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Recognizing the need for research for exploring new business models in the changing business scenario as well as developing new pedagogy in management, and for creating an influence on the academics as well as corporate thinkers, the institute embarked upon publication of its journal, *Review of Professional Management: A Journal of Management*, way back in 2003 and has been published regularly ever since. The Editorial Advisory Board of the journal comprises of eminent academics from universities and business schools from across geographies. It is a biannual peer-reviewed journal. It is an open access journal and all the publications of the journal are licensed under Creative Commons. The journal follows guidelines on publication ethics in accordance with The Committee on Publication Ethics (COPE).

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Aims and Scope

Review of Professional Management: A Journal of Management, a bi-annual peer-reviewed journal of New Delhi Institute of Management, provides a platform to academics, researchers, practitioners, and professionals from public, private and government sectors to share their original research, innovative practices and articles with Indian and international perspective that shape policy or governance or functioning of an organisation. The journal publishes conceptual, analytical, empirical, and perspective articles that significantly contribute to theory, practice or policymaking in all the functional areas of management and allied subjects.

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Future Trends in Sustainability

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The latest trends in sustainability revolve around focus on innovation, systemic change, accountability and leadership. These involve sustainable technology: artificial intelligence and internet of things (AI & IOT) which are being used by organisations to reduce carbon emissions, optimize supply chains, monitor environmental impacts and to track biodiversity. Also, there is increasing adoption of biodegradable material in packaging and consumable goods, among others.

According to UNDP (2023) only 7.2 percent of used materials are cycled back into our economies after use which leads to a significant burden on the environment and contributes to pollution climate crises. The linear model based on “take-make-dispose” has been reported to produce about two billion tonnes of municipal waste globally every year. Consequently, the global material footprint has increased by 70% during the past two decades (Ramboll).

Hence, circular economy has become an urgent need for reuse, recycling and regeneration of materials or products in a sustainable and environment friendly way. This would contribute to minimise ecological footprints and align with consumer demand for greener alternatives (GreenMatch).

About accountability, sustainability reporting requirements reflect an increasing shift towards integration of sustainability into core business strategies with focus on environmental and social responsibility. There are numerous reporting frameworks and standards that vary across countries. India has moved to BRSR (Business Responsibility and Sustainability Reporting) which is a credible and transparent sustainability reporting landscape. This will facilitate India’s commitment to achieve its net zero vision by 2070 made at the 26th session of the United Nations Framework Convention on Climate Change (COP 26) in November 2021. (<https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1945472>).

Sustainable development goals cannot be achieved by any single entity, therefore, collaboration with industries, governments, and non-profit organisations, within a country, is another focus area to leverage resources and foster sustainability. Collaboration is also required between developing and developed countries for climate finance and more ambitious national commitments.

Business schools across the globe and those associated with PRME can play a pivotal role in fostering sustainability by equipping future leaders with the knowledge, skills, and values to drive sustainable practices in business. They may adopt CAMB competency model involving PRME Principles (Sharma, 2015, 2017) for management education for sustainability in curricular, co-curricular, entrepreneurial, immersive and outreach activities.

Leadership plays a pivotal role in attainment of goals of any organisation. While leadership has been one of the most researched topics in the field of

management, sustainable leadership is comparatively an under-researched area. In the context of sustainability, leadership for sustainability assumes considerable significance (Sharma, 2019) that drives collective and holistic efforts envisioning a bright future for future generations.

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Radha R. Sharma 

Editor-in-Chief
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Assessing the Environmental Sustainability Corridor for BRICS Nations by Integrating Three SDGs, 'Biocapacity' and 'Ecological Footprint'

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Rakesh Shahani¹  and Aishwarya Badaik¹

Abstract

The present study makes an attempt to analyse the co-integrating relation between 'ecological footprint' on one hand and GDP, trade openness, forest area and biocapacity on the other for the period 1992–2015 for five BRICS economies with the objective of ascertaining whether the rapid growth achieved by the BRICS is along a 'sustainable' path. Further, the study also tries to lookout for signs of 'convergence' of 'ecological footprint' amongst all BRICS economies. The methodology employed includes ARDL Co-integration Model, TY Causality and Beta Convergence Models. The results showed existence of long run co-integration amongst four BRICS nations (except for India where no co-integration was proved) with fast speed of adjustment towards long run equilibrium. Further, short-run causality was seen moving from 'GDP' and 'forest area' towards 'ecological footprint' in three of the five BRICS nations, while variable 'trade' was not seen causing 'ecological footprint'. 'beta convergence' was also proved for 'ecological footprint' amongst all BRICS nations. These results thus provide a clear indication as to which variables need to be targeted to achieve a 'sustainable' growth. The results also reveal the pace of long-term adjustment as shown by ECM(–1) term, which would enable policymakers to plan their action for fulfilment of the objective of tackling 'environmental degradation' in BRICS economies. Also, convergence of 'ecological footprint' across BRICS indicates that similar policies to tackle environmental degradation could be framed for BRICS at their group meetings.

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Keywords

Biocapacity, BRICS, causality, co-integration, convergence, ecological footprint

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Introduction

The controversy regarding who was more responsible for the current state of environmental degradation and who should bear the costs for the same has been for long and the topic has been discussed in many global summit meetings of the country heads. Meanwhile, realising that poverty, health, education and other deprivations are closely linked to environmental degradation, the United Nations in 2015 adopted 17 Sustainable Development Goals (SDGs) to be achieved by member nations by 2030.¹ The main motive behind these SDGs is to make a country's growth and development sustainable.

Taking a clue from above, our study has been designed to examine whether the growth achieved by some of the fast-developing economies follows a sustainable pattern, and to this end, we have included BRICS nations—Brazil, Russia, India, China and South Africa—in our sample. The choice of BRICS is strongly influenced by the separate growth stories of each of the BRICS's economies. BRICS bloc has become one of the most growth-oriented blocks and shares a lot of common features like abundant natural resources, fast-evolving services sector and a strong agrarian base, amongst others (Sharma & Shahani, 2018). The importance of the BRICS bloc lies in its contribution to world GDP and the world's share of trade. BRICS contribution to world GDP has risen from 11.9% in 2000 to 25.6% in 2021, while share in world exports stands at 10%. Perhaps the biggest achievement of the BRICS bloc is in terms of reduction of poverty rates, and all the countries belonging to the BRICS group managed to surpass the targets set for them in Millenium Development Goals (MDGs) adopted at the 2000 UN Summit (Agarwal & Kumar, 2023).

Moving to our study objective, which ascertains whether or not the rapid growth achieved by the BRICS is along a 'sustainable' path, we have developed a co-integrating relationship for which we have selected five variables; three of the five variables, namely trade openness, GDP and forest area have been taken from SDGs of the United Nations, while the remaining two are complex variables—'ecological footprint' and 'biocapacity'—both sourced from the Global Footprints Network.²

The inclusion of two complex variables was necessitated as most traditional proxies for environmental degradation had failed to provide a comprehensive picture of its degradation. The first complex variable, 'ecological footprint', represents a combined environmental impact of all human activities. It measures the impact of all goods and services produced and all waste generated (Network, 2014; Rashid et al., 2018). 'Ecological Footprint' covers six categories of land types: forest land, grazing land, cropland, built-up land, ocean and carbon footprint. It covers resources demanded by individuals, businesses and governments and makes a comparison with what resources the 'Earth' can renew in a sustained manner (Nathaniel & Khan, 2020). The variable is measured in global hectares and takes the shape of a dependent variable in our study.

The second complex variable included is ‘biocapacity’, which represents the country’s bioproduction area and includes the sum total of land, wasteland and sea to produce goods and services. This too is expressed in global hectares and makes a strong case against ‘ecological footprint’. A country may have ‘biocapacity’ higher or lower than ‘ecological footprint’. Biocapacity hurts ‘ecological footprint’ and is ideally expected to be negatively related to our dependent variable ‘ecological footprint’.

Furthermore, amongst these three SDGs, included in our study, two are linked to the growth of an economy, namely GDP and trade openness, and both can have either a positive or negative relation with ‘ecological footprint’. This relation, however, also depends upon the country’s approach towards growth and development, and as stated above, is one of the thrust areas of the current study, that is, to analyse the growth of each of the BRICS nations from the angle of ‘sustainability’.

The third SDG variable is ‘forest area’ and the reason for its inclusion is a massive decrease in ‘forest area’ in some of the BRICS nations on account of the acquisition of land to support growth and development projects. Hence, it would be interesting to explore the quantum of relation this variable has with ‘ecological footprint’. For all three SDGs, we obtain data from World Development Indicators with the period of data being 1992–2015.³ The choice of the study period is strongly influenced by coming into existence of the ‘BRICS’ acronym in 2001 (O’neill, 2001), and the study considers data 10 years before this date till the year for which last information was available on all the variables from the World Bank website. Thus, by exploring the relation of the variables included in our study with ‘ecological footprint’, the study aims to understand whether the growth achieved by these fast-developing economies follows a sustainable pattern or not. Table 1 provides a summary of the variables included in our study along with their unit of measurement.

Another objective of the study is to look at the aspect of ‘convergence’ of all BRICS economies in the long run with respect to the variable ‘ecological footprint’, and to achieve this novel concept, we would be developing a model for ‘beta convergence’ for our dependent variable ‘ecological footprint’, which considers the pooled annualised average growth rate of all BRICS nations to be regressed against initial emissions.

Table 1. Summary of the Study Variables and their Sources of Data.

Sr No.	Name of the Indicator	Unit of Measurement	Source of Data
1	Ecological footprint	Global hectares per capita	Global Footprints Network (GFN) (2023)
2.	Biocapacity	Global hectares per capita	Global Footprints Network (GFN) (2023)
3.	Economic growth	GDP per capita constant 2015 prices	World Development Indicators
4.	Trade openness	Merchandise {Sum of exports and imports (% of GDP)},	World Development Indicators
5.	Forest Area	Forest area as a % of total land area	World Development Indicators

Review of Literature

Under the literature review we have included studies that have tried to link ‘ecological footprint’, the dependent environment proxy variable in our study with a host of other variables, including traditional and popular variables, such as energy consumption, renewable energy trade, GDP, etc. and some of the newly introduced variables like democracy, environmental regulations and also complex variables like biocapacity.

Our review begins with three studies—Danish et al. (2020), Ahmed et al. (2022) and Fotis and Polemis (2018)—where they considered ‘environmental regulations’ (*environmental patents as its proxy*) against ‘ecological footprint’. The results from all three studies revealed that ‘environmental regulation’ decreased ‘ecological footprint’. In another study, Sarkodie and Adams (2018) working in a related area of ‘environmental regulations’ showed how quality of governance plays an important role in the implementation of ‘environmental regulations’. On the other hand, researchers have also shown that the variable ‘environmental regulations’ also entails a lot of indirect benefits for the betterment of the environment like stimulating renewables and discouraging non-renewables. Furthermore, while working on variable ‘environmental regulations’ researchers have also noticed that this variable being a state-managed affair, with its implementation too being state responsibility, the standards followed across nations differ vastly, which has also impacted findings of researchers working on his variable.

Yet another newly introduced variable explored by the researchers in their studies against ‘ecological footprint’ is ‘democracy’. This variable is often linked to freedom of speech and freedom of the press (media). It also includes the accessibility of the public to vital information. As far as the relation of this variable with ‘ecological footprint’ goes, the results in many studies have shown a negative relation (e.g., see Payne, 1995). Furthermore, researchers have also linked this variable ‘democracy’ to another variable ‘environmental regulations’, and the logic provided was that the general public can force the government to enact stringent ‘environmental regulations’ leading to improvements in ‘ecological footprint’. Then, the ‘Democratic Accountability Index’, a variant of this index, was used in a study by Ahmed et al. (2022), and they too tried to link the variable to ‘ecological footprint’; however, the relation was found to be negative.

Speaking of the complex variable included in the study, a variable that has caught the attention of the researchers is ‘biocapacity’. A research article by Hassan et al. (2019) showed that biocapacity as a variable too was negatively related to ‘ecological footprint’ and many researchers have also found this to be true.

