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THEORETICAL PERSPECTIVE OF DYNAMIC CREDIT RISK ANALYSIS AND LENDING MODEL;
EFFECTIVE TO ENTERPRISES OF FRAGILE ECONOMY

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“Success in Banking is attained not by avoiding risk but by effectively selecting and managing risk”

ABSTRACT

There is an empirical evidence, which justify the core functioning of money in economic growth and the development of a State, which equally establishes the reason of the relevant role of Banks to every economy. The underpinning of this research, is to present the necessity for the financial industry of undeveloped and developing economies very fragile in their functioning, to adopt the proposed theoretical perspective of dynamic credit risk analysis and lending, as an upgrade model over the existing static risk analytical approach, found to be inefficient in credit-lending-support to the productiveness of enterprises, emerging from such economies, hence creating frustration to the welfare nature of the State and heightening it unemployment tension.

Keywords: *Economics, Banking, Enterprises, Credit Lending, Credit Risk Analysis, Employment*

1. INTRODUCTION

In order for the paper to deeply establish the bases of its argument, with quality submission of theoretical analysis. Some relevant terminology used herein, lacking precise definition in the taxonomy of economic science, has to be defined in the context of this paper based on critical assessment of varied definitions adopted by scholars in the social science community. And these terms are as follows;

- i. Fragile Economy
- ii. Credit Analysis & Risk

- i. Fragile Economy

It is a term argued to have been coined by Morgan Stanley in 2013, representing an emerging market economies that are too dependent on unreliable foreign investment to finance growth ambitions. Bruce & Jennifer (2013) defined fragile economy as a National economic network to venerable metropolitan economies, consisting of networks of innovative firms, talented workers, risk-taking entrepreneurs, supportive Institutions and associations that cluster together in metropolitan areas and co-produce economic performance and progress. Demirek (2009), almost like the intent of the originator of the word, defined fragile economy as an environment where it firms rely heavily on external funds to finance its operational costs.

However in respect of this paper, fragile economy will be defined as, *an economy, experiencing a significant weaknesses in its currency, making it difficult to finance its account deficits and growth projects, contributing to a slow down and vulnerability in its welfare functioning.*

There are numerous factors known to cause economic fragility of a State, for instance, weak political institution, poor constitution functionality, poor governance, poor financial industrial policies, bad tax regulations, high cost of having a strong balance sheet as an enterprises in an economy, poorly developed investment market, high inflationary effect, complex bureaucracy,

capital adequacy of banks, and finally in respect of this paper, corruption. All the listed factors will be extensively diagnosed to establish its significant contribution to a fragile economy and negative impact on Enterprises existence. Which will guide in analyzing the effectiveness of the use of Static-credit-risk-analysis for potential profitable Enterprises that emerge from such economies, struggling to survive.

ii. Credit Analysis & Risk

Kagan(2018) defined credit analysis, as a type of analysis that an investor or bond portfolio manager performs on companies or debt issuing entities, to measure the entity's ability to meet its debt obligations. Which the content and the argumentative direction of this paper, will concur with the above definition to establish the bases of its theoretical analysis. Banks remain a major conduit for the transformation of Savings into productive investments. And much particular in emerging countries where capital markets are still not sufficiently developed and where savers have limited access to direct-credit-risk-opportunities. Jonathan & Philippe (2013) state, Banks and Financial Systems should share the blame with profligate politicians, outdated socioeconomic models and a shift of the world's center of gravity towards newcomers in the financial-economic warfare. And further argued Banks cannot survive unless they take risks. The trick for them is to manage those risks without destroying shareholders value. The fatter the better, from credit worthiness point of view and without endangering depositors and creditors. It must be acknowledged, financial intermediaries like Banks do carry substantial credit and market risks. They act as the shock absorbers by removing it from their depositors' shoulders and charging hefty fee for the services.

It is observed, no individual with money to spare, that is Savings or Capital, will provide credit on a commercial basis, unless she believes that the borrower has both the requisite willingness and capacity to repay the funds, advanced. To form such believe rationally, she must be satisfied that, the two questions can be answered in affirmative. Which are;

- a) The prospective borrower will be willing, so long as the obligation exists, to repay it?
- b) The prospective borrower will be able to repay the obligation, when required under its terms?

To respond to these questions, a credit analysts will re-sought to a judgment of probability. Banks acceptance of credit risk is inherent to their operations, since the very reason of existence as banks, is the supply of credit through the advance of cash and the corresponding creation of financial obligations.

Credit Risk in the perspective of this paper will be defined as, *the risk of money loss arising from the default of a counterparty on a fundamental financial obligation or higher than expected loss of severity, arising from a lower than expected exposure at the time of default*. The following is a formulated assessment of credit risk in the framework of this paper assumed as the generally accepted tradition of the banking industry:

- a. Examining the obligator's capacity and willingness to repay credit
- b. The country risk and operational conditions as in it macroeconomic climate that the obliged is exposed to.
- c. Examining the attributes of obligation from which the credit risk arises in the instance of legal or derivative risk and character of currency.
- d. Assessing the credit risk and mitigation such as collateral utilization, pledges, guarantees and insurance.

