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CONFERENCE PROCEEDINGS
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Contents

The impact of COVID-19 on the insurance industry

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Keywords
COVID-19; Insurance industry; Market prices; Asset pricing; State-space model

Abstract

This study analyses the impact of COVID-19 pandemics on the insurance industry. While COVID-19 increased morbidity and mortality other factors resulting from the pandemic benefit the industry. Overall, the response of the insurance industry to COVID-19 reflects other sectors in the market like transportation and trade. However, a structural downturn in the insurance industry like the one observed in 2016 was not found during the year 2020. We found that the insurance industry did not absorb extra losses during the year 2020 and did not suffer from the pandemics more than the economy as a whole. This article explores the past two decades and compares the structural break of the insurance industry in 2016 with that of 2020 due to the COVID-19 pandemic. In addition, during the year 2020, the returns to investors in the insurance industry were very similar to returns in the general market as measured by S&P500.

Introduction

SARS and MERS pandemics occurred during the last two decades, prepared the economy and the medical industry for the current COVID-19 pandemics. These Coronavirus pandemics were carefully investigated by the academy and pharmaceuticals industry since 2002. This research was the basis for the medicines and vaccinations developed recently by Moderna, Pfizer and other laboratories around the world. The insurance industry, as part of humanity, took care of these diseases in the past and was prepared to face the present Covid-19 pandemics. Overbeck (2003) from Swiss Re-insurance publishes the consequences of epidemics on the insurance industry. As for March 2021 the financial reports of the insurance industry like the GDP statistics for the year 2020 and the actuarial reports are not released yet. We just read that "Overall, the industry could face at least $100 billion in total underwriting losses from the pandemic, Lloyd's of London predicted in May", (Feeley & Chiglinsky, 11/30/2020).

This paper analysis the global insurance industry during the COVID-19 pandemic. The paper details several insurance policies, and describes the management of the industry, emphasizing its global diversification. Moreover, the paper presents preliminary study of the stock market performances of the insurance industry and how it is comparable to the general stock market index.

The reminder of the paper is organized as follows: Part II details several insurance policies. Section III describes the asset management of insurance companies. Section IV emphasized the global dimension of the insurance industry by presenting the industry as a global insurance entity. Section V studies the effects of the COVID-19 on shareholders of the insurance companies. Section VI briefly summarizes.

Several insurance policies

This section presents a few major insurance areas. This includes health, motor vehicles, travel, car insurance, Long Term Care, Business interruptions, Credit, and Life Insurance and Annuities. We turn to briefly describe each of these insurance policies.

Health Insurance: As of August 2020, about 6.2 million Americans lost their health insurance provided by their employer. Four million of US families were added to Medicaid. (Bivens & Zipperer, 2020). While health insurance companies encountered less incomes, the claims went down as many medical procedures were delayed. Insured patients avoided doctors' visits and hospitals postpones non urgent procedures. Telemedicine was further developed, increasing industry's efficiency.

Motor vehicle insurance: Number of claims have decreased due to reduced traffic in part by strict lockdowns. Several insurers even offer reimbursed to policy holders due to reduced driving.

Travel Insurance: The losses stem from cancelling travels, which cause loses to airlines, hotels, restaurants, bars, theatres, stadium, and other trip providers. Despite the exclusion of pandemics from many policies, insurers are facing an increase in claims. During last year, most insurers stopped selling these policies. Even policies that were already sold by brokers, were cancelled. Such policies are offered recently for a higher, more expensive, premia (10% of the trip costs, as compared with a premium of 6% before the pandemics), (Phoenix, 2021). Consequently, airlines, hotels etc. add to their products options for cancelled reservations.

Long Term Care Insurance: According to the American Academy of Actuaries "As of the latter part of 2020, there remained considerable uncertainty concerning the impacts that the pandemic will have on actuarial experience, both short-term and long- term. While a clearer picture of short-term experience is starting to emerge, it will take many years for long-term experience to emerge, stabilize, and allow for an accurate measurement." (American Academy of Actuaries (1/21/2021). Excess morbidity brought insurance companies to limit their sales and lobby regulators to raise prices. Insurance companies are now demanding more pre-approval medical tests, extending waiting period and avoiding issuing insurance policies to the elderly.

Business interruptions insurance: Previous corona virus pandemics during the last decades brought insurers to exclude pandemics as the cause for compensating their clients. During last year, thousands of lawsuits cases are in court to ascertain the exact meaning of specific words in policy. (Feeley and Chiglinsky, 2020).

Credit Insurance: Because the economic downturn, governments help households, producers and many other businesses to pay their debts. Yet, claims for lost credit increased significantly. As insurers stopped selling new policies, firms that were used to buy policies protecting from credit loss, limit credit arrangements. (HC insider, Chambers et.al.2020).

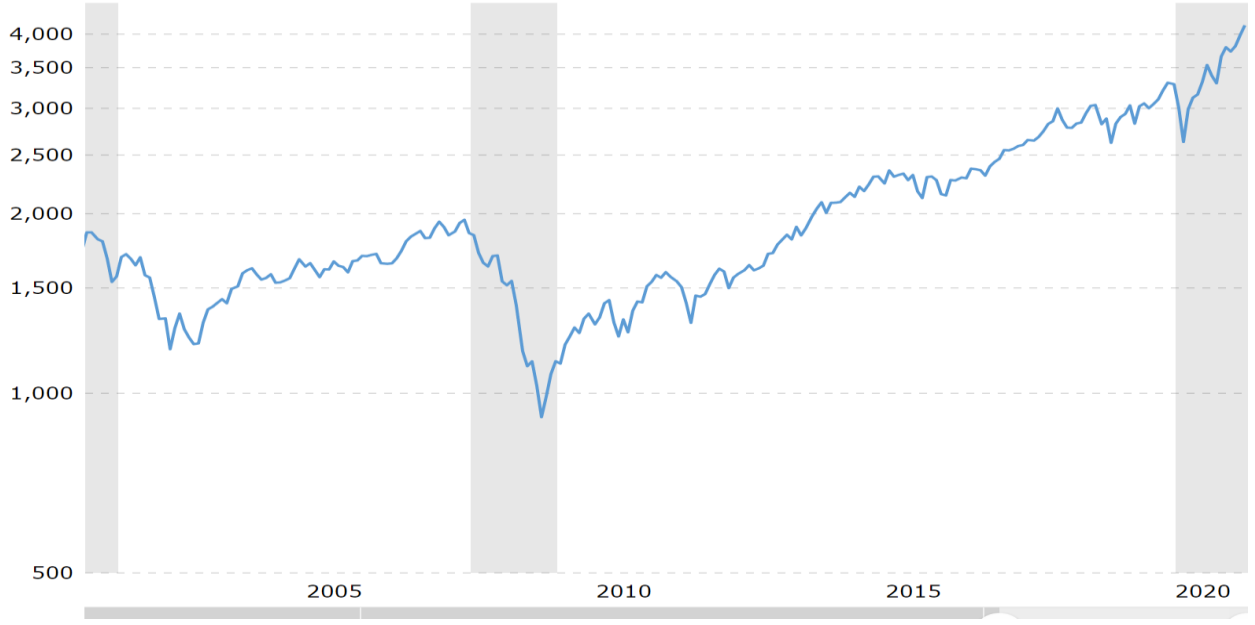
Life Insurance and Annuities: Two factors hit these products: Increasing mortality and assets returns. In the USA, general mortality increased by 15% during 2020, (CDC). Though, mortality rates of the insured population are usually lower than those of the general population, data are not as yet available to ascertain whether lower traffic volumes balanced the increasing mortality due to corona for the working age group 30-67. Usually, education and wealth lower probability of mortality but raise demand for insurance. Facing changes in mortality, the demand for life insurance policies as financial assets should increase. In fact, insurers report a significant increase in demand. (Iacurci ,2020). However, economic downturn due to the pandemic decreases demand. Changes in mortality decreases demand for annuities as financial assets. Hanoch and Levy (1969) show that a transformation that exhibits a permanent change in probability of death decreases demand by all rational agents who prefer higher income, independent on the existence of risk aversion preferences. At the same time, lower incomes of agents also reduce demand for annuities. Pensions based on Defined Contribution (DC) do not promise benefits. These policies protect insurers where only the insureds incur lower returns. Annuities and Defined Benefits (DB) pensions cause losses to insurers. Evidence shows that last year people who lost their job redeemed their annuities (OECD, 2020). Several insurers offer loans to help insureds to keep their savings for pension. However, an increase in mortality rates of retirees lowered current liabilities of insurers.

Asset Management

Although insurance companies claim that fluctuations in financial markets hit them, it seems that the industry has been aware of low interest rates pursued by the Fed for many years. Figure 1 exhibits the United States Federal Fund Rates since 1995. The figure displays the tendency for lower interest rates.

Figure 1: United States Federal Funds Rate

Figure 2: S&P500 Price Index 2001 - 2020



Experienced with SARS and the 2008-2009 crisis induce 27 European States to enact the 2016 Solvency II's regulations requiring every insurance company selling policies in the EU, to be supervised. Armed with the history of fluctuations in assets returns and economic downturns, so far, insurance companies are capable to honour claims.

Global Insurance

Insurance companies that manage most of world's savings are now in most cases, a subsidiary of a financial holding company like Lloyds Bank. Most insurers diversify risks by selling multi-line products. They sell insurance products such as life insurance, health, and property insurance, either by the same firm or by managing separate firms under a joint ownership. The need for decreasing risks and improving marketing have brought a wave of international mergers and acquisitions to the industry. Insurance companies around the world are seeking the umbrella of larger insurance companies with global

reputation. Table 1 displays major holding companies and the countries which they operate in. Clearly, holding companies ae well diversified among many countries.

Table 1: Holding companies and number of countries where they own a local insurance company as a subsidiary.

Insurance company	Number of countries
AIG	140
Allianz	70
AXA	54
Generali	50
Prudential	40
Phoenix	9

Source: Internet publications of the 6 companies.

These local insurance companies are selling insurance policies subject to local regulations, which are nationally supervised. Claims against them are dealt by local courts. In addition, insurers like Cigna or GeoBlue, are marketing health insurance employing hundreds of brokers around the world. This global activity pools together local risks of natural disasters together with exchange rates fluctuations. Samuelson (1967) shows that pooling *independent* risks increases the variance of loss to the insurer. However, in the Covid-19 pandemic risks are Highly correlated among countries. Such *Dependent* risks of different products in different locations and variety of currencies are pooled together.

The global losses of the current Covid-19 pandemic have some positive effect due to sharing information among local insurers who need advice with their struggle. The lockdowns brought technology for remote services, improving service production. Moreover, insurance policy prices are raising when permitted by regulators.

Facing increased global risk, holding financial companies are expected to be ready for this situation. Solvency II (2016) regulations for the 27 EU states to be more prepared to encounter global risks. Regulators in the USA have always prevented insolvency of insurers and enforced reinsurance arrangements. So far, it seems that claims are honoured by all insurers over the world. Only shareholders of the holding companies may incur possible losses.

Share Holders

Shareholders of stocks of insurers are carefully following losses and profits of the insurance companies and forecast their future value. We thus follow the stock markets' performances of the large insurance companies. Following the prices of Prudential's stocks, one sees that they are dove-tailing the general stock market indices. Initially, share prices went down during Spring 2020, however, recover soon after. Figure 3 plots the stock price for Prudential.

Figure 3: Prudential Stock Price 2001-2021

As Sharp (1964) suggest, we measure the relationship between S&P500 Insurance Select Industry stock prices of the insurance industry as a function of S&P500 general index and the total revenue (TR) in the insurance industry, for the last ten years (since 2/22/2011 till 3/24/2021). The regression estimates are presented in Table 2. An increase in the S&P500 general index leads to an increase in the price of the insurance index.

Table 2: Linear regression equation. SP insurance index as a function of SP500 and volume of SP insurance index trade.

Method: Least Squares (Gauss-Newton / Marquardt steps)				
Date: 03/24/21 Time: 11:11				
Sample (adjusted): 1 2532				
Included observations: 2532 after adjustments				
S_P_INSURANCE_SELECT_INDUSTRY_INDEX = C(1) + C(2)				
*SP_CLOSE + C(3)*S_P_VOLUME				
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	446.1119	20.22393	22.05861	0
C(2)	0.938408	0.006178	151.9049	0
C(3)	-9.52E-08	4.51E-09	-21.1111	0
R-squared	0.901419	Mean dependent var		2168.78
Adjusted R-squared	0.901341	S.D. dependent var		650.1855
S.E. of regression	204.2237	Akaike info criterion		13.47749
Sum squared resid	1.05E+08	Schwarz criterion		13.48441
Log likelihood	-17059.5	Hannan-Quinn criter.		13.48

Table 2 shows that the regression coefficient of the General S&P500 Index C(2) is 0.938. We learn that shareholders as a group believe that on average, the index of stocks of the insurance industry is almost neutral to the market and even slightly defensive. This index fluctuates overall, along with the market. The estimation of the regression coefficient shows that shareholders do not see insurance as a branch that took on itself the economic downturn. According to shareholders' forecasts, the insurance industry with its multi-lines and global spread, does not incur additional risks as compared to other industries and the whole economy. A further analysis shows that the general S&P500 index explained 88.4% of the variance of the S&P500 insurance index while the volume of Total Revenue C(3) of the insurance sector estimated by S&P500 index explained only 1.4% of the variance.

Conclusions

Under the Covid-19 crisis, insurance companies suffered losses, but their shareholders believe in quick recovery. Insurers have been prepared for the pandemics where regulators allow them to exclude certain provisions from the policy. When the pandemics hit the economies, they stopped selling specific insurance like travel insurance or long-term care to the elderly. When risk increases, insurers raise premia for new policies to the extent permitted by the regulators.

Fluctuations in financial markets adversely affect the insurance companies. However, the insured public has been protected. The involvement of shareholders of insurance companies in financial markets does not reveal special attitude to the insurance industry or any specific additional risk losses.

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Exploring the impact of tax policies on small and medium scale enterprises' (SMEs) performance in Nigerian Economy

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Keywords
Business growth, SMEs, Economy, Tax policies, The Unicist Theory

Abstract

Small and Medium Enterprises (SMEs) are very significant to the economic growth of many societies and countries at large. Contrastingly, SMEs have been contributing little to Nigeria Gross Domestic Products (GDP). This study aimed at exploring the effects of tax policies on the performance of SMEs. The Unicist Theory of business growth was used to underpin the study, the theory analysed the implications that multiple tax could have on the growth of SMEs in Nigeria. Survey method with close ended structured questionnaire was administered to 110 SMEs owners in three local government areas in Lagos State. Collected data were analyzed with descriptive statistics while formulated hypothesis was tested with Chi square method. Findings revealed that various Governmental policies on taxes significantly affect the performance of SMEs in Lagos State. The paper implicates a possible diversity for tax policies that will favour SMEs operator to make meaningful contributions to the economy. *The study therefore recommends among other things that Government should design and implement the most effective ways of administering various tax policies that can enhance the growth of SMEs, while tax collection should be well defined to avoid multiple taxations by the three tiers of government. The study also recommends that taxes should be levied according to the growth of the business; sales, size and profit; with consideration to enterprises' ability to pay taxes regularly.*

Introduction

SMEs are critical to economy sector of any country; they are significant to the economic growth of many societies. Adanlawo and Vezi-Magigaba (2021a) avow that SMEs have been a good avenue for job creation and empowerment of Nigerian citizens; with provision of jobs for almost 50% of Nigerian labour force. According to Adanlawo, Vezi-Magigaba and Owolabi (2021), SMEs operate in different sectors of production, they are associated with all parts of industrial development, and they account for 66% of employment levels in service industry sector. The significance of SMEs in the sustenance of economy, reduction in poverty, advancement in employment, innovation in technology and elevating in economic wellbeing and standard is comprehensively recognized particularly in developing nations (Eniola and Ektebang, 2014; Adanlawo and Vezi-Magigaba (2021b). Igbinovia and Okoye (2017) opine that the impact of SMEs is felt in the utilization of natural resources, thereby, expanding the nation's wealth through higher productivity. Job provision through SMEs have impacted many lives, providing regular income and provision of basic needs of life; particularly for those in the rural areas.

According to Small and Medium Enterprises Development Agency of Nigeria (SMEDAN), 80% of SMES struggle to operate and may cease to operate within five (5) years in business due to tax related issues that ranges from multiple taxations to enormous tax burdens (SMEDAN, 2012). According to SMEDAN's (2012) report, the mortality rate of these small businesses in Nigerian economy sector is very high. Seemingly, Muriithi (2017); Adanlawo, Vezi-Magigaba and Owolabi (2021) opine that the death pace of SMEs among African nations remains exceptionally high with five out of seven new businesses failing in their first year. Oboh, Yeye and Isa (2013); Ocheni and Gemade (2015); Muriithi (2017) have identified

tax related issues among several factors for untimely close down of the SMEs. This implies that the survival of most of the SMEs are determined by their ability to survive tax related issues amidst other economic challenges. According to Michael (2014), government introduces various sort of taxes in an attempt to increase revenues, and these taxes invariably impacted negatively on small and medium scale businesses. For SMEs to survive and to continue to operate smoothly, there is need for government to structure policies, particularly tax policies that will support the development and improvement of these ventures to guarantee their survival at maximum capacity. Adanlawo and Vezi-Magigaba (2021c) assert that if favourable environment is created for these small businesses to grow through appropriate guidelines, the SMEs sector has the highest propensity to transform our economy. Studies have indicated that government strategies are usually targeted towards large companies, leaving behind small businesses (Adeusi and Aluko, 2014; Adanlawo and Vezi-Magigaba, 2021c); hence, there is need to devise strategies to enhance a supportive, conducive and regulated environment for small businesses to thrive. Diversion of government strategies relating to taxes towards enhancement of small businesses will encourage and support small businesses to make a meaningful contribution towards economy.

This study therefore focuses on the impact of multiple taxes as one of the major barriers that causes SMEs performing below optimum level and as well hinders the development of SMEs in Nigeria. The study tends to provide how tax policies affect the performance of small business activities in Nigerian economy, as well as the impact of tax increase on small business formations and their survival.

Aim of the Study

The main aim of this study was to explore the effect of tax policies on the performance of SMEs in Lagos State.

Research Question

The below research question guided the study:

Do tax policies by the government have significant impact on SMEs performance?

Hypothesis

In line with the above research question, the hypothesis of interest states thus:

H1: Tax policies do not significantly affect the performance of SMEs operators in Lagos State.

Significance of the Study

The importance of SMEs sub sector in Nigeria economy cannot be over-estimated. It is the economy sector that promotes equitable distribution of national income for realistic system, which is achievable through large scale employment and creation of more employment opportunities for the people (Tee et al, 2016). Some small-scale businesses may meet untapped demand, while some simply fill a niche in the market, yet others provide some distinct services that cannot be matched by large organisations. Hence, SMEs contribute to the succession of large businesses, enhance judicious distribution of resources; and also provide quicker returns on investment within short period (Soyode and Kajola, 2016). Feyitimi et al. (2016), report in their longitudinal study that SMEs facilitate balanced industrial development through their economic presence in many rural areas to reduce urban congestion. This further implies that SMEs also present a potent means of alleviating rural-urban migration and the associated urban congestion and unemployment. SMEs promote competition and hinder monopoly (Adanlawo and Vezi-Magigaba, 2021c). This implies that the existence of many healthy small-scale business firms in a nation constitutes a barrier against monopoly. The importance of a competitive market to the consumer in particular and the economy in general cannot be over-flogged. Seemingly, the existence and active participation of many SMEs in any economy promote healthy competition in production of goods and services in any nation, as well as free choices for the consumers to choose from variety of available goods and services (Tee et al., 2016; Adanlawo, Vezi-Magigaba and Owolabi, 2021).

This research significantly explores the operations of a vital segment of the industrial sector 'Small and Medium Scale Enterprises' (SMEs) by examine the effects that multiple taxes have on the capability of SMEs on improving per capital income and contribution to the economic growth. The major value-added of this research work will be proffering of suggestions that can help policy makers in defining strategies

that can rapidly improve commitment of SMEs to economic growth pertinent to employment generation, thereby, adding to the existing literature on the subject matter.

Tax and the Growth of SMEs

SMEs have not accomplished commendably thriving in Nigeria and have not performed expected substantial role in economic growth (Adanlawo, Vezi-Magigaba and Owolabi, 2021). SMEs growth can be measured in a few different ways which include growth in sales, profits, or number of workers. For growth in sales, the business must be able to record increase in its sales. Growth in profit is when there is an increase in the business income compared to the previous income after tax and every input cost have been deducted. While the growth in the number of workers is when business grows over time to increases the number of its workers, paying its tax considerably that will enable the business to make profit and expand the business that it will create more jobs. Adanlawo, Reddy and Rugbeer (2021) aver that the linkage between business and economic growth is indicated whenever business operators reinvest profit, thereby, make the economy more productive by creating more job opportunities. According to Kamunge, Njeru and Tirimba (2014); Aribaba et al. (2019), tax policy can influence small business activities in different manners. In a situation, whereby, small business income is taxed uniquely in contrast to wage income, this can affect the business.

Ojeka (2011) asserts that SMEs tax must be done in such a way that places the income and need of the operators into consideration. For a tax system to be proficient, the tax policy needs to be planned with the end goal that the tax rates are proper and discerning in such manner, the tax collection organization are progressively effective. Seemingly, the tax levied on small businesses ought to be lighter and the fight against corruption and tax evasion should be much more intense. Tax policies can be structured in such a way that they do not only directly influence SMEs but also indirectly push for deliberate compliance and their growth. In a study conducted by Aribaba et al. (2019), high tax rates, low efficiency, high collection charges and the low amounts of received taxes are identified among the factors counting against SMEs tax compliance. Eragbhe and Omoye (2014); Igbinovia and Okoye (2017) also add that double taxation, lack of tax consultant, improper tax planning, high taxation costs are part of the factors affecting SMEs. Ojeka, (2011) avows that the lower the amount of taxes paid by the SME, the more the project the business will embark-on with the profit generated. Ocheni and Gemade (2015); Oladipupo and Obazee (2016) affirm that numerous tax collection has negative impact on SMEs' survival and the relationship between SMEs' size and its capability to pay taxes is momentous. The researchers, therefore, conclude that multiple taxations affect the survival and growth of SMEs (Ocheni and Gemade, (2015).

Michael (2014); Okolo, Okpolaojiego and Okolo (2016) assert that the issues of multiple taxes on the small business by different tiers of government have now become a deterrent to business activities. Similarly, Adebisi and Gbegi (2013) postulate that in many government policies, SMEs are usually viewed and treated in the same light as large organisations. Nevertheless, their size and nature of business make them distinctive. Therefore, in dealing with SMEs, these remarkable characteristics should be thought of when collecting taxes. Issues that should be considered are the manner by which these tax policies can support the development of SMEs and the best approaches to administer them.

It is worth mentioning that taxes are important sources of revenue for the government expenditure, as the tax collected from individuals and businesses are utilized to run government machineries; as well as to provide amenities such as good roads, water supply and electricity. These amenities are fundamental for the smooth running of the economy (Adanlawo, Naidoo and Rugbeer, 2021), especially, manufacturing companies that depend on these amenities for survival. Adebisi and Gbegi (2013); Adanlawo and Vezi-Magigaba (2021c) aver that if favourable environment is created for these small businesses to grow through proper regulation; SMEs sector has the highest propensity to create jobs and transform nation economy. As declared by Adanlawo, Vezi-Magigaba and Owolabi (2021), Nigeria needs to promote the development of small businesses; this can be done by creating favourable and enabling environment for the growth of SMEs. Strengthening the needed factors that can enhance small businesses success and also, addressing mitigating problems against their smooth existence and growth will go a long way in contributing to nation building.

Theoretical Framework

The Unicist Theory of Business Growth

The Unicist Theory was developed by Peter Belohlavek, as a paradigm shift of the scientific approach to complex adaptive systems. The theory was modified and used to research and discover the fundamentals that drive growth both at a macro and micro level. This brought forth the Unicist theory of macroeconomic growth and the Unicist theory of microeconomic growth. Both were incorporated into a unified field that permitted developing situations, future situations and execute solid methodologies to promote growth. The Unicist theory of business growth allowed the conditions that need to be given and the activities that should be created to advance businesses development. It additionally established the limits that are given by the accessible assets. The objective of the theory is to establish the rules that need to be considered when developing growth programs. According to the proponent of the theory, there are two concurrent activities that need to be developed to grow any business: (1). Conjunctural activities to take advantage of opportunities and (2). Structural activities to develop the structural growth of a business (Belohlavek, 2015).

The rationale for this theory in this study is to understand the sense that SMEs have the capacity to contribute to nation development if the businesses have the opportunity to grow. This implies the need for tax policies to be relaxed to encourage and support entrepreneurs, especially those who are experiencing challenges. Ojeka (2011) avers that the importance of SMEs as a mechanism of economic growth and development is often ignored as they are perceived as small businesses that have insignificant influence on the economy. However, if conducive environment is created for these SMEs to operate through proper regulation, the SME sector has the highest tendency to transform our economy. This implies that there is need for governments to reform policies and conditions that have a bearing on firm creation and expansion, with the end goal of enhancing the contributions that these businesses can make to economic growth (Taiwo, Falohun and Agwu, 2016). There are many issues that should be considered when levying taxes for the SMEs, which include: how these tax policies are designed to support and promote the growth of SMEs and the most effective ways to administer them without affecting their financial growth.

According to Tee et al. (2016), the Unicist Theory proposes for a favourable tax policy that support SMEs operators to use available income to expand their business operations, without being hindered by various taxes. This implies that an expansive work environment for SMEs will stimulate business activities and will lead to growth in sales, profit and number of employees. When they grow, they will generate more money for the government through taxes and they can as well generate more employment. As the businesses expend, the more people will be needed to cater for the expansion; this is the understanding of the Unicist theory. But if multiple taxation is allowed, it ends up placing huge tax burden on these SMEs firms; and the chance of survival or struggling to survive becomes so high to the SMEs. Also, the possibility of these SMEs firms to die prematurely is very high. Therefore, the growth of SMEs to contribute to economic development is attached to non-multiple taxation and absence of huge tax burdens levied on these small businesses.

Methodology

The focus of the study is small and medium scale enterprises (SMEs) in Nigeria. Lagos state. A total of 110 SMEs were purposively selected sampling for this study. Purposive sampling is adopted in order to use the judgment of experts (SMEs operators) on how government tax policies affect their businesses. The three local governments were purposively selected based on convenient reach of SMEs operators for the researcher. Creswell and Poth (2016) support the use of purposive sampling as it allows the researcher to match the study aims and objectives with the qualities of the several subgroups. A simple random sampling was employed to administer questionnaire to the owners or proprietors of these 110 SMEs as prospective representativeness of small businesses in Nigeria (Creswell, 2014). These respondents were SMEs operators from three local government areas in Lagos (Mainland, Shomolu and Agege). Questionnaires were administered to them at their business premises and retrieved one week after. Consent forms were given to them after the study had been carefully explained to them in English language, which they were all comfortable with. Their participation was made to them as voluntary and

could be withdrawn at any stage of the study. Collected data (n=110) were analyzed with descriptive statistics while formulated hypothesis was tested using Chi square method.

Presentation and Discussion of Findings

Classification of ownership structure of respondents

Respondents indicated various ownership of SMEs operators. Sole proprietorship dominates ownership of SMEs in most part of the world. The nature of micro and small enterprises is self-survival and potential display of self-employment orientation. This significant engine of economic growth is one-man business most time. (Oyetola et al., 2013). As indicated in Table 1 below, 13.6% of the respondent's indicated partnership as SMEs ownership, 4.5% were public liability, 48.1% were sole-proprietorship, 30% were private liability, while 3.6% of the respondents indicated other form of ownership as their own category. The results indicate that the vast majority of the SMEs operators are sole proprietors. The result conforms to Tsagem et al. (2015) study which identify sole proprietorship as the major dominance of SMEs.

Table 1: Ownership structure of the respondents (n=110)

Ownership	No of Respondents	Percentage %
Partnership	15	13.6%
Public Liability	5	4.5%
Sole Proprietorship	53	48.1%
Private Liability	33	30%
Others	4	3.6%
Total	110	100%

Capital base of the business at inception

Small and Medium Scale Enterprises emerge from individual or individuals' passion to earn a living from ideas which are deemed profitable ventures and to satisfy one's desire. Most SMEs in Nigeria have start-up capital that is below Fifty Thousand Naira (N50, 000.00) which are from their personal savings, loans form family and friends (SMEDAN, 2012). Table 2 below shows that 6.3% of the respondents started their business with a capital below N50,000.00, 11.8% of the respondents started their SMEs with capital between N50,001.00 and N200,000.00 as start-up capital, 26.3% respondents had start-up capital of N200,001.00-N500,001.00, 29% of the respondents started with N500,001.00-N1,000,000,00, while 20.9% had above N1,000,000.00 as start-up capital. 5.4% respondents did not respond to the capital base of their SMEs.

Table 2: Capital base of the respondents

Options	No of Respondents	Percentage %
Below 50000	7	6.3%
50001-200000	13	11.8%
200001-500000	29	26.3%
500001-1000000	32	29%
1000001and above	23	20.9%
Missing	6	5.4%
Total	110	100%

Purpose of establishing business enterprises

Establishment of SMEs in Nigeria like any other developing countries has become a hatchery of employment for teeming youths. Employment of many youths in vibrant SMEs will curtail social vices and crimes that are driven with joblessness. Hence, there is need for Federal government and other stake holders to enhance youth employment. SMEs has potentials to create more employment opportunities for the jobless youths, the Federal Government needs to support the SMEs with incentives to create more jobs that will absorb our millions of youths (CBN 2010). Seemingly, SMEs are key instrument to tackle the issue of unemployed graduates (Bowale and Ilesanmi, 2014; Adanlawo, Vezi-Magigaba and Owolabi, 2021). Findings from Table 3 below indicated that 47.2% of the respondents started SMEs because of unemployment. 34.5% respondents agreed that they joined SMEs activities because they were not

gainfully employed, while yearning for profit making attracted 10% respondents. However, 8.1% of the respondents did not indicate their reason for establishing SMEs. Employment still remains a vital force behind formation of SMEs as indicated in this study. This concurs with findings from Abor and Quartey (2010)'s longitudinal study that SMEs contribute 75% employment to the working population of developing nations.

Table 3: Purpose of Establishing SMEs

Options	No of Respondents	Percentage (%)
Due to unemployment	52	47.2%
Under-employment	38	34.5%
Profit making	11	10%
Missing	9	8.1%
Total	110	100%

Classification of annual tax of Respondents

Taxation is critical to revenue of any nation. Tax and levy as government policy is a negligible factor that can affect growth and existence of SMEs (Okolo, Okpolaojiego and Okolo, 2016). Table below shows that 32.7% of the SMEs operators pay less than N50, 000.00 per annum as tax, while 58.1% of SMEs operators pay within the range of N50, 000.00 -N150, 000.00, however, 2.7% of SMEs operators pay within the range of N150,000.00 -N500,000.00 while 3.6% respondents didn't indicate their tax ranges.

Table 4: Annual Taxes of the Respondents

Options	No of respondents	Percentage (%)
Less N50,000.00	39	32.7%
Above N50,000, less N150,000	64	58.1%
Above N150,000, less 500,000	3	2.7%
Missing	4	3.6%
Total	110	100%

Effects of Multiple Taxations on SMEs

It is observed that operators of SMEs pay different taxes and levies to all tiers of government in Nigeria, depending on the structure of ownership. This leads to multiple taxation that grossly affects the activities of these entrepreneurs. Table 5 below indicates that 29% of the respondents agreed that multiple taxation had severe impact on their business, 37.2% of the respondents agreed to mild impact of multiple taxation on their business which is negligible while the remaining 38.1% of the respondents expressed that the multiple tax did not have noticeable impact at all on their business. However, 4.5% of these respondents were silent on the effects of multiple taxation. The result harmonizes with Eragbhe and Omoye (2014) study which posited that the effect of multiple taxation on SMEs will vary according to the size and nature of the business (SMEs).

Table 5: Effects of Multiple Taxations on SMEs

Options	No of Respondents	Percentage
Large Extent	32	29%
Mild Extent	41	37.2%
Poor Extent	42	38.1%
Missing	5	4.5
Total	110	100%

Test of Hypotheses

Hypothesis one

$H_{0:}$ Tax policies do not affect the performance of SMEs operators in Lagos.

Chi-square Tests

	(O)	Expected (E)	(O - E)	$(O - E)^2$	$\frac{(O - E)^2}{(E)}$
Large Extent	32	27.5	4.5	20.25	0.74
Mild Extent	41	27.5	13.5	182.25	6.63
Poor Extent	42	27.5	14.5	210.25	7.65
Missing	5	27.5	-22.5	506.25	18.41
Total	110				33.43

Interpretation

Our calculated Chi square is 33.43 which is greater than Table chi square of 12.59. According to the results, X^2 tabulated is less than X^2 calculated, thus, the null hypothesis that tax policies by the government do not have significant impact on SMEs performance in Lagos state is rejected. The alternative hypothesis that tax policies by the government have significant impact on SMEs performances in Lagos state is accepted. The findings validate Oboh, Yeye and Isa (2013); Adebisi and Gbegi (2013); Michael (2014); Eragbhe and Omoye (2014); Igbinovia and Okoye (2017); Okolo, Okpolaojiego and Okolo (2016); Aribaba et al. (2019) Oladipupo and Obazee (2016); results that indicate that tax policies by the government have significant impacts on SMEs performance and contribute to high mortality rate of small **businesses in Nigeria.**

Conclusion

Most of the small and medium scale enterprises (SMEs) are sole proprietorship (one-man business), and they start their businesses with little start-up capital which are mostly from their personal savings. Involvement of these operators in SMEs have been mostly driven to reduce unemployment and to support the production of goods and services to the immediate environments. Heavy and multiple taxes on SMEs operators will subsequently affect their businesses and eventually kick them out of the economy. However, for these SMEs businesses to remain in business and make meaningful contributions to nation's economic growth, governments at all levels should design and implement strategies that will enhance the growth of these important segment of the economy.

Recommendations

SMEs are important in the economy of every nation, aside from employment opportunities they create; they also provide goods and services to the nation with variety of choices for the targeted population. Therefore, the following are recommended to enhance SMEs:

Government at all levels should harmonize to design and prescribe the most effective ways to administer tax policies that will bolster the growth of SMEs; tax collection should be defined with respect to which tier of government should collect certain taxes from SMEs owners to avoid multiple taxations from all the three tiers of government from the same SMEs enterprises; taxes should be levied according to the growth of the business: sales, size and profit; the ability of the business should be considered in levying taxes to avoid tax evasion; tax incentives and exemptions increase should be considered by government to attract investors and as well to encourage tax voluntary compliance.

This study has its limitations, firstly, the study was conducted in Lagos state, which is one out of 36 states in Nigeria. The result might not be applicable in every part of Nigeria. However, the study shows some results regarding impact of government tax policies in Lagos state, Nigeria. Likewise, it shows possible key constraints to successful SMEs that have been almost neglected in the subject literature. The study creates new avenues for future research. Possible future research may focus on how multiple tax discourage youth to venture into small business.

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Modeling of the economic-political systems

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Keywords
Economic system, political system, system efficiency, effectiveness of the economic system, optimal management.

Abstract
This article presents the general economic system, the main purpose of which is to meet all the basic needs of society. Important features of the economic system are described. The classification of the economic system according to the ability to meet the main goal is given. It also takes into account the fact that the essence of the economic system depends on the political system in society, which is constant at certain intervals of time, but can change at any time unknown in advance.

Indicators of efficiency and effectiveness of the economic system are introduced, which give us information about the state of the economic system at a given time interval and at a given point in time, respectively. Based on the performed analysis, three types of tasks for optimal management of the economic system are posed. One simple optimal control example is presented for illustration.

Introduction

Economic-political system is unity of possibility complex actions, which provides all the basic public service needs satisfaction in every time moment from a given time interval. Society's production is mainly involved in the governance of the existing material and labor resources. In addition, the economic system depends on the essence of the current political system, which is constant at the given time interval. All of them received from the general economic-political system. Obviously, the economic-political system has a cyclical nature and is conjugate with the time interval (cycle). Therefore, it provides information about the weaknesses of the economic-political system only at the end of the cycle.

The model of the general economic-political system is discussed. We generate a specific regressive equation of the economic-political system, which envisages different conditions of the political system. Based on the generated regressive equation, we give an appropriate analysis.

Statement of the problem

An economic system is a set of tools that work together to satisfy all the basic needs of society at any given time interval.

An economic system is optimal if it satisfies all the basic needs of society at minimal cost. Denote the sum of the basic needs of the society at a given time t from the interval T by $D(t)$:

$D(t) = \{D_1(t), \dots, D_n(t)\}$,

Where $D_i(t), (i = 1,2,\cdots,n)$ is the community's i-th basic demand at t moment, and n is the number of basic needs at t moment, which generally varies with time: $n = n(t)$.

Denote the starting moment of the time interval (i.e., the cycle) with t_0 and the last moment with t_1 i.e., $T = [t_0, t_1]$. Let $K(t)$ be the set of community-owned material resources at the moment t i.e.

$K(t) = \{K_1(t), \cdots, K_k(t)\}$,

Where $K_i(t), (i = 1,2,\cdots,k)$ is an i-th material resource, expressed in the corresponding units, and k is their total number. Let $L(t)$ be the set of community-owned labor resources at the moment t i.e.

$L(t) = \{L_1(t), \cdots, L_k(t)\}$

Where $L_i(t), (i = 1,2,\cdots,k)$ is an i-th labor resource, expressed in the corresponding units, and k is their total number.

Thus, the state of the economic system at each time moment t will depend on the following variables: the initial t_0 moment; The length of the time interval T, i.e., at t_1 moment; At the basic needs unity of society every moment of time, i.e. At $D(t)$; At set of community-owned material resources every moment of time, i.e. At (t) ; At the set of community-owned labor resources every moment of time, i.e. At $L(t)$ and at investment every moment of time, denote by $I(t)$, $I(t) = \{I_1(t), \cdots, I_k(t)\}$, where $I_i(t), (i = 1,2, \cdots, k)$ is the amount of investment made in the i-th field at time t. Denote the condition of the economic system of society at any given time moment by $E(t)$. Obviously, $E(t)$ as an endogenous variable will depend on: t_0 and t_1 numerical parameters and $D(t)$, $K(t)$, $L(t)$, $I(t)$ vector exogenous variables. I.e., We can write that
$E = E(t_0, t_1, D(t), K(t), L(t), I(t))$. The private face of the function $E(t)$ can be a production function:

$$Y(t) = AK_1^{\alpha_1} \cdot K_2^{\alpha_2} \cdot \dots \cdot K_n^{\alpha_n} \cdot L_1^{\beta_1} \cdot L_2^{\beta_2} \cdot \dots \cdot L_n^{\beta_n} \cdot I_1^{\gamma_1} \cdot I_2^{\gamma_2} \cdot \dots \cdot I_n^{\gamma_n}$$

To evaluate the effectiveness of the functioning of the economic system, we need to take into account eE- the rate of effectiveness of the economic system. At the given time moment t an indicator of satisfying i-th basic needs is

$$s_i(t) = D_i(t) - Y_i(t),$$

Where $Y_i(t), (i = 1,2, \cdots, n)$ is the volume of output produced for satisfying i-th demand at the moment t. If $s_i(t) > 0$ - the demand is satisfied overestimation at the t - moment. If $s_i(t) = 0$ - the demand is satisfied exactly at the t – moment. If $s_i(t) < 0$ - the demand is fully not satisfied at the t - moment. Everywhere below implied that every value, except time, is represented in monetary units.

Definition 1. The effectiveness rate of the economic system at the time interval $T : t_0 \le t \le t_1$ is

$$eE(T) = \int_{t_0}^{t_1} \sum_{i=1}^{n} s_i(t)dt$$

Definition 2. An economic system is optimal over a T time interval if the following conditions are fulfilled:
$s_i(t) \ge 0, \forall\, i = 1,2, \cdots, n\,; t \in T.$
Thus, an optimal economic system over a T time interval is able to satisfy all the basic needs at any moment from this time interval.
Quasi-optimal economic systems are usually more widespread, not optimal economic systems that sometimes cannot be implemented.
Definition 3. An economic system is quasi-optimal over a time interval T if the following conditions are fulfilled:

$$\sum_{i=1}^{n} s_i(t) \ge 0, \qquad \forall\, t \in T\,.$$

It is clear that if the economic system is optimal, it is also quasi-optimal. The opposite provision is unfair because in the case of a quasi-optimal economic system, some of the indicators of basic needs $s_i(t)$ can be negative (i.e., some requirements may not be fully satisfied). In this case, to fulfill the condition of definition 3.

$$\sum_{i=1}^{n} s_i(t) \ge 0, \qquad \forall\, t \in T\,.$$

The sum of the basic needs at the time moment t must be non-negative, which means that at the moment t the surplus output produced by some of the basic needs and that total product must overlap (at

its value) the product needed to satisfy other basic needs. If the above condition is violated at some time interval, but so that the following condition remains in effect:

$$eE(T) = \int_{t_0}^{t_1} \sum_{i=1}^{n} s_i(t)dt \geq 0$$

then such an economic system is integrally quasi-optimal. I.e., The deficit arising from various basic needs is covered by excess production not instantaneously, that is, every t moment, but throughout the whole T interval. Such an economic system may present difficulties if the time interval T is large. If an integral condition is also violated, then the economic system is unsatisfactory - it can in no way satisfy all the basic requirements of the T -interval. Thus, we got the following:

Statement of the first model.

The economic system can potentially satisfy all the essential requirements over the time interval T and only when the efficiency rate of this system is non-negative over the time interval T, i.e.

$eE(T) \geq 0.$

The following naturally follows:

Definition 4. The economic system at time T interval is called:

extremely satisfactory or effective if $eE(T) > 0$; Satisfactory or Neutral if $eE(T) = 0$; Unsatisfactory i.e., ineffective if $eE(T) < 0$. It is clear that the optimal (as well as quasi-optimal) system can be both effective and neutral. If we compare these economic systems together, we get: Rational is a neutral optimal economic system - it satisfies all basic needs at all times of the time interval T and does not create excess products (i.e., rational use of material and labor resources). Ideally is an effective optimal economic system - it satisfies all the basic needs at every time moment of time interval T and generates a surplus product in advance. Reliable is an effective quasi-optimal economic system, because at the end of the cycle (i.e., for time moment t_1) it generates a reserve (excess product) that contributes to the reliability of the next cycle.

Risky is a neutral quasi-optimal economic system, since it contains a risk factor over a time interval T and does not create a reserve at the end of the cycle (i.e., for time moment t_1), which enhances the risk factor over the next cycle. Unacceptable is an ineffective economic system as it cannot satisfies basic needs over a time interval T.

From the Definition 1 It follows directly that the effectiveness rate of an economic system is of a cyclical nature and is bound by the time interval T. It therefore provides information on the economic system's performance only at the end of the cycle and does not provide any information on the functioning of the economic system at any time moment t from the time interval T. To get this information we need to introduce a new function of time called the economic system efficiency indicator.

Definition 5. Efficiency indicator of an economic system we call a function given by the following integral

$$X(t) = \int_{t_0}^{t} \sum_{i=1}^{n} s_i(\tau)d\tau \ , \qquad t \in T \ .$$

From this definition it follows that

$eE(T) = X(t_1),$

I.e., The efficiency indicator of the economic system over the time interval $T : t_0 \leq t \leq t_1$ coincides with the value of the effectiveness rate at the end of the cycle, i.e., at the moment t_1. The efficiency indicator of the economic system gives information about the system at any time interval $t_0 \leq t \leq t$ ($t \leq t_1$). For example, if $X(t) > 0$, the economic system is overly satisfying, i.e. it is effective at time interval $[t_0, t]$; If $X(t) = 0$, then the economic system is satisfactory or neutral at time interval $[t_0, t]$; If

$X(t) < 0$, the economic system is unsatisfactory or ineffective at time interval $[t_0, t]$. The economic system of some nature at the time interval $t' \leq t \leq t''$ may have a tendency to change its nature. To get this information, we need to introduce efficiency gradient indicator of the economic system.

Definition 6. The gradient indicator of efficiency of an economic system at any moment t from time interval T is

$$\frac{dX(t)}{dt} = \sum_{i=1}^{n} s_i(t), \qquad t_0 \leq t \leq t_1 . \qquad (1)$$

Statement of the second model

The value of the gradient indicator of the efficiency of the economic system at any time moment from the interval T provides the following information:

If $\frac{dX(t)}{dt} > 0$, then the economic system has a positive tendency; If $\frac{dX(t)}{dt} = 0$, then the economic system has a tendency to change its nature i.e., has a neutral nature tendency; If $\frac{dX(t)}{dt} < 0$, then the economic system has a tendency of a negative nature. From the formula (1) we directly have

$$\frac{dX(t)}{dt} = u(t), \quad t_0 \leq t \leq t_1 , \qquad (2)$$

Were

$$u(t) = \sum_{i=1}^{n} s_i(t) = \sum_{i=1}^{n} Y_i(t) - \sum_{i=1}^{n} D_i(t) = \sum_{i=1}^{n} (Y_i(t) - D_i(t)), \quad t_0 \leq t \leq t_1 , \qquad (3)$$

is the indicator of all major's aggregate demand and its real aggregate satisfactory at any time moment t from the time interval T.

The first optimal control problem.

Consider the control process of an economic system over the time interval $T : t_0 \leq t \leq t_1$ in a generalized form. We have:

$$(I) \qquad \frac{dX(t)}{dt} = u(t), \qquad t_0 \leq t \leq t_1;$$

$$(II) \qquad X(t_0) = X_0 \ , \ X(t_1) = X_1 \qquad ;$$

$$(III) \qquad u \leq u(t) \leq U, \qquad t_0 \leq t \leq t_1;$$

Here X_0, X_1, t_0, u, U are given numbers. We need to find the control $u(t)$: $t_0 \leq t \leq t_1$, that satisfies (I), (II), (III) conditions and the time $t_1 - t_0$ will be a minimum, i.e. We want the given $X(t_0) = X_0$ efficiency indicator of the economic system (which determines the nature of the economic system) through permissible control (as shown in (III)) reduced to the efficiency indicator $X(t_1) = X_1$ in a minimal time ($t_1 - t_0$ is minimal). For example, make the economic system of a negative nature ($X_0 < 0$) a neutral or positive nature economic system ($X_1 \geq 0$) in the shortest possible time.

We want to change the given $X(t_0) = X_0$ efficiency of the economic system (which determines the state of the economic system) through permissible management $u \leq u(t) \leq U, t_0 \leq t \leq t_1$, in the shortest possible time and transfer to the given efficiency $X(t_1) = X_1$, which determines the another economic state. For example, switch from neutral (first) to effective (second) or vice versa.

This is a simplest time optimal control problem with fastened ends. If we apply the principle of maximum, we will have either $u(t) = u$ or $u(t) = U$ over the entire $t_0 \leq t \leq t_1$ interval. In the first case we have

$X_1 = X_0 + (t_1 - t_0)u\,,$ (4)

And in the second case we have

$X_1 = X_0 + (t_1 - t_0)U\,.$ (5)

Obviously, if there is a solution of the considering optimal control problem (for given X_0, X_1, t_0, u, U values) and $X_1 > X_0$, then the optimal control and optimal time will be $u(t) = U,\ t_0 \le t \le t_1$, and $t_1 - t_0 = \frac{X_1 - X_0}{U}$, respectively.

If $X_1 < X_0$, then optimal control and optimal time will be

$u(t) = u,\ t_0 \le t \le t_1$, and $t_1 - t_0 = \frac{X_0 - X_1}{u}$, respectively.

Remark 1. Since $u(t) = \sum_{i=1}^{n}\big(D_i(t) - Y_i(t)\big),\quad t_0 \le t \le t_1$, and $D_i(t), (\,i = 1,2,\cdots,n.)$ are already given values (requirements), so we are controlling the process through production volumes i.e., by $Y_i(t), (\,i = 1,2,\cdots,n.)$ production functions.

Remark 2. For theoretical considerations, if $Y_i(t), (\,i = 1,2,\cdots,n.)$ are advanced given values (are production volumes), then we are controlling the process through demand volumes i.e., by $D_i(t), (\,i = 1,2,\cdots,n.)$ demand functions.

Remark 3. We do not exclude cases where some components of control are production volumes and others are requirements.

Consider a qualitative factor such as a political system or, more simply, a political regime. Note such a factor with the letter P. We assume that the political system can be of three types: the first, the transitional, and the second. In this case, the qualitative variable P in the econometric model (regression equation) is as follows:

$$P_1 = \begin{cases} 1, & \text{if the system is in transition state,} \\ 0, & \text{if the system is in other state;} \end{cases}$$

$$P_2 = \begin{cases} 1, & \text{if the system is in second state,} \\ 0, & \text{if the system is in other state.} \end{cases}$$

If we take into account fictitious variable $P_1(t), P_2(t)$ denoting the political system, then the state of the economic system of society at any given moment of time, referred to as $E(t)$, takes the form as follows:

$E_p = E(t_0, t_1, D(t), K(t), L(t), I(t), P_1(t), P_2(t))$.

The private face of this function can be the production function:

$Y(t) = AK_1^{\alpha_1} \cdot K_2^{\alpha_2} \cdot \dots \cdot K_n^{\alpha_n} \cdot L_1^{\beta_1} \cdot L_2^{\beta_2} \cdot \dots \cdot L_n^{\beta_n} \cdot I_1^{\gamma_1} \cdot I_2^{\gamma_2} \cdot \dots \cdot I_n^{\gamma_n} \cdot {B_1}^{P_1} \cdot B_2^{P_2}$,

Where B_1 and B_2 are unknown parameters, and P_1 and P_2 are fictitious variables.

Take into consideration the change in the political system, the optimal control problem set out above (I), (II), (III) will take the form of a variable-structure optimal control problem. We call this problem the second optimal control problem.

6.The second optimal control problem.

