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Editorial and Reviewers' Board

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The current issue is the first of the twelfth volume of the *Athens Journal of Business & Economics (AJBE), published by the Business & Law Division and the Economics Unit of Athens Institute.*

Gregory T. Papanikos
President
Athens Institute

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A World Association of Academics and Researchers

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The Economics Unit of Athens Institute, will hold its **19th Annual International Symposium on Economic Theory, Policy and Applications, 29-30 June & 1-3 July 2026, Athens, Greece** sponsored by the Athens Journal of Business & Economics. The aim of the conference is to bring together academics and researchers of all areas of economics and other related disciplines. You may participate as panel organizer, presenter of one paper, chair a session or observer. Please submit a proposal using the form available (https://www.atiner.gr/2026/FORM-ECO.doc).

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- Dr. Henry Thompson, Head, Economics Unit, Athens Institute & Emeritus Professor, Auburn University, USA.
- Dr. Chris Sakellariou, Head, Economics Unit & Associate Professor of Economics, Nanyang Technological University, Singapore.

Important Dates

- Abstract Submission: **10 March 2026**
- Acceptance of Abstract: 4 Weeks after Submission
- Submission of Paper: **1 June 2026**

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4-8 May 2026, Athens, Greece

The Business, Economics and Law Division (BLRD) of Athens Institute is organizing its **13th Annual International Conference on Business, Law & Economics, 4-8 May 2026, Athens, Greece,** sponsored by the Athens Journal of Business & Economics and the Athens Journal of Law. In the past, the six units of BLRD have organized more than 50 annual international conferences on accounting, finance, management, marketing, law and economics. This annual international conference offers an opportunity for cross disciplinary presentations on all aspects of business, law and economics. This annual international conference offers an opportunity for cross disciplinary presentations on all aspects of business, law and economics. Please submit an abstract (email only) to: atiner@atiner.gr, using the abstract submission form (https://www.atiner.gr/2026/FORM-BLE.doc)

Important Dates

- Abstract Submission: **20 January 2026**
- Acceptance of Abstract: 4 Weeks after Submission
- Submission of Paper: **6 April 2026**

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- **Dr. Gregory T. Papanikos**, President, Athens Institute.
- **Dr. Michael P. Malloy**, Director, Business, Economics and Law Division, Athens Institute & Distinguished Professor & Scholar, University of the Pacific, USA.
- **Dr. David A. Frenkel**, LL.D., Head, Law Research Unit, Athens Institute & Emeritus Professor, Law Area, Guilford Glazer Faculty of Business and Management, Ben-Gurion University of the Negev, Beer-Sheva, Israel.

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The Trump Effect on Globalization: If the First Time was a Farce, Would the Second be a Tragedy?

By Gregory T. Papanikos[*]

The American people, through their democratic vote, have brought Trump back to the White House, hoping that this time he will fulfil his promise to "make America great again" by retreating from the globalization process. This process has continued to accelerate at a nonlinear pace since the end of the Second World War. During Trump's first term in the White House, he did not succeed in deglobalizing the U.S., at least as measured by the KOF Globalization Index. The aim of this paper is to trace the historical process of globalization since 1970, the earliest year for which data are available. Three distinct phases of globalization are defined: ***hyperglobalization*** *(when the globalization index increases by more than 1% per annum for at least one decade),* ***stagnated globalization*** *(when the globalization index increases within the range of 0%-1% per annum for at least one decade), and* ***deglobalization*** *(when the annual rate of change in the globalization index is negative for at least one decade). The data reveal two cycles of stagnated globalization, one cycle of hyperglobalization, and no cycle of deglobalization. This paper also examines the U.S. experience of globalization. The evidence demonstrates that despite the rhetoric during Trump's first presidency (2017–2020), the globalization process in the U.S. continued to follow its long-term upward trajectory. Furthermore, the paper concludes that the U.S. has always been great and that the slogan "Make America Great Again" is primarily a tool to maximize electoral support. However, if the objective is to maximize economic benefits—measured as per capita GDP—then globalization has been, and remains, the only sound policy approach. Finally, the paper discusses the future of globalization under the new Trump administration. The conclusion is that the U.S. will likely continue its global business as usual because this remains its best economic, political, and military strategy.*

Keywords: *globalization, hyperglobalization, deglobalization, US, Trump, MAGA, wars*

Introduction

I have always wondered if Karl Marx's famous phrase might also hold true in reverse: if the first time was a farce, would the second be a tragedy? Or is the second time always a farce, regardless of the first? The re-election of Donald Trump in 2024, following his initial term from 2017 to 2020 and subsequent loss, has led many outside the U.S. to question whether his second term (2025–2028) could prove to be a tragedy for the world—particularly for the long-term trend toward globalization.

[*]President, Athens Institute, Greece. The author has previously taught in various Canadian, Greek and U.K. Universities.

In this paper, I argue that this second attempt would also be a farce. Even if the new administration wanted to reverse economic trends toward globalization, it would be unable to do so. Moreover, even if it succeeded in the short four years of his term, reversing globalization would not serve the economic interests of those who protest against it and vote accordingly. In reality, "Making America Great Again" can only be achieved through globalization—perhaps a different kind of globalization, but globalization nonetheless. After all, globalization was what made America great in the first place, and it is globalization that has contributed to making the world greater, as I demonstrated in Papanikos (2024a).

This paper argues that the globalization process has its own dynamics, best described as a kind of a 'ratchet effect'—one that is largely independent of who occupies the White House or any other 'House' around the world. I support this argument using the KOF Globalization Index, which provides data from 1970 to 2021. I also address key international political concerns, such as the two regional wars that began under Biden's administration and with which the new administration must contend. Regional wars, rather than world wars, have characterized the extended period of global prosperity that the world enjoys since the end of the last world war.[1]

I organize the discussion in this paper into five sections, starting with this introduction. In the next section, I analyse world time-series data on globalization and world GDP per capita from 1970 to 2021. Section three focuses on the United States, providing a similar analysis of its globalization and GDP per capita trends, including the four years of the Trump administration (2017–2020). This section also examines the factors contributing to the United States' enduring strength despite various economic, political, military, and natural challenges. Section four considers the future of globalization under the new Trump administration. Finally, the last section concludes the paper.

The Persistence of Globalization

This section aims to demonstrate that globalization persists through (a) recessions of varying magnitudes, (b) pandemics both minor and severe, (c) significant political changes, and (d) regional wars. While it does not provide a definitive explanation for this resilience, I offer some thoughts on potential causes, particularly emphasizing the roles of information technology and democracy in section four of this paper, following my discussion of U.S. performance in the third section. Today, people can instantly observe events in other countries, and if they find them appealing, they are quick to imitate them. It's much like the use of high-tech gadgets: never before in history has an invention from one country spread so quickly to another.

[1]I have written extensively on the Russian-Ukrainian war; see Papanikos (2022a, 2022b, 2022c, 2022d, 2022e, 2024b). The U.S. is directly involved in this conflict, and the new president-elect has already begun addressing it, as it primarily serves the economic interests of the U.S. This is yet another demonstration of U.S. globalization.

World Globalization Index

Figure 1 illustrates the global trajectory of globalization, as measured by the KOF Globalization Index.[2] Data are available for the period from 1970 to 2021. The index measures globalization on a scale from 0 (complete isolation) to 100 (complete openness) and includes a total of 123 countries. For each country, a value is calculated and weighted to produce an overall index, referred to as the World Globalization Index. These estimates for the 1970–2021 period are displayed in Figure 1.

In 1970, the first year of the dataset, the globalization index stood at 36.87 units. By 2021, it had risen to 61.21 units, representing a 66% increase. This remarkable growth occurred despite numerous negative factors that could have hindered the globalization process, some of which are discussed later in this paper. Notably, the 1970 value represents the lowest level of globalization for the entire period, while the highest value, 61.34, was recorded in 2019—just one year before the Covid-19 pandemic disrupted the global order.[3]

Globalization has generally increased over time, with the exception of six years highlighted in Table 1. These years can be described as periods of deglobalization, characterized by decreases in the globalization index compared to the previous year. However, these instances are exceptions that reaffirm the broader trend: globalization persists despite the challenges it faces.

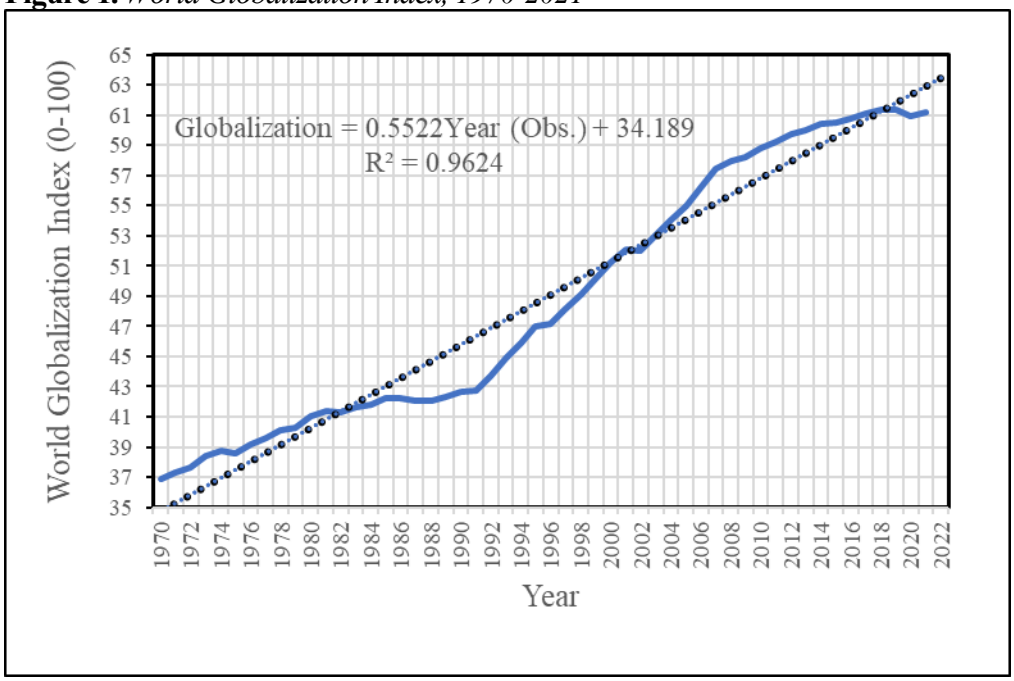
The year with the largest decline in globalization—defined as the most significant one-year decrease in the index—was 2020, during the height of the Covid-19 pandemic. In that year, the globalization index fell by 0.37 units, from a peak of 61.34 in 2019 to 60.97 in 2020. The second-largest one-year decrease occurred in 1987; a year marked by the stock market crash. Notably, this was the only instance of two consecutive years of reversed globalization, although the decline in 1986 was minimal, at just 0.01 units. Interestingly, globalization continued to rise during the Great Recession of 2007, which lasted several years, demonstrating its resilience. The third-largest decline occurred in 1975, with a decrease of 0.16 units. The other two instances of declines, in 1982 and 2002, were minor, as reported in Table 1. Notably, the 1981–82 recession was the worst economic downturn since the Great Depression of 1929. Despite this, the decline in globalization was minimal, at just 0.05 units. Similarly, the year 2002 is of particular interest, as it followed the September 11, 2001, terrorist attacks in New York and the subsequent stock market downturn.

[2]The method is explained at https://kof.ethz.ch/en/forecasts-and-indicators/indicators/kof-globalisation-index.html. The world has undergone globalization through a process I described in Papanikos (2000). Other measures of globalization have been used, relying on trade openness, as explained in Papanikos (2024a). These measures, which are based on longer time series, primarily assess trade openness rather than globalization; see, for example, Williamson (2002). In contrast, the KOF Index measures the economic, social, cultural and political dimensions of globalization. This index is more appropriate for the present study because it not only examines global trends in globalization but also considers how the future of globalization may be affected by the new Trump administration in the United States. As cited in the conclusions, Marx and Engels, writing in 1847 and 1848, emphasized that opening up not only affected (capitalist) production but also world civilizations. Stripped of their jargon, history has been remarkably kind to them in this prophecy.

[3]For a selected review of the effects of Covid-19, see Bäckman (2021), Boutsioli et al. (2022a, 2022b), Jones (2022), Jones & Comfort (2020), Papanikos (2020a, 2020b, 2021, 2022f) and Reid (2022).

Despite these significant political and economic shocks, the decline in the globalization index was only 0.09 units.

Figure 1. *World Globalization Index, 1970-2021*



Source: https://kof.ethz.ch/en/forecasts-and-indicators/indicators/kof-globalisation-index.html

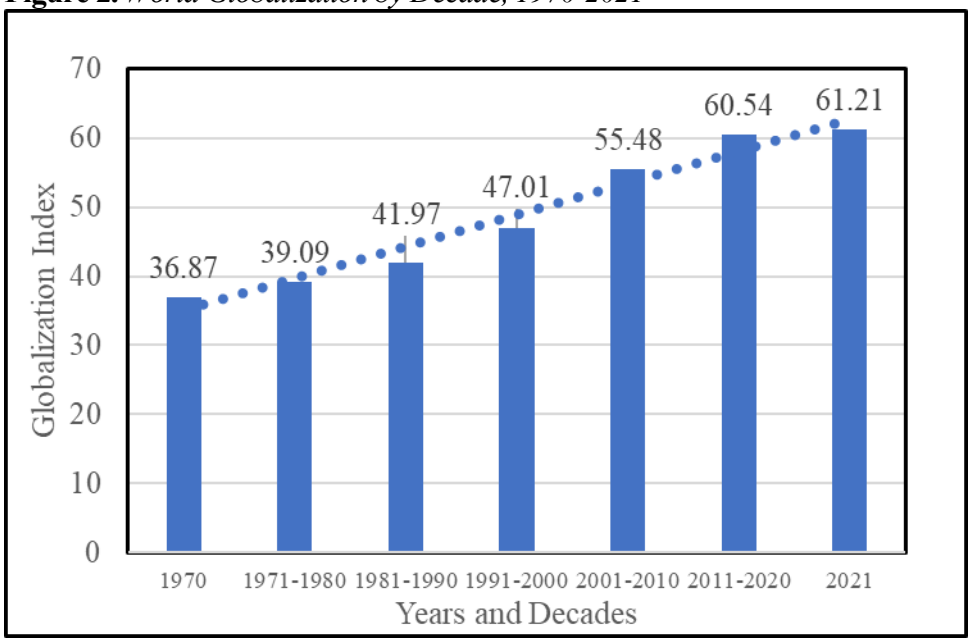
Table 1. *Years of Globalization Decreases*

Year	Score	Change
1975	38.59	-0.16
1982	41.29	-0.05
1986	42.25	-0.01
1987	42.03	-0.22
2002	52.00	-0.09
2020	60.97	-0.37

Globalization is a long-term process, and while annual downturns may occur, the overarching trend is what matters. As shown in Figure 1, the long-term trajectory of globalization is clearly upward. Another way to illustrate this is by analyzing the average globalization index for each decade. The data span five full decades, in addition to the first and last years of the dataset. These figures, along with the decade averages, are presented in Figure 2.

This evidence highlights that globalization is a persistent, long-term phenomenon, demonstrating resilience in the face of various global challenges—economic, political, military, pandemics, and more.

Figure 2. *World Globalization by Decade, 1970-2021*



The descriptive analysis above shows that globalization increases over time, though not in a smooth or uniform manner. Different rates of growth are evident from the varying slopes of the line in Figure 1. This becomes even clearer when examining deviations in the globalization cycle from its long-term trend, which is analyzed next.

World Globalization Cycles

The linear approximation of the dataset fits the entire period exceptionally well, as shown in Figure 1. Deviations of actual values from these fitted linear values are illustrated in Figure 3, which I refer to as globalization cycles. The globalization series contains a unit root, as the hypothesis of a unit root is not rejected based on the ADF test. However, the detrended series, shown in Figure 3, is stationary, with a constant mean and a standard deviation of 1.66. Additionally, the graph indicates no evidence of heteroscedasticity. The globalization cycle divides the dataset into three distinct phases:

Phase A: Stagnated Globalization (1970–1991) – Globalization increases at a decreasing rate.

Phase B: Hyperglobalization (1992–2007) – Globalization increases at an increasing rate.

Phase C: Stagnated Globalization (2008–2021) – Globalization increases at a decreasing rate.

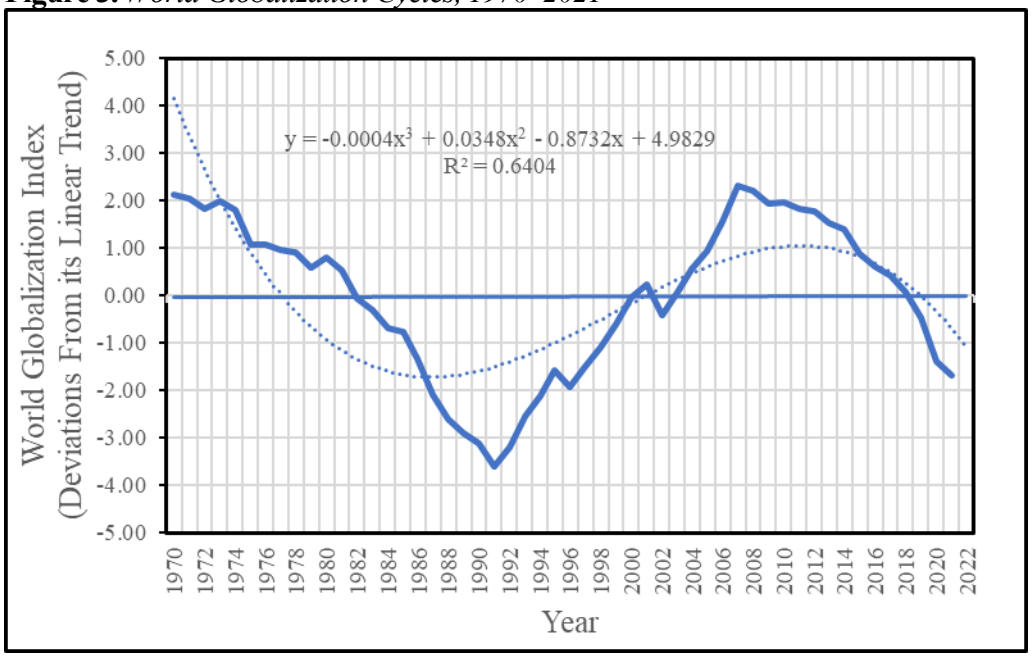
Summary statistics for these three phases are presented in Table 2. The annual percentage changes shown in the last column of Table 2 are used, albeit somewhat arbitrarily, to define the following three types of globalization processes:

(a) **Hyperglobalization**: when the globalization index increases by more than 1% per annum for at least one decade.

(b) **Stagnated globalization**: when the globalization index increases within the range of 0%-1% per annum for at least one decade.

(c) **Deglobalization**: when the annual rate of change in the globalization index is negative for at least one decade.

Figure 3. *World Globalization Cycles, 1970–2021*



Source: Author's Calculation

Table 2. *Summary Statistics of the Three Phases of Globalization*

Phase	Period	Years	Mean Score	Standard Deviation	Total Change (%)	Annual Change (%)
A	1970-1991	22	40.46	1.88	15.88	0.71
B	1992-2007	16	50.45	4.13	31.51	1.87
C	2008-2021	14	60.11	1.17	5.66	0.45
	Total	52	48.82	8.53	66	1.00

Source: Author's Calculation

In the remainder of this section, I discuss the characteristics of each type of globalization. The evidence presented above indicates two periods of stagnated globalization, one period of hyperglobalization, and no sustained period of deglobalization (reversed globalization). Although, as noted earlier, there were six years

of deglobalization, these were minor exceptions. Even in relative terms, their impact was minimal—less than half a unit.

Hyperglobalization (1992-2007)

This phase represents the most significant period of globalization in the entire timeline. During this phase, the globalization index increased by 31.51%, corresponding to an annual growth rate of 1.87%. This rate is markedly higher than the annual increases of 0.71% in the first phase and 0.45% in the final phase.

This period of hyperglobalization included several major events, such as the terrorist attacks of 2001 in New York, the subsequent start of the U.S. war in Afghanistan (which continued throughout the remainder of this phase), and the recession of 2002.

Despite these challenges, the period witnessed substantial positive developments. Notably, China's entry into the World Trade Organization in 2001 established it as the world's preeminent mega-trader. Equally significant was the introduction of a common currency in Europe and the creation of the eurozone.

Stagnated Globalization (1970-1991 & 2008-2021)

Two of the three phases are characterized as periods of stagnated globalization, defined as a positive annual increase in the globalization index of less than 1%. During the first phase (1970–1991), the average globalization index was 40.46 units, and the period lasted 22 years. The total increase in the index was 15.88%, with an annual growth rate of 0.71%.

The final phase is the most concerning of the three. It has persisted for 14 years and is likely to continue for an extended period. Many anticipate that a deglobalization cycle will eventually occur. From 2008 to 2021, the globalization index increased modestly, from 57.93 to 61.21, at an annual rate of just 0.45%. Despite this modest growth, it represents a relatively significant achievement for the globalization process, given that three major factors were expected to have a severe negative impact but ultimately did not. Not only was deglobalization widely anticipated, but active efforts were made to accelerate it.

Interestingly, the three negative shocks to globalization were distinct in nature, yet arguably interdependent. Chronologically, the first shock was economic. The Great Recession, which began in the United States in 2007, spread globally, causing widespread disruption and threatening to destabilize key institutions, including the euro, introduced in 2002. It was the most severe economic crisis since the Great Depression of 1929. This period concluded in 2020 with the United Kingdom officially exiting the European Union, following the 2016 referendum.

The second shock was political. Donald Trump's election in 2016, accompanied by pronounced anti-globalization rhetoric and policies in favor of deglobalization, could have led the world to brace for a potential shift in the global order. I will elaborate on this issue in the next section.

The third shock can be classified as natural—an act of God. Pandemics, though infrequent, are a recurring phenomenon in history. The Covid-19 pandemic, which began in late 2019 in China, quickly spread westward. Europe was hit hard before the

virus crossed the Atlantic. By the first quarter of 2020, global economies were effectively shut down, and international travel came to a standstill.

One might argue, however, that all these negative effects were themselves products of globalization. In a more isolated world, the pandemic might have been contained within China. Similarly, if the United States were not such a dominant global power (as defined in the next section), its economic (the Great Recession) and political (the election of Donald Trump) events might have had little to no impact on global economies and societies. The question, of course, is what the cost would have been in terms of GDP per capita and, consequently, absolute poverty reduction, as argued by Papanikos (2024a).

Deglobalization

Deglobalization is defined as a reduction in the globalization index. Based on data from the 1970–2021 period, this occurred during six individual years. However, no decade overall experienced a negative rate of deglobalization—all rates remained positive. Many expected deglobalization during Donald Trump's first presidency, but it did not materialize. Nevertheless, deglobalization may be linked to an issue Trump opposes: transitioning away from certain energy sources that evidence suggests contribute to environmental degradation. A strand of literature suggests that climate change and environmental degradation result from significant increases in global consumption driven by unprecedented growth in world GDP. If globalization contributes to GDP growth and eventually leads to hyperglobalization, then deglobalization could potentially benefit the environment.

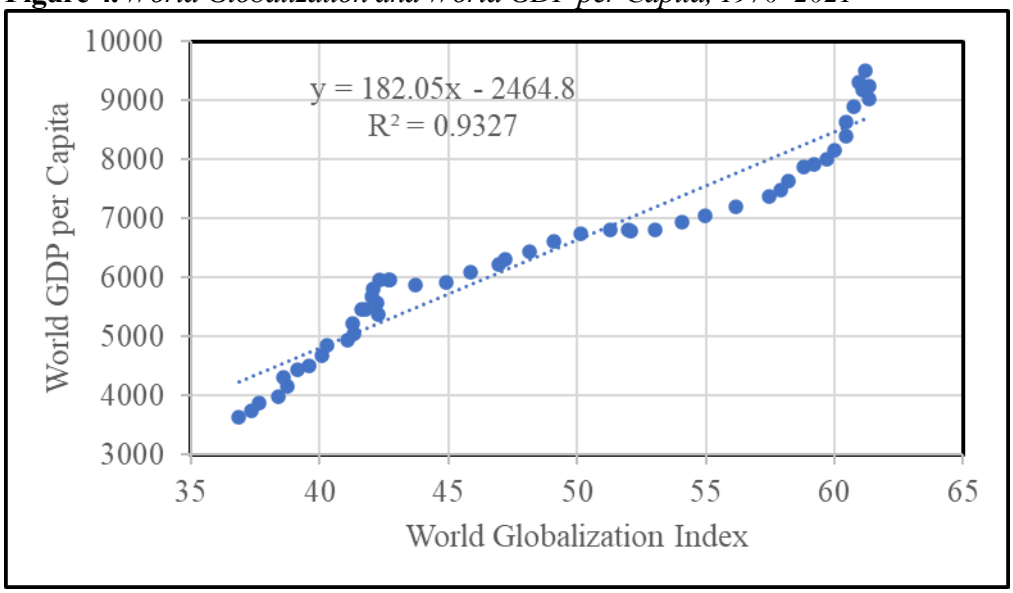
To summarize the above discussion, one conclusion that emerges from the descriptive evidence is that globalization is a long-term phenomenon that persists despite economic, political, military, and pandemic challenges. In Papanikos (2024a), I demonstrated that globalization has been beneficial for those living in absolute poverty, as it reduces the percentage of the world's population in extreme poverty. Ultimately, the primary objective of any scientific endeavor or global public policy should be to improve the living conditions of those in absolute misery.

The question then arises: have these unprecedented increases in world globalization led to higher world GDP per capita? Figure 4 presents the scatter plot depicting the relationship between the world globalization measurement and world GDP per capita for the period 1970–2021.

There is a strong positive association between globalization and GDP per capita. Notably, this relationship can be well approximated by a linear regression line. However, it appears that after globalization reaches 57 units, the association becomes nonlinear. Specifically, if one assumes that causality runs from globalization to GDP per capita, then increases in globalization lead to increases in GDP per capita at an accelerating rate.

Since this is a very important association for the arguments of this paper, it is necessary to explore the relationship between world GDP per capita and the world globalization measurement further. The apparent strong positive correlation between the two variables (with an R^2 of 93.27%) might result from a spurious relationship driven by a third factor influencing both. To investigate this, we first examine the stationarity properties of these two variables.

Figure 4. *World Globalization and World GDP per Capita, 1970–2021*



There are two types of stationary processes: trend stationary (TS) and difference stationary (DS) processes. Both the world globalization index (GW) and the world GDP per capita (GDPCW) exhibit a trending mean, which is a common violation of stationarity. A distinction is made between TS and DS processes. In the TS process, the mean trend is deterministic: the trend can be estimated and removed from the data, making the residual series stationary. This method was applied to GW to reveal the globalization cycles shown in Figure 3. On the other hand, the DS process has a mean trend that is stochastic. To remove the effect of the trend and make the series stationary, the series must be differenced (d) times until stationarity is achieved.

The distinction between these two types of processes has important implications for the analysis. If globalization and GDP per capita are time series with deterministic trends, they would always revert to the trend in the long run, and the effects of shocks would eventually dissipate. Conversely, if the two series have stochastic mean trends, they would not recover from shocks, and the effects would be permanent. In this context, even Trump's second administration could be considered a negative shock to the long-term trend of global and U.S. globalization, assuming he proceeds this time with efforts to deglobalize the U.S. economy.