The concern herein is not the underlying probability of default but the degree of uncertainty associated with forecasting this probability. As Hale (1983) succinctly put across, if the pawn broker lends money against a gold watch, he does not need credit analysis. He needs instead to know the price of the gold watch in respect to time. The Traditional Credit analysts of the banking sector are best known of sieving through quantum of data ranging from cash flows, credit history, in its ratio and trend analysis to draw a probability line in terms of exposure to

default, the recovery rate and the loss given default. Which this style of credit analysis is modeled as structural and reduced form. The [structural model] considers the positions of stakeholders of the company, while the [reduced-form model] seek to predict, when a default may occur based on observable variables. Which the theoretical construct of this paper in conclusion seek to critique against the stringent application of this model in fragile economy due to it questionable effectiveness and reliability observed over a decades in such economy, hence provide alternative model as a theoretical perspective.

2. OBSERVED FACTORS CONSIDERED TO CONTRIBUTE TO FRAGILE ECONOMY

Even though, there is observed wide range of factors identified to contribute significantly to the cause of fragile economy, this paper narrow the analysis of the observable factors and variables affecting the potential effective functioning of a productive Enterprises in credit wise and it related financial industry. Which are;

- I. Weak Governance and Political Institution
- II. Poor constitutional functionality
- III. Poor developed investment market
- IV. Bureaucracy
- V. Corruption
- VI. Banks capital adequacy

- I. Weak Governance and Political Institution

It was suggested by Adji et.al (1997) as well as Feng & Chen (1997) that a political government, which is an active economic participant, can positively intervene to shape an environment to attract investment. They further argue that, lower political capacity, indicate less ability to extract resources, which critically implies higher budget deficits and an increase in uncertainty. Finally, they observed that, faced with low capacity, a country is more likely to create new taxes or increase existing ones, thereby reducing the return on investments. Which sum up to the

fact that capable government align their policies with sound macroeconomics criteria, while weak governments stress political survival and mostly exposed to challenges, which act as a huge frustration to Enterprise survival in such economy. When political Institution formed is captured as an ideological gloss through which the minority who exercise real power through the State and its monopoly, seek to conceal this fact from the subject population as Lenin (1917), did put it in his paper the State and Revolution, then the Institution become hopeless in its function denied in its expected benefit to its members, than to serve the interest of the political elite. In such a circumstance, Enterprises not engaging in cronyism, suffocate in a smooth and successful growth in such economy as observed from this studies.

II. Poor Constitutional Functionality

In an economic environment, where the legitimacy of the State, the nature of its authority and the nature of its obligations to its citizens and of its citizens to it, lack clarity, with the constitution functioning not as the rule of law but the rule of men ruled by subjective and arbitrary will of particular men instead of objective determinant of general and public laws, as Kant (1724-1804) asserted, for a strong constitution, is a union of an aggregate of men under rightful law. In such a circumstance, the labour of men through their enterprises to serve the market as well as to generate private property are easily undermined, and mischievously destroyed in the spirit of plundering, which weaken the spirit of innovation, creativity and sacrifice through entrepreneurship for economic growth, a major challenge faced by Enterprises in fragile economy, as observed from this studies.

III. Poor developed Investment Market

Poor developed investment market could be defined as an economic environment, whereby either bank-based or market-based financial system are poorly developed in promoting long-run economic growth. Stiglitz (1985) submit that, well developed markets quickly and publicly reveal information, which reduces the incentives for individual investors to acquire information.

While Boot et.al (1993) indicate, Banks reveal of information is slow to public due to it long run relationship with firms, however with Boot & Thakor (1997) added to the debate that, a coordinated coalitions of investors with Bank is better than uncoordinated with the market, where monitoring firms and reducing post-lending moral hazards is weak. Bhide (1993) also posit that, liquid markets hold a myopic investor climate, making bank-based system a preferable in policy guide and theoretical practice. So in fragile economy whereby both the Bank-based and Market-based financial system are underdeveloped, causes visionary enterprises to struggle in productivity and smooth growth. Further observed from this studies that in such environment, investors assume there is a potential high risk to invest in private sector of such economy, yet with the sector known to be holding the highest volume of macroeconomic contribution and performance of the State. And if, it is considered by Investors as a secured environment to support, that is the private sector, then it has to be politically guaranteed in such economy, a process that slows economic growth and innovations by private hands.