Consider optimal control process of economic system, at $T:\ t_0 \le t \le t_1$ time interval, in such a general form:

$$\begin{cases} \dfrac{dX(t)}{dt} = u_1(t), & t_0 \le t \le \theta_1 , \quad (7) \\ \dfrac{d\tilde{X}(t)}{dt} = u_2(t), & \theta_1 \le t \le \theta_2 , \quad (8) \\ \dfrac{d\hat{X}(t)}{dt} = u_3(t), & \theta_2 \le t \le t_1 , \quad (9) \end{cases}$$

$$X(t_0) = X_0, \quad X(\theta_1) = \tilde{X}(\theta_1), \quad \tilde{X}(\theta_2) = \hat{X}(\theta_2), \quad X(t_1) = X_1 \ ;$$
$$u_1 \le u_1(t) \le U_1, \qquad t_0 \le t \le \theta_1;$$
$$u_2 \le u_2(t) \le U_2, \qquad \theta_1 \le t \le \theta_2;$$
$$u_3 \le u_3(t) \le U_3, \qquad \theta_2 \le t \le t_1.$$

Where $X_0, X_1, t_0, u_1, U_1, u_2, U_2, u_3, U_3$ are given numbers; $\theta_1, \theta_2, t_1 \in T$ are unknown moments from a given time interval.

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How assistive technology impacts college students and faculty

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Abstract

2019-2020 enrollment data for universities and colleges reports that the number of students enrolled exclusively in online programs increased from 3.5 million to 5.8 million, an increase from 17.6 percent to 22.7 percent. This is higher than previously reported. The number of programs and courses that institutions of higher education offer online are continuing to increase in response to meeting the needs of a diverse population of students. Yet, a group that is significantly impacted in meeting specific needs with online learning are students diagnosed with one or more disabilities. According to the United States (U.S.) National Council on Disability, in 2015 approximately 11 percent of undergraduate students have a disability, equating to approximately 11 million individuals. In supporting students with disabilities, a larger population are positively impacted. Providing typed transcripts or closed caption for videos and lectures is imperative for an individual with a hearing disability, but it also improves learning for students where English is a second language. Few institutions would argue the importance of providing needed access and support to students, yet there may be a disconnect with faculty having the understanding and training to support online learning utilizing Assistive Technology (AT). Possessing the skillset to implement AT in online courses lags significantly. This paper evaluates current trends related to college students with disabilities and the impact of providing AT to improve online academic success, the role faculty play in developing and teaching courses that implement AT, as well as the responsibility of college and university administration in supporting the implementation of these strategies. Examples of implementation of AT in business courses is presented and discussed.

Introduction

Prior to 2012, the U.S. Department of Education did not collect data related to distance education ((Smalley). To understand the current and future state of higher education, it is imperative that this data is collected to support decision making by colleges and universities. Understanding the demographic data of current and future students allows institutions to adapt to the needs of those individuals. This is especially true with the continued growth of online programs and classes. The number of college students in online courses continues to increase with 51.8 percent enrolled in at least one course online during the 2019-2020 year. It is important for colleges and universities to meet the academic needs of a very diverse population of students. Students with disabilities are a segment of the college population that has particular requirements in obtaining a degree.

College enrollment rates for young adults in the United States (U.S.) with disabilities in 2017 was 25.4% compared to 40.9% of a peer population without disabilities. In addition, the average national rate for college completion was only 3.6% of young adults (ages 18-24) with disabilities compared to 10.9% of young adults without disabilities—the gap between those with and without disabilities earning a bachelor's degree or higher was 7.2% (Hill, Schwitz, and Queener, 2020).

It is important for institutions of higher education to look for ways to decrease the barriers to earn a college education. The Rehabilitation Act of 1973, The American with Disabilities Act (ADA) of 1990, and the 2008 Amendments to the ADA (ADAAA), full inclusion has not been obtained. Not only must the legal rights of students with disabilities be supported, every faculty, administrative and staff member on campus requires training, but this training must be implemented in the strategic and daily mission of each institution. To meet the needs of all students studying at colleges and universities a culture of inclusion is

necessary. Utilizing "best practices" by incorporating techniques and tools related to assistive technology improves the learning success of not only students with disabilities, but all students.

Hill, Schwitz, and Queener (2020) report that in "2019 that 26% of people in the U.S. have a disability. Youth and young adults with disabilities are less likely than those without disabilities to complete secondary school, enter postsecondary education, or complete a bachelor's degree." As individuals with disabilities enter institutions of higher education, support structures are required to improve the success and graduation rates. This can be even more challenging with online courses and programs this population may enroll in. The majority of colleges and universities have removed physical barriers such as high curbs at crosswalks, adding handicap parking spaces on campuses, automatic doors to buildings, Braille signage, and handicap restrooms. It is as important that assistive technology be incorporated in designing and teaching online courses.

Assistive technology refers to "any item, piece of equipment or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve the functional capabilities of an individual with a disability" (Individuals with Disabilities Education Act, 2004). This could include notetakers, readers, interpreters, voice synthesizers, or assistive listening devices. For online classes, this could mean closed captioning or transcripts for videos or lectures, and online forms that meet or exceed Web Content Accessibility Guidelines2 (WCAG 2.1).

According to the American Council on Education if incoming students do not encounter a feeling of belonging during the initial eight weeks of beginning college, there is a significant risk of dropping out. (Higher Education Today, 2020). Students with disabilities have an even more significant negative experience with a 25 percent withdrawal rate by the conclusion of the first year and 35 percent withdrawing by the end of year two. This supports the importance of higher education facilitating a culture to support goals related to inclusion and diversity. Students with disabilities do not have diminished mental capabilities, they may just need support to assist in learning or have a processing disability

Literature Review

Most U.S. colleges and universities have introduced the basic requirements of the American with Disabilities Act on their campuses. This has been accomplished by the development of disability offices. These offices provide support for students with disabilities such as providing sign language interpreters, notetakers, recording course lectures, additional examination time, and quiet locations to take examinations. Disability office staff are also an excellent resource for faculty.

Wynants and Dennis (2017) investigated the impact on student learning following faculty completing development training related to Universal Design for Instruction (UDI). The researchers reported improved faculty attitudes and confidence in applying UDI principles, increasing accessibility in course materials and content presentation. Understanding the pedagogy of teaching students with disabilities and of inclusive technologies is imperative. Faculty attitudes also play an important role in willingness to provide accommodation. Faculty may also have a fear of lowering academic standards or that students may be afforded unnecessary accommodations by providing AT.

Institutions of higher education are required by federal and state laws to provide accommodations and support for individuals with disabilities. The U.S. Department of Justice (DOJ) has provided technical assistance in the high stakes testing context that guide institutions of higher education in requiring documentation of disability and needed accommodations (U.S. Department of Justice, Testing Accommodations). According to Hill, Schwitz, and Queener (2020), "the DOJ points to recommendations of qualified professionals, proof of past accommodations, observations by educators, results of psycho-educational or other professional evaluations, an applicant's history or diagnosis, and an applicant's statement of their history of accommodations, and notes that only one or two of those methods of proof should be sufficient. In some cases, students may develop or identify their disabilities, such as learning or mental health disabilities, after entering higher education. Obtaining timely medical documentation of the disability while managing a course load may be difficult due to the time and financial resources needed to get appointments with qualified medical professionals. As a best practice, schools that rely on medical testing and verification should take steps to ensure that such testing is readily available to students and

that students are informed of the school's requirements and how to meet them." Verification of this information is time-consuming and in some instances the Disability Office on a campus may have a single employee responsible for all disability services. Sufficient personnel support is imperative.

What are reasonable accommodations? Hill, Schwitz, and Queener (2020) report that "the ADA requires colleges and universities to reasonably modify their policies and practices to allow a student with a disability an equal opportunity to participate and succeed in school. Reasonable accommodation is an extremely broad and flexible concept encompassing any change that is necessary and disability-related, as long as it is not unreasonable or unduly burdensome and does not fundamentally alter the school's program." This might include course formatting, accommodations for a quiet location or additional time for examinations or emotional support animals permitted in buildings and housing.

Research supports the fact that assistive technology provides independent means for students with disabilities to overcome curricular barriers and increase the quality of learning experiences (Rose, Hasselbring, Stahl, & Zabala, 2005). Craig and colleagues (2002) affirm that assistive technology is an equalizing agent in learning for students with disabilities. In the field of technology, extensive research has focused on how individuals with disabilities use enablement devices to have more independent lives. Hiring staff who are experts in instituting policies and structures with faculty in designing online courses is imperative. According to Hill, Schwitz, and Queener (2020), "schools should require, not just offer, training for staff and faculty on criteria and procedures for accessing and authorizing accommodations. Educating staff should be part of their ongoing professional development…Often the faculty in higher education do not know the legal rights and responsibilities of students with disabilities, do not understand their responsibility for accessibility, and do not understand the role of the disability support services office. Even when campuses offer training on accessibility to faculty, those staff who do not make time to participate may find themselves in an "emergency" situation attempting to respond to accommodation requests.

Bouck and Long (2021) reported that, "prior to 1997, and presumably, even shortly thereafter, research and practice involving assistive technology for students with disabilities involved students with low incidence or severe disabilities." (p. 249) Early research also concentrated on K-12 students versus college-aged students with disabilities. Students with learning disabilities were the group to most frequently report their disability, whereas students with emotional/behavior disorders were the least likely of the high-incidence disabilities categories to report a disability. The researchers also noted that less than one fourth of college students reported receiving AT assistance and that students with more sensory impairments (e.g., deaf-blindness and visual impairment) reported the greatest frequencies for receiving assistive technology. College students with autism, other health impairments, and traumatic brain injury were the least likely to report receiving assistive technology. Bouck and Long (2021) reported findings of approximately 30% of students with disabilities, aggregated, reported using assistive technology. This is a relatively low percentages of disabled students receiving the assistance they require for success in college.

Universal Design for Learning Instituted in Business Courses

Both researchers of this paper have a strong commitment to best practices in online and hybrid course development. The preparation of all business students for the workplace is the mission of the Business Department. Most of the accommodations for online course development are low cost, but there is a significant time commitment by course developers and faculty. Kowalewski has completed the Online Learning Consortium (OLC) Online Teaching Certificate (OLC Website). Both researchers completed the Higher Ed Peer Reviewer Course (PRC) and Kowalewski completed the K-12 Peer Reviewer Course with Quality Matters (K-12 RC) (QM Website). These certifications provided the framework to build courses that would be assessible for all students. Quality Matters is an organization that provides research-supported rubrics and standards (eight General Standards and 42 Specific Review Standards used to evaluate the design of online and blended courses) in course design. A QM review provides "objective, evidence-based ways to evaluate the components of online learning" (QM Website). Possessing a strong commitment to teaching and course development provides the impetus to continued excellence.

Completion of these courses were integral to the researchers in understanding implementation of universal design and AT in online development.

The researchers of this paper created multiple online courses incorporating UDL. The goal was to develop courses that were customized for all learners by design, virtually eliminating the need for retrofitting versus traditional methods for developing online courses. Examples can include using standardized statements on syllabi, on the course learning management system (LMS) or course site, and in online orientation material.

Developing PDF documents with headings is a preliminary place to begin with pre-set bullets, numbering, and tables. If photos are included, the use of alternative (alt) text that provides an explanation of the photo is suggested. Also, turning on computer accessibility options and dividing long documents into shorter, more easily managed documents improves access.

Best practices of colleges require faculty to include a statement of disability or information related to the Disability Support the campus offers. Including the link in the syllabus is also helpful. QM also provides to members an Accessibility & Usability Resource Site (AURS) that provides 1) Accessibility and Usability Resource Site, 2) Digital Accessibility White Paper Series, and 3) QMs Bridge to Quality Course Design Guide (QM Website). Today, there is more support than previously provided to faculty to develop courses that meet UDI standards.

Discussions and Conclusions

Understanding the complexities of assistive technology and its impact on students with disabilities' success at the college level in online courses brings opportunities, as well as challenges. Additional research from a more egalitarian perspective may ultimately contribute to a more thorough understanding of the impact of assistive technology and its awareness by professors in the process of human development and learning. The use of additional institutional surveys of students with disabilities engagement and academic life is recommended as resources to expand this analysis and compare outcomes of other peer and aspirant groups.

Supporting individuals with disabilities begins as perspective students are in high school deciding on a college to attend by designing websites and hard-copy materials that are universally accessible. The information in this paper is recommended to be used as relevant information for higher education planning. Application of these findings would benefit students with disabilities success initiatives and further the understanding of AI technology and the important role in education and science. Implementation of this information could positively influence improved approaches to curriculums, skill-development, learning support services, and overall, more supportive, inclusive, and egalitarian college environments. Testing accommodations should prevent a student's disability from interfering with the demonstration of knowledge. The amount of time provide to students for testing is often determined by administrative concerns of the faculty, school, or testing provider. Extending examination time would be a reasonable accommodation for a student whose disability interferes with speed due to cognitive or physical processing if physical or cognitive processing efficiency or communication is what is what is being evaluated (Hill, Schwitz, and Queener, 2020).

Inclusion in college campuses has two facets, services and accommodation overall on campuses, as well as ensuring that the individuals students receive the support and accommodations needed. Faculty can initiate conversations with students facilitating ideas that could assist the student in a particular class. Hiring and training staff who reflect the mission of truly including and supporting 'all' students is an initial clear commitment is imperative (Hill, Shawitz, & Queener, 2020). Supporting diversity increases inclusion for all individuals on a campus. Processes and standards for accommodation for college age students are regulated by ADA accommodations, where special education services for secondary students are regulated by the Individuals with Disabilities Education Act.

Professional development is not only necessary for faculty, but all personnel employed by the institution. Having staff who are knowledgeable about higher education ADA legal requirements who can review and make decisions regarding providing accommodations. It is important to provide the necessary accommodations while being consistent to avoid discrimination litigation by standardizing processes related to approving accommodations. When designing new buildings, incorporating ADA

accommodations in the initial layout can ensure access in the classroom as well as when attending activities on campus.

Many students don't disclose their disabilities. Another obstacle for an individual is that it can be very expensive to obtain testing and diagnosis to fulfil disability requirements. The idea is to institute a proactive approach to designing classes to meet the needs of a diverse student population. Leaders and professionals in higher education can utilize current information, such as presented in this paper, to create academic environments that will assist students with disabilities to succeed through their innovation, creative, and critical thinking methodologies in establishing policies and support structure that provide equalizer expertise such as assistive technology. Colleges and universities need to provide tools, such as checklists, testing mechanisms, and training to facilitate accessible technology and content (Hill, Shawitz, & Queener, 2020). It is important for planning and development purposes that faculty are informed before classes begin as to what accommodations are necessary and to allow time for implementation.

Direction for Future Research

It is the responsibility for all members of institutions of higher education to support all students. Professors should design perceivable, operable, understandable course materials that incorporate robust educational activities that are accessible and usable for all. "Recognizing that most facilities, policies, rules, classes, textbooks, and activities were designed for students without disabilities is a basic premise" (Hill, Schwitz, and Queener, 2020). The ADA requires affirmative changes to educational facilities, policies and procedures, practices, and methods of communication when necessary to provide students with disabilities an equal opportunity to benefit, participate, and succeed.

Hill, Shawitz, & Queener (2020) report that as many as two-thirds of students with disabilities may have invisible or hidden disabilities. Adopting principles of universal design for learning will benefit all students. Faculty and staff can take the following steps to improve classroom inclusion by following UDL principles without fundamentally altering the content or changing the standards to which all students are held. Many students with disabilities face stigma associated with being different. Additional research surveys related to students and if they have faced stigma, discrimination, or bias during their studies would support and add to the research that continues to be completed in this field. With the continued growth of online learning, research needs to continue to be done evaluating student experiences, faculty experiences, and organizational support to improve graduation rates for students with disabilities.

It is important that colleges and universities provide the required funding, support, and personnel to lead accessibility efforts. Ensuring that students have access to an array of AT such as screen readers and magnifiers, and text-to-speech equipment is imperative-for on campus use also. Additional research related to the type of AI students are using in colleges and universities would add to the data and information to enrich faculty training. There is a variety of assistive software that is free and gives students options to use technology independently in common areas on campus. Additional research regarding assistive technology and students with disabilities is necessary to develop fully inclusive higher education institutions. Continued research with recommendations instituted in colleges and universities is necessary until disabled and non-disabled students have achieved academic equality.

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Impact of macroeconomic and idiosyncratic uncertainty on firms' financing decisions: Evidence from SADC countries

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Keywords
Capital Structure, risks, Financing Decisions, SADC.

Abstract

Purpose of Study: The purpose of this study is to investigate the impact of idiosyncratic and macroeconomic risks on financing decision on SADC countries.

Methodology: Employing data from the African Financials database, the analysis is conducted over a ten-year period spanning from 2008 - 2019 for 309 companies. Unit Root Fisher Chi- Square Test and Granger Causality test were employed to test for unidirectional and bidirectional relationships cross-sectionally. Pooled Regression Analysis- (Fixed and Random effect) was employed as main topology for panel regression analysis.

Findings: The study confirmed that companies become risk averse when there is an increase in idiosyncratic and macroeconomic risk and therefore take less leverage whichever type of financing decision is opted. In other words, when there are high idiosyncratic risks, debt to equity ratio is low. Banking and financial institutions charge a higher risk premium for companies having a high-risk profile. Due to this, the cost of debt financing augments. Therefore, companies employ internal financing and reduce debts due to high bankruptcy risk and costs. This finding is in line with the pecking order theory (Myers and Majluf, 1984). Conversely, a significant positive linkage is reported in Namibia and South Africa. This estimate posits that these companies use more debts during periods of high idiosyncratic risk which corresponds to the trade- off theory.

Originality: The study is among one of the pioneering works underpinning the idiosyncratic risk and macroeconomic risk on capital structure and relying on a large number of companies across the SADC region. In this respect, it adds contribution to the existing literature on risks and capital structure to the socio-economic goals of the SADC region.

1.0 The Introduction

A theoretical linkage exists between companies' leverage and economic indicators andprevious research confirm that capital structure is a substantial part of strategic financial decisions due to its relationship with the economic (microeconomics and macroeconomics) and institutional environment of a specific jurisdiction (Riaz et al. 2014; Toadler et al. 2021).

Different theories of capital structure stipulate various sources of predictions associated with the effect of risk in firms' own business operations and macroeconomic conditions affecting financial decisions on companies at any level. Based on the trade- off theory, it is assumed that higher idiosyncratic risks increase bankruptcy and bankruptcy costs, thus reducing leverage. So, a negative relationship between idiosyncratic risks and leverage is implied. Meanwhile, according to the agency theory, as higher idiosyncratic risks reduce agency debt cost, companies have a tendency to upraise their debt financing, thus revealing a positive association with business uncertainty and leverage (Myers, 1977).

According to Gertler& Hubbard (1993), firms lower the negative effects of idiosyncratic risks, but they cannot overcome systematic and macroeconomic risk exposures completely. Economic indicators drive an economy towards a certain direction and play a crucial role in influencing the firms' choices of leverage (Riaz et al 2014). Therefore, firms prefer equity to debt financing so as to share at least some of the systematic risk with their outside investors when macroeconomic risk is high. While taking the

optimal capital structure decision of the firm, it is important to understand both the magnitude and the stability of the firm's cash flows relative to the fixed charges associated with the use of debt. It is seen that firm cash flow is highly sensitive to systematic risk (highly correlated with macroeconomic volatility), hence, it would not be able to justify higher leverage in its capital structure, as probability of default behaves countercyclical for firms with high response to macroeconomic conditions. Here, a high level of leverage expects an increase in the level of financial distress costs. Hence, a heightened level of macroeconomic uncertainty will consequently lessen leverage.

Empirical evidence proving the negative relationship between idiosyncratic risk and leverage are as follows:- ("Castanias, 1983;Booth et al., 2001;Titman and Wessels, 1988;Rashid, 2012; Wahom, 2015)". Further, evidence reporting negative relationship between macroeconomic risk and leverage include Chen (2017); Sinha (2015); Salim (2019) and Toadler et al. (2021).

The SADC debt market has provided adequate facilities for African corporate. The SADC Protocol on Finance and Investment was implemented in 2010 to foster harmonisation of the financial and investment policies of member States so as to make them consistent with the aims of SADC and ensure that any alterations to financial and investment policies in one member State do not necessitate undesirable adjustments in other member States' investment policies and laws. More precisely, SADC has set itself macroeconomic convergence benchmarks of 3 per cent inflation rate by 2018, a budget balance deficit of 3 per cent, public debt less than 60 per cent of GDP. The SADC and the Committee of Insurance, Securities and Non-Banking Financial Authorities (CISNA) implemented strategies to coordinate the regulatory framework for securities markets across the region. However, continuously rising of public debt leads to increased interest rates, lower credit rating, and increases the odds of a country defaulting on its debt. In the SADC region, debt has become more expensive to service because interest rates are very high. Hence, a large amount of revenue is being channelled towards servicing the debt instead of investing in critical areas of the economy and this leads to poor long-term economic performance. SADC countries must use domestic and regional public leverage management strategies ensuring that public debt does not become a fiscal burden (Political Economy, 2019).

The purpose of the study is to examine the influence of risks on financial decisions on the SADC countries. The objective is to assess the effect of the two types of uncertainties on debt-to-equity ratio to ascertain whether companies prefer debt financing or equity financing.

To the best of the author's knowledge, there is a lack of research studies regarding firm specific and macroeconomic uncertainty on financial decisions in developing countries. Previous studies were performed in developed and developing countries (US, UK, India, Pakistan) namely Byoun (2008), Bahmra et al. (2010), Rashid (2012), Riaz et al. (2014), Sinha (2015), Panda (2015), Venanzi et al. (2017),Toadler et al., (2021) have analyzed the effect of idiosyncratic and macroeconomic conditions on firms' financial decisions. Ultimately, this is one of the first studies investigating the impact of idiosyncratic risks and macroeconomic volatility on financial decisions in the emerging markets particularly the SADC region. As such, the estimates are of direct relevance to those financial researchers, investors, managers and other agents involved in the African capital market. In addition, this research enables financial researchers and investors to assess and determine the cyclical state of economy on different jurisdictions of the African financial economy. Another objective is that it aids to determine any similarities and differences of capital structure's behaviour of companies in developing countries as well as the effect of time- varying macroeconomic risks on financial decisions employing different types of leverage and equity components and different sources of risks. By concentrating on the emerging market, this study brings new contribution to the existing literature (on emerging market or for SADC).

The study is sub-divided as follows. Section 2 provides a clear description of the data and topologies to be employed on the study. Section 3 focuses on the empirical results of the research. Section 4 concludes the study.

2. Data and Methodology

This section explains the topology of the research focussed on the impact of idiosyncratic, macroeconomic uncertainty on security issuance decisions on SADC countries. The study is thus based by analyzing the various sectors of the economy namely banking and insurance, manufacturing, ICT,

retailing, financial services, and investment companies listed on the different stock exchange institutions of the following markets: Botswana, Malawi, Mauritius, Namibia,South Africa, Tanzania, Zambia and Zimbabwe over a ten-year period spanning from 2008 to 2019. This study employs both time series model including Principal Component Analysis and GARCH model to test idiosyncraticrisks and macroeconomic risks. Moreover, the technique utilized for analysis is pooled regression- fixed and random effects, as adapted by Singh and Bagga (2019).

2.1 Population

SADC Countries	Potential Number of Companies	Actual Number of Companies
Botswana	34	17
Malawi	14	11
Mauritius	51	30
Namibia	39	21
South Africa	362	181
Tanzania	25	11
Zambia	24	15
Zimbabwe	64	23
Total	613	309

Table 1 represents the population of the study.

2.2 Data

To undertake the investigation, the study constructs an annual panel dataset for the 8 SADC countries using financial information collected from annual reports, handbook, board's managers' reports, companies' websites, African Financials and Datastream database.

2.3 Conceptual Framework

Prior to empirical evidence, the conceptual framework of the study has been designed as follows:-

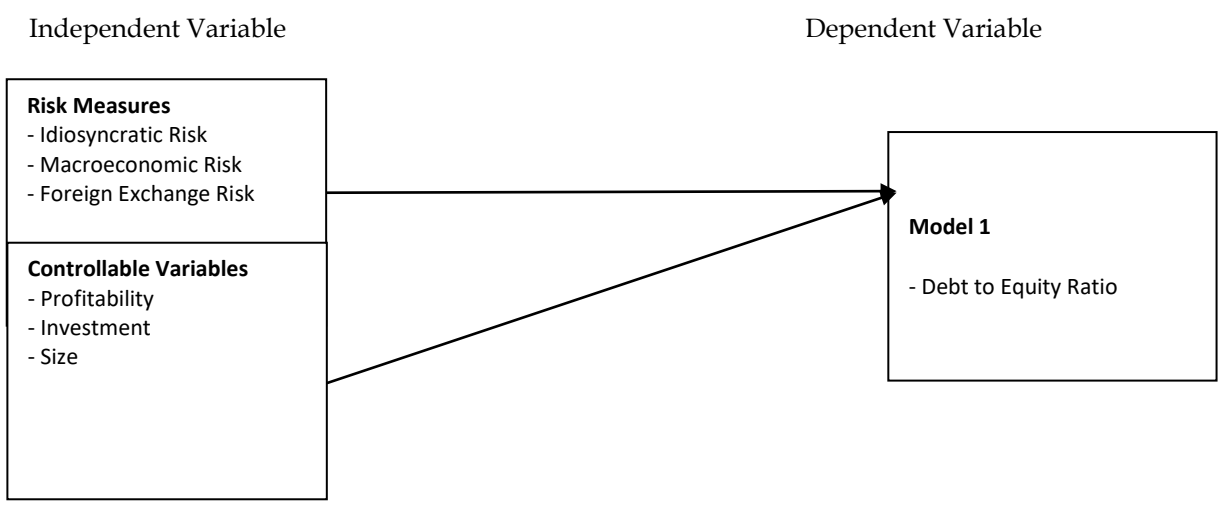

Figure 1 indicates the Conceptual Framework of the study.

(Author's computation)

Figure 1 reports the conceptual framework of the study. Here, the study examines the impact of risk on financing decisions. Initially, the model is measured by considering debt to equity ratio. Meanwhile, the independent variables involve idiosyncratic risk, macroeconomic risk and foreign exchange risk. The controllable variables are profitability, investment and size.

2.4 Main Regression Model -

Referring to the previous empirical studies adopted by Rashid (2012), the analysis on the influence of idiosyncratic and macroeconomic risk on financing decisions has been investigated using a standard leverage model augmented by idiosyncratic and macroeconomic uncertainty to measure debt to equity ratio and net profitability. The main regression model of the study is explained as follows:-

$$\boldsymbol{DER_{i,t}} = \boldsymbol{\beta_0} + \boldsymbol{Z_{i,t-1}}\,\boldsymbol{\beta_1} + \boldsymbol{\beta_2}\boldsymbol{R_{it-1}^{firm}} + \boldsymbol{\beta_3}\boldsymbol{R_{it-1}^{macro}} + \beta_4\,FREX_{it-1} + \beta_5 ROA_{it} + \beta_6 INV_{it} + \beta_7 Size_{it} + \boldsymbol{\varepsilon_{i,t}} \quad (1)$$

where:-

$\boldsymbol{DER_{i,t}}$ stands for Debt Equity Ratio on firm i at time t.

Z is a vector factor that denotes one of time- varying lagged leverage.

$\boldsymbol{R_{it-1}^{firm}}$ refers to one of time-varying lag firm- specific risk measure on firm i at time t.

$\boldsymbol{R_{it-1}^{macro}}$ denotes to one of time- varying lag macroeconomic risk measure on firm i at time t.

$FREX_{it-1}$ refers to one of time- varying lag foreign exchange risk measure on firm i at time t.

ROA_{it} is referred to as return on assets-profitability measure on firm i at time t.

INV_{it} is investment on fixed tangible assets on firm i at time t.

$Size_{it}$ is size of natural logarithm of the total sales on firm i at time t.

ε_{it} stands for error term.

2.4.1 Research Hypotheses

Based on conceptual framework and previous empirical research, this study designs the main hypotheses which are explained as follows:-

Main Hypothesis

H_1= There is significant relationship between idiosyncratic risk, macroeconomic risk, Foreign Exchange Risk, return on assets, investment and size on Financing Decisions.

Sub- Hypotheses

Model 1

H_2= There is significant relationship between idiosyncratic risk, macroeconomic risk, Foreign Exchange Risk, return on assets, investment and size on Debt Equity Ratio.

2.5 Econometric Measures

Unit Root Test

Before proceeding to the panel regression analysis, unit root test is conducted to the data set to examine whether the variables used to measure for reverse causality are stationary. Augmented Dickey Fuller Test is utilized in this study. The two-unit root tests measures are explained as follows:-

(i) Augmented Dickey Fulley Test

The ADF test was developed by Dickey and Fuller in 1984 which is an augmented version of the DF test. The augmented Dickey–Fuller (ADF) statistic, used in the test, should be a negative number. The more negative it is, the stronger the rejection of the hypothesis that there is a unit root at some level of confidence. It is also important that the error term should be correlated. The ADF test is indicated as follows:-

$$\Delta xt = a_0 + b_0 x_{t-1} + \Sigma c_0 \Delta x_{t-1} + wt \quad (2)$$

Where:-

- Δ is the difference operator, a_0, b_0, c_0 are coefficients to be estimated,
- x is a variable whose unit roots are examined, and w is the error term.

The null hypothesis for this is $b_0 = 0$ (i.e., the series is non-stationary and a random walk with drift) against the alternative hypothesis $b_0 < 0$ (i.e., the series is stationary).

The Fisher-ADF and PP tests allow for individual unit root processes so that ρimayvary across cross-sections. The tests are all characterized by the combining of individual unit root tests to derive a panel-specific result. Im et al. (2003) begins by specifying a separate ADF regression for each cross section:

$$\Delta y_{it} = \alpha y_{it-1} + \sum_{j-i}^{Pi} \beta_i \Delta y_{it-1} + X_{it}^{i}\delta + \varepsilon_{it} \quad (3)$$

H_0 : α = 0 for all i while the alternative hypothesis is given by $H_1 \begin{Bmatrix} \alpha_1 = 0 \; for \ldots i = 1,2,N_1 \\ \alpha_1 < 0 \; for \ldots = N+1, N+2 \ldots N \end{Bmatrix}$

2. Granger Causality Test

The Granger Causality test Brooks (2008) is employed to test for the presence of reverse causality issues. Moreover, this test is appropriate as the study is dealing with variables of a dynamic financial and economic nature. In terms of econometric terms, it is useful in finding whether one time- series (x_t) can be predicted by another time series (y_t). The test is carried out by regressing (x_t) on its lagged values and the lagged values of (y_t). If the results indicate that(x_t) can be predicted by (y_t), it is said that (y_t) Granges causes (x_t). However, the Granger causality implies a correlation between the current value of one variable and the past values of others; it does not mean changes in one variable cause changes in another. If there are two series (x_t) and (y_t) , then it is said that (x_t) doesn't granger cause (y_t). If all lagged coefficient for (x_t) are zero, then

$$y_t = \alpha_0 + \alpha_1 y_{t-1} + \alpha_2 y_{t-2} + \cdots + \beta_1 y_{t-1} + \ldots + \ldots + \beta_1 y_{t-p} + \varepsilon_t \quad (5)$$

$$x_t = \beta_0 + \beta_1 x_{t-1} + \beta_2 x_{t-2} + \ldots + \beta_p y_{t-p} + \mathrm{u}_t \quad (6)$$

Then, $\beta_1 = \beta_2 = \ldots = \beta_p = 0$ that is lagged of x_t has no effect on y_t .

If there is reverse causality between risk and capital structure and secondly, capital structure and risk, this study will resort to simultaneously equations models. This means that the both relationships could be bi- directional.

3. Fixed Effects and Random Effects

The pooled OLS method is a "form of mathematical regression analysis that finds the line of best fit for a dataset, providing a visual demonstration of the relationship between the data points. The fixed effects model explores the relationships between independent variables and explained variables in separate entities, assuming that companies have their own characteristics that affect the relationships between variables. On the contrary, the random effects model implies random variation across companies, uncorrelated with explanatory variables. The Hausman test reveals the better model between the fixed and random effects. The null and alternate hypotheses for this test are that the random effect and fixed effect are appropriate, respectively".

3.0 Results and Discussion

3.1 Diagnostic results

Unit Roots Test

The study employed Eviews 12 to test for Augmented Dickey Fuller to examine whether the variables used to measure for reverse causality using the Granger causality method are stationary.

Augmented Dickey- Fuller (ADF) Fisher Chi- Square Test

Country	Level			First Differences		
	Intercept & Trend	Fischer Chi-Square	P-Value	Intercept & Trend	Fischer Chi-Square	P-Value
Botswana	-0.286	32.809	0.002	-3.500	101.733	0.000
Malawi	-0.851	42.843	0.000	-3.199	63.252	0.000
Mauritius	-0.176	65.137	0.002	-1.912	335.580	0.000
Namibia	-0.518	17.766	0.001	-3.533	39.164	0.000
South Africa	-0.381	31.051	0.000	-3.272	176.556	0.000
Tanzania	-0.228	25.017	0.013	-2.097	91.888	0.000
Zambia	-0.447	26.904	0.000	-2.614	40.883	0.000
Zimbabwe	-0.161	48.728	0.000	-2.886	135.054	0.000

*MacKinnon (1996) one-sided p-values.
(Author's Computation)
Table 2: ADF Unit Root Test Results of the study.

The Unit roots test conducted on the study employing the ADF root test indicates that the results become non- stationary at the first difference of analysis.

3.2 Regression Analysis Results

3.2.1 Regression Analysis Results- Model 1: Capital structure and Debt to Equity Ratio

First of all, the estimates pertain that there is a positive relationship between lagged leverage and debt to equity ratio in Botswana, Mauritius, South Africa and Zambia. This finding indicates companies in these countries take debts on a continuous basis to be able to finance their finance and investment operations.

Secondly, the findings postulate that again that there is a statistically significant and negative association between idiosyncratic risk and debt to equity ratio in Zambia. In other words, when there is high idiosyncratic risk, debt to equity ratio is low. This result makes sense as banking and financial institutions may charge a higher risk premium for companies having a high-risk profile. Due to this, the cost of debt financing may amplify. Therefore, companies prefer to employ internal financing and reduce the level of debts due to high bankruptcy risk and costs. Ultimately, companies prefer to use internal financing or issue equity and retire their outstanding debts. This finding is in line with the pecking order theory (Myers and Majluf, 1984) and Rashid (2012). On the other hand, a statistically and significant positive linkage is reported in Namibia and South Africa. This estimate posits that these companies have a tendency to take on more debts during periods of high idiosyncratic risk which corresponds to the trade- off theory. "It is reported that debt increased by 60% in Namibia and 63.3% in South Africa in 2019 (Trading economics, 2021).

On the other hand, it is seen that there is statistically and significant positive nexus between market risk and debt to equity in Zimbabwe. In this case, when the level of macroeconomic risk is heightened, companies have a tendency to employ more leverage. In short, companies do not finance investment and capital expenditures using equity financing due to the rise in the cost of capital but prefer to employ leverage to carry out their expenditures. "In 2019 Zimbabwe public debt amounted to USD 181,867 million and has expanded to USD 167,408 million since 2018. This amount refers to the debt in 2019 that reached 113.92% of Zimbabwe GDP, a 52.43 percentage point rise from 2018, when it was 61.49% of GDP (Country economy, 2021)". The findings are in conformance with Rashid (2012). Meanwhile, a statistically significant negative relationship is posited in South Africa. During high economic downturns, South African companies might reduce the employment of debts. Botswana, Mauritius and Namibia have positive but insignificant results whereas Malawi, Tanzania and Zambia have negative coefficient, but they are insignificant.

Based on the results gathered, it is observed that Namibia has a positive and statistically relationship between foreign exchange risk and debts to equity ratio. This finding is similar to the second regression. The findings are in line with Purnanandam (2008) who stipulated that companies with tighter financial constraints / higher leverage are more likely to use foreign exchange derivatives for hedging purposes. Moreover, according to Bris and Koshiken (2000), they argued that in terms of debt structure, a positive exposure is expected as currency movements might trigger a raise in leverage during times of currency depreciation. On the other hand, Malawi, Mauritius and Tanzania exhibit an insignificant positive association whereas Botswana, South Africa and Zambia report an insignificant negative relationship.

Moreover, the study reports a statistically significant and negative association between return on assets and debt to equity ratio in Malawi. In short, companies prefer to employ internal financing and diminish the level of debts when there is an improvement or increase in the level of profitability. This finding is in line with the pecking order theory (Myers and Majluf, 1984). Contrarily, Botswana, Mauritius, Zambia and Zimbabwe exhibit an insignificant negative nexus while Namibia, South Africa and Tanzania illustrate an insignificant positive association.

Now, Model 1 (Investments and Debt to equity ratio) mentions that Botswana, Malawi, Namibia, South Africa, Tanzania and Zimbabwe state statistically insignificant negative figures. However, Mauritius is the only country where a statistically significant negative relationship has been observed. This result can be due to that Mauritius, there are many low- growth companies, the higher the level of debts will compel those companies to reduce investments. Recently, Ahn et al. (2006) discovered that the negative relation between leverage and investment in diversified institutions is significantly stronger for high Q segments than for low Q business segments and is significantly stronger for non-core segments than for core segments. As to low-growth leverage will force them to give up investment. Meanwhile, debt can restrict the excessive investment in non-profit programs. Hence, it protects the interest of shareholders, thus strengthening the negative correlation between debt financing and investment behavior. As to the high growth company, higher level of debt can induce the impulse in asset substitution. They invest in high-risk projects in seek of high profits, though there exists risk of bankruptcy, which can restrict the investment behavior to some extent.

Finally, all countries with the exception of South Africa and Zambia have statistically and significant positive nexus between size and debt to equity ratio. "It is stated that more total assets provide the opportunity to the managers of SADC countries that they could include more debt in their capital structure by adding more assets as collateral". According to Ang et al. (1982) postulated that bankruptcy costs are relatively higher for small companies, because large firms indicate more stability and hold more diversified portfolios of activities. This situation supports a positive relationship between firm size and total and long-term debt. Conversely, Botswana, Mauritius and Zimbabwe have an insignificant positive association whereas Malawi, Namibia and Tanzania exhibit an insignificant negative linkage.

Table 3: Regression Analysis Results- Model 1: Capital structure and Debt to Equity Ratio

REGRESSORS	Bostwana		Malawi		Mauritius		Namibia		South Africa		Tanzania		Zambia		Zimbabwe	
	FE	RE	FE	RE	FE	RE	FE	RE	FE	RE	FE	RE	FE	RE	FE	RE
Constant	0.09	0.07	0.51	0.48	0.33	0.24	0.19	0.14	0.17	0.07	0.43	0.36	0.13	0.05	0.52	0.37
LFINLEV	11.83*	10.7	-7.48	-6.52	30.14***	28.15	-0.83	0.72*	15.67***	13.52	4.09	3.02	256.09*	115.2	13.85	12.52
LEVBETA	-1.94	-1.07	-8.86	-7.32	-3.75	-2.89	1.66**	1.48	1.42***	0.86	6.51E-02	0.08	-34.71*	-26.85	-0.91	-0.76
MRISK	-6.94	-5.27	97.75	82.12	-6.27	-5.21	-13.99	-12.85	-7.67*	-6.89	2.08E+01	0.02	182.94	95.21	148.76**	139.52**
FREX	-64.21	-63.0	3.08	2.07	35.64	33.24	93.65**	90.65	-15.32	-10.30	0.78	0.64	-443.99	-224.2	0.00	0.00
ROA	-0.05	-0.02	-5.74*	-4.82	-0.15	-0.04	0.11	0.09	0.06	0.03	0.00	0.00	-0.33	-0.29	-0.44	-0.43
INV	-2.69	-1.56	59.95	48.82	-21.96***	-20.14	-1.72	-1.68	-1.28	-1.25	-9.19	-8.03	-0.04	-0.03	-1.28	-1.15
SIZE	1.61	1.03	-0.56	-0.36	0.85	0.75	-0.46	-0.34	0.61***	0.59	-0.06	-0.05	36.13**	34.2**	1.49	1.34

***, **, * stands for statistical significance at the 1%, 5% and 10%.

***, **, * stands for statistical significance at the 1%, 5% and 10%.
(Author's computation)

Table 3.illustrates the regression analysis results: Model 1- Capital Structure and Debt to Equity Ratio.

While working with Panel data, the choice between fixed effect and random effect model has to be made. These techniques help to control time invariant inter-firm heterogeneity. Hausman test is used to choose the suitable model and in cases where the level of significance of the chi-square test is lower than 5%, then fixed effects model has to be applied. Hence this test is conducted to check whether fixed effect model or random effect model is appropriate for this study.

Country	Chi-Square	Model to be opted
Botswana	7.24**	Fixed Effect is appropriate
Malawi	3.26**	
Mauritius	11.96***	
Namibia	7.82*	
South Africa	25.86***	
Tanzania	13.25*	
Zambia	9.61***	
Zimbabwe	6.54**	

Table 4.represents the Hausman test results of the study.

The estimates of the Hausman test with a chi square value of Chi- square of the different countries in Table 4 supported the option of the fixed effect model. The study therefore selects the coefficients of the fixed effect model for further discussions.

Reverse Causality: Capital Structure and Idiosyncratic and Macroeconomic Risk

Table 5: Reverse Causality- Capital Structure and Idiosyncratic, Macroeconomic and Foreign Exchange Risk

Null Hypothesis	Botswana		Malawi		Mauritius		Namibia		South Africa		Tanzania		Zambia		Zimbabwe	
	F-Statistics	Prob.	F-Statistics	Prob.	F-Statistics	Prob.	F-Statistics	Prob.	F-Statistics	Prob.	F-Statistics	Prob.	F-Statistics	Prob.	F-Statistics	Prob.
BRISK does not Granger Cause FINLEV	24.21950	0.000	3.291	0.041	2.013	0.135	0.380	0.684	1.411	0.244	9.185	0.000	3.492	0.033	7.492	0.001
FINLEV does not Granger Cause BRISK	0.00487	0.995	5.839	0.004	40.431	0.000	0.026	0.074	1.787	0.168	2.272	0.108	0.531	0.589	0.118	0.888
MRISK does not Granger Cause FINLEV	0.231	0.793	1.858	0.160	0.747	0.475	0.317	0.728	10.674	0.000	1.976	0.143	5.261	0.006	1.183	0.308
FINLEV does not Granger Cause MRISK	0.091	0.912	0.991	0.375	5.767	0.004	0.352	0.704	0.139	0.870	1.309	0.274	0.232	0.793	1.019	0.363
FREX does not Granger Cause FINLEV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FINLEV does not Granger Cause FREX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 5: Granger Causality Test Estimates of the study.

To investigate reverse causality, Granger causality test was employed using Eviews 12 to determine whether risk Granger causes capital structure, or it is capital structure that Granger causes risks of institutions in SADC countries. Table 5 reported that the F- Statistics are not significant meaning that the null hypothesis of no causality is not rejected. In other words, there is no reported reverse causality in the study.

Based on this, the study is utilizing an instrumental variable (IV) estimation that is System GMM econometric application.

Conclusion

The rationale of the study was to investigate the impact of idiosyncratic risk and macroeconomic risk on financing decisions on eight countries listed firms from the SADC region. A panel data set of 2738 observations for a time period of 12 years spanning from 2008 to 2019. Different proxies of risk for both idiosyncratic, macroeconomic and foreign exchange risk are employed. The estimates can be summarized as follows:--

In this research, the findings postulate that there is a statistically significant and negative association between idiosyncratic risk and debt to equity ratio in Zambia. In other words, when there is high idiosyncratic risk, debt to equity ratio is low. This result makes sense as banking and financial institutions may charge a higher risk premium for companies having a high-risk profile. Due to this, the cost of debt financing might augment. Therefore, companies prefer to employ internal financing and reduce debts due to high bankruptcy risk and costs. This finding is in line with the pecking order theory (Myers and Majluf, 1984). Conversely, a statistically and significant positive linkage is reported in Namibia and South Africa. This estimate posits that these companies use more debts during periods of high idiosyncratic risk which corresponds to the trade- off theory and asymmetric information theory.

Meanwhile, a statistically and significant positive nexus between market risk and debt to equity in Zimbabwe is reported. In this case, when the level of macroeconomic risk is heightened, companies employ more leverage. In short, companies do not finance investment and capital expenditures using equity financing due to the rise in the cost of capital but prefer to employ leverage to carry out their expenditures. The findings are in conformance with Rashid (2012). Meanwhile, a statistically significant negative relationship is posited in South Africa. During high economic downturns, South African companies might reduce the employment of debts.

Finally, Namibia has a positive and statistically relationship between foreign exchange risk and debts to equity ratio. The findings are in line with Purnanandam (2008) who stipulated that companies with tighter financial constraints / higher leverage utilize foreign exchange derivatives for hedging purposes.

Finally, even though the SADC countries investigated involve eight countries listed on the stock exchange. The study postulated that each respective country has its own capital structure behaviour, which is based according to the market structure, industry, stock market operations, market capitalisation and size of the country. On the other hand, the study vindicates that companies take lower leverage where there is a boost in either idiosyncratic or macroeconomic risk for whichever use of financing method. The estimates support the literature of pecking order theory, trade- off theory.

Appendix A. Expected Hypothesis Signs

Table 2 reports the expected hypothesis signs for the three models. Firstly, impact of firm risks (accumulated) and macroeconomic risks (GDP) on financial decision considering the effect of Debt to Equity on financial decisions.

Variable	Notation	Model 1 and 2	Predicted Effect	Explanation	References
Dependent					
Debt Equity Ratio		*		N/A	
Net Profitability	New Retained Earnings difference / Book Value of Total Assets	*			Rashid (2012)
Idiosyncratic Risk	Beta on Leverage		Negative	A negative nexus between firm risk and leverage signifies that firms will use less debts in their capital structure.	Rashid (2012) , Baum et al. (2016)
Macroeconomic Risk- GDP	GARCH Model and using PCA	*	Negative	A negative relationship between macroeconomic risk and leverage states that companies tend to utilize less debts in their capital structure.	Rashid (2012) , Baum et al. (2016)
Foreign Exchange Risk	Std. Deviation of monthly changes real effective foreign exchange rate	*	Negative	According to studies such as Sinha (2015), foreign exchange risk is negatively affected by total debt. Therefore, it can be considered that firms that have high foreign exchange risk, they tend to take lower total debt in their capital structure.	Sinha (2015), Khanna (2015), Panda (2015)
Return on Assets	ROA	*	Negative	Myers (1984) found a negative relationship between capital structure and profitability on the basis that successful companies do not need to depend so much on external funding, thus relying on their internal reserves accumulated from past profits.	Myers (1984), Martin et al (2017)
Investment	INV	*	Positive	A positive relationship would mention that an increase in capital investment will lead to an increase in the use of debts as a means of external finance	Titman and Wessels (1988), Rashid (2012),
Size	SIZE	*	Positive	A large-sized company is less likely to become bankrupt, and therefore attracts more debt. Therefore, corporations with more total assets use the higher level of debt in their debt equity mix. More total assets provide the opportunity to the managers that they could include more debt in their capital structure by putting the more assets as collateral.	Lim (2012), Alnajjar (2014)

Table 2 represents Expected hypothesis signs of the study.

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Building career skills through virtual exchange

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career, COIL (Collaborative Online International Learning), Netherlands Thailand, USA, virtual exchange

Abstract

As globalization expands and interactions between people increase around the world, organizations need individuals with skills that are not only acquired from traditional curricula. Furthermore, the World Economic Forum has noted that, by 2025, 97 million new jobs will be created with the need for soft skills such as leadership, intercultural fluency, and teamwork. Therefore, higher education institutions may need to develop high-impact pedagogies with internationalized curriculums that bring results beyond classrooms and articulate the link between internationalization and employability. Business educators identified these career success skills through a virtual exchange project known as Collaborative Online International Learning (COIL) in two pairs of courses, Thailand-USA and the Netherlands-USA. Students from Queens College, City University of New York in the U.S. (n=54), Assumption University in Thailand (n=22), and The Hague University of Applied Sciences in the Netherlands (n=19) engaged in a shared assignment across borders through COIL. Using discussions, questionnaires with a five-point Likert scale, and regression analysis, authors discovered that, by using virtual exchange in higher education instruction with an innovative COIL project that included intercultural communication, students build competencies that employers seek. Students specifically enhanced their ability to speak publicly (oral communications), to interact respectfully with all people (intercultural fluency), and to identify their strengths relevant to career goals (career management). The objective of this study is to encourage university leadership to promote and prioritize COIL in order to increase content knowledge and employability.

Introduction

With today's challenges, employability is the center of higher education strategic planning. According to the National Association of Colleges and Employers (NACE, 2020), which surveyed 150 organizations from New England, the Southwest, the Southeast, the Rocky Mountain/Far West, the Plains, the Mideast, and the Great Lakes in the United States, across 22 industries and varying market shares, the percentage of employers that screen candidates by grade point average or area of study has decreased by 10%. Employers valued attributes that were not gained from traditional curricula (Deming, 2017). They were seeking skills on a candidate's resume or in an interview that showcased how broadly prepared a college graduate was for a successful transition into the workplace. NACE (2020) noted that these skills that reflect career readiness competencies are (1) *Critical thinking*, (2) *Oral/written Communications*, (3) *Teamwork*, (4) *Information Technology Application*, (5) *Leadership*, (6) *Professionalism*, (7) *Career management*, and (8) *Global/Intercultural fluency*. Outside the United States, the European Commission stated, in UNESCO's Declaration of Incheon (2015), "People need the right set of skills and competences to sustain current standards of living, support high rates of employment and foster social cohesion in the light of tomorrow's society and world of work." UNESCO noted that internationalization of learning was a global

trend, particularly due to technology-enabled cross-border academic access. By incorporating this opportunity into higher education, the European Commission recognized that employability of graduates could be enhanced by fostering these skills that enable graduates to participate actively in labor markets. However, literature suggests that, although higher education institutions acknowledge the need to include employability into syllabi, academics are skeptical as it is sometimes viewed as an invasion on academic freedom and diminution of academic standards (Gunn & Kafmann, 2010). The reason for this hesitance may be due to the conviction that academia educates within a branch of knowledge for lifelong learning or future study rather than preps graduates for immediate employment. Furthermore, in order to integrate career readiness competencies that are relevant after graduation into course syllabi, faculty has to collaborate with educational technologists, administrators, and career coordinators which requires additional professional workload that may not complement tenure or promotion. Their concern can be addressed by incentivizing technology-enabled learning and by promoting high-impact pedagogy (Kahn & Agnew, 2017). Recognition and reward systems could support faculty that use innovative tools in their curricula that focus on building specific professional skills. Therefore, this article demonstrates how business educators identified dominant career readiness competencies by utilizing technology to engage students across borders through an innovative virtual exchange project known as Collaborative Online International Learning (COIL).