Coming to the traditional and popular variables and their relation with ‘ecological footprint’, the first variable under consideration is ‘growth’ which is proxied by variables, such as ‘GDP’, ‘income’, ‘per capita’ and so on. Then, by virtue of its close linkages with mass consumption of resources, the relation between ‘growth’ and ‘ecological footprint’ has been found to be positive in the majority of the studies. Another traditional macro-economic indicator that has been studied in most studies against ‘ecological footprint’ is ‘trade’. This indicator is known to work in both directions with respect to ‘ecological footprint’; the variable has a positive relation

with ‘ecological footprint’ in case of a high flow of energy-intensive technology into the country; however, the same variable was seen decreasing ‘ecological footprint’ where the imports were mainly in green technology, thereby making way for technology substitution (Ahmed et al., 2022; Murshed et al., 2021).

One variable that has been extensively studied against ‘ecological footprint’ is ‘renewables energy’ (Nathaniel et al., 2020a, 2020b; Radmehr et al., 2022). Radmehr et al. (2022) in their comprehensive study on G7 nations concluded that even in high-income countries, ‘renewable energy’ was not effectively utilised and the rapid economic development of these nations was mainly by using fossil fuels, which had actually resulted in the depletion of natural resources and hence contributed to environmental destruction. The primary reason for all countries (developed or developing) resorting to fossil fuels for development was the high substitution costs, which were preventing countries switching from non-renewables to renewables, even though the variable was making a positive impact and resulting in a fall in ‘ecological footprint’ as seen in the majority of research studies. Whereas Nathaniel and Khan (2020) proved the same for six ASEAN economies, Danish and Khan (2019) found the same to be true for BRICS economies. On the other hand, Hastik et al. (2016) showed that renewable energy alone was not capable of addressing a country’s environmental problems in the long run and must be accompanied by other steps, such as developing its own energy-saving production processes. Then, a lot of researchers have clubbed ‘renewable energy’ with other variables; for example, Danish and Khan (2019) clubbed the same with another variable ‘urbanisation’ while Murshed et al. (2021) clubbed it with ‘environmental regulations’. The results from both studies showed that jointly, after clubbing, there was an enhanced reduction in ‘ecological footprint’.

Next, we discuss the two popular and related variables, ‘age’ and ‘life expectancy’, and their impact on ‘ecological footprint’ and the environment in general. With respect to variable ‘age’, a general viewpoint is that as people grow older, their attachment towards the environment rises; however, empirical evidence for the same points otherwise. This was seen in a study by Zagheni (2011) where ‘age’ was found to be positively related to ‘ecological footprint’. Then ‘life expectancy’ a close associate of ‘age’ was also found to be positively related to ‘ecological footprint’. However, urban ‘life expectancy’, a subset of ‘life expectancy’, was found to be enjoying a more positive and stronger relation with the ‘ecological footprint’ than other subsets, rural ‘life expectancy’.

Another variable that has been studied frequently by the researchers against ‘ecological footprint’ is ‘urbanisation’. Although the variable ‘urbanisation’ was found to be positively related to ‘ecological footprint’ in a number of studies (Ahmed, 2020; Ansari, 2020; Nathaniel et al., 2020b), there are some studies like Danish and Khan (2019) that gave a contradictory viewpoint and showed that ‘urbanisation’ improved environment quality.

Thus, the review of the literature given above does give some idea about how different macro variables, which have been conveniently classified as traditional, non-traditional and complex variables, are related to the variable ‘ecological footprint’. Thus, there are three important takeaways from the above review; first,

barring one or two variables, most traditional variables do promote environmental degradation and hence are positively related to 'ecological footprint', while the same is not true for most non-traditional variables; second, the relation between non-traditional variables and 'ecological footprint' apart from being negative appears to be much stronger as compared to traditional variables; and third, very few studies have tried to explore the relation of 'ecological footprint' by including its counterpart 'biocapacity'. Since both the variables 'ecological footprint' and 'biocapacity' are complex in nature and sourced from a common source, 'Global Footprints Network', the nature of their formulation is such that they enjoy a negative relation. Thus, it is important for inclusion of both of these complex variables to get meaningful results from the study; otherwise, there is a very strong chance of omission and model misspecification.

In the light of the above discussion, we develop our study with the objective of establishing a co-integrating relationship for BRICS nations with variable 'ecological footprint' on one hand and three SDG goals, namely trade openness, GDP and forest area as variables on the other. We also include 'biocapacity' as a main control variable representing the country's bioproduction area. Further in the study, we shall also make an attempt to develop a β -convergence model for 'ecological footprint' for BRICS nations, which would determine whether or not the countries of the BRICS group have a long-run convergence. These objectives are achieved by establishing three models: an ARDL co-integration model, a causality model and a β -convergence model. So that the models are robust, we carry out all the diagnostics (serial correlation and heteroscedasticity) and, more importantly, consideration that none of the variables included are integrated at levels I(2) or higher.

Methodology

Under this section, we would be developing three models: co-integration, causality and convergence models. Our first model establishes a cointegrating relationship using ARDL methodology (Pesaran & Shin, 2001; Pesaran et al., 1999) for BRICS nations between 'ecological footprint' and four other variables. Amongst various co-integration models, the selection was made for the ARDL model after considering two important aspects; first was to obtain efficient results even for a small-sized sample, and second, to select a model that gives robust results when the stationarity levels of variables include a mix of I(0) and I(1) (see Shahani & Aayushi, 2019).

Further, we have developed two equations under the ARDL framework, first being the ARDL representative equation (Equation (1)), a single representative equation, which provides information about both short- and long-run variables, and second, the ECM equation (Equation 2), which shows the adjustment from disequilibrium in the short run to equilibrium in the long run. However, the results obtained from Equation (2) need to be interpreted only after co-integration is confirmed under the study for which we have applied the 'F' bounds test with critical values of the same being provided by Pesaran et al. (1999).

ARDL Representative Model

$$\begin{aligned} \Delta EFP_t = & \delta_1 + \delta_2 EFP_{t-1} + \delta_3 GDP_{t-1} + \delta_4 TO_{t-1} + \delta_5 BC_{t-1} + \\ & \delta_6 FA_{t-1} + \sum_{i=1}^n (\delta_{7,i} \Delta EFP_{t-i}) + \sum_{i=0}^n (\delta_{8,i} \Delta GDP_{t-i}) + \\ & \sum_{i=0}^n (\delta_{9,i} \Delta TO_{t-i}) + \sum_{i=0}^n (\delta_{10,i} \Delta BC_{t-i}) + \sum_{i=0}^n (\delta_{11,i} \Delta FA_{t-i}) + u_{1,t} \end{aligned} \quad (1)$$

For Equation (1), EFP is the ecological footprint, GDP is gross domestic product, TO denotes trade openness, BC represents biocapacity and FA is the forest Area. $u_{1,t}$ is the residual error term for Equation (1). Model (1) regresses change in ERP against the first lag of all the variables, including dependent variable EFP, thereby creating a long-run relation between 'ecological footprint' and other variables. The model also includes short-run variables shown as the change in lag of each variable, summed up to ' n ', with ' n ' being optimal lag length provided by AIC lag criteria.

ARDL ECM Equation

$$\begin{aligned} \Delta EFP_t = & \theta_1 + \theta_2 ECM_{t-1} + \sum_{i=1}^n (\theta_{3,i} \Delta EFP_{t-i}) + \sum_{i=0}^n (\theta_{4,i} \Delta GDP_{t-i}) + \\ & \sum_{i=0}^n (\theta_{5,i} \Delta TO_{t-i}) + \sum_{i=0}^n (\theta_{6,i} \Delta BC_{t-i}) + \sum_{i=0}^n (\theta_{7,i} \Delta FA_{t-i}) + u_{2,t} \end{aligned} \quad (2)$$

Equation (2) is the equation for Error Correction Mechanism (ECM) and has change in EFP as a dependent variable. The term, ECM_{t-1} is the first lag coefficient of residuals obtained by running the equation of long-run variables, while the rest of the variables are short-run variables, which were also included in Equation (1). The term ECM_{t-1} assumes importance as it reflects the speed at which short-run disequilibrium gets corrected in the long run, and to be meaningful, this coefficient must be negative and statistically significant.

The Causality Model

For testing causality, we apply Toda and Yamamoto (1995) modified 'F' model. The choice of this model (TY) is again based upon the level of integration of included variables. Under TY causality, for say two variables X_1 and X_2 , we develop two models (3) and (4), the first being a restricted model and the second one as unrestricted. Under TY methodology, both models, model (3) and (4), are lag augmented by taking the higher level of integration (I)high of the causal variables, which gets added to the optimal number of lags obtained by using AIC criteria. Upon running the two regressions, we obtain the sum of the squared residuals (SSR_R and SSR_{UR}), which we use to obtain modified 'F' to test for the existence of causality amongst the two variables.

$$\text{Mod } F_{\text{Wald}} = \frac{(SSR_R - SSR_{UR}) / k}{SSR_{UR} / (n - k)}$$

Restricted Model (R)

$$X_{1t(R)} = \tau_{0(R)} + \sum_{j=1}^{(1)high} \alpha_{j,(R)} X_{2,(t-j)} + \sum_{i=1}^{h+(1)high} \beta_{i,(R)} X_{1,(t-i)} + e_{1t} \quad (3)$$

Un-Restricted Model (UR)

$$X_{1t(UR)} = \tau_{0(UR)} + \sum_{j=1}^{k+(1)high} \alpha_{j,(UR)} X_{2,(t-j)} + \sum_{i=1}^{k+(1)high} \beta_{i,(UR)} X_{1,(t-i)} + e_{2t} \quad (4)$$

Model for Beta Convergence

The concept of ‘convergence’ which was originally used to study reduction of income inequalities amongst nations has now been extended to other variables including environmental indicators (Omojolaibi et al., 2020). Under the study, we develop a model for ‘beta convergence’ for our dependent variable ‘ecological footprint’. ‘ β -convergence’ model assumes linear relation amongst variables and the model is given as Equation (5):

$$\beta - \text{convergence} = \ln \left| \frac{EFP_{i,t+k}}{EFP_{i,t}} \right| = \beta_1 + \beta_2 \ln. EFP_{i,t} + u_{i,t} \quad (5)$$

For Equation (5), $EFP_{i,t}$ is the emission in initial time say ‘ t ’, while $EFP_{i,t+k}$ are the emissions in time ‘ $t+k$ ’. Under the model, we take $k = 10$ years. Equation (5) thus considers annualised average growth rate of the i^{th} BRICS nation for the 10-year period as a dependent variable, which is regressed against initial emissions for the same BRICS nations and the entire process is carried out at a pooled level. The ‘convergence’ occurs if the two coefficients, as given in Equation (5), β_1 and β_2 are statistically significant but with dissimilar signs (i.e., if one is positive then other must be negative and statistically significant). Another condition to be satisfied is that the slope coefficient $\beta_2 < 0$ (Tiwari & Mishra, 2017).

ARDL Model Pre-requisites and Diagnostics

After building three models, we next state the methodology adopted for model pre-requisites and diagnostics. Under this section, we will be discussing the methodology for model pre-requisite, namely variable stationarity and two diagnostics: serial correlation and heteroscedasticity.

For the stationarity pre-requisite, we would be applying the popular ADF unit root test; the equation for the same is given as Equation (6). Next for residual-based diagnostics, namely serial correlation and heteroscedasticity, we would be applying ‘Q’ statistics (Equation (7)) and the White (1980) heteroscedasticity test (Equation 8).

$$\Delta X_t = \beta_1 + (\beta_2 - 1) X_{t-1} + \sum_{i=1}^m \beta_{3,i} \Delta X_{t-i} + e_t \quad (6)$$

Equation (6) is the ADF stationarity equation, where $\beta_2 - 1$ is the coefficient for X_{t-1} whose computed 't' is compared with table 'tau t values' to determine the level of stationarity. Further, the equation also includes a coefficient $\beta_{3,i}$ which takes care of serial correlation, while β_1 is the constant.