IV. Bureaucracy

As Niskanen Jr. (1990) argued, a large part of our population wants to expand the role of government particularly to alleviate poverty and improve the environment, correspondingly large part of our population is exasperated by the methods of bureaucracy and dissatisfied by its performance, just as Max Weber (1864-1920) recognized bureaucracy as the characteristic form of public administration for a State with extended territorial sovereignty developed, what has become the standard definition of this form of organization in our contemporary times. Von Mises book 'bureaucracy', had established relevant information, he argued, 'bureaus' specialized in the supply of those services, the value of which cannot be exchanged for money at per-unite rate. As a consequence of the above, 'bureaus' cannot be managed by profit goals and the economic calculus, therefore must be centrally managed by the pervasive regulation and monitoring of the activities of subordinates with the absolute solution, to reduce the scope of government. Enterprise success in both endogenous and exogenous climate of a State

depends much on strategic exploitation of opportunities in respect to time. In an advent of competition, time become a valuable commodity to take advantage of, which fragile economy drawn in complex bureaucracy, lacking respect to time and speed of the market development as a result of a system architecturally designed to serve self-interest and political elite, downplaying the struggle of an entrepreneurs effectiveness and Enterprise efficiency is observed to be the major cause of venture collapsing in such economies.

V. Corruption

Olken & Pande (2012) posits that, survey evidence suggest that corruption is rampant in the developing world and more prevalent in developing countries than in rich ones and justify further, there is a situation where 'bureaucrats' official salaries were less than their market wage in expectation of the corrupt rents, they would obtain. Mocan (2008) finds that, the income and education of the individual have positive impacts in the likelihood of being asked for bribe in developing countries. There is an Instances, reported by Reinikka & Svensson (2004), using public expenditure tracking survey, they compared the amount of special education block grant sent down from the Central government of Uganda, with the amount of the Block grant received by the schools. They estimated a leakage rate of 87%. Another instance, which Olken (2007) report of a rural road projects. He compares the official amount spent on the road to an independent engineers, estimate of what the road actually cost to build, in which engineers dug core sample of the roads to estimate material quantities, did price surveys to estimate local prices, and interviewed villagers to estimate actual wages paid, it was realized, some amount of materials disappeared during construction. And an estimated missing expenditures in respect of the village claim and the engineering estimation to the promoted cost was approximately 24% per average. Olken & Pande (2012) did further argue that, corruption lessens the government's ability to correct an externality. If someone can bribe a police officer or a judge instead of paying an official fine, the marginal cost of breaking the law is reduced from the official fine to the amount of the bribe. Furthermore argued, if the police officer extracts the same bribe regardless of whether the person has broken the law, the

marginal cost of breaking the law falls to zero, and the law ceases to have a disincentive effect altogether. An environment which has a strong networks of corruption driven in complex innovations, any honest transactions, which should be the hallmark of any successful and credible enterprise, becomes difficult, as a result, a long term progression of such a venture in competing against its counterpart in a strong economic environment becomes questionable.

VI. Capital Adequacy of Banks

In the studies of Inoue et.al (2019) on lending behaviour of Banks, they submitted, when a substantial adverse shock hits the economy and many borrowers become insolvent and banks face impaired capital, there are two types of lending behaviour observed, which are, stagnant lending in a capital crunch and forbearance lending. With the stagnant lending in a capital crunch, the banks decrease credit to borrowers, irrespective of whether they are good or bad borrowers. While that of Forbearance lending, the banks conduct window-dressing to avoid the realization of capital losses and thus allocate more credit to insolvent borrowers, with the hope that their situations will improve with also the premise that, the impaired banks adopt this lending behaviour as a considerable effort to avoid further deterioration of their balance sheets. In practice, it implies the stagnant lending in a capital crunch involves the issue of overall credit undersupply to all borrowers. Whereas forbearance lending involves the issue of credit allocation to low-quality borrowers. As the spirit of this paper seeks to promote a lending model very effective in a fragile economy, this does require a very vibrant banking industry, which Diamond (1984) and Calomiris & Wilson (2004), arguing within models of banking, under asymmetric information, have all emphasized the potential conflict of interest between banks and depositors. And such an informational problem, encourages the banks to offer short-term-low-risk debt, concentrating most in the balance sheet risk of their capital and thus insulating depositors from this risk. Therefore it is important to determine whether banks are well capitalized enough to absorb their balance sheet risk and stabilize the banking system. Since the theoretical proposition of the paper on dynamic-credit-risk analysis and lending is established on the premise of a vibrant banking sector of a fragile economy, then rise a debate