Theoretical background

Global exchange, Global skills

As Altbach and Knight (2007) indicate, globalization and internationalization, although related, are not the same. Globalization includes the economic, political, and societal forces while internationalization includes global policies and practices of academic institutions (Altbach & Knight, 2007). As globalization integrates world economies, the World Economic Forum discovered that the need for Data/Artificial Intelligence (AI) and People/Culture is expanding (WEF, 2020). The workforce is quickly automating while displacing 85 million jobs by 2025 (WEF, 2020). However, the World Economic Forum also noted that, by 2025, 97 million new jobs will be created with the need for soft skills that AI cannot replicate. In a developing world, the value of abilities such as leadership, intercultural fluency, and teamwork will likely increase in order to manage AI. Pursuant to Pew Research Center's 2016 survey, respondents believed that, although technology may outperform humans, AI would not be able to duplicate creative human skills in diverse environments (2017). These respondents saw education as a medium that could develop these competencies to prepare people to work alongside AI. Among the findings from the National Academies of Sciences report (2017), experts recommended changes in educational environments for future labor force, "The education system will need to adapt to prepare individuals for the changing labor market." Therefore, there is a growing demand for employees with certain skills, such as the ability to work in teams, adapt to change, and understand behaviors. According to Deepa and Seth (2013), as workplaces become diverse and teamwork becomes common practice, such abilities have become indispensable. The authors note that "75% of long-term job success depended on people skills and only 25% on technical skills" (p.9).

One essential competency is *intercultural fluency*, i.e., the ability to interact respectfully with all people and understand individuals' differences (NACE, 2020). "Understanding the cultural ways behind behavior," is essential, according to Gardenswartz, Cherbosque, and Rowe (2008), as "it helps people recognize a wide array of norms that exist around the world, from how people communicate to how they participate in meetings" (p.4). To train students to become interculturally aware, many institutions organize exchange programs, such as study abroad with universities worldwide. Although this is a valuable experience, many students cannot afford to participate in such exchanges because they do not master English well or they lack financial resources (Guimares et al., 2019). Therefore, universities are attempting to make internationalization more inclusive by offering opportunities to gain *intercultural fluency* at home. This idea of internationalizing at home could be in various forms such as integrating global perspectives into the curriculum (Kahn & Kahn, 2017), creating local opportunities for student engagement with international organizations, fostering engagement with international students, or including online work with partner universities. Another approach to gaining this important skill can be through collaborative online learning. Lock and Redmond (2021) studied online collaborative learning

over a 12-year period and found that, when online discussion engaged in real world issues that related to today's diverse classrooms, an organic environment emerged and a community (one that respected values, customs, etc.) was fostered. This indicates that communication between classrooms develops *intercultural fluency* through the use of technology and collaboration.

Although implementation of internationalization across institutions and countries is varied, data clearly indicates that when international components exist in a curriculum (Withanachchi, 2020), when students are mobile (Beelen & Jones, 2018), and when cultural diversity is understood (AU, 2019), then employability increases. A study conducted at Queens College (QC), the City University of New York, found an interesting outcome when a global perspective was included into the discipline. According to this study of 524 QC alumni over two decades, findings revealed that, out of the 74% who did not study abroad, a globalized curriculum increased the probability of them being employed full-time by 69% and increased their first job wage by 11.5% (Withanachchi, 2020). This indicates that if an international component is embedded within a curriculum, career success could be positively influenced. Despite such outcomes, the concept of internationalization has traditionally been on mobility. In the Netherlands, several studies prove that student mobility helps students acquire employability skills (Beelen & Jones, 2018). The European Commission has brought student mobility to the center of agendas and institutions have included such effects in higher education policies (UNESCO, 2015).

However, according to Van Gaalen and Gieslen (2016), between 2003 and 2013, an average of only 22.6% of Dutch graduates had been internationally mobile. To make up for this loss of opportunity for the 77.4% of students who stayed home, many higher education institutions explore other forms of internationalization, such as foreign lecturers, international projects, or intercultural modules. An example of such implementation is the online delivery of education. This model could be a student enrolled at a foreign university while "at home" or in another location, such as Dutch students studying in Belgium or German students studying in the Netherlands (Beelen & Jones, 2018). Such domestic experience has been shown to be valuable in building useful intercultural knowledge with positive effects on student learning and career outcomes (Rubin, 2017). This increased attention is not limited to the West, it is also gaining traction in the East. For example, in Thailand, internationalization is incorporated differently. Thai international university programs refer to those using English as the medium of instruction to necessitate global economic trends and upward socioeconomic mobility. Such efforts to internationalize higher education in Thailand show a quantitative growth in programs and an increase in job placement (AU, 2019). However, despite a growth in these programs, graduates do not recognize the importance of professional skills as complements to knowledge gained within a discipline.

A survey of recent graduates from the Martin de Tours School of Management and Economics (MSME) at Assumption University (AU) of Thailand indicated that English communication and understanding of cultural diversity were ranked among the lowest skills from a students' perspective on the curriculum (AU, 2019). Therefore, institutions need to articulate the link between internationalization and employability. UNESCO's (2015) interviews and case studies found that employers perceived a lack of systematic higher education institution practice that promoted employability. Instead, there seemed to be an irregular good practice at individual faculty or departmental levels (UNESCO, 2015). As employers recognize the importance of human competence in diverse environments, universities need to invest in resources that encourage curricula innovation towards career success.

What is COIL?

While several institutions internationalize their curricula with international students and lecturers, others have explored other innovative methods through technology. For example, Dai's study (2019) on how intercultural knowledge can be enhanced in a technology-enabled learning environment identified that, while all undergraduate students formed cultural-specific knowledge, some students built deep cultural knowledge and insightful cross-cultural interpretations. The execution of a sustained, technology-enabled person-to-person interaction between individuals or groups from different cultural backgrounds could be broadly defined as virtual exchange (O'Dowd, 2018). Virtual exchange has evolved over the last three decades in different contexts and terminology such as telecollaboration, online intercultural exchange, collaborative online international learning (COIL), globally networked learning, etc. (O'Dowd, 2018) and different online group-based projects such as X-Culture (Taras & Ordeñana, 2015) and Globally

Distant Multicultural Teams (Osland, et al., 2004). The COIL approach was developed at the State University of New York (SUNY) in 2006, by Jon Rubin (Rubin, 2017). The objective is to connect (sometimes interdisciplinary) classes from different institutions, in different countries, to work together virtually on a common project. This is facilitated by instructors in the partner universities who implement course modules so that the two different student populations collaborate and engage in communication. The fundamental difference between COIL and other online learning, according to Guth and Rubin (2015), is the collaborative nature of COIL, the shared syllabus, and the emphasis placed on using cultural differences to interpret content. Several academics from Vietnamese universities, for example, who have successfully used COIL, acknowledge that such methods help students expand social networks, acquire a better cultural understanding, and develop a stronger professional identity (Nghia, Giang & Quyen, 2019).

Although COIL was developed more than a decade ago, it is not widely practiced, not institutionalized, not recognized as common pedagogy, and not invested as a tool for student outcome. Some reasons may be due to the lack of knowledge of COIL or misconceptions about it. One common misconception may be that COIL replaces teaching and learning or acts as substitute for in-person learning rather than adding to a pedagogical approach. Another misconception could be that COIL requires a mastery of various online tools. According to Van Gaalen and Gielesen (2016), some universities recognize the importance of internationalization at home, but few formulate a coherent strategy to implement it due to lack of time, funding, and instructor training. Such preconceived ideas necessitate illustrating COIL as a novel pedagogical practice that utilizes minimal resources with many benefits (Rubin, 2017). In the USA, COIL is gaining popularity but is rare at Queens College. In the Netherlands, COIL is well-known in certain universities, but not generally applied. In Thailand, COIL is uncommon. Since there is no definitive COIL methodology, the objective of this project was to use the concept of a shared assignment across borders through an innovative virtual exchange project that focused on building career readiness. Therefore, the goal of this article is to identify specific career readiness skills gained through collaborative online international learning (COIL) in the interest of encouraging university leadership to promote COIL projects and commit to prioritizing COIL in education.

Method: The Coil Project

Since COIL was utilized as a tool to build competencies, the intentionally designed international activities were integrated into two pairs of courses, Thailand-USA and the Netherlands-USA. Students in the United States were from Queens College, the City University of New York. Students from Thailand were enrolled at Assumption University. Students from the Netherlands were at The Hague University of Applied Sciences. The paring did not occur simultaneously. They were two separate projects that occurred in two consecutive semesters, Fall 2019 and Spring 2020.

The demography of the enrolled student population at Queens College is 28.4% Hispanic or Latino, 28.1% Asian, 26.9% White, 8.62% Black or African American, 2.28% Two or More Races, 0.346% Native Hawaiian or Other Pacific Islanders, and 0.316% American Indian or Alaska Native (Data, 2021). The Assumption University in Thailand has a student body of about 19,000 that includes a large component of foreign students from 75 countries of the world (AU, 2019). The international community of scholars similarly represents a diverse population for students to relate to. The Hague University of Applied Sciences (THUAS) also has a diverse and internationally oriented student population. Some of the THUAS student population are 'bi cultural' students (meaning that they are Dutch students with a migrant background). Some of the THUAS student population are first generation students (meaning that they are the first in their family to enter higher education).

The sample included 54 economics and business undergraduate students from Queens College, a four-year public college in a New York City borough with a diverse undergraduate population. Out of the 54 students in the sample, 22 collaborated with 22 multicultural undergraduate students in a statistics and information literacy course from the Martin de Tours School of Management and Economics (MSME) at the Assumption University of Thailand in 2019. The 22 students from MSME included 5 students from China, Japan, India, Vietnam, and the rest from Thailand. Students produced a short video to introduce themselves and their campus, then worked in global teams in a parallel statistics project to present economic solutions to an intercultural audience based on their topics. They were required to analyze

quantitative data on a global issue and compare it to qualitative data that was obtained through discussion of the issue with peers across the border.

The remaining 32 students in the sample collaborated with 19 undergraduate students from the Faculty of Management & Organisation at The Hague University of Applied Sciences (THUAS) in the Netherlands in 2020. These students were of various ethnicities (such as Dutch, Vietnamese, Lithuanian, etc.) and were of interdisciplinary majors taking a course in journalism and media. Students worked in global teams, each with a different global issue. THUAS students interviewed their QC counterparts about their quantitative data and opinions, then wrote a journalistic article about the issue. Topics included child poverty, sustainable living, and of course, since the assignment took place just when the COVID-19 crisis started, many articles were about the pandemic and its impact on the economy. The projects lasted six weeks in which students discussed various global issues referencing their own languages, socio-cultural, and educational backgrounds.

Results and Discussion: The Student Experience

Intercultural competence of Netherlands-USA

The pre- and post-questionnaires were delivered at the beginning and end of the project. They were completed by 54 Queens College students in the U.S. to explore participants' self-perceived intercultural competence, based on the International Cross-Cultural Experiential Learning Evaluation Toolkit (Rhodes, 2010), and to identify specific competencies that were influenced by the COIL project. The students were asked questions on their openness, cultural worldview and knowledge, general connection of experience to personal growth, connection of cultural experiences to academic context, cultural self-awareness, general transfer of knowledge and skills, understanding of global context and impact, and effective communication (Rhodes, 2010). The self-assessment also gave students the opportunity to reflect on previous experiences with cross-cultural opportunities, such as study abroad, language study, growing up outside the U.S., languages spoken at home, etc. The goal was that the pre- and post-questionnaires could measure the impact of collaborative online international learning on career success skills.

Table 1. Anecdotal evidence from students in the USA
What aspects of this project were most useful or valuable?
I believe this project taught students how to be accountable for their actions. The communication skills that I learned in this class are invaluable.
Cooperation and communication with others are so important, this is the most important thing I learnt from this project.
This course forced us to look at the world outside the United States and how vastly different it can be.
This project could add to my career because I had to learn to communicate and work together with members who had significant time differences.
…working in a group and managing a group within your class and out of country was a big learning a curve. That on its own shows how to work as a team…which can help me in my future.
Hearing about firsthand experiences of our COIL team members overseas was most useful. Even among them there was diversity in experiences growing up.
The views are different from us and theirs. This project helps us to collaborate with international people and relate to them. The most valuable aspect of this project is we got a chance to make new friends and know about their ideas.
The time difference was a huge challenge.

Regarding intercultural competence, a five-point Likert scale (1=Strongly Disagree, 5=Strongly Agree) gauged the U.S. students' self-perceived dimensions after the COIL project. The 8 dimensions of a student's (self-identified) intercultural competence included COIL 1 = I am more confident about communicating with people whose first language is not the same as my own, COIL 2 = I am better able to understand my own culture and personal perspectives, COIL 3 = I am better able to communicate with

individuals who have different cultural backgrounds, COIL 4 = I am less interested in studying or travelling to other countries, COIL 5 = I am less interested to keep abreast of news and events in my partner's country, COIL 6 = I am more interested in working only with those who look and talk like me, COIL 7 = I am more aware of those from different national, cultural, religious, or socioeconomic backgrounds, and COIL 8 = I am less interested in learning about global or international issues. With the U.S. students, the results showed that 85% strongly agreed/agreed that they were "better able to communicate with individuals who had different cultural backgrounds" (COIL 3), 73.5% were "more aware of those from different national, cultural, religious, or socioeconomic backgrounds" (COIL 7), and 59% were "more confident about communicating with people whose first language was not the same as my own" (COIL 1). This aligns with Chun, (Junior & Finardi, 2018) who noted that, by participating in COIL projects, students gain "an understanding not only of the culture and language being studied but also the readiness to suspend disbelief and judgment about the other culture and the willingness to reflect on one's own culture and question the values and presuppositions in one's own cultural practices" (p. 21). Some anecdotal evidence from students in the USA is displayed in Table 1.

The qualitative date indicated that the two most impactful areas of student learning were *communication* and *teamwork.* As Table 1 demonstrates, *communication* became vital as a result of the project. Additionally, *teamwork* trained students to perform collaboratively and relate to international cultures. Most students found such a virtual exchange to be transformative. One student stated, "I never thought that living in New York, I would make friends with someone from across an ocean." Some students felt that they had conquered their stage fright and were able to take initiative when speaking out loud. However, setbacks also occurred due to unforeseen events of the 2020 pandemic that hindered the exchange.

During discussions, the Netherlands students, at The Hague University of Applied Sciences, stated that their cultural differences forced them to take a different approach when working with students from the U.S. For example, how much should they share about themselves initially? According to Erin Meyer, in her book *The Culture Map*, Americans are a lot more open initially, and tend to share more about themselves. The Dutch, on the other hand, tend to be more reserved with people they have just met, and take more time to build up relationships (2014). Also, more practically, the students had to decide which channels to use to communicate. Students organically selected social media channels and What App to communicate within teams. According to Meyer, email (and WhatsApp) etiquette varies greatly from culture to culture, and here too, cultural misunderstandings can easily occur (2014). By looking at the assignment with the eyes of students from a different field of study, the journalism students were forced to think out of the box. Students valued experience through Facebook groups or videos to introduce their cities, school, or hobbies. Also, several mentioned how working on a common assignment made them feel closer to their partners and bridged their differences. Students felt that group discussions facilitated idea generation and creativity, it improved productivity, and boosted motivation. Some of the biggest challenges were scheduling meetings.

Students observed that accommodating busy schedules within a team was hard enough without the additional element of time differences. Similar to the reference by Kahn and Agnew (2017), the "global classroom" helped students "see deeply across the world while reflecting upon themselves" (p. 55). The COVID-19 pandemic also heightened the difficulties of making and respecting appointments. However, as some students reflected, the pandemic accelerated student reliance on technology; to work remotely, navigate time zone differences, and empathize with global events. The virtual exchange also gave students an opportunity to connect profoundly. For example, an international student from Queens College returned home to Stockholm, Sweden, amidst the pandemic, but was able to complete the COIL project with her partners in the U.S. and Netherlands despite the sudden shift to online learning. She was even able to provide comfort to her peers affected by the coronavirus through WhatsApp. Suddenly, collaborating with peers abroad became essential. This insight reflects skills that could not be gained through content knowledge without the application of a COIL project.

Career readiness skills of Thailand-USA

To identify which competencies were influenced by the COIL project for Queens College students, the eight independent NACE (2020) skills were tested against the different dimensions of intercultural competence using multiple regression (see Appendix). Specifically (1) *Critical thinking*, (2) *Oral/written Communications*, (3) *Teamwork*, (4) *Information Technology Application*, (5) *Leadership*, (6) *Professionalism*, (7) *Career managemen*t, and (8) *Global/Intercultural fluency* were tested against the 8 COIL dimensions of intercultural competence. The multiple regression results indicated that COIL 3, the dimension in the COIL project that enabled students "to communicate with individuals who have different cultural backgrounds," was the most significant predictor across all career readiness competencies (p<0.01) when country (Thailand/Netherlands), discipline (same/different), type of project (same/different) and team size (small/large) were held constant. COIL 2, the dimension in the COIL project that executed students' "understanding of their own culture and personal perspectives," significantly influenced *Intercultural fluency* (p<0.01) and *Career management* (p<0.05) skills, while COIL 8, interest "in learning about global or international issues," influenced *Intercultural fluency* (p<0.05). This demonstrates that the COIL project was beneficial for U.S. students to interact respectfully with all people (*Intercultural fluency*) and identify strengths relevant to career goals (*Career management*). It was interesting to discover that personal accountability and effective work habits (*Professionalism*) was affected by the country in which the COIL project was situated.

At the end of semester, MSME students at Assumption University, in Thailand, also completed a questionnaire to assess their development of competencies after participating in the COIL project. It was conducted using a five-point Likert scale (1=Strongly Disagree, 5=Strongly Agree) with an open-ended question based on seven skills (Critical Thinking, Oral Communications, Teamwork, Diversity, Information Technology, Leadership, and Professionalism) that students could have developed through the collaboration. As Table 2 shows, among all seven skills, diversity awareness (i.e., *Intercultural fluency*) skill had the highest rating with an average score of 4.23 while the lowest rating of 2.55 was devoted to the *Professionalism* skill. This demonstrates that, when Thai students completed a COIL project that involved collaboration in global teams, they perceived an enhancement in understanding and respecting diverse cultures, races, ages, genders, sexual orientations, and religions (*Intercultural fluency*) but not as much in understanding effective work habits or dependability (*Professionalism*).

However, during the discussions, students stated that they had a better understanding of how diversity affected the research methodology and work ethic. Additionally, the sample results revealed that the *Oral communications* was the second highest rating skill. Students found that the COIL project increased their ability to articulate thoughts and ideas clearly and effectively in oral forms to peers in the U.S. Although English is the medium of instruction at AU, Thai students rarely use English for daily communication. Therefore, weekly communication with native English speakers enhanced confidence in non-native English speakers. Interestingly, when 1039 market employers were surveyed across Thailand, both English communication and diversity awareness were competencies that were also expected as the top skills from MSME graduates (AU, 2019). This study's results reflect the preferences of these employers who seek candidates from institutions that produce graduates with good language skills who understand cultural diversity as they enter the labor market.

Table 2. Development of student's skills

Skills	N	Mean	St. Dev.	Min	Median	Max
Critical Thinking	22	3.45	1.06	1.00	4.00	5.00
Oral Communications	**22**	**4.18**	**1.01**	**1.00**	**4.00**	**5.00**
Teamwork	22	3.18	0.85	1.00	3.00	5.00
Diversity	**22**	**4.23**	**0.87**	**2.00**	**4.00**	**5.00**
Information Technology	22	3.00	0.93	1.00	3.00	5.00
Leadership	22	2.77	0.81	1.00	3.00	4.00
Professionalism	22	2.55	1.01	1.00	2.00	4.00

Conclusions

General findings

Despite varying levels of academic standards and degrees of teamwork, there were areas of overlap for Netherland-USA and Thailand-USA. The most significant predictor across all career readiness competencies was communicating with individuals across cultures. This demonstrates that, in order to enhance certain skills, it is essential to include intercultural communication in the curriculum. When Economics and Business students collaborated on a project (despite subjects) that involved discussion with peers from another country, they became individuals who knew how to respect cultural differences and understand international customs. The finding that a cross-cultural exchange leads to improved intercultural competence or improved communication skills may be expected or logical, but the finding that internet technology enhanced professional skills through curriculum innovation is critical. At the end of this study, we reflected on our methods and collaboration. All three faculty partners found that it was necessary to initiate icebreakers for students to become congenial with one other. These initial icebreakers encouraged dialogue and facilitated meaningful discussions. As students became more comfortable in their teams, they were able to complete course-specific tasks. They demonstrated the ability to speak publicly (*Oral communications*), to interact respectfully with all people (*Intercultural fluency*) and identify their strengths relevant to career goals (*Career management*). This aligned with the findings of Gardenswartz et al. (2008) and the confidence suggested by Guimares et al. (2019) through weekly communication with native English speakers. The results show that, by using virtual exchange by means of an innovative COIL project, educators were able to link professional skills with employability while teaching in respective disciplines for lifelong learning. These findings also reflected the work of Kahn and Andrew (2017), in which students were encouraged to think about what they learned and what they could do with their knowledge, skills, and attitudes.

Limitations

The research design considered validity and reliability. In terms of validity, the generalizability of this study was limited to a sample of students from institutions in the U.S., Thailand, and Netherlands in particular disciplines; therefore, it might not be generalizable to other institutions or disciplines. Also, bias in self-evaluation may result from different motivations. However, the appropriateness of the measures was relevant, and the accuracy of the results was consistent. In terms of reliability, the study was consistent as data collection techniques and analytic procedures could be replicated to produce similar results. However, the study's use of analysis could be criticized based on causal analysis of the relations among variables. For instance, a first-generation or new immigrant student may have scored high with intercultural fluency prior to the COIL project. One way to improve such analysis would be to perform a lagged study to establish temporal precedence.

Suggestions for future research

Building on the findings of this study, future research could compare perceptions across countries. For example, by analyzing differences in communication styles, were views on integrity and respect different? How would that affect career success skills? An ethnographic study may provide greater understanding of the contexts of interaction. Another study would be to analyze the impact of a COIL initiative on knowledge content. Would the implementation of collaborative online learning in an international setting that included discussion increase a student's knowledge of course content? Additional research could study COVID-19 and the impact of internet technology in higher education learning in relation to the Fourth Industrial Revolution.

Implications for practice

Although collaboration required careful coordination on the educators' side with one partnership occurring during the chaos of a pandemic, these notable results suggest that it is imperative for faculty to craft a curriculum that links international interactions, career success skills and learning goals. As the most competitive organizations select individuals who have all required skills, there is a need for higher education institutions to communicate that internationalized curriculums are high-impact pedagogies that bring results beyond classrooms. Innovative COIL projects that apply virtual pedagogy can also ensure equity of graduate outcomes and build knowledge-based economies. With the COVID-19 pandemic, COIL has uncovered many opportunities to teach global competencies and collaboration across borders. As institutions across countries realize the importance of building such skills in diverse environments, COIL should be institutionalized with funding as a lever to develop student employability. One of the suggestions listed by Deloitte Global Business Coalition for Education (2018) is for businesses to engage with education systems to encourage integration of the specific skills in program design. This could mean providing opportunities to job shadow and mentor or partnering with higher education institutions to sponsor innovative curricula. With the Fourth Industrial Revolution transforming the type of work that people do, it also offering new opportunities to build skills in areas that AI cannot accomplish (Deloitte, 2018). COIL projects not only link students across geographic barriers while disseminates knowledge and culture, but also introduces innovative pedagogy that can be effortlessly replicated across institutions using easily accessible tools that increase intercultural fluency. Whether these future professionals become colleagues or clients in international business, institutions could market their graduates as emotionally intelligent international scholars who transfer experiences into indispensable skills.

Appendix

Predictors of Career Readiness Competencies								
	Dependent variable							
	Critical Thinking	Oral Comm.	Teamwork	Information Technology Application	Leadership	Profession-alism	Career Mgt	Intercultural Fluency
Independ. var†	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
COIL1	-0.034	-0.053	0.007	-0.127	0.034	-0.054	-0.073	-0.12
	(0.13)	(0.12)	(0.14)	(0.14)	(0.10)	(0.12)	(0.13)	(0.11)
COIL2	0.162	0.204*	0.125	0.16	0.169*	0.186*	0.251**	0.258***
	(0.11)	(0.11)	(0.12)	(0.12)	(0.09)	(0.11)	(0.11)	(0.09)
COIL3	**0.615*** **	**0.640*** **	**0.635*** **	**0.586*** **	**0.553*** **	**0.556*** **	**0.407** **	**0.427*** **
	(0.16)	(0.15)	(0.18)	(0.17)	(0.13)	(0.15)	(0.16)	(0.13)
COIL4	-0.029	0.002	-0.077	-0.093	-0.008	-0.048	-0.058	-0.045
	(0.09)	(0.09)	(0.10)	(0.10)	(0.07)	(0.09)	(0.09)	(0.07)
COIL5	-0.057	-0.012	-0.08	-0.005	-0.046	-0.021	0.001	0.091
	(0.10)	(0.09)	(0.11)	(0.11)	(0.08)	(0.10)	(0.10)	(0.08)
COIL6	0.084	0.036	0.121	0.154	0.091	0.087	0.01	-0.047
	(0.09)	(0.09)	(0.10)	(0.10)	(0.07)	(0.09)	(0.09)	(0.08)
COIL7	0.065	0.024	0.025	0.013	0.113	0.022	0.064	0.092
	(0.09)	(0.09)	(0.10)	(0.10)	(0.07)	(0.09)	(0.09)	(0.08)
COIL8	-0.137	-0.118	-0.135	-0.237*	-0.133	-0.199*	-0.102	-0.225**
	(0.12)	(0.11)	(0.13)	(0.13)	(0.10)	(0.12)	(0.12)	(0.10)
COUNTRY1	0.021	0.019	0.055	0.035	0.039	0.065**	0.037	-0.005
	(0.03)	(0.03)	(0.04)	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)
Constant	0.12	0.087	0.117	0.219**	0.063	0.168**	0.215***	0.272***
	(0.08)	(0.07)	(0.09)	(0.08)	(0.06)	(0.07)	(0.08)	(0.06)
Observations	54	54	54	54	54	54	54	54
R^2	0.804	0.813	0.784	0.761	0.869	0.815	0.752	0.849
Adjusted R^2	0.763	0.775	0.74	0.712	0.842	0.777	0.702	0.818
Residual Std. Error (df = 44)	0.114	0.107	0.125	0.121	0.089	0.108	0.111	0.092
F Statistic (df = 9; 44)	19.993***	21.265***	17.768***	15.585***	32.480***	21.505***	14.849***	27.498***
Note:	*p<0.1; **p<0.05; ***p<0.01, constants not shown in order to conserve space							

†Dimensions of intercultural competence:

COIL 1 = I am more confident about communicating with people whose first language is not the same as my own.

COIL 2 = I am better able to understand my own culture and personal perspectives.

COIL 3 = I am better able to communicate with individuals who have different cultural backgrounds.

COIL 4 = I am less interested in studying or travelling to other countries.

COIL 5 = I am less interested to keep abreast of news and events in my partner's country.

COIL 6 = I am more interested in working only with those who look, and talk like me.

COIL 7 = I am more aware of those from different national, cultural, religious, or socioeconomic backgrounds.

COIL 8 = I am less interested in learning about global or international issues.

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The impact of mobile phone channels on brand awareness and brand choice

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Keywords
Brand awareness, brand choice, mobile phone choice, privacy, location sensitivity

Abstract

Due to the continuous technological advancement, mobile phones have become one of the most used tools among users around the world. Mobile phones now are more attractive and used by individuals than ever before (Green, 2003). Mobile marketing is a multi-way communication that enables the business to directly promote and engage with the customer (Nysveen, 2005). The focus of this paper is to examine the impact of mobile phone channels on brand awareness and brand choice. A conceptual model has been developed with 15 hypotheses. The channel members considered in this research are SMS marketing, email marketing, content marketing, in-app-marketing, games-based marketing, video marketing and social media marketing. A quantitative research method will be employed. Data will be collected from 250 to 300 targeted participants. It's expected that mobile marketing channels have an impact the brand awareness and brand choice.

Introduction

Promotion is described as all the marketing activities performed by a business in order to promote and market its products or services (Honea and Dahl, 2005). Among all the direct marketing communication channels, mobile marketing is considered to be one of the latest and lately most popular among business practices in the market (Amirkhanpour, Vrontis and Thrassou, 2014). Mobile Marketing started by focusing on advertisement messages that are sent to mobile phones where the major target for businesses was to build relationships with their customers (Nysveen, 2005). Mobile marketing now is using many features available for the newest smartphones in the market such as using the location of the customers to start advertising campaigns in certain places (Rafieian and Yoganarasimhan, 2021). Due to the increment of the usage of smartphones, more direct communication is initiated between the business and their customers. This direct method of communication and connection through mobile marketing can be integrated at any time and place (Kumar and Mittal, 2020). It's demonstrated due to the advancement of technology that mobile devices will be the most used technology tool among the users in the world. Mobile devices are more attractive and popular among online customers than ever before (Hutton, 2012).

Mobile marketing is rapidly increasing between small and big businesses and as more customers use mobile devices to get products online, it became necessary for businesses to adapt through this online network business platform where the use of fun tools is very useful for the customers (S, 2019). Businesses who implement their marketing plans through mobile devices have much higher read rates and return on investment when compared to other methods of direct marketing used like sending emails or TV advertisements (Sun and Xu, 2019). The implementation of mobile marketing has many opportunities including the increase of brand awareness (Rafieian and Yoganarasimhan, 2021). Mobile marketing has started with methods such as sending emails, search engine optimization, creating content for social media platforms, video and in-games advertisements and many more ways to reach the customers through their mobile devices. Mobile marketing strategies can also include having a friendly mobile device website, sending emails, SMS, MMS and either having a business personal app or showing business advertisements on different apps (Kumar and Mittal, 2020). Moreover, mobile marketing can be integrated through mobile devices and can be done through QR codes, social media platforms, mobile applications and mobile advertising (Amirkhanpour, Vrontis and Thrassou, 2014). Businesses must consider mobile marketing strategies and campaigns, as mobile devices are the most preferable and useful

way now to search and access information for the business's consumers (Kumar and Mittal, 2020). The purpose of this research is to integrate the mobile phone channels, and its impact on brand awareness and brand choice.

Literature review and conceptual framework

Features of mobile marketing: Some of the most important features and the key aspects of today's mobile marketing efforts are as follows (Kumar and Mittal, 2020):

Ubiquity: Due to the wide scale adoption and their versatility, smart mobile devices are becoming progressively acknowledged around the world.

Alterable multi-way communication: It is the interaction between the consumer and the marketer and vice versa.

Continuous round-the-clock availability: Mobile phone devices are commonly actively switched on which results in guaranteed delivery of the marketing content no matter when and wherever the targeted customer is.

Marketing Channels: The availability of several useful tools and different marketing channels.

Personalisation: Provides inflated potential for highly localized and personalized campaigns with satisfactory objectives due to the effective utilization of analytics.

Opportunities & challenges in the mobile phone environment: Mobile marketing adheres many opportunities for marketers which includes localisations, customer personal preferences and user preferences. Moreover, the challenge of integrating mobile marketing includes the security of transactions and the privacy of customer information (Scharl, Dickinger and Murphy, 2005). Some of the top opportunities and challenges in the implementation of mobile marketing include:

Permission-based marketing: It's rather essential that mobile marketers need to settle a strategy to assure that customers are not annoyed by unwanted SMS and all other forms of mobile marketing in their smart devices. The permission of the customer to receive promotions and advertisements in his/her mobile phone is an important aspect that contributes to the success of a business marketing campaign. The marketing campaign should have the feature of an opt-out process to address the customer permission issues (Kumar and Mittal, 2020).

Location sensitivity: Using artificial intelligence and mobile analytics is considered very important to efficiently use the location of targeted customers. When marketers have the location information of the customer, they would send notifications of promotions and discounts of brand shops nearby the customer's current place (Kumar and Mittal, 2020).

Privacy: Customers often don't feel very confident to give their personal data to mobile applications. Giving such information puts the person's financial information and records at risk. In addition to tracking the person's location by mobile apps. It's rather very important to give the customer a choice of revealing their information or data as a business can provide a guest user or taking permission to share such information (Rafieian and Yoganarasimhan, 2021).

Mobile marketing channels: Through the evolution of technology in mobile phones to now, it was gradually growing starting with SMS and MMS reaching out to provide many useful channels to reach out to customers using the network in their smart devices. Using the smart devices internet allows access to all the channels, those channels now come with greatly improved features and tools to better reach out to possible customers in the market. The mobile marketing channels give better access to customers (Rafieian and Yoganarasimhan, 2021). To better understand mobile marketing as a concept, description must include the activities that are implemented by business in the customers' mobile devices. However, choosing what type of mobile marketing channel to use depends on the strategy of the brand or the business owners.

The Conceptual Framework

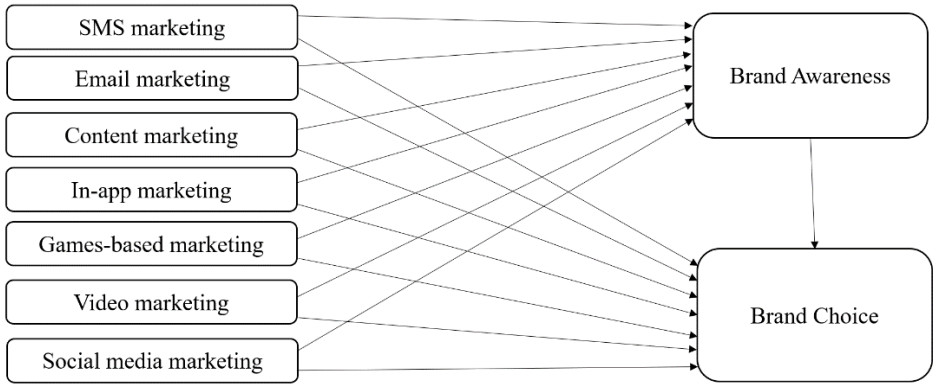

Figure 1: Mobile phone channels

SMS marketing: During the initial phase of mobile marketing, SMS was the primary method to communicate as an easy and less costly approach that resulted in good promotional results. One significant reason is that SMS does not depend on the availability and usage of the internet in customers' mobile phones. SMS can include website links or links to download apps inside the text message itself. Many businesses in the market promote their products and services through SMS in order to get the attention of the customer and for the customer to be interested in more information about their brands (Frolick and Chen, 2004).

H1: SMS through mobile marketing influences customer brand awareness.
H2: SMS through mobile marketing influences customer brand choice.

Email marketing: Smartphones are considered to be the first and primary method for sending and receiving emails. Modern technology customers who are using iPhones and Android mobile phones and tablets tend to integrate their personal emails in their personal smart devices, while on the other hand, their official emails are accessed through their desktop computers and laptops from their workplace. Personal emails are the target of the marketers as it's an opportunity for them to influence the buying behavior of customers by directly communicating and sharing their promotional and contact information with the targeted customers (Zhang, Kumar and Cosguner, 2017).

H3: Email through mobile marketing influences customer brand awareness.
H4: Email through mobile marketing influences customer brand choice.

Content marketing: Content Marketing is the business process and marketing for establishing and distributing valuable and relevant content to acquire, engage a defined target audience, and attract customers to promote beneficial actions for the business (Pikuła-Małachowska, 2017). It involves the creation and sharing of various forms of media, including newsletters, articles, social media posts, and podcasts that are relevant to as many people as possible. The business designs the content in a manner that shows the audience that the organization values its consumers (Plessis, 2017). The primary goal is to not only attract new customers but also retain the current customers. A study by Plessis (2017) shows that the businesses that use content marketing experience a higher growth rate of about 30 percent than the ones that do not use content marketing. The difference could be due to the possible impact that content marketing creates in the nurturing of relationships between the consumers and the business. The idea is also based on the assumption that consumers that have already developed a relatively strong relationship with a specific business have a relatively high likelihood of purchasing from the same business anytime they think of buying a product or service offered by the business. A good example of content marketing is the case in which an architecture company creates and shares an article on the "things to consider" when hiring an architect. Another form of content marketing is search marketing. Search marketing involves the use of online search engines to achieve the desired online presence. Some of the search engines which are appropriate for that purpose include Yahoo, Bing, and Google (Ward, 2017). It's definite that technological

advancement achieved over the past few decades has led to widespread access to smartphones and other technological devices that allow people across the globe to access such search engines. The individual types a text in the "search query" section of the relevant search engine. The search engine then directs the individual to the Search Engine Results Page or SERP. The number of search engine users accessing a specific page is directly proportional to the position of the website in the SERP rank in most cases. Businesses try as much as possible to rise to the highest level in the search engine rank to be more reachable to customers. They use strategies such as pay-per-click and search engine optimization. The Search Engine Optimization or SEO involves the use of unpaid tactics to raise the website's search engine ranking. Content marketing is one of viable approaches to achieve that goal. The pay-per-click or PPC involves the use of paid advertising to increase the website's search engine ranking (Green, 2003).

H5: Content searching through mobile marketing influences customer brand awareness.
H6: Content searching through mobile marketing influences customer brand choice.

In-app marketing: With the developing sorts and number of applications, marketing has added a channel for mobile marketing apps campaigns. Apps for social media, ecommerce, news and games, etc., have chances for the banners, interactional surveys/forms, promoted content, and animations. To get more income or revenue by influencing the customers' choices, marketers present their content to these app channels. It's the App engineers who can develop space for accommodating these business marketing contents. Banner ads which can be integrated in different applications seek to influence the customer to purchase a product or service by grabbing the attention of as many app users as possible (Kumar and Mittal, 2020).

H7: In app advertisement through mobile marketing influences customer brand awareness.
H8: In app advertisement through mobile marketing influences customer brand choice.

Games-based marketing: In comparison of both Mobile gaming and Hollywood movies, the revenue within the same time is almost similar (Sutton, 2018). In order to attract customers, marketers tackle the control of play to boost by including gaming components and elements to the marketing blend (Kumar and Mittal, 2020). Advertisements using the In-game strategy considers implanting corporate brands and products inside the video games and computers. There are two types of in-game advertising: static ads which cannot be removed due to it being fixed in the game itself, and dynamic ads which are the opposite of static ads in which they are replaceable and can be used to reveal up-to-date information (Terlutter and Capella, 2013).

H9: Game based marketing through mobile marketing influences customer brand awareness.
H10: Game based marketing through mobile marketing influences customer brand choice.

Video marketing: The demand and popularity of mobile-based video platforms is drastically increasing everyday Moreover, videos play a major role in businesses. When deciding for a purchase 80% of millennials are considering video contents (Tafesse, 2020). As the clients are finding that paying for subscription-based services through video applications is helpful, the income of the top video mobile apps is increasing as well. This has opened doors for a huge set of opportunities in the field of video marketing. Taking this into consideration, Twitter has executed the live streaming. In contrast, Facebook introduced Facebook Live. On the other hand, Instagram extended the length of the videos to 60 second. These types of various video services in the applications grabs the attention of the users which makes it easier to consider advertisements to the viewers thus attracting more customers to the business (Kumar and Mittal, 2020).

H11: Video marketing through mobile marketing influences customer brand awareness.
H12: Video marketing through mobile marketing influences customer brand choice.

Social media marketing: social media has appeared as a well-known tool for marketing, with the continuous growing use base and a top-level engagement which makes it very important to integrate in the marketing plan to influence customer buying behavior. 80% of the time on the mobile phone is spent on social media. Variety of different ways of marketing for the advertisers in social media platforms, right

from the company pages, banners advertisements, interest groups, embedded videos or social media platform games to direct sales activities, engagements of the customers and branding. Social media platforms presented almost limitless opportunities to the marketer to promote their businesses. (Kumar and Mittal, 2020).

H13: Social marketing through mobile marketing influences customer brand awareness.
H14: Social marketing through mobile marketing influences customer brand choice.

Brand awareness impact on the brand choice: The process of branding requires the business marketers to reach the mind of the customers through two different communication ways, creating the proper brand awareness which leads to a positive brand attitude (Rossiter, 2014). Brand awareness refers basically to the creation of a recognizable name and logo of a business, while brand attitude refers to the expected attitude of the customer toward a business, mostly what are the results and benefits (AAKER, 2014). The creation of brand awareness gives the customer the ability to recognize important details about a brand which is considered a significantly important step to establish brand attitude. Brand awareness and recognition directly affect the customer brand choice at the point of purchase (Rossiter, 2014). Customer brand awareness in the market is considered the first and critical step to influence customer purchasing decisions (OZTURK, 2016).

H15: brand awareness increases brand choice in the mobile environment.

Conclusion

Mobile marketing plays an essential role in today's marketing strategy plans of businesses. Each mobile marketing channel uses its methods to increase the influence of the customers buying behavior and brand choice for a business. For a mobile marketing campaign to succeed, the business should take into consideration the challenges in this aspect, such as tracking the location or actions of customers. Mobile marketing thus needs continuous improvement, monitoring and good control from its marketers.

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An analysis of residential land prices and fundamentals in Mauritius

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Residential Land, National Land Prices, Regional Land Prices, Fundamental Factors, Equilibrium Pricing-Model

Abstract

This study dwells on an analysis of how fundamental factors affect residential land prices in Mauritius. A further aim is to depict if the fundamentals have the same effect on land prices at the national level, as well as the regional level. Regional differentiation in terms of urban and rural residential land prices is made, to explain how these regional differences are due to the influence of fundamental factors on land prices. A fixed-effect panel regression technique over the period 2000 – 2019 is used for the case of the Mauritian residential land market. It is found that the variable income is significant at the national level and in all regions, with a more significant influence on land prices in rural regions. Another variable found to be important in explaining land prices at the national level is population. In the urban region, the population was positively significant in explaining land prices unlike in rural regions. The interest rate was also negatively significant in explaining land prices in both urban and rural regions. Whilst supply-side factors were observed to be insignificant in explaining land prices. Thorough knowledge of the factors explaining regional land price differences is deemed important for policymakers.

Introduction

In the land market, land prices are depicted as fluctuating over time. At one point in time, it is noted that land prices also tend to vary in terms of regions. Different factors have been used in past studies to explain the aforementioned land price variations. Land characteristics constitute one category of determinants used to justify the regional land price differences and examples of characteristics used are distance, land topography, or accessibility among others (Hanonen, 2005; Malaitham et al., 2020). Fundamental factors have also been used to explain regional land price differences. Among the fundamental factors deemed important in explaining regional land price differences are population and income. Roos (2006) shows that regional average income or population size can be regarded as important explanatory variables for regional price differences. Other fundamentals commonly included in the real estate pricing model to justify regional price differences are interest rate, unemployment, construction costs, and residential building approvals. These factors would be affecting the demand and supply of land and consequentially land prices. An equilibrium pricing model that assumes equality in terms of demand and supply has been used to find land prices in the market.

Before assessing the factors affecting regional land prices, a regional breakdown is undertaken. An approach similar to Bramley and Leishman (2005) is used, consisting of two regional land classifications, namely urban and rural regions. Subsequently, it is assessed how fundamental factors affect prices and justify land price differences. Land price data is collected in the different regions (regrouped as urban and rural), over the period 2000 – 2019 and a panel data approach is used to find the link between regional land prices and fundamental factors. A fixed-effects model is used to find how fundamentals affect residential land prices in urban and rural regions.

There is a lack of studies on regional price differences and fundamentals (Oikarinen and Engblom, 2015) and this study is believed to be a supplement to the scant literature on regional land price differences using fundamentals as determinants. Most of the studies on the regional link between real estate prices - fundamentals were undertaken in the US, with relatively fewer research in other contexts.

As such there are no studies on residential land price dynamics in small and island economies. Mauritius remains an interesting study context given that the residential real estate market is characterized by land transactions followed by housing constructions, thus the availability of data on residential land prices. Such data tend to be limited in several contexts where mostly housing transactions are undertaken.

The rest of this work is organized as follows: section 2 reviews both the theoretical underpinnings and the related literature, section 3 discusses the methodology, section 4 discusses the findings and section 5 concludes.

Related Literature

Theoretical review

A strand of studies (Muth, 1971; Witte, 1975; Manning, 1988; Quigley, 1999; Jud and Winkler, 2002; Jiang et al., 2013) has used the equilibrium-pricing model for representing land prices.

The equilibrium land price for each region at a time it would be as follows:

$$\boldsymbol{Land\ Price i_{i,t}} = \boldsymbol{f\ (Income_{i,t}, Unemployment_{i,t}, Population\ Size_{i,t}, Interest\ Rate_{i,t}, Residential\ Building\ Permits_{i,t},}$$

Equation 1

The above equilibrium equation illustrates that demand and supply-side fundamental factors are at the basis of the formation of land prices in the market.

Most of the initial studies on the relationship between land prices (or housing prices) and fundamentals were conducted in the US context. In one of the pioneering works, Witte (1975), using the demand-supply equilibrium framework for establishing the factors affecting regional residential land prices in the US, explained that differences in land prices across different urban areas could be caused by differences in demand or differences in supply or the supply of other factors. The main factors found significant in justifying the interurban differences in land prices were the average plot sizes, the level of income and population growth. An analysis of the influence of these main variables over time showed that the coefficients remained significant and almost constant. Ozanne and Thibodeau (1983) subsequently explained regional housing price differences by using data for 54 metropolitan areas in the US. Using a similar theoretical framework and using OLS estimations, they established that the nonelderly single and the price of farmland explained housing price differences while they could not find any impact concerning income and population on housing prices[1]. They further asserted that segmentation of the housing market could improve the results obtained in the study. Studying the US urban land market for 40 regions, Rose (1989) found that interregional differences in land prices could be explained in terms of income, population size, and population growth, with the variables bearing a positive significant link with land prices. Manning (1988) also used a least-squares regression technique to investigate the factors leading to regional land price variations and found that, among the main variables found significant in explaining regional land prices, were population density, population growth, the real high income[2], construction costs and climate. In the study, it is also suggested that land supply restrictions could be leading to higher land prices.

In a later study, Abraham and Hendershot (1996), using a data set for 30 US regions over 15 years in a linear regression approach, conducted a region-wise analysis to confirm that deviations in the equilibrium real housing prices can be caused by changes in real income, real construction costs and after-tax interest rates. Follow-up work by Potepan (1996) with data collected from 56 regions validated that income and construction costs (positive and significant) were the main factors in explaining regional land price differences. Population change, on the other hand, was also found to have a positive significant link with house prices. Income was determined as being the variable most significant. Baffoe-Bonnie (1998) used quarterly data from 1973 to 1994 in the US and applied a Vector Autoregressive (VAR) approach to determine how particular macroeconomic variables affected housing prices at both national and regional

[1] The authors mentioned that there could have been measurement errors for some variables as the R^2 value obtained was relatively low.

[2] Represents the income earned by individuals in the higher income range.

levels (four main regions). The author observed that at the national level, housing prices were influenced by changes in the mortgage rate and at the regional level housing prices were explained by mortgage rate changes, employment level and inflation in one region. Baffoe-Bonnie (1998) further suggested that the regional housing price differences can also be explained by regional differences in structural conditions and that the increasing housing prices might not be justified by macroeconomic factors only but there could also be speculative bubbles present in the market. Using a wider panel set of 130 metropolitan areas in the US, Jud and Winkler (2002) employed a fixed effect approach to determine that real housing prices were positively and significantly affected particularly by population and real income but also by construction costs, stock price appreciation and after-tax interest rates. Dummy variables were also included in the model to verify if region-specific factors affected housing prices and it is noted that in 69 regions the dummy variables were significant in explaining housing prices. The location-specific factors could include aspects such as land scarcity or regulations on housing constructions (non-measurable/ latent variables).

In a more recent study, Pijnenburg (2015) used regional housing data from the US and a spatially fixed effect panel estimation method and concluded yet again that income and unemployment have the same influence on housing prices in the different regions over time Whereas the relationship of population and building permits with housing prices was heterogeneous when taking into account space and time. The author also explained that real estate price dynamics in coastal regions tended to be different from those in inland regions.

Few other studies focused on other countries. Using regional data on building land prices in Germany, Bischoff (2010) found a significant positive link between income and land prices. Similar to the US case, the author found population as being an important factor justifying regional differences in land prices. As such, structure and tourism were also depicted as having a positive link with land prices. Belke and Keil (2017) subsequently studied how fundamental determinants affected housing prices in different regions in Germany (approximately 125 regions were included in the study sample) using annual data from 1995 to 2010. A positive relationship was obtained between interest rate and housing prices, indicating that it was not the affordability argument that defined the link between housing prices - interest rate but rather how economic activities were affected by higher interest rate leading to more housing demand and higher prices. Housing price increases were mainly justified by considering demand-side factors.

Studying the Finnish housing market, Oikarinen and Engblom (2015) found that regional house price differences were quite small. It was also highlighted that in different regions the elasticities of housing prices and fundamentals were different. The focus was mainly on the significance of income in explaining housing prices, with a higher elasticity in larger cities. The authors found that in the short term the regional variations tended to be relatively small.

In the Malaysian context, Wong et al., (2018) used a fixed-effects model and pooled mean group (PMG) estimator to find how particular determinants affected housing prices. According to the authors, the main housing price determinants were income and population, while regional housing price differences were principally explained in terms of economic activities, population and income. Other explanatory variables included in the model were foreign real estate investment (FREI) and speculative buying. Interestingly apart from income and population, foreign inflows (FREI) were deemed significant in explaining housing prices, but speculation was not a significant factor in explaining the Malaysian housing market.