There are two main approaches to checking the type of mean trend. The first approach is graphical, involving the examination of the autocorrelogram for each variable. If the autocorrelogram of a variable degrades slowly, it may indicate the presence of a unit root or a trend, whereas for a stationary process, the decay is faster. While not reported here, the autocorrelogram for both variables in this study suggests the presence of a unit root, as the correlograms degrade slowly.

The second approach involves conducting formal statistical tests. Table 3 presents the results of the unit root tests, which indicate that both variables exhibit a unit root. This finding suggests that any relationship between the two variables is unlikely to be spurious.

Table 3. *Unit Root Tests (Augmented Dickey-Fuller Test)*

Variables	Level t-values	Prob*	1st Difference t-values	Prob*
World Globalization Index (GW)	-1.61	0.777	-3.95	0.017
World GDP per capita (GDPCW)	-1.03	0.931	-5.62	0.0001

*MacKinnon one-sided p-values.

While causality may run in both directions, theoretical reasoning suggests that it is more likely to flow from globalization to GDP per capita. The argument is that globalization stems from political decisions influenced by a country's willingness to open or close its economy, either unilaterally or through binding multilateral agreements, which are often difficult to reverse in the medium term. As demonstrated by Brexit, disentangling a country from economic and political integration can take many years.

The measurement of the globalization index itself includes international trade liberalization treaties. The World Trade Organization monitors trade openness, assuming it has a positive effect on global economic welfare. This assumption manifests in an increase in global GDP per capita as well as in individual countries' GDP per capita. The opposite may also occur, as Trump has promised for his second term. Tariffs and import quotas could restrict international trade.

One method to test the potential causality between these variables and determine its direction is the Granger causality test. Table 4 presents the results of this test for the two variables. The findings indicate that if any causality exists, it is more likely to run from globalization to world GDP per capita rather than the reverse. Specifically, the null hypothesis that world globalization does not Granger-cause world GDP per capita is rejected at the 5% significance level. Conversely, the null hypothesis that causality flows in the opposite direction is strongly rejected.

Table 4. *Granger Causality Test*

Null Hypothesis	F-Statistic	Probability
GW does not Granger Cause GDPCW	3.093	0.0551
GDPCW does not Granger Cause GW	0.062	0.9402

For those who support the global goal of advancing globalization and believe it fosters shared prosperity, there is significant concern that a second Trump presidency could jeopardize this progress. In the next section, I present evidence demonstrating that U.S. economic conditions, as measured by GDP per capita, have been positively associated with increases in world GDP per capita. These global gains are driven by globalization. Assuming some degree of causality, this relationship remained positive —even during Trump's first administration from 2017 to 2020.

This raises an important question: If the world benefits from globalization, is the U.S. losing out? If evidence supports this notion, Trump's argument for restricting U.S. exposure to globalization might have merit. However, if the U.S. also benefits from globalization, then Trump's rhetoric could be seen as either a calculated bluff—another farce—or, if he genuinely believes his stance, a potential tragedy. In this latter case, his policies could backfire, with the U.S. economy and its GDP per capita

emerging as the primary casualties. The next section looks at the US and its globalization performance.

The United States and Globalization

This section focuses on the United States. The main thesis of this paper is that Trump's first four years in office were a farce with regard to globalization. According to the U.S. Globalization Index, the country remained an open economy and society, as illustrated below in Figure 7. During the Trump years, the U.S. achieved and maintained its highest-ever measurement of globalization, reaching 82.0858 units in 2019. Notably, the average globalization measurement during Trump's tenure (2017–2020) was 81.7830 units. When compared to the average of 80.8674 units during Barack Obama's eight years in office (2009–2016), this represents a 1.13% increase. For this reason, I argue that Trump's first presidency was a farce in terms of globalization—not only did he fail to reverse the trend, but globalization in the U.S. actually increased during his term.

One could correctly argue that (a) Trump never intended to deglobalize the U.S. economy; rather, he was merely saying what some critical voters wanted to hear, and (b) even if Trump had wanted to reverse the U.S. globalization process, he would have been unable to do so. This is because the U.S. and global forces driving globalization are beyond the control of any single politician, including the president of the most powerful country in the world.

The question is whether a second term would turn into a tragedy for U.S. globalization. As this section demonstrates, if such a scenario materializes, the U.S. economy will likely be the first victim. This would represent a significant tragedy—not so much for the rest of the world, but for the United States itself.

To examine my hypotheses, I employ descriptive statistics and Granger causality tests. However, before delving into the analysis, I explain why the U.S. has always been the greatest nation in the world. As such, it cannot "become great again" because it never lost its greatness.

Since the Second World War, the United States has always been the Greatest Country in the World

The United States has been the greatest country in the world, at least since the end of the Second World War. Rival nations[4] have never possessed the economic, political, military, or social advantages of the U.S. No other country has seriously challenged its global dominance, nor does any appear likely to do so in the foreseeable future. Consequently, the slogan "Make America Great Again" has little substantive meaning, as the U.S. has consistently been great, with or without Donald Trump. The slogan serves primarily as a campaign strategy to maximize votes, which makes it a

[4]By "rival nations," I refer to all those countries that, at various points in time, have been considered challengers to the global dominance of the United States. Japan, Russia, and China are among the nations frequently mentioned in the literature. While many smaller countries, such as those in Europe, outperform the U.S. in certain areas, they are not rivals. Instead, they are part of a broader U.S.-led alliance.

rational and expected tactic. Once in office, however, such slogans can be downplayed or redefined—a common practice among politicians both before and after elections.

More significantly, the U.S. faces no real competition from any other nation or alliance of nations. Moreover, as I argue in this section, the U.S. rose to and has maintained its position as the sole superpower by adhering to globalization. Its economic benefits align with the nation's remarkable achievements in increasing GDP per capita, as demonstrated in this section. Assuming a causal relationship between globalization and GDP per capita growth, the descriptive evidence does not contradict this hypothesis.

Before presenting this evidence, I will briefly discuss the economic, political, and military factors underpinning U.S. dominance.

US Economic Dominance

The U.S. boasts the highest per capita GDP of any country, past or present, that has appeared to challenge its dominance. This section further examines the specifics of GDP per capita. What is crucial, however, is not just the high per capita GDP itself but the fact that it is supported by a robust foundation of discovery, innovation, and technological advantage—highlighting the potential for sustained future growth. In Papanikos (2025), I examined the US-China innovation gap and concluded that the United States will remain the leader in overall levels of innovation. China is taking advantage of this US leadership, a phenomenon commonly referred to in development literature as the "advantage of backwardness."

This economic superiority of the U.S. is a primary factor attracting people from around the world who aspire to migrate there to work and live. If the U.S. were not so economically dominant, there would be little interest in migration. According to evidence reported by Gallup (2021),[5] the U.S. remains the most desired migration destination worldwide. For an economist, the most concrete evidence lies in actions, and the fact remains that millions of people wish to migrate to the U.S., with many concentrating at the U.S.-Mexico border. This immense demand for migration to the U.S. is just one of many manifestations of the country's global prominence. [6]

Given that xenophobia is as old as humanity itself,[7] Trump leveraged fears of immigration to win votes. While this paper does not delve into the topic in depth, it is worth noting that the U.S. was, is, and will remain great largely due to its open-door policies, which includes migration. These policies represent one of the most compelling manifestations of globalization at the human level. People aspire to move to the best country in the world[8], and the persistent demand for both legal and illegal

[5]https://news.gallup.com/poll/468218/nearly-900-million-worldwide-wanted-migrate-2021.aspx

[6]According to numerous opinion polls, the economy and immigration, along with abortion, ranked among the top priorities for Trump's voters. Notably, the Pew Research Center reports that from 2020 to 2024, immigration saw the largest increase in importance, rising from 61% to 82%. The economy also became slightly more significant, increasing from 86% to 93%. In contrast, abortion saw a notable decline in interest among Trump supporters, dropping from 46% in 2020 to 35% in 2024. (https://www. pewresearch.org/short-reads/2024/11/13/what-trump-supporters-believe-and-expect/)

[7]See Papanikos (2020).

[8]There is a certain tautology here because I define "the best country in the world" as the country to which most people vote with their feet, i.e., they want to migrate to this country. It is a revealed preference.

migration to the U.S. is a strong indication of how the rest of the world perceives its greatness.

US Political Dominance

The political dominance of the U.S. is multidimensional. The U.S. has a democratic system that no rival country, past or present, can match. In the modern world, democracy is the only system that ensures political and social stability. U.S. presidential elections attract unparalleled global interest. No other country's electoral process garners such attention, and this is due to four main reasons.

First, U.S. election results are inherently uncertain, as should be the case in any functioning democracy. This uncertainty is enshrined in the U.S. constitution, which prohibits anyone from serving as president for more than two terms. Even if the same party remains in power, the individual holding the presidency must change after two elections. This stands in contrast to other democracies, such as the U.K. and Germany, or non-democracies like China and Russia.

Second, the immense global attention drawn by U.S. presidential elections is a strong indication of the nation's unique influence. The political developments surrounding these elections have an impact unmatched by any other country's political events, highlighting the U.S.'s status as a preeminent global power.

Third, the U.S.'s political superiority lies in its strategic alliances with the world's most advantaged countries, many of which share a strong cultural affinity, including a common language: English. No rival nation has comparable global political connections, nor is it likely to develop them in the near or distant future.

Fourth, the U.S. enjoys uniquely positive relations with its two neighbours, Canada and Mexico. Compared to the border issues faced by other nations, it becomes evident that the U.S. holds an unparalleled political advantage in maintaining regional stability. As Herodotus taught in the 5th century BCE, regional stability is a necessary condition for global dominance: first, care for your neighbours, and then expand to the rest of the world. This is why I do not consider the alleged rival countries of the U.S. as even coming close to challenging its global dominance. Following the father of history, who claimed that a great power must first address its problems with its neighbours, China and Russia are far from resolving their border issues. In fact, they are at war—especially Russia, which has seen Ukraine invade and occupy its territory, and has been shelling places within Russia. The analogy with the U.S. would be if it were at war with Mexico and Texas was bombed and occupied by Mexico. Similarly, China has to cope with regional enemies such as India, Taiwan, Vietnam, South Korea, and even Japan. A country with so many political problems at its borders cannot be a world power because it is not an accepted regional power. Even with Russia, China has historical disputes; however, the most important one right now is their disagreement over the Arctic.

US Military Dominance

Military dominance is closely tied to both economic and political global supremacy. The U.S. military is the strongest in the world, strategically deployed across the globe. No other military operates on such a widespread scale. Additionally, the U.S. maintains strong alliances with numerous countries, some of which are on the brink of conflict with nations allegedly opposed to U.S. interests. This military superiority is founded on the U.S.'s technologically advanced weaponry, highly skilled personnel, and its strong democratic tradition.

The two regional wars currently underway demonstrate what a small country, with continuous support of technologically advanced weapons, can achieve. Both Ukraine and Israel are fighting enemies with larger populations. It is the technology and support from the U.S. that make the difference. No other country can rival this capability, and it is this military might that has made the U.S. a great power, both in the past and for the foreseeable future. There is no need to "Make America Great Again" if the country has never lost its greatness in the first place, and this holds true for the military as well.

The Long Upward Tendency of the US GDP per Capita

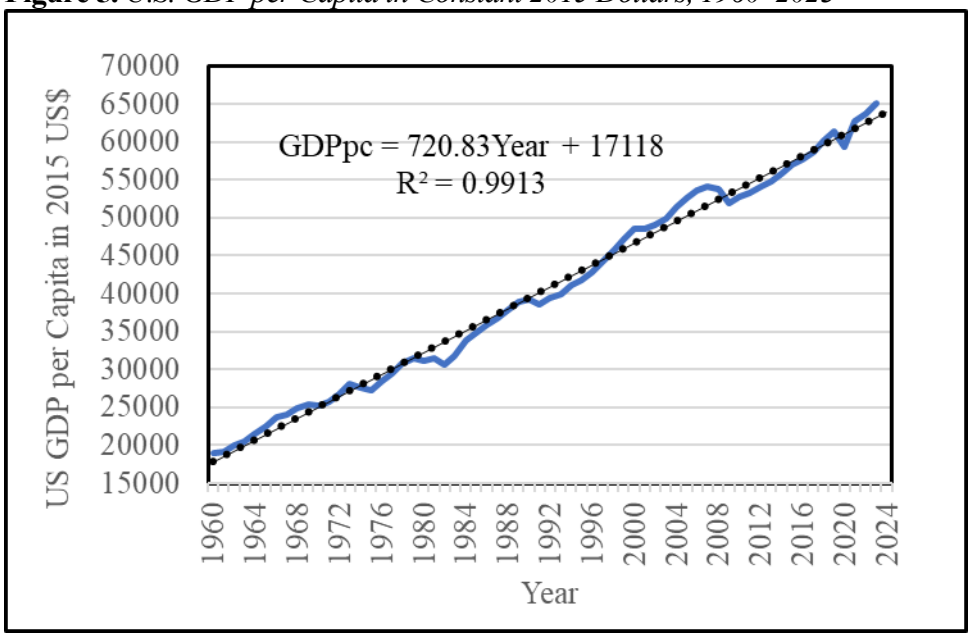
Figure 5 illustrates U.S. GDP per capita in constant 2015 dollars. Starting at $18,992 in 1960, it more than tripled to $65,020, representing a 3.4-fold increase. This growth reflects an impressive rise in absolute terms. But how did the U.S. economy perform relative to the rest of the world?

Figure 6 depicts the ratio of U.S. GDP per capita to world GDP per capita. From 1960 to 1982, this ratio remained relatively stable, hovering around 5.2. After 1982, however, the ratio began to accelerate, reaching its peak of 6.19 in 1999, a period that coincided with the height of global hyperglobalization. The lowest recorded value, 5.07, occurred in 1974, during the initial phase of stagnated globalization.

Following the 1999 peak, the ratio declined, eventually stabilizing at a new plateau in 2011. Between 2011 and 2023, the ratio has remained consistently close to an average of 5.6. These figures highlight that the U.S. has never lost its economic prominence. If anything, its relative standing has grown even stronger compared to previous decades.

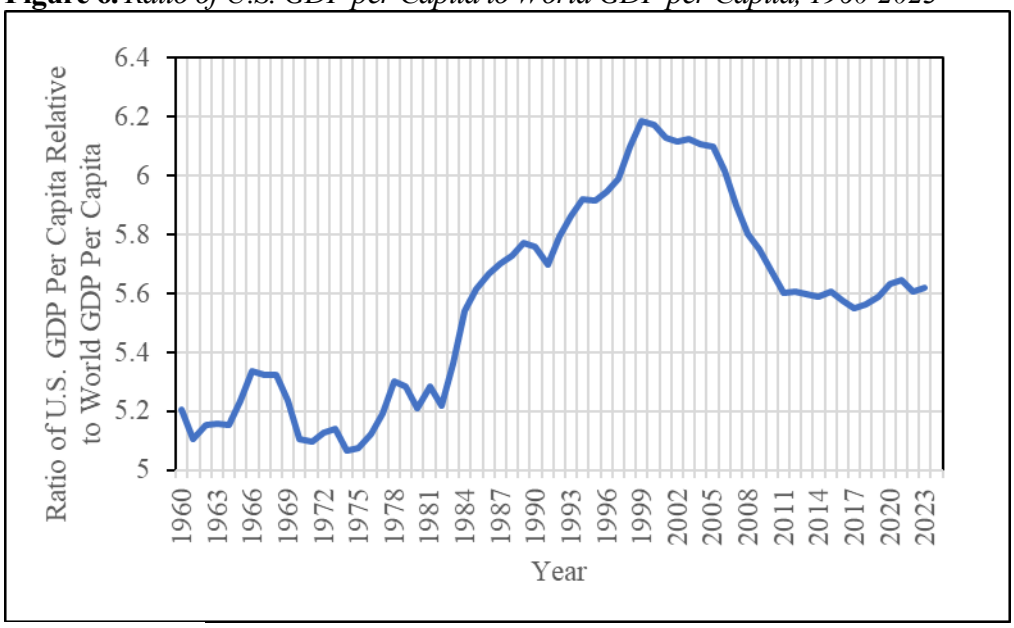
This is less of a U.S. ‘achievement’ and more a reflection of the rest of the world’s inability to capitalize on what is known in economic development as the 'advantage of backwardness.' I have applied this concept in Papanikos (2025) to explain the innovation gap between the U.S. and China. In the long term, there should be economic convergence, leading to a narrowing of the gap between U.S. GDP per capita and that of the rest of the world. The fact that the U.S. has widened the gap may be interpreted as a ‘failure’ of globalization to distribute its benefits to the rest of the world. It could also indicate that more globalization, rather than less, is needed.

Figure 5. *U.S. GDP per Capita in Constant 2015 Dollars, 1960–2023*



Source: World Bank

Figure 6. *Ratio of U.S. GDP per Capita to World GDP per Capita, 1960-2023*



Source: World Bank

In terms of economic achievement, as measured by GDP per capita, the US economy consistently performed well over these 52 years. This strong performance is closely correlated with its globalization metrics. Figure 7 illustrates the US globalization trends, which closely mirror global globalization patterns, including their cyclical fluctuations. Therefore, everything mentioned earlier about world globalization applies to the US globalization index as well. Similarly, as shown in

Figure 8, there is a comparable relationship between the US GDP per capita and US globalization.

Figure 7. *The U.S. Globalization Index, 1970-2021*

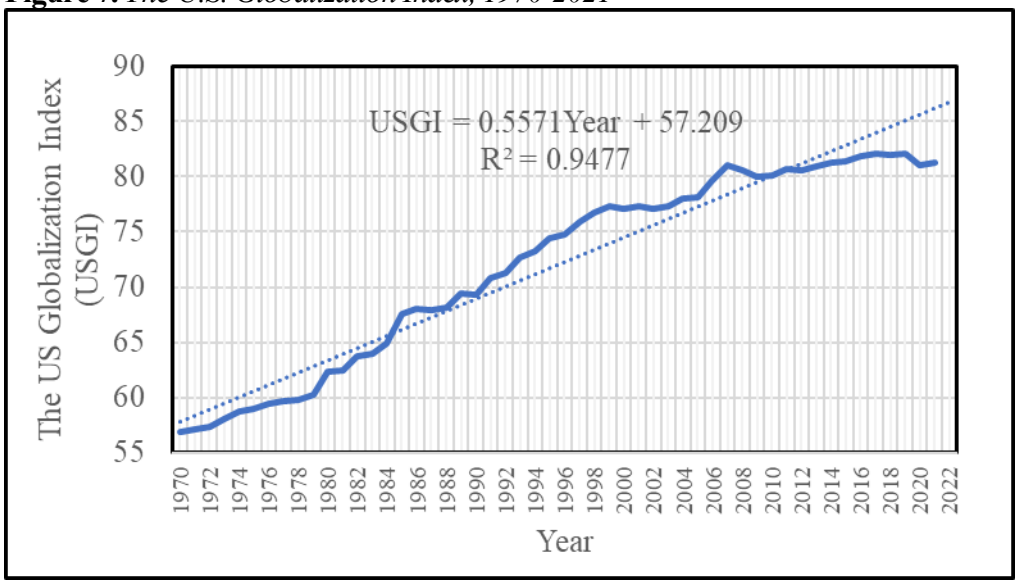
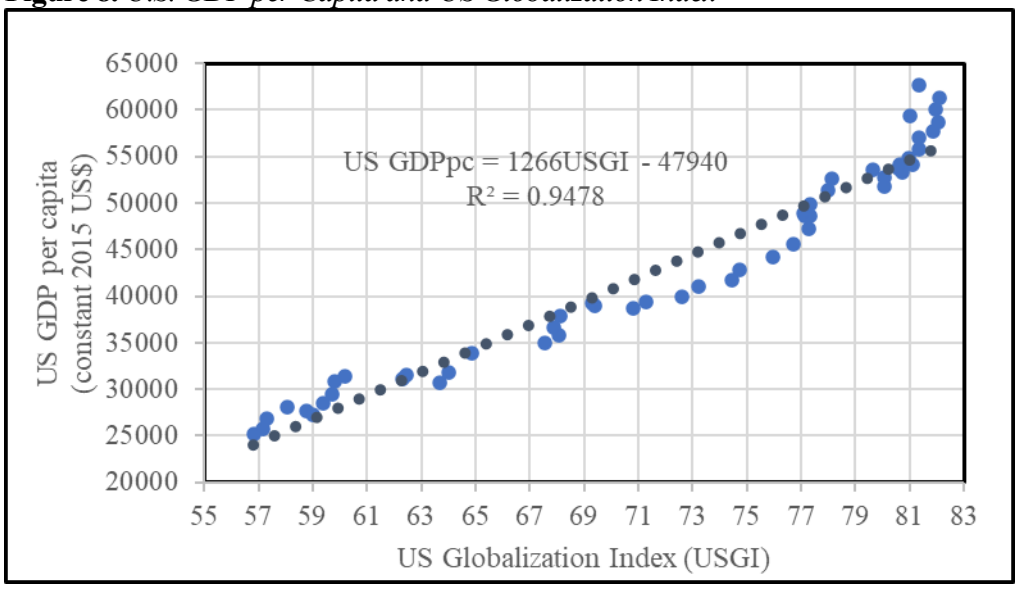


Figure 8. *U.S. GDP per Capita and US Globalization Index*



Even if this relationship is a pseudo-correlation and says nothing about causality, it is difficult to argue that the U.S. lost its greatness because it became more globalized. However, one might argue that if there had been a decrease in globalization, the U.S. economic performance could have been even stronger had it deglobalized. I test this hypothesis below in this section. Meanwhile, I report the unit root tests for the two variables in Table 5. Both time series are non-stationary, but their first differences are stationary. The autocorrelograms of these two variables show that

they thin out slowly, implying that shocks do not have a permanent effect on the long-run trend of either variable. The mean trend is most likely stable and not stochastic.

Table 5. *Unit Root Tests (Augmented Dickey-Fuller Test)*

Variables	Level t-values	Prob*	1st Difference t-values	Prob*
US Globalization Index	-0.12	0.9932	-8.12	0.0000
US GDP per capita	-2.67	0.2546	-6.35	0.0000

*MacKinnon one-sided p-values.

The focus of this study is not merely to demonstrate a positive association between U.S. globalization and its GDP per capita, but rather to explore how these two variables interact with global measures of globalization. The key question is whether there is any form of causality between the four variables examined in this paper: world globalization, U.S. globalization, world GDP per capita, and U.S. GDP per capita. If the U.S. economy operates independently of the global economy, then deglobalization should have no effect.

The purpose of this paper is not to develop a comprehensive model of the interactions between these variables. Instead, the analysis focuses on Granger causality tests. In the previous section (Table 4), it was shown that Granger causality flows from world globalization to world GDP per capita, but not the other way around. What about U.S. GDP per capita? How is it influenced by world globalization?

Table 6 presents the Granger causality tests. Based on the evidence, we cannot definitively determine the direction of the effect. It appears that there is no direct causal relationship between world globalization (GW) and U.S. GDP per capita (USGDPpc) in either direction.

Table 6. *Granger Causality Test GW and U GDPpc*

Null Hypothesis	F-Statistic	Probability
GW does not Granger Cause USGDPpc	0.212	0.8099
USGDPpc does not Granger Cause GW	1.491	0.2360

Table 7 presents another interaction between two variables: world GDP per capita and U.S. GDP per capita. The test indicates that we cannot reject the null hypothesis at the 1% level of significance, suggesting that world GDP per capita may Granger-cause U.S. GDP per capita. Moreover, there is no evidence of Granger causality in the opposite direction, from U.S. GDP per capita to world GDP per capita.

Table 7. *Granger Causality Test WGDPpc and USGDPpc*

Null Hypothesis	F-Statistic	Probability
WGDPpc does not Granger Cause USGDPpc	5.561	0.0069
USGDPpc does not Granger Cause WGDPpc	1.158	0.3234

Table 8 reports another Granger causality test, this time between world globalization and U.S. globalization. The results indicate that U.S. globalization Granger-causes world globalization. One interpretation of this finding is that the U.S.

plays a leading role in driving world globalization. As noted earlier, world globalization is heavily influenced by political factors, with countries like the U.S. playing a dominant role. This is another indication that U.S. is great country and always was since 1970.

Table 8. *Granger Causality Test GW and GUS*

Null Hypothesis	F-Statistic	Probability
GW does not Granger Cause GUS	1.449	0.2457
GUS does not Granger Cause GW	2.833	0.069

If we take the above Granger causality tests at face value, significant interrelations emerge that support the thesis that the U.S. has benefited from world globalization, which, in turn, has shaped its development. By taking a leading role in globalizing itself, the U.S. has encouraged other countries to follow suit, thereby driving world globalization. Increasing globalization, which includes the opening of international markets, positively impacts U.S. GDP per capita, as demonstrated by the Granger causality tests reported in Table 7.

Summarizing the evidence from the descriptive statistical analysis, the U.S. economy appears to have reaped substantial benefits from global globalization. These benefits were achieved by the U.S. first globalizing itself and then leading others to do the same. Economists have always argued that free trade is the best strategy for the participating countries. The conclusion that emerges is that if the U.S. were to deglobalize, the world would likely follow suit, creating an adverse environment in which both the global economy and the U.S. economy would suffer. Is this the outcome a future Trump administration would want? I don't believe so. Thus, all the rhetoric about "Making America Great Again" was a farce during Trump's first term, and it would remain a farce in a second term.

The next section explores the future of globalization, emphasizing long-term trends that extend beyond the four years of Trump's administration.

Whither Globalization

The previous descriptive analysis identified three significant stylized facts based on data from the experience of globalization since 1970:

a) There has been a long-term trend (spanning approximately 52 years) of increasing globalization.
b) This increase has occurred in two symmetric cycles, characterized by what I termed "stagnated globalization."
c) With the exception of six years of minor deglobalization, all other years have been marked by an overall increase in globalization.

The purpose of this section is to address two pertinent questions:

a) What drives the persistence of globalization?
b) What does the future hold for globalization?

In the following discussion, we examine these questions in turn.

What Drives the Persistence of Globalization?

The evidence presented above leads to the conclusion that globalization is resilient to any force that appears to threaten it. It is apparent that while the world can experience periods of deglobalization—as evidenced by six different, non-consecutive years within the 52-year period from 1970 to 2021—globalization nevertheless exhibits a strong long-term tendency to increase, whether at a decreasing or an accelerating rate, despite numerous adverse shocks.

Why does this happen? The answer is simple: globalization persists because people around the world desire it. They value it primarily for its ability to enhance their welfare, particularly their economic well-being. If given the freedom to choose, citizens will consistently opt for more globalization. By this, I do not mean that people will change their ideological stance for or against globalization, but rather that, when it matters, they would continue buying and selling in the global market if it is more profitable for them.

Two interrelated forces drive this phenomenon. First, information technology spreads news of both positive and negative developments worldwide. As most people seek to maximize benefits and minimize costs, there is a natural demand for goods and practices proven effective in other countries. This demand inherently fuels globalization.