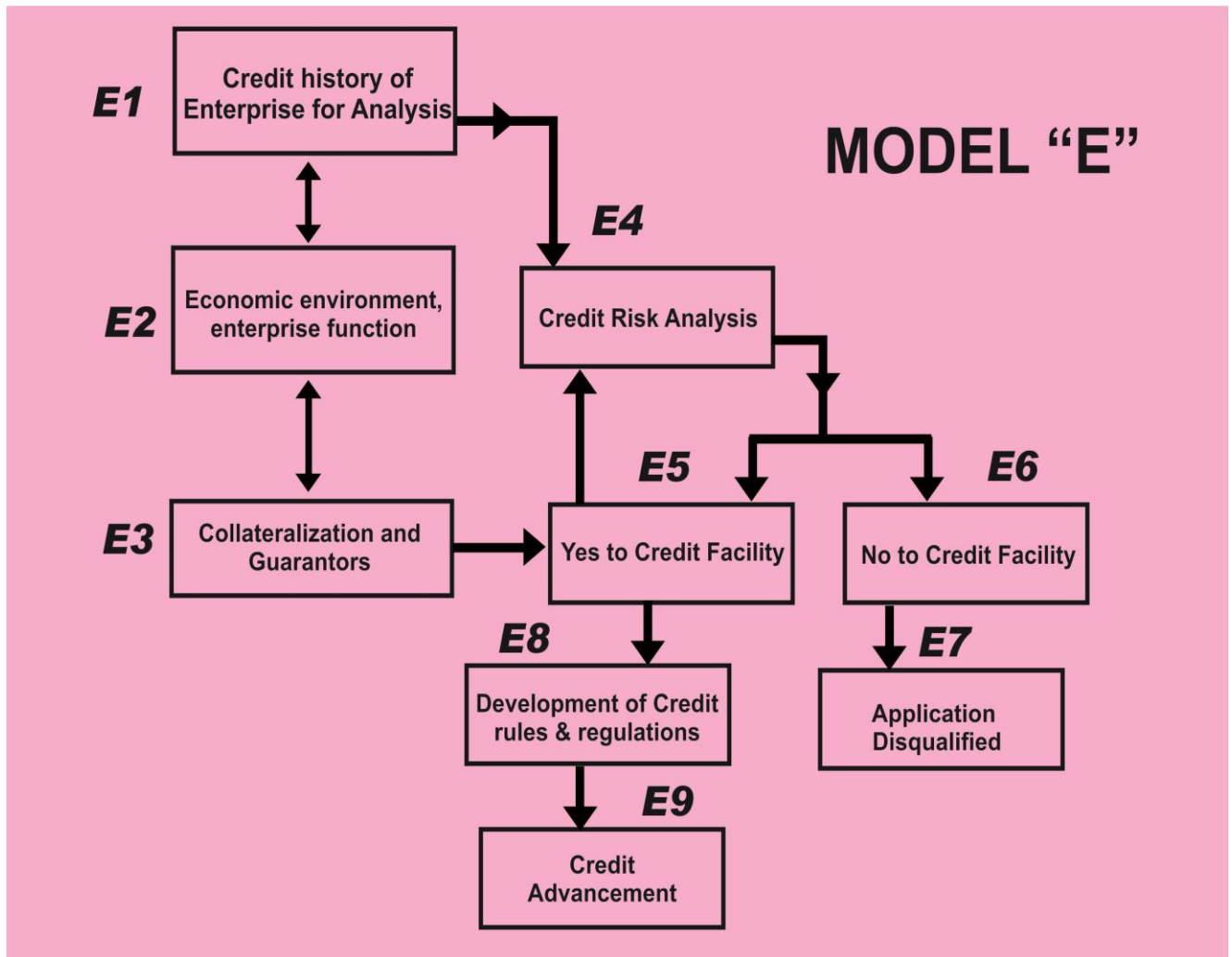
of, what are the signals of an economy to serve as a predictive power for Bank failures. Haldane (2014) and Bulow & Klemperer (2015) pointed out that regulatory measures of Bank Capital do not necessarily have predictive power for Bank failures. Empirically, Haldane & Madouros (2012) and Sarin and Summers (2016) measured Bank risk using both regulatory measures and market measures. And realized, the market measures, which is defined as the Capital ratio in the value of equity relations to total assets has the most explanatory power in predicting banks failure, than regulatory measures of bank capital in respect to Basel accord. The limitation of this paper was to ignore the theoretical factors that anchors vibrancy to bank operations in credit-lending within fragile economy for instance the arguments of Khwaja & Mian (2008) and (Jimens et.al. 2012; 2014) in understanding bank loans level data and firms-level panel data to appreciate the omitted variable problems in controlling borrower-side factors in bank loan equation but rather relied squarely on the theoretical pathway for effective credit-lending for a smooth industrial progression. Which we believe further studies in the recommended area, could explore this factors metrically.