The latest research by Zhou et al., (2019) in the Chinese housing context used an equilibrium-pricing framework to investigate how fundamentals affected regional housing prices. Using panel data estimation, namely an ordinary least square method (fixed coefficients for different regions) and a geographically and temporally weighted regression approach (GWTR, where the coefficients vary for different regions), to find how the particular explanatory variables affected housing prices in different regions, the authors found that income and population had a higher influence in some coastal regions. The effect of income on housing prices in different regions seemed to vary over time. The authors also concluded that in regions with higher urbanization levels, population increase had a higher influence on housing prices while the development costs had a positive significant effect in most regions studied.

The above studies illustrate that fundamental, namely income and population have been commonly used to justify regional land price differences. Most of the above studies are based upon the least square methodology or have used correlation coefficients and some more recent studies have used the fixed-effects model. Only a few studies have used a dynamic approach and less emphasis has been laid upon the short-run effect of fundamentals on land prices on a regional basis.

Methodology

Model Specification

In past research (see Witte, 1975; Jud and Winkler, 2002 and Wong et al., 2018) common demand-side factors, namely income and population have been used to justify regional land price differences. Other variables included in this model are real interest rate and unemployment, while on the supply-side common explanatory variables included are construction costs and residential building permits (land supply through regulatory authorities).

$$\boldsymbol{LNRLPI_{it} = \alpha + \pi_1 LNRPCE_{it} + \pi_2 LNPOP_{it} + \pi_3 LNRIR_{it} + \pi_4 LNUNEMP_{it} + \pi_5 LNRBP_{it} + \pi_6 LNRCCI_{it} + \varepsilon_t}$$

Equation 2

Where LNRLPI represents the logarithm of real land price index used as a measure of land price; LNRPCE is the logarithm of real per capita earning and used as a measure of income; LNPOP is the logarithm of the population in each region; LNRIR is the logarithm of real interest rate; LNUNEMP is the logarithm of the level of unemployment; LNRBP is the logarithm of residential building permits and LNRCCI is the logarithm of real construction cost index.

Dependent and Independent Variables

Land Price (RLPI)

The data for residential land prices for this chapter is collected from eighteen regions across Mauritius. Subsequently, these regions are classified as urban and rural regions. Within the urban category, there are seven regions and in the rural, there are eleven regions. In each region, the data is collected every year from 2000 to 2019. In each region, the prices for several plots are compared and an average residential land price per square meter per region is estimated.

Income

The logarithm of the real per capita of earnings is included in the model as a measure of income. It measures the purchasing power of individuals and as previously mentioned it normally bears a positive relationship with land prices (see Gottlieb, 1965; Witte, 1975; Davis and Heathcote, 2007; Wang, 2007).

Population

The population data is collected for each region from the sample of eighteen regions, the figure englobes all the inhabitants within the particular regions. Most past studies have depicted a positive significant link between this demographic variable and real estate prices (See Maisel, 1964; Poterba, 1981; Mankiw and Weil, 1989; Nakamura and Saita, 2007) and specifically for regional studies (Refer to Potepan, 1996; Jud and Winkler, 2002; Pijnenburg, 2015; Wong et al., 2018).

Real Interest Rate (RIR)

The logarithm of the real interest rate will be included and is used in the model. Normally when a decrease in interest rate occurs this should entail an increase in real estate demand and also prices. Belke and Keil (2017) consider interest rate changes from the perspective of monetary policy changes and according to the study a positive link exists between interest rate and real estate prices.

Unemployment

The unemployment level prevailing in the country over the period of study is used and it is the same for the different regions. The logarithm of the unemployment figure is included in the model. The few studies (Liu et al., 2016; Gan et al., 2018) on the link between unemployment - housing prices have shown a decrease in unemployment leading to an increase in housing prices. This is justified by the fact that

when the unemployment level decreases this entails an increase in real estate demand and hence real estate prices.

Residential Building Permits (RBP)

The RBP measures the number of permits approved for housing construction by regulatory authorities and it indirectly gives an idea of the number of residential plots having been transacted, it, therefore, serves as a measure for housing supply (Lerbs, 2012 uses a similar measure). According to Lerbs (2012), there should be a positive relationship between the number of residential building permits and real estate prices. The logarithm of the RBP is included as an explanatory variable in the model.

Real Construction Cost

The logarithm value of the real construction cost index is included as an explanatory variable in the model. An initial study on the link between construction cost and land prices by Manning (1988) using correlation coefficients and least squares regression found a positive relationship. According to Somerville (1999) and Lerbs (2012), an increase in the construction costs would imply a decrease in housing supply (housing construction activity). According to Belke and Keil (2017), construction costs can either have a positive or negative effect on real estate prices.

Data

The data series spans from 2000 to 2019 and it has been collected every year. The data for land prices have been obtained through several valuation officers. This data is then regrouped in terms of urban and rural regions, with seven main regions within the urban category and eleven regions in the rural category respectively. The data for the explanatory variables were obtained from two main sources. Data relating to population size per region, unemployment level, residential building permits, and construction cost index is obtained from the website of Statistics Mauritius while the data for income (earnings) and the real interest rate was collected from the website of the World Bank.

Data Analysis

A static panel regression technique was chosen to analyze the link between land prices and fundamental factors at the national level and in the two specific regions chosen for the study.

Unit Root Test Results

Following the panel unit root tests, namely the Levin, Lin and Chu test (LLC) and the Im, Pesaran and Shin (IPS) test. For the national data sample, as well as for the two regional samples of panel data under study, it is noted that the data series for the dependent and independent variables is stationary at level. Given that the variables are stationary at level, the panel least squares method can be used for the estimation of equation 2.

Hausman Test

For panel least squares regression, either a fixed-effects or a random-effects model can be used. To choose the appropriate technique, the Hausman test is done. The results indicate that the null hypothesis should be rejected and hence a fixed-effects model is more appropriate to estimate the model. the Hausman test is conducted for the three samples under study and for all three the fixed effect model is chosen.

Fixed Effects Panel Estimation

Several pieces of research (see Schnure, 2005; Oikarinen and Engblom, 2015; Belke and Keil, 2017; Wong et al., 2018) studying the fundamental determinants of regional real estate prices have used fixed-effects model. The econometric specification for the present study is as follows:

$$\boldsymbol{LNRLPI_{it} = \alpha_i + \beta_1 LNRPCE_{it} + \beta_2 LNPOP_{it} + \beta_3 LNRIR_{it} + \beta_4 LNUNEMP_{it} + \beta_5 LNRBP_{it} + \beta_6 LNRCCI_{it} + \varepsilon_{it}}$$

Equation 3

i = 1, 2, 3, … N represents the different cross-sections or regions in the study and t = 1, 2, 3, … T denotes the time dimension. α_i is a variable representing the region-specific fixed effects and it normally captures the influence of region-specific unobservable and heterogeneous factors which do not vary over time?

Descriptive Statistics

The Mauritian context is subdivided into two main regions, namely urban and rural regions, depicting different evolutions in their residential land prices over time. Table 1 gives the descriptive statistics for real land prices in the whole sample and the two main regions. It is observed that the mean and median value for real land prices in urban regions is the highest followed by rural regions. The lowest real land prices occur in rural regions. From the standard deviation figures, it is noted that the regional variation in land prices is highest in urban, followed by rural regions.

Table 1: Descriptive Statistics for Real Land Price for the whole sample and in the two Regions from 2000 - 2019

	WHOLE SAMPLE	URBAN	RURAL
Mean	7385.88	12883.23	4560.1
Median	5887.24	11107.27	4854.73
Maximum	24753.67	24753.67	13692.62
Minimum	2500	5250	2500
Std. Dev.	4563	5742	2390.41
Skewness	1.72	0.67	1.74
Kurtosis	6.11	2.29	5.96
Jarque-Bera	430.81	9.63	191.04
Probability	0	0.008	0
Sum	3545225	1288323	1201222
Sum Sq.Dev.	9.98E+09	3.26E+09	1.25E+09
Observations	480	100	220

A graphical analysis of the average real land prices in the two regions (figures 1 & 2 below) illustrates that the highest land prices prevail in the urban regions and the lowest land prices in the rural regions.

Figure 1. Evolution real residential land prices in Mauritius from 1980 - 2019

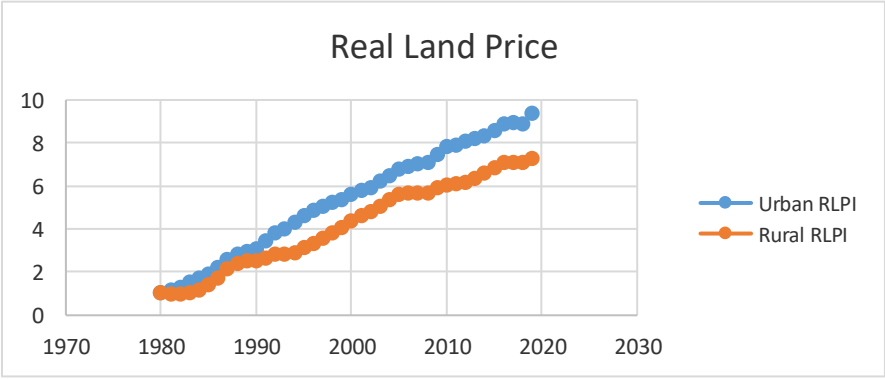
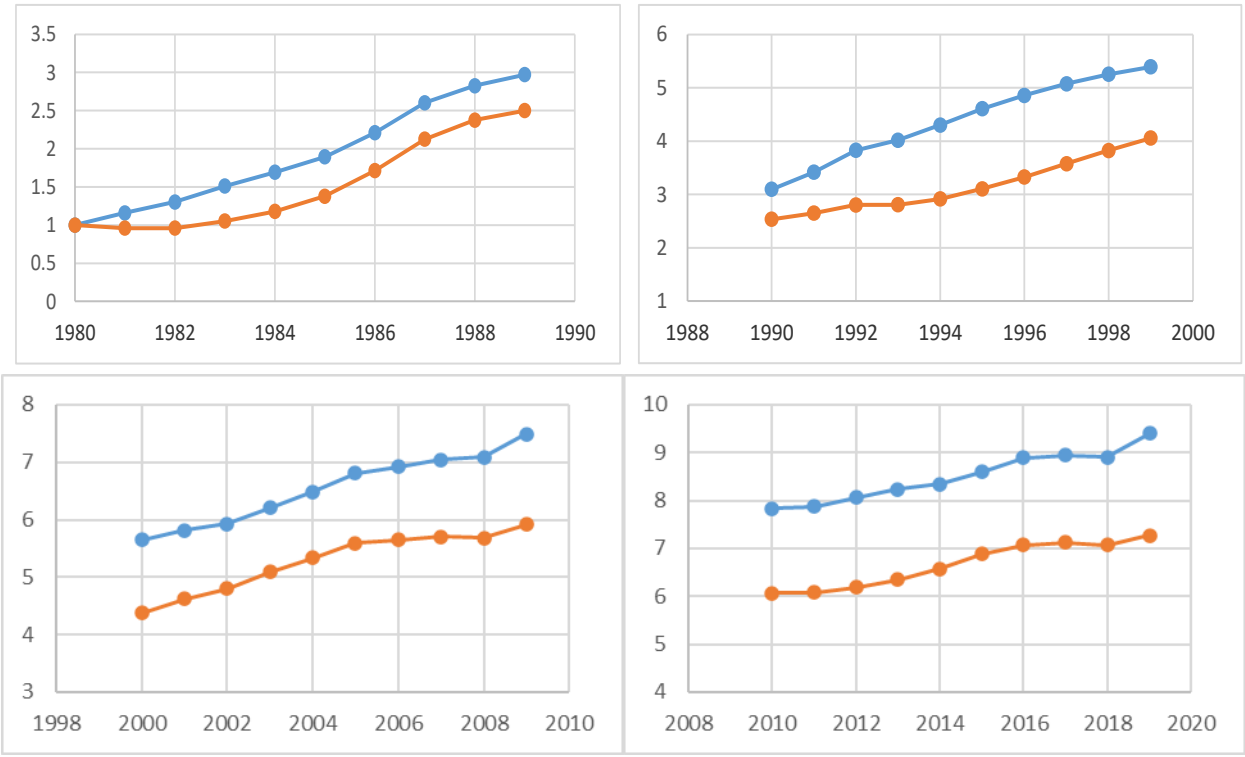


Figure 2. Evolution real residential land prices in Mauritius over past four decades



Although the same fundamentals prevail within the country (except for population that varies as per the region), a sustained difference in the land prices of plots situated in urban and rural regions is noted.

Fixed Effects Panel Estimations

From Oikarinen and Engblom (2015), the fixed effects model considers the influence of fundamentals on real estate prices as being the same in all regions. Subsequently, through the regression results, it will be assessed if the fixed fundamentals affect the prices to the same extent in all regions. The results obtained from the fixed effects estimation are given in table 2.

Table 2. Fixed Effects Panel Estimations residential land prices - fundamentals

	Whole Sample		Urban		Rural	
Explanatory Variables	Coefficient	T-Statistics	Coefficient	T-statistics	Coefficient	T-statistics
Constant	1.279	1.12	-16.501***	-3.42	0.583	0.39
Population	0.179***	3.03	1.524***	3.06	0.036	0.59
Income	0.736***	8.51	0.489***	3.34	0.750***	6.35
Real Interest Rate	-0.072***	-3.49	-0.082**	-2.37	-0.067**	-2.38
Unemployment	0.174***	3.2	0.193**	2.1	0.272***	3.64
Residential Building Permits	0.075	1.1	-0.005	-0.04	0.095	1.02
Real Construction Cost Index	-0.07	-0.27	0.091	0.18	0.167	0.47
	$R^2 = 0.783$		$R^2 = 0.819$		$R^2 = 0.798$	

**** represents significance level at 1%, ** represents significance at 5% and * represents significance at 10%*

The variable found to influence land prices in the most significant way is income. For the whole sample, at the national level, income is found to have a positive significant effect on land prices. In the two regions income positively significantly affect land prices, although the influence differs in terms of magnitude. An increase of 1% in income leads to an increase in land prices of around 0.49% and 0.75% in urban and rural regions respectively. A higher influence of income is depicted in rural regions. Some past studies, for example, Malpezzi (1999) and Oikarinen and Engblom (2015) had also depicted a positive link between the two variables. The present study shows that for the same rise in income, a higher is noted in land prices in rural regions as compared to urban regions.

At the national level, the population is depicted as having a positive significant effect on land prices. Although for the regional breakdown, it is found that the population is significant and positive only in urban regions and not in the rural regions. The Mauritian population consists of around 1.2 million individuals and the number of inhabitants in the urban regions is approximately equal to 500000 (all the urban regions in Mauritius have been included in the sample) and the remaining individuals live in rural (around 163000 for the selected regions). Given that roughly around half of the inhabitants stay in urban regions, this could justify the positive significant bearing that the variable has on land prices in urban regions. Using a fixed-effects approach Oikarinen and Engblom (2015) concluded that population and income were insignificant in regional real estate price differences.

Unemployment bears a positive significant link with land prices at the national level, as well as in urban and rural regions. A positive relationship had also been obtained by Belke and Keil (2017) when studying housing prices in Germany. Normally categorized as a demand-side factor, as unemployment increases land demand and prices should decrease. In the main residential zones in Mauritius, that is urban and rural regions, the opposite is noted. Unemployment could be affecting the supply of real estate, mainly housing as this is quite a labor-dependent industry. A decreasing supply of housing and hence land supply could entail price increases. Coastal regions are not affected by the unemployment level.

The real interest rate is found to have a negative significant relationship with real land prices in the three samples, namely national, urban and rural. This suggests that a lower interest rate would encourage borrowing and consequently increase land demand and prices. In the Mauritian context, the majority of individuals have their primary houses in the urban and rural regions. These are normally financed with savings and borrowings, justifying the higher demand at low-interest rates. Using a similar approach to explain regional housing price differences, Oikarinen and Engblom (2015) found a negative link between interest rate-housing prices. Among the supply-side factors, namely residential building permits and real construction costs, in most of the regions the variables are insignificant in explaining residential land prices. The fixed effects panel model demonstrates that fluctuations in land prices mainly occur as a consequence of changes in the demand-side factors.

Conclusion

The objective of the present study was to establish if regional land price differences can be explained by their link with fundamental factors. More so to depict if the same fundamentals can have different influences on land prices depending upon the region where the land plot is situated. The regional categorization is done by using urban and rural distinctions, with the fundamental factors categorized as demand and supply-side factors.

Using a panel data estimation method, namely a fixed-effects panel model, the regional relationships between the fundamentals and real residential land prices were estimated. The fixed-effects model, a static model assumes that the fundamentals' influence on regional residential land prices is the same across the different regions. The population is found to be positively significant in explaining residential land prices and it is in the urban regions that this influence is most significant. Income has a positive significant effect on real land prices in all regions, which is more pronounced in rural regions. In urban and rural regions, which contain most of the residential real estate properties, interest rate has a negative significant link with land prices. Whilst the supply-side factors are mostly insignificant in explaining land prices.

Implications

In the Mauritian context, over the study period, it is noted that some supply-side factors are not influencing land prices. The regulators and other parties operating in the land market should be focusing

more on the demand-side fundamental factors, as these represent the factors determining land prices. Although in rural areas land availability is higher and restrictions on the use of land tend to be lower and according to Jud and Winkler (2002), these two aspects are important in justifying regional land price differences. In the rural regions of Mauritius with a higher supply, the residential land prices are relatively lower as compared to urban regions.

The influence of some variables, such as population size should be assessed more on a regional basis, rather than at the national level. The analysis of the results at the national level illustrates that population is significant in explaining land prices, although in rural regions it is insignificant.

Limitations

The analysis is not without its limitations. Data availability has restricted the study period from 2000 to 2019, for example, data for the construction costs index is available from the year 2000. An analysis over a longer period might have provided a better definition of the links fundamentals-land prices in the regions. Given the lack of studies on land prices and fundamentals in similar contexts, direct comparisons could not be made in terms of the results obtained. Latent variables such as land-use restrictions will normally have a regional bearing on residential land prices and the fact that there is no quantifiable measure available for this variable, its effect on land prices could not be studied. Another component not included in this study due to lack of data is regional taxes where inhabitants of urban regions pay a municipal tax in contrast to those living in rural regions and this could partly explain land price differences.

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Assessing the impact of financial inclusion on economic growth: A comparative analysis between lower middle-income countries and upper middle-income countries

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Abstract

Despite tremendous financial development, it has been increasingly acknowledged that financial systems are far from inclusive. With greater dynamism in the financial sector now, a critical evaluation around financial inclusion surfaces. The principal intention of this paper is to assess the impact of Financial Inclusion on Economic Growth in the Middle-Income countries. The evaluation concentrates on a comparative analysis between the Lower-Middle Income Countries and Upper Middle-Income Countries. The system Generalised Methods of Moments (GMM) model was adopted for a sample of 15 Lower-Middle Income Countries (LMICs) and 15 Upper Middle-Income Countries (UMICs) over the time period 2008 to 2019. Financial Inclusion was assessed by 3 dimensions, namely account ownership, demographic outreach and outstanding loans. The results showed that in the UMICs, all dimensions of financial inclusion had a positive relationship with economic growth. On the other hand, while the first two dimensions establish a positive link with economic growth in the LMICs, outstanding loans had a negative and significant effect. As for Financial Stability, the bank Z-score left a positive and significant footprint on economic growth in the MICs, with the significance being more prominent in the UMICs. Non-performing loans as an indicator for financial instability had a strong and adverse impact on growth in the MICs. Also, the paper further extends the analysis to the effect of financial inclusion on financial stability owing to the existence of a potential trade-off. While, account ownership and demographic outreach improved financial stability, outstanding loans, nevertheless, exhibit a negative and significant impact on financial stability in the MICs.

1. Introduction

Distortion to real sectors, in terms of inherent and significant output loss, has often been mutually reinforced with elevated risks associated with financial instability during the crisis periods. Practical implications thus emerged to pursue financial stability goal alongside sound, competitive and effective financial institutions, conducive to enhancing growth. Indeed, well-functioning and stable financial systems deliver a critical impetus to economic development by propounding savings, credit, payment, and risk management services.

Despite tremendous development in the financial sector and considerable advances in all areas pertaining to financial profitability, competitiveness, and sustainability, it has been increasingly acknowledged that financial systems are far from inclusive. A rapid emergence of financial inclusion was eventually observed in the 2000s. Financial inclusion entails a greater share of individuals that have access to and use basic financial services (Barajas *et al.,* 2020). FI has been widely defined as the ease of access to the basic financial products and services in the formal financial system to all levels of society; in particular, the under-banked and unbanked population, in a fair and transparent manner (UNCTAD, 2014). However, Sarma (2008) argued that access to the financial services does not completely correspond to the comprehensive notion of FI. Sahay *et al.* (2015) thus captured FI as being both the access to, availability of and the effective use of the financial services. Jahan et al. (2019) provided an extension to include the quality of the products and services in the financial system.

On the international discussion front, the importance of an inclusive financial system has increasingly gained recognition, with financial inclusion being set out as a facilitator of other goals in the 2030 Sustainable Development Goals and has positioned prominently as a target in eight of those goals. Over 50 territories have already adopted a Financial Inclusion Strategy for their economy (Espinosa-Vega *et al.*, 2020). An all-inclusive financial system is thus, fundamental to ease the efficiency of resource allocation and curtail the growth of informal sources of lending.

At the basic level, financial inclusion surfaced with account ownership that serves as an entry point to the formal financial system. Early literature exemplified that financial accessibility allows people to park their funds in the formal sector, creating a multiplier effect on economic growth. Yet, while account ownership remains nearly universal in high-income countries, almost half of the unbanked individuals across the globe, reside in the populous middle-income countries such as Bangladesh, India, Indonesia, Mexico, Nigeria, and Pakistan (World Bank, 2017). This pertaining issue establishes a particular interest to assess the significance of a stable and inclusive financial sector on economic growth. As a matter of fact, the issue has been addressed from manifold viewpoints, whether from an international or domestic context

Theoretically, financial inclusion, in facilitating the access of financial services to all individuals and in particular to the weaker segments of the population, is expected to lead to more expenses/developments and hence increase the level of economic growth. As such, a more inclusive financial system is critical in easing the efficiency of resource allocation and curtailing the growth of informal sources of lending. Financial accessibility should allow people to park their funds in the formal sector, creating a multiplier effect on economic growth. FI also reinforces the efficiency of the intermediation process through sound investment patterns, leading to increased stability and economic upturn (Cull *et al.*, 2012). As such FI is pinpointed to as a potential means which is connected to manifold financial parameters, including the financial well-being and stability of an economy. Although no direct theoretical linkage has been established, Khan (2011), Sahay *et al.* (2015) and Cihak *et al.* (2016) brought to light major constructive mechanisms through which FI contributes to FS.

Empirical work (A summary of the empirical evidence has been provided in Appendix 2) on the financial inclusion-growth nexus is relatively recent and a majority of the existing work has established a positive link (See Sarma, 2008; Sarma and Pais, 2011; Kim et al., 2018; Sethi and Acharya, 2018; Van et al., 2019; Nizam et al., 2020). It is noteworthy that few studies in the literature have so far focused on developing and middle-income countries sample or case studies (Vo *et al.*, 2021).

This paper goes beyond filling this research gap by providing a comparative evaluation between the lower middle-income countries and the upper middle-income countries. Owing to a potential trade-off that has emerged between financial inclusion and financial stability (Sahay *et al.*, 2015), this study further provides an extension by assessing the impact of financial inclusion on financial stability. This research is based on a sample of 30 middle-income countries from 2008 to 2019 and adopted a Generalised Methods of Moments (GMM) estimation to take into account the dynamic link in the financial inclusion-financial stability-growth nexus.

The rest of the paper is structured as follows: section 2 discusses the related empirical literature on the Financial Inclusion-Economic growth nexus, section 3 dwells into the methodology and provides an analysis of the findings while section 4 concludes.

2. Related Empirical Literature

Positive relationship between FI and EG

A way back, King and Levine (1993) initiated the analysis on the effect of financial development on EG in a cross-section of 80 economies over the time frame 1960 to 1989. Employing the partial correlation, extreme bounds and three-stage squares method, the scholars deduced a significant and positive influence on growth which was highly supportive to the theory of Schumpeter (1911). They concluded that efficient financial intermediaries foster productivity and growth through deploying resources towards promising investment projects.

The emergence of an inclusive financial sector in 2000s brought subsequent empirical evidence. Despite not using the terminology FI, Beck *et al.* (2007) was the first to explicitly examine the effect of both the breadth and outreach of financial systems on EG in 99 countries for the two-year period from 2003 to

2004 through a questionnaire. More basically, the academics captured the effect of the geographic and demographic access to banking services and the number of deposits and loans on growth. Increased access was perceived as being positively correlated with economic development and low financing obstacles were discovered in countries where ATMs and bank branches penetration and usage of loan services were high.

Sarma (2008) introduced a FI index, considering accessibility, availability, and usage of banking services, to probe the factors of FI in 54 countries. The findings inferred that, economies with higher GDP per capita, literacy rates and urbanization and low levels of income inequality are more financially inclusive, aligning with the 'demand-following' hypothesis established by Patrick (1966). Adopting this multi-dimensional FI index, Sarma and Pais (2011) evaluated its impact on economic development in 49 countries for the year 2004. The Ordinary Least Squares regression provided support to the positive and strong link with development in the economies. However, the findings revealed that banking sector liberalization impedes FI and development due to slow credit growth and credit access by foreign banks.

A comparative study of the low, middle, and high-income economies by Boldbaatar and Lee (2015), focused only on financial accessibility. Employing the GMM estimation, its relationship with EG was analyzed in 165 countries over 7 years, using multiple financial access indicators. The outcomes revealed that financial accessibility significantly fosters the economy. Likewise, Loukoianova and Yang (2018) adopted the GMM methodology to test for 188 nations in the Asia-Pacific region from 1990 to 2016. Despite a positive correlation between FI and per capita income growth was established, the degree differed substantially across the economies. The results disclosed that the benefits drawn from FI for growth reduce as FI expands, implying that low-income and developing economies derives more significant growth advantages than the advanced ones.

Kim *et al.* (2018) considered the exposure of FI to economic growth in 55 OIC economies from 1990 to 2013. The panel Vector Autoregressive (VAR) estimation supported the strong and positive relationship. Yet, the magnitude of the relationship differed across countries due to religion or financial literacy level. Controlling for trade openness and inflation, the findings decried positive and statistical significance to EG. Granger causality tests performed indicated the presence of mutual causality between FI and EG.

Huang *et al.* (2020) studied the influence of FI on economic development in 27 European Union (EU) economies. For more practical policy inferences, the sample was categorized into old-EU, present-EU, low and high-income members over 21 years from 1995 to 2015. Fully modified least squares methods employed, provided a less robust positive consequence of FI on economic development in high-income and old-EU countries in comparison to the low-income and recently joined EU economies where considerable and untapped areas for expansion and financial development is observed.

Suidarma (2019) evidenced the positive contribution of FI to EG by adopting the GMM estimation on a panel data of 10 ASEAN countries from 2008 to 2015. A similar approach by Adzimatinur and Manalu (2021) for their study in Indonesia revealed that this positive impact is reinforced by an increased financial literacy level. In the same vein, Thathsarani *et al.* (2021) sought to address the relationship in 8 countries in the South Asian region from 2004 to 2018. Employing the VECM method, FI was revealed to exhibit a positive and strong impact on growth in the short -run, while only outstanding deposits positively and significantly influenced growth in the long-run.

Negative relationship between FI and EG

Merely one exception to this positive relationship was identified. For the 2014-2018 span, Purwiyanta*et al.* (2020) focused their study of FI and EG in 34 Indonesian provinces. The analysis of panel data via the fixed effects model suggested that financial depth and FS have positive effect on EG. However, an unfavorable effect of financial access on growth was discovered. The explanation validates the existence of the paradox of thrift in the country. Indeed, given savings are withdrawals in the circular income flow, an increased ratio of public savings to GDP implies an absence of distribution of funds to the productive sector and hence, causing a decline in output.

Mixed relationship between FI and EG

At distinct time spans, Gourene and Mendy (2019) employed the heterogeneity panel causality model to analyze the causal linkage in 8 countries of the West African Economic and Monetary Union from 2006 to 2015. It was revealed that the usage of financial services influenced EG more significantly as compared

with demographic penetration. A long-run bi-directional causality was observed between FI and EG although none was found in the short and medium-term. The results were more supportive to the growth-led hypothesis rather than the finance-led effect. Contrastingly, Nwogu (2021) adopted the VECM method in his study on 15 nations of the Economic Community of West African States over an extensive time span from 1970 to 2017. While a short run causal association was established between FI and GDP per capita, there was no long-run causality.

More recently, Chima *et al.* (2021) delivered support for the significance of an inclusive financial sector on growth in 48 sub-Saharan African countries over the span of 1995 to 2017. The outcomes from the system GMM method indicate that inclusive financial access improves EG and also, moderates the negative relationship between income inequality and EG. Yet, credit from banks and loan issuance costs exert a negative association with growth.

3. Data and Research Methodology

Model Specification

With reference to the main independent variables, the model specification of this paper pursues the work of Kim *et al.* (2018); Huang *et al.* (2020) and Ratnawati (2020). As control variables, the researchers adopted a similar set of variables, including trade openness, government expenditure, population, and inflation. Inspired by these scholars and relying on the availability of data, the relationship between FI, FS and EG will be outlined based on the following functional equation:

$$GDPC = f(FAC, FAV, FU, Z, NPL, CPI, TO) \quad (1)$$

Were,

GDPC: Gross Domestic Product per Capita

FAC: Financial Access indicator proxied by the Number of deposit accounts with commercial banks per 1,000 adults

FAV: Financial Availability indicator proxied by Automated Teller Machines per 100,000 adults

FU: Financial Usage indicator proxied by Outstanding loans from commercial banks as a percentage of GDP

Z: Bank Z-score

NPL: Non-Performing Loans to Total Gross Loans

CPI: Consumer price index (Base year: 2010)

TO: Trade Openness proxied by Sum of exports and imports as a percentage of GDP

Table 1: Summary of the Variables included in the model

Variables	**Expected sign (+ or -)**	**Comments**	**Related refereces**
Financial access (FAC)	Positive	An increase in FAC will drive EG up due to rising economic activities.	Boldbaatar and Lee (2015); Loukoianova and Yang (2018)
Financial availability (FAV)	Positive	An ease in FAV implies an improvement in the financial infrastructure which leads to efficient flow of funds and EG.	Thathsarani*et al.* (2021)
Financial Usage (FU)	Positive	A rise in FU through loans increase economic activity and economy's output through investments in high value-added activities.	Ratnawati (2020)
	Negative	A rise in FU through loans which are diverted towards health and emergency needs instead of productive units, comes at a cost to EG.	Chima*et al.* (2021)
Bank Z-score (Z)	Positive	A highly stable banking sector indicates a resilient financial system and higher output growth	Ijaz *et al.* (2019) ; Ntarmah*et al.* (2019)
Non-performing loans to gross loans (NPL)	Negative	Greater NPL indicates a poor credit environment and a diversion of resources away from productive units, which adversely affect EG.	Manu *et al.* (2011); Ferreira (2018)

Inflation (CPI)	Negative	A rise in price levels creates uncertainty in the economy and depresses investment.	Guru and Yadav (2019)
Trade openness (TO)	Positive	An increase in TO spurs EG through increased productivity and competitiveness.	Huang *et al.* (2020)
	Negative	An increase in TO results in a negative impact on EG when there is poor financial development and low human capital	Kim *et al.* (2018)

Sample Selection

This research makes use of secondary data extracted from the database of World Bank and IMF. The data was collected on a yearly basis ranging from 2008 to 2019 for 30 MICs. The choice of this particular period was reached exclusively on the basis of availability of figures. The list of the MICs was adopted from the World Bank Classification of countries for the year 2019 for it to coincide with the end period of this research.

Table 2: List of Countries

LMICs	UMICs
Bhutan, El Salvador, Eswatini, Ghana, Honduras, India, Kenya, Lesotho, Nicaragua, Nigeria, Pakistan, Philippines, Ukraine, Vietnam, West Bank and Gaza	Argentina, Armenia, Brazil, Colombia, Costa Rica, Fiji, Georgia, Malaysia, Mauritius, Mexico, Montenegro, Paraguay, South Africa, Thailand, Turkey

Source: World Bank Group

Econometric methodology

The panel model below is thus, set as a result of an expansion of the functional model (1) into an econometric one and the application of a logarithmic transformation:

$$\boldsymbol{lnGDPC_{it} = \alpha + \beta_1 lnFAC_{it} + \beta_2 lnFAV_{it} + \beta_3 lnFU_{it} + \beta_4 lnZ_{it} + \beta_5 lnNPL_{it} + \beta_6 lnCPI_{it} + \beta_7 lnTO_{it} + \varepsilon_{it}} \quad (2)$$

The inclusion of logs, denoted by *ln*, on both sides transforms the variables into their natural logarithmic forms, allowing for the reduction of the effect of outliers and the normalization of data distribution. α represents the constant term. $\beta_{,}$ indicate the estimated coefficients. ε entails to the error terms. Subscripts *i* and *t* capture the number of countries and time dimension, respectively.

Dynamic Panel Data Regression

Even upon estimating the panel data, the issue of endogeneity of the explanatory variables arises, as the endogenous variables are possibly correlated with the error term. A loss of dynamic particulars eventually, emerges. The nature of a growth model often entails to a dynamic effect, whereby its past value is closely linked to its current one. In general, governments target a growth rate which is time-adjusted and hence, this elucidates that EG might be characterized as a time-persistent phenomenon and high inertia (Seetanah, 2009). To account for this dynamism, a lagged dependent variable is added as an explanatory variable to control for convergence. The confirmation of convergence induces that an economy with lower initial growth will grow rapidly given it is at a distance of its steady rate (Barro and Martin, 1992). The following model based on the work of Fauzel (2017) incorporates this dynamic effect and the adjustment process:

$$\boldsymbol{lnGDPC_{it} - lnGDPC_{it-1} = \lambda(lnGDPC*_{it} - lnGDPC_{t-1})} \quad (3)$$

Equation (3) depicts the process of adjustment of to the corresponding target growth level, $lnGDPC*_{it}$. The adjustment speed, ranging between 0 and 1, is delineated by the coefficient λ. The target growth level can be estimated as follows:

$$\boldsymbol{lnGDPC*_{it} = \alpha_t + \beta x_{it} + \mu_{it}} \quad (4)$$

where, $\boldsymbol{x_{it}}$ entails to the vector of explanatory variables (FAC, FAV, FU, Z, NPL, CPI, TO) and $\boldsymbol{\beta}$ portrays the corresponding coefficients. While $\boldsymbol{\alpha_t}$ indicates period specific intercept term, $\boldsymbol{\mu_{it}}$ indicates the time variant idiosyncratic error term.

The combination of equations (3) and (4) result in the following:

$$\boldsymbol{lnGDPC_{it} = \alpha_t + (1-\lambda) lnGDPC_{it-1} + \lambda\beta x_{it} + c_i + \varepsilon_{it}} \quad (5)$$

$c_i$denotes the unobserved effects of firm specific and time invariant, expressly, the unobserved fixed effects.

First differencing of equation (5) results in the elimination of component c_i.

$$\Delta lnGDPC_{it} = \alpha_t + (1-\lambda)\Delta lnGDPC_{it-1} + \lambda\beta\Delta x_{it} + \Delta\varepsilon_{it} \quad (6)$$

Owing to a possible endogeneity of $lnGDPC_{t-1}$two error terms through μ_{it-1}, it needs to be addressed by an instrumental variable. In this regard, the Instrumental Variable (IV)approach initiated by Hsiao (2006)can be adopted. Under this approach, despite consistent estimates of the parameters are produced, these are not necessarily efficient. As such, a second technique, the Generalised Methods of Moments estimators (GMM) advanced by Arellano and Bond (1991)is considered in this paper. This estimator deters dynamic panel bias (Nickell, 1981) while dealing with crucial modelling issues such as fixed effects and endogeneity. With regards to growth models, the GMM estimator is highly suitable and generates consistent estimates even when heteroskedasticity is present.

Following the choice of the GMM estimator, the selection between the difference and system GMM arises. Blundell and Bond (1998) put forward those lagged levels are merely weak instruments in case of persistent series such as GDP growth. As such, the first differences GMM estimation will possibly be affected poorly and have biased finite sample properties. Against this backdrop, the system GMM modelled by Arellano and Bover (1995) and Blundell and Bond (1998) will be adopted. The system GMM modifies the difference GMM to include lagged levels and lagged differences. The scholars depicted that the system GMM estimator generates efficient and consistent estimations while also owning improved asymptotic and finite sample properties. The one-step system GMM estimator will be adopted given the two-step system GMM produces asymptotic standard errors that are downward biased (Blundell and Bond, 1998; Baltagi, 2008).

Accounting for all the above, equation (2) is expanded as follows:

$$lnGDPC_{it} = \alpha + \beta_0 lnGDPC_{it-1} + \beta_1 lnFAC_{it} + \beta_2 lnFAV_{it} + \beta_3 lnFU_{it} + \beta_4 lnZ_{it} + \beta_5 lnNPL_{it} + \beta_6 lnCPI_{it} + \beta_7 lnTO_{it} + \varepsilon_{it} \quad (7)$$

Results And Analysis.

The GMM regressions results for the various samples are reported in the table below.

Table 3: GMM Estimates for the relationship between FI and EG

lnGDPC as dependent variable						
	LMICs		**UMICs**		**MICs**	
Variables	***Coefficient***	***p-value***	***Coefficient***	***p-value***	***Coefficient***	***p-value***
lnGDPC (L1.)	0.6487	0.000***	0.4806	0.000***	0.4213	0.000***
lnFAC	0.4433	0.058*	0.1777	0.030**	0.2243	0.012**
lnFAV	0.0711	0.176	0.1185	0.025**	0.2459	0.097*
lnFU	-0.0851	0.037**	0.1710	0.130	-0.1648	0.088*
lnZ	0.0111	0.064*	0.2044	0.021**	0.6243	0.031**
lnNPL	-0.3257	0.013**	-0.2980	0.078*	-0.0490	0.086*
lnCPI	-0.0904	0.016**	-0.2455	0.043**	-0.1612	0.053*
lnTO	-0.1584	0.011**	0.0193	0.509	0.3120	0.126
constant	2.6798	0.003***	4.5809	0.000***	5.5052	0.000***
F-statistic	52.01	0.000	55.48	0.000	24.18	0.000
AR(2)	0.231		0.300		0.699	
Hansen test	Prob > chi2 = 0.367		Prob > chi2 = 0.319		Prob > chi2 = 0.183	
Difference-in-Hansen	Prob > chi2 = 0.312		Prob > chi2 = 0.233		Prob > chi2 = 0.194	
, ** and * denote the significance level at 10%, 5% and 1%, respectively*						

Source: Computed

Discussion of estimation results

The table delineates the linear relationship between the dependent and the independent variables by the coefficients. Strong evidence is provided to the finance-growth hypothesis, conforming the theoretical underpinnings of Goldsmith (1969) and McKinnon (1973). This has been empirically attributed to stable

expansion of deposits base (Hannig and Jansen, 2010), lower information asymmetries (Jokipii and Monnin, 2013) and improved credit allocation process (Feghali *et al.*, 2021). Yet, considering the outcomes individually, an apparent mixed support is evinced in this study given not all p-values in the LMICs, UMICs and MICs are significant at the different levels.

In essence, the one-year lagged value of lnGDPC demonstrates its positive and significant relationship with current lnGDPC across all estimations. Interestingly, the coefficient varies across the estimations, where a value of 0.6487 is noted in the LMICs and a relatively lower value of 0.4806 is marked in the UMICs. This induces a slower adjustment pace in the LMICs with deviations from the target being amended by 35% (λ=0.35) after each year. Van *et al.* (2019) and Kim *et al.* (2018) also reported this convergence sign and a similar adjustment speed, across the same groups and in OIC countries, respectively. Therefore, a wider persistent nature in the pattern of EG is substantiated in the LMICs, whereby these countries grow relatively faster than their peers. The result further indicates the appropriateness of a dynamic model for estimation.

Financial accessibility (FAC)

In the MICs, the effect of FAC on EG is positive and statistically significant. This finding aligns to the supply-leading hypothesis of the finance-growth nexus, implying accessibility to financial services promote growth. An expansion in accounts penetration in the formal sector thus, improves savings that reflects the principal potential for funds for capital investment and ultimately, resulting into growth. This is in conformity with the study of Dahiya and Kumar (2020) and Ribaj and Mexhuani (2021). The latter made express reference to adequate monetary facilities in place that brings savings for favourable investments, an effective risk management and distribution of funds.

However, owing to the weaker effect in the LMICs, the outcome contrasts that reported by Loukoianova and Yang (2018) and Huang *et al.* (2020). These academics advanced that the benefits for account penetration for growth is higher in the low-income and LMICs due to the considerable scope for expansion of economic activities than the advanced countries. Arguably, their studies focused on Asia-Pacific and EU respectively, where the low-income and developing territories are also likely to engage in technology leapfrogging.

Indeed, this is less pertinent to LMICs globally as indicated by this study, where the mere access to and opening of bank accounts are inconsequential to growth. This was also concluded by Balele (2019) and Giron *et al.*(2021). The results of this study suggest that either account ownership does not necessarily translate into adequate deposits that would be provided as loans, or part of the deposits either remains ideal or are disbursed to unproductive areas that do not contribute directly to growth. Dupas*et al.* (2016)further averred that extending access had a limited effect on growth in developing states due to accounts that were not suited to the specific requirements of the marginalized segment and the high transaction fees involved with opening and using the account.

Financial availability (FAV)

The effect of outreach of financial services on growth enters insignificantly positive in LMICs, suggesting that the benefits of ATMs on growth are highly restricted. This can be attributed to the lack of development in the regions where despite ATMs being a less costly approach to enhance coverage, not enough services are provided except for cash withdrawals. The results coincide the studies of Iqbal and Sami (2017) and Ekechukwu and Mbah (2020) in the Indian and Nigerian economy, respectively. The researchers elucidated that the non-significance is explained by the high-cost financial resources and a poor level of financial infrastructure that exist in these LMICs.

Remarkably, in the UMICs, the coefficient is rather significant. The outcomes are congruent with the manifold findings of Beck *et al.* (2006); Boldbaatar and Lee (2015) and Gehrung (2020). The latter insinuated that the demographic outreach of availability of banking services allows cash and credit movements, ensures consumption levels during lean events, and lowers financing obstacles. Thathsarani *et al.* (2021) further advanced that banks in the UMICs move highly towards efficiency and quality of services. Indeed, they focus on migrating transaction activities to self-service channel. In turn, an efficient flow of funds is descried that eventually, nurtures EG. This also conforms the theoretical view of McKinnon (1973).

Financial usage (FU)

In the UMICs, the results support the findings of numerous research, notably, Demirguc-Kunt*et al.,* 2017 and Siddik*et al.* (2019), that has identified rising loan amount extended by banks as an increase in economic activity and ultimately, growing economy's output. Aligning with the work of Ratnawati (2020) and Chen and Yuan (2021), the positive coefficient of 0.1710 on EG is expected, particularly when loans are diverted towards investments in high value-added activities such as education that contributes to human capital, and entrepreneurships, that promotes technological progress, rather than emergency and health needs. This implies an advanced credit environment, resulting in efficient deployment of resources towards the most productive units. Yet, a better credit environment to support the lending practices, also comes with strict collaterals exigencies and restrictions on credit accessibility to underserved segments. Giron *et al.*(2021)reported that lack of documentation limits credit inclusion and potential investments in the less developed territories. This is further supportive to the insignificant effect that might be attributed to smaller amounts of loans disbursed to productive underserved groups that retards greater investments, conducive for growth.

As opposed, in the LMICs, the results establish a negative and significant relationship. Although a boom in credit growth implies greater FI, this is translated into an unfavourable impact on EG, particularly when there is an expansion of low-income borrowers with poor ability to repay or whose activities are only limited to low-scale investments. This also reflects the poorly regulated credit conditions in the LMICs, that renders an inefficient allocation of funds. This goes well with the study of Angeles (2015) and Sikarwar *et al.* (2020) and who ascribed the negative relationship to extensive household debt, whereby credit is principally used for consumption-smoothing. Chima*et al.* (2021) also reported that loan issuance expenses are higher than profit from loans itself in several SSA economies that are part of the LMICs, which further hinder banks' motivation to disburse loans to the underserved segment, which eventually halt economic progress.

Other independent variables

The other independent variables had the overall expected impacts on economic growth, although to varying extent for different sub samples, except for trade openness which was reported to have either insignificant or negative relationship with growth in selected sub samples.

4. Conclusion

Summary of findings

Despite tremendous financial development, it has been increasingly acknowledged that financial systems are far from inclusive. With greater dynamism in the financial sector now, a critical evaluation around financial inclusion surfaces. This paper extends empirical support by assessing and comparing the impact of financial inclusion and financial stability on economic growth in the LMICs and UMICs. Using a sample of 30 countries, equally distributed between the LMICs and UMICs for the period 2008 to 2019, the study exemplified whether the numerous dimensions for financial inclusion and financial stability have a significant relationship with economic growth or not. The system GMM estimation was adopted as the principal methodology in the study.

Policy Implications

Extending financial inclusion through access to deposit accounts comes off as pertinent to improve both growth and financial stability in the MICs in order for these countries to escape the 'middle-income trap'. First, governments' commitment, and involvement towards setting financial inclusion as a policy priority is indispensable. Flexible regulations towards simplified accounts can be adopted to ease the process for the financially excluded people, without undermining the KYC and money laundering policies. Besides, for long-term growing financial inclusion, an adequate consumer protection framework needs to be instituted to capture the trust of the unbanked and underserved segments. Reference can be made to India, where in 2014, the introduction of biometric identification cards was of huge success to foster account ownership given it brought transparency and consumer protection across the formal sector. As for banks in the MICs, an initiation to create a 'lock-in' effect by taking the first-mover advantage of attracting untapped clientele base is important to reduce the likelihood of default.

In the LMICs, a feeble effect of financial availability explains a greater need to foster banking penetration through technology-based approaches such as ATMs in order for the LMICs to climb the income scale. It is recommended to improve investments in market studies and stimulate regulatory efforts around innovation in the banking sector such that the banks can design products that would suit the characteristics, needs and preferences of the unbanked and low-income populations. This would also offer the financial sector with a diverse portfolio of channels for bringing the products and services closer to the marginalised group. This approach is particularly more critical in LMICs, where majority of the greatest unbanked segment resides (Barajas*et al.*, 2020[3]). In the UMICs, governmental incentives to enhance the range of services of ATMs and improve the delivery through voice-activated interfaces or haptic touch screens must be initiated.

In the LMICs, greater outstanding loans come off as a cost to both stability and growth. A need for greater focus of policy measures to address frictions to financial inclusion, notably to the credit infrastructure arises. It is recommended to ensure a promising regulatory environment for banks, particularly through; the creation of lending mechanisms that are tailored to the borrowers' unique purposes which can curtail the moral hazard risks in banks' quotidian activities; the reduction of default risk as a result of credit information bureaus being established or improved; a risk-based approach to due diligence; and greater legal actions to reduce the size of the informal financial sector. With reference to the UMICs, where a trade-off emerged between financial inclusion and financial stability, policies around making credit affordable must therefore be initiated. More specifically, liquidity supports can be provided to banks that target the underbanked or unbanked groups or credit facilities can be offered to entrepreneurs.

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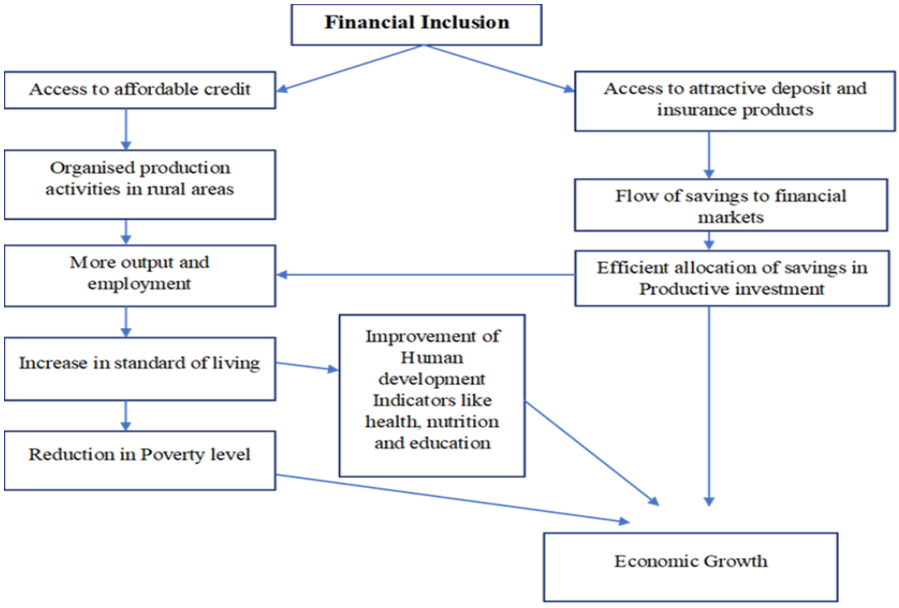
APPENDICES

Appendix 1: Financial Inclusion- Economic Growth link: Transmission channels.



