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RESEARCH PAPER

Scoring Financial Health of Business Sector: A MIMIC Analysis Approach

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ABSTRACT

The objective of the study is to measure business sector's financial health capability as an important functionality. Business sector financial worth aggregates to national financial health, which is another function of businesses other than production. Motivating firm investment can have far-reaching effects beyond production. Multiple Indicators and Multiple Causes (MIMIC) model is used to measure financial health. The deployment of 99 country panel data between 1980-2021 used firm-level indicators like working capital, management efficiency, liquidity, and leverage and economic level consequences like inflation, investments, growth, stock market, and employment. The financial value of businesses leads to an increase in investments, growth, stock market, and employment. And it depends on working capital, and leverage of the firms. In order to boost the performance of business sector in terms of its financial health capability government must provide support in working capital, management efficiency and profitability of businesses.

KEYWORDS Business Competitiveness, Business Sector Development, Cross Country Analysis, Firm Investment, Government Expenditure Multiplier, MIMIC Analysis

Introduction

According to the Keynesian theory of economics, there is a need for government expenditures to assist economies that are stuck in bad market equilibrium (Jahan et al., 2017). The gains from this intervention have far-reaching results. The government expenditure multiplier theory explains the activation of households and firms when expenditures are motivated in the economy (Corsetti et al., 2012). Like the government expenditure multiplier, firm expenditure (private investment) can also have a multiplier impact (Bivens, 2012), further the flow of cash from households and firms (expenditures) do play a role in defining the level of multiplier impact of government expenditures or firm investments. This highlights the role of a firm in defining growth trajectory. There are several dimensions in which firms contribute to the economy. This study discusses support for financial health, among other dimensions like economic contribution and sustainability.

Theories related to firm investment are motivated by the idea that the government can induce firms to invest more in their ability to produce, leading to increased expenditure-led production and employment. The two main reasons for studying investment are: the combination of firms' investment demand and households' saving supply determines how much of an economy's output is invested, resulting in investment demand being the determinant of standard of living over the long run and investment demand is highly volatile thus causing short-run fluctuations (D. Romer,

2012). Literature has pointed out that increasing firms' spending quality in attaining or sustaining the competitive advantage can help increase gains of expenditure multiplier (Farida & Setiawan, 2022). The flow of government spending in the competitive business environment can help increase employment and private-sector partnerships in large-scale projects (Azeem et al., 2021). The idea for exploring firm-based expenditure multiplier determinants is necessitated for developing economies whereby the government is overburdened with the need to maintain necessary expenditures to overcome capital depreciation and population growth needs, leading to an overhanging debt burden. Under this premise, this study intends to measure business sector development. Its determinants can be exploited to increase the private sector's contribution to improve the expenditure multiplier. This innovative approach can rank business sector financial performance at national level based on its indicators and consequence.

The business sector, often considered the heartbeat of any economy, is central to driving economic growth (Emily, 2023), creating employment opportunities (Komninos et al., 2024), and fostering innovation (CIIP, 2024). Understanding this sector's health and dynamism is crucial for policymakers shaping economic policies and businesses seeking insights to enhance their strategies and competitiveness. While various economic indicators and performance metrics provide valuable snapshots of specific business activities, they often fail to offer a comprehensive and integrated view of business development at the macroeconomic level.

The need emerges for a comprehensive macro-level business development index from the understanding that companies function within a complicated web of interdependent elements, both influencing and being influenced by the larger economy via forward and backward linkages. Suppliers and dependent industries are the backward and forward linkages, respectively. These demonstrate how businesses collectively influence economic actors, with mature enterprises enhancing the spending multiplier effect through established ties (Battat et al., 1996). The expenditure multiplier demonstrates that investments made by SMEs significantly increase economic output, employment, and revenue. Further, mature enterprises with bigger investments amplify this effect, fostering stability and economic advancement (Egger et al., 2023).