3. DYNAMIC CREDIT RISK ANALYSIS & LENDING MODEL

This section of the paper seeks to analyzed the exiting model of credit-risk-analysis termed as Model 'E' by this paper and establish the empirical evidence of it inefficiency in fragile economy and the preposition of an upgrade model termed by this paper as Model 'D' to address the weaknesses of model 'E' application in fragile economy. In the theoretical settings of model 'E', it is observed in practical experience that, the tool is applicable to Enterprises having a historic operational existences in an economy, hence used three (3yrs) as the average data qualification used by the financial industry as a criteria for credit application and approval. Any Enterprise chosen to be analyzed on the scale of probability in credit-risk-analysis, should meet the following conditions as parameters

- i. The Enterprise is assured of profitability
- ii. The Enterprise has passed credibility test
- iii. The Enterprise has a successful historical data of operational performance.

Fig. A1. Model 'E'



E. T. Senzu (2019), Credit-Lending- risk analysis model structure

The empirical efficiency of Model 'E', passing through an evaluation test as an Old Static Banking approach in credit-risk-analysis of the following chosen countries, as a sample frame of a fragile economies used, were;

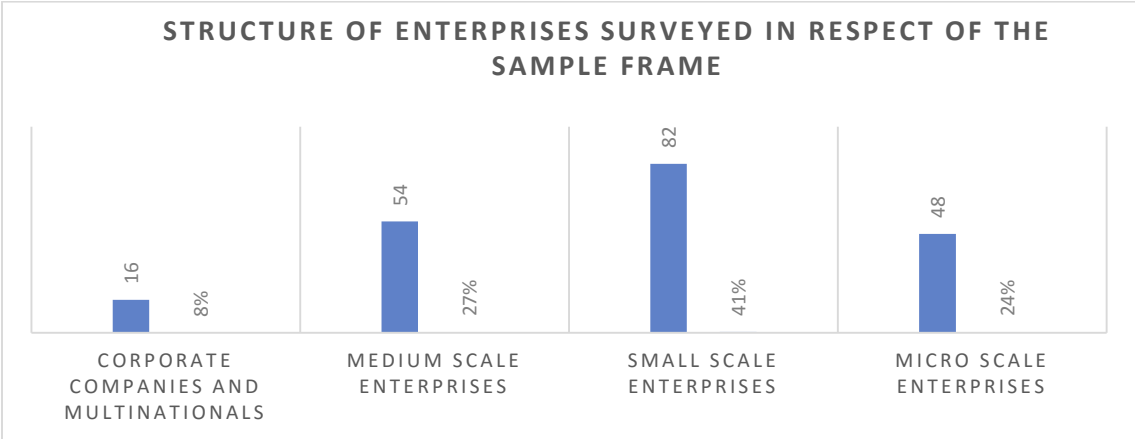
1. Ghana
2. Nigeria
3. Uganda
4. Liberia
5. Zimbabwe

A total of two hundred (200) companies were contacted, all from the five chosen countries as a case study approach in respect to Best and Kaln (1998), as they argue that, case study probes deeply and analyzed interactions between factors that explain present status or influence change. The size of the sample, which was two hundred (200) companies, was believed by the

researcher as sufficient enough to be a good inference as Fink and Kosecoff (1995) posit, the size of a population from which the sample of a particular size is drawn has virtually no impact on how well a sample is likely to describe a population. Finally Fowler (1993) did also assert, a sample size of one hundred and fifty (150) respondents could describe a population of fifteen thousand (15,000) or five hundred million (5,000,000) with virtually the same degree of accuracy, assuming all other aspects of the design and sampling procedure were the same.

This two hundred (200) companies selected were based on their application for credit facility in the period of 2018 October to 2019, January from the Financial Institutions of their choice, with their request processed at the time when the research studies was on-going. Therefore Figure A2 below define the structural component of the Enterprises surveyed as a sample frame.

Fig. A2



E. T. Senzu, 2019; field Report

To be able to complete the empirical testing of the Model ‘E’ efficiency in the chosen fragile economies, the following question was asked

Q1. How many of the companies, had their credit facility approved among the two hundred companies who applied for it? The findings were tabled as Table X1

Table X1

Types of Companies	Percentage of Company Size (%)	Granted Credit Facility (%)
Corporate Companies & Multinationals	8%	4%
Medium Scale Enterprise	27%	8%
Small Scale Enterprise	41%	3%
Micro Scale Enterprise	24%	0%
	100%	15%

E. T. Senzu, 2019; field Report.

A total of two hundred (200) companies, which applied for the credit facility as 100% sample frame work, with the response presented above. It was observed, only 15% out of the two hundred (200) loan applications were considered for credit facility approval, by going through Model 'E' Credit-Risk-Analysis and Lending framework, as it has always been, the traditional banking approach. Which empirically justify the argument of this paper of the inefficiency of the use of Model 'E' in fragile economy. To further examine the cause of it weaknesses as a traditional banking model, another question was asked to the respondents.

Q2. Why were you disqualified, despite meeting the parametric conditions stated above, as the Enterprise being profitable, credible and has historical data of operational performance?