Appendix 2: Summary of empirical evidence

Author	Sample	Time-Period	Method	Findings
Financial Inclusion and Economic Growth				
King and Levine (1993)	80 countries	1960-1989	Partial Correlation, extreme bounds and three-stages squares	Positive
Beck *et al.* (2007)	99 countries	2003-2004	Questionnaire	Positive
Sarma and Pais (2011)	49 countries	2004	Ordinary Least Squares	Positive
Boldbaatar and Lee (2015)	165 countries	2004-2011	GMM estimation	Positive
Loukoianova and Yang (2018)	188 countries in Asia-Pacific region	1990-2016	GMM estimation	Positive
Kim *et al.* (2018)	55 OIC countries	1990-2013	Panel VAR and Granger Causality	Positive
Suidarma (2019)	10 ASEAN countries	2008-2015	GMM estimation	Positive
Huang *et al.* (2020)	27 European Union countries	1995-2015	Fully modified least squares	Positive
Thathsarani*et al.* (2021)	8 South Asian countries	2004-2018	VECM	Positive
Purwiyanta*et al.* (2020)	34 Indonesian provinces	2014-2018	Fixed effects model	Negative
Gourene and Mendy (2019)	8 West African Economic and Monetary Union	2006-2015	Heterogeneity panel causality model	Mixed
Nwogu (2021)	15 countries of the Economic Community of West African States	1970-2017	VECM	Mixed
Chima*et al.* (2021)	48 sub-Saharan African countries	1995- 2017	GMM estimation	Mixed

Appendix 3: FI trends in LMICs and UMICs

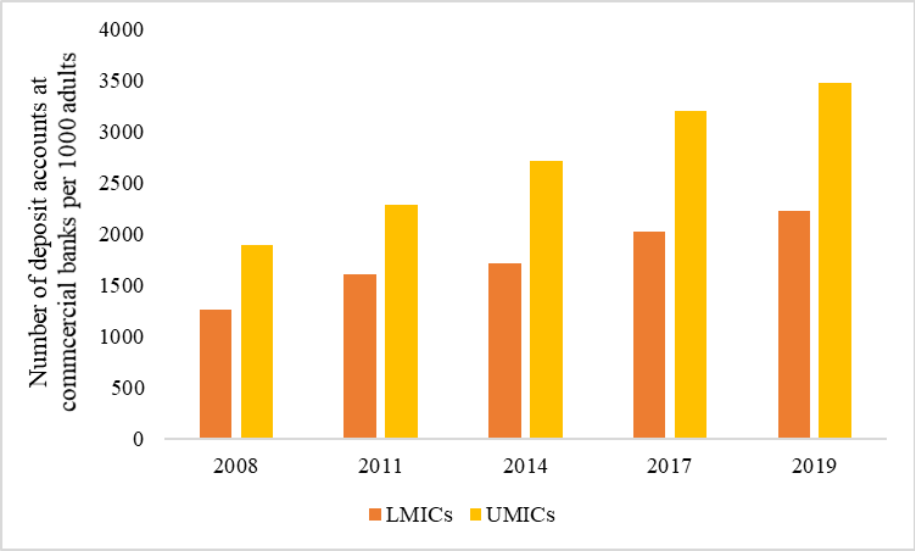


Figure A1: Account penetration
Source:IMF

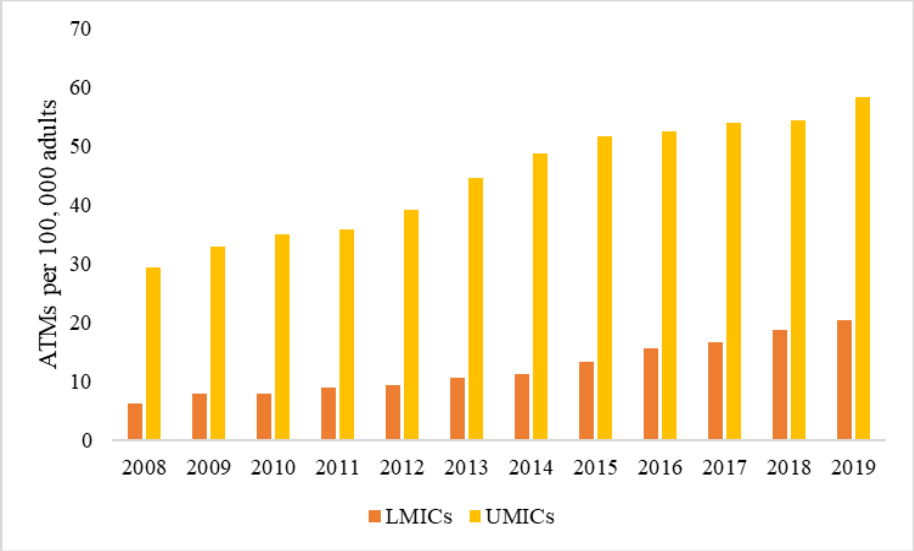


Figure A2: Financial Availability (ATMs)
Source: World Databank Indicators

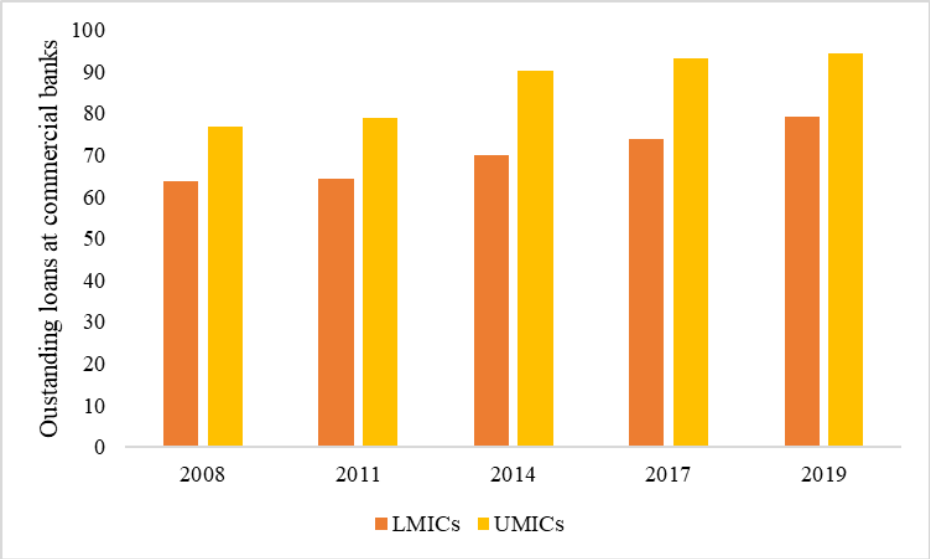


Figure A3: Credit Inclusion
Source:IMF Database

Investing human capital in education for unlimited excellence in KSA

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keywords
Investment - Human Capital - Education - Economic Growth - Excellence Without Borders.

Abstract

The study aimed to shed light on the importance of investing human capital in education for distinction without borders and to identify human capital indicators, human capital theory, internal growth theory, and the importance of investing in human capital in education. The study problem was represented in the following main question: Is investment in Human capital in education a way to achieve sustainable development? The study relied on data issued by some international institutions such as the reports of the global capital index issued by the World Economic Forum, the World Bank report, the International Monetary Fund report, in addition to previous studies that dealt with human capital. The results of the study showed that human capital is the real wealth, as it abounds with young human capital with high capabilities that enable it to grow and develop, and there are large investments in education, impressive growth in enrollment rates, and equal opportunities for both genders at almost all levels of education. This requires specialized cadres and high technologies, in addition to This human capital index measures the current results of education and health policies quantitatively on future outputs, and this is what the strategy of the Kingdom of Saudi Arabia 2030 aims at. The study recommended the Develop a plan based on sustainable development of human capabilities and develop them to cope with future challenges that are heading towards technology and artificial intelligence as a type of human investment to obtain an education Excellence Without Borders. Building bridges of cooperation between Saudi universities and internationally accredited training centers inside and outside the Kingdom to support innovation, creativity, and motivation for Excellence Without Borders.

Introduction

Investing in human capital in education is the basis for the advancement, progress of individuals and societies at all times and places. This is theoretically confirmed by the summary of recent literature based on the theory of human capital (Becker, Schultz, 2012) and the theory of endogenous growth that appeared in the eighties of the last century (Lucas, Romer Barro,2019). This is practically confirmed by the experience of emerging economies that have focused in their development strategies on the priority of investing in people.

Investing human capital in education is the most important source of promoting human development, given that education is the key to knowledge and the development of societies through real human capital development. Economic reforms in Saudi Arabia are beginning to yield positive results. In order to achieve a diversified, productive and competitive economy, reforms should work to increase and raise the competencies of faculty members in different disciplines to exploit untapped energies and direct them towards new programs that are developed according to the needs of the labor market.

The Study Problem

UNESCO reports confirmed that there is an important positive relationship between investment in human capital and economic growth in all countries the world, according to the World Bank report, education brings more important returns to human societies, and the World Bank confirms that education is one of the main factors for achieving sustainable growth. In its strategic objectives, the Saudi Ministry of Education emphasized the importance of developing the capabilities of educational cadres, hence the study problem in the following main question: Is investing in human capital in education a way to achieve sustainable development?

Study objective

The study aimed to shed light on the importance of investing in human capital in education, which contributes to achieving the vision of the Kingdom of Saudi Arabia 2030. This can be explained as follows: First, the low rates of spending on education in the Arab countries compared to other developing countries, which have achieved rapid rates of growth, in addition to the lack of optimal use of this spending, and secondly, the inappropriateness of higher education outputs to the needs and requirements of the labor market in Arab countries, which ultimately leads to a weak contribution of human capital to economic growth in Arab countries. Finally, human capital differs from the labor component in the integration of skills, competencies and education required by the development process.

Importance of studying

The Kingdom of Saudi Arabia seeks to invest in human capital in university education to excel without borders through various disciplines and work to develop and improve them, as well as the importance of the university education sector and its role in economic and human development.

Methodology

The paper adopted the secondary method of data gathering technique on Investing human capital in education, these include journals, books, references, literature, previous experiences of some countries, and the report issued by some international institutions, also the World Bank report for some countries such as Ghana, Egypt, Morocco, the Philippines, and Singapore.

The Theoretical Study

Theoretical Framework

Investing in human capital contributed to the transfer of some countries, which were considered developing until recently, to the ranks of the advanced industrial countries such as South Korea, it is a vivid example and a good example in this context. This movement in the path of progress, or this progressive shift, is characterized by its pillars, which are the increase in spending on education and health (Iman, 2021), and in line with the trend toward building an advanced knowledge economy (Economic Growth Theory, 2020). Also, the countries of South and East Asia (the Asian Tigers). whose development path was based on the importance of human capital development in driving development, which resulted in accelerating growth rates and in increasing the per capita national income, as recent studies indicate that one additional year of education achieves growth in GDP of 7% and this Explains the importance of investing in education in general and higher education in particular.

Human Capital

Human capital is a measure of the economic value of an employee's skill set. This measure is based on the basic production inputs to measure work as all employment is believed to be equal, the concept of human capital recognizes that not all workers are equal and that the quality of employees can be improved by investing in them; The education, experience, and capabilities of employees have economic value to employers and to the economy as a whole (Bakari,2019). human capital is like any other type of capital, it can be invested through education and training and enhance benefits that lead to an improvement in the quality and level of production, and it is often said that an organization is only good for its people, and it is the managers, employees, and leaders who make up human capital An organization is critical to its success, human capital is usually managed by the organization's human capital department (HCM), commonly referred to as human resource management, the HCM department oversees the organization's workforce acquisition, management, and improvement, other directives of the HCM department include force planning Operating and strategy, staffing, staff training and development, reporting and analysis. (Schultz, 2002) raised two important points in the field of investment in education:

a- Ignoring and neglecting the study of human capital.

b- The moral or psychological factor related to the treatment of education as an investment in the human being.

In Schultz's, 2002 opinion, the biggest mistake or shortcoming in the way capital was dealt with in economic analysis is the exclusion of human capital from this analysis. Some have believed that considering education as a means of creating and forming capital is one of the things that degrade the

human being and harm his psyche. In Schultz's opinion, these researchers built their beliefs on the basis that the original purpose of education was the cultural, not the economic. Education in their view develops individuals into good and responsible citizens by giving them an opportunity to gain an understanding of the values they believe in (Schultz, 2002).

Education Economics

The concept of human capital appeared in the sixties AD and belongs to the economist Theodore Schultz, and it reflects the value of human capabilities. The quality of work and the level of production, raising the level of competition and then achieving the desired goals.

Economists have been interested in studying the economic value of education. (Mill, 2020) considered education as a tool that helps instill values and habits related to how to exploit economic resources in individuals and uses education as a positive change tool for workers towards work, production, and consumption. Stroman, (1998) attempt is considered one of the earliest in this field, as he studied the economic value of education.

Education was linked to national planning processes as a cause and result at the same time for development processes. Alfred Marshall, (1879)was the first to directly refer to education as a kind of investment, and paved the way for the transfer of the role of education from being an external factor in economic growth to considering it as one of the factors The directness that enters into the production process and has a direct impact on economic growth and that the most valuable type of capital is the latent capital in humans, and the use of different measurement methods and determining the degree of effects and comparing the role of education in comparison with the role played by other elements that enter into production as direct factors (such as capital, Quantity of work, workers), and stressed the need for economists to pay attention to the role of education in economic development .

the interest in the economics of education appeared clear since the sixties of the twentieth century in the writings of "Theodor Schultz", where the first systematic appearance of the theory of human capital was in the wake of the statement of the relationship between education and economic growth, as "Schultz" presented this theory in his book The Economic Value of Education in 1963. The basic idea of this theory is the assumption that education is necessary to improve productive capacity, and a number of scholars such as Denison, Baker, Harbison, Myers, George Biscarbules have contributed to promoting the idea of the economic value of education, as these and other specialists see in the field of education economics, and educated people are more productive. The more a country invests in education, the easier and easier it will be to break into this country for the desired economic development reasons.

The importance of the education sector and its relationship to the development of the national economy

The education sector is one of the vital sectors closely related to society and has a strong connection to advancing the national economy, as it contributes to transforming the economy from dependence on a single source of income to an economy that depends on highly skilled minds and creative and productive human energies by developing human capital and contributing to achieving the requirements of and market needs for work.

Adam Smith likened the educated world to a sophisticated machine that facilitates work and reduces effort and time and believes that states are morally responsible for ensuring the individual's right to education and that the presence of competition in educational institutions ensures high quality and efficiency provided. The scientist "David Hume" at the same time agreed with the scientist "Adam Smith" on the need for personal financing for education and to get rid of the monopoly of the churches for education. The scientist "John Stuart Mill" also agrees with the scientist "Adam Smith" that the labor force is the basis of wealth, but he disagrees with him in subordinating education completely to the private sector.

Economists believe that the best investment in capital is an investment in people and that human development has become a necessity of economic development, and then choosing to invest in human capital has become the best choice in the field of economic development.

The reality of the Kingdom of Saudi Arabia investing human capital

According to the global human capital index, the Kingdom topped the second category of the human capital index, which works to quantify the contribution of health and education to the level of productivity expected to be achieved by the next generation of labor.

According to the Kearney report, Riyadh ranked first among the cities of the Gulf Cooperation Council in the dimension of human capital, which highlights the size and diversity of its demographics and its ongoing efforts to attract international talent. Moreover, six Saudi cities earned a place in the list of the top 20 cities in the Middle East and North Africa region, namely Riyadh, Jeddah, Dammam, Abha, Makkah, and Madinah. The findings of the annual Global Cities Report for 2021, prepared by Kearney, reflect the Kingdom's focus on creating a more diversified and sustainable economy, in support of its Vision 2030.

Saudi Arabia paid attention to the dimension of human capital by launching the Human Capacity Development Program - focusing on enhancing the capabilities of its citizens to prosper nationally, regionally, and globally. This will be done through advancing education, preparing young people for the future labor market, and supporting innovation and entrepreneurship to seize emerging opportunities.

Vision 2030 in the Kingdom and the guidelines of the International Monetary Fund to invest in human capital in education.

Saudi Vision 2030 in the Kingdom of Saudi Arabia emphasizes the need to pay attention to education and support its progress, and based on this message, the vision came to provide educational opportunities for all in an appropriate educational environment in the light of the Kingdom's educational policy, raise the quality of its outputs, increase the effectiveness of scientific research, encourage creativity and innovation, and develop partnership community, and upgrading the skills and capabilities of education staff. Among the goals by 2030 is the implementation of the "Irtiqa" program, which aims to involve families in 80 percent of school activities in the education of their children in 2020, in addition to developing indicators to measure education outcomes and review them annually.

The International Monetary Fund (IMF) experts report (2017). In the context of the Article IV consultations that there is a need to continue a significant and continuous fiscal adjustment in line with the fiscal measures announced in the fiscal balance program; With the aim of improving the elements of expenditure adjustment and providing more space for spending on social safety nets or other aspects of spending to support structural reforms aimed at achieving balance in the state's general budget. The Fund considers that the ongoing reforms in the education and training systems are a very important step towards developing the skills of Saudi citizens and preparing them to work in the private sector.

Literature review

Eman (2021), study the impact of human capital on economic development in Arab countries. The study concluded that there was a waste of Arab human resources is due to, the low rates of spending on education in the Arab countries compared to other developing countries, also, the inadequacy of higher education outputs with the needs and requirements of the labor market in Arab countries. Finally, human capital differs from the labor component in the integration of skills, competencies, and education required by the development process.

Bakari (2019), Shed light on the role that investment in human capital plays in developing human competencies, it was found that human capital is the real wealth of Algeria, as it is rich in young human capital with high capabilities that enable it to keep pace with the wheel of growth and development with the required effectiveness and efficiency, this requires specialized personnel and high technology.

Ghanima's study (2018), introduced a new mechanism for planning Arab human capital investment to meet the challenges of the new millennium. the study included the theory of human capital, the relationship of human capital to sustainable development, and the proposed vision for investing Arab human capital as an entry point to achieve sustainable growth for Arab countries in the third millennium.

Al-Fadil and Abufanas (2017), they studied the impact of human investment on economic growth in Libya during the period (1980-2010). The study used both the outputs of higher education and spending on education, in representing economic growth. The study indicated an improvement in the level of human capital in Libya during the study period. and increase in human investment leads to an increase in economic growth.

Al-Minqash and Uneq (2017), built a proposed model for investing in specialized academic programs in higher education institutions in the Kingdom of Saudi Arabia. The study found that there are no specialized programs for the development and training of the human capital component. Saudi Arabia keeps pace with the requirements of the labor market when choosing its specialized academic programs, which work to pay attention to the element of human capital and work to develop and improve it through continuous training.

Belhanafi & Mokhtari study (2016), The study aimed to measure the impact of education on economic growth in Algeria during the period (1962-2012) and the study relied on the Ordinary Least Squares (OLS) method of measurement. In the representation of human capital, the study used a number of indicators such as the development of the number of students in the primary stage, the development of the number of students in the basic stage, the development of the number of students in the secondary stage, the development of the number of students at the university level, and spending on education in Algeria, while it used an average of Crude internal production as an indicator of economic growth. The results showed a positive and significant impact of the development of the number of students in the primary and basic levels on economic growth, as education in these stages reduces the rates of ignorance and illiteracy. The results also showed that the development of the number of students at the university level negatively affects growth. This is due to the high unemployment rates among university graduates.

Al-Shaafi & Al-Ghussein's study (2015), The study aimed to measure the reciprocal relationship between investment in education and economic growth in Libya during the period (1970-2010). The study relied on some human capital indicators such as the number of university graduates, those enrolled in public education, those enrolled in universities, the external technological progress indicator, and investment spending on education. Using the Johansson Co-Integration Methodology, the study concluded that there is a positive relationship between economic growth and university education outcomes (public and private) on the one hand, and economic growth and the number of university students on the other. Also, there is an inverse relationship between spending on education and economic growth and indicated the weak exploitation of the capabilities of the human element due to the low rates of human investment in Libya. Despite the importance of these results, they cannot be passed and inferred, based on their implications, because they are based on a wrong measurement due to ignoring the degree of stability of the time series in use.

Previous studies and their relationship to the current study

The current study and all previous studies agreed on the importance of investing in education. The current study benefited from previous studies in enriching the theoretical aspect. But this study sheds light on the investment of human capital in education for excellence without borders, and it is compatible with the "Goals of the Kingdom's Vision 2030" that the vision seeks to achieve, by improving the financial efficiency of the education sector, opening the doors of human capital investment in education and encouraging innovation, creativity, and competition Encouraging human capital investment in the education sector.

Previous countries' experiences in investing in human capital in education

Investing in a child's early years is one of the smartest investments a country can make to break the cycle of poverty, tackle inequality, and boost productivity in the later stages of a child's life. Today, there are millions of children who are unable to reach their fullest potential due to undernutrition, lack of stimulation and early learning, and exposure to stress.

Human capital in the Gulf Cooperation Council GCC

Most GCC countries have made progress in the Human capital Index (HCI) in the last decade. However, the region's performance still lags behind, compared to countries with the same income level. As we shared in our presentation, a child born today in the GCC will attain only between 56% and 67% of his/her full health and learning potential and therefore potential productivity by age 18. To help improve this index, the GCC generally needs to focus on these pillars:

Prioritize public investment in early childhood development (ECD) and expand enrollment in early childhood education.

Focus learning on skills rather than credentials.

Promote female labor force participation and reduce skills mismatch.

Reduce risk factors of noncommunicable diseases (NCDs), especially among youth.

Develop all-of-government, whole-of-society actions that motivate behavioral changes and increase value for money in these investments.

The experience of the Saudi Basic Industries Corporation (SABIC), in interaction and cooperation with Saudi universities and research institutes

It focused on three things: developing human capital, applying the best technologies and programs, implementing an ambitious strategy for global growth, through agreements establishing research centers or sponsoring chairs and research projects or annual grants to support universities, with several programs, including: research support grants, conference attendance grants, Scientific chairs, SABIC award for the best graduation project in chemical engineering, building and equipping laboratories in universities and research centers, comprehensive agreements, advisory services, specific contracts. Thus, SABIC's support for Saudi universities in all its forms contributes to enriching their research and technical aspects in a way that meets the goals of industrial development and enhances economic movement. It contributes to achieving administrative development.

Methodology

The paper adopted the secondary method of data gathering technique on Investing human capital in education, these include journals, books, references, literature, previous experiences of some countries, and the report issued by some international institutions, such as the reports of the global capital index issued by the World Economic Forum, the World Bank report, the International Monetary Fund report, in addition to previous studies that dealt with human capital, including Al-Maliki's study, and a study Muhammad and Suleiman, The Human Capital Project Fund, the World Bank report for some countries studies such as Ghana, Egypt, Morocco, the Philippines, and Singapore. and economic theory depicts the role that human capital plays in economic growth.

The Neoclassical Growth Model

The neo-classical theory examines the importance of technological development in offsetting the negative effects of the diminishing marginal productivity of capital, without which both the rates of output growth and population growth would be equal, as the growth rate of per capita income would be zero. Solo's 1956 model is one of the most important models that analyzed the sources of growth. This model is based on expanding the Harrod-Domar model by introducing the labor component and adding a third independent variable, which is technical progress, to the economic growth equation.

Solow tested the hypothesis that capital accumulation is the main reason behind the increase in labor productivity and the increase in each worker's share of capital over time. The results reached by Solow showed that only 12.5% of the change in productivity in the long term is due to capital, while the rest of the productivity growth - more than 85% - which explains the growth in the long term is determined by the rate of growth of technological development.

According to the neoclassical model, growth is not the result of endogenous factors, nor does it last long. In the absence of technical development or external shocks, the economy will tend to have zero growth. The growth of output, according to the classical growth model, is a temporary growth that is caused by an increase in the quantity and quality of work, an increase in capital, and technological development.

Mankiw, Romer, and Weil (MRW, 1992) developed the Solo model (1956) by adding human capital as an internal variable like physical capital and labour. This model was based on the assumption that human capital is accumulated in the same technique as physical capital accumulation, whereby a fixed percentage of the output is invested annually in education, and in training the labor force.

The MRW model contributed to determining the effect of the rate of human capital accumulation on the individual labor output, which helps explain the differences between rich and poor countries.

The Endogenous Model of Growth

Cognitive Accumulation (Romer, 1986)

Romer presented the accumulation of knowledge as an internal variable. For Romer, knowledge is a public good and is part of the capital. Influenced by Arrow's work, Romer categorized capital into the

stock of physical capital and the stock of knowledge generated by it. According to him, economic growth in any economy is linked in the long run to the ability of this economy to acquire knowledge and to accumulate knowledge. Accordingly, Romer believes that any economic policy aimed at affecting the economy's ability to acquire knowledge will have a favorable impact on the achieved growth rates.

Romer model 1990, Knowledge capital accumulation, research, and development.

Romer divided economics into three sectors: the research sector, which uses human capital and existing technology to produce modern knowledge, which includes modern designs for capital goods or intermediate goods. Intermediate goods sector: This sector purchases modern knowledge from the previous sector, using it to produce new capital or intermediate goods. The final goods and products sector produces final goods with a technology that links human capital, in-kind capital (intermediate goods), and labour.

Romer emphasized the importance of allocating human capital between research and innovation activities and between production activities, on the basis that the higher the proportion of human capital allocated to research and innovation activities, the more the economy would be able to achieve a high growth rate in the long run. According to Romer's model, the output is determined from within the model and depends on the level of technological development, which depends on the balance of human capital allocated to research and development activities. This is why Romer's model is one of the most important approaches to self-development.

Human Capital Accumulation (Lucas Model 1988)

Lucas stressed the importance of human capital in light of the insufficient accumulation of natural capital (Physical Investments) to achieve continuous growth. According to Lucas, investment in education and training leads to many gains on both the individual levels, as it leads to an increase in worker and overall productivity, as it works to push the rate of economic growth in the long term.

Lucas provided an explanation for the increase in the rate of growing inequality between developed and less developed countries. According to Lucas, the marginal productivity of capital increases with the increase in the ratio of human capital to in-kind capital, due to the savings (externalities), which result from working in the presence of more qualified people.

Composite Indicators (Metrics) for Human Capital

In the Arab Competitiveness Report, issued in 2003, the Arab Planning Institute presented a composite index of human capital, which consists of five sub-indicators: life expectancy at birth, the rate of adult illiteracy reduction, the net enrollment rate in secondary education, the net enrollment rate in university education, and the percentage of public spending on education.

This indicator was developed in the Arab Competitiveness Report for the year 2006, and it consists of eleven variables. Three variables related to health: life expectancy rate at birth, expenditure on health as a percentage of per capita income, and expenditure on health as a percentage of GDP, while the human capital balance index contains two variables: literacy and reading knowledge among adults (15 years and above)) and literacy among young people (15-24 years), while the human capital formation index contains six variables: the ratio of females to males in the primary and secondary levels of education, the total secondary enrollment rate for females, the total secondary enrollment rate for females, the secondary enrolment rate Total, total university enrolment rate, and public spending on education as a percentage of GDP.

The Human Development Index of the United Nations Development Program (UNDP), which publishes annual reports on the level of human development in various countries of the world starting in 1990. This indicator is known as the Human Development Index (HDI), and this indicator includes three important dimensions:

Life expectancy at birth as an indicator of health.

The level of education, as indicated by the literacy rate of adults, in addition to the overall rate of enrolment in education.

The standard of living is indicated by the per capita GDP.

The World Bank launched the Human Capital Project in 2017, which is a tool that determines the extent to which health and education contribute to the productivity of the next generation of workers in a country. In addition to this, the Human Capital Indicator, which was developed by the World Bank on October 11, 2018, within the framework of the Human Capital Project, Human Capital Indicator measures the results of current policies for education and health on future outcomes. The index consists of five indicators that include Probability of Survival to Age 5, Expected Years of School, Harmonized Test Scores, Learning Adjusted Years of School, Fraction of Kids Under 5, not Stunned, and Adult Survival Rate. The HCI index is measured in units of productivity attributed to reference points related to the full achievement of education and health. The index takes values ranging from zero to one. Also, quantifies the contribution of health and education to the level of productivity expected to be achieved by the next generation of the workforce. Convert these losses into gains if these countries work to develop the human capital component.

Finally, there is the Global Human Capital Index (HCI), which is issued by the World Economic Forum, which was established in 1971. The World Economic Forum has issued a number of reports on measuring the ability of countries to develop and enhance human capital from 2013 until now.

The report on the Global Human Capital Index reveals the most successful global economies in the field of long-term economic employment of their workforce, by measuring the capabilities of 130 countries with regard to the extent of development and distribution of trained and capable workers. Both the World Bank's Human Capital Index and the World Economic Forum's Global Human Capital Index are distinguished from the Human Development Index (HDI) by their focus not only on measuring the balance of human capital or its detailed indicators, as does the Human Development Index, but on the extent to which this balance is utilized. The human capital index of the World Bank, for example, pays great attention to the impact of the balance of human capital on the productivity of the next generation, and it also allows the assessment of lost income due to human capital gaps. By measuring the ability of countries to employ, develop and distribute human capital, the importance of this trend increases, especially in the case of Arab countries, developing countries in general, which suffer from many manifestations of human capital waste, on top of which is unemployment among the educated and brain drain.

According to the report of the global human capital index, it covers only 12 Arab countries, as shown in Table (1), which shows the positions that Arab countries obtained according to the 2017 World Capital Index report. and looking at Table (1), the UAE ranked 45th in the world, topping the countries in the Middle East and North Africa region, while Bahrain ranked 47th. On the other hand, Saudi Arabia came and is considered the largest economy The region ranked 82, while Egypt, which is considered the largest in terms of population, ranked 97. Algeria, Tunisia, and Morocco came in the last ranks, with points 112, 115, 118, respectively, followed by Mauritania and Yemen, which ranked 129, 130 of the global ranking.

Table (1) Components of the Global Human Capital Index

Countries	Global ranking	Overall index	Capacity	Deployment	Development	Technical knowledge Know-How
UAE	45	65.48	91	69	19	32
Bahrain	47	64.98	30	45	77	53
Qatar	55	63.97	94	10	52	69
Saudi Arabia	82	58.52	60	124	71	58
Jordan	86	58.15	46	129	56	45
Kuwait	96	56.08	105	50	94	66
Egypt	97	55.99	80	126	86	50
Algeria	112	51.51	113	115	82	103
Tunisia	115	50.76	110	127	78	73

Morocco	118	49.47	106	121	99	108
Mauritania	129	41.19	116	125	128	126
Yemen	130	35.48	122	130	130	127
Average		56.00				

Results

1- The Human Capital Index Report 2017 indicates many weaknesses in human capital development efforts in Arab countries, including:

a. Human Capital Index Report 2017, the global average for human capital development is 62% of the total global human capital. The percentage of waste in human resources is about 38% of the global human capital.

B. The human capital development rate is on average about 56%, which is lower than the global average (62%), which means that about 44% of human capital in the Arab countries, which is a very high percentage, and the global average has exceeded the gap in human capital development Global (38%) is wasted untapped due to error in the allocation of skills within the labor force, in the development of future skills, and in the insufficient promotion of continuous learning of the workforce

2- The investment of human capital represents the best investment in order to build societies that enjoy economic prosperity.

3- Human capital has a role in increasing and improving the level of productivity and investing in it is essential for its development and the development of its knowledge and skills so that they can be exploited for the benefit of the organization.

4- The experiences of international countries confirmed that the investment policy in human capital falls to a large percentage on the government and the private sector.

5- International experiences have a positive role in setting the future strategy towards investing human capital in university education in the Kingdom of Saudi Arabia, and this is what the Kingdom of Saudi Arabia's strategy 2030 aims at.

6- The development indicators in the study indicated that the primary responsibility in the issue of investment planning rests with senior leaders, consultants, and planning experts in the state, which enhances their full material and moral support and their commitment to pushing the wheel of development forward through the development of policy frameworks for education and administrative organization, and the follow-up and supervision mechanism, and setting up Appropriate control in each device.

7- Education is one of the main factors for achieving development in human capital for sustainable growth to reach Excellence Without Borders.

8- Growth in developed countries is greater and stronger than that of less developed countries.

9- That the in-kind capital tends, accordingly, to move from the less developed countries to the more advanced countries, which leads to an increase in the disparity between them. Thus, in contrast to the convergence idea, which was promoted by Solo, Lux stresses that growth, as well as the accumulation of in-kind capital, are more significant in developed countries than in less developed countries.

Recommendations

Working to reduce the percentage of waste in human resources through developing a plan based on:

Develop a plan based on encouraging student innovation, creativity, developing the skills to cope with future challenges that are heading towards technology and artificial intelligence as a type of human investment to obtain an education Excellence Without Borders.

Investing in human capital is essential for the development and the development of its knowledge and skills so that they can be exploited for the benefit of the organization.

Setting future strategy towards investing human capital in university education in the Kingdom of Saudi Arabia, to arrive at the Kingdom of Saudi Arabia's vision 2030.

support senior leaders, consultants, and planning experts to push the wheel of development forward through the development of policy frameworks for education and administrative organization and the follow-up and supervision mechanism, and setting up Appropriate control in each device.

Building bridges of cooperation between Saudi universities and internationally accredited training centers inside and outside the Kingdom to support innovation, creativity, and motivation for Excellence Without Borders.

Enhancing an attractive investment environment for human capital in education by providing opportunities for all workers in the education sector to join training centers to raise their efficiency.

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Towards an Environmental Sustainability Management Accounting Template

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Keywords
Management accounting; environmental reporting; sustainability.

Abstract

In the 1980s, a recognition of the growing significance of environmental sustainability saw a momentum of pressure to go beyond financial reporting to include non-financial reports, with a focus on corporate governance and sustainability matters (Larrinaga and Bebbington, 2021). That momentum stemmed from general references to sustainable development by the International Union for Conservation of Nature (1980), through to defined references in the Brundtland Report (World Commission on Environment and Development, 1987), initiatives from the International Federation of Accountants (IFAC 2005). Further work by the GRI - Global Reporting Initiative (1999, 2016), and successive COP summits led to the establishment of the International Sustainability Standards Board (November 2021) by the International Financial Reporting Standards (IFRS) Foundation, linked to the International Accounting Standards Board. Currently, on a voluntary basis, many companies disclose sustainability initiatives and results, often based on the framework and methodology issued by the GRI. In some localities, aspects are now compulsory (e.g., France, Sweden, Brazil, South Africa, UK). The reporting scope itself has evolved from, initially, the three pillars of people, planet, profit, wider scopes. The three evolved into four: human, social, economic and environmental, and then into five: people, planet, prosperity, peace and partnerships. The challenge to organisations is to identify what needs to be measured and how, and to be reported upon.

This working paper explores how an organisation's internal management accounting function can provide a template for that, and to good effect. As a base it draws upon the UNDSD (United Nations Division for Sustainable Development, 2001) recommendations that environmental management accounting should focus on identification, collection, analysis and use of two types of information for internal decision making: physical information on the use, flows and destinies of energy, water and materials (including wastes), and monetary information on environment-related costs, earnings and savings. It builds on that base by identifying an examining what organisations are currently reporting upon and evaluating the strengths and weakness of such reports.

Introduction

This focus of this paper is the role environmental management accounting (EMA) can play in helping businesses, societies and nations in achieving the commitments, agreements, aspirations and targets set out in the COP26 global climate action summit in Glasgow, Scotland (November 2022). It considers the scope of EMA and identifies specific areas which should be planned for, monitored and measured after implementation, and reported upon. In so doing, as context, it reviews the development of the scope of EMA from the 1980s through to the present. As a departure point, although explored in more detail further below, the following description of EMA sets a steer for the EMA considerations in this paper: 'EMA supports managers to make better decisions by informing them about environmental impacts of an organization beyond its boundaries and about environmental issues that influence the organization. This includes economic drivers and consequences of environmental issues. EMA can help identifying environmental problems caused, environmental improvements made and how they relate to the economic performance of the organization.' (Burritt, Schaltegger and Christ, 2021).

COP26 was the twenty-sixth meeting of the Conference of Parties (COP), the membership of nations arising from the initial meeting in 1992 under the auspices of the United Nations Framework Convention on Climate Change. Representatives of the 197 nation states attending discussed and reached agreements on a number of issues across a range of areas including: '…the continuation of key principles from the

Paris Agreement and previous COPs, including multilateralism, and the importance of nature and biodiversity to climate action, as well as human rights, the rights of indigenous peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations, gender equality, empowerment of women and intergenerational equity.' (https://ukcop26.org/ p.5, 2021). Specifically, key aspects of the continuation of key principles from the Paris Agreement (in 2015) were affirmed regarding the targets of limiting global warming to 1.5 degrees (C) and adapting to the impacts of climate change and establishing financing to help achievement of those targets. As part of that, there was a commitment by most nations to i) strengthen emissions reduction targets by 2030, and ii) aspire to net zero emissions by 2050 through a combination of reducing carbon emissions and using carbon capture and storage strategies. These aspects are summarised under four broad headings: recognising the emergency; accelerating action; moving away from fossil fuels; and delivering on climate finance (https://www.un.org/en/climatechange/cop26). It should be noted that, perhaps not surprisingly with such a volume of nation states, each with their own contexts, that not all nation states agreed to each commitment but did pledge to move in the broad direction. As part of the COP26 deliberations, the term carbon budget was often cited. This is the term used by many national governments to set legally binding steppingstones towards the 2050 target. It is a cap on the amount of greenhouse gases emitted over a series of five-year periods. Illustratively, through its Climate Change Act, the UK government has committed to reduce emissions by at least 100% of 1990 levels (Net Zero) by 2050.

Drivers for applying EMABurritt

At a meta-level, the COP26 agreements, affirmations and pledges are drivers in themselves for EMA as a planning and reporting system. There are other drivers, both broad and specific. One is the location within the arena of ESG matters, environmental, social and governance. Businesses in many parts of the world are required to report on such matters through legislation or codes of conducts, often linked to corporate governance reviews and reports. The momentum towards ESG inclusion originated in the 1980s with pressure to supplement financial reports with non-financial matters, the focus of the latter being corporate governance and sustainability matters (Larrinaga and Bebbington, 2021). General references to sustainable development were made by the International Union for Conservation of Nature (1980). Generalities evolved into specific and defined references in the Brundtland Report (World Commission on Environment and Development, 1987), and initiatives from the International Federation of Accountants (IFAC) in 2005. ESG received formal recognition in the UN's Principles for Responsible Investment (2006) report. This required ESG matters to be incorporated in the financial evaluations of companies for the first time with the aim of developing sustainable investments. Atkins (Forbes, 2020) reports that in the aftermath of that report sixty-three investment companies with $6.5 trillion in assets under management incorporated ESG issues in their reports. Atkins (ibid) notes that in June 2019, 2,450 signatories were reporting on ESG, with $80 trillion in assets under management ($ in US dollars.) In this arena of investments, in 2015, with Michael Bloomberg as Chair, the Taskforce on Climate-related Financial Disclosures facilitates reporting by companies on climate-related financial risks. In 2020, more than 1,000 public and private companies with $138.8 trillion assets under management were engaged with ESG reporting. For commercial organisations and investment companies, the link between climate impacts and financial performance requires a focus of planning, measurement and reporting systems, located within EMA.

Further work by the GRI - Global Reporting Initiative, established in 1997, saw the creation and evolution of an accountability framework for companies to report on responsible environmental business practices amended in each of 1999, 2009, 2016. That framework's focus is climate change, human rights, governance and social well-being. Concurrently and since, there have been specific developments regarding economic and financial aspects. Blending such aspects with carbon-related matters, the Carbon Disclosure Project was set up in 2000 seeking to create a global economic system that protects against climate change and now has (Atkins, ibid). In 2011 the Sustainability Accounting Standards Board initiated development of standards covering both sustainability and financial matters. This has evolved to the establishment of the International Sustainability Standards Board in 2021 by the International Financial Reporting Standards (IFRS) Foundation, linked to the International Accounting Standards Board.

The EMA journey towards established scope and principles: the early years

Given that there have debates of concern about environmental issues since the 1980s, including financial consequences, it is not surprising that businesses and interested parties have been engaged with identifying and implementing approaches to relevant reporting across time. The early approaches reflected differing priorities and suffered from a lack of consensus. Management accounting literature reflects this with a range of views regarding the scope and focus of EMA systems. Illustrative research by Gray et al (1993), Hamner and Stinson (1995), White and Savage (1995), Schaltegger (1996), Parker (1999), Schaltegger and Burrit (two thousand) observed differences in the scope and a range of practices, with may relating to financial measures through internal accounting. Porter and van der Linde (1995), focusing on pollution, argued that pollution equates to inefficiency and inefficiency leads to economic disadvantage for a business. They translated this into a contention that preventing pollution should form the underpinning for business cases to improve financial performance. This was a in contrast to the views of many businesses that 'environmental actions' were nothing more than an expense.

The context however was still internal accounting linked to external financial reporting of profit figures. Thereafter research started to reflect two broad approaches to EMA were reported. Bennett and James (1998) report that EMA is considered by some to be based on a monetary measure on an internal accounting basis, and the second approach, as in Bennett and James (1998), and IFAC 1998, reflects both monetary and non-monetary scope and associated measures again on an internal accounting basis (UNDSD 2000, p. 39). Jasch (2003, pp. 667-668) reports that a clearer focus began to develop in a more meaningful manner following the establishment in 1998 of the Expert Working Group on Improving Government's Role in the Promotion of Environmental Management Accounting, motivated by that year's meeting of the United Nations Commission on Sustainable Development, and in particular the sub-group of the UN Division for Sustainable Development. That led to a consensus on concepts and associated principles and practices in Jasch's publication Environmental Management Accounting – Procedures and Principles in 2001. That publication, on behalf of the Expert Working Group. This was a watershed in that for the first time a degree of consensus established a framework for what to report on and how to report on it via EMA. The ethos underpinning this publication was an acknowledgement of the necessity of monetary and non-monetary scope, requiring associated costs to be identified to be measured.

Within that was the recognition that in conventional cost accounting and management accounting, at least in circa two thousand, environmental and non-environmental costs are aggregated together within the overheads umbrella categorisation, leading to management failures to recognise the cost and impact of environmental issues as they are hidden (Jasch ibid p. 669). The publication proposed that the scope of EMA should expand from conventional cost accounting to include both internal and external costs relating to environmental damage and protection. It should focus on identification, collection, analysis and use of two types of information for internal decision making: physical information on the use, flows and destinies of energy, water and materials (including wastes), and monetary information on environment-related costs, earnings and savings. At a more detailed level, it recommends identifying costs associated with contaminated sites, effluent control technologies and waste disposal, including prevention costs. It advocates inclusion of the i) conventional definition of environmental costs comprising all treatment, disposal and clean-up costs of existing waste and emissions, and ii) prevention and environmental management.

The EMA journey: the later years

Burritt, Hahn and Schaltegger (2008) developed Jasch's work further, seeking to develop a more comprehensive framework, facilitating better decisions by an organisation's managers, leading to improved environmental-related decisions and outcomes. They proposed expansion of the scope and content from environmentally related impacts on the economic situation of companies to include company-related impacts on environmental systems (p. 95). The former demands monetary environmental information, and the latter physical environmental information. Given the emphasis on ESG reporting referred to earlier, it is mooted that these groupings contribute towards improved and more meaningful external reporting, not least within annual reports with sections focusing on corporate governance and sustainability. Internally the data and information generated assists managers in a range of matters including, as reproduced from p.97:

identifying environmental improvement opportunities.
prioritizing environmental actions and measures.
environmental differentiation in product pricing, mix and development decisions.
transparency about environmentally relevant corporate activities.
meeting the claims and information demands of critical environmental stakeholders, to ensure resource-provision and access; and
justifying environmental management division and environmental protection measures.

As a framework for decision-making and reporting, Burritt, Hahn and Schaltegger (ibid p. 101) adapt Porter's 1985 value chain theory. This identifies operational activities and requires support activities and links them to whether the required information is specific or aggregate. The operational activities: purchase, production, logistics, marketing/sales, and Disposal/recycling, are supported by activities of senior management: finance/accounting, environmental management, health/safety, quality, human resource management, legal affairs, R&D, product design, corporate marketing and PR. It is suggested that for operational activities the types of information collected should be very specific and detailed with more aggregated information for support activities. This enables internal accounting systems to be designed to operate in tandem, providing appropriate details for each type of information required. This 2008 framework has been adapted by organisations taking account of their own circumstances, leading to variations on the theme.

One variation on the theme is the recommendations regarding the scope of and approaches to EMA by the Institute of Chartered Management Accountants (CIMA) and the American Institute of Certified Public Accountants (AICPA), published under the guise of the Chartered Global Management Accountant (CGMA) designation. The recommendations are detailed in Figure 1.

Scope of management information	Environmental cost categories
Identifying and estimating the costs of environment-related activities.	Prevention costs: costs associated with preventing adverse environmental impacts.
Identifying and monitoring the use and cost of resources such as water, electricity and fuel, so costs can be reduced.	Appraisal costs: costs of assessing compliance with environmental policies.
Making sure environmental considerations form part of capital investment decisions.	Internal failure costs: costs of eliminating environmental impacts that have been created by the organisation.
Assessing the likelihood and impact of environmental risks.	
Including environment-related indicators as part of routine performance monitoring.	
Benchmarking activities against environmental best practice.	

Figure 1. CGMA EMA Scope (reproduced from https://www.cgma.org/resources/tools/cost-transformation-model/environmental-management-accounting.html)

The CGMA Cost transformation Model accompanying the recommendations specifies incorporating sustainability to optimise profits. Of note is the use of the word optimise rather than maximise. This reflects a growing view that there are important stakeholders in addition to shareholders.

Is EMA working?

On the surface, it might be observed that to a lesser or greater degree EMA has made progress. A range of literature contends that globally EMA improves organisational performance. Illustratively such literature includes in Indonesia Sari, Pratadina, Anugerah, Kamaliah and Sanusi (2021), in Pakistan Amir, Rehman and Khan (2020). Such literature bases observations of improved performance, however on broad brush figures. More detailed studies suggest some positives and some negatives, illustratively Erokhin et al (2019) contend that managers, particularly when faced with turbulent economic times, ignore EMA tools and focus on achieving effects on sales, profits, and other performance parameters using less-sophisticated short-term approaches. Burritt and Christ (2016), through a literature review, report that environmental accounting, and by implication EMA, suffers from a lack of engagement on the part of businesses. They draw upon contentions from Searcy and Elkhawas (2012) and Wiedmann and Barrett

(2010) that this is linked to a combination of a lack of appropriate data, and/or the technology to collect appropriate data, together with challenges in understand the nature of corporate sustainability as a concept. Concurrently, businesses and their management teams are under both explicit and implicit pressure to show 'green credentials.' Lack of data, and/or unwelcome results from data analysis, has resulted in some businesses adopting greenwashing. Through greenwashing, a business makes misleading claims, presenting something as more environmentally friendly and sustainable than it is, in order appeal more to consumers. Brownwashing understates the success of green initiatives, where businesses are concerned that stock markets may react negatively to environmental performance, viewing it as being at the expense of financial performance.

Burritt and Christ (ibid) report that IFAC's contention in 2005 that organisational information is not accurate or detailed enough for environmental purposes still appears to be valid, and limited technology and its use in systems is a driver. They refer, illustratively to interviews they held with managers in Germany which revelated the volumes of departments and differing types of professionals resulted in ad hoc rather than systematic data being gathered. Kokubu and Kitada (2015) report another driver as being a reluctance by managers to be held responsible for environmental costs.

EMA and the journey ahead

Given the references earlier to limited technology, there are those who see the technological advances and digitisation accompanying the fourth industrial revolution as offering opportunities to improve data collection and analysis within more sophisticated EMA systems. Burritt and Christ (ibid) suggest that improvements could occur across a range of areas, including better data quality, reduced opportunity for greenwashing and brown washing, reduced management discretion over what is measured and reported, leading to higher credibility of data. (Seele, 2016) sees i) technological and systems advances being such that real-time data will be available, leading to shorter time frames for decision making and reporting, and ii) scales of economies being such that analysis and reporting system cost will be reduced significantly. Burrit and Christ (ibid) contend that these advances may well reduce the current propensity for departments within businesses to act as silos, leading to environmental and monetary gains from improved management.

Starting in the 1980s, the EMA journey has thus far been long. The reformation required is taking time but the fourth industrial revolution, with its emphasis on data, may well provide a platform for the architecture necessary to incorporate the key ingredients of the sustainability agenda - carbon emissions, water usage, land use, pollution – both individually and blended, as the recipe for the achievements of the 2050 target date.

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Business Transformation Project's Holistic Agile Management (BTPHAM)

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Keywords
Business Transformation *Projects*, Enterprise Architecture, Enterprise Agile Methods, Mathematical Model, Artificial Intelligence, Profile Management, Human Resources, Critical Success Factors and Performance Indicators.

Abstract

This article proposes a Business Transformation Project (BTP), Holistic Agile Management (HAM), to support intensive agile transformations. A BTP assisted by HAM (BTPHAM) uses critical success factors and areas, natural programming language environment and a dynamic decision-making system to improve the enterprise's Time to Market (TTM). BTPHAM supports all phases of a transformation project, and its concept is mainly based on existing standards, methodologies, and conventional practices. Complex markets and high levels of competition forces enterprises to integrate agile product and services management, in all its value chains. A HAM approach forces the used transformation framework and the related set of existing frameworks, to synchronize all types of transformation activities, like the deployment of software components. Such a synchronization process may generate many problems, which are difficult to trace, and which can damage the cyclic development process. This framework's originality is that it can be used in any stage of the transformation project and for any type of problem, and to synchronize BTPHAM's coordination. The main limitations are the enterprise's capacity to restructure and unbundle its legacy environments; and to integrate the BTPHAM in all its environments and implementation processes; which need the optimal BTP manager.

Introduction

The BTP manager (or simply the *Manager*) has become a central issue in managing complex BTPHAM operations. Where BTPHAM's main concepts are based on 1) Enterprise Architecture (EA) blueprints and patterns; 2) An Applied Mathematical Model for Business Transformation *Projects* (Trad, & Kalpić, 2020a); 3) Atomic services and architecture (Trad, 2015a, 2015b); 4) Various levels of patterns (Trad, & Kalpić, 2022a, 2022b); and 5) EA based agile project management (Spencer, 2016). In this article the authors will try to prove that BTPHAM can manage various BTP activities; and such an Agile Management (AM) process can be modelled by using the Applied Holistic Mathematical Model for HAM (AHMMHAM). The AHMMHAM is based on Critical Success Factors (CSF) and on a unique mixed research method (Trad & Kalpić, 2017a, 2018a, 2020a). The BTPHAM can be used to support all BTP's agile activities. The BTPHAM is supported by a Decision-Making System for HAM (DMSHAM), Knowledge Management System for HAM (KMSHAM) and an adapted agile EA methodology (Blackburn & Rosen, 1993). The Proof of Concept (PoC) uses various case studies from: 1) Agile project management; and 2) The insurance domain (Jonkers, Band, & Quartel, 2012a), where the focus is on AM used in BTPs (simply *Entities*). *Manager*s are normally supported by a transformation framework (simply the *Framework*) that can: 1) Manage all *Project* phases; and 2) Estimate the risks of failure of *Entities*. The *Project*'s initiation process identifies BTPHAM's main interfaces, phases and activities, and of course the optimal Manager. *Entity's* main issue lies in the transformation of a Monolithic Business System and Components (MBSC) into an agile and fully automated system, where the role of the BTPHAM is to manage and implement the architecture, design, and implementation phases of the *Entities*.