To help governments and policymakers that are at war against the mounting challenges that pose hindrances in accomplishing their socio-economic targets, a comprehensive macro-level business development index can act as the linchpin in harnessing the capabilities of the business sector to absorb the magnitude of these goals (Malay, 2021). Through its economic activities, the business sector can play a pivotal role in alleviating governments' fiscal pressures, enabling them to redirect resources toward critical social and developmental initiatives.

In many developing nations, the business sector's slowness impedes economic growth by discouraging innovation, increasing trade imbalances, and resulting in cost inefficiencies (CIIP, 2024). Although endogenous growth theory emphasizes the value of innovation for sustainable development, productivity and advancement are constrained by sluggish R&D and technological investment. According to the resource-based view, wasteful resource usage increases production costs, which reduces the competitiveness of home businesses abroad. Additionally, this inefficiency leads to a dependence on imports, which undermines economic stability by creating trade deficits. Therefore, an all-encompassing method is required to evaluate the success of the business sector, surpassing the use of isolated metrics such as GDP growth rates or competitiveness rankings (Barney, 1991; P. M. Romer, 1986).

Current Business Sector Challenges

Climate change makes economic development more difficult by making insecurity rather than deprivation the main focus (Chandy, 2023). Governments are ultimately in charge, but companies across various industries might gain from implementing mitigation strategies. Approximately 45% of younger buyers are prepared to pay extra for goods produced by environmentally conscious businesses (Henderson et al., 2018). By concentrating on environment, social concerns, and governance (ESG), businesses can recruit talent, increase productivity, and satisfy regulatory obligations, investor expectations, and customer desires (Rafi, 2022).

Economic globalization increases investments, lowers capital costs, boosts production capacity, and encourages inclusive growth, benefiting developing nations (Bataka, 2019). MNCs make technology and marketing investments in developed nations while increasing manufacturing in developing nations (Hsu & Chen, 2009). Although easier access to capital fosters financial inclusion and competitiveness, nations with limited absorption capacity can undermine local enterprises and impede the development of knowledge (Demirguc-Kunt & Klapper, 2012).

A robust financial sector provides a range of funding alternatives, enabling business owners to maximize capital structure and competitiveness (Modigliani & Miller, 1958). MNCs make early investments to advance manufacturing and technology, and eco-friendly practices are encouraged by financial development (Hsu & Chen, 2009; Merton, 1992). However, MNCs can hurt local companies by providing cheaper goods, shifting employment and investment, and establishing monopolies (Masroor & Asim, 2019).

Businesses often prefer long-term investment over short-term working capital, with the expectation of profitability (Bhattacharya, 2021). This is a typical reason that leads to a shortage of working cash (Pass & Pike, 1984). Efficient working capital management can help a firm in times of desperation (Nicolas, 2022).

The industry sector is the major energy demander, contributing to emissions. Businesses that pursue energy efficiency tend to improve employment and business prospects (IEA, 2015). It leads to an increase in profitability, productivity, and competitiveness. Energy efficiency will eventually reduce dependency on energy imports and improve the environment (Henriques & Catarino, 2016). The rising prices, cost competition, environmental regulations, and climate change compel businesses to increase energy efficiency using technology (Wang et al., 2017). IoT technology provides real-time monitoring of energy utilization that can help in finding ways to reduce consumption or wastage of energy (Wang et al., 2017). The financial health of businesses assists in funding projects that can increase energy efficiency and related knowledge (Trianni et al., 2013).

Tax revenue from businesses is also an important source of state finances, so financially strong businesses would also lead to a stable income stream for the government (Gurdal et al., 2020), and prediction of future incomes from tax revenue depends on the performance of businesses (Scheuer & Slemrod, 2021). While the government provides public services to businesses, instability of businesses would also create financial distress for the government (Clemens & Veuger, 2020). With globalization and technological development, businesses have found ways to avoid taxes as higher taxes are considered a constraint for businesses, forcing them to venture

towards tax-free countries (Devereux et al., 2014). This forced the government to explore more ways to stabilize this tax revenue (Zucman, 2014).