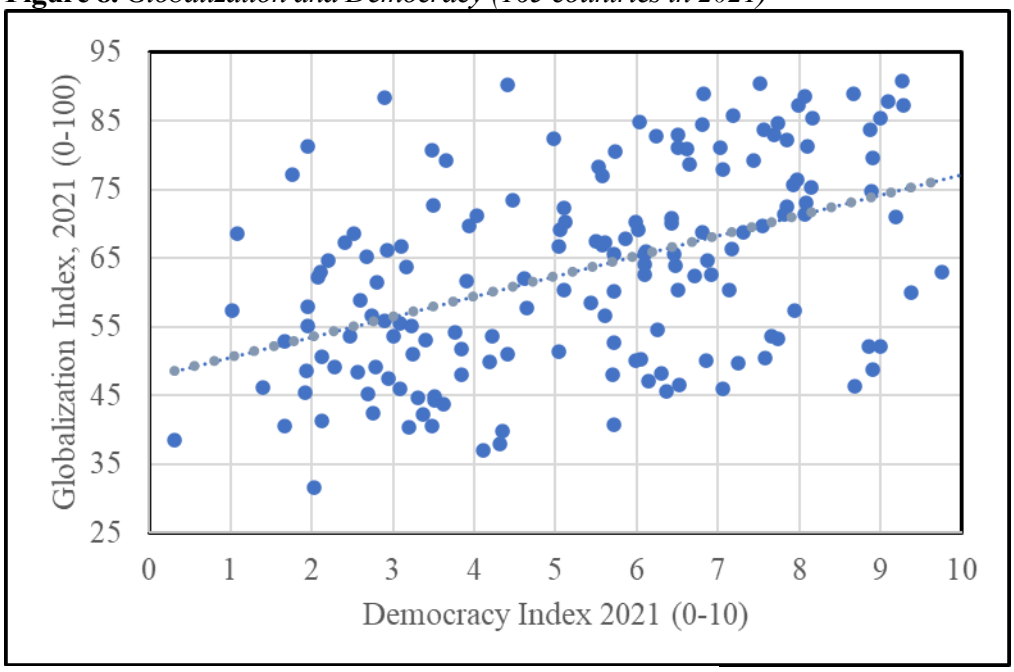
Second, people increasingly have the ability—though not perfectly—to express their opinions and enforce their preferences through a system rooted in Ancient Athens 25 centuries ago: democracy.[9] Applying this form of governance to modern societies is challenging, but technological advancements have expanded opportunities for direct and indirect participation by a growing global citizenry. Even the most oppressive regimes face internal and external pressure to open up and adopt beneficial practices. Globalization, it seems, is one such practice. If this holds true, democracy and globalization are inherently intertwined.

Figure 8 illustrates the relationship between globalization and democracy using a scatter plot of 165 countries for which data are available. The analysis reveals a strong positive correlation between the two variables. Table 9 presents the regression results based on a logarithmic specification. Although the Breusch-Pagan-Godfrey test (results not shown) indicates no heteroscedasticity issues, Heteroskedasticity and Autocorrelation Consistent (HAC) estimators are reported. There is no much difference with the Ordinary Least Squares estimators (results not shown).

There is a positive relationship between democracy and globalization. An increase in democracy tends to enhance globalization. Specifically, a 10% rise in the democracy index corresponds to a 1.9% increase in the globalization index. Evaluated at the average values of the two variables, this implies that a 0.53-unit increase in the democracy index (from 5.33 to 5.86) would lead to a 1.20-unit rise in the globalization index (from 63.33 to 64.53).

[9]I have written extensively on the issue of democracy in ancient times and its future in modern contexts (see Papanikos 2017, 2020c, 2022g, 2022h, 2022j). Additionally, for discussions on globalization in Ancient Athens, see Papanikos (2016).

Figure 8. *Globalization and Democracy (165 countries in 2021)*



Source: Economist Intelligence Unit (EIU) and KOF Globalization Index.

Table 9. *Regression Results of the Effect of Democracy on Globalization*
Estimated equation: Log (globalization) = c + b*log (Democracy)

	Estimated Coefficient	t-statistic	Probability
Constant	3.82	72.2	0.0000
Log (democracy)	0.1911	5.9	0.0000
Adjusted R-squared	0.1879		
F-Statistic	38.95		
Observations	165		

Note: Heteroskedasticity and Autocorrelation Consistent (HAC) Estimators.

However, the scatter diagram reveals significant dispersion across all levels of democracy, indicating that a specific level of democracy can correspond to varying degrees of globalization. This underscores the need for a country-by-country analysis. Despite this variability, the overall relationship remains positive. It is also essential to recognize that globalization is influenced by numerous factors, with democracy being just one among them.

What does the Future hold for Globalization?

The fate of globalization is closely intertwined with the fate of democracy. If democracy functions as a contagious phenomenon, spreading across the globe as it appears to have done over the past 100 years, then the future of globalization looks promising.

Even authoritarian regimes will feel the pressure exerted by democratic nations and may begin to act as if they were democracies. The influence of global social

media is immense. Citizens everywhere are aware of events around the world and aspire to secure the best for their own countries—believing that the best is democracy. Indeed, more democracy is better than less democracy.

However, while democracy is necessary, it is not sufficient. The benefits of globalization must be distributed in alignment with the world's needs, particularly to those living in absolute poverty. As I have demonstrated in Papanikos (2024a), one of globalization's greatest achievements is the significant reduction in the number of people living in absolute poverty.

Conclusions

I began this paper with Marx, and I will conclude with Marx. In his 1848 manifesto, Marx characteristically stated:

> The cheap prices of commodities are the heavy artillery with which it batters down all Chinese walls, with which it forces the barbarians' intensely obstinate hatred of foreigners to capitulate. It compels all nations, on pain of extinction, to adopt the bourgeois mode of production; it compels them to introduce what it calls civilization into their midst, i.e., to become bourgeois themselves. In one word, it creates a world after its own image.

I believe this is the best definition of globalization, once stripped of Marx's jargon. Globalization is not solely economic; it also impacts civilizations. This aligns closely with the definition of globalization used to collect data, which is categorized into economic, political, and social indices. This is the index used in this paper.

My interpretation might seem absurd to many Marxists, but it appears to me that Marx suggests globalization is inevitable—without it, pain could lead to extinction. In Papanikos (2024a), I have demonstrated that globalization significantly reduces absolute poverty. In other words, it alleviates human suffering. Furthermore, nations that do not engage in the globalization process risk remaining barbaric. Thus, globalization acts as a force that brings nations into civilization.

Of course, globalization comes with costs, and it is interesting to note that Engels, in his *Principles of Communism* (1847), writes that:

> We have come to the point where a new machine invented in England deprives millions of Chinese workers of their livelihood within a year's time.

The usual complaint now runs in the opposite direction. Using Marx's jargon, it is the 'cheap price of Chinese commodity labor' that has left thousands of Trump's supporters in the U.S. deprived of their jobs.

The conclusion of this paper is that the U.S. has always been a great country, and Trump is a powerful leader of the most powerful nation in the world today. However, globalization operates like a natural law—no country or leader can stop it. Thus, globalization is here to stay. This will happen with or without Trump. This becomes evident when examining Trump's first presidency. Despite all the rhetoric, U.S. globalization increased. Even if a second term attempts to reverse this trend, it will

only have a temporary effect. Sooner or later, the U.S. will return to its long-term path of increasing globalization.

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Outperformance versus Due Diligence: Which Produces Investment Winners?

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Investment consultants are seasoned professionals who perform due diligence on portfolio strategies of allocating institutional investor funds and assign a rating. Morningstar ratings are classification schemes based on such due diligence. This face-to-face interaction with portfolio managers concludes with the assigning of one to five 'Stars' to a portfolio strategy. Ratings allocate institutional investor funds among investment managers. Consulting firms supply an avenue for plan sponsors to transfer part of a fiduciary responsibility of the retirees' welfare. Regulators are constantly concerned that consulting firms produce recommendations that serve the interests of their own, or the portfolio managers that they evaluate, in breach of fiduciary responsibility. Specifically, the Department of Labor and the Securities and Exchange Commission are concerned that the advisers encourage portfolio managers to offer monetary benefits in exchange for a favorable rating. We compare the outperformance results stemming from the following of ratings to the ones stemming from not following the recommendations implied. We derive a set of buy and sell recommendations, one based on the active performance of portfolio strategies relative to few benchmarks (outperformance), and one based on the due diligence of consultants (ratings). The algorithm J4.8 produces rules that result in recommendations for the outperformance-based and the due diligence or ratings-based decisions of the hypothetical institutional investor in each case. We expected a priori that the rules based on outperformance would bring a better result for the investor. However, our findings showed that there was a slight benefit to the investor who followed ratings, both in terms of simplicity of decision-making, and in terms of risk-adjusted returns relative to the indices or benchmarks selected.

Keywords: *investment management, information ratio, rolling coefficients, government intervention*

Introduction

This study examines investment advising manifested in the form of recommendations of portfolio strategies offered by consulting firms to their institutional clients. U.S. regulatory bodies (Securities and Exchange Commission, the Department of Labor) are keenly interested in the issue of "pay-to-play," referring to an adviser's encouraging portfolio managers to offer a monetary benefit, in exchange for the former's rating the latter's investment strategies favorably. U.S regulators investigate the payments by various methods, indirectly imposed on money management firms, in exchange for access to the advisor firms' clients (Office of

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Compliance Inspections and Examinations 2005). We explore the role of ratings assigned by a specific investment advising intermediary, Morningstar, on the behavior of institutional investors. We compare the risk-adjusted performance results to those obtained by hypothetical investors who did not follow the recommendations indicated by Morningstar ratings. We find that there may be little cause for concern: the rules of selecting strategy 'learned' by Morningstar ratings, outperform similar rules 'learned' by simple outperformance in terms of Information Ratio. The J4.8 machine learning method helped achieve this result (Quinlan 1996). The J4.8 machine learning method is an improvement over the original C4.5 method (Quinlan 1993). Both methods maximize entropy of a system by extracting all of its information in the form of a decision tree (Shannon 1948).

Investment advising firms, through ratings they assign to investment portfolio managers, tend to influence the flows of assets under management (AUM) in and out of the strategies which the investment management firms offer to institutional and retail clients. The regulators are concerned that, in place of the investor-public whose welfare they should safeguard, consulting firms may produce recommendations that serve the interests of the evaluated portfolio managers (Xanthopoulos 2019). The ratings that advising firms such as Morningstar assign to investment managers, are in essence classification schemes that are based on due-diligence, a process that involves face-to-face interaction with the portfolio managers, and a subsequent assignment of a number of 'Stars' (one through five, in the case of Morningstar). Investors may be tolerating the symbiotic relation of the investment managers with the consultants that rate the former's strategies. Consulting firms "supply" needed classification schemes to institutional investors, in their latter's effort to circumvent/ evade their own fiduciary responsibility, as is evident in literature, below. The schemes imply investment recommendations aimed at institutional clients, in allocating funds for large retiree accounts, endowments, and foundations.

Per the Investment Adviser's Act of 1940 "advisers" must evaluate portfolios in a "disinterested" manner that involves "reasonable care to avoid misleading clients" (Barbash and Massari 2008, p. 633). But rating schemes may lead to advice tainted by financial interest, because of (i) potential employment of the research advisor at a firm whose investment portfolios the research advisor evaluates and (ii) generation of excess fees by the consulting firm that owns and operates a rating platform. Since the advisor charges a fee for on-line platform access to ratings and research, an advisor is a fiduciary (Ellis 2005). Investment firms incur "Pay-to-play," as compensation outside of fees officially charged to clients. Compared to a case where institutional investors do not believe in rating schemes, their choice to rely on them instead may have resulted in underperformance. An additional concern is that, in contrast to a potentially antagonistic relationship between investment firms and the consultants, as implied by pay-to-play, investment firms seek the rating intervention supplied by a consulting platform. Literature has also documented the transfer of responsibility from institutional investors' officers, referred to as plan sponsors. Quality control on rating schemes would safeguard the retiree benefits.

The contributions of this study are that: (i) institutional investors have the choice of either examining past performance or relying on ratings provided by Morningstar to decide where accumulated retiree funds should be invested, (ii) a plan sponsor's

choice itself to either look at past strategy performance or invest based on recommendations by ratings, can be modeled by a respective decision three that 'learns' how said investor would have behaved in each choice, (iii) Morningstar ratings do marginally better than investment strategy decision rules learned from past relative performance, (iv) based on the sample and time frame of this analysis, it is not surmised here that Morningstar ratings are affected by "pay-to-play," or that the ultimate interests of retirees, whose wealth is invested either by previous-outperforming or due diligence/ratings are impacted negatively by relying on advisor ratings, and (v) Recommendations based on Quintiles of Outperformance split at the BBB rating, the middle of the credit curve, which makes more sense. The typical strategy of a portfolio manager who is 'long' the AAA and CCC credits, and 'short' long the middle of the curve. Decisions based on due diligence, on the other hand start on 'long' positions on only one end of the curve, that is, AAA.

Literature Review and Institutional Background

Fiduciary duties, fundamental to financial services, corporate governance, and legislative frameworks, have garnered increasing attention for their role in safeguarding client and stakeholder interests while addressing regulatory and ethical challenges. Corcoran (2020) explores the selective application of fiduciary duties, finding them crucial in contexts such as asset management and independent financial advising, where selfless loyalty can mitigate conflicts of interest. By contrast, bank-customer relationships rarely invoke fiduciary obligations due to their transactional nature. This nuanced application highlights the challenges in balancing loyalty with operational realities in financial services. From a corporate governance perspective, Hill (2021) examines the transnational migration of fiduciary norms, particularly through stewardship codes that integrate fiduciary principles into global governance. These codes not only promote accountability but also reflect the interconnectedness of financial markets and the growing societal expectation for corporations to align with broader environmental, social, and governance (ESG) objectives.

Bratton (2020) critiques the theory of "evolutionary erosion" in corporate fiduciary law, arguing that modern governance frameworks have adapted fiduciary principles to contemporary demands rather than weakening them. Mechanisms such as disclosure requirements and independent boards deter self-dealing and align management actions with shareholder interests. Expanding this view, Worthington (2013) addresses the inconsistent application of remedies for fiduciary breaches. She proposes a systematic framework for determining when proprietary remedies should be employed, emphasizing the importance of consistency to uphold the principles of fiduciary loyalty. Together, these works underscore the adaptability and enduring relevance of fiduciary duties within evolving governance systems. The role of fiduciary obligations extends into the financial advisory market, where their application influences both market behavior and investor outcomes. Bhattacharya et al. (2019) demonstrate that fiduciary standards improve the quality of financial advice and enhance risk-adjusted returns by aligning advisor incentives with client interests. However, they caution that higher entry costs associated with such standards may

reduce market competition, presenting a trade-off between investor protection and industry accessibility. Similarly, Egan et al. (2022) analyze the impact of fiduciary duties in the annuity market, finding that stricter standards reduce the sale of high-fee products and shift broker behavior toward prioritizing client welfare. These findings highlight the effectiveness of fiduciary regulations in mitigating conflicts of interest, though they also reveal potential tensions between regulation and market dynamics.

In the legislative context, Tsuji (2022) critiques the failure of governments to fulfill fiduciary responsibilities when formulating policies that affect Indigenous communities. Using economic recovery acts in Canada as case studies, he identifies ethical shortcomings in consultation processes, underscoring the broader implications of fiduciary principles in public policymaking. This ethical dimension enriches the understanding of fiduciary obligations, extending their relevance beyond traditional private law applications. Collectively, these studies reflect the diverse applications and implications of fiduciary duties across financial, corporate, and public domains, illustrating their critical role in fostering accountability, trust, and equity in increasingly complex and interconnected systems.

This study uses standard vocabulary of active management. For example, "[a]lpha is interpreted as a measure of skill" by the global investment community (Ang 2014, p. 307). In its most generic formulation *alpha* is the 'intercept' while *beta* is the slope of a linear regression of portfolio returns, against a portfolio benchmark. *Active return* is defined as the return of a portfolio strategy, over the benchmark, or in this case, over the eight indices that are selected to capture the credit-rating curve (as opposed to investment manager ratings), from AAA to High-Yield or CCC. *Tracking error* is defined as the standard deviation of active returns. Information ratio (*IR*) is *alpha* divided by 'tracking error.' Thus, information ratio (*IR*) measures portfolio returns beyond the returns of a benchmark, usually an index, compared to the volatility of those returns. The benchmark used is typically an index that represents the market or a particular sector or industry that pertains to a 'Universe.'

Numerous studies suggest that consultant recommendations fail to lead to the selection of investment managers that outperform. The implication is that investors who elected to rely on recommendations could have used a method that resulted in selections of equal or better relative performance. Chalmers and Reuter (2020), find that investors who go through an intermediary are younger, less educated, and less highly paid. The clients of brokers take on greater risk and pay higher fees. Investors that rely on these financial advisors would most likely select the managers near the top of a universe or peer group if not rely on advisors. In our study, the portfolios selected could have been recommended solely on estimated information ratio (*IR*). On the other hand, advice constitutes relying on schemes available through on-line platforms such as Yahoo Finance. We regress *IR* against betas to a number of indices as independent variables across all investment strategies in our sample. Institutional investors switch from estimated information ratio to following classification schemes subject a pension plan, a retirement account, endowment, or foundation, to distortions in the selection process based on these betas to indices for each investment strategy. It is these distortions that regulators are concerned about regarding the possibility of pay-to-play. As reiterated above, we are not finding any evidence of the above in this study

– quite the contrary. Machine-learning rules that were learned based on the ratings, do better than those learned out of string outperformance or *IR*, we find.

Fees generated by the platform more than a flat rate raise the incentive to the consulting firm to leave things as are. The literature finds that fee incentives skew recommendations. Chalmers and Reuter (2020), show that face-to-face interaction of financial advisors with institutional investors entail conflicts of interest. The fee-generation incentive leads to investors making riskier but underperforming choices and paying higher fees. When access to recommendations is free of charge, these conflicts of interest vanish. Peculiarly, investor-clients continue to follow ineffective recommendations. The reasoning found in literature, concerning the need or efficacy of investment consultants, extends to on-line platforms of a sizable footprint. In principle, investment firms should not need a ratings scheme. Gennaioli et al. (2015), allude to the fact that investment management firms are flexible enough to respond to the biases of institutional investors, all by themselves. Money managers pander to investors who exhibit persistent biases. This pandering affects arbitrage and poses a risk of market destabilization. To receive higher fees, portfolio managers abandon arbitrage and turn into noise traders, if investors become trusting. Contrarianism pays in the long run but becomes less attractive to profit-maximizing managers, these authors conclude. Similar results are found in Jegadeesh et al. (2004), in the context of recommending individual stocks: analysts' excessive focus on glamour stocks contributes to noise trading. In this paper, we do not conclude that rating schemes exacerbate the systemic risk of market destabilization. Noise-trading raises market volatility, as per Gennaioli et al. (2015). However, based on our results, we cannot conclude that portfolio outperformance distortion by ratings can lead to en-masse redemptions. Still, pay-to-play of any kind has been of concern to the U.S. regulatory authorities.

Weber (2015) mentions regulators' hesitation to restrict the flow of capital from banks to the stockholders before the 2008 crisis, from 2005 to 2007. In pay-to-play, it is the research advisor, who "curries" favors (Weber 2015, p. 45). By analogy, classification schemes that safeguard investor interests should act as an impediment to en-masse redemption of funds entrusted by shareholder/institutional investors. Lack of quality control in schemes contributes to the fallacy of composition, where one investor runs for the proverbial theatre exit, while every other investor does too. A cushioning effect by ratings is envisioned.

Like the original regulatory capture in Stigler (1971), who proposed a "second view" of the political process, advisory capture "defies rational explanation." Contrary to the idealistic view that a portfolio manager dreads any robust classification scheme, it is the 'Consultant Relations Team' of investment advising firms that act toward the consultant/advisor in a manner that promotes a good rating. The schemes maintained by research advisors of the consulting firms resemble "the congressman feathering his own nest" through licensing practices. In advisory capture, licensing equates to recommending a portfolio for initial or prolonged investment by a plan sponsor amid responsibility-transfer. This depiction is like Stigler's industry-demand for regulation. In issuing responsibility-shielding licenses as ratings, research advisors evolve to 'regulators under capture' as in Levine and Forrence (1990). They develop narrow, self-interested goals of job retention, self-gratification from exercise of power, and post-advisory wealth. High tolerance for harassment develops internally, while rating

schemes become valid only for small subsets of research, like Dal Bo and Di Tella (2003). Symptoms of "repeated extortion" that pertain to such capture as in Choi, 2004, lead to the perpetuation of antiquated technologies, arbitrariness, and unpredictability. Luckily, "larger plans are less likely to retain consultants to assist them in the selection process and have higher post-hiring excess returns than their smaller counterparts" (Goyal and Wahal 2008, p. 1808). Larger institutional investors are less prone to responsibility-transfer. Still, these classification schemes entail immediacy of portfolio manager contact with the research advisors who maintain them. Consultant Relations teams of portfolio management firms seek after contacts, beyond the scope required for pure strategy evaluation. Through simultaneous contact with plan sponsors, after gaining familiarity with responsibility transfer, the teams perceive the void between consultant and research advisor. In this study, we were unable to find evidence that supports the above, based on rating classification schemes, in contrast to investment manager selection based on outperformance. We conclude that rating schemes may not always result in a loss for investors. Advisors produce recommendations that are neither "fruitless," not harmful to the institutional investor[10].

The Department of Labor's Fiduciary Rule

Consulting firms serve as regulating gatekeepers for the flows of assets under management (AUM) in and out of portfolios. Recommendations are revealed through the schemes maintained by research advisory teams and made available on their on-line platforms. A concern of regulatory agencies in the U.S. is that in place of the investor-public, whose welfare they safeguard, consulting firms produce recommendations that serve interests of the evaluated portfolio managers. The undertaking by the US Department of Labor (DOL) to expand the "investment advice fiduciary" definition under the Employee Retirement Income Security Act of 1974 (ERISA), and to modify the prohibited transaction exemptions for investment activities in light of that expanded definition, had become at the time, the most controversial, politicized retirement rulemaking since the enactment of ERISA. Everything about this rulemaking has been initially unprecedented. The fiduciary rule, finalized in 2016 under the Obama administration, broadened the definition of when a person or entity was taking on fiduciary responsibilities and replaced the five-part test used to determine whether an investment professional or financial institution is a fiduciary. Before that time investment advisors fell outside of the definition of a fiduciary, and therefore, kickbacks were not only legal, but it is common practice. To curb these practices, DOL's new ERISA rules expanded the definition of a fiduciary and created a new method of exempting certain prohibited transactions. The prohibited transactions related mainly to the method that fiduciaries received their compensation. For a fiduciary to receive commission-based compensation, they should comply with the requirements for a Best Interest Contract Exemption (BIC exemption) that required extensive disclosure about possible conflicts of interest. On April 8, 2016, the DOL

[10]Jenkinson et al. (2016, p. 2333), refer to recommendations offered directly to clients. Our study refers to ones implied by ratings found on-line or housed within on-line platforms, made available for a fee.

published the final rule that modified the existing regulation of conflicts of interest in the market for retirement investment advice under ERISA.

Title I of ERISA covers and protects employee benefit plans, imposing an obligation on people who engage in activities related to the plan as fiduciaries. The fiduciary standard under this Title imposed a duty of loyalty and prudence upon the fiduciaries. Title II established rules for the tax treatment of IRA's and other plans subject to the Internal Revenue Code. Under both Titles, advisors were subject to the Prohibited Transaction rules and their exemptions. However, while still titled fiduciaries, Title II did not create a private right of action and due to its lack of state law preemption, advisors were not subject to the fiduciary duties of loyalty and prudence as Title I advisors. The fiduciary claims against advisors under this Title fell under state law. The two changes mentioned above consisted of 1) a new definition of Fiduciary under ERISA and the Code and 2) the creation of the Best Interest Contract Exemption. Registered Investment Advisors and Broker-Dealers are the two groups that provide investment advice to retirees. Outside of ERISA, these groups of professionals have different standards in regard to the duty owed to their client in the general course of business. Under the Investment Advisors Act of 1940, Investment Advisors are held to a fiduciary standard. However, this is not the same as the fiduciary responsibility under ERISA. Broker dealers are subject to the suitability standards under the Financial Industry Regulatory Authority (FINRA) guidelines. FINRA is a self-regulatory organization (SRO) that operates under the Securities and Exchange Commission (SEC), a federal government agency. While both agencies protect investors, FINRA primarily regulates broker-dealers and their agents, while the SEC has broad authority over securities markets.

To be deemed a fiduciary under the 1975 ERISA definition, one must satisfy a five-part test, the details of which are beyond the scope of this analysis. Due to the changing landscape of retirement investment products, certain one-time transactions like rolling assets into an IRA failed to satisfy the "regular basis" element of the test. The DOL was concerned of this gap because rollover investments are often "the most important financial decision that many customers make in their lifetime." Furthermore, in the fine print disclosures of the contract, advisors would commonly avoid fiduciary duties by stating: "investment advice is not intended to be the primary basis for decisions." The fiduciary rule replaced this five-part test with the goal of broadening the definition. The new rule defined a fiduciary as anyone who rendered investment advice and received compensation, directly or indirectly. Investment advice is intended to be read broadly to include any communications that are likely to be considered a suggestion to take, or refrain from taking, a particular action. For the purposes of Title II, this new rule merely expanded the range of fiduciaries subject to the prohibited transaction rules, but the rule did not necessarily burden them with the fiduciary duties set out in Title I. While this new rule did have some implications on Title I advisors, the main thrust of the rule is aimed at Title II advisors of IRAs and other non-Title I plans (Botkin 2018). President Trump tried to have the law rescinded. The broker-dealer profession pushed back on the law, citing that "there [was] ample evidence in the record to warrant materially revising or rescinding the Fiduciary Rule, and it is entirely possible that the Fiduciary Rule Re-evaluation Study will clearly articulate the need to modify the current form of the Fiduciary Rule or eliminate it all together." At

the time the Fiduciary Rule's fate was uncertain, due to fears that it invited unprecedented litigation exposure and forced financial institutions to make immediate, harmful, and sweeping changes to their businesses, operations, and compliance policies and procedures. The Department's approach to this rulemaking in this regard was critiqued to be hasty, counterintuitive and irresponsible, causing irreparable harm[11].

Ultimately, the Law was vacated, in 2018. In 2018, a three-judge panel at the 5th U.S. Circuit Court of Appeals in New Orleans vacated a Labor Department rule, commonly known as the fiduciary rule. It was done in a 2-1 decision because it said the department exceeded its legal authority. Allowing fiduciary advisors to receive compensation directly from mutual fund companies, albeit with certain restrictions, means participants don't pay out of their own pocket for advice, which might otherwise be unaffordable for them, supporters of the new guidance said. Critics contended that allowing third-party payments to advisors raised concerns about participants receiving conflicted advice that is not in their best interest. However, the Securities and Exchange Commission was still concerned with the recommendations for portfolio strategies offered by consulting firms to their institutional clients.