Findings were tabalized as X2, below.

Table X2.

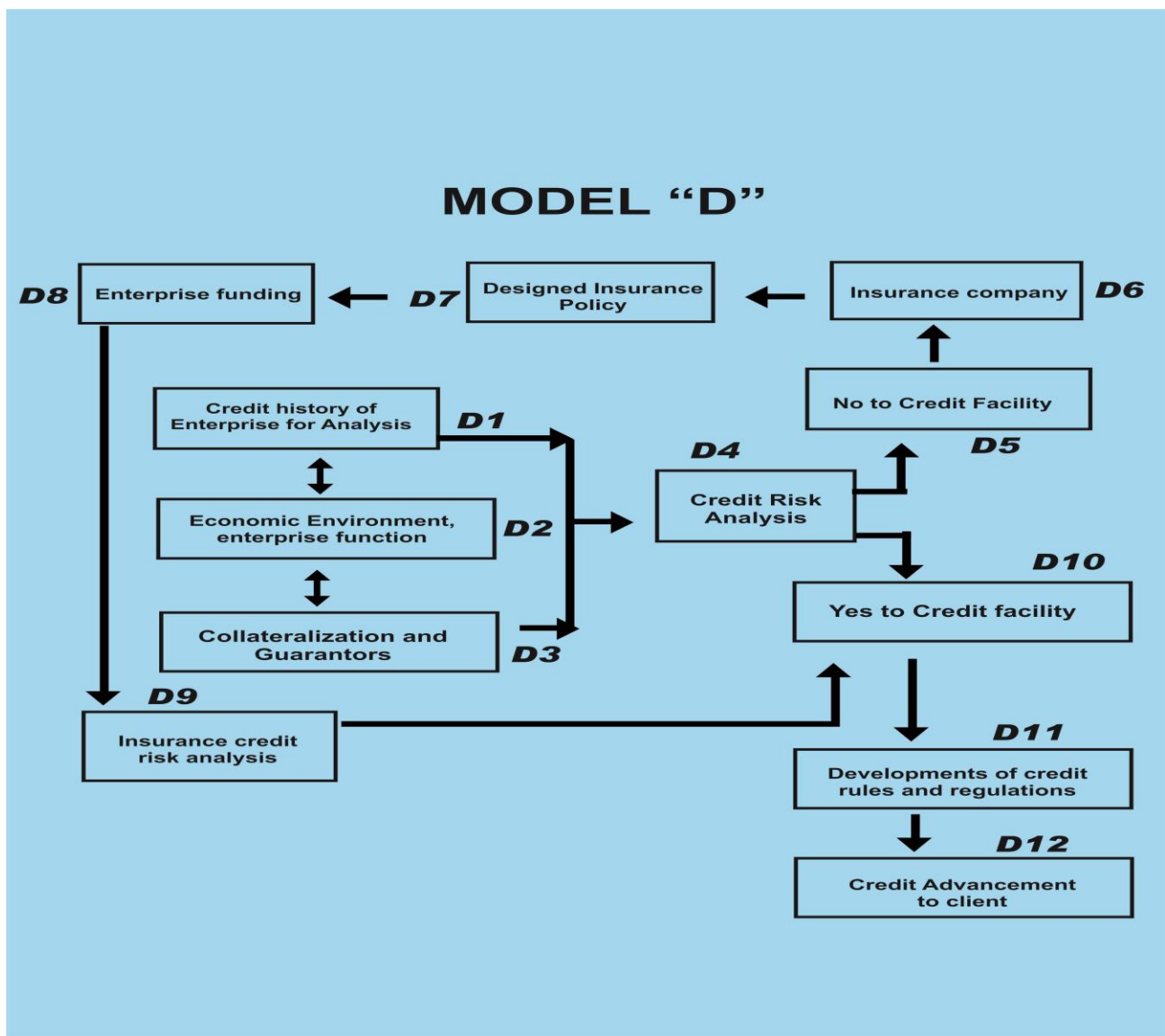
Reasons behind Credit disqualification

Response	Rate
1 Credit history suffered discrepancies with the reason of most, to avoid tax burden	34%
2 A weak economic environment due to weak governance	22%
3 capacity	12%
4 Weak collateralization and guarantors	15%
5 High Interest rate, making the credit facility disinteresting	2%
Unreliable location of the Enterprises	85%

E. T. Senzu, 2019; field report

Even though, at the exposure to the empirical evidence, it indicated the targeted respondents had more than one reason to be denied of credit facility by these banks, however the study rather dwell much on the core factor among the list of factors in respect to the companies to be denied the credit facility. With this studies, it has empirically justified, that most of the causes, resulting to disqualification of Enterprises credit accessibility, falls within Model 'E' framework in Credit-Risk-Analysis, which the paper seeks to advance this model theoretically as Model 'D' framework of Credit-Risk-Analysis that will be efficient tool for fragile economy to the benefit of Enterprise developers in such regions. With the Model 'D' framework labeled as Fig. A3

Fig. A3.