Betterment in liquidity management is required for businesses to capitalize on opportunities (Adeyanju et al., 2011). There are mixed results in relating liquidity with profits, where (Zimon et al., 2021) advocate negative relations and (Ismail, 2016) advocate positive effects. Access to debt and equity funding can help in creating leverage in the business sector (Bolton et al., 2020). Excess reliance on debt would limit a firm's ability to compete (Parsons & Titman, 2008). Firms strategically use leverage to sustain their market share, which is only done by keeping their financial sustainability (Bolton et al., 2020).

Under these circumstances, a model that assesses the financial flexibility of the business sector at macroeconomic level would help policymakers intervene and ensure better financial health. The MIMIC model is used to develop the financial health indicator of the business sector to help policymakers address economic challenges and improve corporate performance by bridging theoretical ideas with the real world.

Countries face a twin dilemma of low productivity and scarce resources at the end of government policy-making, which impedes their economic growth (World Bank, 2020). The trade-off in resource utilization aggravates the challenges the government faces to support the economy (Gylfason & Zoega, 2006). Under this scenario, the business sector can step up with the government's support to contribute to the economy (Carayannis & von Zedtwitz, 2005). But, businesses need regulatory support from the government to help boost spending, elevate expenditure multiplier, and increase resource productivity (Naudé, 2009). The major indicator is the increase in investment by firms, which increases the proportion of cash resources that are being spent, increasing the spending multiplier. This will eventually lead to job creation and infrastructure expansion (Atkin et al., 2018). Cutting-edge technology adoption can enhance resource productivity of business sector (Hidalgo & Hausmann, 2009). Funding to develop integrated value chains may help reduce poverty and increase productivity (Reardon & Barrett, 2000).

Literature Review

Financial Health and Business Performance

Financial health is a pre-requirement for business performance in the global setup of businesses. After profitability there are several other metrics which are linked with financial health of the company like liquidity, operating efficiency and solvency (Czerwińska-Kayzer et al., 2021; Horvathova & Mokrisova, 2020). Working capital management efficiency, including credit management, cash flow forecasting and inventory control, are essential for profitability (Mathuva, 2009).

Globalization necessitates businesses with a global presence to sustain competitiveness. This requires operation diversification, expansion of market size, and access to new talent and resources (Katerina & Aneta, 2014). Multinational businesses are also influenced by exchange rates in terms of variation in their trading bills (Shapiro & Hanouna, 2019). Borrowed capital costs are also influenced by monetary policy and economic conditions (Madura, 2018). The debt holding and its sensitivity to economic conditions can affect the business's financial health (Mishkin & Eakins, 2006). Hence it is known that the business environment is influenced by government policies and economic conditions (Acemoglu & Robinson, 2012). Government policies can facilitate

businesses in order to increase firm and government revenue (Williams, 2019). Government intervention is critical. During COVID-19, businesses that received government aid had an average sales income of 11% higher (Ismanu & Kusmintarti, 2020; Turkson et al., 2021).

Healthy business leads to profitability and consequently, higher tax revenue, trade, new businesses and investments. This progress has far-reaching effects on other businesses and industries (Auerbach & Slemrod, 1997). Trade openness also helps increase investment returns and productivity (Wacziarg, 2001). Well-performing businesses will increase employed labor productivity, contribute to growth, participate in innovation, and increase exports (Audretsch & Keilbach, 2007).

Government policies, infrastructure, and political stability are important factors that can develop a stable business environment in developing countries (Kaufmann et al., 2011), lack of these facilities obstructs businesses from growing (Arvis et al., 2010). Better handling of the business support factors can help in improving business environment and attracting foreign direct investment (World Bank, 2024). The ease in operational hurdles and a stable environment can support businesses to contribute to economic growth (Blomstrom et al., 1992).

All these studies point out that the inner crux of the financial soundness of businesses are firstly dependent on many firm-related factors which are determined by economic conditions and secondly this soundness helps the economy in several ways. The theoretical model in the next section will underpin the framework in measuring the financial health of the business sector of the economy. The use of MIMIC model also aids in providing the determinants and outcomes of national level performance of the business sector in terms of financial health.