A BTPHAM capable *Manager* has to deliver a precise concept for managing *Entity's* Project Complex Implementation Phase (PCIP) that requires a set of in-depth agile methodologies, DMSHAM, KMSHAM,

EA, and implementation integration concepts and skills. As already mentioned in previous articles, the PCIP is the major cause of *Projects*' high failure rates. The authors' previous works have located a gap in the existing project management methodologies related to *Entities* that offer no insight into BTPHAM-like concepts and have concluded that the Architect of Adaptive Business Information System (AofABIS) is to be considered as the optimal choice, to manage *Projects* and its relevant agile processes. Unfortunately, *Entities* are managed by accountants' profiles which is one of the origins of their failures. BTPHAM requires an agile cross-domain specialized management skills and adequate education.

BTPHAM cross-domain specialized management skills

BTPHAM supports the transformation of MBSC's Information and Communication Systems (ICS) and to optimally exploit avant-garde technologies to successfully finalize *Projects for Entities*. The BTPHAM needs to interface standard methodologies, like The Open Group's Architecture Framework's (TOGAF). This article shows that the BTPHAM needs cross-functional capabilities. The BTPHAM can be used by the *Framework* that is based on the Research and Development *Project* (RDP) (Trad & Kalpić, 2018a); and it is agnostic to any specific application field and is based on the Architecture Development Method (ADM) (The Open Group, 2011a). The used EA methodology and its ADM are central to implement *Entities,* where the BTPHAM is used for enterprise-wide (or simply the *Entity*) synchronization of activities. The BTPHAM needs to be assisted by a DMSHAM to solve various types of problems. In general, *Entities* lack a holistic approach and have desynchronized activities, which need a BTPHAM to create synchronizer product creation. The *Framework's* interactions include three components: 1) DMSHAM; 2) KMSHAM; 3) BTPHAM; and 4) RDP.

The research development project

The Researched Literature Review and the Gap

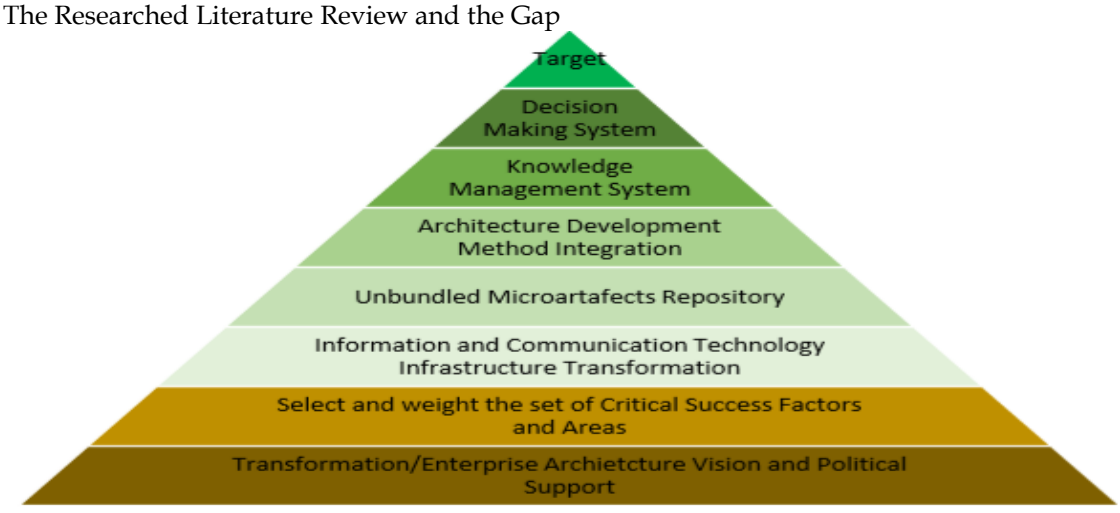

Figure 1. Levels of *Entity's* AM's interaction.

Entities various levels of complexities and high failure rates that are mainly related to the PCIP, need the right qualified skills and a holistic *Framework,* which recommends the usage of AHMMHAM-based Heuristics Decision Tree (HDT), to all levels of *Project's* AM, as shown in Figure 1 (Agievich, 2014). The BTPHAM can be applied to various types of *Projects* activities and the Research Question (RQ) is: "Which transformation agile projects' management characteristics are optimal for the complex implementation phase of transformation and enterprise architecture projects?" This RDP acknowledges an important knowledge gap.

The Knowledge Gap

The knowledge gap was acknowledged mainly because the existing literature on *Projects'* failure rates, EA and AM methodologies treating *Entities'* transformation processes, offer minor and siloed insights into the usage of AM and BTPHAM, which are vital for the *Entities, Projects* and their PCIP. This RDP inspects the BTPHAM, which is mainly based on existing business, organizational and technology standards, and is enforced with newly discovered AM related findings. The uniqueness of this RDP

promotes a holistic unbundling process, the alignment of standards, the usage of AM and EA strategies to support BTPHAM in agile manner (Farhoomand, 2004). This RDP uses a holistic agile concept that combines: 1) *Entities'* AM topics; 2) AHMMHAM and HDT based decision making; 3) Enterprise & architectural patterns, software modelling and implementation; 4) Business architecture and engineering; 5) Financial audit and analysis; 6) It offers a concrete cross-functional-methodology; 7) EA support for agile *Entities* management; 8) Integrating standard market business and technological standards; and 7) BTPHAM integration and success metrics, based on CSFs.

Review and Check of the Critical Success Factors/Critical Success Areas

As already mentioned, the *Framework* promotes AM based transformation concepts that use Critical Success Area (CSA) that contains a set of CSFs, where a CSF is a set of Key Performance Indicators (KPI), where each KPI corresponds to a single *Entity's* requirement and/or an item that can be a profile requirement or skill that has a column in each evaluation table (Putri, & Yusof, 2009; Peterson, 2011). *Project* starts with the first phase called the **feasibility phase,** that checks the basic CSFs (in the form of DMSHAM tables), to check if the *Projects'* objectives and roadmap make sense, which delivers a success or failure values. Based on the literature review and evaluation processes, the CSFs are used and evaluated using the following rules:

- HAM-related references must be credible and are estimated by the authors, DMSHAM and follow a defined classification process.
- *Projects'* iterations are the result of defined changes measured by CSFs.
- EA's modelling language, like Archimate, should be limited to make the *Entities* transformable.
- The AM-based ADM is mature and can be used to manage the PCIP.
- The AM-based ADM manages the *Framework's* iterations and CSFs tuning.

If the aggregations of all the *Project's* CSA/CSF tables are positive and exceed the defined minimum, the *Project* continues to its PoC or can be used for BTPHAM, or any other type of *Project's* problem solving that uses AM business cases, related to BTPHAM.

Agile management business cases

Business Cases' Basics

The PoC uses an AM-related Applied Case Study (AMACS), developed by the Open Group as a concrete study and other cases, which represent the possibilities to implement a *Project* which transforms the *Entity,* like ArchiSurance that is empowered by an AM case. These studies are suitable because they integrate cross-functional domains, in agile, synchronized, and glued manner. BTPHAM CSFs are measurable by a weighting concept that is roughly estimated in the 1st iteration and then tuned through agile sprint-oriented ADM iterations. In each iteration, the BTPHAM evolution is verified by using the DMSHAM; where CSFs are essential to support ADM's cycles (Felfel, Ayadi, & Masmoudi, 2017).

The Architecture Development Method and Projects

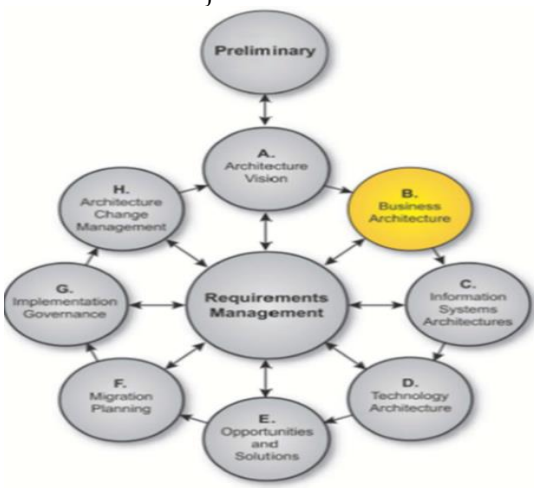

Figure 2. Business architecture phases (The Open Group, 2011b)

This RDP focuses on RQ's justification and on delivering design patterns for an *Entity's* AM integration and it also presents the influence of BTPHAM on concrete PCIP activities. In the actual age of distributed intelligence, complexity, knowledge, economy, and technology, the *Framework* offers a HDT that supports a set of BTPHAM problem types (Markides, 2011), where the DMSHAM offers a set of BTPHAM oriented solution types in the form of recommendations. The *Framework's* parts must synchronize with ADM's business architecture phase, as shown in Figure 2. BTPHAM activities are based on a proven mathematical model.

Mathematical model's support

The Mathematical Model Basics

CSFs define the initial nodes that are identified as vital for successful targets to be reached and maintained and is the AHMMHAM's basic element which is needed for the *Entities'* transformation's capabilities (Morrison, 2016). The BTPHAM uses a CSF/CSA based AHMMHAM, which uses a proprietary algorithm for *Entities*. The AHMMHAM nomenclature is presented in Figure 3, in a basic form, to be easily understood by the reader, on the cost of a holistic inter-related formulation of the dynamic and static models. AHMMHAM's application ***Domain*** is the **AM**, as shown in Figure 3:

- The symbol ∑ indicates summation of weightings/ratings, denoting the relative importance of the set members selected as relevant. Weightings as integers ranging in ascending importance from 1 to 10.
- The symbol U indicates sets union.
- The AHMMHAM defines the *Entities* as a model, using CSFs weightings and ratings.
- The selected corresponding weightings to CSF ϵ { 1 … 10 } are integer values.
- The selected corresponding ratings to CSF ϵ { 0.00% … 100.00% } are floating point percentage values.
- A weighting is defined for each BTPHAM CSF, and a rating for each KPI.

The AHMMHAM applied a research mixed model, which is mainly a qualitative concept which uses specific quantitative method.

A Quantitative-Qualitative Research Mixed Model

A BTPHAM problem, RQ, CSF or phenomenon, are examined/analysed in iterations relating breadth and depth, using AHMMHAM's HDT, which is specialized for unknown problems or the ones that appear in the *Project's* preliminary phase or initial iteration(s). Then, the *Framework qualitative research module* inputs data stream(s), which consist of(s) of sets of numbers that are collected from channels generated by using designed/structured and approved/validated statistically processed data object collection modules. Just analysing data is a partial, limited static solution, or a limited insight. There is a need for a dynamic proactive qualitative heuristic method like the proposed HDT algorithm. There is also a need to control the activities and behaviour of persons (and groups), which are an important part of the *Entity's* internals and to proactively detect any probable violations to the defined AHMMHAM constraints. Possible violations can be modelled to deliver controlled access to *Entity's* internals through political backup, informational services, assigned roles, responsibilities & credentials, and defined standards; and to support the transformation model.

Basic Mathematical Model's (BMM) Nomenclature

microRequirement	= KPI	(B1)
CSF	= Σ KPI	(B2)
Requirement	= CSF = ⋃ microRequirement	(B3)
CSA	= Σ CSF	(B4)
microKnowledgeArtefact	= ⋃ knowledgeItem(s)	(B4)
neuron	= action->data + microKnowledgeArtefact	(B5)
microArtefact / neural network	= ⋃ neurons	(B6)
microArtefactScenario	= ⋃ microartefact	(B9)
AI/Decision Making	= ⋃ microArtefactScenario	(B10)
microEntity	= ⋃ microArtefact	(B7)
Entity or Enterprise	= ⋃ microEntity	(B8)
EntityIntelligence	= ⋃ AI/Decision Making	(B11)
BMM(*Iteration*) as an instance	= EntityIntelligence(*Iteration*)	(B12)

The Generic AHMM's Formulation

AHMM	= ⋃ ADMs + BMMs	(B13)

AHMM's Application and Instantiation for a Specific Domain

Domain	= EARM	(B14)
AHMM4(*Domain*)	= ⋃ ADMs + BMMs(*Domain*)	(B15)

AHMM's Application and Instantiation for National Security and AIbDS

Domain	= AIbMT	(B16)
AHMM(*Domain*)	= ⋃ ADMs + BMMs(*Domain*)	(B17)

Figure 3. The applied mathematical model's nomenclature (Trad, & Kalpić, 2020a)

The Applied Business Transformation Mathematical Model

The AHMMHAM for BTPHAM has a composite structure that can be viewed as follows: 1) The static view; 2) The dynamic or behavioural view; and 3) As the skeleton of the *Framework* that uses Microartefacts' scenarios. The AHMMHAM can be modelled after the following formula for Business Transformation Mathematical Model (*BTMM*) that abstracts the *Project*:

AHMMHAM=$Weigthing_1$*AHMMHAM_Qualitative+$Weigthing_2$*AHMMHAM_Quantitative (B18).

AHMMHAM = ∑ AHMMHAM for an enterprise architecture's instance (B19).

BTMM = ∑ AHMMHAM instances (B20).

The objective function of the *BTMM*'s formula can be optimized by using constraints and with extra variables that need to be tuned using the AHMMHAM. The variable for maximization or minimization can be, for example, the *Entity's* success, costs, or another CSF. For BTPHAM's PoC the success will be the main and only constraint and success is quantified as a binary 0 or 1, where the objective function will be to minimize the risk for BTMM. The BTMM is a combination of *Entities* methodologies and AHMMHAM that integrates the *Entity's* organisational concept(s) and the ICS. The AHMMHAM is a part and is the skeleton of the *Framework* that uses Microartefacts' scenarios to support BTPHAM requests (Kim & Lennon, 2017). The BTPHAM components interface the DMSHAM and KMSHAM as shown in Figure 5,

to evaluate, manage and map CSFs for BTPHAM's selection activities; if the aggregation of all the *Entity's* CSA/CSF tables exceeds the defined minimum, the *Entities* continues to its second part of the PoC. The initialization phase generates the BTPHAM types of AM problems to be analysed. The AHMMHAM is a part of the *Framework* to support the application domain's requests (Agievich, 2014).

The application domain

As already mentioned, the application domain is AM, which includes many *Entity*'s resources and cross-functional fields and features, like the Minimum Viable Product (MVP).

Minimum Viable Product

To support BTPHAM for the *Entity's* agile aspects, there is a need for swift and reactive activities related to change. Implementing various types of EA artifacts, like patterns and Building Blocks (BB), which can define all possible business scenarios and solutions. The located solutions correspond to all acquired requirements. At the *Project*'s initial phase, all the requirements might not be all well specified. For that goal, the MVP concept is in development. In such a case, the value of BTPHAM is to support the *Entities* in the PCIP, where the **Development Sprints** are planned, with the notion of highest-value services, which are implemented first. As the PCIP applies the **burn-down** phases, the *Manager* identifies the first release to be deployed. Therefore, BTPHAM supports all MVP's requests, which is not encompassing all requirements, but it will move to patterns through a transitional state(s) towards a target architecture (Spencer, 2016). Such an approach supports the Minimum Business Increment (MBI).

Minimum Business Increment

In the cases where the value of changes or enhancements (or new product/service) are known, the concept of MBI can be applied. MBI focuses on the realization of business value in the optimal manner. It is a guaranty not to deliver less; it is a concept to deliver sooner. An MBI is the smallest unit of functionality that can be delivered which has well defined value to the business. The MBI's main characteristics are (Shalloway, 2021):

- Adds long-term business and organizational values.
- Provides valuable *Return on Experience* (ROE) on the optimal functionalities to be implemented.
- Provides valuable ROE that the functionalities will be successful in the PCIP.
- Offers functionalities that can be delivered, and which can be useful.
- Enhances the *Entity*'s ability to deliver tangible and intangible value after the *Project*'s ending.
- Has a continuum of all the patterns and BBs that are needed for value realization; and that includes works like documentation, ops and marketing, and other.
- They are created by determining the target business architecture, which can be external or internal. Then, it the DMSHAM decides which scenarios are needed for a specific functional domain, where the focus is on the MBI.
- Various *Project* iterations are needed to evaluate the MBIs, which are required to implement the needed functionalities. Iterative PCIP supports value and ROE enhancements and offers business opportunities to capture. Such a business value is based on what is considered as various values for the *Entity* and its end-clients.
- Values for an *Entity* may include debts, enhancing BTPHAM, improving ICS' platforms, or other types of values. Values depend on the type of the functional domain.
- Since MBIs are focused on the realization of value and not merely on deploying a feature, they must also describe all that is needed for full value delivery. This includes what would be required for ops, marketing, support and anything else.
- An adverse effect of MBIs, which they may have on existing functionalities, must be integrated to be built-in and not thrown over. Determining how MBIs can affect each other, is the responsibility of the Manager or the EA specialist.
- For an AM of a *Project* and all its sub-domains, there is a need for a **Scaled Agile Framework (SAFe),** which can support the used *Framework* and other market products.
- The Scaled Agile Framework

As shown in Figure 4, the main complexity if not only in the transformation process, but also in that most *Entities*, are using project management frameworks and infrastructure models that are obsolete. Today things have changes with a frequency rate at which the monolithic systems, structures, and methodologies built previously cannot keep the pace with frequent transformation demands. The recommended approach is not to throw away the existing knowledge base, but instead to reintroduce a parallel system, which would be transformed and managed by a SAFe, which includes seven core competencies (Kersten, 2021).

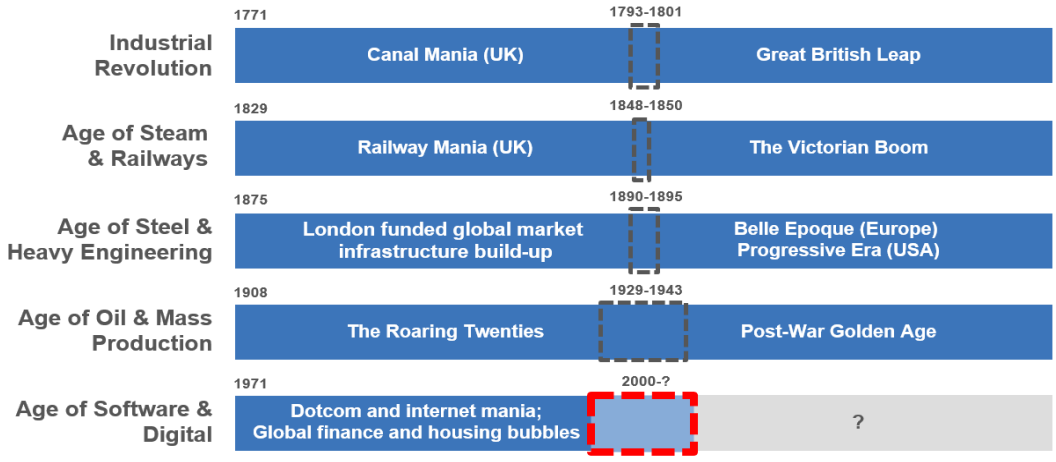

Figure 4. The main evolution phases (Kersten, 2021)

The Seven Core Competencies of Business and Organizational Agility

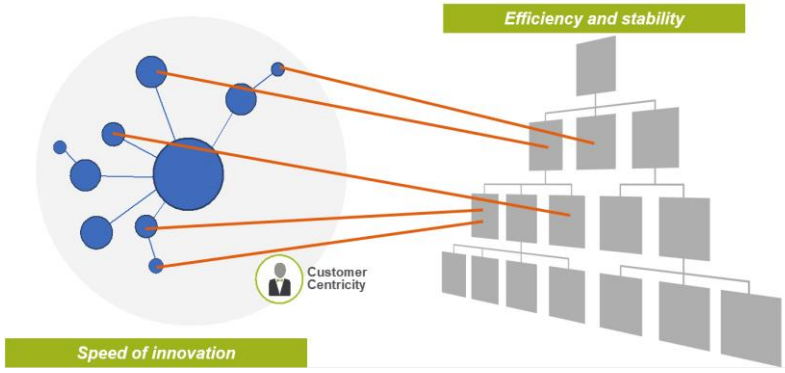

Figure 5. The relation between the speed of transformation and stability (Kersten, 2021).

Practically all today's systems are based software systems; and to achieve an advanced state of **Business Agility (BA),** means that the whole *Entity*, and not only its ICS department(s) must be engaged in continually and proactively delivering innovative business and organizational solutions quicker than their competitors. BA needs technical agility and a business-level commitment to support end-product, service, and value stream approaches. These approaches require all *Project* members use lean and agile practices, by using SAFe. As shown in Figure 5, SAFe integrates the power of lean, agile, and Development and Operations (DevOps) into a comprehensive environment that supports *Entities* activities in the turbulent digital age by offering innovative products and services faster, more predictably, and with better quality (Kersten, 2021).As shown in Figure 6, to manage a dynamic environment and *Project,* needs a Manager with **Lean-Agile Leadership (LAL)** skills and an adequate team.

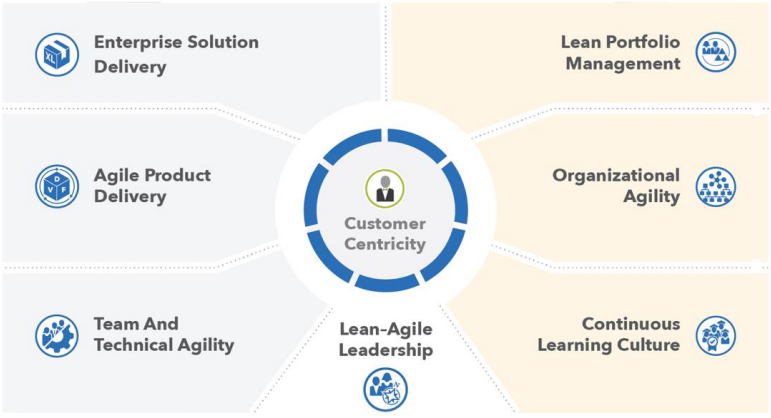

Figure 6. The seven core activities (Kersten, 2021)

Lean-Agile Leadership

Managers are responsible for the adoption, success, and ongoing improvement of lean-agile transformation iterations and the skills that lead to BA; they have the authority to continuously transform the *Entity*. The LAL set of competencies describes Managers should (Kersten, 2021):

- Drive *Projects* and operational activities by enforcing agile individuals and teams. Agile teams and teams of agile teams create and support *Project's* solutions that deliver value to end clients. The *Entity*'s ability to finalize a *Project* depends on the ability of its teams to respond to end-clients' needs.
- The team and technical agility competency describe the needed critical skills and defines the main lean-agile principles and practices, which agile teams use to create optimal solutions.
- To ensure BA, *Entities* must increase their ability to deliver innovative products and services. To verify if the *Entity* is delivering the optimal solutions, the focus must be set on the end client.
- Agile product delivery is an end client centric approach for defining, implementing, and releasing a continuous flow of valuable products and services.
- Major transformations require innovation, experimentation, and knowledge from various domains. *Project* members bring these innovations to end products, by designing and coordinating all the activities. The competency in delivery of enterprise solution specifies how to apply lean-agile principles and practices to the *Project*'s design, specification, development, deployment, operation, and evolution activities.
- Obsolete traditional approaches to portfolio management were not intended for a global and networked economy or for the impacts of massive ICS disruptions. These CSFs put immense pressure on *Entities* to implement with high risks' rate. The lean portfolio management competency aligns *Project*'s strategy and execution by applying lean system's thinking to support the strategy and investment funding, agile portfolio operations, and global governance.
- The lack of organizational agility means that *Entities* cannot respond to *Project* challenges and opportunities to rapidly respond to changing markets. Organizational agility competency, describes how lean system's approach and agile teams optimize their *Project*'s, define a strategy with clear and decisive objectives, and adapt the *Entity* to any emerging opportunity.
- To thrive in the actual very competitive environment *Entities* must transform into adaptive automated structures for continuous change, which should be supported by a habit of effective learning at all levels and in various domains. Learning *Entities* leverage their collective knowledge, decision-making, experience, and creativity of their teams, end-clients, and their ecosystem(s).

Complex *Project's* environment(s) need *AM's logic to be scaled*.

Scaling Agile Management

Today's ICSs are facing dynamic environments, where this dynamicity demands from Entitles to deliver software systems at faster pace and to be more tolerable to ever changing user requirements during the PCIP. Agile software development is an iterative and incremental concept for software development, which has emerged as an alternative to the traditional development concepts to address actual challenges; and proposes the following (Stojanov, 2015):

- Among the different agile methods is SAFe, which arose in the last decade, and can be used for implementing agile concepts at *Entity*'s scale. SAFe's main focus is to highlight the roles, activities and EA artefacts necessary to scale agile to teams, *Project* programs and *Entities*. Due to the lack of the optimal implementation strategy for SAFe, the proposed Framework can be used for process improvements and as a *maturity model*.
- Lean software development originated from the success of Toyota and its production system. This lean production system is based on preserving value while minimizing work. This is done by offering the right things to the right place at the right time, while reducing waste and being open to change. The success from the Toyota Production System initiated the lean movement towards applying the practices and principles of lean software development. SAFe incorporates several of these principles while applying the framework for lean software thinking.

The Portfolio Level, as higher level of abstraction, is required for large *Entities* which have many PCIP teams. In such cases SAFe introduces new governance and management models with new EA artefacts. The portfolio levels the focus on establishing balance between four potentially conflicting goals: 1) To maximize the financial value of the portfolio by identifying value streams using the Kanban system; 2) To link the portfolio to the *Entity*'s strategy through investment schemes; 3) To ensure that the scope of activities is feasible by using metrics, like CSFs/CSAs; and 4) To balance the portfolio on relevant levels by defining and managing business and EA objectives, which run across value streams. Such operations are to be supported by a *Framework and a competent Manager*.

Framework and the Manager

Meta-management and business integration require a *manager* who is also an agile innovation specialist. The *Manager* must be an excellent AM expert, who can implement a very light version of the disciplines of TOGAF and SAFe, related EA/AM, services, and processes. The use of AM processes will enhance the management of *Projects*. BTPHAM's specific characteristics require a special educational curriculum based on ICS and business engineering, for *Managers*. *Managers* need to have the ability to deeply understand *Entity's* unique EA/AM/BA paradigms, and to swiftly identify *Project* plans and to effectively implement them in the transformation process. The implementation of this managerial recommendation is done by selection of the right *Manager* who has the proposed qualities and at least some education in business and ICS; and many years of concrete experience. The *Manager* needs to be supported by a *Framework*, that interfaces TOGAF/SAFe and to establish *Entity's* transformational patterns. Such transformational patterns structure the *Entity* and its PCIP; by executing the following tasks: 1) Unbundling through services, 2) Architecture, modelling and integration; and 3) Finding and aligning the needed experiences or ROE.

Needed Experience

The RDP is also based on the authors' experiences and ROE sources, which have often encountered *Entities* with serious problems and having high rates of failure. That is why they want to pursue this RDP and contribute to this visceral problem related to complex *Entities* and to offer a BTPHAM. The main difficulty lies in the duration of *Projects* that take many years to be finalized. The complex activity of interconnecting the *Entity's* business processing nodes, which is known as unbundling, is extremely complex, and in general it causes major resistance. But to avoid such scenario(s) the use an AM based ADM can be applied.

Architecture development method and agile management

The ADM is a generic method and recommends a set of phases and iterations to develop the *Project*; it designs parts of the transformed end system interfaces, with other *Projects* deliverables and standard frameworks, like TOGAF and SAFe. The BTPHAM must be capable of defining the set of basic *Project's* requirements and use AM to synchronize architecture phases.

Architecture Phases

The ADM manages the *Project's* AM based development iterations; in this section the authors present main ADM's phases and *Entity's* interactions: 1) The preliminary phase selects the relevant BTPHAM CSFs and interactions; 2) The architecture vision and business architecture; 3) The ICS architecture; 4) The technologies architecture, and 4) The requirements management and tests. For BTPHAM, BA's integration is important.

Business Architecture, Modelling and Integration

The *Project* uses the *Framework* (with TOAGF's and SAFe's support) to apply standards that deliver added value and robustness to *Entities*. In order to move towards a just-enough AM based BA that is known as the target or the final interaction architecture, where the important adjacent domains are clearly shown and the others are blurred, because of their low level of importance. The BTPHAM must be capable to align: 1) BA's traditional vision; 2) BA's principles; and 3) Standards management to support BA and EA. Traditional BA layers represent a silo model of the fundamental system, and it is very hard to merge its components into an AM based system. BA scenarios can be used to automate the *Entity's* value chains which rationalize the *Entity's* activities and enables them to communicate with external partners. The implementation of BTPHAM is done by training of the *Project* team, who should have the minimal experience in these domains. To support an AM based BA, CSFs are needed, to ensure the rationalization of the *Entity's* ICS platform nodes and to enable cloud enabled business communication. For various *Entities* that must be transformed using BTPHAM, the infrastructure is a crucial CSF, to link its ICS to partners and clients. The *Project* should implement performance CSFs to monitor its progress. All *Project's* BA, AM and EA artefacts are stored in the enterprise continuum.

Using the Enterprise Continuum

Complex *Projects* require efficient repository management to support AM based *Projects*. The different categories of artefacts are used to perform cross-functional tasks and business scenarios. The combination of foundation, systems, solutions, and architects' artefacts may be utilized, to create various types of patterns and BBs. Each *Project* member may have a specific task and focus, or a specific role and responsibility, within AM based ADM's phases of the PCIP. For a PCIP, the BTPHAM should assign, manage, and lead team members. The BTPHAM coordinates the Foundation Architecture activities, whose responsibility includes architectural design and documentation at a technical reference model level (The Open Group, 2011d). But all these AM activities there is a need for defining the Unit of Work (UoW) as a BB.

Unit of Work as the Building Block

The *Framework's* Microartefact granularity and responsibility for a given AHMMHAM scenario is a complex undertaking (Kim & Lennon, 2017). The implementation of the "1:1" mapping and classification concept ensures that resources pass from one component to the other with a mapping concept. The EA concept uses methodologies like the ADM to support BTPHAM's activities. Such activities use Microartefacts bundles in the form of UoW, that facilitates the integration of various technologies and standards.

EA, SAFe, Technology, Services and Standards

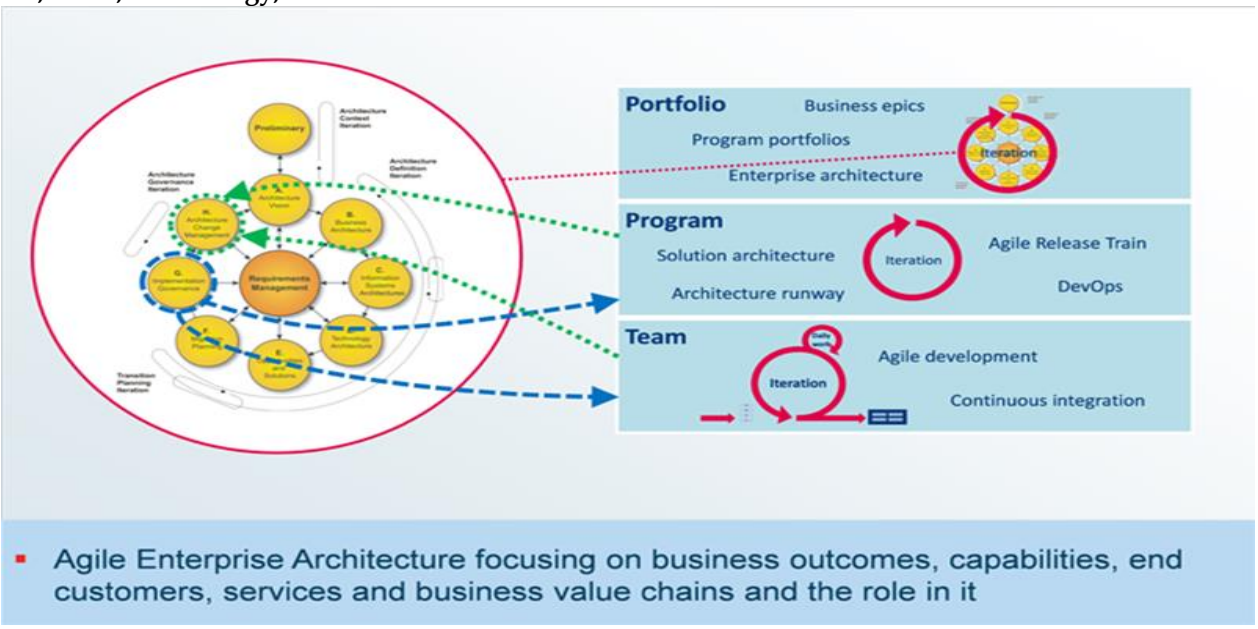

Figure 7. AM based EA using TOGAF (Lankhorst, 2016)

A *Manager* must have in-depth skills to manage AM based *Projects*; where adequate mapping and synchronization concepts can be used to integrate various types of standards like TOGAF, SAFe, Unified Modelling Language (UML)…; this coordination is BTPHAM's major responsibility. BTPHAM's strategy is enabled by the establishment of an ADM/SAFe based iterative model that can map *Entity's* Microartefacts in an "1:1" manner (The Open Group, 2011b). The scope of encountered complexities lies in capability of the BTPHAM to synchronize the *Entity's* transformational vision that encompasses its real capabilities (Trad & Kalpić, 2015b). The BTPHAM uses the *Framework by* using a mixed bottom-up approach that is based on services' architecture standards, which are the backbone of the *Entity's* unbundling process. AM based EA is a key ability of an *Entity*, because the pace at which end clients require innovative services and products, at which new governance rules, laws and regulations affect services and introduce new business processes, and the easiness at which business competitors can disrupt the *Entity's* business sustainability, drives to huge pressure.

Pressure to change frequently and quickly, to integrate Avant-Garde technologies, to generate growth, to scale up or to reduce costs. That is why for *Entities* being agile, is a crucial CSF which shows how able is the *Entity* to innovate. Innovation and agility are crucial competences for a sustainable business. As shown in Figure 7, EA and SAFe uses a layered, iterative approach, to support *Project* teams in the bottom layer. Such an approach delivers results with a typical agile frequency of 2-3 weeks. In the middle, the results of these teams are integrated and released using EA based patterns and BBs, like, the *Architecture Runway and the Agile Release Train*, which ensure the integration process. This layer iterates at speed that is a few multiples of the team layer, delivering quality products in each period. At the top part, the long-term PCIP is positioned; and this is where EA is used to deliver *Project* blueprints. The *Entity's* business strategy fills this layer, with principles and then provides the context for large-scale, high-impact EA decisions, priority setting and budget estimations (Lankhorst, 2016). BTPHAM, must consider all long-term aspects of the enterprise's security concept and strategies.

Enterprise Security Strategies

Entities face a set of barriers and difficult situations, which need the AM of Entity's Security Risks (ESR), using a specialized framework to support their activities. ESR may include CSFs related to reputation, routine Secured Development Operations (SecDevOps) procedures, legal and human resources management, financials, the risk of failure of internal controls systems and Entity wide governance. The BTPHAM supports the capabilities to protect the *Entities* by 1) Localizing gaps in the infrastructures of partners; 2) Review of detection, and real-time security solutions; 3) Blocking of

cumulative attacks; 4) Defining a security strategy to locate potential weaknesses; 5) Building a robust defence; 6) Integrating security in transactions; and 7) Applying qualification procedures (Clark, 2002). Transformed *Entities* with an efficient ESR management automate this management by using the *Framework,* which is in turn supported by the ADM and SAFe. The *Entity* chooses an ESR strategy to achieve its goals and tries to find ways to avoid major problems. Evaluation of ESRs and the definition of the probability of hazardous events and the choice of solutions is specific to *Entity* and its eco-system. ESR are, in most cases, difficult to discover and classify, due to their diversity and complexity. There are various types of ESR that are related with each application domain. ESR's neutralization is a technical, financial, and mathematical process for the implementation of decisions for the transformation measures. The ESR's AM structures SecDevOps by using CSAs, weights them and uses delimiters to select the related CSFs. ESR's AM analyses the CSAs by applying scenarios for mitigation. ESR AM system's key principles are: 1) Principle of integration using a systemic and holistic approach; 2) Principle of continuity using a set of procedures; 3) Integration of SecDevOps; and 4) Principle of validity based on CSFs and qualification procedures (Kiseleva, Karmanov, Korotkov, Kuznetsov, & Gasparian, 2018).

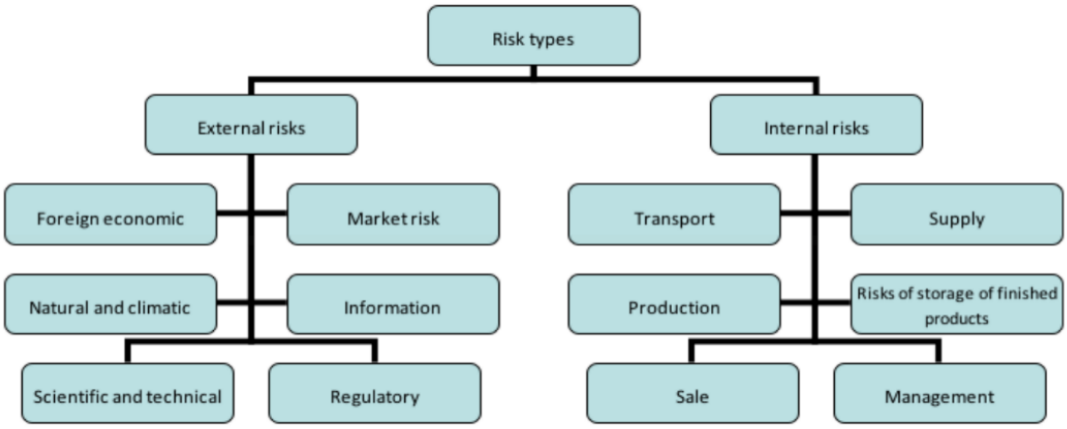

Figure 8. Types of economic risks (Kiseleva, Karmanov, Korotkov, Kuznetsov, & Gasparian, 2018).

Resources, Artefacts, Factors Management and Qualification Procedures

Actual design, development, qualification, and SecDevOps for *Entities* are still in infancy stage, or simply chaotic. Tools for the PCIP are still confronted with serious issues. These issues show that tools are still inappropriate for large *Entities* of intelligent systems and the authors recommend using an HDT similar concept. The BTPHAM manages the *Framework's* repository and continuum that map CSFs to various types of *Project's* resources. This mapping concept is supported by the ADM which associates CSFs, resources and Microartefact scenario instances to *Entity's* requests (The Open Group, 2011a). These requests are intercepting the *Entity's* decision making and knowledge management systems.

Decision making and knowledge management systems

A Highly Agile, Complex and Risky Process

BTPHAM is supported by DMSHAM and KMSHAM systems, which deliver sets of possible solutions to identified types of *Project* problems. The best selected solution(s) proposes transformational changes and minimize *Project* risks. DMSHAM and KMSHAM systems' integration may face possible problem types, due to complex HDT processing evaluation process, what implies that the analysis and AM of risk(s) is one of the important pre-requisites to ensure the success of BTPHAM activities (Hussain, Dillon, Chang & Hussain, 2010).

The Knowledge Management System

The BTPHAM must be capable of managing agility Knowledge Items (aKI); where aKIs and Microartefact scripts are responsible for the manipulation of intelligence, and they control various knowledge processes. The KMSHAM supports the *Entity's* underlying mechanics to manage aKI Microartefacts. The *Manager* is responsible for designing extraction of aKIs using holistic systemic approach (Daellenbach & McNickle, 2005). The *Framework* interfaces the KMSHAM to enable an efficient aKI search process. The KMSHAM manages various types of information related to *Entities,* which helps

the BTPHAM activities. A *Project* interfaces the KMSHAM/aKI, where sets of CSFs are stored (Trad & Kalpić, 2017a). KMSHAM's strategy is included in BTPHAM's roadmap that includes the DMSHAM.

The Decision-Making System

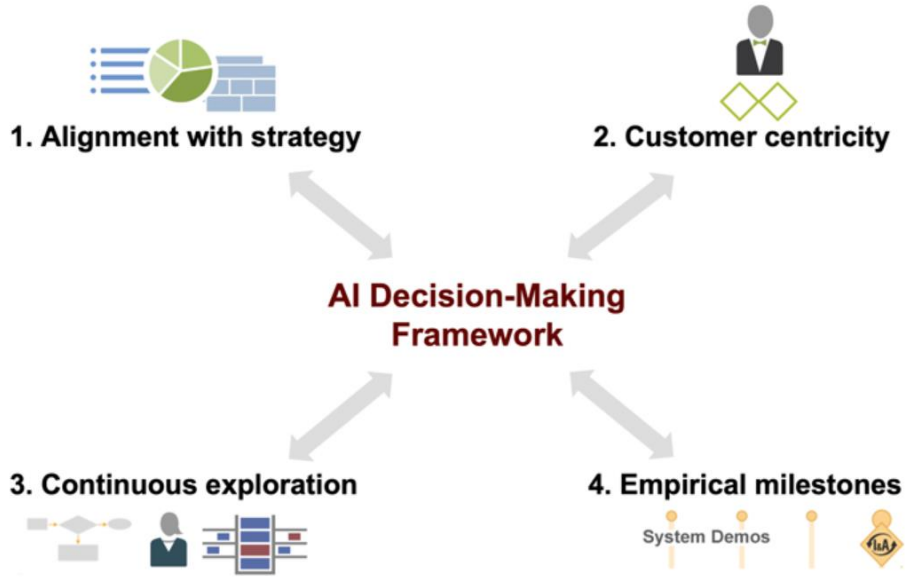

Figure 9. The decision-making framework enabled by SAFe (Scaled Agile, 2022).

The DMSHAM is supported by the AHMMHAM formalism that uses a holistic approach for delivering a set of BTPHAM suggestions in form of *Project* enhancements (Daellenbach & McNickle, 2005). The BTPHAM interfaces the DMSHAM, in which various AM solution templates are stored; these solutions are selected, enhanced, and tuned, using selected CSF sets, then this process is orchestrated by the AHMMHAM's HDT, used to select the optimal BTPHAM set of actions. The HDT is a form of Deep Learning in the domain of Artificial Intelligence (AI). AM oriented *Entities* have today, efficient environments to support DMSHAM; like the ones shown in Figure 9 (Scaled Agile, 2022):

- *The alignment* with the *Project* strategy which ensures that DMSHAM pursue beneficial business results. Aligning the AI activities and DMSHAM roadmap with *Portfolio strategy* is an essential iteration in the *Project*. Some AI-based initiatives may require substantial financial support; where others need to be reoriented or stopped; such decisions are based on an economic viability. *Projects'* financial activities need *Lean Budgeting*. Environments like the *Portfolio Kanban System* and a *Lean Business Case* support in establishing the alignment with EA/SAFe strategy. Program Increment (PI) planning provides the foundation for the alignment of AI based DMSHAM strategy with the PCIP.
- *Customer centricity* is critical for ensuring that an AI initiative can solve a problem type. Explicitly defining the customer problem is an important step and hugely benefits from applying *Design Thinking to AI capabilities*.
- *Continuous exploration* supports AI-enabled solution(s); where solution development contains a high degree of uncertainty. In *Project's* case(s) of AI, the level of uncertainty is very high in finding the optimal solution and its possible implementation. Such an implementation is supported by EA and SAFe *Lean Startup Cycle*. Defining clear business objectives/hypotheses, implementing an AI based MVP, and validating it by using an HDT and CSF/CSA are at the essence of a successful *Project*.
- *Empirical milestones* direct the PCIP to achieve successful AI-based solutions. *Project's* AI capabilities need to be continuously integrated with the other *Project's* artefacts and are managed by an AM-based ADM. *Project's* increments and gap analysis are used to elicit important end clients' feedbacks. The *Project* organizes to *Deliver AI Solutions Organizing* around delivered value that is a critical enabler of flow and is one of SAFe's DevOps

principles. AI-powered solutions have specific implications for EA and SAFe managed *Entities*.

BTPHAM usage and integration, and other related topics like EA, SAFe, DMSAHM, where presented and the next section presents the PoC.

THE PROOF OF CONCEPT

The already mentioned AMACS has an archaic and legacy ICS, based on a mainframe, various types of files service, end client service department. The main goal is to show how BTPHAM can support agile *Project,* with the application portfolio rationalization scenario.

Application Portfolio Rationalization Scenario, ICS Unification and CSFs

The PoC will try to select the needed set of BTPHAM pool of CSFs to satisfy the *Project's* requirements. The AMACS has already *Entities* goals as shown in Figure 10, which can be considered as the base sets of CSAs. The BTPHAM's needed actions in ADM phases, are: 1) In EA's Phase A or the Architecture Vision phase, to setup a global roadmap; 2) In Phase B or the BA phase, it needs to setup *Entity's* target architecture and the set of *Project* requirements definition(s); 3) In Phase C or the Gap Analysis phase, there is a need for modelling a target application landscape; 4) Phase D or the Target Technology Architecture and Gap Analysis phase needs the final *Entity's* infrastructure design; 5) In Phases E and F, (verifies the PCIP), Implementation and Migration Planning, one needs to define the transition architecture, proposing possible intermediate situation, and evaluate the *Project's* status.

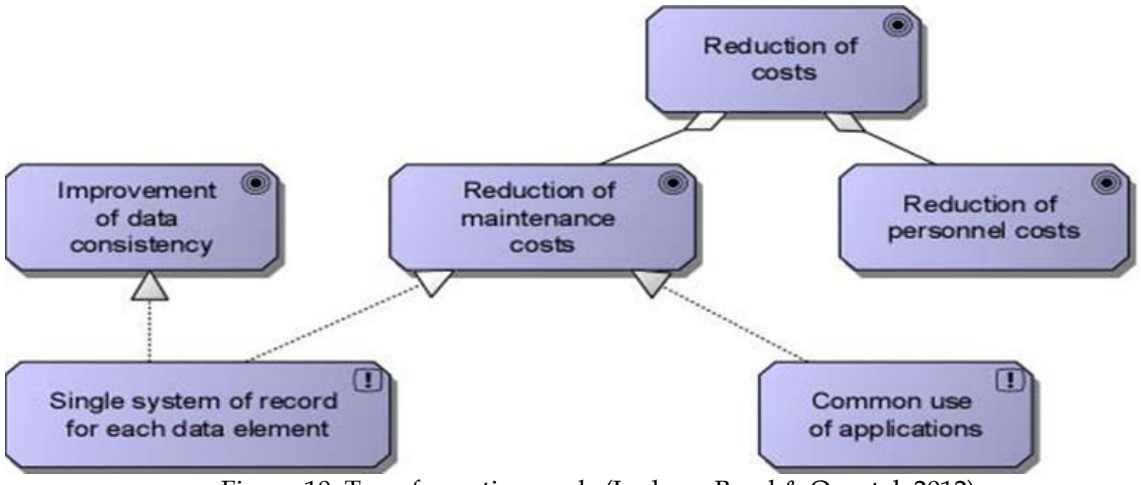

Figure 10. Transformation goals (Jonkers, Band & Quartel, 2012)

The first step is to design the Entity's Meta Model (EMM) which is a composite construct.

The Composite Construct

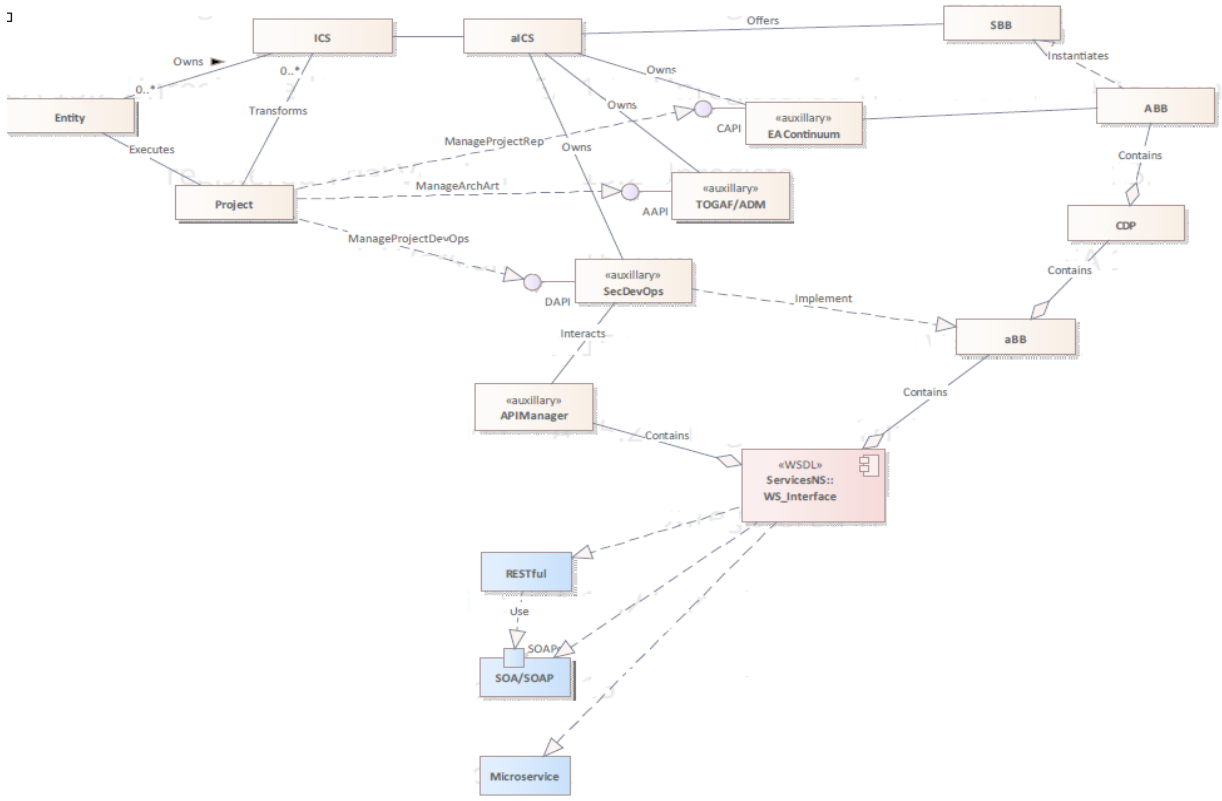

Figure 11. The EMM.