SEC Regulation Best Interest (Reg. BI)

On June 5, 2019, the Securities and Exchange Commission adopted a package of rulemakings and interpretations designed to enhance the quality and transparency of retail investors' relationships with investment advisers and broker-dealers, bringing the legal requirements and mandated disclosures in line with reasonable investor expectations, while preserving access (in terms of choice and cost) to a variety of investment services and products. Specifically, these actions include the new Regulation Best Interest, the new Form CRS Relationship Summary, and two separate interpretations under the Investment Advisers Act of 1940. Individually and collectively, these actions are designed to enhance and clarify the standards of conduct applicable to broker-dealers and investment advisers, help retail investors better understand and compare the services offered and make an informed choice of the relationship best suited to their needs and circumstances, and foster greater consistency in the level of protections provided by each regime, particularly at the point in time that a recommendation is made. The SEC's Best Interest Regulation (Reg. BI) under the Securities Exchange Act of 1934 establishes a "best interest" standard of conduct for broker-dealers and associated people when they make a recommendation to a retail customer of any securities transaction or investment strategy involving securities, including recommendations of types of accounts. As part of the rulemaking package, the SEC also adopted new rules and forms to require broker-dealers and investment advisers to provide a brief relationship summary, Form CRS, to retail investors. In addition, the SEC published interpretations concerning investment advisers' standard of conduct under the Investment Advisers Act of 1940, and the "solely incidental" prong of the broker-dealer exclusion from the Advisers Act. Regardless of retirement plan design, the advance-funding of retirement expenses will prove difficult in the

[11]Definition of the Term "Fiduciary" and Related Prohibited Transaction Exemptions Proposed Extension of Applicability Date (RIN 1210-AB79).

previous low-interest rate environment, which is rapidly changing to a high-interest rate environment after decades of central bank intervention (Quantitative Easing). The combination of no succinct fiduciary responsibility for financial consultants, combined with QE-induced tendency of portfolio managers to 'swing for the fences may entice the liquidation of assets backing the financial performance of U.S. retirement accounts, especially in the face of prevalence of defined benefit and defined contribution plans. Lawmakers and political leaders may exhibit the syndrome of a short memory. However, the retirees who now see market values plummet currently comprise the same cohort that watched the value of their real estate evaporate in the 2008 financial crisis. They may think, "fool me twice, shame on me," and they may exit the financial markets by prematurely liquidating their private retirement portfolios, leading to a crisis again. In the face of these fears, it is important to stress that our study did not find evidence of Morningstar's ratings contributing.

Methodology

Admissible investment strategies for most retirement plans, endowments and foundations are classified as 'long-only' meaning that short-selling is not allowed. 'Fixed income', 'equity', and 'hedge-fund' is the first level of taxonomy of investment strategies. The second level is universes of strategies, in each category above. For fixed income strategies, a general/non-inclusive list of universes is shown below:

Aggregate Bond
Aggregate Bond Intermediate
EM Bond Local Currency
Foreign Aggregate Bond
Foreign Blend
General Corporate Bond

In each universe there are investment strategies, for which data were collected on Net Asset Value (NAV) from Yahoo Finance by research assistants at Lewis University[12]. Data on NAV collected were changed to monthly percentage changes or returns. The data collection was run for investment strategies in the universes listed above. A flat file with all strategies, in all universes across, with returns per month going down the file, was put together. The top five lines had information about the name of the strategy, its universe, its overall outperformance rating by Morningstar, and its risk rating by Morningstar. The returns and the ratings were used in the analysis described below. A separate sheet of the file had index returns for the indices provided by the Federal Reserve of Saint Louis, as discussed below. Returns for strategies and indices were put together in another file, in which the following steps were programmed in VBA. This particular methodology, programmed in the VBA language, has been used in an actual industry investment consulting environment, and is thus replicated here.

[12]The Authors want to express their sincere thanks to Lewis Graduate Student Anudari Chuluubbaatar Graduate Research Assistant Sravya Chigurupati for their dedicated effort in pulling data for more than one thousand actual fixed income portfolios, from Yahoo Finance and other sources.

Given Excel's ability to record user applications through keystrokes, the point to be made here is that putting together a methodology such as this, to assess the quality and monitor the level of efficacy of ratings, should be relatively simple. The step taken in this paper, beyond that point, was that of devising a decision tree based on the J4.8 methodology, programmed in the software package Weka. But consulting and general finance companies maintain large volumes of data in Excel. We could have entered this data into R or Python and redo the analysis there. However, that additional step may have taken away a portion of the authenticity of the methodology.

Step 1: Select Strategies to be Analyzed

A lookup drop-down box in Excel lets the user select one or more of the universes listed above. The Excel file goes to the flat-file and selects the strategies that fulfill the universe criterion selected. The strategies selected from the flat file were isolated in a separate Excel sheet for data-scrubbing. For example, there may be months of missing data for some strategies. Portfolio strategies often start and terminate within a varied range of months due to their prospect of success or failure. The authors inspected the results.

Step 2: Estimate Coefficients

The VBA (Visual Basic for Applications) – programmed informs of the maximum number of months of clean data that is available across all the investment strategies selected. The estimation methodology runs on a rolling sample of successive 24 months (for this version of the paper). The 24-month sample is rolled forward one month at a time, and the estimation described below is repeated. In this version, there were 154 strategies that belonged in the first universe listed above, 'Aggregate Bond.' Estimation results as described here, were run for all these investment strategies, against eight indices selected (see below).

For each one of the 200 strategies the following processes are run: (i) Rolling Regression to Benchmarks for 24-month period that starts at a certain date, (ii) Rolling Information Ratio for a 24-month period that begins at the same date, (iii) Regression of Information Ratio against benchmark coefficients from (i). The result shows the sensitivity of the information ratio of each strategy to the 'exposure' of the strategy returns to each of the eight benchmarks selected for the analysis. The portfolio manager thus is assumed to have generated risk-adjusted return (IR) through beta-exposure of strategy returns to varying indices.

Regressing Information Ratio (IR) against beta-exposures could give new coefficients, which measure the degree to which the portfolio manager generates performance (IR) through such exposure to each index. This work may be performed in subsequent study. In this study, we decided to translate the magnitude of the beta coefficients into categories, so that decision trees using machine-learning methodologies can be constructed. Specifically, we constructed two such decision trees that would help an institutional investor decide to invest (buy or move funds into) or divest of (sell or move funds out of) the strategies that fell within certain ranges/categories of beta coefficients.

Step 3: Produce Results

Items (i), (ii) and (iii) in Step 2 above require standard regression estimation of the monthly returns of each strategy against the benchmark of each strategy. In this study, we tried to extract as much 'alpha' out of each strategy by regressing its returns against eight selected indices or benchmarks described below.

A. Rolling Regression to Benchmark: Twenty-four monthly returns of the first of the 154 investment strategies were regressed through linear regression against eight preselected benchmarks: In this example:

- Bloomberg Global Aggregate Bond (LEGATRUU)
- ICE BofA AAA US Corporate Index Total Return Index (BAMLCC0A1AAATRIV)
- ICE BofA AA US Corporate Index Total Return Index (BAMLCC0A2AATRIV)
- ICE BofA Single-A US Corporate Index Total Return Index (BAMLCC0A3ATRIV)
- ICE BofA BBB US Corporate Index Total Return Index (BAMLCC0A4BBBTRIV)
- 10 ICE BofA BB US High Yield Index Total Return Index (BAMLHYH0A1BBTRIV)
- ICE BofA Single-B US High Yield Index Total Return Index (BAMLHYH0A2BTRIV)
- ICE BofA CCC & Lower US High Yield Index Total Return Index (BAMLHYH0A3CMTRIV)

The coefficients of regression for this rolling sample become part of the data for further analysis. This model usually has a high F-test significance, but only a few t-statistics of the coefficients are significant, pointing to possible multicollinearity. To correct this issue, we plan in future studies to arrange the returns of the eight indices (benchmarks) into linear combinations through Principal Component Analysis (PCA). We can also separate clusters of return data through k-means clustering for variable reduction. Perhaps the number and size of beta coefficients could be estimated through maximum likelihood with a penalty function, such as the Akaike Information Criterion (AIC). At any rate, this is a forecasting model for which the beta coefficients to indices indicates the sensitivity of portfolio returns to different indices that lie across the credit curve, from AAA Corporate to CCC or High Yield. Given the name of the universe, Aggregate Bond, we would have expected the top level of separation in the decision tree to be on the most conservative index in the group, that is, Bloomberg Global Aggregate Bond (the Agg). The results below will show that this was not the case at all. In a hypothetical example, beta - coefficients of the returns of the fixed income investment strategy XYZ - Core Plus, against the eight benchmarks are produced from rolling samples of 24 months each. Fifty-nine months of data were available for all 154 strategies in the Aggregate Bond Universe. These months produced estimates for 13 months for Information Ratio, given that the rolling sample of estimation was 24

months, and that the number of monthly observations for the Information Ratio (*IR*) was also twenty-four.

B. Rolling Information Ratio: Information ratio is defined here as measuring portfolio returns beyond the returns of the combined eight-index benchmark, divided by the volatility of same difference. That volatility is called tracking error. It is the standard deviation of portfolio returns beyond the benchmark. It captures the risk-adjusted ability of a portfolio manager to generate active returns above a benchmark. The monthly portfolio returns above the benchmark, often called 'active' returns, are calculated. That is the difference between the actual monthly return of the fund known, and the return of eight benchmarks, weighted by the beta-coefficients estimated in the step above. The assumption is that if the portfolio manager held the eight indices, in proportion of the beta-coefficients, then the manager would not have to engage in active management to exceed this weighted sum of the eight benchmarks. This thread of an issue cuts into the compensation scheme of a portfolio manager, in terms of being able to justify the manager's ability to generate above-index returns.

C. Regression of Information Ratio: The information ratio, based on which probability of information ratio is estimated, is a forecast. If for the current month, the forecast is based on the regression of the 24 months of IR against the current beta coefficients. If one month forward, the forecast is based on the regression of the 24 months of IR against the lagged beta coefficients. This part of the analysis is where time-series analytics can be applied (ARMA/ARIMA, GARCH, Regime-Switches, ANN, etc.). For the version supplied here, only three 'forward-looking' items (forecasts) are provided: current month (not a forecast per se), a six-month forecast, twelve-month forecast, and a twenty-three-month forecast. In the last step of this project, Report Generation, we ran the set of *IR* and beta coefficients as of a current month (the end of our period of data which was September 2023), and divided these numbers into five quintiles, like the five star-ratings that Morningstar assigned to these strategies. Then, we devised two decision trees, (i) the first one based on *IR* the (ii) second based on Morningstar's ratings. Then, we ran the Report for *IR* and beta coefficients again but for a two-year forecast of *IR* as described herein. We applied the decision-tree rules for (i) and (ii) and looked at average *IR* for each case. Pleasantly the decision tree based on (ii) Morningstar ratings produced an average two-year-forward *IR* that was greater than that of the tree based on (i) Information Ratio.

D. Use of Machine Learning Techniques: As is the case in other applications of machine learning methodologies, it is assumed here that the beta coefficients to indices and the Information Ratio (*IR*) have a simple logical structure, which is captured by a decision tree. The idea makes sense with one 'attribute' (that is, one beta coefficient, plus *IR*) but here, we have eight of them plus *IR*. We make rules that test a single attribute and branch accordingly. Each branch corresponds to a different value of the attribute. We first select an attribute (one beta coefficient to an index) to place at the root node and make one branch for each possible value. This splits up the example set into subsets, one for every value of the attribute. Now the process can be repeated recursively for each branch, using only those instances that reach the branch. If at any time all instances at a node have the same classification, such as Invest or Not-Invest (in the investment strategy going through the tree) we stop developing that part of the tree (Witten et al. 2016). The concept of information-measure relates to the amount of

information obtained by deciding. The measure relates to the amount of information obtained by making decisions, with properties: (i) when the number of either yeses or no's is zero, the information is zero, (ii) when the number of yeses and no's is equal, the information reaches a maximum, and (iii) the information should obey a multistage property. 'Entropy' satisfies all these properties, and it is used in the methodologies programmed in the software 'Weka' that we used to derive the decision trees below[13]. The original decision tree program called C4.5 and its successor C5.0 were devised by Ross Quinlan over a 20-year period beginning in the late 1970s (Quinlan 1993). J48 is the implementation of Quinlan's C4. 5 algorithm that can generate a trimmed decision tree. Information is split into smaller subsets based on standardized data gain obtained by dividing the data by an attribute. This process ends if each subset is equivalent to a class.

E. Possible Extensions for Future Research: Other techniques could be implemented in the data, for future research. In this version of the paper, the *IR* forecast was changed to a binary response variable, in the sense that advisors recommend strategies for which *IR* exceeds a threshold (recommend = 1). We could have used logistic regression to find the beta-exposures, of strategies that are recommended versus those that are not. This method would reveal what exactly it was, which made a strategy outperform in a group of others, within a period, in a repeatable, quantitative way. In contrast, the y – variable in binary form [recommend, do not recommend] could be inferred from actual ratings assigned by vendors such as Morningstar. Logistic Regression would then be based on [recommend, do not recommend] rating decisions arrived at through some form of qualitative, subjective analysis (which Morningstar data also provides). The coefficients of that ratings-based Logistic Regression (MLE, with possibilities of use of penalty functions), would then be compared to the coefficients of Probability of Outperformance if *IR* was changed to a probability measure within the set of strategies that were examined. We could then argue as to where the qualitative analysis went wrong.

"Discriminant" analysis could also be used to produce a score, in either of the two cases or both. The researcher could then compare differences between the weights of the separating hyperplane between the two cases. Perhaps the Probability of Outperformance is associated with the coefficients of strategy returns to benchmarks, through a non-linear relationship that has as part of it, a regime-switching, hyperbolic tangent function in it. Regularly, the non-linear portion of such an equation captures 'tactical' elements of strategic investment, such as forerunning a decision on rates by the Fed. The other, the linear part of the equation would then be the 'strategic' part of the strategy, mandated by the client or advertised as such by the investment manager firm. Is a strategy that claims to be mainly tactical good at it? What portion of the investment management do ratings assigned by professionals at Morningstar and elsewhere depict? Do funds with a higher tactical (i.e., nonlinear) element as revealed here, correspond to a higher value of the discriminant analysis on ratings assigned? Does analysis change across universes, times, or domiciles? Does the name of the analyst constitute a better forecast of outperformance (good strategies, given to seasoned raters)? These possibilities will be examined in future versions of this research effort.

[13]https://www.cs.waikato.ac.nz/ml/weka/.

Table 1. *Portion of Current Report of Information Ratio against Beta Coefficients*

Moment 1. Strategy beta Coefficient to Index, Average Over Time		Global Aggregate Bond	AAA US Corporate Index Total	AA US Corporate Index Total	BofA Single-A US Corporate	BBB US Corporate Index Total	BofA BB US High Yield Index Total	BofA Single-B US High Yield Index	CCC & Lower US High Yield Index	24 Monthly Returns From 11/30/2018	
Measure 1. Information Ratio in Universe Forecast 0 Mo Fwd											
Forecast 1. Forecast of Information Ratio for Curr Mo		(LEGATRUU)	Return Index	Return Index	Index Total	Return	Return	Total	Index Total	To 4/30/2023	
Portfolios that are 'Aggregate Bond'	alpha	1 Bloomber	11 ICE BofA	15 ICE BofA	20 ICE Bo	8 ICE BofA	10 ICE Bo	12 ICE Bo	5 ICE BofA	Curr Mo	Rank
Pioneer Multi-Asset Ultrashort Income Fund - K (MAUKX	0.001	-0.045	-0.143	-0.262	0.400	0.247	-0.345	0.219	0.087	0.789	1
Pioneer Multi-Asset Ultrashort Income Fund - A (MAFRX	0.001	-0.021	-0.192	-0.257	0.496	0.208	-0.384	0.258	0.080	0.701	2
Pioneer Multi-Asset Ultrashort Income Fund - C2 (MAUC	0.000	-0.026	-0.158	-0.262	0.418	0.232	-0.355	0.224	0.088	0.609	3
BBH Limited Duration Fund - I (BBBIX)	0.001	-0.014	-0.292	0.141	0.134	0.257	-0.147	0.098	0.042	0.604	4
Pioneer Multi-Asset Ultrashort Income Fund - C (MCFRX)	0.000	-0.032	-0.211	-0.164	0.426	0.206	-0.372	0.234	0.091	0.596	5
BBH Limited Duration Fund - N (BBBMX)	0.001	-0.004	-0.263	0.190	-0.024	0.311	-0.087	0.025	0.051	0.592	6
Delaware Diversified Floating Rate Fund - Institutional (D	0.002	-0.117	-0.562	0.636	0.132	0.128	-0.408	0.550	0.150	0.542	7
Delaware Diversified Floating Rate Fund - A (DDFAX)	0.002	-0.115	-0.579	0.631	0.189	0.102	-0.410	0.548	0.152	0.523	8
Delaware Diversified Floating Rate Fund - R (DDFFX)	0.002	-0.116	-0.543	0.514	0.201	0.175	-0.408	0.535	0.153	0.456	9
Delaware Diversified Floating Rate Fund - C (DDFCX)	0.001	-0.119	-0.591	0.747	0.050	0.143	-0.411	0.543	0.150	0.437	10
Dreyfus/Laurel Funds Inc - Dreyfus Floating Rate Income	0.002	-0.311	-0.689	0.495	0.708	0.113	-0.619	0.745	0.155	0.393	11
Credit Suisse Strategic Income Fund - I (CSOIX)	0.002	-0.040	-0.298	-0.101	0.485	0.203	-0.354	0.546	0.257	0.377	12
Dreyfus/Laurel Funds Inc - Dreyfus Floating Rate Income	0.002	-0.324	-0.663	0.466	0.663	0.160	-0.614	0.738	0.149	0.377	13
Credit Suisse Strategic Income Fund - A (CSOAX)	0.002	-0.059	-0.261	-0.093	0.349	0.293	-0.333	0.513	0.257	0.353	14
CM Advisors Fixed Income Fund (CMFIX)	0.000	-0.166	-0.542	0.876	1.091	-1.171	-0.032	0.007	0.183	0.333	15
Dreyfus/Laurel Funds Inc - Dreyfus Floating Rate Income	0.002	-0.327	-0.691	0.425	0.808	0.096	-0.639	0.775	0.146	0.328	16
Lord Abbett Inflation Focused Fund - F (LIFFX)	0.003	0.435	-1.067	1.849	-1.749	0.685	0.253	0.101	0.004	0.309	17
Lord Abbett Inflation Focused Fund - R3 (LIFRX)	0.003	0.438	-1.080	1.930	-1.799	0.670	0.273	0.071	0.013	0.300	18
Dreyfus/Laurel Funds Inc - Dreyfus Floating Rate Income	0.001	-0.295	-0.641	0.402	0.680	0.169	-0.646	0.781	0.137	0.297	19
Lord Abbett Inflation Focused Fund - A (LIFAX)	0.003	0.442	-1.019	1.769	-1.779	0.730	0.255	0.095	0.003	0.296	20
Lord Abbett Inflation Focused Fund - R2 (LIFQX)	0.003	0.456	-1.063	1.830	-1.767	0.696	0.292	0.047	0.018	0.269	21
Lord Abbett Inflation Focused Fund - C (LIFCX)	0.003	0.442	-1.089	1.965	-1.875	0.715	0.237	0.108	-0.001	0.253	22
Ave Maria Bond Fund - R (AVEFX)	0.002	-0.056	-0.314	1.297	-1.277	0.312	0.618	-0.111	-0.096	0.240	23
Managers Bond Fund - Institutional (MGBIX)	0.002	0.562	-1.138	0.820	4.388	-3.088	-0.064	-0.258	0.510	0.236	24
Managers Bond Fund - Service (MGFIX)	0.002	0.565	-1.150	0.842	4.368	-3.085	-0.060	-0.266	0.512	0.225	25
Credit Suisse Strategic Income Fund - C (CSOCX)	0.001	-0.053	-0.269	-0.091	0.353	0.293	-0.328	0.505	0.262	0.194	26
AllianceBernstein Taxable Multi-Sector Income Shares (C	0.001	0.073	-0.405	0.407	0.000	0.244	-0.075	0.017	-0.026	0.059	27
Loomis Sayles Global Bond Fund - N (Trust II) (LSGNX)	0.000	0.591	-1.624	1.838	2.049	-1.611	-0.019	-0.100	0.217	-0.074	28
Loomis Sayles Global Bond Fund - Institutio (LSGBX)	0.000	0.600	-1.593	1.785	2.035	-1.591	-0.027	-0.084	0.213	-0.079	29
Loomis Sayles Fixed Income Fund - Institutio (LSFIX)	0.000	-0.684	-1.434	1.907	2.489	-1.701	0.309	-0.395	0.567	-0.103	30
DoubleLine Flexible Income Fund - I (DFLEX)	0.001	0.062	-0.546	0.382	0.330	0.378	-0.652	0.423	0.242	-0.113	31
John Hancock Income Fund - R5 (JSNVX)	0.000	0.353	0.082	-0.180	-0.092	0.216	0.276	0.092	0.000	-0.114	32
MFS Bond Fund - R5 (MFBKX)	0.000	-0.043	-0.537	0.613	1.449	-0.381	-0.037	0.061	0.063	-0.120	33
John Hancock Income Fund - R6 (JSNWX)	0.000	0.308	0.125	-0.336	0.195	0.084	0.277	0.097	0.011	-0.121	34
MFS Bond Fund - I (MBDIX)	0.000	-0.043	-0.521	0.589	1.437	-0.365	-0.035	0.053	0.064	-0.126	35
MFS Bond Fund - R4 (MFBJX)	0.000	-0.053	-0.529	0.607	1.446	-0.372	-0.037	0.058	0.064	-0.135	36
Pimco Unconstrained Tax Managed Bond Fund - A (ATM	0.001	0.158	-0.442	0.225	0.274	0.139	-0.043	0.079	0.002	-0.137	37
Loomis Sayles Investment Grade Bond Fund - Institutio (	0.000	-0.217	-1.549	2.225	1.576	-1.327	0.280	-0.226	0.305	-0.160	38
John Hancock Income Fund - INSTITUTIO (JSTIX)	0.000	0.319	0.108	-0.269	0.059	0.149	0.295	0.073	0.009	-0.161	39
MFS Bond Fund - A (MFBFX)	0.000	-0.064	-0.570	0.659	1.483	-0.401	-0.061	0.096	0.056	-0.161	40
MFS Bond Fund - R3 (MFBHX)	0.000	-0.070	-0.563	0.640	1.499	-0.400	-0.065	0.099	0.058	-0.161	41
Madison High Quality Bond Fund - Y (MIIBX)	0.001	0.205	-0.668	1.197	0.105	-0.308	0.027	-0.017	-0.067	-0.164	42
MFS Bond Fund - R2 (MBRRX)	0.000	-0.040	-0.550	0.625	1.474	-0.400	-0.055	0.088	0.057	-0.180	43
BlackRock Strategic Income Opportunities Portfolio - Inst	0.001	-0.005	-0.431	0.198	0.818	-0.175	-0.103	0.130	0.138	-0.181	44
MFS Strategic Income Fund - I (MFIIX)	0.001	0.120	-0.197	0.256	0.886	-0.208	-0.209	0.159	0.107	-0.187	45
John Hancock Income Fund - R4 (JSNFX)	0.000	0.331	0.084	-0.346	0.144	0.176	0.219	0.164	-0.020	-0.216	46
MFS Bond Fund - B (MFBBX)	-0.001	-0.054	-0.559	0.671	1.464	-0.410	-0.062	0.080	0.067	-0.217	47
BlackRock Strategic Income Opportunities Portfolio - Inv	0.000	-0.008	-0.400	0.115	0.852	-0.151	-0.081	0.085	0.150	-0.226	48
MFS Bond Fund - R1 (MFBGX)	-0.001	-0.046	-0.531	0.601	1.465	-0.388	-0.048	0.072	0.062	-0.228	49
MFS Bond Fund - C (MFBCX)	-0.001	-0.054	-0.580	0.692	1.443	-0.394	-0.048	0.082	0.055	-0.231	50
John Hancock Income Fund - R2 (JSNSX)	0.000	0.342	0.164	-0.444	0.172	0.129	0.236	0.133	0.008	-0.232	51
BlackRock Bond Allocation Target S Shares Portfolio - S (	0.000	0.007	-0.557	0.347	0.329	0.302	-0.120	0.096	-0.024	-0.256	52
MassMutual Premier Core Bond Fund - S (MCBDX)	0.000	-0.662	-1.325	1.383	3.410	-1.825	-0.331	-0.016	0.355	-0.257	53
MFS Strategic Income Fund - A (MFIOX)	0.000	0.136	-0.200	0.259	0.876	-0.219	-0.141	0.106	0.116	-0.258	54
Pimco Unconstrained Tax Managed Bond Fund - C (ATM	0.000	0.165	-0.436	0.252	0.246	0.122	-0.037	0.069	0.007	-0.267	55
MassMutual Premier Core Bond Fund - Y (MCBYX)	0.000	-0.650	-1.302	1.342	3.383	-1.799	-0.308	-0.025	0.355	-0.271	56
MassMutual Premier Core Bond Fund - R4 (MCZRX)	0.000	-0.606	-1.277	1.366	3.169	-1.682	-0.265	-0.069	0.345	-0.294	57
BlackRock Bond Allocation Target C Shares Portfolio - C (	0.000	-0.323	-0.563	0.697	1.751	-0.640	0.232	-0.276	0.158	-0.306	58
MassMutual Premier Core Bond Fund - A (MMCBX)	0.000	-0.603	-1.247	1.356	3.095	-1.645	-0.276	-0.040	0.336	-0.306	59
Delaware Core Plus Bond Fund - A (DEGGX)	0.001	0.155	-0.175	-0.467	0.322	0.747	-0.231	0.417	0.088	-0.335	60
BlackRock Strategic Income Opportunities Portfolio - Inv	0.000	-0.003	-0.455	0.197	0.896	-0.219	-0.096	0.123	0.141	-0.336	61

Quintiles of Outperformance versus Signs of Beta Coefficients

Under Step 3: Produce Results, above, we list items: A. Rolling Regression to Benchmark, B. Rolling Information Ratio, and C. Regression of Information Ratio. The result of these processes is Table 1.

Item D. Use of Machine Learning Techniques in our study involves connecting through a decision tree process, programmed through the J48 algorithm in Weka, the Information Ratio (*IR*) estimates in the second column from the right in Table 1, with the eight beta-coefficient columns to the right of. Thus, the first question we are answering is, where would an investment strategy fall in the ranked *IR* that is estimated contemporaneously with the estimation of beta coefficients, if the strategy had a set of beta coefficients/signs portrayed in Table 1? To make the decision tree easier to follow, we restated the *IR* numbers into quintiles by dividing the strategies ranked through *IR* into fifths. Common industry practice dictates the splitting of performance measures such as *IR* into quartiles instead of quadrants. However, a reason we selected quintiles is that Morningstar ratings are from one star to five stars, so in essence, these ratings split a universe of investment strategies into fifths (quintiles) as well. The second question we are addressing is, where would an investment strategy fall in such rating by Morningstar, based on the same beta coefficients/signs in Table 1. Thus, in this phase of the analysis, we create two decision trees, in which the attributes are the beta coefficients of investment strategies to the eight indices selected as the benchmarks, In the first tree, classification (the y-variable) entails the quintile into which a strategy would fall, given its estimated Information Ratio (*IR*) as shown in the second from the right column in Table 1. In the second tree, classification of the strategies entails the rating that analysts performing due diligence at Morningstar would undergo. A reasonable expectation may be that the levels of attributes based on which the second three splits (Figure 2), would be like the levels of attributes of the first one that is based on the relative performance of investment portfolio strategies (Figure 1). Some formal measure of the difference in the two decision trees has not been proposed, but the differences are obvious:

1. If the institutional investor did not rely on the recommendations of the consultant (Morningstar, in this case), the first characteristic of interest they would look at, would be the sign of the beta coefficient, that is the exposure of a strategy to triple-B corporate debt, which is not default-level (CCC) but is not investment grade either (AAA), as shown in the top spit of Figure 1 below. If that BBB beta exposure of a strategy is positive, then the investor not relying on ratings would jump the BB rating and look at the B rating. If that was positive, and the beta exposure to the Bloomberg Aggregate was positive, but that to A was negative, then only, the strategy would rank in the top quintile of Information Ratio (*IR*) based on outperformance.
2. Notice how much more risk is entailed in the investment recommendations implied by ratings, which may or may not result in future outperformance (we examine that aspect next). Figure 2 implies that if the institutional investor relied on recommendations by a consultant/advisor, developed through due diligence, then the first characteristic of interest would have been the exposure

of a strategy to the highest credit rating that is possible, that is AAA. Notably, if that AAA exposure was positive, that is if the strategy invested in safe, AAA-rated corporate bonds, the strategy would be recommended to fall in the fourth quintile, end of story (a similar requirement is not implied by quintile classification based on just relative performance).