Theoretical Foundations

The performance of businesses beyond production plays an important role in defining how this sector contributes in achieving national goals (Manyika et al., 2021). The performance of businesses beyond production plays an important role in defining how this sector contributes in achieving national goals. One of the goals is to increase velocity of money by maintaining financial soundness and liquidity in businesses. The macro-level assessment of business sector contribution in financial health of the economy is grounded in economic and management theories. Several theories which assess the financial worth of businesses advocate this stance how much cushion the company has in the time of need. This financial worth has many dimensions like what is its net present worth (Net Present Value Theory), how frequent are their cash flows (Discounted Cash Flow Theory), value of current asset, stocks and enterprise (Tobin Q, market capitalization and enterprise value theory), economic value of businesses (Economic Value Added theory) and productivity of resources at hand (Resource Based View). The financial soundness of businesses are depicted as financial health at macroeconomic level. Hence economies aiming to boost financial health need to device strategies to boost business financial value. The interdependence of the corporate sector, sellers and other economic sectors is highlighted by this new statistic. It provides a dynamic picture of corporate contributions by taking organizational financial maturity into account. The sector's contribution to promoting financial health it terms of managing inflation (Bekaert & Engstrom, 2010), investments (Aghion et al., 2005), growth, stock market (Fama & French, 1992) and job creation (Haltiwanger et al., 2009) are examined by the index.

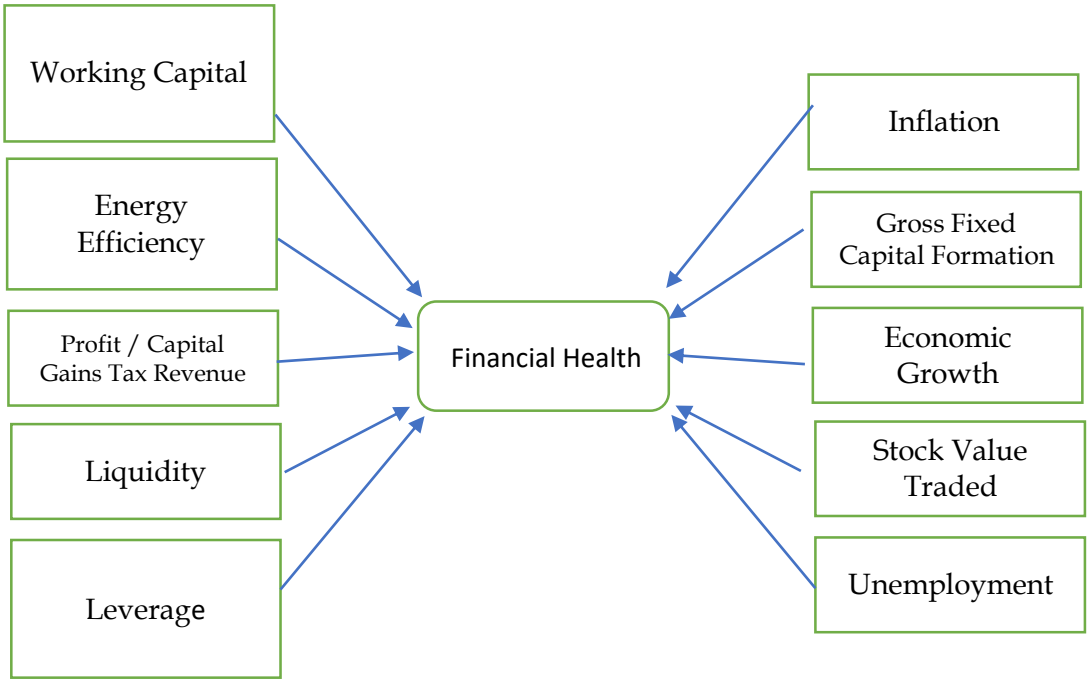

Figure 1 – Theoretical Models

Material and Methods

Sample

This study aims to collect data from sample countries between 1980 and 2021. It will concentrate on unbalanced panel data for the selected variables to optimize the sample size.