The EMM, which is Shown in Figure 11, depends on various types of patterns, and the BTPHAMM coordinates the optimal manner to integrate patterns in a coherent *Project* architecture that would use:

Implementation patterns, consists of a family of patterns that have composite structures, like 1) Classical design patterns; and 2) Services patterns.

The integration and enterprise patterns: These types of patterns understand patterns that have a component structure, like 1) Integration patterns; 2) the EA patterns; and 3) the business process patterns.

To deliver an EMM that delivers the *Project's* main artefacts:

- This PoC focuses on BTPAHM capabilities to support the PoC's execution process.
- The Execution
- The PoC is implemented using the *Framework* and is based on the AHMMHAM's instance.

The BTPHAM interfaces the DMSHAM that uses the selected sets of CSFs which are presented and evaluated in Table 1. The BTPHAM-required skills have mappings to specific *Entities* resources like CSFs and the used microartefacts are designed using EA/AM/BA methodologies. The BTPHAM also defines relationships between the AM (managed by SAFe) main artefacts like the original set of requirements and pattern microartefacts. The PoC was implemented using the *Framework* client's interface, where the starting activity is to setup BTPHAM CSFs. Once the development setup interface is activated, the scripting interface was launched to implement the needed Microartefacts to process the defined CSAs. After starting the *Framework's* client, the sets of CSFs were selected and linked to a specific node of the HDT and the pool of microartefacts. The scripts link the AHMMHAM instance to the set of actions that are processed in the background. The AHMMHAM-based HDT uses services that are called by the DMSHAM actions. The BTPHAM instance and its related CSFs, AM actions, were setup to be used; then the scripts were launched. This article's decision table and its result conclude the PoC's first initial phase, as illustrated in Table 1, which shows clearly that the BTPHAM can be used in *Projects*. BTPHAM is not an independent component and is bonded to all the *Project's* overall EA and AM concepts. The *Framework* and hence the AHMMHAM's main constraint to implement the BTPHAM is that CSAs for simple *Entities* components, having an average result below 8.5 will be ignored. In the case of the current CSF evaluation an average result below 7.5 will be ignored. This work's conclusion with the result of 8.80 implies that

BTPHAM's integration is feasible for all types of *Projects*, where the complexity is integrating the BTPHAM in *Entities* that must be done in multiple agile transformation iterations, where the first one should try to integrate EA and SAFe, then to define *Project's* initial node to reach the final state.

CSA Category of CSFs/KPIs	Influences transformation management	Average Result
The Applied Case Study Usage	Complex & CredibleStable	From 1 to 10. 8.00
Agile base Architecture Development Method	FullyIntegrated	From 1 to 10. 9.50
The Information and Communication Technology System	Transformable	From 1 to 10. 9.00
The Mathematical Model's Integration	IsApplicable	From 1 to 10. 9.00
The Decision Making System	Implementable	From 1 to 10. 9.00
The Knowledge Making System	Implementable	From 1 to 10. 9.00
The BTPAHM Feasibility	Implementable	From 1 to 10. 8.00

Evaluate First Phase

- Table 1. The BTPHAM's research's outcome is 8.80.

Conclusion and recommendations

In this article, the focus is on the optimal BTPHAM coordinates the design and PCIP *Projects*. There has been a lot developed and written on enabling success in transformation projects and AM, but the authors propose to inspect the agile aspects of PCIP. That is mainly due to silos concepts and the *Manager*'s lack of knowledge in AM and the non-existence of adequate EA/SAFe integration for such initiatives. This RDP proposes a set of recommendations on how to proceed with the *Projects* where BTPHAM attempts a holistic implementation approach. The usage of the EMM considers that the ICS is a commodity used to glue the various business components of an *Entity* (Uppal & Rahman, 2013). There has been a lot of development and research work on the reasons for success or failure in *Projects*, but the authors propose to inspect AM to improve these rates. The managerial recommendations are offered to help *Project* members decrease the high failure rates and are a result of the resources review, surveys outputs, interviews, simulation, and prototyping.

BTPHAM managerial recommendations, and the *Framework*, round up the approach needed for the BTPHAM, and the roadmap for integrating a coordinated BTPHAM with: EA, AM, SAFe... The most important managerial recommendation that was generated by the previous research phases was that the business transformation manager must be an AofABIS. The managerial recommendations for the BTPHAM are based on the processing of CSFs which resulted from the literature review and surveys' outputs; these inputs were fed in the HDT. In this article, the focus is on the BTPHAM's capabilities, coordination, and AM effect. These characteristics and prerequisites are needed to holistically manage the design of PCIPs. The RDP tries to define the optimal BTPHAM, which should be capable to synchronize various types of *Project* activities. There has been a lot developed and written on enabling success in *Entities*, but the authors propose to inspect why they fail in the PCIP. Because of the satisfactory score, above 8.8, Table 1 shows that BTPHAM's usage in *Project* is possible and that today the *Framework* is ready and is practically the only methodology that can in parallel construct *Projects*, SAFe/AM, EA/BA blueprints, KMSHAM, DMSHAM and other. The resultant technical and managerial recommendations are:

- As BTPHAM was established, the PoC checked its feasibility, and it replaces traditional project management technics.
- The PCIP is the major cause for failure, therefore there is a need for the optimal AM concept.
- The *Manager* must be an AM expert, who can implement EA blueprints.

- The literature review proved the existence of a knowledge gap between the traditional project management.
- An evolutionary HDT supported by the RDP is used to create the initial BTPHAM concept.
- The RDP proposes a concrete *Framework* on how to support AM.
- Traditional business environments can hardly cope with complexity of heterogeneous business and technical systems.
- The PoC proved the research feasibility and delivered the recommendations on how to integrate BTPHAM.
- BTPHAM coordinates EA to deliver architectural blueprints, patterns, and BBs.

BTPHAM, uses an AM like SAFe, to coordinate all *Project's* activities.

The *Framework* supports the *Entities* by using the BTPHAM and delivers a set of managerial recommendations.

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User perceptions of fake news sharing behavior on social media through social networking sites

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Keywords
Fake News, social media, Social Networking Sites, User Perceptions, User Behavior

Abstract
In the age of information technology, online social networks are part of our daily lives and are the main source of obtaining and transmitting information, which can be a blessing or a curse. Although social networks facilitate access to news and information, one issue remains of serious significance, namely the phenomenon of fake news. The short time of spreading fake news in the online social environment is the main cause for concern, and users' attitudes towards fake news can facilitate or reduce its spread. Therefore, the main objective of the current study is to perform an overall analysis of users' perceptions on the behavior and attitudes toward distributing fake news through social networks. To ensure a comprehensive interpretation of the research topic, we analyzed both the reasons behind the behavior of distributing fake news and the active or passive actions that users apply in relation to them. As verifying the authenticity of the source is an essential component of the preventive behavior of fake information distribution, an analysis of the action was performed to verify the credibility of the sources among users. Therefore, the detailed and joint analysis of the above variables gives a note of originality to this study. In addition, the results of the study have significant practical implications for social platforms and are intended to provide a better understanding of how online social network users perceive fake information and interact with it. More specifically, they can be used in the development of predictive models that have the role of automating the identification of fake news in the context of machine learning algorithms and big data.

1. Introduction

The spread of fake news is not a new concept, but the speed with which it can spread through online social networks and the growing effects on members of society have been a major concern for many stakeholders. Fake news is information that looks realistic and has been created to facilitate the spread of misleading information about a particular person, product, or organization that is intended to achieve goals such as profit or loss (Mishra and Samu, 2021). About 65% of the US adult population is addicted to using social networks to keep up with the latest news and information (Meel and Vishwakarma, 2020), and this dependence because of fear of missing out also contributes to the spread of fake news. Thanks to the continuous development of social networking sites (SNS), users can communicate more easily, quickly, and more frequently with their virtual friends, coworkers, family, or others, but they also have the power to raise up or destroy a brand (Pundir *et al.*, 2021), due to the recommendations and opinions they express in the online environment regarding a certain product or service. Any fake news distributed repeatedly on the online social environment can have a negative impact on a brand (Talwar et al., 2019), but it can also have a negative influence on consumers/users, creating confusion and doubts about the topics discussed in the news they read frequently (Domenico *et al.*, 2021).

Thus, brand managers should understand as deeply as possible the way consumers perceive and respond to fake news spread on social networks related to a product or service (Chen and Cheng, 2019). Since the onset of the Coronavirus pandemic, researchers such as (Apuke and Omar, 2021) have pointed out that people with an altruistic attitude may experience a greater tendency to share misinformation about COVID-19 in the belief that they share useful information that could help others. In the current

context, there is a lot of fake news spread in the SNS about political parties, the COVID-19 pandemic, or the war between Russia and Ukraine, which makes the phenomenon of spreading fake news ubiquitous in our attention. At the same time, the probability of spreading fake news to the detriment of true ones is 70% compliant (Miller, 2019), but little is known about the motivation and process behind the action of SNS users to spread fake news and social misinformation. In addition, the lack of an in-depth analysis of the factors that influence the behavior of sharing fake news is an important gap in the literature. At the same time, the behavioral impact, and changes in attitude toward a brand, product, or service that occur as a result of interaction with a multitude of fake information and news have not been previously analyzed.

Recognizing the need to fill a lack of information in the literature, our study focuses on analyzing users' perceptions of fake news, their distribution behavior on social networking sites, and also the reasons and reasoning behind the information sharing action and the effects that these actions have on users. The results of the study make an important contribution both theoretically and through their practical implications on a deeper and clearer understanding of how to spread and reason people who share fake information online.

2. Literature review

Online social networks facilitate quick access to information and news (Mican *et al.*, 2020), providing a much simpler way to pass it on to other users verbally, in writing, and visually (Rampersad and Althiyabi, 2019) and with a strong impact on their well-being and support for peers, transforming the users into digital socialligators (Sitar-Taut *et al.*, 2021). The study (Talwar *et al.*, 2019) show a dark side of the SNS that grows rapidly to the detriment of the well-being of communities and individuals, but also that online confidence, self-disclosure, fear of losing out, and fatigue after using SNSs are related to the intentional distribution of fake news, while trust in SNS has a negative association with news authentication before sharing. Thus, the phenomenon of spreading fake news occurs whenever a new technological innovation becomes more and more popular (Agarwal and Alsaeedi, 2021). User interactions on social networks give rise to a multitude of constantly distributed information, many of which turn out to be fake, sometimes created intentionally and with a predefined or unintentional motive, respectively, accidentally (Meel and Vishwakarma, 2020). The category of fake news includes news satire, parody, fabrication, manipulation, propaganda, and advertising (Chen and Cheng, 2019), and all these forms of fake news are classified into two categories, namely the facticity that refers to the degree to which the information is based on facts and the intention to mislead the reader. To these categories is added the spread of fake misinformation, which refers to information based on real events but used to harm an entity that may be a social group, an organization, a person, or even a country (Balakrishnan *et al.*, 2021).

Dividing fake news into categories such as misinformation, i.e. intentional sharing of fake news, and misinformation, i.e. accidental or unintentional sharing of fake information, is very important (Pundir *et al.*, 2021) because for online users, identifying the credibility of social media news is a challenge. As for misinformation, according to (Agarwal and Alsaeedi, 2021), it contains uncertain, vague, ambiguous, or not entirely accurately described information, intentionally or mistakenly distributed, classified as clickbait, propaganda, satire, careless journalism, misleading headings, and biased or slanted news. At the same time, the rapid and advanced circulation of fake news on online social networks has become a worrying and serious problem in the age of technology that is developing more and more every day and where anonymity, user-generated content, and geography factors can encourage the distribution of fake news (Talwar *et al.*, 2020). In principle, an individual's behavior can be passive or active and consists of any observable and quantifiable action he performs in a given environment, which is part of a previous chain of events that explains the cause of action and its consequence (Miller, 2019). News credibility is also a factor with a significant impact on the behavior and actions of consumers in the online social environment, being the bridge between news credibility and behavioral intentions (Sharif *et al.*, 2021).

The reason behind the misinformation is uncertain and not analyzed in detail, as there may be several motivational factors, such as lack of time to verify the credibility of the source or the user's desire to raise awareness among those with whom he/she shares information. News sources such as the print media, radio, television, or SNS are the basis for raising awareness of local and global events, and a key factor in sharing information that can lead to misinformation if the information is fake is the nature of the

information itself (Nanath *et al.*, 2022). However, the abundance of unfiltered information has created problems such as confusion, concerns about the security of online social networks, concerns about the privacy of personal data, and trust issues (Miller, 2019). At the same time, SNS can be seen as an amplifier for articles that contain real or fake news and information alike, but are much more likely to be used as platforms for distributing fake news, and about 42% of people who have shared the news in SNSs have stated that they have shared the wrong information at least once (Islam *et al.*, 2020). According to (Pundir *et al.*, 2021), fake news repeatedly distributed in the SNS affects users' trust and perceptions and increases their perceived accuracy, and those who spend more time online are more likely not to check the credibility of a news source or information before sharing it. Concerning active or passive corrective action against the distribution of news or fake information, if users do not perceive this information as harmful and do not feel threatened about it, they are less likely to take action against its dissemination (Tang *et al.*, 2021). Users perceive the information displayed on social networks through the prism of a certain level of intelligence and their degree of awareness of certain facts that are the central subject of the information. Depending on their interests and knowledge of these facts and information, they may pass them on as if they were true, or they may remove them on the basis that they are fake, or they may develop a neutral behavior toward it (Meel and Vishwakarma, 2020).

At the same time, one criterion that can determine the level of trust given to a news source is that users tend to share the same categories of information they see at their friends, colleagues, family, or other people online. Therefore, they attribute a higher level of trust to the source they see the most often. The credibility of the news is, on the other hand, adopted from the concept of the credibility of a message transmitted in the field of journalism and communication and from the human perception of this subject that is defined by the correctness of the content, but each individual has a personal perception of the credibility of information (Sharif *et al.*, 2021). If the perceived level of credibility of a news source decrease, it will affect both the credibility of the journalist and journalism in the field, as well as the confidence that consumers will place in the future to the source. At the same time, if the user's level of trust in a particular source of news is kept low for a longer period, this will gradually increase the individual's level of skepticism about any news or information from that source (Chen and Cheng, 2019). Users can share information or news on their personal SNS profile with the desire to create awareness among the list of friends, acquaintances, colleagues, or family who use the same network. Therefore, according to (Mishra and Samu, 2021), they are less likely to spread negative news with a negative emotional impact because such a post would affect their social image in the online environment, while fake news, which does not have a negative impact, is not perceived as harmful to one's image.

Due to the social nature of the SNS, the actions of acquaintances on a particular post or topic may influence the user's future behavior, as a post that is the focus of a group and is sufficiently viewed and commented on might encourage or discourage a person to express his own opinion about it (Miller, 2019). However, the sharing of fake news can be prevented by developing a specific behavior of SNS users. As a result, they will be aware of the need to authenticate the information before distribution, verify the credibility of the source, and act consciously and objectively on the information distributed by known people.

3. Research methodology and sample

Data needed for the analysis were collected using Google Forms from a number of 482 people, students at the biggest university in Eastern Europe. The students were enrolled in full-time and distance learning. The survey was carried out using a questionnaire to collect quantitative data. Regarding age, the survey used short answer text with data validation for the number. Regarding gender, multiple-choice was used. For all other questions, seven-point Likert scales were used to measure the degree of agreement of the respondents concerning different statements. By the Likert method, the measurement of the degree of agreement or disagreement for each variable was performed numerically, starting from 1, which means a strong disagreement, to 7, which means a strong agreement. The numbers between 1 and 7 have the role of reflecting a different degree, stronger or weaker in agreement or disagreement, depending on the perception and opinion of each respondent. The questions used to construct the questionnaire were adapted from (Apuke and Omar, 2021; Sui and Zhang, 2021; Talwar *et al.*, 2019, 2020).

Respondents were invited to complete the online survey and share it with other friends on their online social networks. The sample included responses from women in percentage (57%) and men in percentage (43%) aged 19-24 years (73%), 24-29 years (16%), and over 30 years (11%). In conducting this study, the authors used descriptive statistics to analyze the data and describe the basic characteristics of the sample.

4. Data analysis and results

Regarding fake news sharing behavior, as can be seen in Figure 1, the results show that (13.07%) of the respondent's state that they distributed the SNS content that initially seemed true to them, but which they later found out was fake, (6.02%) neither agree nor disagree and a majority of (80.91%) disagree that they would have distributed such content. At the same time, a majority disagreement (84.23%) is also found in the case of distributing content on social networks without verifying the facts through reliable sources, but also in the case of unconscious distribution of exaggerated content on social networks (80.50%). On the other hand, a percentage of (9.34%) stated the distribution of content without verifying the credibility of the source, while (6.43%) neither agree nor disagree with it. A percentage of (13.69%) states the distribution in the SNS of exaggerated content that they did not know was exaggerated. The vast majority of respondents (84.44%) disagree with the fact that they shared content on social networks without reading the whole article, and only a percentage of (11.83%) agree to some extent that they shared content on social networks without reading the whole article.

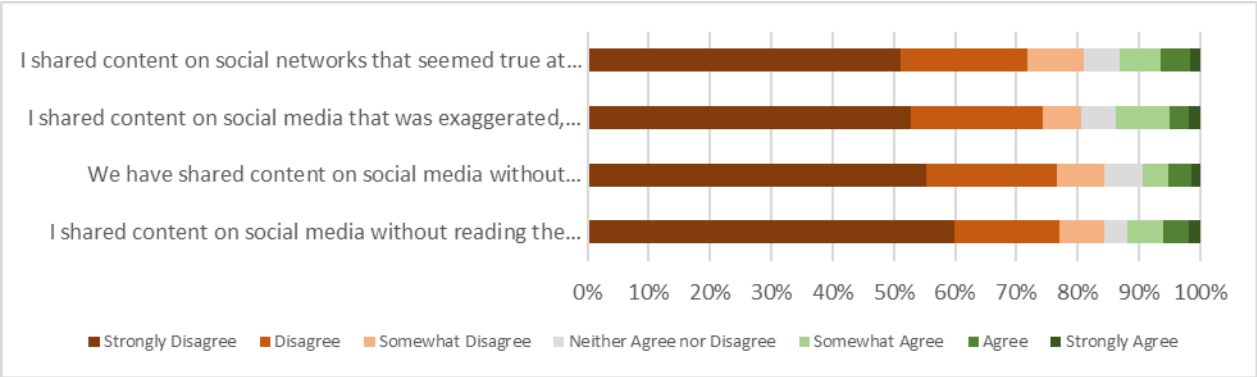

Figure 1. Fake news sharing behavior

Regarding awareness of fake news and authentication of news before sharing, in our study, as shown in Figure 2, the analysis of the responses shows that in terms of respondents' ability to identify fake news and misleading information, a percentage of (74.48%) states that they usually have this ability. However, (9.75%) neither disagree nor agree, while (15.77%) expressed disagreement about it. A percentage of (43.98%) agree that they usually check the authenticity of the messages before distributing them, (16.39%) neither agree nor disagree, and (39.63%) do not agree with the statement. Regarding the request for a third-party opinion on the authenticity of the messages before distributing them, a percentage of (17.63%) agree, while the majority (69.71%) do not. At the same time, a majority, respectively (80.71%) do not consider that they rely on TV news channels to verify the authenticity of messages before distributing them, (14.94%) are impartial about the agreement or disagreement related to this statement, and only (4.36%) agree.

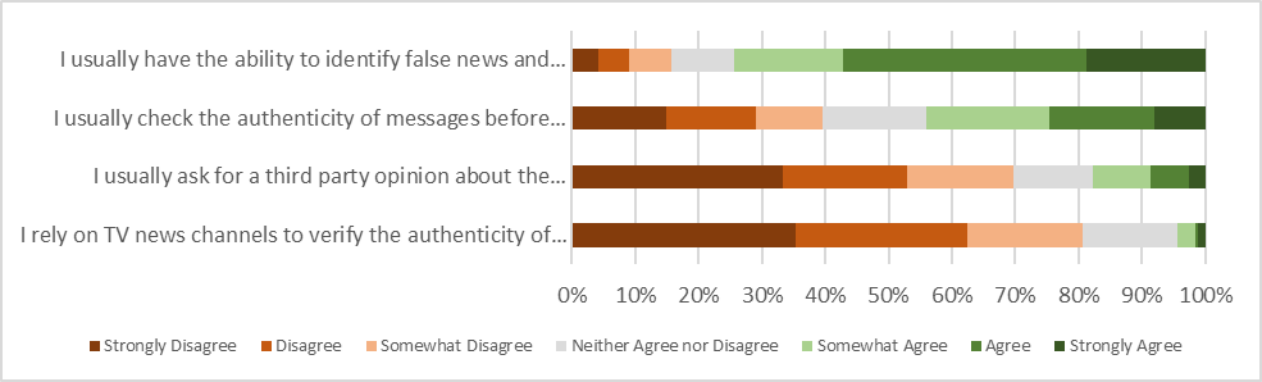

Figure 2. Fake news awareness and authentication of news before sharing

Regarding the analysis of sharing fake news online due to lack of time or to create awareness, as shown in Figure 3, the results show that the majority (92.53%) do not agree that they would sometimes spread fake news because they do not have time to verify their authenticity. Only (3.53%) of the respondents agree with this statement. Similarly, (91.70%) of the respondents do not agree that they sometimes spread fake news because they do not have time to verify the facts through reliable sources and only (4.36%) are strongly opposed to it. Furthermore, (3.94%) agree nor disagree with it. At the same time, (23.65%) agree that they try to raise awareness by distributing news online, although some of them were fake, while (62.24%) firmly opposed and (14.11%) of the respondents neither agree nor disagree with the statement. Regarding the desire to educate their friends online by sharing online news content, even though some of that news was fake, (24.69%) strongly agree, (13.49%) neither agree nor disagree, while the majority of respondents, respectively (61.83%) expressed their disagreement with it.

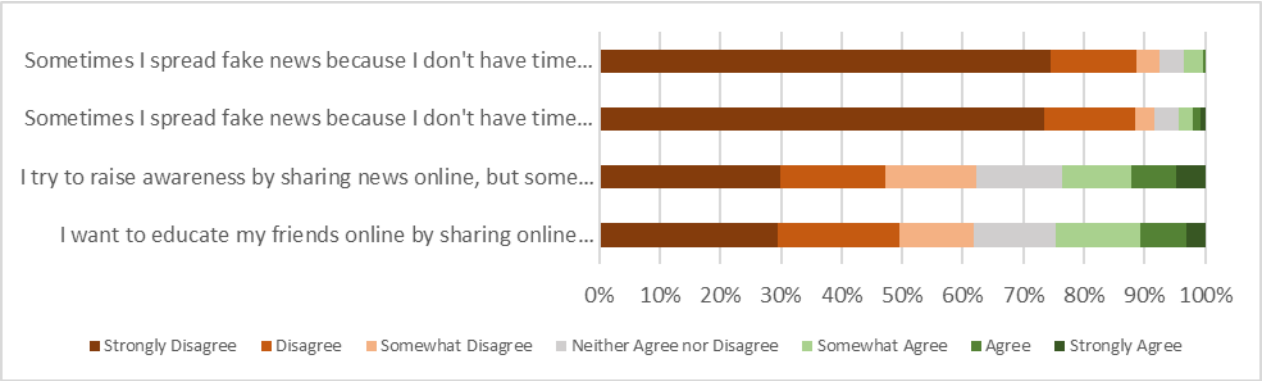

Figure 3. Sharing fake news online due to lack of time or for creating awareness

Regarding active and passive corrective actions against fake news, as can be seen in Figure 4, the results show that (67.01%) disagree with the fact that they usually advise the sender of fake news not to distribute them, a percentage (12.03%) neither agrees nor disagrees, while (20.95%) agrees. Then, almost half (42.32%) of the respondents disagree that they usually try to make people aware of the fake news and the same percentage (42.32%) agree with that, while (15.35%) neither agree nor disagree with this. At the same time, a significant percentage (59.34%) disagree that they usually advise the sender of fake news to always check the authenticity before distributing them, (12.66%) neither agree nor deny this behavior, while (28.01%) agree with it. A percentage of (66.18%) disagree that in some cases they educated the sender of fake news about how to check the news, while (24.69%) agree with it, and (9.13%) neither agree nor disagree. Also, (41.91%) affirm that they announce the sender that he/she sent a fake message to them, and an almost equal percentage, respectively (46.47%) disagree with this. Only (11.62%) are impartial regarding this statement. Almost half (56.64%) of the respondents say they report the account that constantly sends them fake news, while (34.23%) disagree, and the majority of respondents (62.86%) say they block accounts that send them fake news, (26.56%) disagree with it, and (10.58%) are impartial about this.

Regarding the perceived information quality, source expertise, authority, and credibility analyzed in Figure 5, the results show that the majority (67.43%) of respondents usually share news when they believe that the source of information is reliable, (20.12%) do not agree with this and (12.45%) neither agree nor disagree. A significant percentage (69.92%) shows that respondents usually spread the word when they think the source of the information is secure, while (20.75%) are not concerned about it. On the other hand, (41.70%) disapprove of the fact that they usually share news when they think the author is a recognized authority, while (38.38%) agree with it.

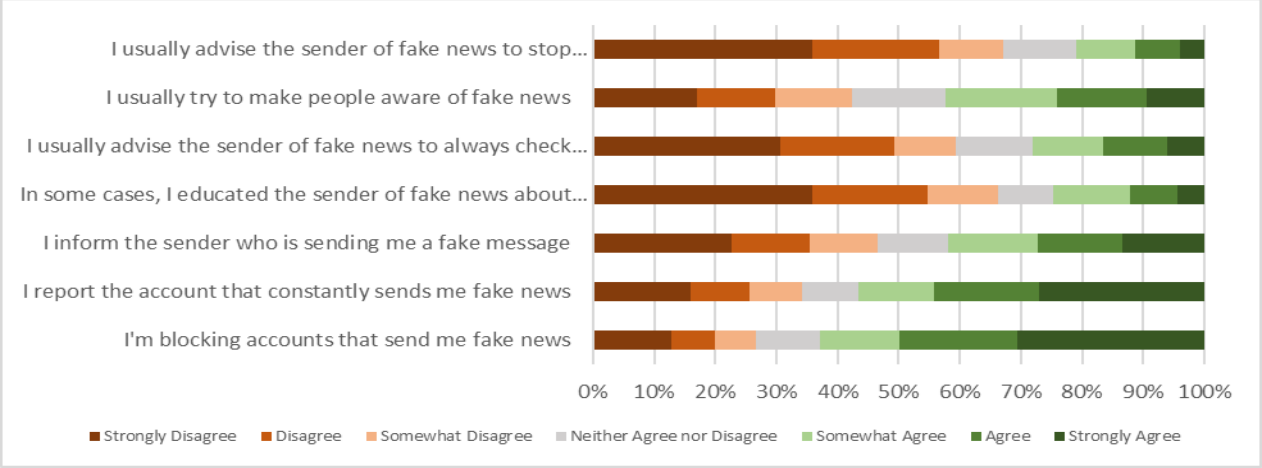

Figure 4. Active and passive corrective actions on fake news

More than half of the respondents (53.94%) do not agree that they usually spread the news when they think the author has a reputation, (16.60%) do not agree or disagree, and (29.46%) agree with it. More than half (54.56%) of the respondents say that they usually share news when they think the author is familiar with the knowledge of the topic and (30.08%) disagree about it. At the same time, most (58.51%) consider that they usually share news when they think the information provider is an expert in this subject, while (26.35%) do not agree. (61.83%) agree that they usually share the news when they think the information makes sense, (25.10%) of them disagree, while (13.07%) neither agree nor disagree. In any case, the majority (66.60%) consider that they usually share news when they think the information is valuable, only (9.96%) are impartial about it, and (23.44%) of them do not agree with it.

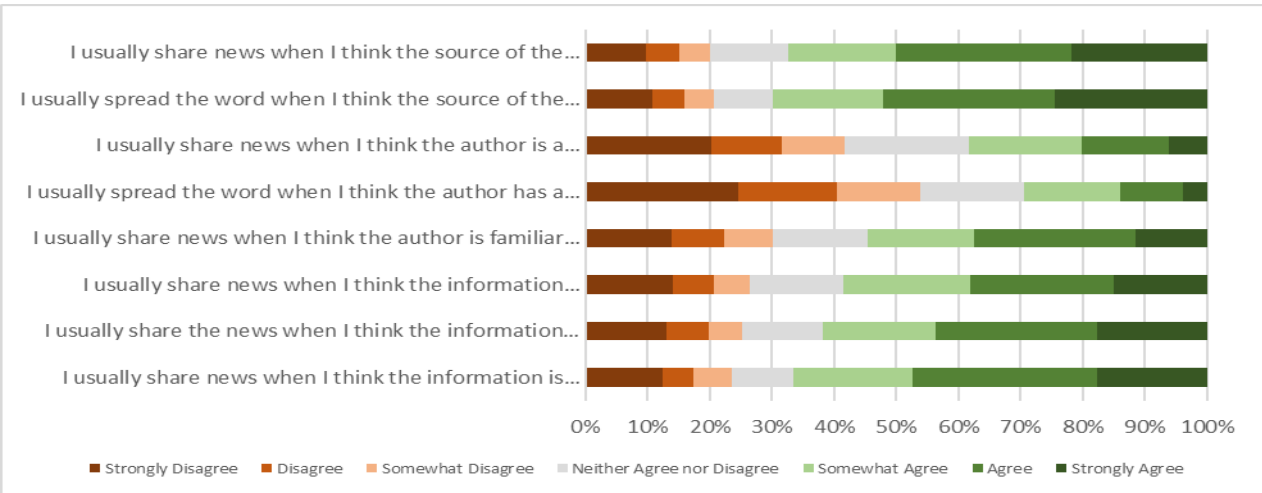

Figure 5. Perceived information quality, source expertise, authority, and credibility

5. Conclusions

Online social networks have become a part of our daily lives, consuming a substantial amount of our time. The very fact that we devote this daily time to the consumption of information that is made available to us through the SNS makes the probability of receiving and encountering fake news, information, or

news worryingly high for each of us. Thus, the problem of the phenomenon of fake news is not a negligible one but one to which we must pay special attention, to be able to understand the mechanism of spreading this news and to be able to differentiate it from the true ones. It is, however, a problem that can have multiple causes, but whose "treatment" requires a collective approach and effort, both political and social, as well as technological and human. For these reasons, our study provides an overview of users' perceptions of the behavior of sharing fake news on social networks online by addressing several concepts and factors studied in the literature, but also connections that have not been analyzed previously, such as the behavioral impact of constant interaction with fake news on individuals.

The results show that most of the respondents did not consider that they shared content on social media without reading the entire article, and only a small part agreed that they had not read the entire article before sharing it. Most of the respondents also believe that they did not distribute content without verifying the credibility of the source, while only a small part agree that they distributed exaggerated content without knowing from the beginning that it was exaggerated, as well as that they shared fake information but believed that those are true at some point. Regarding awareness of fake news and its authentication before sharing, most respondents say that they have the ability to identify fake news and misleading information, but a similar percentage, almost half of the total number agree, respectively, disagree that they check the authenticity of messages before sharing them on SNS. This indicates that some respondents consider it important to authenticate the information received before sharing it with others, while the other half do not. At the same time, most of them do not ask a third party for an opinion on the authenticity of messages before they are distributed and do not rely on news TV channels to verify the authenticity of messages before sharing.

Regarding the distribution of fake news due to the lack of time to verify the authenticity of sources or the desire to raise awareness among acquaintances on a particular topic, most respondents do not consider that they sometimes distribute fake news due to the lack of time to verify the authenticity of the source. Approximately the same percentage disagreed with the occasional distribution of fake news due to a lack of time to verify the facts reported by reliable sources. More than a quarter of the respondents agree that they are trying to raise awareness by sharing news in the online social environment, some of which was fake news, and a similar percentage say that they share news out of a desire to educate friends and acquaintances on social media but that some information was fake. Regarding the active or passive corrective actions related to fake news, among the respondents, usually, most of them do not advise the sender of the fake news not to distribute them, and almost half of them try to make the others aware of the fake news, while in the opposing camp, a similar percentage disagree with this. Almost a third of the respondents said they had tried in some cases to educate the sender of fake news about how to verify the authenticity of the news. At the same time, a third of the respondents advise the sender of fake news to always check the authenticity of the information before distributing it, and more than half stated that they report the accounts from which they constantly receive fake news.

Regarding the perceived quality of the information, the expertise of the source, respectively its authority and credibility, the results showed that out of all respondents, most distribute news, usually when they consider their source reliable and when they think the source is reliable. Similarly, almost half distribute news when they consider that its author has a recognized authority, while in terms of the author's reputation, only a third attach importance to it when distributing information. More than half of the respondents share the news because they think that the author is familiar with the topic of the discussion and has the necessary knowledge to approach the topic or because they think that the author is an expert in the field. A high percentage of respondents share the news when they consider it valuable and meaningful information.

The results of the study complete the existing literature, to inform both professionals and marketing managers, who in order to streamline the process of transmitting information to consumers need to know a behavioral analysis of them and how they react to fake information. The findings of this study come to help online social networking sites, due to providing an overall analysis that includes the factors influencing the behavior of distributing fake information. Through this, we want to encourage the development of users' behavioral skills for objective analysis of the information received through the SNS, as well as the verification of the authenticity and credibility of the information sources that they share.

Limitations and direction for future research

As always, every research, in addition to the contributions it brings, has some limitations. In this case, the data were collected from a small group of people studying at the same faculty, even if there are students enrolled from almost every district in the country. Therefore, the results of the study may not be generalizable globally. Even if the sample size is considered appropriate for current research, it would be preferable to extend the sample to include another category of the nonstudent population. In future studies, we want to use the variables analyzed and the collected data to build a structural model that can predict the distribution of fake news online. In addition, we want to analyze the effects of some moderators and mediators in the model, to provide a more accurate understanding of how the variables studied influence the final variable, i.e., the spread of fake news on social media and online social networks.

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Adaptation of dynamic capabilities: A case of small-scale bakeries in a South African Metropolitan City

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Keywords
Capabilities, Innovation, Operations Management

Abstract
The paper explores how small-scale bakeries in the South African Metropolitan City adapt and view automation as part of dynamic capabilities. Dynamic capabilities are a set of specific and identifiable processes such as product development, strategic decision making. They are detailed, critical, stable processes with foreseeable outcomes. This paper argues that automation is part of dynamic capabilities and can enhance operational and financial performance in a small-scale bakery context. As such the paper contributes to operations management literature concerned about efficiency and innovations in small business operations. The study employs a quantitative approach to data collection using a survey questionnaire. The population of the study is 400 bakery managers. A total sample of 120 completed survey questionnaires was achieved. Key findings show a strong correlation between equipment and food safety and show a significant relationship between automation and dynamic capabilities in small-scale bakeries. The study's findings show that automation is a dynamic capability. It enhances efficiency in production and profitability. This study concludes that there is significant correlation between automation and dynamic capabilities. The correlation explicates the need to integrate automation and other dynamic capabilities for improved operational and financial performance in small business operations.

Introduction

The study of operations has been trying to understand, define, and measure how business capabilities may lead to an increased efficiency and production than rivals. According to Permana et al., (2017) a dynamic capability is the potential of a business to develop and align internal and external factors associated with volatile changes in any given context and/or business environment. Even though there are definitions and research work on dynamic capabilities there are still delays and gaps on the study of dynamic capabilities in small business operations (Pisano, 2017). Debates about dynamic capabilities tend to pay attention to medium sized and large corporate enterprises at the exclusion of small and micro business operations. Unlike other research this study contributes to literature by bringing into sharp focus dynamic capabilities as an issue in the operations management of a small business.

This study will address the research question and objectives that we aim to achieve followed by the literature review. A review of previously published studies on dynamic capabilities. One of the major challenges small-scale bakeries faces is the concern in competition which requires a balance misuse of existing capabilities (Warner, and Wager., 2019). Warner, and Wager., (2019) points out that dynamic capabilities background has become very important research topic in the publications related to strategic management. This area of study explains how business cope with fast changing environments. An overview of the research methods used have been explained below and the research instrument used, followed by the findings and results. Bakeries adapting to new opportunities need to escape the current business situations and set skills to deal with change resistance. Findings of the study from the data collected has been discussed and the last past is conclusions whereby we conclude that for a successful automation process in small-scale bakeries, execution of dynamic capabilities is essential.

Through difficult economic times the business capability to make use of new opportunities in the market has been recognised as business resilience (Owoseni, and Twinomurinzi, 2019). A good approach on operations of a business model does depend on capabilities of the firm (Teece., 2018). Teece., 2018

states that business model designs are the root structure of business success as much as they provide efficiency to operation and new technology. The business model gives an opportunity by which the new technology joined with the use of tangible and intangible assets lead to the streams of profit (Teece., 2018). Similarly, Mikalef et al., (2019) states that the competitive benefit is that the business manages to get results of strengths to quickly respond to environmental changes. These strengths can be described as organizational effectiveness, i.e., "procedures that enable the greatest efficient, effective, and competitive use of a business assets" (Mikalef et al., 2019).

This study has two research questions. First, what is the importance of dynamic capabilities in small-scale bakeries for efficient operations using new technologies? Second, what are the procedures and techniques that business owners mature to merge dynamic capabilities for efficient small-scale bakeries?

These questions demonstrate the need for knowledge that is required to understand how micro-foundation activities merge with higher-order dynamic capabilities such as foreseeing change, new possibilities and modifying organisations (Schoemaker et al., 2018). Schoemaker et al., (2018) points out that it is very important for these three clusters to set the direction for small business but often cannot be recognised by outsiders. Both product and process are critical here considering the level of the business and the nature of the strategy between cost advantage and differentiation (Schoemaker et al., 2018).

Literature review

A collection of business processes describes dynamic capabilities as sensing, seizing, and transforming potential (Bogers et al., 2019). "These three bundles of dynamic capabilities can help small businesses to effectively achieve benefits of innovation" (Bogers et al., 2019). While Schwarz et al., (2020) describes dynamic capabilities as an attraction on a set of fundamental managerial resources, management cognition, managerial social capital, and managerial human capital. Regarding the sensing opportunities before they fully occur, the ability of managers must realise these opportunities through the scanning of environment and creating new opportunities through sensemaking is very important (Schwarz et al., 2020).

The literature on this study will examine previous studies that have been published by other scholars in the same vein dynamic capabilities and modern technology. This study explains the dynamic capabilities business model by Tecee.,2018. For example, the process of sensing, seizing, and transforming is shown on this literature. In a review study by Bocken and Geradts., 2020 they state that organizational design encourages the solidity of a firm's capabilities. Bocken and Geradts., (2020) also support how "Sustainable Business Model Innovation (SBMI)" is essential in this topic to achieve competitive advantage, while resolving social and environmental problems. Bocken and Geradts., (2020) "define SBMI as innovation to rely on positive impacts and get rid of the negative ones, through changes in the way business value network create, deliver, and change their proposals". However, there are distinct types of the concepts of dynamic capabilities that are competing separately, and the frequently asked question is how effectively they adapt to change in the environment? (Suddaby et al., 2020). By contrast, Eisenhardt and Martin (2000), claim that dynamic capabilities can justify businesses adapting to stable environments, while they are unable to explain adaptation in environments with rapid and discontinuous change (Suddaby et al., 2020).

A venture with strong and healthy dynamic capabilities is likely to be profitable, it builds, extends resources and normal capabilities, transform them, and respond to fast changing markets (Teece., 2018). Teece., (2018) support that business enterprise resources should be in order and correspond with the activities of business partners to bring value to consumers. A major part of business dynamic capabilities for grabbing opportunities, in most case it is managerial abilities for creating and improving business models (Teece., 2018). Again, Teece., 2018 points out that a decade ago, managerial competences have developed into smaller sub-field of dynamic capabilities, which mapping and executing new business models had been an essential characteristic.

Dynamic capabilities business model structure

The concept of business model increased the strength during the 1990's dotcom boom era and after (De Silva et al., 2019). Business ventures began to realize, communicate, and spelled out innovative business ideas that could generate income (De Silva et al., 2019). While there is no consensus on what a

business model is, the literature gives a definition on transformation, whereby business models are regarded as the philosophy which organizations produce and capture value (De Silva et al., 2019).

Developing a business model must be done repeatedly because very often there is always a room for improvement (Randhawa et al., 2021). To create such changes and understand business model innovation, businesses often need to act and bring resources into effective actions of dynamic capabilities (Randhawa et al., 2021). However, in this study little has been known regarding promoting innovative business models in roles of dynamic capabilities of small-scale enterprises. De Silva et al., (2019) state that a business model is a well-known principle which appears and develops in people's minds. It is an organizations terminology that performs and recommend the practical tools and devices (for example, offerings, business plans and marketing strategies) through generating value (De Silva et al., 2019). Teece., (2018) adds that, "to defining what a business model is, it is also worth considering what it is not".

The dynamic capabilities framework is an interdisciplinary model of the business with key capabilities, reflecting the interdependence (Teece., 2018). A simple structure is presented below except some of the feedback channels such as organizations design, dynamic capabilities are shown in Fig, 1. These capabilities and strategy merge to design and improve a justifiable model, which samples change within business ventures (Teece., 2018). "These leads businesses to achieve sufficient profits to allow businesses to carry its capabilities and resources" (Teece., 2018).

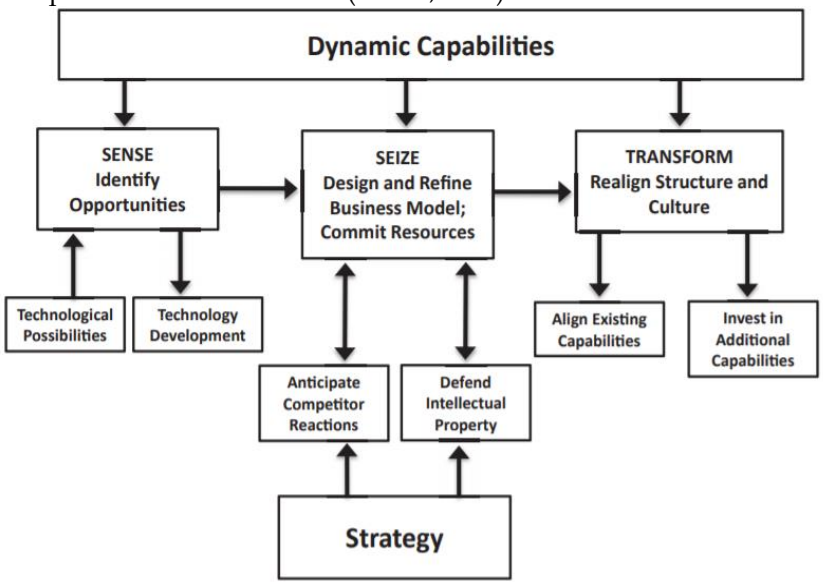

Fig. 1. Business model of dynamic capabilities (Teece., 2018)

An analysis of strategy is needed to indicate different methods which can be used to avoid the loss of financial gain caused by rivalries striving to be greater. Grainy strategic analysis is necessary to identify separate methods which are valuable to prevent the loss of income through emulation by competitors (Teece., 2018). Teece., (2018) state that there are many methods, including copyright or trademarks to safeguard key knowledge, transforming costs to improve customer lock-in and rapid scaling to achieve large market share and cost advantage.

Building dynamic capabilities for efficient small-scale businesses

Through the resource-based understanding perception of capabilities, a strong competitive environment relies on resources such as assets, information, processes, and knowledge which have value, unusual to find and hard to repeat (Kabongo and Boiral., 2017). It is therefore very important to implement strategies that improve organizational effectiveness, through complex routines, tacit knowledge and competencies coordinated by capabilities (Kabongo and Boiral., 2017). In Table 1, the study presents the organizational capabilities recognized management literature of the environment.

Table 1. Essential Capabilities in a Small Business (Adapted from Kabongo and Boiral., 2017).

Capabilities	Description	Reference
Total quality management – tacit skills	The ability to use knowledge developed through employee involvement and work in teams	Abbas., 2020
Continuous improvement	Continuous improvement resulting from organizational efforts to reduce, minimize and eliminate waste	Jagusiak-Kocik., 2017
Cross-functional management	The strength to employ working relationships between employees and customers.	Shams et al., 2019
Innovations shared	The capacity to share what an organization envisions for the future	Walpole et al., 2017
High level of knowledge	The potential to development and new ways to seeks new existing knowledge	Chi et al., 2018
Constant improvement	The power to continuously provide ways of new innovations and the organization to be ahead of rivals	Aykol et al., 2020
Process transformation	The capability to renovate existing equipment and technology	Xie et al., 2019
Raw materials and goods produced	Delivery of goods control systems such as Just-In-Time (JIT) need to be implemented	Kabongo and Boiral., 2017
Management of rapid change in technology	The management of how new manufacturing good are implemented is crucial	Zolas et al., 2021
The execution	The ambition to implement Advanced manufacturing technologies and equipment	Kabongo and Boiral., 2017

"The second column provides a description of these capabilities as found in the studies." The third column displays the corresponding references. As shown, most research in this arear focuses on the quantity of both direct and indirect different types of capabilities and related factors, industry growth organizational size etc. Kabongo and Boiral., 2017 "has revealed that less is known about how capabilities for environmental management are understood, learned, and implemented in practical terms within businesses".

Research methodology

This study is based on small-scale bakeries located in the South African Metropolitan, the city of Johannesburg. This study adopted a convenience sampling approach, which enabled the researcher to choose subjects based on their accessibility and availability. The study employs a quantitative approach to data collection using a survey questionnaire. The population of the study is 400 bakery managers. A total sample of 120 completed survey questionnaires was achieved. The aim of the study was to have both employees and supervisors as participants because of the knowledge they have about their daily operations.

The study describes the research methods that were used when the data was collected and further review the approach that was used which is convenience sampling approach employed when data was collected. Employees and supervisors of selected small-scale bakeries took part and completed the questionnaires distributed to them. The study tried to discover if these employees had the knowledge about their baking processes, and if they understood automated machinery and dynamic capabilities. The distribution of the questionnaire had some delays that had the researcher taking three to five weeks making means of distribution and collecting data. Some of the participants were not against sending back the data by emails, while some struggled to even use emails. A traditional method was adopted in this research, whereby it had participants using the pencil-and-paper responding method. One of the major challenges encountered was participants who were quite ignorant of the electronic emails, which lead to

this study collecting data in person to accommodate all participants. A self-administered survey was adopted whereby all the participants completed the survey and had it returned to the researcher once completed. This research has classified the importance on how efficient bakeries adapt to the fast-changing technology and how at the end they meet their demand and supply.

"*Statkon* provides a professional, goal-orientated statistical consultation service to postgraduate students at the University of Johannesburg (UJ)". The consultations took the researcher through on how to embark on the "research design and methodology, experimental, questionnaire design, and statistical analysis of data". The analysis of this study was focused on making sense of what dynamic capabilities entailed and how they lead to technological transformation and small-scale bakeries (Warner, and Wager., 2019). This approach is best believed to answer the "how" and "why" proposed in the research questions of the study (Jafari-Sadeghi et al., 2021). Kabongo and Boiral., 2017 state that dynamic capability studies are not entirely related to experience and interpretation by managers in the management field. Their research also suggests that the enhancement of business capabilities rely on the views and ideas of managers and their readiness to welcome and execute changes.

Findings/results

Our research explores on findings and results. For example, the study attempts to analyse and discover whether there is a relationship between automation and dynamic capabilities and the need for small-scale bakeries to adopt dynamic capabilities. Our findings show whether automation can be regarded as a dynamic capability in small-scale bakeries and based on the data of this study, it is shown below that equipment happened to be more correlated than the rest of the automation factors. Findings have shown a complete response rate on equipment speeding up the process of moulding dough and made this factor one where all 120 participants had shown more interest on. This reveals or probes whether could automation be a variable under dynamic capabilities? This study has shown strong correlation among its factors especially on equipment, and the findings presented most of the items of correlation were bigger than 0.3 which is accepted in practice. This shows that automation is variable of dynamic capabilities in small-scale bakeries.

Equipment

The Table below provides different questions asked on this factor equipment. "A complete response of 120 small-scale bakeries was achieved on equipment speeding up the process of moulding dough". This question had many participants intrigued more than the rest in the data collected. The interest shown on speed in the baking process with ovens being ready for the next load had participants willing to respond. Again, the study experienced majority of interest and willingness of participants to respond on item B1.5 below.

Table 1. Descriptive statistics on equipment

Our automated (electrical) equipment…	N	Mean rating/5
B1.1 provides efficiency in dough mixing	118	3.96
B1.2 speeds up process of moulding dough	120	3.96
B1.3 ensures ovens are ready for the next load of baking	120	3.91
B1.4 ensures speed in our baking process	120	4.11
B1.5 ensures accurate temperature on ovens	119	3.71
B1.6 adds steaming in ovens that reduces the use of oil	120	3.44

One of the significant factors on this data is equipment. "Automation begins here whereby bakeries must save time and increase their speed in the baking process to achieve good operational performance". The above results show that automation in small-scale bakeries is relevant to be part of their dynamic capabilities. This data also discovered that the items on speed in the baking process made the question to be the most rated. "Business ventures like small-scale bakeries have a challenging task of creating

accessible and decent employment for our youth". The table above also presented the mean on the consistency of the instrument. These items are interrelated and disclose how crucial is equipment with automation in small-scale bakeries. This then proves that for small-scale bakery's dynamic capabilities to be efficient, there is a need to have highly improved equipment to better their speed in operations. This then means automation is indeed a dynamic capability in small-scale bakeries.