Next, for two residual-based diagnostics, namely serial correlation and heteroscedasticity, we first run the regression and obtain the residuals. For serial correlation, we apply the formula

$$Qm = n \sum_{i=1}^m \rho_{u_{it}}^2 \quad (7)$$

where ' Q_m ' $\sim \chi^2$ distribution with 'm' being df or simply the number of lags. Null (H_0) for the same being $\rho_{u_{1t}} = \rho_{u_{2t}} = \dots = \rho_{u_{mt}} = 0$, while alternative being some of the $\rho_{u_{it}}$ are not equal to 0.

We further define $\rho_{u_{1t}} = \frac{\text{cov}(u_t, u_{t-1})}{\sqrt{\text{Var}_{(u_{t-1})} \text{Var}_{(u_t)}}}$ and the study computes serial correlation at lags 1, 5 and 8. For the heteroscedasticity test, we use the test developed by White (1980). The test requires an auxiliary equation with the square of residuals as the dependent variable, that is, Equation (8):

$$u_t^2 = \varphi_1 + \varphi_2 X_{1t} + \varphi_3 X_{2t} + \varphi_4 X_{1t}^2 + \varphi_5 X_{2t}^2 + \varphi_6 X_{1t} X_{2t} + e_t \quad (8)$$

Null Hypothesis heteroscedasticity test: $H_0: \varphi_2 = \varphi_3 = \varphi_4 = \varphi_5 = \varphi_6$ (i.e., residuals are homoscedastic).

Results and Discussion

This section gives the results of the study duly supported by Tables 2–6. Table 2 gives the results of our long-run co-integration, for which we had established an ARDL co-integrating model for each of the BRICS nations. The results revealed that in four of the five BRICS nations, namely Brazil, Russia, China and South Africa co-integration was proved, while only for India this was not seen under the study results. The computed 'F' statistics under bounds test for all the countries (except India) were higher than the upper bound critical, while this was lower than the lower bound for India (Table 2).

Thus, having proved for co-integration in four out of five countries, the next logical step was to establish the speed of adjustment from short-run disequilibrium to long-run equilibrium. The results of the same are shown in Table 3, with the speed of adjustment towards equilibrium given under column 2 of the table. The movement appears to be quite fast, with the long-run adjustment process getting completed in 1–3 years for all four countries except India. For India, co-integration was not established under the study.

The next set of results pertains to causality (Table 4) and we have tested for uni-directional causality from all four variables towards 'ecological footprint' for all five BRICS nations. The results revealed that two variables, namely 'GDP' and 'forest area' were causing an 'ecological footprint' in three of the five BRICS

Table 2. Co-integration Results for BRICS Using 'F' Bounds Test Under ARDL.

Country	'F' Statistics	Critical 'F'(Lower Bound) 5% Level	Critical 'F'(Upper Bound) 5% Level	Results
Brazil	7.7	3.12	4.25	Co-integration
Russia	23.9			Co-integration
India	3.05			Co-integration not proved
China	15.7			Co-integration
S. Africa	9.3			Co-integration

Result: Co-integration was proved for all BRICS except for India.

Table 3. ECM Results for BRICS and Adjustment Speed to Long-run Equilibrium.

Country	Speed of Adjustment to Long-Run Equilibrium (years)	Computed ECM Value	'p' Statistics
Brazil	3.06	-0.327	.0001
Russia	2.22	-0.45	.0000
India	<i>Not applicable as long run co-integration not proved</i>		
China	1.75	-0.57	.0005
S. Africa	1.39	-0.72	.0001

Table 4. Unidirectional Causality Results.

Country	Direction of Relation	Chi Square	'p' Value	Null Hypothesis (Accept /Reject)
Brazil	Biocapacity → Ecological footprint	0.0197	.991	Accept, No Causality exists
Brazil	Trade Openness → Ecological footprint	2.2536	.324	Accept, No Causality exists
Brazil	Forest Area → Ecological footprint	0.0851	.9583	Accept, No Causality exists
Brazil	GDP → Ecological footprint	5.2193	.0361	Reject, Causality exists
Russia	Biocapacity → Ecological footprint	8.8515	.012	Reject, Causality exists
Russia	GDP → Ecological footprint	0.0979	.952	Accept, No Causality exists
Russia	Trade Openness → Ecological footprint	2.7073	.258	Accept, No Causality exists
Russia	Forest Area → Ecological footprint	3.0553	.2170	Accept, No Causality exists
China	Biocapacity → Ecological footprint	1.4352	.487	Accept, No Causality exists
China	GDP → Ecological footprint	7.7787	.025	Reject, Causality exists
China	Trade Openness → Ecological footprint	3.8499	.146	Accept, No Causality exists

(Table 4 continued)

(Table 4 continued)

Country	Direction of Relation	Chi Square	'p' Value	Null Hypothesis (Accept /Reject)
China	Forest Area → Ecological footprint	5.4491	.035	<i>Reject, Causality exists</i>
India	Biocapacity → Ecological footprint	4.4747	.1067	Accept, No Causality exists
India	GDP → Ecological footprint	6.7931	.0335	<i>Reject, Causality exists</i>
India	Trade Openness → Ecological footprint	2.3759	.306	Accept, No Causality exists
India	Forest Area → Ecological footprint	6.9107	.031	<i>Reject, Causality exists</i>
South Africa	Biocapacity → Ecological footprint	3.5219	.172	Accept, No Causality exists
South Africa	GDP → Ecological footprint	0.1565	.925	Accept, No Causality exists
South Africa	Trade Open → Ecological footprint	3.1557	.206	Accept, No Causality exists
South Africa	Forest Area → Ecological footprint	8.1624	.0205	<i>Reject, Causality exists</i>
Result: Short-run causality moves from 'GDP' and 'forest area' towards 'ecological footprint' in three BRICS nations and from 'biocapacity' towards 'ecological footprint' in Russia.				

Table 5. Results of Beta Convergence for 'Ecological Footprint'.

	Coefficient	Standard Error	t Statistics	'p' Value
β_1	1.315127991	0.041979614	31.32778	6.60E-90
β_2	-0.499310074	0.016126118	-30.9628	7.20E-89
Result: The convergence stands proved as β_1 and β_2 are significant (as given by 'p' values and 't' statistics) but with opposite signs and $\beta_2 < 0$. The test applied was $\ln \left \frac{EFP_{i,t+k}}{EFP_{i,t}} \right = \beta_1 + \beta_2 \ln EFP_{i,t} + u_{i,t}$.				

nations. Then, uni-directional causality was also seen moving from biocapacity towards 'ecological footprint' in only one country, that is, Russia. Further, the only variable that was not seen causing an 'ecological footprint' in any of the BRICS was 'trade openness'.

Moving to Table 5 results, which pertain to test results of 'beta convergence' for our variable, 'ecological footprint', and the results show that 'convergence' stands proved for 'ecological footprint' amongst all BRICS nations as revealed by the sign and significance of coefficients β_1 and β_2 from Equation (5), which were found to be significant with opposite signs.

Finally, we have results of Tables 6–7, which pertain to model diagnostics and model pre-requisites. Table 6, which gives the results of stationarity tests using ADF unit root methodology, clearly reveals the mixed nature of our variables, some as I(0) while the rest as I(1) integrated. Whereas GDP was stationary at level for Brazil, this was at first difference for the rest of the BRICS, as shown by the

Table 6. Results of Test for Variables Stationarity for BRICS (Unit-Root ADF).

Name of the Variable	Type of Model	Null Hypothesis	Brazil			Russia			India			China			South Africa		
			Computed ADF 't' values at level ('p' values in parenthesis)	Computed ADF 't' values at level ('p' values in parenthesis)	Computed ADF 't' values at level ('p' values in parenthesis)	Computed ADF 't' values at level ('p' values in parenthesis)	Computed ADF 't' values at level ('p' values in parenthesis)	Computed ADF 't' values at level ('p' values in parenthesis)	Computed ADF 't' values at level ('p' values in parenthesis)	Computed ADF 't' values at level ('p' values in parenthesis)	Computed ADF 't' values at level ('p' values in parenthesis)	Computed ADF 't' values at level ('p' values in parenthesis)	Computed ADF 't' values at level ('p' values in parenthesis)	Computed ADF 't' values at level ('p' values in parenthesis)	Computed ADF 't' values at level ('p' values in parenthesis)		
Trade openness	Intercept & Trend	Trade openness has a unit root	-1.509274 (0.7964)	-4.328967 (0.0168)	-3.329315 (0.0865)	-4.222015 (0.0203)	-0.496556 (0.9760)	-3.925823 (0.0283)	-3.259886 (0.0991)	-0.561738 (0.038)	-3.323887 (0.0897)	-4.879121 (0.0057)					
Biocapacity	Intercept & Trend	Biocapacity has a unit root	-2.567829 (0.2791)	-3.221910 (0.0131)	-3.817118 (0.0341)	-6.316337 (0.0002)	-2.852504 (0.1945)	-6.183105 (0.0003)	-3.38246 (0.0902)	-8.179770 (0.0000)	-4.858513 (0.0039)	-7.401379 (0.0000)					
Ecological footprint	Intercept & Trend	Ecological footprint has a unit root	-3.429659 (0.0787)	-3.699652 (0.0440)	-3.092764 (0.1344)	-4.212651 (0.0167)	-1.445899 (0.8186)	-5.410874 (0.0013)	-2.224730 (0.4540)	-1.223367 (0.0400)	-2.005255 (0.5680)	-6.294368 (0.0002)					
GDP	Intercept & Trend	GDP has a unit root	-3.757337 (0.0416)	-2.799617 (0.0018)	-3.329315 (0.0865)	-2.942161 (0.044)	0.009679 (0.9937)	-3.175077 (0.049)	-2.642087 (0.2676)	-2.186514 (0.046)	-3.310997 (0.0905)	-3.371761 (0.0424)					
Forest area	Intercept & Trend	Forest area has a unit root	-0.438637 (0.9788)	-4.638406 (0.0071)	-2.407955 (0.3657)	-3.586845 (0.0450)	-2.726659 (0.2363)	-1.176305 (0.006)	-1.913514 (0.6136)	-4.304844 (0.0139)	-3.735270 (0.0462)	-3.538768 (0.0671)					

Notes: (1) Model included 'trend and intercept', level of significance: 5%.
(2) Critical 't' value at 5% level for ADF (with trend and intercept) at level is -3.622033 and at first difference is -3.632892.

Table 7. Diagnostics: Serial Correlation and Heteroscedasticity for BRICS.

	Brazil	Russia	India	China	South Africa
A Heteroscedasticity Test: White (1980)					
1. Observed R^2	6.920177	7.407842	5.351089	11.66373	6.603983
2. Probability χ^2	0.4372	0.8295	0.8665	0.5554	0.4712
B Serial Correlation: Using 'Q' Statistics					
Lag 1 Statistics and ('p' values)	0.2249 (.635)	3.2927 (.070)	0.0592 (.808)	4.1960 (.071)	0.2340 (.629)
Lag 5 Statistics and ('p' values)	8.0765 (.152)	9.1299 (.104)	4.3912 (.495)	7.0875 (.214)	2.8489 (.723)
Lag 8 Statistics and ('p' values)	11.531 (.173)	13.012 (.111)	6.1240 (.633)	8.0504 (.429)	7.4556 (.488)
Result: The results clearly reveal that (a) homoscedasticity and (b) no serial correlation for all the five BRICS nations.					

'p' values given in parentheses in Table 6. Again, biocapacity was stationary at $I(0)$ for Russia and South Africa and the same was $I(1)$ for the rest of the BRICS nations. Then, moving to our last table, Table 7, which gives the results of serial correlation and heteroscedasticity, and the table clearly shows that both the diagnostics are adequately satisfied for all the BRICS nations under the study.