Proposed Measurement Model

In Table 1 we have the variables; these are the tentative variables that will be used in the study. This study target to get data between 1980 to 2021, we will be focusing on unbalanced panel data means we will be utilizing as much data as possible for each variable.

Table 1
Proposed Variables

Variable Name	Category	Definition	Symbol	Source
Financial Health (FH) Index Construction				
Working Capital	Determinants	Trade as a % of GDP	LTRED	WDI
Energy Efficiency	Determinants	Energy use / GDP	LENER	WDI
Profit / Capital Gains Tax	Determinants	Amount of taxes paid by businesses on profits.	TOPT	WDI
Liquidity	Determinant	Foreign reserves / GDP	LTRA	WDI
Leverage	Determinant	Debt service as % of GDP	DSE	WDI
Inflation	Outcome	Percentage change in Consumer Price Index	LCPI	WDI
Investments	Outcomes	Gross Fixed Capital Formation % of GDP	LGFCF	WDI
Economic Growth	Outcomes	Real GDP per capita	LGDP	WDI
Stock Value Traded	Outcomes	Stock Value Traded % of GDP	LSTRAD	WDI
Unemployment	Outcomes	People in workforce who are willing and able to work	UNEM	WDI

Equations and hypothesis

Following are the equations for this study. Equation 1 – 6 are used to measure FH (Financial Health).

$$FH_{it} = a_1 + a_2 LTRED_{it} + a_3 LENER_{it} + a_4 TOPT_{it} + a_5 LTRA_{it} + a_6 DSE_{it} + \varepsilon_{it} \quad \text{--- (1)}$$

$$LCPI_{it} = a_{11} + a_{12} FH_{it} + \varepsilon_{it} \quad \text{--- (2)}$$

$$LGFCF_{it} = a_{21} + a_{22} FH_{it} + \varepsilon_{it} \quad \text{--- (3)}$$

$$LGDP_{it} = a_{31} + a_{32} FH_{it} + \varepsilon_{it} \quad \text{--- (4)}$$

$$STRAD_{it} = a_{41} + a_{42} FH_{it} + \varepsilon_{it} \quad \text{--- (5)}$$

$$UNEM_{it} = a_{51} + a_{52} FH_{it} + \varepsilon_{it} \quad \text{--- (6)}$$

Estimation Method

Multiple Indicator and Multiple Causes (MIMIC) model quantifies latent variables with several covariates. It uses the Structural Equation Modelling (SEM) and Principal Factor Analysis (PFA) do measure latent variables and their relationships simultaneously (Bohrnstedt, 1977). Its ability to comprehensively measure causal relationships and be flexible enough to be integrated with other SEM models makes it superior to other models that measure latent variables (Baltagi, 2015). Several studies have used this model (Arshed et al., 2021; Chaudhuri et al., 2016) in the measurement of latent variables.

Estimation results and discussions

MIMIC Estimates

The MIMIC model is based on 412 observations from 99 countries. The estimates are provided in Table 2, 3 and 4 in an appendix, which provides the structural model for determinants and measurement model for effects. The overall LR test is significant, confirming that the model is fit in Table 2. Table 4 provides the overall and equation level goodness of fit. Here, we can see that the model explains 90.38% of the changes in the dependent variable of FH overall. While FH is able to explain 18% changes in inflation, 17% changes in gross fixed capital formation, 0.03% changes in economic growth, 26% changes in stock value traded, and 0.02% changes in unemployment.