Correlation Matric

The correlations simple have a relationship amongst each of the items of this study. Pallant (2007) states that for "the correlation matrix to be considered suitable for factor analysis, the correlation should show at least some correlations of r=.3 or greater". These findings reveal that majority of the items in particularly the correlation in section B of the questionnaire are bigger than 0.3. According to Pallant (2007), "the Bartlett's test of Sphericity should be statistically significant at $p< 0.05$ and the Kaiser-Meyer-Olkin value should be .6 or above".

Table 2. KMO and Bartlett's test

The below table present the "KMO and Bartlett's test, which shows the validity of the data of this study and support the factorability of the correlations".

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,847
Bartlett's Test of Sphericity	Approx. Chi-Square	1408,259
	df	300
	Sig.	0,000

"The Kaiser-Meyer-Olkin value is 0.847 and this means that this study is valid with the data presented". "The Bartlett's test of Sphericity and Sig (anything with Sig is for significance) which is the P value and at is 0.000 and it should be < 0.05 and in this study, it is considered as good because it supports the factorability of the correlation matrix".

As per the findings of the correlation in factor analysis, the communalities extraction range between 0.312 and 0.692. In practice communalities must be bigger/greater than 0.3. "The data shows that all the communalities are greater than 0.3 which is good for this study". "It was at this stage whereby the researcher realised that item B2.4 (which is automation in bakeries ensures that customers have access to quality products by reducing damaged products during delivery) was the lowest with a communality of 0.166". Because the required value must be 0.3, this had this communality being omitted from the rest of the data.

Our findings suggest that small-scale bakeries should strive to mature dynamic capabilities that are suitable for successfully backing up innovation procedures. Again, build quality of design relationships with customers in time and in new better ways. Previous studies also propose the continuous development double approach and real time interaction (Capurro et al., 2021). The "time" for interconnections is becoming brief small-scale bakeries must develop new skills that are able to promote "real time" relationships with customers (Capurro et al., 2021). Our findings have shown that the speed and ability to do things quicker and easy may lead small-scale bakeries to discover new capabilities and target market activities (Capurro et al., 2021).

Discussions and conclusions

The study therefore reviews the findings and discuss how these finding mean to the small-scale bakeries within the City of Johannesburg. Small-scale bakeries have had their fair share contribution to the sustainable development of the world (Eikelenboom and de Jong., 2019). "However, it is important for these bakeries to discover methods that drive social, environmental, and economic performance" (Eikelenboom and de Jong., 2019). This study has investigated the importance of dynamic capabilities and the justifiable performance of small-scale business operations. The results proceed the debate about the challenges and the growth of small-scale businesses in remarkable ways. "This research specified,

theoretically and analytically, that external integrative dynamic capabilities positively relate to scales of performance and growth in small-scale businesses." These findings provide a significant foundation for how small-scale businesses might overcome challenges to the employment of sustainability by developing suitable dynamic capabilities and advances current research (Eikelenboom and de Jong., 2019). Teece, 2007 suggest that small-scale bakeries should advance managerial activities that create capably dynamic. Again, they should focus "on the new space of business customer relationships to classify and assess opportunities existing between the world, the inside and the outside of the firm" (Teece, 2007).

Results also showed the relationship between learning, integration and reconfiguration that may help small-scale bakeries to achieve dynamic capabilities. In this case we demonstrated that the firm's dynamic capability encourages a positive relationship with knowledge/learning and firm performance. Therefore, "we conclude by stating that dynamic capabilities are a result of learning to shape operational capabilities" (Winter., 2003), and that "knowledge management and learning are key elements in creating and renewing dynamic capabilities" (Easterby-Smith and Prieto., 2008), based on sensing, seizing and transforming (Teece., 2007) it to impact positively on business performance (Bitencourt et al., 2020).

Research has recently begun to emphasise the managerial propositions of analytics in the field of Operations Research (OR). It stresses the main challenges in exact principle or providing deployment frameworks (Conboy., et al 2020). However, little research exists on how dynamic capabilities can add value on OR activities, because of uncertain and constantly changing environments (Conboy., et al 2020). To date, several studies in other fields outside the field of OR, "suggest that business analytics may have positive effect on firms' dynamic capabilities" (Wamba., et al 2017); (Conboy., et al 2020). However, these studies have not specifically studied an OR background and have also continued at a general, higher-order conceptualisation of dynamic capabilities (Conboy., et al 2020). This study considerable contributes to the field of operations and to the context of dynamic capabilities in small-scale businesses.

Directions for further research

This study is limited to 120 small-scale bakeries in the City of Johannesburg region made up of major towns namely Roodeport, Randburg, Alexandra, Sandton, Rosebank, Johannesburg CBD, Booysens, Soweto and Lenasia. The study only focused on bakeries in this city region. The 120 bakeries were operational, and this qualified them to be included in this research. However, there is still a need for future research to be done on dynamic capabilities since at the time of this research a large portion of these bakeries were applying automation in a limited sense and still exploring further options. This study recommends that future research must try to understand transition to automation and how this assist in both operational efficiency and financial performance.

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The Societal Transformation Framework-State Organized Global Financial Predators' Tracking and Blocking (SOGFP_TB)

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Keywords
Global Predators, Swiss Fatal Financial Traps, Financial Crimes Analysis, Risk Management, Transformation, Cyber Transactions, Artificial Intelligence, Discrimination.

Abstract
The continuous global financial, geopolitical, structural, and societal crisis needs a holistic societal or geopolitical transformation framework. This framework can be important to predict global incoming wave of organized misdeeds. A holistic protective Financial & Technical (FinTech) activity is based on control, governance, and audit prerequisites; such prerequisites are crucially needed to predict global financial predators before they execute their fatal misdeeds. These protective controlling processes depend on measurable framework variables, like Critical Success Factors (CSF), which evaluate the possibilities of possible predator's financial misdeeds and tries to define sources of such organizations and even countries. The framework can be also used for the dependence of the evaluation of societal or organizational transformational processes, which can block global financial crimes, or a SOGFP_TB. This article discusses in depth the concept of a framework that can be applied to support SOGFP_TB, which can be a structural manner to detect global destructive financial crimes, by applying the Global Financial Crimes Analysis (GFCA), and for that goal a strategic vision is needed for the integration of FinTech risks and controls mitigation mechanisms. The GFCA is fundamental for the organization's long-term societal and business longevity; and also, for combatting SOGFP. Besides all the previously presented facts, this article highlights SOGFP_TB's importance for the organization, to optimally integrate the global economy in a coordinated, controlled, and above all in an ethical manner. Knowing that SOGFP_TB's appliance, is complex, risky and difficult; but the SOGFP_TB is needed to combat the irregularities, like the Swiss Fatal Financial Traps (SFFT) ones, which are well organized and sealed.

Introduction

The main motivation for this article, are the latest news and facts on SFFT activities, which confirm the author's previous works, alerts and recommendations related to SOGFP activities (BBC, 2022a); which makes this article and other author's work credible and identifies a the destructive SFFT. Therefore, this article's focus and goal, is to bring out a concept for an efficient SOGFP_TB. Actual SFFT related risks, controls, legal/governance, and ethical standards are not at all mature, chaotic, and for various reasons, consciously avoids to pinout SFFT specialists and misdeeds. The main reason is that politicians, leaders and legal organizations, are evidently corrupt; and do not point out SFFT misdeeds. SFFT behaviours and intentional misdeeds damage the organizations or country's (simply an Entity) transformation (or evolution) perspectives, or even existence. Entities have in general minimal notions of organizational architecture and societal transformation projects (simply a *Project*). Such Projects need a strategic concept and vision, which is, in this case, based on SOGFP_TP and GFCA, to minimize the risks of financial intentional destructions. Therefore, there is a need to support the tracking, detection of financial irregularities, locked-in traps, global organized crimes, and unethical behaviours (Le Monde, 2019), which can be fatal for the Entity. SFFT's immense gigantic financial crimes like the ones, which are related to global fraud, money laundering, and other activities, damage many Entities like, the one related to the *Union des Banques Suisse* (UBS). The UBS, an SFFT based bank, and other financial institutions have illegally swallowed and hidden an immense number of trillions; today it has become evidence, that like the minor SFFT money hiding cave, in which 32 trillion US dollars were simply hidden (Stupples, Sazonov & Woolley, 2019). There are thousands of such cases, and another interesting one is the gigantic fraud organized by the Swiss Fidusuisse, which shows the state of mind of such SFFT accountants, who promote SOGFP well-designed misdeeds concept (Cornevin, 2020). This article is about SOGFP crimes

and focuses on the most fatal one the SFFT. The author is proud to have pointed out such SFFT acts, which are today proved facts (BBC, 2022a), but in the same time he has received many threats from SFFT backed (il)legal bodies, but the author considers that nobody, no SFFT or other Entity is above the law; and especially when the SFFT has ruined many Entities. The state related, or more precisely organizes and sponsors, the SFFT, enjoys an excellent world class reputations, therefore the following questions arise: 1) Can SFFT related damages be quantified ?; 2) What are the real roles of control, ranking, ethics and audit organizations?; 3) Are powerful politicians and world leaders corrupt and why?; 4) Is today's global financial system viable?; 4) Why are SFFT bankers, in so-called ethical and advanced countries above the law?; and 5) Is SFFT today bankrupt? These are the main topics to analyse, in this Research and Development Project (RDP).

The research development project for GFCA

The Researched Literature Review and the Gap

Projects complexities that are due to various CSFs, like, corruption, siloed financial systems, an optimized SFFT, needs a societal transformation framework (simply the *Framework),* which recommends linking of the Applied Holistic Mathematical Model for GFCA (AHMM4GFCA) based Heuristics Decision Tree (HDT), to various types SOGFP models. This RDP's Research Question (RQ) is: "*Which societal transformation characteristics are optimal for the detection and tracking of global financial crimes*?" The knowledge gap was acknowledged because, the existing literature on SFFT are inexistant. This RDP inspects the SOGFP_TB, which is mainly based on the author's works, which includes the alignment of standards, strategies, and CSFs.

Review and Check of the Critical Success Factors/Critical Success Areas

The applied *Framework* promotes the societal transformation using Critical Success Area (CSA) that contains a set of CSFs, where a CSF is a set of Key Performance Indicators (KPI), where each KPI corresponds to a SOGFP_TB requirement that can be a control requirement that has a column in each evaluation table(s) (Putri, & Yusof, 2009; Peterson, 2011). A *Project* starts with the feasibility phase to check the selected CSFs and if the RQ *Project* makes sense. Based on the literature review and evaluation processes, the CSFs are evaluated using the following the *Framework's* selected rules : 1) References should be credible and are estimated by the author; 2) *Projects* are the result of defined changes measured by CSFs; 3) Applied modelling language should be limited in order to make the *Projects* manageable; 4) The ADM manages the *Framework's* iterations and CSFs tuning; 5) If the aggregations of all CSAs are positive and exceed the defined minimum; and 7) The evaluation of business cases.

Business Case Basics

The Proof of Concept (PoC) uses Applied Case Studies (ACS), developed by the Open Group's case study, supported by other cases, that basically represents the possibilities to transform the Entity ArchiSurance. SOGFP_TB CSFs are measurable by a weighting that is roughly estimated in the 1st iteration, using Architecture Development Method's (ADM) iterations. In each iteration the SOGFP_TB evaluation is done by the Decision-Making System for GFCA (DMS4GFCA). The HDT to supports a set of SOGFP problem types (Markides, 2011) and is based an agile approach. This RDP and its underlying AHMM4GFCA, use an agile approach that can be applied to any domain that needs to be transformed (Trad, & Kalpić, 2022a).

The Mathematical Model Basics

The *Project's* CSFs define the initial nodes that are vital for SOGFP targeted solutions and is AHMM4GFCA's most basic element that is needed for the evaluation processes. The SOGFP uses a CSF based AHMM4GFCA uses a proprietary environment. The AHMM4GFCA nomenclature is presented in a basic form. The Domain is the GFCA, as shown in Figure 1: 1) The symbol $\sum$ indicates summation of weightings/ratings, denoting the relative importance of the set members selected as relevant. Weightings as integers range in ascending importance from 1 to 10; 2) The symbol $\underline{U}$ indicates sets union; 3) The AHMM4GFCA defines the *Project* as a model, using CSFs weightings and ratings; 4) The selected corresponding weightings to CSF ϵ { 1 … 10 } are integer values; 5) The selected corresponding ratings to CSF ϵ { 0.00% … 100.00% } are floating point percentage values; and 6) A weighting is defined for each SOGFP CSF, and a rating for each KPI.

Basic Mathematical Model's (BMM) Nomenclature

microRequirement	= KPI	(B1)
CSF	= Σ KPI	(B2)
Requirement	= CSF = ∪ microRequirement	(B3)
CSA	= Σ CSF	(B4)
microKnowledgeArtefact	= ∪ knowledgeItem(s)	(B4)
neuron	= action->data + microKnowledgeArtefact	(B5)
microArtefact / neural network	= ∪ neurons	(B6)
microArtefactScenario	= ∪ microartefact	(B9)
AI/Decision Making	= ∪ microArtefactScenario	(B10)
microEntity	= ∪ microArtefact	(B7)
Entity or Enterprise	= ∪ microEntity	(B8)
EnityIntelligence	= ∪ AI/Decision Making	(B11)
BMM(*Iteration*) as an instance	= EnityIntelligence(*Iteration*)	(B12)

The Generic AHMM's Formulation

AHMM	= ∪ ADMs + BMMs	(B13)

AHMM's Application and Instantiation for a Specific Domain

Domain	= EARM	(B14)
AHMM4(*Domain*)	= ∪ ADMs + BMMs(*Domain*)	(B15)

AHMM's Application and Instantiation for National Security and AIbDS

Domain	= AIbMT	(B16)
AHMM(*Domain*)	= ∪ ADMs + BMMs(*Domain*)	(B17)

Figure 1. The applied mathematical model's nomenclature (Trad, & Kalpić, 2020a).

A Quantitative-Qualitative Research Mixed Model and the Transformation Model

A SOGFP problem type, RQ, CSF or phenomenon, are examined in iterations relating breadth and depth, using the HDT, which is specialized for problems that appear in a preliminary phase. There is a need for the qualitative HDT, and for the control of SFFT's activities. The AHMM4GFCA has a composite structure as follows: 1) A static view; 2) A behavioural view; and 3) It is the skeleton of of microartefacts' scenarios. The AHMM4GFCA can be modelled after the following formula for Business Transformation Mathematical Model for GFCA (*BTMM4*GFCA):

AHMM4GFCA=$Weigthing_1$*Qualitative+$Weigthing_2$* Quantitative (B18).

AHMM4GFCA = ∑ AHMM4GFCA for an enterprise architecture's instance (B19).

BTMM = ∑ AHMM4GFCA instances (B20).

The objective function of the *BTMM4GFCA* can be optimized by using constraints and with extra variables that need to be tuned using the HDT. The minimization CSF can be, SFFT's risks. For the PoC the success will be the main and only constraint and success is quantified as a binary 0 or 1, where the objective function definition will be:

Minimize risk *BTMM4GFCA* (B21).

The *BTMM4GFCA* is a combination of *Project* methodologies and the AHMM4GFCA that integrate the Entity's structure. The SOGFP_TB interfaces the DMS4GFCA and KMS4GFCA, to evaluate, manage and map CSFs for SFFT's risky activities; if the aggregation of all the *Project's* CSA/CSF tables exceeds the defined minimum, the *Project* continues to its second part of the PoC. The initialization phase generates the SOGFP types of problems to be analysed. The AHMM4GFCA supports requests (Agievich, 2014). This concept has been published in many author's works.

The Author's RDP Related Works

The most important author's related works are:

- The Business Transformation and Enterprise Architecture Framework Applied to Analyze the Historically Recent Rise and the 1975 Fall of the Lebanese Business Ecosystem. In Impacts of Violent Conflicts on Resource Control and Sustainability (Trad, 2018a).
- The business transformation and enterprise architecture framework-The London Interbank offered rate crisis-the model. The Business & Management Review (Trad, & Kalpić, 2017a).
- The Financial Crime Analysis Concept (FCAC's) Vision (FCAV) that can be used to support Enterprise Control and Audit for Financial Crimes (ECAFC) in its essence.
- The Business Transformation Framework and Enterprise Architecture Framework-The Role of Enterprise Control and Audit in Financial Crimes (ECAFC) (Trad, 2020a).
- The Business Transformation Framework and Enterprise Architecture Framework-The Financial Control and Technology Concept (FCTC) (Trad, 2020b).
- The Business Transformation Project of a modern business/financial environment needs a well-designed Information and Cyber Technology Security Automation Concept (ITSAC) (Trad & Kalpić, 2018a).
- Enterprise Transformation Projects in the Financial Industry and Ethics (Trad, 2022b).

An attempt to apply the Business Transformation Framework and Enterprise Architecture Framework for Managers in Business Innovation to explain the changes that followed the 9/11 attack. e-Leaders, Warsaw, Poland (Trad, 2019).

SOGFP_TB main structural topics

Introduction

The SOGFP_TB is to be managed by a *Manager*, GFCA experts, financial officers/auditors, Enterprise Architecture (EA) experts, who, are supported with a methodology and a *Framework* that can estimate SFFT risks. The *Manager* is responsible for the implementation of SOGFP_TB mechanisms using various types of GFCA patterns. To implement the SOGFP_TB for such a risk and control mechanisms, the author's, Transformation, Research and Architecture Development framework (*TRADf)* is optimal. *TRADf* proposes default CSFs, that can be used to evaluate SFFT risks and misdeeds (IFRS, 2017). CSFs can be configured to measure the influence of SFFT financial flows and the integration of possible controls of Entity's local and international financial environments. An SOGFP_TB needs to integrate complex technologies to facilitate the strategic financial control planning. The integration of FinTech with Secured Information and Communication Technologies (SICS) is crucial for financial systems (Rafay, 2019). A FinTech platform must support SOGFP_TB's concept and vision, to avoid SFFT misdeeds. SOGFP_TB recommends standardized and fully integrated SICS technology stacks, governance and monitoring subsystems (Kowall & Fletcher, 2013). The GFCA promotes FinTech driven financial systems that use *services*-based technologies (Kabzeva, Niemann, Müller & Steinmetz, 2010). *TRADf*, relates to other author's works and it is important to understand its structure, which is based on standards like, The Open Group's Architecture Framework (TOGAF) (The Open Group, 2011). SOGFP_TB topics are treated by accountants, whereas SOGFP_TB strategy and vision need EA/transformation experts.

The Strategy and Vision

A *Project* establishes SOGFP_TB's strategy and vision to integrate controls, capable of recognizing SFFT's illegal activities and fraud/tax evasions. The SOGFP_TB is supported by the GFCA that can be used to analyse and audit complex financial operations. SOGFP_TB vision supports GFCA's financial engineering risk management, legal controls and integration in a complex automatized globalized environment (Grewal-Carr & Marshall, 2016). SOGFP_TB's strategy needs a specific approach for the integration of concepts that is based on the following facts: 1) A strategy needs a multimodal financial model that minimizes the dependencies between partners; 2) An important CSF is the *Financial Cost Ratio*; which can be used before and after the *Project's* completion. To calculate SFFT risks; 3) To define SFFT security schemes, where financial transactions are orthogonal to security; 4) Financial transactions define the responsibility of the financial results; 4) Timestamps based regulations of the security requirements need qualified timestamps to build robust certification techniques; and 5) Timestamp servers that work on the basis of taking a hash of a block of items. An optimal strategy needs to be supported by a DMS4GFCA.

A Decision-Making Approach and the Role and Risks of Intermediaries

Important decisions can be made in a just-in-time manner by using outputs from the financial system's tracing, monitoring and logging sources; and an internal DMS4GFCA to assess risks and legally assert, govern or control the Entity's various financial resources. Today Entities have standardized audit, governance, control and monitoring mechanisms; comparing to less than 10% before a decade 10 years; that enables the Entities to trace SFFT acts (Kowall & Fletcher, 2013). The GFCA evaluates Entity's risks and consult legal teams, to apply changes to the financial construct and regulations; that stimulate the reduction of of risky financial services (Rafay, 2019).

The Role of Financial Services and Related Risks

Existing financial models, provide FinTech services over based online frontends. SOGFP_TB can help Entities reshape their financial system, like during the 2008 financial crisis, where the financial control focused on geographical reach, redefining global initiatives and reorganizing the trade services and prioritizing an end client-centric approach. Risks that can affect the Entity ate (Shahrokhi, 2008): 1) Various complexities can lead to significant financial risks; 2) The SOGFP_TB adopts GFCA concepts; 3) *GFCA* complete policy issues should be controlled, verified and integrated; 4) Entities are reluctant to execute radical *Project*s; 5) *GFCA*, in most cases causes resistances; 6) The Swiss government has given SFFT, due to the 2008, 70 billion Swiss Francs (with no obligation to return); knowing that SFFT hides multi-trillions.; and 7) Legal support for SOGFP_TB, which depends on behavioural predispositions (Minarchiste, 2015).

Behavioural and Cultural Predisposition

SOGFP_TB's main problem, is that SFFT is hermetically closed and is characterised by 1) Its legal system, ignores any attempt to investigate financial crimes; and would even look into making their financial institutions look as victims, like in the case of the UBS (and practically all SFFT banks) and its tax fraud crimes against France and many other countries. SFFT was hit with multi-billion historic fines, even when it was protected by the Swiss state; 2) SOGFP_TB is capable of finding and tracing SFFT misdeeds and especially by accountants (Cornevin, 2020); 3) In SFFT's area, legal support is very expensive, this fact discourages any action of law enforcement; like in the case of the second World War Two (WWII) and other types of misdeeds; 4) Psychological collective harassment, that is a part of SFFT's culture, which discriminates by using even with racism to discourage people seeking to be refunded; 5) *Intolerance based misunderstanding attitude* are used, in order to block any foreign request; 6) A global network of world leaders, is used to embed and hide various dubious operations and to corrupt any person or Entity worldwide; 7) SFFT guerrilla-like, *hit and run tactics*, is used to confiscate wealth; 8) Occurrence of financial locked-in situations and seizure of wealth; 9) SFFT haven states target to become leaders in FinTech, which is a major danger; because FinTech should combat state criminality and enforce international law; 10) SFFT wants to be a leader in FinTech, which is a major risk; 11) Police and information services are used to block any attempt to pursue financial criminal acts. They even will attack the parties looking for deposits, like in the Libyan case (Paravicini, 2018); 12) Unfortunately all these facts are true, and it is strongly recommended to avoid collaborating with SFFT institutions, who use the previous scenarios; the found sources confirm these dubious SFFT misdeeds and locked-in situations (BBC, 2022a).

SFFT Locked-in Situations and Solutions

SFFT locked-in situations occur, when the financial system becomes dependent of various types of financial schemes, and the *Manager* must be cautious not to fall in locked-in situations. Even if SFFT offers attractive financial and tax package(s), it applies a legal, societal and financial locked-in trap. It is a sealed system, with an unwritten concept that can sweep out the financial resources from any Entity or person, even from very powerful countries like, the USA, France and other. This SFFT locked-in crimes model, combines cultural and mentality specific features, the power of its law, *Too Big to Fail* concept for banks, banking secrecy that protects and promotes financial crimes, ultraliberal economy, rejection of global standards, isolationism and racism, unethical attitude, and a supportive socio-political environment for collective plundering. *Swiss banking secrecy laws are immoral. The pretext of protecting financial privacy is merely a fig leaf covering the shameful role of Swiss banks as collaborators of tax evaders* (BBC, 2022a). SFFT is under no supervision, whatsoever; and SFFT experts are free to operate, using *hit, run and hide tactics*. That

indirectly makes it, the financial industry's super predator that sets up fortifications against any possible legal intrusion; even when these institutions are executing massive criminal acts. Entities should try to avoid SFFT and its accountants; it is wiser to pay more taxes and social services then to face such an unstable phenomena and traps (International Monetary Fund, 2009).

The Role of Accounting and Currency Management

The SOGFP_TB must propose a credible and non-SFFT related currency to be used in the Entity's financial transactions. Lately there is a convergence of major industrial electronic currencies, this fact shows the will to adapt to electronic currency, which it is strongly recommended to avoid. Because SFFT may usage e-currency to abstract transactions, which are a damaging fact for Entities, who might lose their transformational and evolutional momentums, and to become prone to ruthless accounting austerity procedures. SOGFP_TB supports the automation of financial operations and accounting processes, and that enables the control the accounting subsystems which interacts with the global eco-systems. The SOGFP_TB FGCA control that is supported by different types of governance, SICS and business service technologies frameworks. Accountancy consultancy firms are accused of global tax fraud, where they are supposed to advise *Entities* to avoid it (Le Figaro, 2022b), and are facing pressure to protect their ethical integrity, by trapping SFFT predators.

Predators and Ethics

The main limitation to correct and ethical attitudes is the ongoing ethical and regulatory bodies that governed by corrupt organizations. Today, finance related risks' management, ethical and legal standards are not mature and are even very chaotic. Some of major states and financial powers are responsible of most of GFPA crimes, and they even enjoy excellent world class reputations. In this article various cases are mentioned, because they are related to known SFFT financial centres, who enjoy top worldwide positions in transparency and ethical rankings (Transparency, 2020; Swissinfo, 2021), and who in the same time have committed massive major financial irregularities and crimes. The main reason for this unethical and global contradiction is that SFFT bodies, have overwhelming legal, political and financial advisory support, who block any attempt to divulgate such unethical and illegal misdeeds. *TRADf* can be used to evaluate risk and control of GFPA misdeeds and measure of such misdeeds (Trad, Nakitende, & Afe Babalola, 2021). The *precise* motivation is extreme cupidity which is destroying global financial capacities, that has been proven by the author and it is today enforced by the revelations of the *Swiss Leaks affair*, where SFFT instances have committed misdeeds and have been condemned for tax avoidance shows the need for an evolution towards ethical banking and that future generations of students in finance, economics and management, must be aware of ethical values. In this article it is related to many concrete cases which are today, more than massive, like: 1) Many UBS' and CS' multiple cases (Stupples, Sazonov & Woolley, 2019), in which trillions of US dollars were/are hidden; 2) Gigantic frauds organized by the SFFT accounting, like Swiss Fidusuisse, which shows the state of mind of such a GFPA accountant approach (Cornevin, 2020); 3) Global tax fraud by UBS' and CS' (Financial Times, 2021); and 4) These SFFT misdeeds are organized by top bankers (LENA, 2022).

SOGFP_TB's standards and concepts adoptions

Finance, Transactions, Security and Legal Constraints

FinTech's influence is immense, in all business domains and it should be supported by the SOGFP_TB; it is a technology-driven domain, but the Entity must avoid the locked-in situation. Locked-in should be avoided by implementing internal tools who *may* respect standards, which includes Cybersecurity: Architecture, Governance, EA based frameworks (like the Sherwood Applied Business Security Architecture), and a control/logging subsystem. SOGFP_TB manages the differences in Entity's, local and international laws, where Entities must have the capacity to proactively recognize erroneous and suspicious SFFT based Cybertransactions. From SOGFP_TB's perspectives, uniform bodies promulgate governance acts to legally enforce activities, like in 1) The importance of financial planning (CEU, 2004); 2) Cybertransactions should be asserted; 3) Avoiding major standardized frameworks; and 4) International law is inefficient and is even controlled by SOGFP. SOGFP_TB implements a regulatory component, for legal intelligence. The International Organization of Securities Commissions (IOSCO) identified eight areas that actually constitute what is currently called FinTech. Such areas are payments, insurance,

planning, trading and investments, blockchain, lending/crowdfunding, data and analytics, and security. The growth of FinTech market implies high SFFT risks, therefore financial regulation is increasingly complex.

The complexity for regulators is to find the balance between FinTech, mentalities and ethical behaviour. There are today many regulatory, governance and legal frameworks, like, ISACA's COBIT, but the complexity is due to: 1) SFFT seems to be above the law…2) The integration complex frameworks; 3) A discriminatory approach that is applied only to weak Entities and never to SFFT and its sponsors (BBC, 2022a; Stupples, Sazonov & Woolley, 2019); 4) FinTech can enable massive fraud by: By using interactive financial services and Entities that support SFFT are making investments (Ravanetti, 2016); 5) e-currency supports uses encryption forms and that needs regulations, law enforcements and cybersecurity mechanisms; in these domains there is a new type of misdeeds. These new avant garde domains are fully exploited by SFFT and its sponsors, who are the origins.

Types and origins of financial crimes and misdeeds

SOGFP_TB explains the damages done to Entities by using the DMS4GFCAand information sources like: state organized financial crime references, banks' influence/legal processes, financial valuation, currency manipulation, Growth Domestic Product (GDP) indices, finance institutions and global financial and influence networks. The SOGFP_TB uses these sources, like geopolitics, to identity financial crimes (BBC, 2022a; Stupples, Sazonov & Woolley, 2019; Cornevin, 2020).

The Role of Geopolitics

SFFT's geopolitical construct is based on the following facts: 1) The Phoenician General, Hannibal Barca, who tried to conquer Rome by crossing the Helvetic Swiss Alps, was slowed down by ambushes for *collective and organized looting*. These ambushes and looting schemes were launched by Helvetic tribes, who are the ancestors of peaceful Swiss nation. Such looting schemes became the moral founders of today's SFFT. This historical cultural heritage and geopolitical construct can be considered as *unique*; 2) SFFT can be considered as a type of extreme ideology, oriented to seize wealth similar to terrorist ideologies; where the notion of states applying state crime (like SFFT) exists (Agger & Jensen, 1996). SFFT, can be labelled as organized plundering other states by the means of financial terrorism; 3) SFFT ideology destroyed many countries like Lebanon, where the Swiss government took the unprecedented step of contacting Palestinian militants in 1970 to destroy Lebanon (Fitsanakis, 2016; Izzo, 2019), but there are many other cases, like Sri-Lanka where SFFT's misdeeds were fatal (Chandrasekhar, 2018); and there are too many cases to be listed. Geopolitical influence can be classified as follows: 1) Select CSFs which influence geopolitics which support SFFT misdeeds; 2) Localise geopolitical frontends for SFFT influence that is based on elite networks, which are misused; 3) Geopolitics for destabilizing Entities like, Lebanon; and to plunder their wealth (D'Amato, 1995), and historical valuable objects (Duparc, 2010); 4) SFFT high level meetings, like *Davos*, where leaders plan the dismantlement of Entities and the seizure of their wealth (*It was Kissinger who destroyed the nation of Lebanon…* (El Hashem, 1990); and 4) History and crimes against humanity, like Slavery.

Slavery and Financial Aggressiveness

The case of slavery, discrimination and racism in SFFT areas, is studied by Swiss historians, who are supported by dozens of major public figures, together have launched a committee that inspects the case for *organized and structured worldwide slavery* managed by Swiss bankers and political leaders. This committee's main aim is to estimate reparations in the context of Switzerland's related organize slavery related crimes against humanities. In these crimes' major Swiss high-level politicians, trading companies, world class banks, cantons (like the Canton of Vaud, who still carry a slavery mentality), predatory family enterprises, mercenary contractors, soldiers and private individuals; all of them profited from the slave trade. Swiss organized financial links to the slave trade, makes them global predators of manhood and nationhood, this fact shows this nation's culture of greediness that comes out always, exactly like in the period of major plundering of victims of the Holocaust (Swissinfo, 2019). But nothing has changed, today the Lebanese are SFFT slaves.

Special Relations with Legendary Dictators

SFFT crimes schemes, where brutal dictators like neo-Nazi brigands have a special status where the ownership of substantial financial assets can remain anonymous under the illegal banking secrecy and its opaque legal system, which is a demise (Parker, 2016). Dictators maintain strong financial relationship to SFFT, who have been influenced by war criminals, like the notorious Swiss Nazi banker Francois Genoud, from canton Vaud (Brown, 2016; Johnson, 1983). SFFT ensures provides security to dubious collective crime schemes, investors. SFFT is the leader in worldwide financial crimes/scandals, misdeeds, and criminal acts including; igniting civil wars, the LIBOR manipulation, currency manipulations, credits manipulations, supporting arms dealing transactions, hijacking people's wealth, subprime crisis, war victim wealth confiscation, organized tax evasion, drug dealing financial support, support against future financial competitors, forced confiscations, drastic fines, financial spying, immigrants plundering and arms dealing (BBC, 2022a, Trad, 2018a; Clarke & Tigue, 1975; Parker, 2016). Brutal dictators like the Syria's Bashar al-Assad and his private brigand-bankers have a special status in Switzerland, where the owns a billion of USD (Brown, 2016). Probably one of the worst SFFT scenarios, was the WWII, where it was actively financially supporting the Nazis, and have lent them large amounts of money, which prolonged the war. This collaboration with the Nazi German Reich and other dictators raises extreme doubts regarding the Swiss government, mentality, and financial institutions and leads one to conclude they will do anything for financial profit. SFFT has taken all the gold, money and other assets, which the Nazis have stolen in Europe, have not been recovered by destroyed European countries (LCP ,2022).

Economic Growth of SFFT

SFFT took advantage in many human catastrophes like Lebanese drama, Iraqi drama, WWII…, By comparing GDP diagrams, as shown in Figure 2, it seems that the GDP slopes are inversely equivalent. SFFT is the only winner in all human dramas, they have the expertise to turn human agony into Swiss francs and gold (Rickman, 1999; Trad, 2018a; Rolland, 2004; AMInfo, 2014).

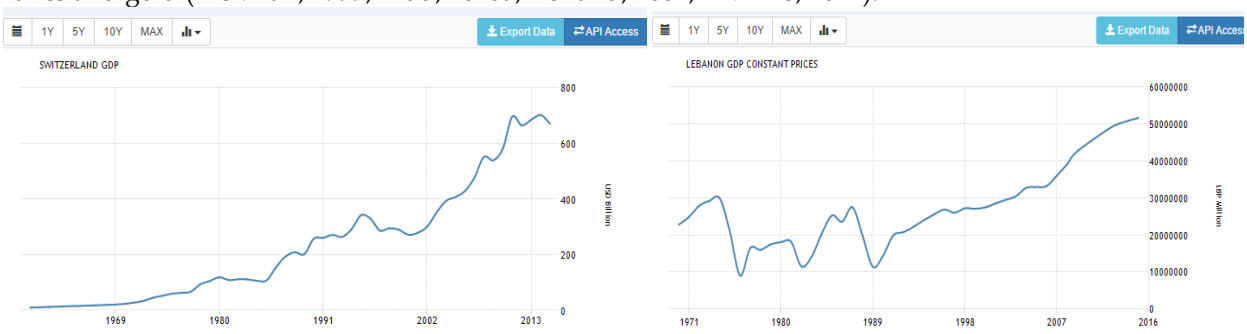

Figure 2. Switzerland's and Lebanon's GDPs (Trading Economics, 2017a).

Ruthless and Immoral Attitudes

The immense number of SFFT cases of immorality and misdeeds are based on the following pattern: 1) Creating new SFFT models, like the assistance in euthanasia cases, which helps people committing suicides and seizing their belongings; that provoked the opening of penal cases; 2) Swallowing inheritance, the SFFT financial pillar in which national banks make billions per year and their judicial system makes it impossible to make any claims, like in the WWII… All assets make SFFT influences' greater in the world; 3) Its unique collective behaviour; 4) Colonization of many rich regions, by means of wealth management; 5) Intentional discrimination towards foreigners and coloured people, where Switzerland's main political and ruling party, the *Schweizer Volks Partie* (SVP), a neo-Nazi like construct that uses 1933-like attitude; where even Europeans are considered as an inferior race (Maurisse, 2016; Miller, 2017; Le News, 2015, 2017). Snowden declared: …*Switzerland is the most racist state in the world* (Snowden, 2015), Racism based on the color of skin as shown in Figure 3; 6) SFFT related politicians, where convicted for major racist hate crimes; and Christian Levrat, compares the ruling SVP to Nazi regimes (Tribune de Geneve, 2014); where the main aim is to plunder foreigners; 7) The latest major financial crisis' main and only winner is SFFT, who looted the invested capitals, that is based on the motto: … when an Entity goes bad, collect its fortune from its fleeing and desperate immigrating

population, like in WWII (Rickman, 1999;BBC, 2016), and they even stripped the belongings of the latest immigration waves, where the Swiss police actively took a part.

Figure 3. The apartheidic Swiss ruling party's poster (The Local, 2017).

Tax and Global Fraud

SFFT's global fraud mechanisms: 1) They practically all countries and the hidden capital is reused to credit many Entities; 2) Accountancy uses locked-in schemes to blur financial flows and to block recuperation; 3) SFFT is been frequently pursued for money-laundering cases, profits from cocaine trafficking, which includes international crime rings involving top-level figures (McDermid, 2016); 4) Invest to polish its image and influence on transparency bodies, which is a form of corruption. The *Global Forum on Transparency and Exchange of Information for Tax Purposes* peer review has identified flagrant corruption in Switzerland (OECD, 2011; 2014); 5) SFFT's role in enabling corruption schemes in Venezuela and other Entities is not just an internal minor problem; it's also directly related to Swiss laws that encourage stringent banking secrecy and punish whistleblowers and block any legal attempt to punish criminals. *The Swiss banking system remains a favorite destination not only for the proceeds of massive bribery schemes like the ones involving PDVSA, but for the use of companies like PDVSA as vehicles for laundering criminal proceeds*," said Alexandra Wrage, president of the anti-corruption nonprofit TRACE. But as corrupt leaders and elites have massively plundered, while Venezuelans and a huge number of people are struggling to survive… The country's economy has cratered since 2013, with high levels of poverty, unemployment, and hunger, while hyperinflation has eaten into both the savings and the salaries of those lucky to still have them; but Switzerland got much richer (O'Brien, 2022a); 6) Massive leaks have confirmed SFFT's criminal character; where they revealed that Credit Suisse harbored the hidden wealth of clients involved in torture, drug trafficking, money laundering, corruption and other serious crimes. The revelations point to apparently widespread failures of due diligence by the lender, despite repeated pledges to weed out dubious clients and stamp out illicit funds (Horta-Osório, 2022a); 7) President of Algeria and other Algerian elites have illegal accounts in SFFT related banks (Le Figaro, 2022a); and 8) As the result of the massive leaks and their contents, SFFT asks its institutions and dubious clients to destroy all related documents (Liberation, 2022a).

LIBOR, Subprime, Mortgage Fraud, Manipulation and Growth

SFFT's mortgage manipulations are: 1) It has caused *catastrophic* investor losses in residential mortgage-backed securities (Stempel, 2019); 2) Vertically integrated mortgage-backed securities issuers and underwriters committed illegal securities fraud (Fligstein & Roehrkasse, 2019); 3) Paula Ramada estimated the lost money due to the benchmark of interest rates debacle is estimated at $300 trillion in financial instruments, ranging from mortgages to student loans (Trad, 2019a); 4) Cash in Cash Out (CICO) overflow and disruption affected the modern global financial system, created a gap that in turn generated panic and the Subprime, LIBOR and many other financial misdeeds. The Subprime debacle, which was closely linked to the LIBOR and mortgage debt-based system (Utt, 2008); and 5) *Paradise papers fallout*, evokes numerous SFFT misdeeds (Allen, 2017).

SFFT misdeeds destabilized many Entities, like the case of France, USA, Lebanon, Malaysia, Mozambique and many other... SFFT gains are noticed by analysing GDP diagrams.

Regulated and Stable Financial Systems

Figure 4. Shows the French *Société Général* robust approach.

SFFT institutions that do not respect ethical and regulatory standards; but there are financial institutions that are stable and reliable, like the French *Société Général*, which evolution is shown in Figure 4, that demonstrates a well-controlled, human and ethical approach that is imposed by the French government and financial system. The French (and European Union's) financial system can be considered as the most stable secure and reliable one; knowing that France is doing well in coordinating a global human, financial and industrial vision. Such an approach can become a raw model for the West and the rest of the world. There is a need for an ethical approach, which is the main CSF for the *Entity's* long-term business and financial sustainable strategy.

GFCA and the Evolution of Financial Systems

As already mentioned, the author has been researching the SFFT for a long period of time, and his findings have become facts; mainly due to the latest data leaks from SFFT institutions. Lately, the CS was hit by a massive data leak (to the German newspaper Süddeutsche Zeitung), which has showed the immense hidden wealth. These data on thousands of accounts, holding more than $100 billion. It includes personal, shared and corporate accounts, as well as suspicious accounts from the 1940s. Worldwide medias' (like the *Organized Crime and Corruption Reporting Project*) investigations, confirm that CS accounts are owned by clients involved in serious crimes such as fraud, money laundering or drug trafficking (BBC, 2022a). There is also the fact that most powerful people have immense capital stocked in SFFT related banks, like Russia's president Putin who has more than 500 bilion USD on his private account (Swissinfo, 2016); and USA's ex-president Trump has also impressive stocks in SFFT related banks. Powerful people linked to SFFT banks gives Switzerland extreme power and influence on any global geopolitical topic; and it is known that in practically any summit between world leaders, there is always an SFFT banker, who's presence is vital, which a form of geopolitical corruption. After all the presented facts the major dilemma and a question is to can be asked, how can such a country be a synonym of honesty and anti-corruption… Are judges, accountants, control organizations and politicians corrupt? (Alderman, 2019; Tagliabuejune, 1986; Cornevin, 2020).

The proof of concept or protype's integration

The Literature Review's Outcome, Phase 1 to Phase 2

The literature review process' (or Phase 1) outcome that supports the PoC's background, by the use of an archive of an important set of credible references and links that are analysed using a specific interface. After selecting the CSA/CSFs tag is linked to various DMS4GFCA scenarios; which are implemented as an item, in an Excel file; where all its details are defined; this concludes Phase 1.

Critical Success Factors	KPIs	Weightings
CSF_SOGFP_TB_GFCA	Feasible	From 1 to 10. **09 Selected**
CSF_SOGFP_TB_ DMS4GFCA_Approach	Mature	From 1 to 10. **09 Selected**
CSF_SOGFP_TB_RDP	Mature	From 1 to 10. **09 Selected**
CSF_SOGFP_TB_TRADf	Proven	From 1 to 10. **10 Selected**
CSF_SOGFP_TB_SFFT_Crimes	Factual	From 1 to 10. **10 Selected**
CSF_SOGFP_TB_Structural_Topics	Feasible	From 1 to 10. **09 Selected**
CSF_SOGFP_TB_Origins_Standards_Concepts	Factual	From 1 to 10. **10 Selected**
CSF_SOGFP_TB_Integration_PoC	Feasible	From 1 to 10. **09 Selected**

valuation

Table 1. The sheet that concludes phase 1 with an average 9.4.

In this article related PoC (or Phase 2), the HDT is used to process solutions. The *Project's* enumeration of CSAs is presented in the related works. *TRADf* and the AHMM4FCA's main constraint, is to implement the PoC using simple *Project's* components, having a constraint, that is the CSA's average must be higher than 7.5. In the case, of the current CSA/CSFs evaluation, has an average result higher than 9, as shown in Tables 1, which qualifies this phase. The PoC uses the *TRADf's* implementation environment to configure the DMS4GFCA and selects problems, actions and applicable solutions to verify the SOGFP_TB, by using the ACS4FCA.

Linking the Applied Case Study – Integration and Unification

The PoC and the ArchiSurance case, with defined *Project* goals. This case analyses a merger, of an old business system's landscape that has become siloed and unmanageable, that resulted in abundant misdeeds and chaotic SICS. For this PoC, a financial auditing and automated controls' approach is tested to detect possible financial crimes.

Experiment's Processing on a Concrete Tree Node

In Phase 2, the HDT finds a combination of actions, that are used to solve a SOGFP problem related to this article's RQ. A selected CSF is linked to a SOGFP problem type and a related set of actions where the processing starts in the root node. For this PoC, the CSF_FinancialTransaction_Validation selected as the active CSF. In this PoC the goal is to find solutions related to this selected CSF's related problems. The AHMM4FCA based reasoning is applied to try to solve the CSF_FinancialTransaction_Validation problem or the PRB_FinancialTransaction_Validation, which is solved by using the following steps:

- Relating the ACS4FCA controls and financial transactions' integration capabilities to CSF_FinancialTransaction_Validation capabilities is done in Phase 1.
- Link the processing of this node to the pseudo-quantitative modules, then by using qualitative modules, filter and deliver the initial state that is the root node of the *TRADf's* HDT.
- The HDT is configured, weighted and tuned using configuration information.
- The set of possible solutions results from HDT. Then the reasoning engine is launched to find the set of possible solutions in the form of possible transformation iterations.
- Then follows the CSF attachment to a specific node of the HDT; to link later the Project microartefacts.

From the *TRADf* client's interface, the development and editing interface can be launched to develop the SOGFP_TB services to be used in microartefacts.

Selected Node Solution in Phase 2

HDT scripts make up the processing logic of the SOGFP_TB's defined problems and is supported by a set of actions. Where these actions are processed in the *TRADf* background to support Project microartefacts that are called by the engine's actions, which deliver the solution.

Solutions and recommendations

The SOGFP_TB and the GFCA are concepts that can be used to transform the Entity's financial environment and to protect itself from SFFT misdeeds. Many industries have been implementing financial visions to respond to probable SFFT risks, legal problems and challenges in combatting financial crimes. In this article, the main issue is how to define the optimal SOGFP_TB using relevant resources discovered in the literature review phase and the *TRADf's* PoC proved the feasibility of this approach and defined a related set of recommendations that are sorted by their importance:

- The PoC proved RDP's feasibility by implementing the defined SOGFP_TB CSFs concept.
- The Project must build a strategy and an anti-locked-in approach.
- SOGFP_TB needs skills related to 1) Financial engineering and the needed audit, logging, monitoring, and assertion architectures; 2) Automated real-time controls; and 4) Governance and regulations' integration to detect SOGFP misdeeds.
- To design and implement an adequate SOGFP_TB and GFCA components, that interfaces the DMS4GFCA that can be easily integrated with any framework or tool (Gray, 1997).
- Legal intelligence, DMS4GFCA and CSFs, enrich logging system's database, to identify SFFT patterns.
- Governance and regulations standard frameworks can be integrated in the *Project* through the use of CSFs.
- Implement a global financial subsystem's approach for the control to block SFFT's intrusions.
- The Entity must choose a currency strategy to be used in its financial transactions and avoid SFFT currency.
- Global consultancy companies are the supporters of global tax fraud, where they are supposed to advise Entities to avoid it (Le Figaro, 2022b).

Conclusion

SOGFP_TB and GFCA are part of a series of publications related to *Project*s and financial crimes; where its internal motor, is based on CSAs and CSFs that support transformation and control activities. In this article the main focus is on the SOGFP_TB, which proposes a strategy to avoid SFFT global financial crimes, which is mainly based on locked-in situations. Locked-in situations are the fundament for the SFFT to seize impressive dirty trillions of gains. These trillions are gained by SFFT, are the result of, organized civil wars and various looting schemes. Concerning, global financial predators and SOGFP_TB, the Nobel prize winner, the British economist, Angus Deatoon, warns about the destructive predator's professionals graduating from business schools, usually called *Winners*, who cause major and devastating financial crimes and never face legal actions. Deatoon recommends stopping this type of financial brutalities (Le Monde, 2019). Such profiles can be classified as SFFT classical profiles. Ultimately, existing worldwide and international laws cannot prevent such an attitude, which has immense dimensions (Clarke & Tigue, 1975); which can imply that the world governing organism are corrupt and are even participating in this global crime; a form of collaboration with SFFT. The evolution of ethics in finance might bring an end to such financial manipulations and eventually bring to trial countries and their financial system for committing major crimes against humanity.

SFFT crimes caused the deaths of hundreds of thousands of people and the looting of their goods; the most astonishing fact is that, why doesn't the state react to just crimes and injustice in such cases of global crimes (Hamel, 2003). Some countries, like France, have convicted SFFT with a multi-billion euros fine for fraud and tax evasion, but did not hinder the SFFT which continues as nothing has happened. In fact, SFFT vision is shortsighted and its cupidity, has resulted with the fact, that its financial institutions were localized and have become a synonym for major financial crimes. SFFT is witnessing the collapse of its institutions' reputations, loss of clients and operational capacities. At the same time SFFT continues its SOGFP behavior and despite the collapse of their values; they seem to have dissimulated illegal immense

amounts of money (Stupples, Sazonov & Woolley, 2019; BBC, 2022a). These major SFFT facts, may provoke the following questions and recommendations: 1) Will public pressure and the evolution of mentalities, cause politicians to act against SFFT behaviour? 2) SFFT bankers' misdeeds are the major headlines, isn't time to solve this major issue legally ? 3) World politicians, leaders and businessman deny wrongdoing and continue in promoting illegal SFFT misdeeds, the details of such misdeeds were reported in *Pandora leaks* and Swiss leaks; 4).

In many reports published by media organisations, like the *Guardian and the New York Times*, SFFT has multi-billion accounts, owned by notorious criminals and individuals involved in fraud, human trafficking and other major criminal acts; 5) WWII destroyed and ruined many Entities, and a need for the gigantic *Marshall Plan*. But was that needed ? The amount of wealth looted by Nazi Germany and their SFFT allies, from these countries exceeds the needed capital to rebuild; so, it was a Win-Win situation from the SFFT and US and that be re-checked; 6) All article's facts, prove that SFFT is panicking and generating massive and visible errors, which are misdeeds, are these signs of SFFT's fall and even bankruptcy ? 7) The US president Joe Biden, has committed a global and massive financial misdeed, by plundering Afghanistan, such behaviour is morally unexpectable, are the leaders of the western free world joining SFFT (Le Point, 2022); 8) The ethical and moral standards are applied only to the so-called third world that's why it can be renamed as relative ethical and moral standards; and 9) SFFT causes many worldwide damage which generates a huge number of victims…

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