Conclusion and Implications

To conclude, the study developed a co-integrating relation between 'ecological footprint' on one hand and GDP, trade openness, forest area and biocapacity on the other for the period 1992–2015 for five BRICS economies. The objective of the study was to determine whether or not the rapid growth achieved by BRICS nations was following a 'sustainable' path. Another study objective was to look for signs of 'convergence' of variable 'ecological footprint' for all BRICS economies. To achieve these objectives, the study employed the ARDL co-integration model, TY causality and β -convergence models. In the study results, co-integration was proved for four BRICS nations (except India) with a fast speed of adjustment towards long-run equilibrium for each of the four BRICS; the adjustment process was seen completing in 1–3 years. Then, short-run causality was seen moving from 'GDP' and 'forest area' towards 'ecological footprint' in three of the five BRICS nations, while variable 'trade' was not seen causing 'ecological footprint' in any of the BRICS. Further, there was evidence of 'convergence' for 'ecological footprint' amongst all BRICS nations.

The study results for variable 'ecological footprint' being strongly co-integrated with other four variables in four BRICS are in line with existing studies, including Ahmed et al. (2022), Ansari (2020). These results thus provide a clear direction to the policymakers of BRICS nations, and if we club the results pertaining to co-integration and causality, we get a better idea as to which variables need to be

targeted if the goal of sustainable development was to be achieved by each of the BRICS within the timeframe set by the United Nations. If we go by the study results, then variables 'GDP' and 'forest area' are the variables that require the highest attention, while the least attention could be towards 'trade'; variable was not seen impacting 'ecological footprint'. The fast pace of movement towards equilibrium as given by the ECM(-1) term gives a lot of encouragement to policymakers as it reveals the pace at which their action would get channelised and transmitted for fulfilment of its objectives. This would also assist the policymakers in developing right-directional policies with precise targets of timely response thereby deciding upon a precise roadmap towards controlling 'environment degradation' in each of the BRICS nations. The other useful result obtained under the study was the proving of convergence of 'ecological footprint' across BRICS, which provides an indication that similar policies can be framed for all BRICS at their group meetings in order to jointly address and mitigate this global concern.

Finally, before we end, we would like to give some future directions for research in this area, which is fast becoming highly sought-after research in social sciences owing to its global importance. Researchers working in this area could add few more variables against the dependent variable 'ecological footprint' that have not been included in the study, for example, population, renewable and non-renewable energy, and a host of non-traditional variables, including environmental regulations and democracy; some of these have been discussed under review of literature. Then, non-linear methodology which is gaining popularity for econometric modelling may also be considered by the researchers. Researchers may also consider a 'switching regression' if they are of the opinion that the variable 'ecological footprint' has undergone a regime change that needs to be incorporated to make their research more meaningful. This would however require extending the period of study to include a sufficient number of years so that variables undergoing a regime shift are able to display a clear shift from one regime to another. Furthermore, researchers could consider extending the coverage of their samples to include more countries, which could also be pooled together into one to make the work more purposeful.

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Notes

1. <https://sdgs.un.org/goals>
2. <https://www.footprintnetwork.org/>
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Pradhan Mantri Jan Dhan Yojna: A Roadmap to Achieve Financial Inclusion and Sustainable Development among Scheduled Tribes—Evidence from Kerala

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Abstract

The financial system has changed due to recent advancements in banking and insurance, but it is only available to some groups of society while excluding others, which is known as ‘financial exclusion’. Every nation strives relentlessly for comprehensive financial inclusion in order to achieve both inclusive growth and overall development. This study aims to analyse the role of the Pradhan Mantri Jan Dhan Yojna (PMJDY) on financial inclusion among tribes of Kerala. A structured schedule was used to collect primary data from 395 tribal respondents of the Attappady tribal area. The data were analysed through the statistical program for the social sciences by using the chi-square test, and the study found evidence that there is a strong association between the perception of tribes about the impact of the PMJDY scheme on financial inclusion. The results support further promoting Scheduled Tribes’ access to and use of the specific scheme in order to ensure the inclusive development of the society.

Keywords

Pradhan Mantri Jan Dhan Yojna; awareness, financial inclusion, sustainable development, perception, tribes of Kerala

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Where you live should not determine whether you live or whether you die.

—Bono

Introduction

India is ranked 62nd out of 74 rising nations in the World Economic Forum's 'Inclusive Development Index' for inclusive development. Despite being well on its way to becoming an economy worth \$5 trillion, economic inequality still exists in India (Barik & Sharma, 2019). There are several elements for inclusive economic growth. Among them, the two most important elements are complete financial inclusion and empowerment of the vulnerable. Having equitable access to formal financing results in increased investments in human capital and improved job creation. There is mounting evidence that financial inclusion increases total economic production, lowers poverty and income inequality at the national level and reduces credit risk. A stable, honest and equal financial system promotes growth. Hence, policymakers should pay attention to financial exclusion caused by various barriers, such as physical, sociocultural and psychological ones.

Access to money is a huge barrier for the poor and underprivileged, particularly in rural areas and in emerging nations like India. They are compelled to rely on shady lenders that charge them outrageous interest rates that they frequently fail to repay, increasing their debt and causing a debt cycle. The lack of financial institutions in rural areas and a lack of financial knowledge and awareness make it difficult for people to access finance. A sound financial system will improve the welfare of the populace and make it possible for money to be invested, increasing the quantity of credit available to the economy and, consequently, the creation of capital assets and economic growth. Pradhan Mantri Jan Dhan Yojna (PMJDY) was launched in 2014 by the Indian government as a component of the National Mission for Financial Inclusion. It aspires to make financial services available to all Indian people.

Low levels of poverty and income inequality are correlated with high levels of financial inclusion (Churchill & Marisetty, 2020). Therefore, we can say that PMJDY has an impact on financial inclusion. A review of the present state reveals that the PMJDY, a new inventiveness for financial inclusion, has resulted in the opening of around 12.54 million new bank accounts (as of January 2015) and deposits totalling more than ₹5,000 crores (as of November 2014). Yet, it has been noted that the majority of the rural market is still untapped and has not been extensively investigated (Joshi & Rajpurohit, 2016). Hence in this study, we are investigating the role of the PMJDY scheme on the financial inclusion of tribes of Kerala, as they constitute one major section of marginalised groups in India.

Review of Literature

Numerous studies have been carried out in relation to the PMJDY scheme since it embarked as the most successful initiative of the Central Government in

transforming the 'excluded' to as 'included'. Shibu (2022) examines the level of awareness of the PMJDY scheme among rural women with primary data collected on a 5-point Likert scale. The analysis results reveal that the source of information significantly influences the level of rural women's familiarity with the PMJDY plan, but schooling had no discernible influence on their level of awareness. Saini and Mittal (2020) analysed the status of the scheme and its role in financial inclusion. This study argues that in order to contribute to the country's inclusive growth, the government and private sector banks will need to make a lot of effort. The researcher describes the advantages of PMJDY and the status of the bank accounts opened under this programme in this study. Bijoy (2017) discussed the status of financial inclusion in India through various government policies, such as Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), Direct Benefit Transfer (DBT) and Pradhan Mantri Jan Dhan Yojna (PMJDY). The study unveils that the number of bank accounts opened by PMJDY for marginalised and underprivileged persons has increased, while the volume of transactions in these accounts has decreased. Many accounts are inactive because there is not enough revenue flowing through them or there are not enough funds to deposit. It is advised that policymakers focus on creating jobs so that everyone in India can fully access the financial system. Yadav et al. (2021) assessed how well the PMJDY has contributed to financial inclusion since its establishment. Using a Financial Inclusion Index, which is similar to the Human Development Index, they measured the level of financial inclusion enjoyed by each state of India. The study used secondary data for analysis. The study's key finding demonstrated that a larger portion of the Indian region falls into the category of low financial inclusion. In terms of financial inclusion, southern regions score better than central, eastern and north-eastern regions. Moreover, there is a strong correlation between FII and HDI. Additionally, only a few regions saw an increase in their ranking from low to medium financial inclusion, indicating that the PMJDY framework has not led the economy to a high degree of financial inclusion. By strengthening and expanding monetary organisations while also managing digital literacy, underlying developments were subsequently given institutional legitimacy. Singh et al. (2019) investigated to what extent the financially excluded folks are using the PMJDY programme's benefits. The study undertakes a systematic review of 60 research publications on PMJDY, which aids in identifying the major problems the programme is dealing with. Several reports on the PMJDY plan and financial inclusion were also taken into consideration for a better analysis. Findings indicated that despite some constraints, such as dormant accounts, financial illiteracy, duplicate accounts, unbanked areas (4.25 lakh) and a lack of ATMs, this programme has significantly contributed to increasing access to financial services. Omar and Inaba (2020) examined how financial inclusion affects the reduction of poverty and income inequality, as well as the causes and confounding effects of each, in 116 developing nations. The findings offer solid proof that financial inclusion significantly lowers income inequality and poverty rates in developing nations. The findings support further improving

marginalised populations' access to and use of formal financial services in order to increase society's overall well-being. Thus, from the earlier studies, it is evident that there exists a nexus between PMJDY, financial inclusion and sustainable development. Hence, the researcher is attempting to investigate the relationship among scheduled tribes, since they constitute a major portion of the vulnerable section in Kerala.

Research Gap

Researchers have offered a number of arguments for and against financial inclusion over the years. The PMJDY initiative received a major boost when the National Democratic Alliance (NDA) administration introduced it. As a result, those in the financially marginalised sector experienced a significant elevation. But the question still stands: what does PMJDY offer that prior financial inclusion initiatives did not? The government claims amazing success with this programme; hence, the question is pertinent. The accomplishment being claimed is not without controversy. Hence, this study aims to determine whether PMJDY has significantly impacted the financial inclusion aspect of the Attappady tribal region, which is the study area.

Scope of the Study

The study will throw light on the extent to which the PMJDY scheme has a role to play in financial inclusion among tribes of Kerala. The current study's focus is mostly restricted to the scheduled tribes of Kerala who are aware of the PMJDY programme. Finding out the current level of understanding, perception and utilisation of the PMJDY scheme is the functional scope.

Objectives of the Study

Objectives of the study are as follows:

1. To assess the level of awareness of the PMJDY scheme among the beneficiaries.
2. To analyse the perception of tribal people about the impact of the PMJDY scheme on financial inclusion.

Hypotheses of the Study

The following hypotheses are derived from the study:

- H_0 : Tribal people of Kerala are not aware of the PMJDY scheme.
- H_0 : There is no association between the perceptions of people of different tribes about the impact of the PMJDY scheme on financial inclusion.

Methodology

Source of Data

The study is based on both primary and secondary data. The former is gathered using an organised schedule, while the latter is gathered from various public documents.

Sampling Design

As per 2011 census data, 32,956 is the total tribal population of the study area. Using the stratified random sampling technique, a total of 395 tribal respondents (as per Slovin's formulae) were selected for the study.

Statistical Tools and Techniques

The data were examined using Microsoft Excel and the Statistical Package for Social Sciences. Frequencies, percentages and the chi-square test were applied in the statistical analysis to test the hypotheses.

Results and Discussion

Level of Awareness of Tribes on PMJDY Account

PMJDY is a national initiative for financial inclusion that aims to guarantee that everyone has affordable access to financial services, such as banking, savings and deposit accounts, remittance, credit, insurance and pensions. This programme comes with a number of extra benefits, such as DBT, interest on deposits, insurance coverage and an overdraft facility.

The mean score analysis of the seven variables used for analysis reveals an awareness level that falls between 'highly unaware' and 'unaware', with a mean score of around 1.5. The severity of the tribal sects' lack of knowledge about the PMJDY system is indicated by the mean score. This predicament can only be changed by providing appropriate education and training. It is significant to notice that despite having a PMJDY account, they are unaware of the fundamental components of this programme. Hence, the result proves that the tribes possess only a low level of awareness about the PMJDY scheme (Table 1).

Perception of Tribal People About the Impact of PMJDY Scheme on Financial Inclusion

This study analysed the role of the scheme in financial inclusion from the perception of tribes in three aspects.