Figure 1. *Classification of Strategies into Quintiles of Outperformance Based on Sign of Beta Coefficients*

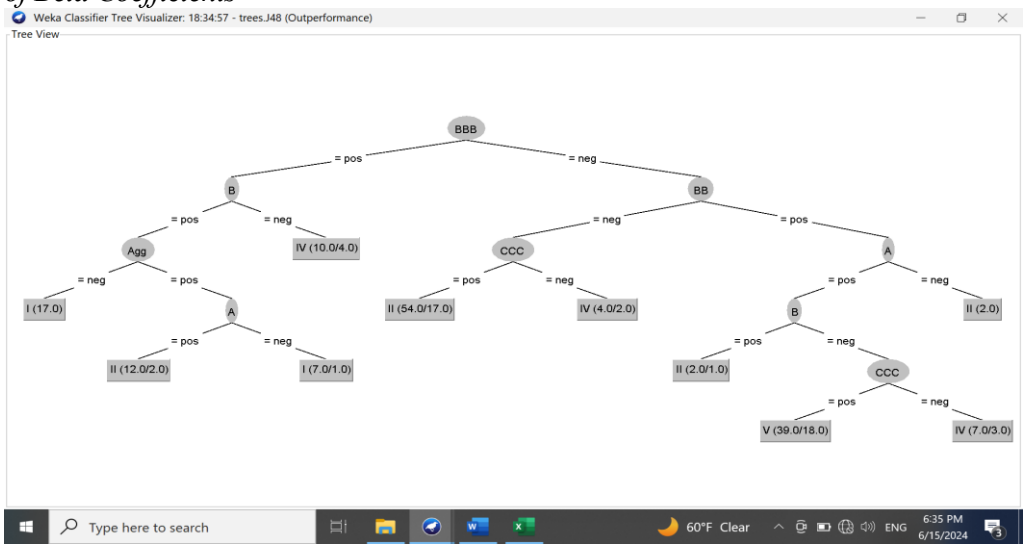
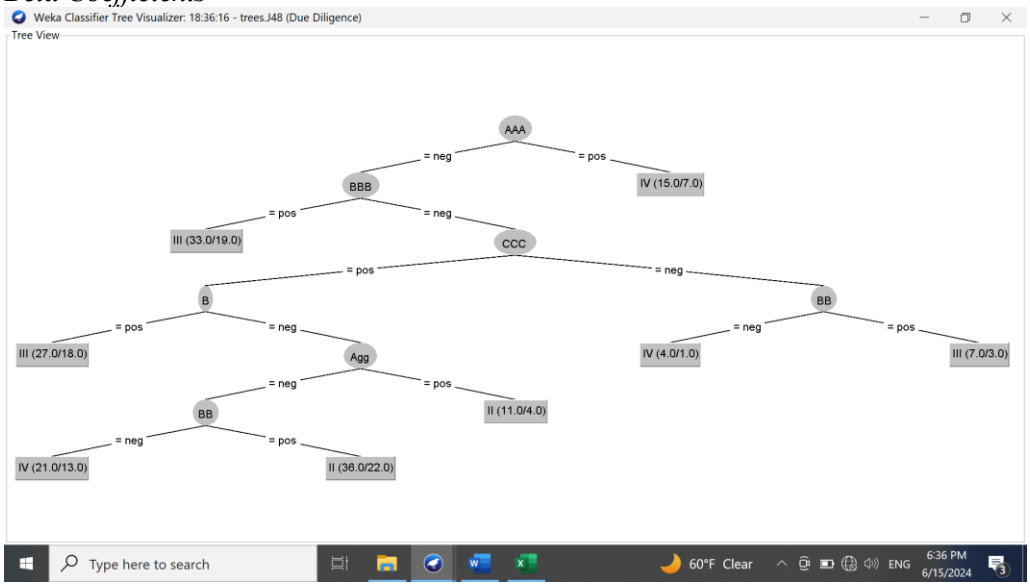


Figure 2. *Classification of Strategies into Quintiles of Due Diligence based on Sign of Beta Coefficients*



3. Based on the Morningstar ratings, as they categorize strategies according to beta coefficient attributes, a five-star strategy would never have been recommended, even though Morningstar due diligence assigns such a star rating to several rated strategies. That makes no sense. Based on the attributes, none of the strategies going down the tree would even be classified as five-star, even though some are rated as such. The highest classification, implying recommendation for investment based on star ratings, would have been the second quintile. To get there a strategy would be negative on AAA, negative on BBB in contradiction to Figure 1, positive on CCC which is risky, negative on B which is contradictive, and either positive on the Agg; or if negative on the Agg, positive on BB (contradicting the outperformance tree in Figure 1). We generally conclude that the rules of influencing institutional investors as to where to allocate retiree funds, implied by Morningstar ratings, generally contradict the rules that would have influenced investors to do the same, based purely on relative outperformance. Are the ratings 'forward-looking' relative to the past? The reader will generally notice that investment recommendations based on Quintiles of Outperformance (Figure 1), which by the way is more 'real' as it depends on actual active management, split at the BBB rating, which is the middle of the credit curve. This makes more sense. In terms of a credit barbell, the typical strategy of a portfolio manager who is 'long' the AAA and CCC credits, and 'short' long the middle of the curve. Decisions based on due diligence, on the other hand (Figure 2) solely start on 'long' positions on only one end of the curve, that is, AAA – too simplistic.

Performance of Buy-Sell Recommendations Based on Signs of Beta Coefficients

Recommendations for the allocation of retiree funds into investment strategies should differ when based on actual past outperformance, versus when based on five-star ratings assigned by due diligence analysts at Morningstar. But which ones result in the most substantial benefit to the investor/retiree, plan sponsor of a pension plan, and manager of an endowment or foundation? If either or both trees depicted in figures one or two above were forward looking, then the investment decisions undertaken today would result in a higher or lower risk-adjusted performance (Information Ratio, *IR*) in the future. We did the following:

a. Keep attribute classes as positive beta or negative beta, but change the dependent classification variable from quintiles and five-star rating categories to binary buy/sell recommendations
b. Create the report as in Table 1 again, but in the second column from the left, have forecasted information ratio 23 months (two years) into the future (see Table 2).
c. Develop a buy/sell tree of outperformance and a buy/sell tree of recommendations. Go through each tree across all 154 strategies in the sample. Take the average *IR* for buys, for each tree.

Table 2. *Portion of Forward-Looking Report of Information Ratio against Beta Coefficients*

Moment 1. Strategy beta Coefficient to Index, Average Over Time Measure 1. Information Ratio in Universe Forecast 3 Mo Fwd Forecast 4. Forecast of Information Ratio for 23 Mo(s) Fwd		Global Aggregate Bond (LEGATRUU)	AAA US Corporate Index Total Return Index	AA US Corporate Index Total Return Index	BofA Single-A US Corporate Index Total	BBB US Corporate Index Total Return	BofA BB US High Yield Index Total Return	BofA Single-B US High Yield Index Total	CCC & Lower US High Yield Index Total	24 Monthly Returns From 11/30/2018 To 4/30/2023	
Portfolios that are 'Aggregate Bond'	alpha	1 Bloomber	11 ICE BofA	15 ICE BofA	20 ICE Bo	8 ICE BofA	10 ICE Bo	12 ICE Bo	5 ICE BofA	23 Mo(s)	Rank
# BlackRock Bond Index Fund - Institutional (BMOIX)	0.000	0.136	-0.093	0.612	0.303	-0.209	0.015	-0.052	-0.019	20.242	1
# BlackRock Bond Allocation Target M Shares Portfolio - M	0.001	0.180	-0.564	0.891	0.356	-0.239	-0.010	0.075	-0.100	15.483	2
# BlackRock Bond Index Fund - Investor A (BMOAX)	0.000	0.119	-0.115	0.606	0.382	-0.242	0.022	-0.069	-0.009	7.686	3
# Delaware Diversified Floating Rate Fund - A (DDFAX)	0.002	-0.115	-0.579	0.631	0.189	0.102	-0.410	0.548	0.152	6.973	4
6 American Century Core Plus Fund - Institutional (ACCUX)	0.001	0.204	-0.351	0.861	0.233	-0.107	-0.225	0.140	0.050	6.612	5
# Principal Government and High Quality Bond Fund - A (C	0.000	0.250	-0.555	0.803	0.529	-0.388	-0.171	0.262	-0.128	5.739	6
# Delaware Diversified Floating Rate Fund - Institutional (D	0.002	-0.117	-0.562	0.636	0.132	0.128	-0.408	0.550	0.150	5.677	7
8 American Century Core Plus Fund - R (ACCPX)	0.000	0.174	-0.364	0.878	0.298	-0.146	-0.201	0.100	0.068	4.507	8
7 American Century Core Plus Fund - Investor (ACCNX)	0.001	0.175	-0.366	0.884	0.294	-0.148	-0.201	0.099	0.069	4.119	9
5 American Century Core Plus Fund - C (ACCKX)	0.000	0.173	-0.366	0.874	0.292	-0.134	-0.195	0.098	0.064	3.650	10
# Credit Suisse Strategic Income Fund - I (CSOIX)	0.002	-0.040	-0.298	-0.101	0.485	0.203	-0.354	0.546	0.257	3.460	11
# Pioneer Multi-Asset Ultrashort Income Fund - C (MCFRX)	0.000	-0.032	-0.211	-0.164	0.426	0.206	-0.372	0.234	0.091	2.708	12
# BTS Tactical Fixed Income Fund - I (BTFIX)	-0.003	0.052	-0.011	-0.272	0.821	-0.433	0.342	0.038	0.057	2.620	13
# Calvert Income Fund - I (CINCX)	0.000	-0.014	0.255	-0.540	0.446	0.607	-0.012	-0.119	0.215	2.580	14
# Credit Suisse Strategic Income Fund - A (CSOAX)	0.002	-0.059	-0.261	-0.093	0.349	0.293	-0.333	0.513	0.257	2.497	15
# Managers AMG GW&K Fixed Income Fund - Investor (MF	0.000	0.147	-0.167	0.490	0.276	-0.006	0.119	-0.022	-0.029	2.492	16
# Credit Suisse Strategic Income Fund - C (CSOCX)	0.001	-0.053	-0.269	-0.091	0.353	0.293	-0.328	0.505	0.262	2.358	17
# Calvert Income Fund - A (CFICX)	0.000	-0.019	0.247	-0.539	0.457	0.604	-0.002	-0.128	0.220	2.264	18
# Dreyfus Bond Market Index Fund - BASIC (DBIRX)	0.000	0.124	-0.207	0.718	0.530	-0.406	-0.066	-0.005	0.009	2.223	19
# BlackRock Strategic Income Opportunities Portfolio - Inst	0.001	-0.005	-0.431	0.198	0.818	-0.175	-0.103	0.130	0.138	1.952	20
# CM Advisors Fixed Income Fund (CMFIX)	0.000	-0.166	-0.542	0.876	1.091	-1.171	-0.032	0.007	0.183	1.950	21
# Pioneer Multi-Asset Ultrashort Income Fund - C2 (MAUC	0.000	-0.026	-0.158	-0.262	0.418	0.232	-0.355	0.224	0.088	1.934	22
4 American Century Core Plus Fund - A (ACCQX)	0.000	0.175	-0.343	0.784	0.369	-0.147	-0.214	0.122	0.059	1.901	23
# BlackRock Strategic Income Opportunities Portfolio - Inv	0.000	-0.008	-0.400	0.115	0.852	-0.151	-0.081	0.085	0.150	1.810	24
# Pimco Unconstrained Tax Managed Bond Fund - C (ATM	0.000	0.165	-0.436	0.252	0.246	0.122	-0.037	0.069	0.007	1.760	25
# Lord Abbett Inflation Focused Fund - R3 (LIFRX)	0.003	0.438	-1.080	1.930	-1.799	0.670	0.273	0.071	0.013	1.728	26
# Lord Abbett Inflation Focused Fund - F (LIFFX)	0.003	0.435	-1.067	1.849	-1.749	0.685	0.253	0.101	0.004	1.714	27
# Managers Bond Fund - Institutional (MGBIX)	0.002	0.562	-1.138	0.820	4.388	-3.088	-0.064	-0.258	0.510	1.703	28
# Managers Bond Fund - Service (MGFIX)	0.002	0.565	-1.150	0.842	4.368	-3.085	-0.060	-0.266	0.512	1.696	29
# Lord Abbett Inflation Focused Fund - A (LIFAX)	0.003	0.442	-1.019	1.769	-1.779	0.730	0.255	0.095	0.003	1.681	30
# Dreyfus/Laurel Funds Inc - Dreyfus Floating Rate Income	0.002	-0.311	-0.689	0.495	0.708	0.113	-0.619	0.745	0.155	1.593	31
# BBH Limited Duration Fund - N (BBBMX)	0.001	-0.004	-0.263	0.190	-0.024	0.311	-0.087	0.025	0.051	1.557	32
# Calvert Income Fund - C (CIFCX)	-0.001	-0.014	0.243	-0.504	0.412	0.620	-0.008	-0.119	0.213	1.308	33
# Pimco Unconstrained Tax Managed Bond Fund - A (ATM	0.001	0.158	-0.442	0.225	0.274	0.139	-0.043	0.079	0.002	1.245	34
# Lord Abbett Inflation Focused Fund - C (LIFCX)	0.003	0.442	-1.089	1.965	-1.875	0.715	0.237	0.108	-0.001	1.181	35
# Pioneer Multi-Asset Ultrashort Income Fund - K (MAUKX	0.001	-0.045	-0.143	-0.262	0.400	0.247	-0.345	0.219	0.087	1.179	36
# BlackRock Strategic Income Opportunities Portfolio - Inv	0.000	-0.003	-0.455	0.197	0.896	-0.219	-0.096	0.123	0.141	1.161	37
# Dreyfus/Laurel Funds Inc - Dreyfus Floating Rate Income	0.002	-0.327	-0.691	0.425	0.808	0.096	-0.639	0.775	0.146	1.084	38
# Lord Abbett Inflation Focused Fund - R2 (LIFQX)	0.003	0.456	-1.063	1.830	-1.767	0.696	0.292	0.047	0.018	1.080	39
# Dreyfus/Laurel Funds Inc - Dreyfus Floating Rate Income	0.002	-0.324	-0.663	0.466	0.663	0.160	-0.614	0.738	0.149	0.998	40
# Managers AMG GW&K Fixed Income Fund - Institutional	0.000	0.135	-0.163	0.410	0.444	-0.078	0.107	-0.011	-0.020	0.936	41
# DoubleLine Flexible Income Fund - I (DFLEX)	0.001	0.062	-0.546	0.382	0.330	0.378	-0.652	0.423	0.242	0.882	42
# Pioneer Multi-Asset Ultrashort Income Fund - A (MAFRX	0.001	-0.021	-0.192	-0.257	0.496	0.208	-0.384	0.258	0.080	0.818	43
# John Hancock Income Fund - INSTITUTIO (JSTIX)	0.000	0.319	0.108	-0.269	0.059	0.149	0.295	0.073	0.009	0.760	44
# John Hancock Income Fund - R4 (JSNFX)	0.000	0.331	0.084	-0.346	0.144	0.176	0.219	0.164	-0.020	0.758	45
# BBH Limited Duration Fund - I (BBBIX)	0.001	-0.014	-0.292	0.141	0.134	0.257	-0.147	0.098	0.042	0.691	46
# Dreyfus/Laurel Funds Inc - Dreyfus Floating Rate Income	0.001	-0.295	-0.641	0.402	0.680	0.169	-0.646	0.781	0.137	0.664	47
3 AllianceBernstein Taxable Multi-Sector Income Shares (C	0.001	0.073	-0.405	0.407	0.000	0.244	-0.075	0.017	-0.026	0.481	48
# John Hancock Income Fund - R2 (JSNSX)	0.000	0.342	0.164	-0.444	0.172	0.129	0.236	0.133	0.008	0.445	49
# Loomis Sayles Global Bond Fund - Institutio (LSGBX)	0.000	0.600	-1.593	1.785	2.035	-1.591	-0.027	-0.084	0.213	0.432	50
# Dreyfus Bond Market Index Fund - Investor (DBMIX)	0.000	0.107	-0.194	0.612	0.663	-0.427	-0.090	0.022	0.004	0.398	51
# Loomis Sayles Global Bond Fund - N (Trust II) (LSGNX)	0.000	0.591	-1.624	1.838	2.049	-1.611	-0.019	-0.100	0.217	0.372	52
# Dunham Corporate/Government Bond Fund - C (DCCGX)	0.000	0.118	-0.201	0.545	0.306	-0.040	-0.127	0.042	0.090	0.371	53
# John Hancock Income Fund - R5 (JSNVX)	0.000	0.353	0.082	-0.180	-0.092	0.216	0.276	0.092	0.000	0.334	54
# John Hancock Income Fund - C (JSTCX)	-0.001	0.344	0.068	-0.260	0.109	0.128	0.274	0.091	0.007	0.230	55
# Madison High Quality Bond Fund - Y (MIIBX)	0.001	0.205	-0.668	1.197	0.105	-0.308	0.027	-0.017	-0.067	0.129	56
# Commerce Bond Fund (CFBNX)	0.000	0.120	-0.385	0.815	0.390	-0.067	-0.176	-0.004	0.083	0.112	57
# Loomis Sayles Fixed Income Fund - Institutio (LSFIX)	0.000	-0.684	-1.434	1.907	2.489	-1.701	0.309	-0.395	0.567	0.084	58
# Thrivent Income Fund - I (LBIIX)	0.000	-0.316	-0.609	0.496	1.949	-0.601	0.144	-0.131	0.170	0.070	59
# Delaware Core Plus Bond Fund - A (DEGGX)	0.001	0.155	-0.175	-0.467	0.322	0.747	-0.231	0.417	0.088	-0.041	60
# Brandes Institutional Core Plus Fixed Income Fund - S (B	0.000	0.127	-0.090	0.658	-0.053	-0.218	0.326	-0.235	0.036	-0.070	61

Under Step 3: Produce Results, above, we list items: A. Rolling Regression to Benchmark, B. Rolling Information Ratio, and C. Regression of Information Ratio. The result is Table 1. The third question we are answering is, where would an investment strategy fall in a buy/sell recommendation (not quintile) that is estimated contemporaneously with the estimation of beta coefficients, if the strategy had a set of beta coefficients (and their signs) portrayed in Table 1, above? We restated the *IR* numbers into a buy (sell/do not buy) recommendation if the sign of *IR* in Table 1 was positive (negative). The fourth question is, where would an investment strategy fall in

such rating by Morningstar (not quintile), based on the same beta coefficients found in Table 1. Thus, we create two new decision trees, in which the attributes are the beta coefficients of investment strategies to the eight indices selected as the benchmarks. In the first tree, classification (the y-variable) entails the buy/sell recommendation into which a strategy would fall, given its estimated Information Ratio (*IR*) as shown in the second from the right column in Table 1. In the second tree, classification of the strategies entails the rating that analysts performing due diligence at Morningstar would undergo. A reasonable expectation may be that the levels of attributes based on which the second three splits (Figure 4), would be like the levels of attributes of the first one that is based on the relative performance of investment portfolio strategies (Figure 3). Some formal measure of the difference in the two decision trees has not been proposed, but the differences are shown in Table 2.

Figure 3. *Classification of Strategies into Buy/Sell Outperformance Based on the Sign of Beta Coefficients*

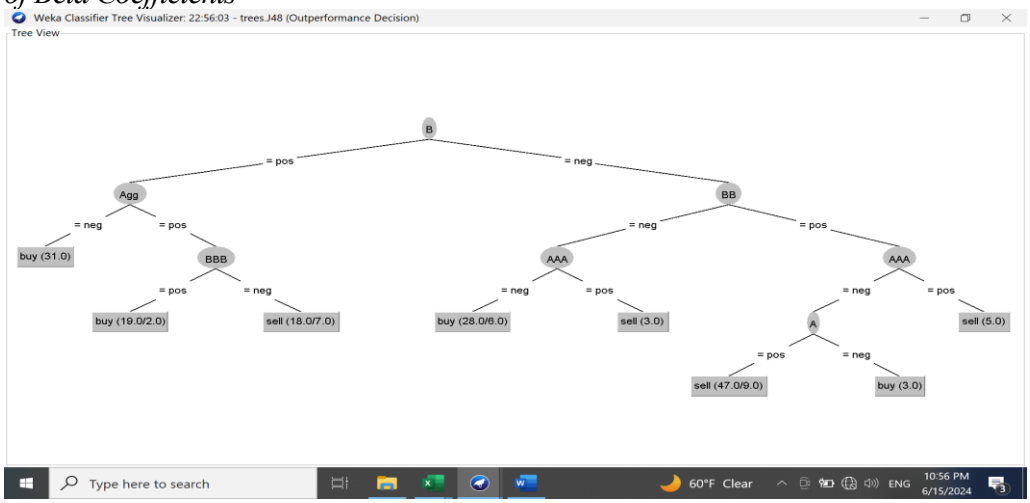
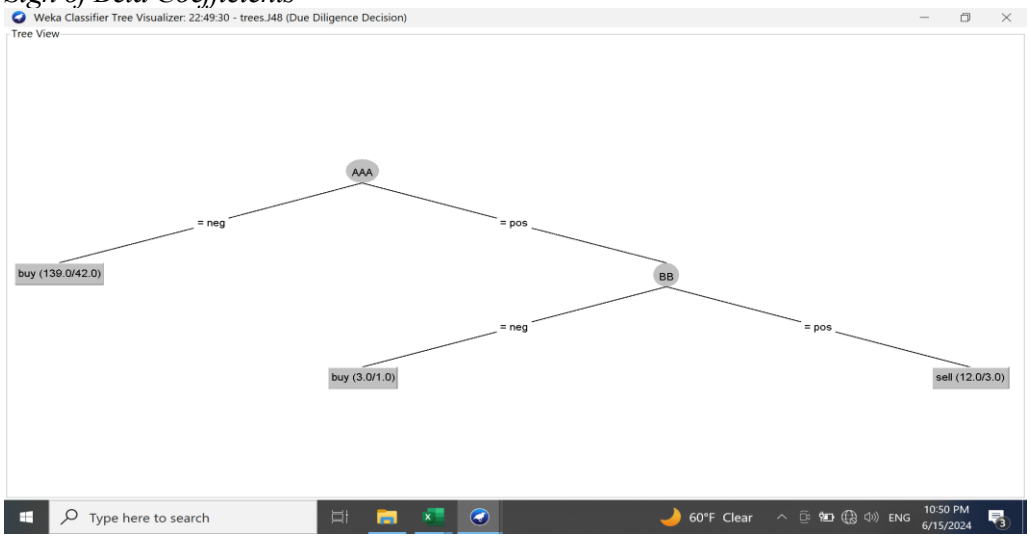


Figure 4. *Classification of Strategies into Buy/Sell Recommendation Based on the Sign of Beta Coefficients*



1. Based on simple outperformance, a buy/sell recommendation decision tree would depend on the B-rating of the investment strategy considered by an institutional investor (Figure 3). In contrast, based on Morningstar ratings, a similar recommendation and investment decision would depend on, again, whether the beta coefficient to AAA credit debt was negative. If it was, a simple rule would dictate to buy or invest in the respective strategy. Otherwise, if positive to AAA, ratings would dictate that a strategy is negative to BB (implying a credit rating barbell) to be invested in.
2. A positive BBB, a negative AAA, and a negative A would result in a 'buy' or allocate funds into, based on outperformance in Figure 3. Notice how exposure to BBB implies a credit barbell that is like Figure 4, implied by the ratings (the investor should buy a strategy that has BBB credit rating exposure, and does not have the bar-belled AAA and BB exposure). The expectation here is that BBB credit is underpriced and will appreciate, while the neighboring on each side AAA and BB credits are overpriced and will go down, causing reduced or negative returns.
3. The classification of strategies into buy and not buy/sell is captured by a much simpler decision tree on Figure 4 based on Morningstar ratings, than it is based on actual past *IR* performance on Figure 3. Average forward-looking *IR* for outperformance (ratings) was -0.57 (-0.25).

Again, we see in Figures 3 and 4 that ratings are not particularly or accurately 'forward-looking' relative to the past. In fact, they appear narrowly focusing on whether a portfolio has AAA credits and penalize recommending such portfolios if such credit sensitivity is high (Figure 4). That is not realistic, since corporate credit portfolio managers often structure credit exposure in a 'barbell' manner. Thus again, investment recommendations based on Quintiles of Outperformance (Figure 3), which are more 'real' as they depend on actual active management, split at for the first time at the single-B rating, which is the middle of the credit curve. This again makes more sense, compared to the AAA split found through due diligence. In terms of a credit barbell, the typical strategy of a portfolio manager who is 'long' the AAA and CCC credits, and 'short' long the middle of the curve. Decisions based on due diligence, on the other hand (Figure 4) solely penalize 'long' positions on one end of the curve, that is, AAA. Consultants only look to see if the portfolio holds AAA, or safe investments. If the portfolio manager has great sensitivity to best credits, the consultant merely rates the strategy lower. This is counterintuitive.

Conclusion

We examined investment advising manifested in the form of recommendations of portfolio strategies offered by consulting firms (Morningstar) to their institutional clients given that U.S. regulatory bodies are interested in the issue of "pay-to-play," referring to an adviser's encouraging portfolio managers to offer a monetary benefit, in exchange for the former's rating the latter's investment strategies favorably. We found that there may be less cause for concern, since the buy recommendations to

institutional investors based on ratings resulted in better risk-adjusted relative performance (*IR*) than the ones implied by outperformance itself. Thus, the issue of pay-to-play may not manifest through the ratings. Institutional investors who have the choice of either examining past performance or relying on ratings have fiduciary responsibility that transfers to consultant/advisors, resulting in distortions such as making decisions based on AAA ratings, as opposed to a credit barbell. There are ways to tell if consultant ratings make sense, such as a respective decision three that 'learns' how said investor would have behaved. Based on the sample and time frame of this analysis, it is not surmised that Morningstar ratings are affected by "pay-to-play," or that the ultimate interests of retirees, whose wealth is invested either by previous-outperforming or due diligence/ratings are impacted negatively by relying on advisor ratings. However, recommendations based on Quintiles of Outperformance are still more realistic than those based on due diligence and ratings.

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The Future of Work Study in the South African Context

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To survive in the current competitive global environment, it is important for organisations to continually look at ways to improve efficiency and productivity. The field of work study seeks to improve the productivity and efficiency of humans, machines and materials. While work study is an important function in organisations, its future in South Africa is uncertain. The purpose of this study was to explore the future of work study by looking at the barriers and contributors to the future of work study in the South African context. The study was exploratory in nature with a qualitative research method. Purposive sampling was used to include work study practitioners who were members of the Southern Africa Institute of Management Services (SAIMAS). Data were gathered from twelve volunteering participants through semi-structured email interviews. The interview transcripts were transferred to Excel sheets to facilitate analysis. Thematic analysis was applied to identify the different themes covering the barriers and contributors to the future of work study. For work study to have a managerial impact, there should be a smooth flow of processes with minimum interruptions; the findings of this study could help achieve that. The study offered new knowledge about the barriers and contributors to the future of work study.