Table 2
Goodness of Fit

Fit Statistic	Value	Description
Likelihood ratio		
chi2_ms(25)	263.529	model vs. saturated
p > chi2	0.000	
chi2_bs(35)	539.14	baseline vs. saturated
p > chi2	0.000	

While discussing the marginal effects of economic indicators on financial health (in Figure 2 and Table 3), these estimates are generated from Equation 1. A 1% increase in the working capital increases the financial health by 0.37% on average. The results comply with the hypothesis that in macroeconomic conditions where input costs are

increasing, the working capital improves the profitability of a business (Alvarez et al., 2021; Bhattacharya, 2021).

Table 3
MIMIC Estimates

Log Likelihood = -9370.29		Obs = 412	chi2(25) = 263.53		Prob > chi2 = 0.0000		
						[95% conf. interval]	
	Dep. var	Indep. Var	Coefficient	OIM - SE	z	P>z	
Structural	FH	LTRED	0.3673156	0.0510737	7.19	0.000	0.2672	0.4674
	FH	LNENER	0.1263596	0.0760442	1.66	0.097	-0.02268	0.2754
	FH	TOPT	-0.002046	0.0017411	-1.2	0.240	-0.00545	0.0013
	FH	LTRA	-0.057782	0.059256	-0.9	0.330	-0.1739	0.0583
	FH	DSE	-0.014893	0.0039195	-3.8	0.000	-0.02257	-0.0072
Measurement	LCPI	FH	1	(constrained)				
		_cons	2.716522	0.4085085	6.65	0	1.91586	3.517184
	GFCF	FH	6.452569	1.166428	5.53	0	4.166413	8.738726
		_cons	14.39179	2.94285	4.89	0	8.625021	20.15857
	LGDP	FH	0.2943019	0.0997083	2.95	0.003	0.0988772	0.4897266
		_cons	7.83568	0.1954071	40.1	0	7.452689	8.218671
	STRAD	FH	36.38646	6.97678	5.22	0	22.71222	50.0607
		_cons	-35.54982	18.2997	-1.9	0.052	-71.41656	0.316928
	UNEM	FH	-2.015436	0.870827	-2.3	0.021	-3.722225	-0.30864
		_cons	11.58348	1.208708	9.58	0	9.214451	13.9525
	var(e.lcpi)		0.6625984	0.0500749			0.5713761	0.7683846
	var(e.gfcf)		29.85268	2.430185			25.45016	35.01677
	var(e.lgdp)		0.4418715	0.030962			0.3851697	0.5069205
	var(e.strad)		555.7553	56.46388			455.4103	678.2103
	var(e.unem)		30.18869	2.13002			26.28973	34.66589
	var(e.FH)		0.0143814	0.0190532			0.0010717	0.1929816

A 1% improvement in energy efficiency increases the financial health by 0.13%. It complies with the hypothesis that implementing energy-efficient devices results in financial savings (Hafez et al., 2023). A 1% reduction in tax on profit leads to a 0.002% improvement in financial health. This advocates the fact that a reduction in tax leaves the business with more profit, which can later be used for investment purposes (Devereux et al., 2014). A 1 % increase in liquidity will cause the financial health of a business to fall by 0.06% but is it also insignificant. This shows that the business holds much of its funds tied up in liquid assets rather than carrying out long-term investments (Panigrahi, 2019). Lastly a 1% increase in leverage in the form of debt servicing leads to a fall in financial health by 0.01%. Financial leverage leads to negatively effects financial performance of firms (Arhinful & Radmehr, 2023; Tsuruta, 2016).