Table 1. Mean Score Analysis on Awareness Level of Tribes on Features of PMJDY Scheme.

SI No.	Features	HA (5)	MA (4)	A (3)	U (2)	HU (1)	Total Score	Mean Score
1	Zero balance account	0	0	18	50	64	218	1.6
2	Interest on deposit	0	0	0	68	64	200	1.5
3	RuPay Debit Card	0	0	9	59	64	209	1.6
4	Insurance cover	0	0	0	68	64	200	1.5
5	Direct benefit transfer of various government schemes	0	0	0	68	64	200	1.5
6	Overdraft facility	0	0	0	68	64	200	1.5
7	Access to pension	0	0	0	68	64	200	1.5

Note: Figures in () indicate the score. HA: Highly Aware, MA: Moderately Aware, A: Aware, U: Unaware, HU: Highly Unaware. The bold values are the Mean Score of each statement, based on which we interpret the result.

Table 2. Access to PMJDY Account.

PMJDY Account	Total	
	No.	Percentage
PMJDY account	395	100.00
No PMJDY account	0	0
Total	395	100

Note: PMJDY – Pradhan Mantri Jan Dhan Yojna.

Access to PMJDY Accounts

PMJDY is a well-known programme for financial inclusion created by the Indian government at the national level (Table 2). This account has no frills and can be actively maintained even when there is no balance. The programme has numerous extra advantages.

H_0 : There is no strong association between the perceptions of tribes with regard to the impact of the PMJDY scheme on financial inclusion in the case of the number of PMJDY account holders.

The p -value is .000, which is less than .05 at the 5% level of significance, as shown in Table 3. As a result, H_1 is accepted and H_0 does not stand accepted. Consequently, it is determined that ‘There is a strong correlation between the perceptions of people of different tribes about the Impact of PMJDY scheme in financial inclusion in the case of number of PMJDY account holders’ (Table 3).

Benefits of PMJDY Accounts

PMJDY account holders can enjoy many added benefits with the scheme. Interest on deposits, RuPay Debit Cards, accident insurance cover, direct benefit transfers and so on are some of them (Table 4).

Table 3. Chi-square Test—Result.

Parameters	Value	df	Asymptotic Significance (Two-sided)
Pearson chi-square	1.3122 ^a	10	.000*
Likelihood ratio	137.040	10	.000
Linear-by-linear Association	13.519	1	.000
No. of valid cases	395		

Note: ^aLevel of significance: 5%. ^a3 cells (16.7%) have expected count less than 5. The minimum expected count is 0.33.

Table 4. Benefits of PMJDY Accounts.

Benefits of PMJDY Account	Tribes	
	No.	Percentage
PMJDY account has benefits	147	37.22
PMJDY accounts have no benefits	218	55.19
Do not know	30	7.59
Total	395	100

Source: Primary data.

Note: PMJDY – Pradhan Mantri Jan Dhan Yojna.

Table 5. Chi-square Test—Result.

Parameters	Value	df	Asymptotic Significance (Two-sided)
Pearson chi-square	58.173 ^a	8	.000*
Likelihood ratio	70.204	8	.000
Linear-by-linear association	7.903	1	.005
No. of valid cases	395		

Source: Computed data.

Note: ^aLevel of significance: 5%. ^a3 cells (20.0%) have expected count less than 5. The minimum expected count is 0.33.

H_0 : There is no strong association between the perception of tribes about the impact of the PMJDY scheme on financial inclusion in the case of benefits of PMJDY accounts.

At the 5% threshold of significance, the *p*-value given in Table 5 is .000, which is less than .05. Therefore, the null hypothesis is rejected, and hence H_1 is accepted. In terms of the advantages of PMJDY accounts, there is a significant correlation between how members of various tribes view the impact of the PMJDY system on financial inclusion. All three categories share a similar understanding of the benefits of the PMJDY account. They knew very little about the advantages of the plan (Table 5).

Difficulties Faced with Opening and Operating of PMJDY Accounts

Despite the many appealing characteristics of PMJDY accounts, creating and managing accounts under this system may have presented some difficulties for account users. They might struggle to follow the process, be unable to provide the

Table 6. Difficulties Faced While Opening and Operating PMJDY Accounts.

Difficulties Faced While Opening PMJDY Accounts	Tribes	
	No.	Percentage
Faced difficulties	143	36.20
Did not face difficulties	219	55.45
Neutral	33	8.35
Total	395	100

Source: Primary data.

Note: PMJDY – Pradhan Mantri Jan Dhan Yojna.

Table 7. Chi-square Test—Result.

Parameters	Value	df	Asymptotic Significance (Two-sided)
Pearson chi-square	72.855 ^a	8	.000*
Likelihood ratio	75.745	8	.000
Linear-by-linear association	10.300	1	.001
No. of valid cases	395		

Source: Computed data.

Note: *Level of significance: 5%. ^a3 cells (20.0%) have expected count less than 5. The minimum expected count is 0.66.

necessary documentation, experience delays or encounter bank workers who are non-cooperative, among other problems (Table 6).

H₀: There is no strong association between the perception of tribes in relation to the impact of the PMJDY scheme on financial inclusion in the case of difficulties in opening and operating PMJDY accounts.

The *p*-value is .000, which is less than .05 at the 5% level of significance, as shown in Table 7. As a result, the null hypothesis is disproved. Consequently, it can be concluded from Table 7 that there is a significant correlation between how members of various tribes view the impact of the PMJDY scheme on financial inclusion when there are obstacles to opening and operating PMJDY accounts (Table 7).

Findings

The findings of this study are as follows:

- The respondents are ‘unaware’ of the significant features of the PMJDY scheme.
- All the respondents are PMJDY account holders. From this, it is evident that the scheme is successful in penetrating among tribes.
- The introduction of the PMJDY account has increased the number of bank account holders in the study area.

- When it comes to the number of PMJDY account holders, there is a significant correlation between how different tribes perceive the impact of the PMJDY plan on financial inclusion.
- There is a strong association between how tribal members perceive the benefits of PMJDY accounts and how the PMJDY system affects financial inclusion.
- From the results, it can be seen that there is a strong correlation between how people from different tribes perceive how the PMJDY scheme would affect financial inclusion when there are barriers to opening PMJDY accounts.

Conclusion

The PMJDY addressed India's financial exclusion issue. The primary goal of the PMJDY programme is to give the most vulnerable members of society access to formal financial services. Those living in rural areas need access to these services. This survey has been done to determine the general public's level of scheme awareness. It also investigates the perception of account holders about the scheme by studying its utilisation and the factors affecting the scheme. The government and Reserve Bank of India can remove financial exclusion by launching this programme since it enables many people to access official financial channels. The study found that there is a correlation between how individuals from various tribes perceive the PMJDY scheme's effect on financial inclusion. The study suggests conducting awareness programmes to enhance the awareness level of tribes on the benefits of the PMJDY scheme. With the help of Bank Mithras and Business Correspondents, the problems faced by tribes while opening and operating PMJDY accounts can be solved. The sample region was constrained by time and material restrictions, which is one of the study's drawbacks. As with any survey-based study, there is a chance that recollection and cognitive bias crept into the results. We utilised straightforward questions with short recollection durations to lessen these biases. In order to minimise bias, the researcher personally gathered data using a systematic timetable. Furthermore, this study can be extended to more aspects of this scheme.

The study found that even for the PMJDY account holders, the full benefits of the scheme still need to be discovered. The scheme is really helpful in uplifting financial inclusion among tribes and achieving sustainable development only if the beneficiaries take full advantage of the scheme. It would be better if the government authorities and non-governmental organisations could conduct awareness programmes on the benefits and features offered under the PMJDY scheme. The basic motive behind introducing this scheme is to include the excluded people financially. But their perception has to be changed towards the scheme. The tribes are facing difficulties while opening and operating accounts under the scheme. The problems should be found out, and we should take remedial measures to resolve the hurdles. Bank Mithras and Business Correspondents can help in this regard. To sum up, it is important to prioritise outreach initiatives that

are specifically created for Kerala's scheduled tribes communities in order to raise knowledge and comprehension of the advantages offered by PMJDY. It is imperative to tailor financial literacy programmes such that they are both linguistically and culturally suitable in order to effectively reach and interact with members of scheduled tribes. Building an accessible banking infrastructure—such as mobile banking capabilities and banking correspondents—is essential to removing geographical obstacles and guaranteeing that financial services are available to everyone. Further encouraging more adoption could be the provision of incentives or favourable lending rates for scheduled tribe households that actively participate in the programme. Finally, to track progress and impact, strong monitoring and evaluation systems should be put in place. Additionally, cooperative partnerships between government agencies, financial institutions and local stakeholders should be fostered in order to co-design and implement inclusive policies that are sensitive to the particular needs of Kerala's scheduled tribes communities.

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Self-efficacy as a Catalyst: The Link between Transformational Leadership and Job Performance

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Abstract

Several studies have examined the link between transformative leadership and professional success, but the role of self-efficacy in moderating this relationship has not been fully explored. This study aimed to examine the influence of self-efficacy on the association between transformational leadership and job performance using a sample of employees from various organisations. The data was analysed using SMART PLS4. The results illustrate that self-efficacy significantly moderates the relationship between transformational leadership and job performance. Specifically, individuals with higher levels of self-efficacy have more robust and favourable correlation between transformational leadership and job performance compared to those with lower levels. This study highlights the importance of self-efficacy in enhancing the impact of transformational leadership on job performance and provides valuable insights for organisations to improve their leadership practices and employee outcomes.

Keywords

Transformational leadership, job performance, self-efficacy, moderating effect, organisational effectiveness, employee engagement

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Introduction

In order to adapt to the ever-increasing complexities and rapid changes of the modern business world, leaders need team members who are fully committed to the achievement of the stated goals of the firm. Moreover, members must be prepared to put up some extra time and succeed above the bounds of what is required by the employer. Those involved need to make more of an effort because job descriptions do not work when duties are not dependent on one another and cannot cover every conceivable sort of action that would be required to complete the requested work. The job description, for instance, cannot lay out the specifics of when and how members will be asking for assistance from co-workers or others in need because these actions are voluntary (Ramhit, 2019). Because of this, leaders need to comprehend reasons for why people do a good job when given tasks related to their roles and what makes them eager to go above and beyond what is required by statutory agreements between employers and employees. Leaders have sway in the workplace because they set an example for subordinates and have a say over their careers. As a result, followers may mimic their leaders' actions. Every leader in an organisation, no matter their position, is capable of displaying transformative leadership (Schiuma et al., 2022). Transformational leaders may influence and motivate their teams to perform above and beyond by four distinct actions: 'idealized influence, inspirational motivation, intellectual stimulation, and individualized' concern (Bass, 1990). Many studies, both theoretical and empirical, have looked at the impact of transformational leadership and found that it improves and influences members' task performance mechanisms like self-efficacy (Hannah et al., 2016), 'leader-member exchange' (Malangwasira et al., 2014; Nohe & Hertel, 2017) and selfless actions (Yammarino & Dansereau, 2008; Ziegert & Dust, 2021).

Moreover, transformational leadership's positive effects on team members' productivity are communicated in a variety of subtle ways. Transformational leaders are capable of motivating their followers to complete assigned tasks and go above and beyond what was expected of them (Shamir et al., 1998), but previous studies mostly ignored this aspect of their effectiveness (Avolio & Bass, 1995). Since motivation is widely recognised as a key factor in shaping the actions of group members, it is essential to gain insight into the mechanisms that underlie the motivational process (Abas et al., 2019). In addition, prior study reveals a positive correlation between member motivation and performance (Cerasoli et al., 2014). However, research studying this motivating process is scarce (Fiset & Boies, 2019). Work involvement (Kahn, 1990; Soane et al., 2013) is an underappreciated process that should receive greater focus. Employees' emotional, cognitive and somatic manifestations, while on the job are referred to as 'work engagement', a motivational construct developed by Kahn in 1990. Family is another factor that can have influence on employee performance (Syed & Abidi, 2018). Furthermore, studies have shown a connection between employee enthusiasm at work and better productivity and teamwork (Rich et al., 2010). We study self-efficacy as a moderating factor that may improve team members' performance by encouraging their task engagement and provide motivation.