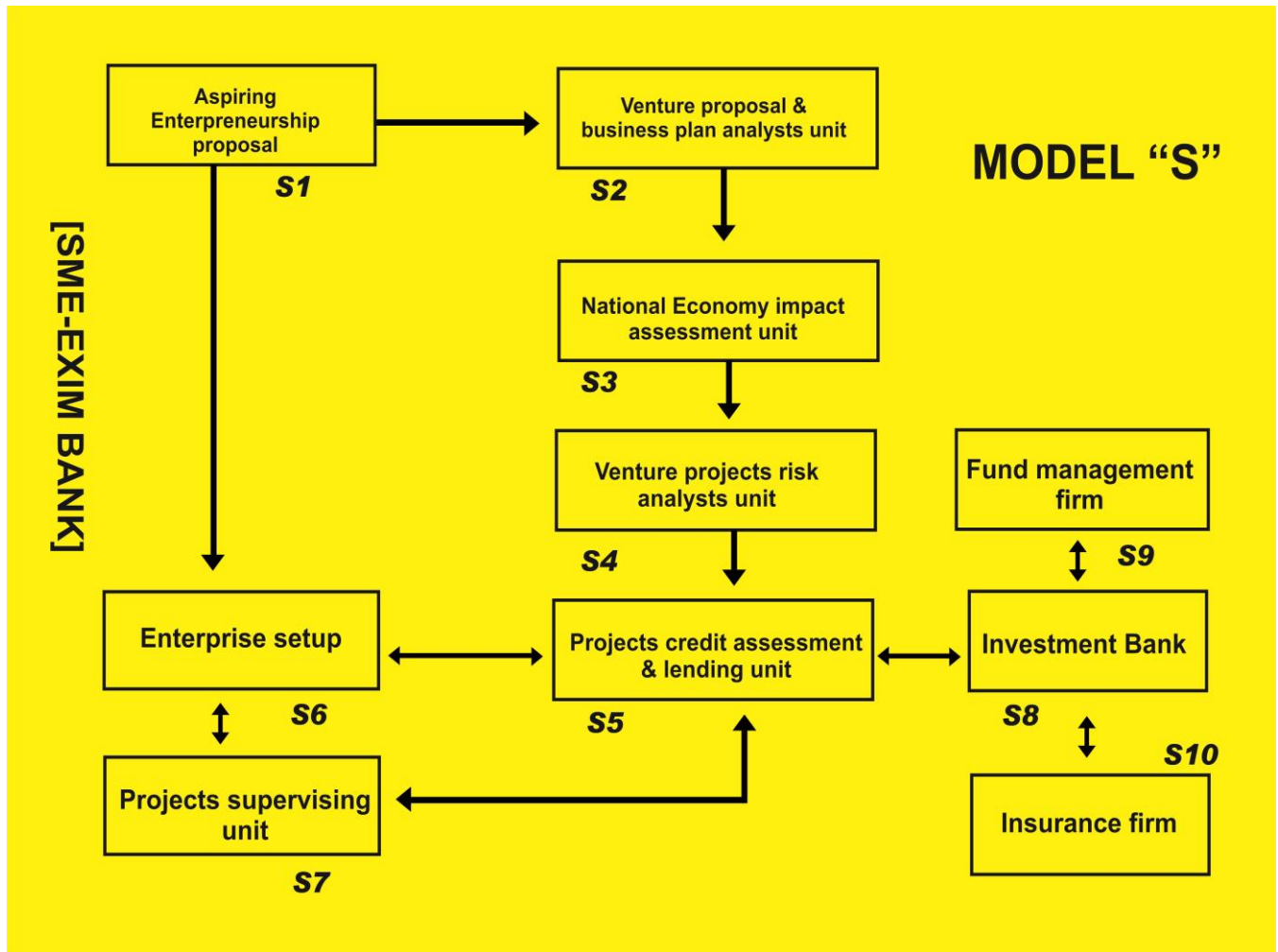


E. T. Senzu (2019) Model D- Credit-Lending-risk analysis structure

The above Model 'D' as shown by Fig. A3 as a Credit-Risk-Analysis and Lending tool, is upheld as dynamic and relatively efficient in its structural implementation comparable to Model 'E' as shown at Fig. A1, because it takes into consideration the triggers of fragile economy that counter a smooth and innovative growth of Enterprises of such economy under financial constraint. The Model 'D' stresses its analytical tool on the parametric qualification of the Enterprises, if such is met, whatever identified risk, will mitigate it for an easy credit accessibility for Enterprise progressive functioning. However the weakness of Model 'D' Credit-risk-analysis and lending, is its inability to assess start-up ventures having zero years of historical performance. Which the paper further postulates Model 'S' to replace Model 'D' in Enterprise funding, when the Venture is in a quixotic stage.