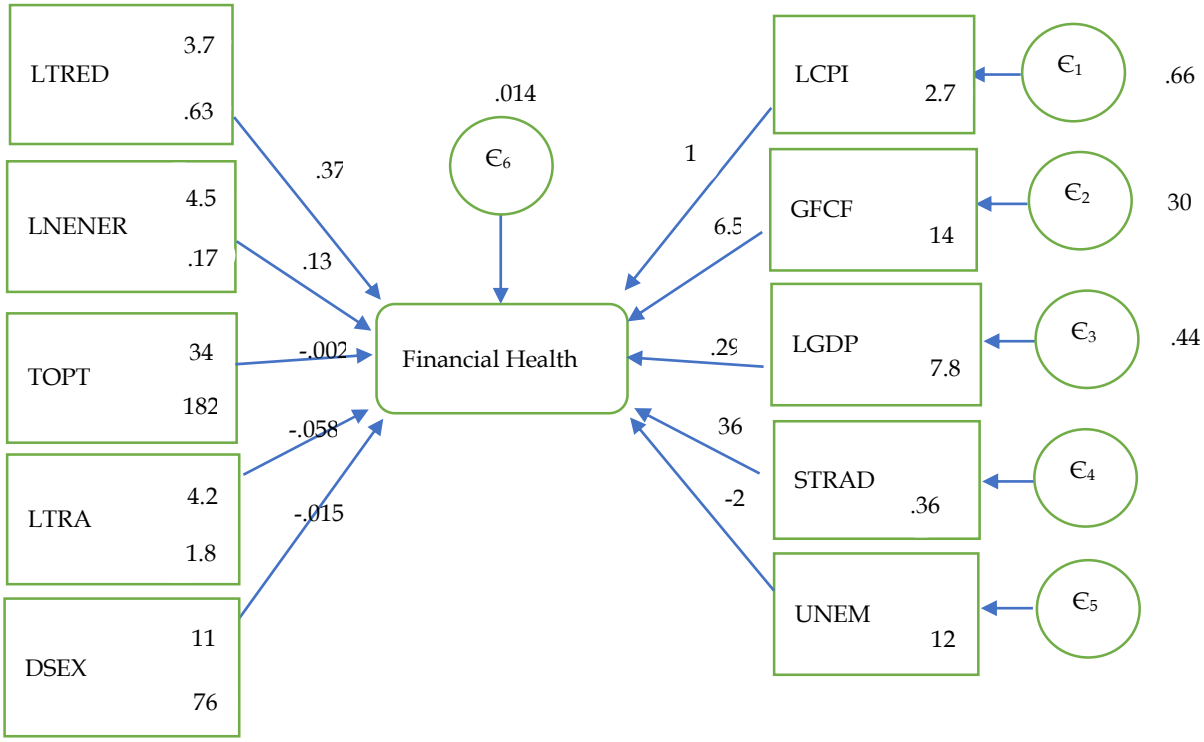

Figure 2 - Estimated MIMIC

While discussing the effects of financial health equations 2 to 6. The effect of financial health on inflation standardized to 1 as a benchmark. Here a 1% increase in financial health leads to a 6.5% increase in the gross fixed capital formation (Boamah et al., 2018), a 0.29% increase in economic growth (Kim, 2015), a 36% increase in the stock value traded (Fitriyah et al., 2020), a 2% decrease in unemployment (Mehry et al., 2021). Here, an increase in financial health contributes largely to enhancing stock value traded, followed by gross fixed capital formation, economic growth, and curtailing the unemployment levels but all of them are higher than the contribution to inflation which is set to 1.

Table 4
Equation Level Goodness of Fit Test

	Dependent Variables	Variance					
		Fitted	Predicted	Residual	R Squared	MC	MC2
Observed	lcpi	0.8121762	0.1495778	0.6625984	0.1841692	0.4291493	0.1841692
	gfcf	36.08045	6.22777	29.85268	0.1726079	0.415461	0.1726079
	lgdp	0.454827	0.0129555	0.4418715	0.0284844	0.16887732	0.0284844
	strad	753.7925	198.0372	555.7553	0.2627211	0.5125633	0.2627211
	unem	30.79627	0.6075823	30.18869	0.0197291	0.1404603	0.0197291
Latent	FH	0.1495778	0.1351964	0.01143814	0.9038532	0.950712	0.9038532
	Overall				0.9038532		

mc = Correlation between dependent variable and its prediction.

mc2 = mc^2 is the Bentler–Raykov squared multiple correlation coefficient.