Research Gap

The previous research has extensively investigated the correlation between transformational leadership and job performance. However, there is a significant lack of comprehension regarding the intricate dynamics of mediating and moderating mechanisms, specifically within the framework of small and medium-sized enterprises (SMEs). Previous studies have shown that there is a positive correlation between transformational leadership and job performance. However, little focus has been given to the dual role of self-efficacy as both a mediator and a moderator in this relationship, particularly in the specific organisational settings found in SMEs.

In addition, whereas several studies have investigated how self-efficacy influences the relation between transformational leadership and job performance, only a limited number of studies have also considered its moderating implications. Gaining insight into the role of self-efficacy as both a mediator and a moderator in the context of SMEs is crucial for obtaining a thorough understanding of how transformational leadership affects job performance outcomes.

In addition, the current research mainly focuses on multinational organisations, neglecting the contextual elements that could impact the efficacy of transformational leadership strategies in SMEs. It is important to study the role of self-efficacy in the relationship between transformational leadership and job performance in SMEs. This is because SMEs face unique challenges and dynamics, such as limited resources and the need for flexibility. Understanding how self-efficacy affects this relationship can help improve our theoretical understanding and provide practical strategies for enhancing organisational effectiveness in the SME sector.

Hence, there is a need for empirical investigation that methodically examines the intermediary and regulatory functions of self-efficacy in the connection between transformational leadership and job performance, particularly in the context of SMEs. By addressing this research gap, we can gain a more comprehensive understanding of the fundamental factors that influence performance outcomes in SMEs. Additionally, this research can offer practical insights for leaders and managers who want to enhance their leadership practices in these contexts.

Significance of Research

The research has great importance as it can enhance both theoretical understanding and practical implementation in the field of organisational behaviour and leadership, specifically in the setting of SMEs. This study seeks to enhance our comprehension of the factors that contribute to employee effectiveness in SMEs by analysing the correlation between transformational leadership, self-efficacy and job performance. These insights can be used to create better leadership strategies that are specifically designed for the unique problems and dynamics of SMEs. This will eventually improve organisational performance and promote sustainable growth. Moreover, the results of this study could have wider consequences for leadership theory and practice in other organisational contexts, providing useful insights into the significance of self-efficacy in enhancing leadership effectiveness and employee performance.

Review of Literature

Like visionary leaders, transformational leaders inspire their teams to achieve remarkable results. Leaders with vision are transformational because they inspire followers to act on that vision. He can motivate his team with his vision and charisma as a leader. Leaders who transform their followers' perspectives and behaviours are called transformational (Asrar-ul-Haq & Kuchinke, 2016). Leaders with transformational skills inspire their teams to succeed (Abdulrab et al., 2020). To achieve organisational objectives, transformational managers inspire and back their teams. Leaders who adopt a transformative stance are able to shift their outlook on the workplace for the better. Leadership that transforms followers into doers is essential to the success of any organisation (Herminingsih, 2021). Followers find satisfaction in a transformational leader because they feel like they are part of the leader's larger goal (Abdulrab et al., 2020; Manzoor et al., 2019). Leaders motivate their teams to achieve greater success by raising morale, motivation, belief, awareness and teamwork. Barnes contends that effective change leaders are well versed in their organisation's objectives and strategies for achieving them (Abdulrab et al., 2020). According to the research of Lai et al. (2020), transformational leadership facilitates self-regulation by inspiring followers to act constructively. Also, effective leadership is characterised by transformation (Ali Larik & Karim Lashari, 2022). By highlighting the flaws in the current system to their followers and outlining an inspiring future for the business, leaders with a transformational style can bring about lasting change. 'Idealized influence, inspirational motivation, intellectual stimulation, and individual consideration' are the four pillars on which transformational leadership rests (Abdulrab et al., 2020). They caused believers' worldviews to shift, and they pushed members to prioritise the group over their interests. Employees' devotion to the organisation as a whole is impacted by transformational leaders (Dabas, 2021; Donkor et al., 2022). They found that workplaces with a positive culture had a significant impact on employee engagement and retention. Culture plays a significant impact on organisational transformation (Das & Roy, 2019; Saad Alessa, 2021). Leaders are often looked to for input from their teams when making important decisions. They argue that workers are more committed and satisfied in a welcoming environment.

Theoretical Framework of the Study

Transformational Leadership

It may be more advantageous and helpful to increase one's capacity to motivate colleagues through the application of transformational leadership. Transformational leadership is a leadership approach that involves inspiring and motivating employees to perform beyond their expected level of performance. This type of leadership is characterised by leaders who encourage and challenge their employees to exceed their own self-interests and focus on achieving a collective goal. Through transformational leadership, leaders can create a platform in which employees are more motivated and committed to their work, resulting in improved job performance.

Additionally, it might enhance one's sense of personal strength (Khan et al., 2020; Thomas & Velthouse, 1990). The four pillars upon which transformative leadership is founded are idealised influence, inspirational motivation to raise confidence, intellectual stimulation and individual concern (Bass, 1990; Khan et al., 2020). An ideal leader is the one who efficiently provides a clear sense of direction while also inspiring his or her followers with inspiring mental images of achieving that mission. Inspiring leadership can be characterised as a leadership style that considers employees' emotions, fosters their self-belief and promotes transparent communication and constructive feedback. Taking each follower into account on an individual basis is an example of a leader's consideration. A few examples of what might fall under this category are training, coaching, assigning assignments in accordance with individual skills and monitoring results (Khan et al., 2020; Zwingmann et al., 2014). Training enhances employee motivation (Gandhi & Kannad, 2020). The leader's intellectual stimulation of his team is the result of his efforts to inspire them to be more adaptable and receptive to adopting innovative technical techniques in response to a wide range of circumstances. As such, it might be helpful to find ways to work around the multiple stages at which cues and barriers appear (Bednall et al., 2018; Khan et al., 2020). When the stakes are greater and the work is more significant, employees are more likely to need a transformative leader (Thomas & Velthouse, 1990).

Transformational leadership is an approach in which leaders motivate, inspire and encourage their subordinates to go beyond their own self-interest and achieve collective goals by creating a vision for the future, developing individualised consideration and providing intellectual stimulation. This leadership style has been widely studied and is illustrated by a positive relationship with job performance.

The research conducted by Avolio and Bass (2008) found that there is a significant and positive relationship between transformational leadership and job performance. This type of leadership challenges individuals to exceed their self-interests and focus on achieving common goals, which creates a motivating and committed work environment resulting in improved job performance. Similarly, Scordato et al. (2013) found that transformational leadership is positively related to job performance because it fosters creativity, innovation and a sense of vision and purpose among subordinates. A meta-analysis conducted by Eliyana et al. (2019) also found a significant and positive relationship between transformational leadership and job performance, as this leadership style leads to increased job satisfaction, commitment and motivation. However, other factors such as self-efficacy may moderate this relationship. Self-efficacy refers to an individual's belief in their ability to achieve a specific goal or task. A study by Chan (2020) and Muliati et al. (2022) found that the relationship between transformational leadership and job performance is stronger for individuals with high levels of self-efficacy than those with low levels. Therefore, it is important to consider the influence of self-efficacy and other factors when examining the relationship between transformational leadership and job performance. Overall, the literature suggests that transformational leadership is an effective approach to improving job performance by inspiring and motivating followers to achieve collective goals.

Job Performance

In order to sustain high levels of efficiency and operational efficacy, businesses must make sure their employees are completely devoted to the job at hand. Work engagement was developed by Kahn (1990) as a way to evaluate an employee's level of mental involvement in their job. Employees who are fully invested in their work 'employ and express their preferred selves in task behaviors that generate work-and-others links, individual presence (physical, cognitive, and emotional), and active, complete performances' (Buil et al., 2019; Huang et al., 2019). Meaningful work, a secure work environment and accessibility are all factors in employee satisfaction (Das & Roy, 2019; Huang et al., 2019).

Leaders who can transform their teams focus on the individual members, make an effort to learn about their circumstances and comfort them when they become emotionally invested in their work. These kinds of affirming actions help team members feel more secure and inspire them to be their best selves while they're working. Previous studies suggested, for instance, that followership of a leader with transformative qualities would be more likely to feel supported by their superiors. Therefore, members may sense psychological safety and, in turn, be more likely to completely show themselves at work if they are given individualised consideration (Bacha, 2014; Chen et al., 2018; Obasan Kehinde & Hassan Banjo, 2014; Pongpearchan, 2016; Widodo, 2020).

Self-efficacy

The favourable effects of self-efficacy on performance have been documented in psychological studies for decades (Lisbona et al., 2018; Salanova et al., 2022; Talsma et al., 2019). Despite 'their capacity', and based on each member's unique set of ideas about the group's needs and capabilities, transformational leaders cultivate deep interdependent relationships with their collaborators by shrinking the space between them (Bass, 1990). Having faith in one's leader, open lines of communication and mutual empathy all work together to boost followers' confidence in their abilities through a combination of second-hand experience and social pressure (Salanova et al., 2022; Walumbwa et al., 2011). In this way, a leader's actions can shape followers' thoughts, feelings and actions. Recent research by Legood et al. (2016) and Salanova et al. (2022) demonstrates that leaders' trustworthy behaviour affects organisational trust by way of followers' trust in their leaders and their leaders' trustworthiness judgements. Recent studies have shown that followers can be influenced by a leader's positive attitude through factors like their own sense of competence (Salanova et al., 2022; Stetz et al., 2006). The notion that one's organisation has a transformational leader who promotes trust, empathy and honesty (social persuasion) may help followers feel more confident in their abilities. Afsar and Masood (2018), Avolio et al. (2009), Dvir et al. (2002), Kark et al. (2003) and Salanova et al. (2022)—all found that the leader's positive behaviours predicted the self-efficacy of team members (Barsade, 2002; Salanova et al., 2022). Emotional contagion processes in organisations are influenced by both bottom-up and top-down factors, including intra-individual

and inter-individual elements as well as leader–follower dynamics. Several studies have examined the relationship between transformational leadership and employee performance, with some suggesting that self-efficacy plays a moderating role. Specifically, employees with high self-efficacy tend to respond more positively to transformational leadership, experiencing higher levels of job satisfaction, motivation and performance (Latip et al., 2022; Liu et al., 2017), while those with low self-efficacy may struggle to internalise leadership values and goals, potentially weakening the relationship between leadership and performance (Wang et al., 2014). Therefore, self-efficacy should be considered an important factor in the relationship between transformational leadership and employee performance.

- H_1 : Transformational leadership influences job performance of the employee.
- H_2 : Transformational leadership influences self-efficacy of the employee.
- H_3 : Self-efficacy significantly influence the job performance of the employee.
- H_4 : Self-efficacy significantly moderates the relationship between transformational leadership and job performance.

Methodology

As stated in the introduction, this study's primary goal is to assess job performance in SMEs, and the study outlines the measures that need to be taken. Transformational leadership influences self-efficacy and job performance moderated by self-efficacy among the employees. Leadership traits take into account the use of the leadership skill proposed. Transformational leadership skill sets were analysed through an interpretive lens to identify patterns among leaders' skills (Guzmán et al., 2020; Mumford et al., 2007). Following is an explanation of the connection and structure of each stage. Based on a survey of the literature found in the relevant publication databases, this study outlined the transformational leadership skills that influence self-efficacy and job performance from WoS and Scopus-indexed journals. Transformational leadership was also highlighted as a factor in developing job performance in the workplace. Based on what we know about the importance of transformational leadership skills in SMEs, the study proposes to hypothesise that these abilities will be the primary factor in shaping self-efficacy and job performance.