Keywords: *Barriers, Contributors, Future, South Africa, Work study*

Introduction

Organisations in South Africa are affected annually by labour unrest, with employees constantly demanding increased remuneration (Labour Research Service, 2022). Sookdeo (2016) states that "strike season" seems to have become a norm in the South African calendar year but if there is an increase in remuneration, it must be combined with a simultaneous increase in productivity to allow for a win-win situation between the employer and employee.

To survive in the current competitive global environment, it is important for South African organisations to continually look at ways to grow efficiency and productivity. Productivity plays a major role in any company. Therefore, work study is known to be a highly effective productivity improvement method (Rajiwate, Mirza, Kazi, Momin, 2020). According to Ewnetu and Gzate (2023), productivity improvement positively impacts the direct costs of products, as the same output is produced with less input. Productivity improvement can be achieved by sorting or

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elimination, reducing variation, repairing ineffective processes, simplifying the method, optimising the system, maximising turnout-up quality or responsiveness, and reducing set-up time. The field of work study seeks to improve the productivity and efficiency of humans, machines and materials. While there is concern about the future of work study in South Africa there is a lack of research on the topic. This called for an exploration of the issue.

The future of work study in the South African context was compromised when it stopped being a distinct field and was incorporated into other units such as Human Resource Management and Organisational Development. So, while work study is a key function in increasing productivity in organisations, its future in South Africa is uncertain. At the same time, there is limited research on the future of work study as well as the barriers and contributors to the future of work study in South Africa. This led to the following research question: What does the future of work study in the South African context entail? The purpose of this study was to explore the future of work study by looking at the barriers and contributors to the future of work study in the South African context.

On a theoretical level, the contribution of the study entails new knowledge about the future of work study by focusing on the barriers and contributors to the future of work study in a South African context. On a practical level, management and work study practitioners should be aware of the future of work study by concentrating on especially the barriers that could harm this career's future and field of expertise in South Africa.

The outline of the article consists of the introduction, theoretical framework, literature review, research methodology, discussion of the findings and conclusions.

Underpinning Theory

The underpinning theory for the literature review for this study was the contingency theory. This theory suggests that for firms to be effective, certain functions must fit with the organisation or external environment aspects to achieve organisational goals. According to Harney (2016), there is an external and internal fit of an organisational function. External fit means work study practices must fit with the organisational strategy and conditions in the environment. Internal fit means work study practices must work together to deliver the same message and the desired outcome. Delery and Doty (1996) state that by using contingency theory, organisations can promote employee behaviours that align with business strategy, because behaviour is the outcome of an employee's ability and motivation. Therefore, the implementation of work study practices can impact employee behaviour and productivity.

Literature Review

Work study may be defined as a modern discipline which analyses and evaluates all aspects of the work systems which analyses and evaluates all aspects of the work system to enhance effectiveness and functional efficiency (Kiran, 2020). According to

Ewnetu and Gzate (2023), work study aims to find the best and most efficient way of utilising available resources to achieve the best possible quality of work in the minimum possible time and cause the least potential fatigue to the worker. Work study is known as a highly effective productivity improvement method.

Work study consists of method study and work measurement/time study. Method study involves the minimisation of the work content and setting the best way to perform the job. This is implemented to decrease manufacturing costs by saving on operation time. Method study is the systematic recording and critical examination of existing and proposed ways of doing work, as a means of developing and applying easier and more effective methods and reducing costs (Rajiwate, Mirza, Kazi & Momin, 2020). Method study entails the following steps, selection of the job, record of the information and examination of the information (Rajiwate, Mirza, Kazi & Momin, 2020). Motion study means to simplify the job and develop a more economical method of doing work (Rajiwate, Mirza, Kazi & Momin, 2020). Work measurement deals mostly with the investigation of ineffective time associated with a job, and setting time standards to execute an operation by conforming to the standard method. This also results in a systematic investigation of all factors that can impact the production efficiency and economy of the case being studied, which effectively allows for achieving productivity gains (Wahid, Che Daud, Ahmed, 2020). Work measurement/ Time study is the application of techniques designed to establish the time for a qualified worker to carry out a specified job at a defined level of performance (Rajiwate, Mirza, Kazi & Momin, 2020).

Work study yields copious information about existing methods and this information helps to identify shortcomings in and determine possible improvements to existing methods. This is called a better method and increases productivity, reduces worker fatigue, minimises losses and improves quality (Gujar & Shahare, 2018).

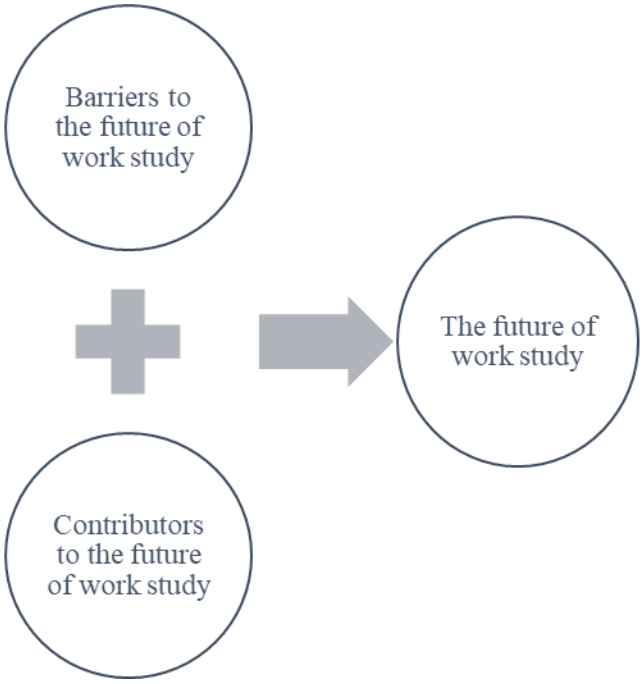
Work study practitioners must try to win and maintain the trust and cooperation of any group which is being investigated (Sookdeo, 2016). Work study practitioners can only keep the goodwill and respect of supervisors if they do not create the impression that they want to take over their positions (Sookdeo, 2005). Decision-making is an important part of work study (Archibald Huang, Chacon & Gaiger, 2018). In many organisations, the head of the work study department is a member of top management and this head must keep top management informed of the possible uses of work study (Sookdeo, 2016). Management needs work study because of its ongoing observation and analysis of the workplace to obtain the applicable facts. This means that management requires someone who can carry out investigations on a full-time basis without interruptions of normal working duties (Sookdeo, 2016) – in other words, a work study practitioner. There is a paucity of previous studies on the barriers to the future of work study.

Work study practitioners are trained to handle workers who do not cooperate and they know how to overcome resistance. Before the start of work measurement, the work study practitioner must gain the confidence and cooperation of the workers and supervisors if he/she is to succeed. If the work study practitioner experiences too much resistance from the staff, management may be compelled to put a stop to the whole work measurement project (Sookdeo, 2016). Archibald et al. (2018) state that teamwork, critical thinking, communication, professionalism and collaboration are essential work

study competencies. Sookdeo (2016) found that work study practitioners should meet the business's needs and add value to an organisation.

Theoretical Framework

For this study, the following theoretical framework was used to guide the study.



Research Methodology

The research design, sample, measuring instrument, data collection, data analysis, trustworthiness and ethical considerations are discussed below.

Research Design

The study was exploratory due to the lack of prior studies on the future of work study. A qualitative research method was used as previous questionnaires were not available and this study had an open-ended approach. This research adopted a constructive interpretive philosophy, which comprised the specific field experiences, perceptions, views and evidence as well as the multiple realities of experts in work study.

Sample

Purposive sampling was used to select work study practitioners/specialists who were members of the Southern Africa Institute of Management Services (SAIMAS)

and worked in the field of work study with a minimum of 5 years of experience in work study. Twelve members of SAIMAS volunteered to take part in this study.

The biographical information of the participants is presented in Table 1.

Table 1. *Biographical Information of the Participants*

Participant	Age	Gender	Highest qualification	Present job title	Placement in the organisational structure
1	67	Male	Master of Business Administration	Private consultant	Self-employed
2	47	Male	Master of Business Leadership	Chief Executive Practitioner (CEO)	Office of the CEO
3	30	Male	BTech	Senior Manager Advisor	Organisational Development and Change Management Unit
4	63	Male	National Diploma	Deputy Head: Management Services	Organisational Development and Change Management Unit
5	59	Male	PhD	Senior lecturer	Department of Operations Management
6	61	Male	Masters Commercii	Private consultant	Self-employed
7	64	Female	Master's Degree	Deputy Director: Organisational Development	Chief Directorate: Human Resource Management and Development
8	64	Male	Master of Business Administration	Private principal consultant	Private consulting firm
9	43	Male	National Diploma	Chief Work Study Practitioner	Organisational Development Unit
10	56	Male	Certificate in Management Services	System Integrator	Directorate Technical Support Services
11	59	Female	BTech	Director: Interventions & Special Programmes Management	Group Human Capital Management Department: Organisational Efficiency Improvement Division
12	24	Female	BTech	Assistant	Institutional Effectiveness and Technology

Source: Authors' own compilation

It is clear from Table 1 that most of the participants were male. All participants had a post-school qualification. Their occupations varied from being part of management to being private consultants, system integrators, academics or assistants. They were employed in divisions such as organisational development, change management, human resource management, operations management, technical support services and institutional effectiveness and technology. Not one of them was employed in a work study unit per se.

Measuring Instrument and Data Collection

Semi-structured interviews were conducted to gather data from 12 volunteering participants. The open-ended interview questions were formulated as follows:

- Share the barriers you experience in your role as a work study practitioner.
- In your opinion, what are the contributors to being successful as a work study practitioner?
- How do you see the future of work study in South Africa?

Data Analysis

The interview transcripts were transferred to Excel sheets to facilitate analysis. Thematic analysis was used to analyse the data. Manual colour coding, as well as deductive and inductive coding, was used. The saturation of data, which means enough data had been collected to draw the necessary conclusions and any further data collection would not produce new value-added insights, was taken into consideration. Tesch's (1990) method of qualitative thematic data analysis was applied to analyse the data collected by way of open-ended questions about the future of work study. The data were organised into Excel spreadsheets such as to facilitate analysis, and colour coding served to categorise the themes. Deductive coding derived from relevant theory was used. During data analysis, other themes and categories emerged from the data and inductive coding was therefore also applied to develop themes. Due to the fact that there was a lack of previous studies on this topic, inductive coding was mostly used.

Trustworthiness

In a qualitative study, reliability and validity are not required but according to Bless, Higson-Smith and Sithole (2020), trustworthiness must be ensured. Trustworthiness involves the following elements: credibility, dependability, confirmability and transferability:

- Credibility was established through peer debriefing and member checks (Lincoln & Guba, 1985). Purposive selection of the participants was used to ensure the credibility of the findings.
- The study used a transparent coding process together with a systematic, comprehensive and exhaustive audit trail of the analysis of data to ensure that the research process followed was logical, traceable and documented in the interests of dependability (Sinkovics & Alfoldi, 2012). Reflective journaling during the research process was also used to ensure dependability.
- Zhang and Wildemuth (2009) state that confirmability is determined by checking the internal consistency of the research product. In the present research, this was done by checking the data, the findings, the interpretations and the recommendations. An audit trail was kept to keep the evidence of all the notes, transcripts and data analysis.

- Transferability was obtained by having data sets and descriptions that were so rich that other researchers would be able to make judgements about the findings and transferability in different settings or contexts, as suggested by Elo, Kaarianinen, Kanste, Polkki, Utriainen and Kyngas (2014).

Ethical Considerations

Ethical clearance was obtained from the Tshwane University of Technology's Research Ethics Committee. A permission letter was obtained from the professional body (SAIMAS). Confidentiality was ensured by supplying each participant with a number to protect their identity. Each member signed an informed consent before the interviews were conducted. This consent form indicated that they could withdraw at any point during the investigation, that there would be no questions asked that would make them uncomfortable and that they give permission to be recorded.

Findings and Discussion

In this section, the themes are discussed by referring to the direct quotes of the participants.

In Table 2, a summary of the barriers and contributors to the future of work study is presented.

Table 2. *Barriers and Contributors to the Future of Work Study in South Africa*

Barriers to the future of work study in South Africa	Theme 1: Lack of understanding of the role of work study
	Theme 2: Manipulation of work study
	Theme 3: Lack of decision-making power
	Theme 4: Lack of management support
Contributors to the future of work study in South Africa	Theme 5: Excellent competencies
	Theme 6: Meeting business needs
	Theme 7: Adding value to the organisation

Discussions on each theme and previous studies are added below.

Barriers to the Future of Work Study

Theme 1: Lack of Understanding of the Role of Work Study

Work study on the one hand examines the method of doing the work and on the other hand, determines the time required to do the work. These two main branches of work study namely method study (motion study) and work measurement (time study) are not used or implemented in all the South African organisations. Various participants mentioned that clients did not understand what the role of work study practitioners was.

" … work study is used and not everybody understands it." (Participant 3)

Sookdeo (2005) found that that during the implementation of productivity improvement techniques through work study, there was great resistance from workers of what work study practitioners can offer.

Participant 12 mentioned that there was a lack of understanding of what work study could offer.

"Lack of understanding/familiarity with work study and what it can offer." (Participant 12)

At all times, the work study practitioners must try to win and maintain the trust and cooperation of any group which is being investigated (Sookdeo, 2016). It is therefore of great importance, that the role of work study be clarified in South African organisations so that their contribution and value be better understood.

Theme 2: Manipulation of Work Study

Managers can sometimes manipulate work study practitioners to suit their agendas and gain. It is therefore essential to agree upon the impartiality of the work study practitioner to ensure the integrity of the outcome of the work study process.

"Before the start of the investigation, the work study practitioner is told what the outcome should be (especially in terms of organisational structure)." (Participant 11)

Sometimes work study practitioners were only used for job evaluations within the human resource management department and not fully utilised for what they were trained to do.

"Work study is merely viewed as an extension of HR responsible for ensuring that jobs are evaluated on demand. What we observe from the outside is that work study practitioners are mainly used/misused to conduct job evaluations to inflate the post levels. This unfortunate situation normally results in top-heavy structures and overpaid." (Participant 8)

Managers can sometimes ignore the work study report or try to manipulate it because it does not suit their objectives.

"As a practitioner, somehow it is very simple to survive. In cases where the senior manager does not buy into your ideas, they tend to manipulate you if they can see that you are not giving them what they want or what you are doing does not favour them. In some instances, your submission might be put aside and gather dust been not signed by the executives." (Participant 9)

Work study practitioners should gain the respect of the management so that their position is not wrongfully used (Sookdeo, 2005). A trustworthy relationship between management and work study practitioners is therefore of utmost importance to allow for work study processes to be ethical and be conducted with integrity.

Theme 3: Lack of decision-making power

The work study practitioners sometimes experience that they do not have the authority to execute the findings in the report and so just do what the managers tell them to do.

> "You do what the boss requests, irrespective of the rationality of such instructions or direction given." (Participant 6)

Work study practitioners also sometimes do not have a say in making decisions.

> "Not afforded adequate voice in decision making." (Participant 3)

However, Archibald et al. (2018) found that decision-making was an important part of a work study practitioner's job. If work study practitioners are not part of line management, it will be difficult to properly make decisions to execute the findings of work study investigations. In many organisations, the head of the work study department is a member of top management and this head must keep top management informed of the possible uses of work study (Sookdeo, 2016).

Theme 4: Lack of Management Support

Managers do not always give their support to work study practitioners because of fear that their shortcomings and weaknesses may be exposed. This could also lead to managers being worried about unwanted consequences including job loss.

> "Managers afraid that work study exposes their shortcomings." (Participant 5)

This may lead to a lack of management support to implement the work study report. It seems that even the mentioning of work study terminologies may lead to management not being supportive of further work study procedures and processes.

> "The lack of support from management within an organisation if the terminologies of work study are used." (Participant 2)

The work study practitioner must be able to rely on the support of top management to do his/her work successfully and the importance of the work study practitioner to the organisation should be communicated to the supervisors, foremen and workers by management (Kanawaty, 1995). A greater awareness, engagement and communication strategy should therefore get the necessary attention.

The following contributors to the future of work study were identified.

Theme 5: Excellent Competencies

Competencies refers to the capability of applying or using knowledge, skills, abilities, behaviours and personal characteristics to perform successfully critical work tasks and specific functions or operate in a given role or position (Wahome, Ng'ang'a & Sakwa, 2013).

Participant 1 is of the opinion that "Having vast experience and thorough knowledge of methodologies, techniques, and tools of efficiency improvement and problem-solving". Experience and knowledge are therefore essential parts of the excellent competencies of a work study practitioner.

For a work study practitioner to properly do his/her work, the necessary competencies should be acquired. Participant 3 mentioned various competencies.

> "Being independent, fearless, effective time management and continuous research and development for informed recommendations and mastering the ever-changing business needs." (Participant 3)

Participant 4 added that the work study practitioners must have "thoroughness (not taking things at face value)".

Work study practitioners should also have interpersonal skills to work with people. If the work study practitioner experiences too much resistance from the staff, management may be compelled to put a stop to the whole work measurement project (Sookdeo, 2016). Participant 5 mentioned that a work study practitioner needs to have the personality to work with people.

> "Having a personality to work with people." (Participant 5)

Archibald et al. (2018) found that teamwork in work study was essential; this was confirmed by the findings of the current study. A positive attitude and being considerate are also part of being a competent work study practitioner. Honesty in the work study processes and procedures is extremely important or else the report and results may be corrupted.

> "Show you are considerate. Have a positive attitude. Be honest. Be a team player." (Participant 10)

To be ethical in the workplace, honesty is almost like a forerunner. Archibald et al. (2018) found that professionalism was critical for work study practitioners.

> "Ethical behaviour and professionalism are the cornerstone and foundation." (Participant 5)

Theme 6: Meeting Business needs

Work study practitioners should meet the business's needs to ensure efficiency, effectiveness and productivity. Business savvy is therefore important.

> "You must understand the business you are working in and you should know the functional side like the back of your hand and understand all rules and regulations relating to your own field." (Participant 7)

To meet business needs, work study practitioners should be able to continuously conduct research and development.

> "…continuous research and development for informed recommendations and mastering the ever-changing business needs." (Participant 3)

Work study practitioners should proactively organise their own projects to improve service delivery and to illustrate to management and the employees that they are there to assist with improving productivity in an organisation.

> "Work study should take initiative and embark on their own initiated projects to improve service delivery. The more they proactively demonstrate the role they could play linked to the value they add, the more they will be used for the right reasons." (Participant 8)

Sookdeo (2016) found that work study practitioners should meet the business's needs. The application of techniques should therefore be established for a qualified worker to carry out a specified job at a defined level of performance (Rajiwate, Mirza, Kazi & Momin, 2020).

Theme 7: Adding Value to the Organisation

Work study practitioners must add value to the organisation so that their functions and roles are not outsourced to external consultants or companies.

> "… that there is more than a need/requirement for work study services in South Africa. Work study practitioners in government have to wake up, take the challenge and do something about the prevailing situation. The answer is not to outsource all the projects to the private sector, but to start adding value from the inside." (Participant 8)

Sookdeo (2016) agrees that work study must add value to an organisation. Work study should add value by staying relevant and focusing on meeting customer needs. A focus on customer needs among work study practitioners is therefore important.

> "It is each OD/Management services unit within an organisation's responsibility to ensure the appointment of skilled practitioners (links to training), to actively market their service, to show with their work what value can be added within an organisation, to ensure they stay relevant and efficient, to focus on needs of your customers." (Participant 11)

Practical and Managerial Implications

On a practical level, it is essential that think tanks be initiated by relevant stakeholders, such as industry, government and universities, to deliberate the implications of the future of work study in South Africa. Conceiving the potential value-add of work study should have a positive outcome in terms of future organisational performance. A practical implication of the future of work study is the fact that the areas for productivity improvement in organisations need to be identified. In a globalised economy, competitiveness means the ability to take the most advantageous position in a constantly changing market environment and work study is a practical way to achieve this.

This study can help management and work study practitioners to focus on the essence and value of work study and thus enhance management effectiveness. An awareness of the barriers and contributors to the future of work study can facilitate a

smooth production flow with minimum interruptions as well as the optimal use of work study. The lack of management support, limited understanding of the role of work study, manipulation of work study and absence of decision-making power might negatively impact work study. On the other hand, competent work study practitioners who meet business needs and add value to the organisation might have a positive effect on organisations. South African organisations should therefore re-imagine the future of work study to remain competitive in a fast-changing world.

Limitations

A limitation of this study was that it could not be generalised to other countries, as a single qualitative study was conducted. Another limitation was that only members of one professional body participated and the views of additional work study practitioners in South Africa were not obtained. The paucity of literature on the future of work study limited both the exploration of relevant literature and the possibilities of comparing the findings of this study with those of other studies. Lastly, only demographics were considered for this study.

Recommendations

It is recommended that management and work study practitioners be made aware of the barriers and contributors found in this current study to ensure that work study in South Africa not only survives but thrives in the future. Management and employees must understand the role of work study and the manipulation of this field should not be tolerated. Work study practitioners should obtain decision-making power to ensure the implementation of their reports. It is also recommended that management support work study because it will help boost production and productivity. Work study practitioners should ensure that they are competent in time management and teamwork and have interpersonal skills. They should also be considerate, positive and honest. Ethical behaviour and professionalism are the cornerstones of the work study profession and must be evident at all times. Work study practitioners must meet the needs of the business and add value.

For future research, it is recommended that this research be extended to other countries to investigate the value that work study can add in the global context. A quantitative study can also be conducted to determine the demographic differences in how management, employees and work study practitioners perceive the future of work study in South Africa and globally. Work study research can impact future work in a positive manner where hybrid companies have a mandate and an opportunity to reimagine how and where they work. The right strategy, supported by the right technology, can empower businesses and employees to be more innovative and efficient while striking better work-life balance. The most efficient way of utilising available resources to achieve the best possible quality of work in the minimum possible time and cause the least potential fatigue to the worker will then be ensured. Future work study research will also enhance the analyses of a job to find the most efficient way to do it and how long it should take. This goal of productivity

improvement by eliminating waste and unnecessary steps can have a positive impact on Industry 4.0 and Industry 5.0.

Conclusions

In this study, new knowledge about the barriers and contributors to the future of work study was obtained. The future cannot be predicted but alternative work study futures can be forecast, envisioned and then invented. Work study can assist in giving South African organisations a competitive edge. Organisations should rethink the future of work study to remain competitive in the global sphere.

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Urbanization of Previously Marginalized Races, the Quality of Jobs and Poverty Reduction in the City of Johannesburg, South Africa

By Brian Tavonga Mazorodze[*]

We examine how the urbanization of non-White races relates with poverty reduction in the city of Johannesburg using a panel dataset comprising the city's 7 municipalities (Midrand, Randburg, Roodepoort, Soweto, Alexandra, Johannesburg central and Orange Farm) observed annually between 1994 and 2023. Our identification strategy exogenizes the urbanization of non-White races using variation in unemployment differentials between the city's 7 municipalities and the national unemployment rate. We observe two key findings. Firstly, the urbanization of Black Africans increases poverty in Johannesburg, but the effect is mitigated when urbanization is accompanied by high 'quality' jobs. In the absence of high-quality jobs, the urbanization of Black Africans is found to aggravate poverty. Secondly and interestingly, the urbanization of Indian and Coloured races is associated with a decrease in poverty even in the absence of decent jobs in the city. These results demonstrate that, despite the end of Apartheid in 1994, the effects of urbanization on poverty reduction in South Africa are still unevenly influenced by the country's racial profile. It is therefore necessary for policies that complement the country's rapid urbanization to acknowledge these racial disparities to achieve more equitable outcomes.

Keywords: *urbanization, poverty reduction, economic development, job quality*

Introduction

Urbanization, defined as the increasing proportion of a population residing in urban areas, has become a common feature in the developing world whose effects on poverty reduction have attracted policy interest. Often driven by rural-to-urban migration, natural population growth in cities, and the expansion of economic activities, urbanization has been associated with economic growth, industrialization, and the expansion of services. In developing countries such as South Africa where poverty is most prevalent, urbanization is seen both as an opportunity for economic advancement and a potential risk in the absence of conditioning factors. This paper examines how the urbanization of non-White races and the creation of good jobs influences poverty reduction in the city of Johannesburg, the country's main economic hub.

South Africa went through an Apartheid regime between 1948 and 1994. During this period, the country was governed by an all-white government which prohibited minority races, including Black Africans, from working in central cities together with White people. Non-white South Africans (Black Africans, Indians and Coloured people) were compelled to live separately from the White minority race.

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Black Africans were particularly required to live in overcrowded townships which were primarily a source of cheap labour for nearby cities. These unwelcoming circumstances meant that poverty was disproportionally high among Black Africans who represented the majority race.

Since the end of Apartheid in 1994, the number of non-white races living in urban areas has increased significantly. For Johannesburg, in particular, Black African households living in urban centers have more than doubled, rising from 479 thousand in 1994 to approximately 1.3 million in 2023 (Quantec 2024). This progress has, however, been undermined by a rather disappointing increase in the number of people living below the international poverty line from 930 thousand in 1994 to approximately 1.1 million in 2023. When narrowed down to South Africa's food poverty line[14], the number of poor households in Johannesburg stood at 1.5 million in 2023, up from 987 thousand in 1994 (Quantec 2024).

While the above background has motivated several studies seeking to link urbanization with poverty alleviation in developing countries (Christiaensen et al. 2013, Chen et al. 2019, Ha et al. 2021, Wang et al. 2022, Mwiinde & Munshifwa 2024), the specific channels through which urbanization affects poverty remain unclear. This paper contributes to this literature by considering how the 'quality' of jobs influences the impact of urbanization on poverty reduction in the city of Johannesburg. Rodrik and Sabel (2020) and Rodrik (2022) have argued the need for building a 'good jobs' economy to sustain economic growth and development. Is a 'good jobs' local economy vital for urbanization to lift people out of poverty?

In theory, the relationship between urbanization, the labour market, and poverty reduction is grounded in Lewis' dual economy model. In this theory, urbanization, driven by rural-urban migration, is closely linked to industrialization and productivity growth in modern cities. As labor moves from agriculture to industry, productivity increases, leading to higher incomes, improved living standards and a decrease in poverty. Complementing Lewis' ideas are endogenous growth theories which emphasize the role of cities as centres of innovation, knowledge exchange, and infrastructure development, all of which contribute to economic growth and poverty reduction.

The dual economy, however, highlights the downside of urbanization in the absence of complementary policies. In particular, without supportive policies, rapid urbanization may result in urban slums, informality, increased inequality and high crime rates. In South Africa, majority of urban immigrants in big cities are trapped in low-paying informal activities. This contrasts China's experience where rapid urbanization was instrumental in lifting millions of people out of poverty. The government's investment in infrastructure, housing, and social services facilitated this transition. In India, urbanization has had a more mixed impact on poverty reduction. Cities such as Bangalore and Mumbai have become economic

[14]Stats SA employed an internationally recognised approach - the cost-of-basic-needs approach - to produce three poverty lines, namely the food poverty line (FPL), the lower-bound poverty line (LBPL), and the upper-bound poverty line (UBPL). These lines capture different degrees of poverty and allow the country to measure and monitor poverty at different levels. The FPL is the rand value below which individuals are unable to purchase or consume enough food to supply them with the minimum per-capita-per-day energy requirement for adequate health.

powerhouses, yet rural migrants often face challenges related to housing, employment, and access to basic services. The proliferation of slums in major urban areas highlights the uneven benefits of urbanization.