The generated index of financial health and HDI of the country are compared as country-wise averages across time in Figure 3. It can be noted that post-1990 there is a high resemblance between the patterns of both indices, suggesting that financial health may have a role to play in determining human development. Earlier 1980, HDI is unable to suggest any pattern, while after 1980 there is a sharp decline in the HDI. On the other hand, financial health has trend available from 1960s, before 1980, financial health shows

an increase but after that it shows a decline as HDI but this decline is gradual as compared to the decline exhibited by the HDI.

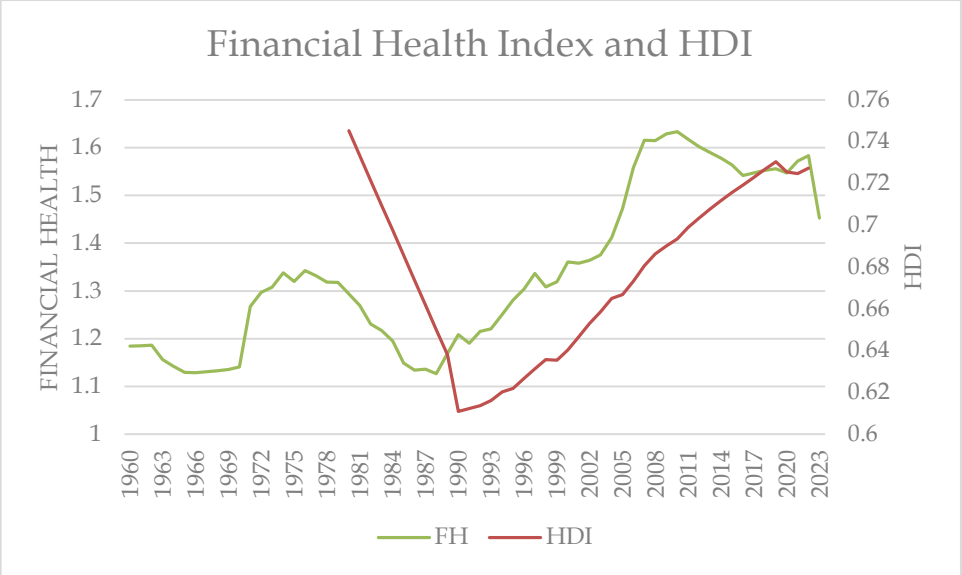

Figure 3- Incidence of Financial Health

Conclusion

Assessing the functionality-based performance of the business sector is a need of the hour to study and increase the contribution of businesses to economic goals. This study is instrumental in exploring the functionality of the business sector beyond production and expanding the understanding of concept business competitiveness. Providing a new perspective on managing and aligning the business sector with national policy targets. This study uses the MIMIC model to quantify the firms' performance to boost the financial health of the economy based on their internal financial value. MIMIC uses indicators like working capital, management efficiency, liquidity, and leverage and uses causes like inflation, investment, growth, stock market, and employment.

The MIMIC analysis used 99 country data between 1980 and 2021 to quantify the index of financial health contribution of the business sector. The results indicated that the financial health performance of the business sector leads to an increase in growth, employment, investment, and stock market activity as an outcome, while this performance is dependent on working capital management, liquidity, and leverage of firms. Based on outcomes, the following are the policy implications.

The government should develop supportive firm regulations that can improve firms' financial worthiness. These initiatives should target improving firms' working capital, liquidity, and leverage. Regulators should initiate training and support services to enhance businesses' financial and cost management and make them financially resilient.

The financial system should ease access to capital by providing inclusive financial intermediation, which can help firms achieve financial stability. Further, policymakers can develop the industry ranking index to assist in data-driven intervention and boost the country's financial health. Using this, governments can reduce the burden of government expenditures in achieving national goals.

Recommendations

This study provides an index that scores the capability of the businesses to induce financial health in the economy. The use of MIMIC model endorses its determinants and consequences. Governments can help boost this functionality of business sector by supporting working capital, management efficiency and profitability of businesses. Further government can help reduce the cost of capital by providing access to debt. These efforts in return will help in achieving macroeconomic goals like investments, growth and employment.

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