In order to foster each attribute, it is crucial to determine which abilities should be developed (Guzmán et al., 2020; Kane et al., 2018). Using the framework developed by Mumford et al. (2007), the study determined the connection between these leadership abilities and the traits of job performance. Taking their cue from the word 'complex', which means to be divided into a specific number of components, the authors of this work dubbed the process by which leadership skills are built across all levels of an organisation (Sousa et al., 2019). Convenience sampling was used to access 10 SMEs across different parts of India (emphasising TIRE 3 cities) and 50 samples were taken randomly from each SME, so making it a 500 sample size for data analysis. The choice to choose a sample size of 500 for structural equation modelling with partial least squares (SEM-PLS) analysis is based on various crucial factors. First, having a sample of this size guarantees enough statistical power,

which is important for accurately identifying real effects and reducing the chances of making type II mistakes. When using SEM-PLS to analyse complicated models with several variables and pathways, it is important to have a greater size of samples to ensure that the statistical results are valid and reliable.

Furthermore, the accuracy and reliability of estimates in SEM-PLS analysis are strengthened by a larger sample size, which minimises the impact of random fluctuations and improves the consistency of parameter estimates, such as path coefficients and correlations between latent variables. A sample size of 500 is crucial as it enhances the generalisability of study findings, enabling broader inferences and applicability to similar groups or circumstances. In addition, the generous size of the sample allows for subgroup analysis and investigation of moderation effects, enhancing the level of understanding gained from the study. The selected sample size fulfils the suggested requirements, which include a minimum of 10–15 observations per indicator variable. This ensures sufficient coverage of both model indicators and latent components. In organisational behaviour research, choosing a sample size of 500 for SEM-PLS analysis achieves a good balance between statistical rigor, model complexity and generalisability. This ensures that the study findings are robust (Shehawy & Ali Khan, 2024; Suhluli & Ali Khan, 2022).

The data collection method used in this project entails developing a well-organised questionnaire using Google Forms, a tool renowned for its user-friendly interface and reliable data management features. Before initiating data collection, ethical approval was sought from the appropriate institutional review board, ensuring compliance with ethical guidelines and the well-being of participants. Participants received an information sheet that outlined the study's objectives, voluntary nature of participation, steps to ensure anonymity and contact details for the researchers. Before proceeding with the questionnaire, each participant was required to provide informed consent. The data collection process was carried out online, where participants accessed the survey link provided through email or other appropriate ways. Participant responses are kept confidential, and data is securely saved on devices protected by passwords. After gathering the data, it was analysed using SEM-PLS to investigate the connections between the variables of interest. In general, the process of collecting data places a high importance on maintaining ethical standards, protecting the confidentiality of participants and implementing strict protocols for managing data. This is done to ensure that the study findings are valid and reliable.

Results and Discussion

An in-depth review would modify the data from the questionnaire to make sure the questions asked are clear and easy to understand for the responders. As part of the review and editing process, the surveys would also be coded for further input. Interpretation of the data is done using statistical methods. SMART PLS4 makes an effort to reformat data so that it may be more readily read and analysed as shown in Figure 1. In this work, we used SMART PLS4 to insert the coded questionnaire data into a spreadsheet and perform statistical analyses, including correlation and regression. The components of transformational leadership, self-efficacy and organisational

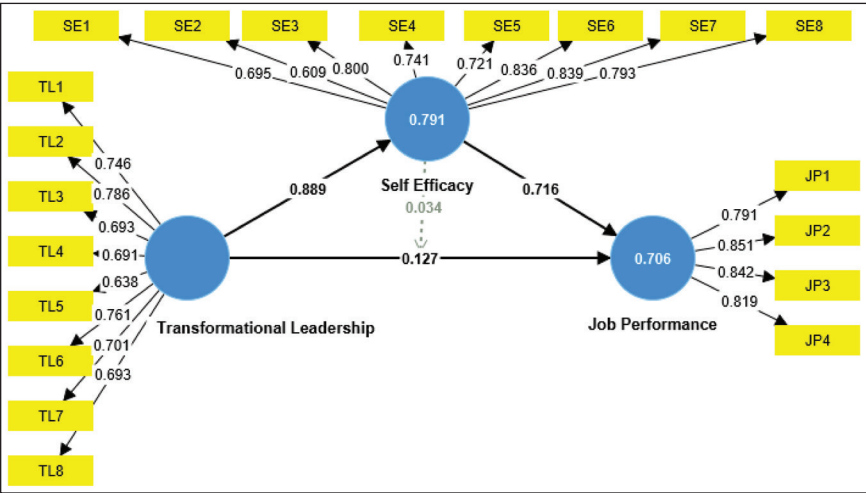


Figure 1. Structural Equational Model.

Table 1. Construct Reliability and Validity Overview.

	Cronbach's Alpha	Composite Reliability (rho_a)	Composite Reliability (rho_c)	AVE
Job performance	0.845	0.846	0.896	0.683
Self-efficacy	0.892	0.898	0.914	0.574
Transformational leadership	0.863	0.866	0.893	0.511

AVE: Average variance extracted.

performance are presented during the development of a SmartPLS model in order to effectively map all of these (Ammad et al., 2021; Vijayabanu & Arunkumar, 2018).

The mathematical formula is calculated using the following formula:

$$\alpha = \frac{k}{(k-1)} \times \left(1 - \sum \frac{si^2}{st^2} \right)$$

where k is the number of items in the construct, si^2 is the variance of item i and st^2 is the total variance of all items.

Construct validity is typically assessed using factor analysis, which involves calculating factor loadings for each item and assessing the overall structure of the construct. Other methods, such as convergent and discriminant validity, can also be used to evaluate construct validity. The specific formula for these methods varies depending on the technique being used.

Using the Cronbach alpha test, the constructions' dependability has been evaluated. The Alpha Reliability results are reported in Table 1. In the present investigation, the construct's reliability ranges between 0.892 and 0.845. Results suggest that the dependability of all constructs is much higher than 0.8, indicating that

Table 2. Construct Discriminant Validity.

	Job Performance	Self-efficacy	Transformational Leadership
Job performance	0.856		
Self-efficacy	0.837	0.758	
Transformational leadership	0.773	0.719	0.715

good reliability is achieved. In addition to establishing the reliability of the measures, validity is also determined, establishing both convergent and discriminant validity. When concepts that ought to be connected are, in fact, related, convergent validity is demonstrated. The construct validity of the measures under consideration is confirmed by the unifactoriality of variables and constructs. Convergent validity is demonstrated if the AVE for the constructs is at least 0.50. Job performance is a unidimensional construct; hence, convergent validity has been established. In addition, AVE is calculated, and the results indicate that convergent validity is established for all constructs because the AVE statistics for all components are larger than 50.

The formula for CDV can be expressed mathematically as

$$CDV = \sqrt{AVE_i} > r_{ij}$$

where CDV is the construct discriminant validity, *AVE_i* is the ‘average variance extracted’ for construct *i* and *r_{ij}* represents the ‘correlation coefficient’ between construct *i* and construct *j*.

‘Discriminant validity’ measures the degree to which sufficiently diverse constructs are weakly associated with one another. If the ‘square root of AVE’ by each concept is greater than the ‘inter-correlations’ between other constructs, ‘discriminant validity’ is proven. Table 2 examines AVE square roots and inter-construct relationships.

In SmartPLS, hypothesis testing is primarily done using the bootstrapping method. The basic formula for hypothesis testing in SmartPLS using bootstrapping is as follows:

$$t = \frac{(\beta - 0)}{SE(\beta)}$$

where *t* is the *t* value, *β* is the estimated path coefficient and *SE(β)* is the standard error of the path coefficient. The null hypothesis is that the true path coefficient is zero (i.e. no relationship between the two constructs), while the alternative hypothesis is that the true path coefficient is not zero (i.e. there is a significant relationship between the two constructs). ‘If the *t* value is greater than the critical value (usually 1.96 for a significance level of 0.05), the null hypothesis is rejected, and the alternative hypothesis is accepted, indicating a significant relationship between the two constructs’ (Sheffett, 2016).

The proposed study model’s construct linkages (paths) are shown in the structural model. *H₁* examines the relationship between self-efficacy and job performance.

The findings showed that PS is significantly impacted (total effect) by self-efficacy ($= 0.716, t = 5.956, p = .000$), supporting H_1 . H_2 assesses the influence of transformational leadership on employee performance. The findings demonstrate that TL has a significance on JP ($= 0.729, t = 11.134, p = .00$). H_3 is, therefore, supported. H_3 determines if TL and JP have a favourable relationship. The findings demonstrated that TL significantly affects JP ($= 0.889, t = 40.515, p = .000$). H_3 is consequently accepted.

Simple Slope Analysis

Further slope analysis as shown in Figure 2 is used, which is the path coefficient (β) or regression weight between two variables in the model. The ‘path coefficient’ represents the strength and direction of the relationship between the two variables. Hence, it is used to understand the strength and direction of the relationship between the variables in the model.

The mathematical formula for slope analysis in SmartPLS 4 is as follows:

For the relationship between two latent variables, Y and X , the slope (b) can be calculated as

$$b = \frac{\sum[(Xi - X_mean) \times (Yi - Y_mean)]}{\sum[(Xi - X_mean)^2]}$$



Figure 2. Moderation Effect of Self-efficacy on Transformation Leadership.

Source: SEM-PLS Output.

where X_i is the value of the X variable for observation i , X_mean is the mean value of the X variable across all observations, Y_i is the value of the Y variable for observation i and Y_mean is the mean value of the Y variable across all observations.

In slope analysis, a graph is created that shows the slope of the line between two variables, indicating the direction and magnitude of the relationship between them. Table 3 demonstrates that self-efficacy moderates the relationship between transformative leaderships, but it may also be claimed that it enhances the association, as depicted in Figure 2 by the less steep angle of the lines. The proposed hypothesis H_4 is therefore acceptable.

Table 4 represents that the statistical analysis results reveal key insights into the relationships between job performance, self-efficacy and transformational leadership. The R -square values indicate that a substantial portion of the variance in both job performance and self-efficacy is explained by the predictors in the model, with approximately 72.7% of the variance in job performance and 76.5% of the variance in self-efficacy accounted for. The adjusted R -square values, which consider the number of predictors in the model, remain high, suggesting robust explanatory power. Furthermore, the f -square statistics highlight the effect sizes of self-efficacy and transformational leadership on the dependent variables. Specifically, self-efficacy demonstrates a medium effect size on job performance, indicating a moderate impact, while transformational leadership exhibits a large effect size on self-efficacy, suggesting a substantial influence. Notably, the absence of an f -square value for transformational leadership in relation to job performance

Table 3. Hypothesis Testing.

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	t-Statistics (O/ STDEV)	p Values
Self-efficacy → job performance	0.716	0.722	0.120	5.956	.000
Transformational leadership → job performance	0.729	0.728	0.066	11.134	.000
Transformational leadership → self-efficacy	0.889	0.891	0.022	40.515	.000
Self-efficacy × transformational leadership → job performance	0.163	0.150	0.074	2.167	.020

Table 4. Model Fit and Size Effect.

	R-square	R-square Adjusted
Job performance	0.727	0.718
Self-efficacy	0.765	0.761
f-Square	Job Performance	Self-efficacy
Job performance		
Self-efficacy	0.167	
Transformational leadership	0.168	3.246

implies its exclusion from explaining variance in job performance. Overall, these findings underscore the significant roles of self-efficacy and transformational leadership in shaping organisational outcomes, shedding light on the mechanisms driving job performance and highlighting avenues for further exploration in leadership research.

The literature analysis highlights the significance of transformational leadership in motivating teams to accomplish exceptional outcomes. Transformational leaders have a significant impact on the way their followers think and act, creating a strong sense of purpose and dedication among team members. Furthermore, the review highlights the beneficial influence of self-efficacy on performance, indicating that individuals with elevated levels of self-efficacy are more likely to respond favourably to transformational leadership.

The statistical findings support the argument by demonstrating substantial correlations between transformational leadership, self-efficacy and work success. The significant *R*-square values for work performance and self-efficacy imply that the predictors in the model can account for a considerable proportion of the variability in these variables. The substantial impact of transformational leadership on self-efficacy provides additional evidence to support the literature's assertion that transformational leaders play a vital role in bolstering the confidence and talents of their followers.