Empirically, Ha et al. (2021) analyze the impact of urbanization on poverty reduction in Vietnam. Using Driscoll and Kraay's method and D-GMM method to estimate the provinces' panel data in the period 2006–2016, they confirm a U-shape relationship between the level of urbanization and the poverty level in Vietnam. Arouri et al. (2017) use data from household surveys to examine the impact of urbanization on poverty. Their results show that urbanization helps decrease the expenditure poverty rate of rural households, albeit by a small magnitude. Literature has little documentation on urbanization and poverty reduction in South Africa. Turok and Borel-Saladin (2014) explore the relationship between urbanisation and living conditions in South Africa over the last decade and find urbanization associated with the growth of informal settlements. We compliment their work by focusing on the urbanization of previously marginalized races and proceed to examine how the availability of good jobs influences the impact of urbanization on poverty in the city of Johannesburg.

We hypothesize that labour markets are crucial in shaping how urbanization affects poverty among the previously marginalized races. We argue that the rural-urban migration is more effective in lifting previously marginalized races out of poverty when accompanied by policies that create good and well-paying jobs in modern cities. In the absence of decent jobs, urbanization may exacerbate poverty, create urban slums, encourage criminality, informality and increase socio-economic disparities. We define 'good jobs or high-quality jobs' in the narrow sense of occupations for skilled workers. These include professional, semi-professional and technical occupations, managerial appointments, executives, administrators, and transport occupations such as pilot navigator. We apply a panel dataset that comprises the city's 7 local municipalities namely Midrand, Randburg, Roodepoort, Soweto, Alexandra, Johannesburg central and Orange Farm. Since urbanization is largely endogenous, we exogenize its variation using the unemployment differentials between each municipality and the national unemployment rate. We argue that a higher national unemployment rate relative to each municipality encourages the migration of job seekers towards Johannesburg which increases urbanization and ultimately affects poverty.

Using the control function approach, our results show that the urbanization of Black African households reduces poverty in Johannesburg areas that create 'high quality' jobs. In the absence of good jobs, the urbanization of Black Africans exacerbates poverty. Secondly and interestingly, the urbanization of Indian and Coloured races is associated with a decrease in poverty even in the absence of decent jobs in the city. These results demonstrate that, despite the end of Apartheid in 1994, the effects of urbanization on poverty reduction in South Africa are still unevenly influenced by the country's racial profile. Regional growth is found to exacerbate poverty in the city for Black Africans highlighting their marginalization from economic development. Additional specifications that consider the alternative measures of poverty reach similar conclusions. We find the urbanization of Black Africans

associated with an increase in urban slums (squatter settlements) and a decrease in the income of the bottom ten.

The rest of the paper is organized as follows. Section 2 describes the data and variables used in the analysis. Section 3 outlines the estimation strategy and specifies the empirical models. Section 4 presents the empirical results. Section 5 provides the conclusion and policy recommendations.

Data Description

South Africa has 257 metropolitan, district and local municipalities. This number comprises eight metropolitans (Buffalo City (East London), City of Cape Town, Ekurhuleni Metropolitan Municipality (East Rand), City of eThekwini (Durban), City of Johannesburg, Mangaung Municipality (Bloemfontein), Nelson Mandela Bay Metropolitan Municipality (Gqeberha) and City of Tshwane (Pretoria)), 44 district and 205 local municipalities. We focus on 7 local municipalities which collectively form the City of Johannesburg metropolitan municipality. These municipalities are Midrand, Randburg, Roodepoort, Soweto, Alexandra, Johannesburg central and Orange Farm. Johannesburg, home to the 7 seven municipalities and nicknamed 'Egoli' (Place of Gold), is the capital city of Gauteng province and a major economic hub of the country. Being the central hub of economic activities makes it a popular destination for job seekers. Our sampling period stretches from 1995 to 2023 which makes a panel dataset comprising 203 annual observations as T=29, N=7 and 29*7=203. The sampling period is dictated by data availability on trade variables which form part of our control variables. Data on trade variables at local municipality level are only available from 1995. Our baseline dependent variable is the number of people living below the international poverty datum line. In additional specifications, we consider the income of the bottom ten and the number of households living in squatter camps. The independent variables of interest are the number of urban Black African households, Coloured and Indian races, and the number of workers employed in high 'quality' jobs. As alluded to earlier, we define high 'quality' jobs as skilled occupations such as professional, semi-professional and technical occupations, managerial appointments, executives, administrators, and transport occupations such as pilot navigator. Our specifications control for the share of imports on total output also referred to as import penetration, population growth, and output growth. Data on all our variables are sourced from Quantec, a local firm based in Pretoria. This is a reliable data source whose data has been used in prominent work on the South African economy including Rodrik (2008).

Estimation Strategy

We consider the following specification.

$$y_{it} = \beta_0 + \beta_1 m_{it} + \beta_2 n_{it} + \beta_3 m_{it} \times n_{it} + \delta' z_{it} + \varepsilon_{it} \quad (1)$$

where i and t denote area and year, respectively, y is the number of people living below the poverty line, m is the log number of non-White households living in urban areas of Johannesburg, n is the log number of skilled workers, $m \times n$ is their interaction so that β_3 captures how good jobs influence the impact of urbanization on poverty, z is a vector control variables which include the log of output, the share of imports on output and the log of population. From this specification, the appropriate estimation strategy is primarily based on two considerations namely the count nature of the dependent variable and the endogeneity of urbanization. On the first consideration, the discrete nonnegative nature of our dependent variable suggests that a count data model should be used (Cameron and Trivedi 1998, Winkelmann 2000). Under count data models, there are broadly two types of models to be considered: the Poisson regression model and the Negative Binomial. The former assumes equality of the mean and the variance also known as equidispersion while the latter accommodates deviation from this assumption i.e., under and overdispersion. Customarily, validity of the equidispersion (i.e., mean=variance) assumption is first checked as deviation from this assumption potentially leads to biased estimates of the variance-covariance matrix which invalidates the statistical inference performed on the model (Guimaraes & Lindrooth 2005). In cases of overdispersion, which is common, the Negative Binomial regression is usually chosen over a Poisson regression (Lord 2006, Chin and Quddus 2003). It has been argued, however, that a Poisson regression model with robust standard errors is more consistent than the Negative Binomial regression[15] if one is interested in the conditional mean even in the presence of under or overdispersion (Wooldridge 1999). Notwithstanding the Negative Binomial's ability to address overdispersion and the Poisson model's ability to produce consistent estimates of the conditional mean when estimated with robust standard errors, both approaches do not handle idiosyncratic endogeneity (i.e., the correlation of urbanization and the omitted time-varying variables nested in the error term). At best, the Poisson model with fixed effects addresses heterogeneity endogeneity which arises from the correlation between urbanization and unobserved time-invariant heterogeneity. It is well-documented that urbanization endogenously reacts to economic factors such as job opportunities hence methods that treat right-hand side variables as exogenous may be biased.

Dealing with idiosyncratic endogeneity is straightforward in linear regression but less so in non-linear regression methods. Within a Poisson cross sectional regression framework, the Generalised Method of Moments (GMM) can be applied with appropriate instruments as discussed in Wooldridge (2010). This approach is problematic however and mulled by scepticism in panel data Poisson regression given two additional challenges that panel data brings; unobserved heterogeneity and period effects often controlled by N-1 and T-1 dummies respectively both which have a tendency of violating order conditions as the structural equation is likely to have more parameters than instruments.

Given the above challenge, a solution proposed Papke and Wooldridge (2008) and recently modified by Lin and Wooldridge (2019) involves the use of a control

[15]The Negative Binomial Regression in panel data is also criticized for its inadequacy of removing time-invariant factors correlated with the explanatory variables (see Allison and Waterman 2002).

function (CF) procedure. This method proceeds in two stages. Firstly in this context, it estimates the expected number of people living below the international food poverty line conditioned on an endogenous urbanization variable ($\boldsymbol{y}_{it2}$), exogenous variables ($\boldsymbol{z}_{it1}$), area-specific effects i.e., unobserved heterogeneity (c_{i1}) and time-varying omitted factors (r_{it1}) as follows.

$$\ln \lambda_{it} = E(y_{it1}|\boldsymbol{y}_{i2}, \boldsymbol{z}_i, c_{i1}, r_{it1}) = E(y_{it1}|\boldsymbol{y}_{it2}, \boldsymbol{z}_{it1}, c_{i1}, r_{it1})$$
$$= c_{i1} \exp(\boldsymbol{x}_{it1}\theta_1 + r_{it1}), \quad (2)$$

and

$$\boldsymbol{x}_{it1} = (\boldsymbol{y}_{it2}, \boldsymbol{z}_{it1})$$

where vector $\boldsymbol{z}_{it1}$ also includes $T-1$ time dummies. The first step estimates the reduced form equation for the endogenous regressor ($\boldsymbol{y}_{it2}$) by the fixed effects (FE) approach and obtains the FE residuals. In the reduced form equation, a valid instrument is needed, and we require a variable that (i) is correlated with urbanization (ii) and likely to affect poverty only through urbanization. An appealing candidate is the unemployment differential between each municipality and the national unemployment rate. A higher national unemployment rate relative to each municipality is likely to encourage the migration of job seekers towards Johannesburg which increases urbanization and ultimately affects poverty. This instrument is included in the first step regression along with fixed effects and other control variables that appear in the structural equation. FE residuals are then computed as,

$$\ddot{\widehat{u}}_{it2} = \ddot{y}_{it2} - \ddot{\boldsymbol{z}}_{it}\widehat{\Pi}_2$$

where the hat denotes predicted values and the two upper dots signal time averages i.e.,

$$\ddot{\boldsymbol{y}}_{it2} = \boldsymbol{y}_{it2} - T^{-1}\sum_{r=1}^{T}\boldsymbol{y}_{ir2}, \quad \ddot{\boldsymbol{z}}_{it} = \boldsymbol{z}_{it} - T^{-1}\sum_{r=1}^{T}\boldsymbol{z}_{ir}$$

and, in the second stage, plugged in the FE Poisson regression mean specification (with bootstrapped standard errors) given by,

$$E\left(y_{it1}\middle|z_{it1}, y_{it2}, \ddot{\widehat{u}}_{it2}, c_{i1}\right) = c_{i1} \exp(\boldsymbol{x}_{it1}\theta_1 + \ddot{\widehat{u}}_{it2}\rho_1)$$

in which robust Wald test of ρ_1 will be a test for exogeneity with respect to idiosyncratic shocks. We hypothesise that the effect of urbanization on poverty in cities depends on the ability of the labour market to provide good and well-paying jobs. In the absence of good jobs, urbanization may aggravate poverty in cities.

Empirical Results

Table 1 presents summary statistics. The number people living below the international poverty line averaged 153 thousand annually in the 7 Johannesburg municipalities. The number of urban households was highest among Black Africans on average followed by the Coloured and Indian races. This is consistent with the country's racial profile as Black Africans are the majority race. The rate of unemployment was lower in the 7 Johannesburg municipalities on average, 21 percent, compared to the national average, 26 percent. Skilled workers were slightly above 57 thousand on average ranging from about 25 thousand to approximately 102 thousand.

Table 1. *Summary Statistics*

Variable	Obs	Mean	Std. Dev.	Min	Max
Poverty headcount	203	152836.67	47109.704	68596	302960
Urbanization - Black African Race	203	130713.67	72002.084	22032	329942
Urbanization – Coloured Race	203	7635.177	3707.241	768	14179
Urbanization – Indian Race	203	6943.507	4082.294	1234	15526
Skilled workers	203	57181.194	17042.199	24753	101701
Unemployment	203	20.466	9.177	3.268	43.761
S.A. Unemployment Rate	203	25.367	3.617	20.421	34.582
Output	203	129029.01	42965.878	45433	222497
Population	203	544792.25	251318.3	200684	1252530
Share of imports	203	0.378	0.344	0.025	1.503

Table 2 presents main regressions results from the structural equations. We estimated three regression variants, control function one (CF1), control function two (CF2) and control function three (CF3). The first, second and third variants are for Black African urbanization, Coloured and Indian races, respectively. Variables u1, u2 and u3 are residuals from the reduced form equations. They all enter significantly across the three specifications validating the endogeneity of urbanization and the necessity to apply an instrumental variable approach. Apart from the residuals, all variables are lagged once to allow a one-year delay in their marginal effect on poverty.

The results in the first variant (CF1) indicate a positive and significant (at 10 percent) impact of Black African urbanization on poverty. It's interaction with the number of skilled workers in each municipality is negative and statistically significant at one percent level indicating that the urbanization of Black Africans is associated with an increase in poverty but that the impact is mitigated by the existence of skilled jobs. This result supports the assertion raised in Turok and Borel-Saladin (2014) that access to meaningful employment is vital for income security and material well-being by affording the necessities of life in food, clothing and shelter. Our result shows that unless the labour market is able to provide good jobs, the urbanization of Black Africans is associated with an increase in poverty in the city of Johannesburg. This is consistent with Rodrik's (2022) call for industrial policies that promote the creation of good jobs to sustain economic development.

Interestingly in variants two (CF2) and three (CF3), the coefficients associated with the urbanization of Coloured and Indian races are both negative, sizeable and statistically significant at one percent level indicating that, unlike for Black Africans, the

urbanization of Coloured and Indian races generally reduces poverty in the city of Johannesburg. This result suggests that South Africa's racial profile still disproportionately affects economic development and poverty reduction in particular. Their interaction with the number of skilled workers is surprisingly positive and statistically significant at one percent. This observation indicates that the urbanization of Coloured and Indian races is associated with a reduction in poverty even in Johannesburg areas where skilled jobs are limited. This result suggests that poverty reduction in the city is achievable through the urbanization of Coloured and Indian races even in the absence of decent jobs demonstrating a clear existence of racial disparities in the manner in which urbanization relates with poverty reduction in the city of Johannesburg.

Table 2. *Urbanization, Skilled Jobs and Poverty*

	(1)	(2)	(4)
	CF1	CF2	CF3
	Black African Race	Coloured Race	Indian Race
L.logurban_coloured		-7.711***	
		(0.0460)	
L.logskilled	1.562***	-4.525***	1.241***
	(0.0374)	(0.0500)	(0.0946)
L.logurban_colouredlogskilled		0.620***	
		(0.00356)	
L.logpopulation	0.336***	-0.740***	-0.119***
	(0.0170)	(0.0164)	(0.00946)
L.logoutput	3.357***	-0.457***	-1.400***
	(0.0177)	(0.0128)	(0.0151)
L.imports_share	0.103***	0.120***	0.0842***
	(0.00229)	(0.00220)	(0.00223)
u2		3.985***	
		(0.0383)	
L.logurban_blackafrican	0.0721*		
	(0.0431)		
L.logurban_africanlogskilled	-0.149***		
	(0.00309)		
u1	0.450***		
	(0.0297)		
L.logurban_indian			-4.932***
			(0.0300)
L.logurban_indianlogskilled			0.334***
			(0.00437)
u3			0.200***
			(0.00304)
Time effects	yes	yes	yes
Observations	196	196	196
Number of ID	7	7	7

Bootstrapped standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Regarding the control variables, the coefficient on output is significantly positive for Black Africans and significantly negative for Coloured and Indian races. This suggests that growth in output may have been exclusive to Black Africans and inclusive to Coloured and Indian races. Similarly, the coefficient on population growth is positive in the first variant and negative in the second and third variants possibly indicating the marginalization of Black Africans from formal economic gains. Imports penetration enter positively and significantly across all the three regression variants. A possible explanation for this observation is that imports displace domestic production and result in jobs losses which lead to poverty. This explanation draws support from Ewards and Jenkins (2015) who find South African manufacturing output lower in 2010 owing to the displacement of domestic production by Chinese imports.

In Table 3, we use income of the bottom ten as the dependent variable. This measure allows us to infer how urbanization relates with income of the very poor. Most importantly, it allows us to understand the importance of urbanization and the quality of jobs on inclusive development. We extract data on the bottom ten from Quantec's income and living conditions surveys. These surveys rank households from low to high income and then group them into 10 equally sized household distributions. Since the dependent variable is not discrete, we use the instrumental variable fixed effects (IV-FE) with robust standard errors. The coefficient of urbanization is negative, sizeable and highly significant in the case of Black Africans. This result shows that the urbanization of Black Africans is associated with a decrease in the income of the bottom ten in Johannesburg. Its interaction with skilled workers is positive and statistically significant at one percent level demonstrating that good jobs mitigate the negative effect of urbanization on income of the very poor. For the Coloured and Indian races, the coefficients of urbanization are positive, sizeable and statistically significant at one percent level corroborating the results reported earlier that urbanization is generally detrimental to Black Africans compared to Coloured and Indian races. From the results in Table 4.4, the urbanization of Coloured and Indian races raises income of the very poor even with limited skilled job opportunities.

Table 3. *Urbanization, Skilled Jobs and Bottom Ten Income*

	(1)	(2)	(3)
	IV-FE	IV-FE	IV-FE
	Black African Race	Coloured Race	Indian Race
logurban_blackafrican	-4.580**		
	(1.907)		
logskilled	-7.835***	2.096***	1.607***
	(1.843)	(0.385)	(0.335)
logurban_africanlogskilled	0.624***		
	(0.165)		
L.logpopulation	-1.656***	-0.228***	-0.0908
	(0.588)	(0.0630)	(0.0621)
L.logoutput	1.377***	0.0735***	0.000431
	(0.218)	(0.0275)	(0.0266)

L.imports_share	0.150	0.00022 1	0.0127
	(0.159)	(0.0265)	(0.0293)
logurban_coloured		1.224***	
		(0.320)	
logurban_colouredlogskilled		0.179***	
		(0.0369)	
logurban_indian			1.351***
			(0.367)
logurban_indianlogskilled			0.132***
			(0.0325)
Constant	70.71***	20.96***	18.55***
	(25.16)	(3.748)	(3.725)
Time effects	yes	yes	yes
Observations	196	196	196
Number of ID	7	7	7

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In Table 4, we use a material measure of poverty namely the number of households living in urban slums. We proxy slums by squatter settlements that are not in the backyard. Data on this variable are sourced from Quantec under household facilities and urbanization. Since the dependent variable is discrete, we use the baseline Poisson model estimated via the control function with bootstrapped standard errors. We observe a positive, sizeable and highly significant coefficient of urbanization for Black Africans. The positive and significant coefficient implies that the number of squatter settlements in the city of Johannesburg increases with the urbanization of Black Africans. Its interaction with skilled workers is negative indicating that the existence of good occupations ameliorates the effect of urbanization on squatter settlements. Interestingly this time, the positive coefficient of urbanization also shows up for the Coloured race although relatively small. These results show that the urbanization of Black Africans and the Coloured race is associated with urban slums and creating good jobs seems to moderate the association. For the Indian race, the coefficient on urbanization is negative and statistically significant. This demonstrates that squatter settlements decrease with the urbanization of the Indian community.

Table 4. *Urbanization, Skilled Jobs and Urban Slums*

	(1)	(2)	(3)
	CF1	CF2	CF3
	Black African Race	Coloured Race	Indian Race
L.logurban_blackafrican	5.213***		
	(0.159)		
L.logskilled	0.822***	-1.886***	-11.03***
	(0.198)	(0.168)	(0.128)
L.logurban_africanlogskilled	-0.487***		
	(0.0137)		
L.logpopulation	1.785***	1.856***	2.600***
	(0.0455)	(0.0518)	(0.0448)
L.logoutput	4.454***	-5.414***	-3.143***

	(0.0655)	(0.0673)	(0.0796)
L.imports_share	-0.0600***	0.103***	0.233***
	(0.00801)	(0.00799)	(0.00854)
u1	-1.543***		
	(0.0826)		
u2		-0.435***	
		(0.0378)	
u3			-0.0285***
			(0.001)
L.logurban_coloured		0.222**	
		(0.111)	
L.logurban_colouredlogskilled		-0.215***	
		(0.0126)	
L.logurban_indian			-8.471***
			(0.132)
L.logurban_indianlogskilled			0.755***
			(0.0122)
Time effects	yes	yes	yes
Observations	196	196	196
Number of ID	7	7	7

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Evidence further shows that population growth is associated with an increase in squatter settlements. This result supports the notion that population growth in cities puts pressure on economies resources and creates informal settlements. Output growth reduces squatter settlements in the Coloured and Indian races. In the specification for Black Africans, output enters positively and significantly suggesting the marginalization of Black Africans from economic development.

The main results primarily suggest that the urbanization of Black Africans is associated with increased poverty particularly in the absence of formal decent jobs in the city of Johannesburg. Urbanization of Coloured and Indian races is associated with a decrease in poverty. This finding needs to be interpreted with caution. The first possible explanation is the argument that race still dictates the inclusiveness (or lack thereof) of urbanization in South African cities. It might be argued that economic opportunities are disproportionately limited for Black Africans compared to Coloured and Indian races. The lack of economic opportunities for Black Africans in South African cities is a multifaceted issue with deep historical, structural, and socio-political roots. Several factors contribute to this disparity, ranging from the legacy of colonialism to systemic racism, lack of access to education, and ongoing discrimination in the labor market. Given the history of Apartheid whose effects remain persistent it is not inconceivable that Black Africans are still subjected to prejudice based on their colour, ethnicity and socioeconomic status, which can limit their ability to secure quality employment or build wealth. This is particularly true in urban centres such as Johannesburg where competition for jobs is intense, and systemic biases may favour other privileged groups. Compounding this, Black Africans, particularly those from rural or low-income backgrounds, often find themselves excluded from informal job networks which ultimately marginalizes them from access to job opportunities.

The second possible explanation could be that the city of Johannesburg has simply not kept pace with the rapid immigration of Black Africans. The city may have particularly struggled to create enough jobs to accommodate the influx of Black Africans who represent the majority race. Like most cities in Africa, Johannesburg has been largely overburdened by insufficient infrastructure, inadequate housing, and limited access to basic services. The informal sector, which many Black Africans, including undocumented foreign nationals, rely on for employment, tends to dominate the urban economy, with jobs that are low-paying, unregulated, and insecure. This creates a cycle of economic instability, as many people in the informal sector lack access to formal social protections, credit, or the skills needed for higher-paying jobs.

Thirdly, unlike the Black majority race, the Coloured and Indian races do not primarily rely on skilled jobs to earn a living. It could well be that the Indian race in particular is particularly accustomed to the running of businesses. A reliance on business would help explain why the urbanization of Indian and Coloured races is associated with a decrease in poverty even in the absence of skilled jobs in the labour market. A third possible reason is that unlike the Coloured and Indian races, Black Africans have disproportionate financial burdens and dependence in remote areas of the country. It could be that most of them migrate to cities and remit much of their income back home leaving themselves worse-off. Given too that the estimated models do not account for such spatial and spillover effects, it could be that the urbanization of Black Africans reduces poverty elsewhere through remittances.

Conclusion and Policy Recommendations

We have examined how good jobs influence the impact of urbanization on poverty among South Africa's three previously marginalized races in the city of Johannesburg and reached several conclusions. Firstly, we conclude that racial dynamics appear to have shaped how urbanization influenced poverty reduction in the city of Johannesburg between 1995 and 2023. Secondly, the urbanization of Black Africans raises poverty if government does not put in place policies aimed at creating good jobs. Thirdly, the urbanization of Coloured and Indian races correlates negatively with poverty. Several policy recommendations can be drawn from these conclusions. The important recommendation is the need for racially inclusive hiring practices in the labour market. The city of Johannesburg municipality could benefit from implementing policies that encourage inclusive hiring practices, particularly in industries that are growing rapidly and are capable of generating well-paying jobs. Such policies could include incentivizing employers to hire from historically disadvantaged groups to achieve equitable outcomes and ensure that good jobs are available to all segments of the population. Given the importance of good jobs as a mitigating factor for Black Africans in all our regressions, it is additionally important for the city of Johannesburg to embark on public-private partnerships that seek to create more decent jobs for Black Africans. The results particularly suggested that, with good jobs in place, urbanization could be a way of breaking the poverty cycle among Black Africans. Cross country evidence suggests that the creation of good jobs is achievable through, among other things, supporting small businesses and improving access to capital for

entrepreneurs. Small businesses and entrepreneurs play a significant role in creating good jobs, particularly in urban areas. They form part of the supply chains and therefore require skilled labour ranging from logistics experts, supply chain managers to accountants. Access to capital can take the form of low-interest loans and grants that could be conditioned on the creation of good jobs for less-privileged groups. In addition, as the city of Johannesburg thrives to combat climate change, investments in green infrastructure—such as renewable energy, energy-efficient buildings, and sustainable waste management—can create a new generation of well-paying jobs for Black Africans. Local governments can, in this regard, consider tax credits or grants to companies that specialize in green technology, as well as invest directly in sustainable infrastructure projects that provide decent jobs for Black Africans. Future studies might consider a spatial analysis which accounts for spillover effects of urbanization.

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Influence of Blockchain in Marketing on Efficiency of E-customer Relationship Management: Moderating Role of Technology Adoption

*By Tareq Nael Hashem**

Current study aimed at exploring the moderating role of technology adoption on the relationship between blockchain (control over personal data, trust and transparency, improved personalization, seamless loyalty programs, enhanced customer service) and efficiency of e-customer relationship management from perspective of customer who has experience in e-shopping. Quantitative methodology was adopted, and a questionnaire was self-administered by (372) individuals who were aware of the concept of online shopping. SPSS was employed to deal with primary data, results indicated the acceptance of study's hypotheses and it appeared that blockchain technology relationship with E-CRM is moderated by technology adoption. The most influential factor of blockchain was on seamless loyalty programs which have helped in increasing the level of trust and transparency of customers' profile leading to more loyalty from them. Study recommended to shed the light on aspects that may influence organizations' acceptance of blockchain in their marketing strategies, in addition to the need to increase the attention of marketing department on aspects of trust and loyalty through online shopping channels.

Keywords: *Blockchain, E-Customer Relationship Management, Technology Adoption, Trust and Transparency, Improved Personalization*

Introduction

In the marketing sphere, the appearance of technology caused a big revolution that directly leads to new methods of linking businesses with their consumers and enabling promotional activities to take place in a different manner (Stallone et al, 2021). Within the timespan of the last couple of years, science and technology has yielded unstoppable wonders like never before, that have instigated applications, systems and methods that have been able to change the face of marketing. Whereas social media platforms and artificial intelligence are but a few big technological breakthroughs in marketing worldwide, technology has evolved to be so important to marketing strategies of all businesses across the globe, making it possible for them to reach wider audiences, to send personalized messages, and to provide unique customer experience (Rejeb et al., 2020).

Jain et al. (2021) argued that traditional marketing strategies are transformed with the help of digitalization, now it draws from the connected world of digital channels and techniques. Marketing has gained major influence by using the internet, mobile devices and social media platforms as the major medium where businesses can reach

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consumers, create brand awareness and drive customer engagement. Gleim and Stevens (2021) agreed on the same idea arguing that via the internet, mobile applications, and social media marketing, organizations can now make a bridge directly between them and their market, producing a quick, real-time chatting where customization is an integral element.

Antoniadis et al. (2020) stated that Customer Relationship Management (CRM) has been significantly influenced by technology through transforming the way businesses interact with customers and manage relationships. Technology has provided businesses with powerful CRM software and tools that centralize customer data, streamline processes, and enhance communication. With the advent of CRM systems, businesses can efficiently track customer interactions, manage leads, and optimize sales pipelines. Additionally, technology has enabled the integration of multiple customer touchpoints, such as social media, email, and website interactions, into a unified view, allowing businesses to deliver personalized experiences across various channels. Automation and artificial intelligence capabilities within CRM systems have further enhanced efficiency by automating routine tasks, providing data-driven insights, and enabling proactive customer engagement. Overall, technology has revolutionized CRM, enabling businesses to build stronger customer relationships, improve customer satisfaction, and drive business growth which has led to the appearance of E-CRM (Tozanlı et al., 2020).