For a State to adopt Model 'S', then the government of such a fragile economy, should have an interest of private sector empowerment as an engine of its economic growth, while it innovatively channels most of its graduates into entrepreneurship; the paper proposed that the model 'S' will require a central Institution termed as [SME-EXIM-BANK] enacted by Law in its operational existence and source of funding, generated by Public-Private-Partnership (PPP) to guide successful implementation of the model. With the ultimate parametric qualification of venture proposal is to prove its significant contribution to Gross domestic production (GDP) of such economy, with a spirit of nationalistic interest. Then with the model framework shown below as Fig. A4, will be applicable.

Fig.4 Model 'S'



E. T. Senzu (2019) model 'S' credit-lending-risk analysis structure

4. RELEVANCY OF STUDIES

Over the years there is a general impression created by literatures of political economics of developing countries, arguing in favour of supremacy of the fiscal policies being an effective tools of government, dictating the success of a welfare state. Which this paper seeks to critique the exuberant of such ideological positioning and prove that, beyond fiscal policy interventions of government, an exceptional attention of government need to be paid on vibrancy of it Banking system in the area of credit lending to Enterprises in fragile economies or else the hope of a welfare state will fail as time elapses, which is justified below, mathematically.

- $[\dot{B}_t^K]$ – – – – Represent a bank with capital adequacy in a fragile economy
- $[\dot{E}_{pt}]$ – – – – Represent a productive Enterprise with time in a fragile economy
- $[\dot{R}_t^{cl}]$ – – – – Represent the Rate of Credit Lending with time in a fragile economy
- $[\dot{C}P_t^n]$ – – – – Represent the Productive capacity with time in a fragile economy
- $[\dot{C}C_t^n]$ – – – – Represent the Consumption capacity in a fragile economy with time
- $[\dot{w}]$ – – – – Wage rate
- $[\dot{p}]$ – – – – Purchasing power
- $[GP]$ – – – – Government Policy
- $[e^q]$ – – – – Quality Employment
- $[WF]$ – – – – Welfare State

It is assumed that, it a fragile Economy with a constant government fiscal policy intervention
Then;

$$[\dot{B}_t^K] = GP [(\dot{E}_{pt}) (\dot{R}_t^{cl})] \text{-----Eq. 1}$$

$$[\dot{E}_{pt}] = [e^q] + [\dot{C}P_t^n] \text{-----Eq. 2}$$

$$[WF] = GP [(\dot{E}_{pt}) + (\dot{C}C_t^n)] \text{-----Eq. 3}$$

$$[\dot{C}C_t^n] = [(\dot{w})(\dot{p})] \text{-----Eq. 4}$$

$$[\dot{E}_{pt}] = \frac{1}{GP} [(\dot{B}_t^K | \dot{R}_t^{cl})] \text{-----Eq. 5}$$

Eq.4 and Eq.5 inserted into Eq.3 to produce Eq.6

$$[WF] = [(\frac{\dot{B}_t^K}{\dot{R}_t^{cl}})(\dot{w})(\dot{p})] \text{-----Eq.6}$$

$$[WF] = [(\dot{w} \dot{p} \dot{B}_t^K)] / [\dot{R}_t^{cl}] \text{-----Eq.7}$$

The final derivation concludes and justify that, for every welfare state, beyond government fiscal policy intervention, it requires a well-capitalized Banking system, strong purchasing power of currency, a good wage rate and high credit lending rate as proven by the equation (7), which comes with a quality credit-lending-models to be used by the banks. Such has been the focus of this paper, specifically on crediting-lending-models very effective as a theoretical proposed models to be adopted by banks in fragile economies.

5. CONCLUSION AND RECOMMENDATION

There are three models, which the paper has presented, beginning with the old traditional Credit-Risk-Analytics of the financial industry, mostly the banking sector, with the first model defined by this paper as Model 'E' with it weaknesses of application explored in fragile economies. As a result, the paper theoretically postulate an advanced version of the credit-risk-analysis of model 'E' and termed it as Model 'D' and 'S' exhibited above for efficient application in fragile economy, depending on the 'life-span' of the venture, either three (3) years and more of productive existence or Zero (0) year productive existence in other words, a venture in an idealistic stage.

These additional models developed theoretically, is to help widen the risk analytics and assessment scope of Enterprises in accessing funds in fragile economy, unlike the straight-jacket-approach, which denied most potential and successful ventures, the opportunity to prove itself, how much it worth and the viability in the short, medium and long term productivity, due to financial constraint.

The researcher do recommend, any further research in this area of studies, should focus on lending behaviours of Banks in fragile economy, approach and methods to improve its potency and sustainability.

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