportions Theory in International Trade. *The Review of Economics and Statistics*, 143-153.

Blaug, M. (1973). *Ricardian Economics. A Historical Study.* Greenwood Press.

Blomqvist, H. C. (1999). An untapped export market for Finland and Sweden? *ASEAN Economic Bulletin*, 230-239.

Confederation of Zimbabwe Industries. (2024). *Annual Manufacturing Sector Survey Results.* Harare: Confederation of Zimbabwe Industries.

Department of International Relations and Cooperation. (n.d). *Trade Agreement between the Government of the Republic of South Africa and the Government of Southern Rhodesia (now Zimbabwe).* Pretoria, South Africa: Department of international Relations nd Cooperation.

Dinh, T. T., & Tran, T. A. (2010). FDI Inflows and Trade Imbalances: Evidence from Developing Asia. *The Europian Journal of Comperative Economics*, 147-169.

Ekelund, R. B., & Herbet, R. F. (1975). *A History of Economic Theory and Method.* New York: McGraw-Hill.

Greene, W. H. (2008). *Econometric Analysis* (6th Edition). Upper Saddle River: Pearson Prentice Hall.

WOHLLEBE & ROSS

Discover publication opportunities:
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Hausman, J. A. (1978). Specification Tests in Econometrics. *Econometrica*, 1251-1271.

Helmers, C., & Pasteels, J. M. (2006). Assessing Bilateral Trade Potential at the Commodity Level: An Operation Approach. *ITC Working PAper*.

Hening, D., & Knight, D. M. (2023). Polycrisis: Prompts for an Emerging World View. *Antropology Today, 39*(2), 3-6.

Hsiao, C. (1986). *Analysis of Panel Data.* Cambridge: Cambridge University Press.

Hurungo, J. T. (2010). *Trade Policy Review: Zimbabwe.* Brighton, Sussex: Institute of Development Studies.

Jordaan, A. C. (2011). *Analysing Exports in South Africa's Chemical Sector: A Panel Data Approach.* Pretoria: University of Pretoria Space Institutional Repository, Research Articles (Economics).

Jordaan, A. C. (2015). Determining South African Export Potential to Australia: A Panel Data Approach. *South African Journal of Economic and Management Sciences*, 354-365.

Jordaan, A. C., & Eita, J. H. (2012). Determinants of South Africa's Exports Leather Products. *Agrekon* , 38-52.

Kwaramba, M., & Mudzingiri C. (2016). Tax Rates, Economic Crises and Tax Evasion: Evidence using Zimbabwe and South Africa Bilateral Trade Flows. *Ecoconomic Research Southern Africa Working Papers*.

Leontief, W. (1953). Domestic Production and Foreign Trade: The American Capital Position Re-Examined. *Proceedings of the American Philosophical Society*, 332-349.

Linder, S. B. (1961). *An Essay on Trade and Transformation.* Almqvist & Wiksell.

Motala. (2023). Crisis, Solidarity Economies and Socialism. *South African Review of Sociology, 53*(4), 350-367.

National Planning Commission. (2012). *National Development Plan 2030: Our future - make it work.* Pretoria: The Presidency, Republic of South Africa.

Nyathi, L. D., & Mutale, J. (2025). Perceptionsof the Zimbabwe Gold Currency (ZiG) as a Panacea to Economic Stability. *International Journal fo Research and Innovation in Social Sciences*.

Oguledo, V. I., & McPhee, C. R. (1994). Gravity Models: A Refomulation and an Application to Discriminatory Trade Arrangements. *Applied Economics*.

Sandeep, K. (2011). Determinants of Export services of USA with its Asian Partners: Apanel Data Analysis. *Eurasin Journal of Business and Economics*, 101-117.

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Shenkar, O., Luo, Y., & Chi, T. (2021). *International Business.* Routledge.

Smith, A. (1776). An Inquiry into the Nature and Causes of the Wealth of ations. In E. Cannan, *Prometheus Book (Original Work Published in 1776).*

Tinbergen, J. (1962). Shaping the World Economy: Suggestions for Economic Policy. *New York: Twentieth Century Fund*.

Trade and Industrial Policy Strategies. (2003). *South Africa's Export Opportunities in Finland: A Trade Map Analysis.* Trade and Industrial Policy Strategies.

Trading Economics. (2024). *South Africa Exports by Country.*

Vernon, R. (1966). International Investment and International Trade in the Product Cycle. *Quarterly Journal of Economics*, 190-207.

Zimbabwe National Statistics Agency (ZIMSTAT). (2024). *2022 Zimbabwe Population and Housing Census: Gender Thematic Report.* Harare: Zimbabwe National Statistics Agency (ZIMSTAT).

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