Technology adoption in all its forms have managed to change the reality of CRM through giving more focus and attention to the usability of data flowing to the organization. This has helped in supporting interested parties with the needed data regarding their relationship customers (Tan and Saraniemi, 2023). Among the technological techniques that have revolutionized CRM is the appearance of blockchain technology. This technology is a smart technology capable of achieving transparency and security during the exchange of information between customers and organizations by improving the data storage mechanism and transforming it into encrypted, tamper-proof data (Antwi, 2023).

Literature Review

Blockchain in Marketing

The advent of blockchain in the marketing industry is making a huge impact on the different activities such as transparency, security and efficiency of the marketing activity by offering new ways of doing the same. Adithya (2023) argued that blockchain technology has become immune to crashes and errors since it was invented along with cryptocurrencies like Bitcoin and, it is also known as a distributed digital ledger that records transactions on multiple computers or nodes. Via removing the necessity for intermediaries, such as banks or third-party platforms, the decentralization feature allows for smooth and traceable transactions, which in their turn cannot be changed (Tan and Saraniemi, 2023).

Blockchain can transform many key areas in the marketing practice such as customer engagement, brand protection, data storage etc. One of the applications

involving the blockchain is in supply chain management, where products can be granularly tracked from shipment end to end (Wasiq et al., 2023). A supply chain that records everything from raw materials right through to final product through blockchain can guarantee that the quality and authenticity of the products are consistent, as well as the ethical origin of its inputs, which the business can communicate to their consumers and thus lead to consumer trust and satisfaction (Peres et al., 2023).

Under blockchain, counterfeit goods, ads, and tracking are also possible applications to take advantage of. The present digital advertising system is sick because it suffers from fraud, lack of transparency, and divergences of reports (Treiblmaier and Petrozhitskaya, 2023; Maseke, 2024). Tan and Salo (2023) stated that blockchain technology is built on the principle of decentralization and immutability and it can be used for tracking ad impressions, clicks and conversions, hence addressing challenges. Advertisers are able message their ads' authenticity guarantee which ensures their ads really reach users they actually mean to. Publishers in turn can have profit of money fair compensation for ads' space they offer.

Whereby, the blockchain technology could similarly impact the management of customer data as well as customers 'privacy. Unlike the traditional data storage and management infrastructure where customer data is prone to unauthorized infiltration and misuse, the blockchain technology gives an immutable, decentralized, and secure layer top it up (Bonetti et al., 2024). The most important advantage of the technology is the fact that there is no central database, which in turn provides higher security and transparency levels. Customers have control over their data which can only be used with their approval. Thus, businesses can feel more comfortable with their clients, who willingly provide their data, which thanks to that, can establish more successfully launched personalized marketing schemes and experiences (Marthews and Tucker, 2023).

Ghavidast Kouhpayeh et al. (2024) noted that blockchain-based loyalty programs can make customer engagement and devotion even more possible. This relevant move - designing virtual coins or cryptocurrencies cashable and redeemable by customers - can be used as the base for innovative and rewarding projects of retailers. Through smart loyalty schemes formed on a blockchain, customers can now enjoy the convenience of online redemption anywhere, reward transfer among brands, and clear monitoring of rewards allocation. This is a win-win both for customers and for brands trying to grow and retain their customer base (Haynes and Hietanen, 2023).

From another perspective, it was noted by Treiblmaier (2023) that blockchain still has a lot of promise for marketers, while it is crucial to understand and accept the present obstacles and boundaries it has. Scaling of blockchain along with energy consumption and regulatory control are some among the big issues which are the reason for the slow spread of blockchain technology in marketing.

In conclusion, it is worth mentioning that blockchain technology is an invaluable tool for marketers to innovate the leading processes of marketing forever. Blockchain, as an emerging technology, can be used in supply chain management, customer data management, digital advertising, and loyalty programs to make order, security, and efficiency transparent. As a result, trust increases, customers have a positive experience, and, therefore, business thrives in the digital world (Abakah et al., 2023).

E-Customer Relationship Management (E-CRM)

Younis et al. (2024) defined E-CRM (E-Customer Relationship Management) as the utilization of electronic channels and their technologies in order to achieve management of customer relationships as well as their improved level. It takes place in the time when marketing practices meet CRM principles and strategies within the context of online and digital interactions. E-CRM was established to leverage technology to understand customer requirements, effect customer experience and establish effective long-term loyalty (Wijaya and Dewanti, 2021).

Karim et al., (2023) noted that the incorporation of blockchain technology has enhanced the effectiveness of e-Customer Relationship Management (e-CRM) by changing the way organizations deal with consumers over the internet. As the published information is distributed and encrypted, the data of customers can be stored on a blockchain, which creates greater trust in the cooperation. Ravan (2023) added that the use of blockchain in e-CRM enabled businesses enhance the efficiency and accuracy in a number of areas including customer data management, transactions, and communications. Blockchain implementation guarantees that the information of the customer is safely stored and may be shared safely decreasing the threat of customer data breaches.

Haqqizar et al., (2023) confirmed that blockchain technology created the basis for smart contracts and decentralized applications (DApps) which can be utilized for some specific e-CRM, including the loyalty programs, collecting feedbacks, and personal marketing campaigns. These automated processes are time-saving and cost-effective besides improving the general experience of interacting with the firm or company.

Nadube and Ordah (2023) agreed on the same idea adding that it was found that blockchain has a positive impact on increasing the efficiency of e-CRM in terms of providing improved data security, optimized processes and task automation, and establishing confidence among the business and customer domains in the BM environment.

Technology Adoption in CRM

Chaudhuri et al. (2023) defined the integration of technology in CRM as the state of using and addressing in business CRM systems to new technological solutions. It refers to the technology solid suspense role to boost customer relations, cut out processes short and succeed in the overall enhancement of CRM functions. Among the numerous advantages that the use of technology in CRM brings, it should be peculiar to mention a few. As a matter of straightforward fact, it facilitates the business organization by having and using one database which has all the customer data which is easier to manage (Ezzaouia and Bulchand-Gidumal, 2023). The CRM systems plus advanced technology are able to carry out the collection, storage, and analysis of customer information, which could be meaningful for marketing and management in a decentralized manner. This is the capability that enables organizations to attain granular data on customers' behavior or interests, and tailored messages can later be sent just specifically to address each of the customers' pain points and needs (Dastjerdi et al., 2023; Al-Duwailah & Hashem,2019; Hashem, 2021).

Bajaj et al. (2023) argued that through the automated completion of the chores like data entry, lead management, and customers tracking, everyone in the management team could establish more valuable and intellectual engagements. This will save a lot of time and resources which can be channeled in more intellectual activities. Automation, further, contributes to precision and accuracy in dealing with the customers as the risk of human error is eliminated while the operation process becomes smoother.

On the other hand, technologists are present-day CRM would ever provide a company with cutting edge analytical and reporting tools. Among its many features, the modern CRM with an array of data analytical tools can produce detailed instantaneous reports, graphs and charts with aggregate metrics for the business as well as customer profiles. Many data analytics offer businesses invaluable insights to base their decision on facts, by identifying trends and maximizing their CRM efforts for better customer engagement and retention (Hilali et al., 2023).

Hypotheses Development

Going through the literature in order to develop our current hypotheses, we have seen that Treiblmaier and Petrozhitskaya (2023) stated that the blockchain-based program based on 5,059 Twitter tweets indicated more positive reviews compared to the paper-based one. In addition, a survey of 206 consumers' evidences that people regard the blockchain-based program more positively than the paper-based one when it comes to accrual, relevance, expiration, and transferability. In addition to that,

Boukis (2020) shed light on the potential implications of blockchain technology for brand–consumer relationships. Boukis (2020) ignited an exploratory discussion around how blockchain applications and platforms can affect consumer–brand relationships, drawing on a number of real-life examples of blockchain adoption. Boukis (2020) confirmed that blockchain features impact on various areas of interest for strategic brand management, such as the adoption of digital currencies, brand storytelling, use of blockchain-enabled loyalty programs, role of intermediaries in online advertising, counterfeit consumption, brand transparency and trust for brands in online marketplaces, amongst others.

On the same idea, Utz et al. (2023) indicated that the developed customer loyalty program restores trust, reduces distrust, and resolves customer ambivalence by providing four features: strengthened customer agency, truthfulness and justifiability through means of end-user interface in data access. However, Safitri (2024) stated that a research gap that still needs to be explored encompasses the long-term effect of blockchain on marketers and the ROI of blockchain-backed projects, while regulatory implications of implementing blockchain in marketing also warrant further investigation. Blockchain technology has a massive potential to speed up the marketing operations through its organizational trust and transparency advantages and business innovations could be applied.

Organizations now are getting more benefits from fuzzy data that they get; they can – through E-CRM – give more attention to their customers' preferences in addition to presenting more secured platform for their interaction with customers through the services that are provided by blockchain. From that point, we aim in this current research to shed the light on the moderating role of technology adoption on the

relationship between blockchain in marketing (control over personal data, trust and transparency, improved personalization, seamless loyalty programs, enhanced customer service) and the efficiency of E-CRM from perspective of customers who have experience in online shopping.

In other words, the study sought to answer the following question:

What is the moderating role of technology adoption on the relationship between blockchain in marketing and efficiency of e-CRM?

Answering this question was attainable through reaching the following objectives:

- Identify blockchain in marketing field
- Explore the relationship between blockchain and e-CRM
- Examine the moderating influence of technology adoption on the relationship between blockchain in marketing and e-CRM in terms of (control over personal data, trust and transparency, improved personalization, seamless loyalty programs, enhanced customer service).

It is worth mentioning here that we have built our problem statement here under the premises of Relationship Marketing Theory (RMT). This theory revolves around building relationship with customers in order to increase organizational awareness of their preferences and support organizational efforts to satisfy them and gain their loyalty. In this case, the study employed technology adoption through blockchain as an approach to realize a more beneficial and healthier relationship with customers.
Stemming from study gap and argument, we have built a model in order to highlight the relationship between variables and extract study's hypotheses in figure 1. It is worth mentioning that the incorporation of variables in the current study are informed by the following reasons:

- Blockchain in Marketing

In making blockchain the subject of study in the research, the study seeks to establish the nature of influence that this emerging technology has on marketing strategies. Thanks to its decentralised, secure and transparent system, the establishing elements of the marketing can witness a change in the four different areas of marketing including data security, transaction transparency and the establishment of the credibility of customers.

- Efficiency of E-Customer Relationship Management (e-CRM)

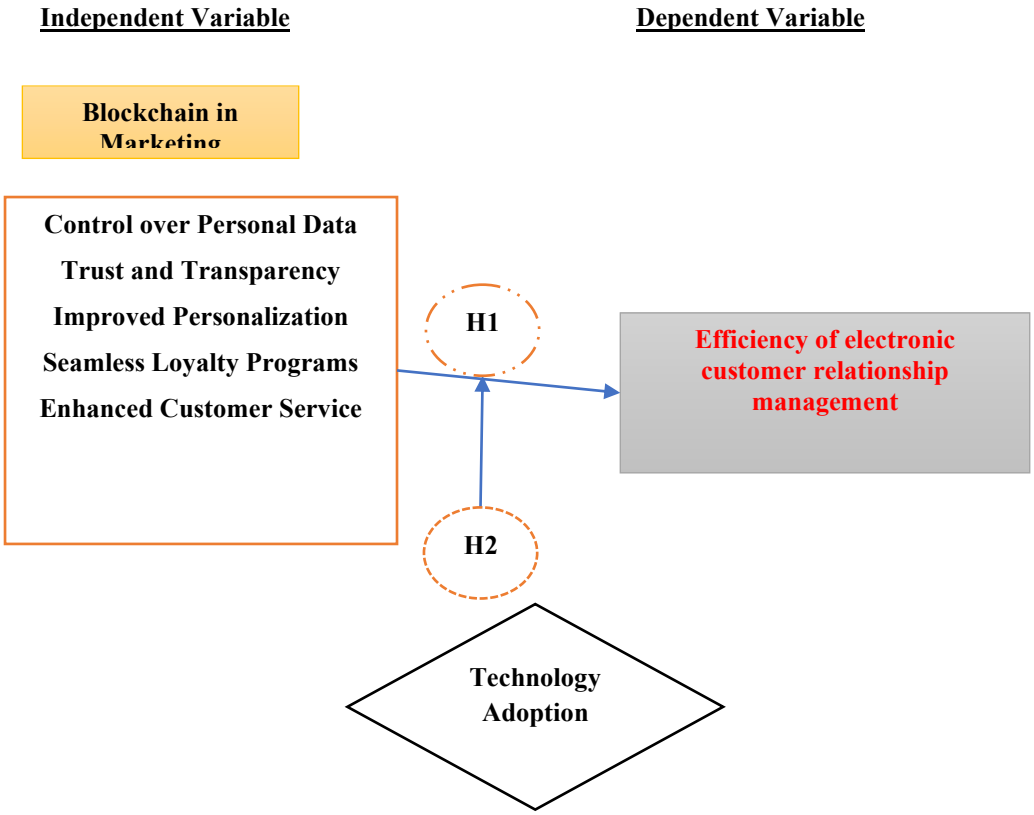
Explaining the concept of e-CRM in terms of the extent of its efficiency shifts the emphasis to the recognition of the opportunities of managing customer relations on the Web. Regarding the impact of blockchain on the efficiency of e-CRM, knowledge may help to enhance customers' interaction, to develop targeted marketing communications, and customer loyalty programme.

- Moderating Role of Technology Adoption

Consequently, by including technology adoption as the moderating variable, the study explains contingencies that determine the connection between blockchain in marketing and e-CRM efficiency. This is because the extent of assimilation of the technology affects the manner in which organizations apply blockchain for marketing and e-CRM and the efficiency it has within the customer relationships and organizational performances.

Thus, by incorporating these variables in the study, the research seek to contribute to an understanding of how; blockchain affects marketing, improves e-CRM, and the mediating role of technology adoption. This approach creates a lever that enables further analysis of the coexistence and interaction between blockchain, e-CRM, and technology adoption aiming at helping organizations harness blockchain to enhance customer relations in technology advanced world.

Figure 1. *Study Model*



Methods and Materials

The current study along with its model hypothesized the following:

H1: Blockchain in marketing has a statistically significant influence on efficiency of E-CRM
H2: Technology adoption moderates the relationship between blockchain in marketing and efficiency of E-CRM

Accepting or rejecting these hypotheses was done depending on quantitative approach was a way to reach primary data. It was seen that quantitative methodology was best suited due to its ability to collect primary data from a larger sample size which can lead to more generalized results.

The main tool adopted in the study was the questionnaire, the questionnaire was built through the aid of previous studies including Treiblmaier and Petrozhitskaya (2023); Boukis (2020); Utz et al. (2023) and Safitri (2024) and consisted of two main sections. The first took into perspective demographics of study sample, while the other section contained statements related to adopted sub-variables including (Control over Personal Data, Trust and Transparency, Improved Personalization, Seamless Loyalty Programs and Enhanced Customer Service). The questionnaire was built on likert 5-point scale and was arbitrated by a group of academics in the field of the sake of validity.

Population of study consisted of consumers who have experience in online shopping. Researcher has chosen a sample of (400) individuals to represent the study's population. After application process, researcher was able to collect primary data from (372) individuals which indicated a response rate of (93%) as statistically acceptable.

Dealing with collected primary data was done depending on statistical package for social sciences SPSS. For demographics we depended on frequencies and percentages, as for questionnaire analysis we have relied on mean and standard deviation. Testing hypotheses was done through multiple regression, and we have used Cronbach's Alpha test in order to make sure that the questionnaire was reliable and consistent with study's aim and objectives.

Analysis and Results

Demographics

Results of demographics' analysis found that majority of respondents were males forming 55.4% of the sample who were above 51 years old forming 35.2%. in addition to that, results indicated that majority of respondents held a diploma forming 40.6% and they had an income that ranged between $1001-$1499 forming 34.7%.

Questionnaire Analysis

Analysis of questionnaire was done in two phases, the first took into account mean and standard deviation of sample responses to questionnaire which indicated that all statements were positively received by respondents given that all statements scored a mean that was higher than mean of scale 3.00. the highest variable was "control over personal data" which scored a mean of 4.17/5.00. while the least mean was scored by "E-CRM" with a mean of 3.85/5.00. looking deeper into questionnaire analysis, it was found that the highest statement that responses have answered positively was "I have the ability to grant and prevent permission to websites according to my own desire" scoring a mean of 4.33/5.00 compared to the least positive statement which was "Deleting my profile guarantees that all information inside it are also deleted" with a mean of 3.75/.500 but still positive as it scored higher than mean of scale.

In the second phase, reliability of study tool was tested depending on Cronbach's Alpha. It was seen that alpha value scored in all variables higher than 0.70 which meant that the tool was reliable and consistent.

Table 1. Questionnaire Analysis

Statement	**μ**	**σ**	**Alpha**
I have the maximum control over my personal data and information	4.151	1.135	0.906
I have the ability to grant and prevent permission to websites according to my own desire	4.331	1.007	
I can only give access to the information I feel can be accessible	4.185	1.123	
I am satisfied with the degree of privacy I have over the internet	4.183	1.069	
I have never faced any troubles leaving my financial data online or on any website	4.005	1.007	
Control over Personal Data	**4.171**	**.911**	
I can easily verify the authenticity of any interaction on the web	3.992	1.005	0.902
My transaction on the web are all protected according to my own need and desire	3.935	1.143	
I can re-verify all previous transactions and interactions with the website or application whenever I want	3.973	1.043	
I think I can trust applications to protect my personal data	3.978	1.064	
If these websites weren't trustworthy, they wouldn't have given me rewards and discounts	3.965	1.034	
Trust and Transparency	**3.969**	**.898**	
My profile contains all the transactions and interactions that I have made with the website	3.906	1.022	0.942
I can access and edit my personal data whenever I want through the profile	3.965	.924	
I can edit the settings of my profile according to my own preferences	3.957	.995	
All recommendations reach me through the profile and on private bases	3.970	.989	

I get relevant marketing recommendations and I am satisfied with them	3.914	1.073	
Improved Personalization	**3.942**	**.902**	
I enjoy loyalty discounts and rewards whenever I buy online which is convenient for me	3.930	.929	0.911
I can track my loyalty points whenever I need	3.997	1.075	
My points and rewards are saved in my profile for future use	3.903	1.060	
I can redeem any point I get any time I decide to do so	4.027	1.053	
All loyalty points and rewards on the website are transparent and can be redeemed for real	4.003	1.034	
Seamless Loyalty Programs	**3.972**	**.886**	
I can edit the settings of communication any time I want	4.140	1.075	0.917
Deleting my profile guarantees that all information inside it are also deleted	3.750	1.017	
I do all my queries and complaints are dealt with through my profile and are answered on the spot	3.895	.959	
There are many automated services that are designed for my own convenience	4.013	.950	
I have never faced a problem in dealing with any issue on the website	4.161	1.111	
Enhanced Customer Service	**3.992**	**.887**	
The website guarantees that I control who ever have access on my profile	4.161	.996	0.811
The process of managing and deleting my profile is easy and not multi-stepped	3.987	1.047	
It doesn't take a long time to answer my queries and resolve my issues	3.777	1.295	
All my transactions are protected and trusted in my profile	3.320	1.557	
The website makes sure that no harm can reach my profile and they always notify me with any suspicious actions	4.011	1.086	
E-CRM	**3.851**	.917	
Algorithm of the website is easy to follow and comprehend	3.927	1.068	0.917
Accessibility of the website is smooth and its connectivity is satisfactory	4.065	1.044	
The website platform is user friendly and can suit all ages	4.032	1.027	
There is Chatbot and assistants if I needed any help	4.177	1.067	
There are continuous upgrading and development on the website all the time	3.777	1.023	
Technology Adoption	**3.996**	**.907**	

Hypotheses Testing

H1: Blockchain in marketing has a statistically significant influence on efficiency of E-CRM

The hypothesis mentioned above was analyzed using multiple regression analysis which revealed a strong positive correlation (r = 0.803) between the independent variables and the dependent variable. The independent variables explained an additional **64.5%** of the total variation in the dependent variable. It is worth mentioning that the F value was statistically significant at the 0.05 level, suggesting that Blockchain in marketing has a statistically significant influence on efficiency of E-CRM.

Table 2. *Hypotheses 1 Coefficients*

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.		
		B	Std. Error	Beta			R	R 2
1	(Constant)	.352	.141		2.495	.013	.803[a]	.645
	Control over Personal Data	.121	.066	.120	1.840	.067		
	Trust and Transparency	.040	.072	.039	.552	.581		
	Improved Personalization	.283	.079	.279	3.564	.000		
	Seamless Loyalty Programs	.169	.089	.164	1.905	.058		
	Enhanced Customer Service	.263	.083	.254	3.169	.002		

By using Correlation matrix, it was found that the highest relationship was between **Seamless Loyalty Programs and e-CRM** as shown in the following table 4:

Table 3. *Correlation Matrix*

		Control over Personal Data	Trust and Transparency	Improved Personalization	Seamless Loyalty Programs	Enhanced Customer Service	E-CRM
ECRM	Pearson Correlation	.723**	.711**	.758**	.765**	.761**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	372	372	372	372	372	372
**. Correlation is significant at the 0.01 level (2-tailed).							

H2: Technology adoption moderates the relationship between blockchain in marketing and efficiency of E-CRM

Table 5 presented a substantial statistical correlation between blockchain in marketing and efficiency of E-CRM, with a p-value of 0.000 (R2 = 0.639). Upon incorporating the Technology adoption in the subsequent phase, we saw a substantial increase in the overall interpretation variable, with an R2 value of 0.4%. The inclusion of the Technology adoption and blockchain in marketing variable resulted in a

substantial increase of 0.8% in the overall interpretation variable, as indicated by the R2 value. This indicated that **technology adoption moderates the relationship between blockchain in marketing and efficiency of E-CRM**

Table 4. *Hypothesis 2 Testing*

ANOVA								
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**	**R**	**R 2**
1	Regression	199.076	1	199.076	653.962	.000[b]	.799[a]	.639
	Residual	112.634	370	.304				
	Total	311.710	371					
2	Regression	200.329	2	100.164	331.841	.000[c]	.802[b]	.643
	Residual	111.381	369	.302				
	Total	311.710	371					
3	Regression	202.926	3	67.642	228.823	.000[d]	.807[c]	.651
	Residual	108.784	368	.296				
	Total	311.710	371					

Discussion

We hypothesized in current study that technology adoption moderates the relationship between blockchain in marketing (control over personal data, trust and transparency, improved personalization, seamless loyalty programs, enhanced customer service) and efficiency of customer e-CRM. We have employed the quantitative methodology in order to test our hypothesis. We developed a questionnaire and it was self-administered by (372) customer who has experience in e-shopping. SPSS results indicated the acceptance of our hypothesis as it turned out that technology adoption is able to moderate the relationship between blockchain and efficiency of e-CRM with focus on seamless loyalty programs.

Results indicated that blockchain increases the efficiency of e-CRM through multiple services on the level of loyalty programs such as rewards, discounts, and sales that are seemed to be convenient for customers. In addition to that, analysis indicated that through blockchain, customers are able to track their profiles and points in order to redeem them whenever it is possible in addition to the level of transparency and trust that blockchain presents in terms of loyalty programs.

Results also indicated that blockchain technology has an ability to transform the effectiveness of that e-Customer Relationship Management (e-CRM) via data security improvement and data integrity gain, through use of transaction transparency and trust, implementation of process automation and smooth operation through smart contracts, application of personal and precise marketing, and increase of consumer trust and confidence through using blockchain technology to enhance the transparency and accountability. This agreed with Utz et al. (2023) and Safitri (2024) who noted that as the blockchain technology is meant to be at the disposal, companies are offered a tool for optimization of data management, process automating, customer experience improvement and more efficient and effective e-CRM.

As for the moderation hypothesis, results reached indicated that due to the existence of the intermediary twist, technology adoption has close association with the blockchain and e-Customer Relationship Management (e-CRM) relationships. The

high degree of integration and the usage of blockchain technology in e-CRM practices is defined mainly by the businesses' readiness to join and support the competing technologies. Key rate of technology adoption factors which are inculcation of new knowledge by the employees, training sessions held on time and organizational support enable the use of blockchain technology in e-CRM to a satisfactory degree of effectiveness. However, the businesses can achieve operational excellence only when the offering of blockchain technology is accepted there, and hence, organizations are able to fully leverage the capabilities of blockchain, and secondly the management of data becomes better through which the operations are streamlined and finally customer experience is perfected. As agreed on by Rane (2023); Treiblmaier and Petrozhitskaya (2023) and Boukis (2020) who saw that while one side of the coin can be very positive for the marketing campaign and useful in data security, the other can be very unfavorable holding the blockchain back from maximizing its potential, thereby limiting efficiency gains in e-business relationship management. This is the reason that the technology adoption is the main moderator which decides the impact of the decentralized technology blockchain on the efficiency of e-CRM systems.

Based on above discussion, current study was limited to opinions of customer who were involved with online shopping. There was no intervention from organizations of any kind, and the development of the problem, tool and results didn't depend on any financial or annual reports that are concerned with a certain organization.

We suggest as a future research to investigate the aftereffects of blockchain utilization for e-customer relationship management over some time. The latter implies conducting a behavioral research of continuous impact of blockchain on customers' opinion, behavior and loyalty over a protracted period of time. Studies of this type may add new dimensions to the on-going developmental processes in blockchain-centered CRM as well as unveil the lasting impact this technology has on customer relationships.

Conclusion and Recommendations

The blockchain does have the potential to significantly augment the customer relationship management (CRM). Blockchain technology brings in an increase in CRM by ensuring the participation of all parties in the stable, decentralized and transparent platform that aids in managing customer data and interactions. Through the blockchain, customer data can be securely mitigated in a tamper-free and transparent way, so you ensure data authenticity another related matter in the trust-building process. Through this way you will be able to build the trust of your customers and signal that you've got the transparency needed by your customers because of the various things like personalized marketing campaigns, secure transactions and finally the control of customer's data. Besides, blockchain uses smart contracts as a tool to execute CRM tasks by bringing automation and optimization of customer relations management into it. In brief, through utilizing blockchain in CRM, businesses can develop customer relationships stronger, bring better customer experience, and operation execute at a maximum.

Study recommended to shed the light on aspects that may influence organizations' acceptance of blockchain in their marketing strategies, in addition to the need to

increase the attention of marketing department on aspects of trust and loyalty through online shopping channels.

Theoretical and Practical Implications

The current study was carried out in order to highlight the moderating influence of technology adoption on the relationship between blockchain and e-CRM from customers' perspective. From a theoretical point of view, the study might be efficient with technology acceptance from the perspective of customers as the moderator being the mediating factor. This can fill in the gap in knowledge and theory about the role of blockchain technology in shaping people's perceptions and behaviors. It could shed light on theories and tend to explain the position of blockchain in customer trust, satisfaction, and loyalty while managing and using e-customer relationships.

From a practical perspective and, the findings could be a very helpful tool for businesses implementing blockchain technology in their marketing or customer management strategy from a customers' perspective. It also can assist in sharing how blockchain integrated CRM could be communicated clearly examples of the benefits to the customers. The study in this regard could assist firms in form mutual knowledge with the customers around the expectations, various challenges and the barriers related to blockchain technology. Through the prism of the above insights' orgs can build and bring specific marketing programs and educational programs to their clients to the enhanced awareness levels of what is blockchain and its right use in CMR. This can later be reflected in the improved customer satisfaction, trustworthiness and connection.

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