Furthermore, the strong correlation between transformational leadership and job performance, as demonstrated by the *t* statistics and *p* values, highlights the efficacy of transformational leadership in influencing organisational results. The presence of self-efficacy moderates the connection between transformational leadership and work performance, indicating that those with greater self-efficacy are more inclined to experience positive outcomes from transformational leadership practices, resulting in improved performance.

Hence, the discussion emphasised the alignment between the observed results and the theoretical framework outlined in the literature study, underscoring the significance of transformational leadership and self-efficacy in fostering organisational achievement. Furthermore, it is important to recognise the constraints of the study, such as possible factors that may influence the results or the applicability of the findings to different situations.

Conclusion

In conclusion, this study aimed to examine the moderating role of self-efficacy in the relationship between transformational leadership and job performance. The findings indicated that self-efficacy plays a significant moderating role in this relationship. The results revealed that individuals with high levels of self-efficacy exhibit higher levels of job performance when exposed to transformational leadership as compared to low-self-efficacy individuals.

This study contributes to the existing literature by highlighting the importance of self-efficacy in the leadership–performance relationship and sheds light on the significance of considering the role of self-efficacy in leadership development programs and initiatives. The results have practical implications for organisations

as they suggest that fostering employees' self-efficacy can improve their job performance in response to transformational leadership.

Self-efficacy can act as a moderator between transformational leadership and job performance. However, it is important to note that moderation is a complex process, and the relationship between self-efficacy, transformational leadership and job performance may vary across different organisations, industries and cultural contexts. Additionally, other factors, such as situational factors, personality traits and cognitive processes, may also play a role in this relationship.

Therefore, while self-efficacy is a significant moderating factor in the relationship between transformational leadership and job performance, it should not be viewed as the only factor. Further research is needed to fully understand the complexities of this relationship and to develop a more comprehensive understanding of how transformational leadership and self-efficacy interact to influence job performance.

The study's implications are manifold: practically, organisations stand to benefit from cultivating transformational leadership among managers, fostering a culture of high performance and engagement. Managerially, focusing on developing transformational leadership skills and bolstering employees' self-efficacy can lead to improved job performance and organisational success. Organisational implications underscore the importance of selecting and nurturing transformational leaders at all levels, integrating transformational leadership principles into leadership development initiatives and embedding them into organisational culture. Additionally, the study highlights the need for further research into the mechanisms underlying the relationships between transformational leadership, self-efficacy and job performance, suggesting avenues for exploring additional factors and conducting longitudinal studies to deepen our understanding of these dynamics over time. Overall, the study underscores the potential for organisations to harness transformational leadership and self-efficacy as strategic levers for driving performance and achieving long-term success in today's competitive landscape.

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Bridging the Gap in Financial Inclusion and Empowering Small Businesses: Evidence from North-East India

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Abstract

This study aims to investigate the significant impact of microcredit on small businesses and entrepreneurs in north-east India. The research employed a primary survey approach, gathering responses from 205 small business owners through purposive sampling. The analysis utilised a probit model to assess the data, highlighting that factors such as the business's status, participation in awareness programmes by entrepreneurs, operating the business from home and other relevant variables play a crucial role in determining access to microcredit. The findings point out that the businesses experiencing decline are more likely to access credit from microfinance institutions. Also, there is a significant correlation between awareness programmes attended by the entrepreneurs and access to microfinance services. These findings suggest that an increase in the awareness programme participation by entrepreneurs will significantly encourage access to microfinance services.

Keywords

Access to microcredit, financial inclusion, microfinance institutions, small business, small business management, status of business

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Introduction

Microfinance is understood as the provision of financial services to low-income individuals, who lack access to banking and related services. Microfinance allows people to take collateral-free loans with a very less financial burden, as the interest rates are low and affordable to the poor. Although institutions providing microfinance exist all around the globe, the majority of them are present in developing nations where most of the population live in poverty and are mostly excluded from formal financial services. According to the World Bank (2022) estimates, microfinance institutions (MFIs) have served more than 500 million people, directly or indirectly. However, there still exist lacunae in terms of the outreach of microfinance services. In fact, an estimated 1.7 billion people still lack access to basic financial services.

Proponents of microfinance argue that such access helps people move out of poverty through higher employment and higher incomes (Bannerjee et al., 2015). It also encourages entrepreneurship, especially among women, who are discouraged to take up entrepreneurship mainly due to lack of financial access (Nath & Nochi, 2014). It is expected to have a positive effect on the nutrition and education of the borrower's children. It is also considered a tool to empower women. On the contrary, microfinance is accused of adding the burden of loans on the already downtrodden populace that lives life on the edge (Ellerman, 2007; Soni & Sharma, 2020). Loans from such institutions also lead to the 'feminisation of debt' and worsen the position of women.

Despite garnering so much attention among policymakers, microfinance has been criticised for being inaccessible for some sections of society—mostly uneducated rural women (Sane & Thomas, 2013). Studies have found that it is mostly men who gulp a major chunk of loans, which is mainly targeted at rural women. Such disparity in access to microfinance services has led to serious speculations about its impact in recent years (Kalpana, 2005).

Access to MFI loans has been a major issue in India. Studies have pointed towards the gender disparity in access to MFI services. There is evidence of rural–urban disparity as well. Again, the awareness about MFI loans is also very low. Acknowledging this, our study is intended to examine some of these aspects of microfinance services in Nagaland, India, particularly related to its outreach, access and impact on small businesses.

To be precise, we aim to address the following research questions:

- (a) Does the status of the business influence the accessibility of microfinance services for small business owners in Nagaland, India?
- (b) How does awareness program participation by the entrepreneurs provide access to microcredit?

By examining the roles of business status, participation in awareness programmes by the entrepreneurs and operating the business from home, the study aims to document the dynamics of microfinance accessibility in North Eastern Region (NER) of India.

The rest of the study is organised as follows. In the following section, we discuss the existing literature. The third section discusses the data and variables employed in our analysis. The fourth section presents the results and discussion. The fifth section presents the empirical results. The final section concludes the study.

Review of Literature

There is a large body of literature review and research conducted to examine the role of the financial aid to the small business owners. Various studies including Jain and Ekta (2014) tried to capture the role of financial aid to the marginalised business owners. Its financial aiding tool proved to be an important factor to help many semi-rural, rural and urban marginalised people to start their businesses and even grow their businesses (Khandelwal, 2007). However, understanding the functioning of the MFIs is an important parameter to analyse its sustainability in the market (Lensink & Hermes, 2007). But various research studies argue and question the constructive outcomes of microfinance services as a tool in poverty reduction (Singh, 2019). Its discriminatory approach has been documented in the studies by Kharti (2014). Another literature also documents the deliberate exclusion of the urban or semi-urban poor small business owners (Lensink & Hermes, 2007). Further, the ethical crisis is also being brought in various studies including Hudon and Sandberg (2013), which involves documenting the dark episode of Microfinance Regulatory and Policy with its exploitive lending techniques and trapping marginalised borrowers with micro or small loans with the high rate of interest which is often quoted as the ‘debt trap’ (Hudon & Sandberg, 2013). This further presents MFIs, an exploitative social banking system in various semi-urban and rural areas, with various profit-driven players entering the market of financial institutions (Turvey, 2011). With the increase in the awareness on health, education and standard of living, it has also given a space for various NGOs, self-help groups (SHGs) and MFIs to start organised approach for the awareness of financial services and its role in the overall improvement of the marginalised people (Helmig & Pinz, 2015). With the rising evidence of the varied treatments of MFIs with various borrowers, a proper policy regulatory constitution for the efficient and transparent functioning of MFIs would have shown a different picture of its outreach within various intra-groups or regions (Angelucci et al., 2013). The positive initiatives of microfinance will undoubtedly act as a poverty reducing catalyst under certain circumstances for some marginalised groups and their clients (Nath & Nochi, 2014). Although the mechanism of microfinance is passive, the results of various empirical findings happen to trouble the foundational motto of the Institution (Soni & Sharma, 2020), thereby directing various research studies and scholars to question the mechanism of MFIs as a poverty reducing catalyst (Ellerman, 2007). The outreach of microfinance is also sometimes said to be dependent on how SHGs create its effective connection to reach the marginalised people (Kalpana, 2005). But an inefficient regulatory policy of MFIs results in its inefficiency as a poverty reduction catalyst (Sane & Thomas, 2013).

Although the above studies address on the microfinance services in India, very few studies have been conducted in NER of India and no research studies have been performed in context of small business owners post-COVID-19 period, which is secluded and do not share the same ethos of the population from other parts of the country. Therefore, the findings of previous studies carried out for the rest of India cannot be generalised for NER of India. This makes it imperative to understand the implementation and effectiveness of MFIs in this region. We argue that the determinants of access to MFIs is different in NER than other parts of India, as the region is demographically, socially, economically and politically different from the mainland India. Thus, this study is intended to examine some of these aspects of microfinance services in Nagaland, India, particularly related to its outreach, access and impact on the small businesses. To be precise, we exploit the recent primary information collected from January 2022 to April 2022 to empirically investigate the determinants of access to microfinance services among small business owners in Nagaland.

Formation of the Hypothesis

To comprehensively document the impact of the business status in accessing the microloan from MFIs, the study aims to examine the influence of business status in accessing microloan alongside other significant factors such as participation in awareness programmes by entrepreneurs on MFIs and microcredit and the role of the business operated from home or residence of the owner.

H_1 : Business status plays an important role in accessing microcredit.

Built upon the findings of Rupasingha and Wang (2017), Lensink and Hermes (2007) and Hameed et al. (2020), which advocate the linkages between ‘status of the business’ and ‘location of the business’ and how the size of the business defines its sustainability in the market. Our study aims to document status dimension of the business by examining the role of business status and access to microfinance services. It proposes that the status of the business, that is, ‘growing’, ‘declining’ or ‘stagnant’ might shape the requirement for accessing microfinance services. Therefore, to understand the significant role of the ‘status of business’ and the likelihood in accessing microcredit, it is employed as an important variable.

H_2 : Awareness programme participated by the entrepreneurs on microfinance services significantly determines access to microcredit.

Aligned with the findings of Helmig and Pinz (2015), this hypothesis asserts that the role of the awareness programmes plays an important role in accessing financial services from institutional sources particularly microfinance services. This hypothesis forms the foundation for the study to empirically document the awareness dynamics and entrepreneurs’ participation in awareness programmes in determining the accessibility of microfinance services.

H_3 : Business operated from home determines the access to microfinance services.

Drawing insights from Kalpana (2005), Sane and Thomas (2013) and Turvey (2011), this hypothesis predicts that businesses operated from home plays a significant role in access to microloans. The study aims to document how business operated from home or residence of the entrepreneurs defines accessibility of microloans from MFIs.

Research Methodology

Nagaland is one of the most important states of NER, which has population of over 2.28 million. The data used in the study are collected from 205 small business owners in Nagaland to understand the determinants of access to microfinance services. We followed a purposive sampling method to collect the data. We employ a number of variables for the econometric exercise. MFIs, commercial banks and informal sources or non-institutional sources to observe the impact of the determinants on the accessibility of the mentioned financial services. The study employed six explanatory variables, namely education, age square of the client, the age of the firm/business, microfinance awareness programme attended by the clients, business run from home and status of the business. To observe the role of awareness, we have employed the control variable microfinance programme attended by the clients, which is dichotomous in nature, that is, 1 = business owner has attended any awareness programme about microfinance services and 0 = otherwise. We further employ the status of business as an indicator to capture the status of the businesses from the entrepreneurs' perspective: whether the business is 'growing', 'stagnant' or 'declining'.

Probit Regression Model

We employ the probit regression model to formally understand the determinants of the access to microfinance services by the small business owners. The model takes the following form:

$$\text{Finance}_i = \beta_0 + \beta_1 \text{Education}_i + \beta_2 \text{Business Home}_i + \beta_3 \text{Firm Age}_i + \beta_4 \text{Age}^2_i + \beta_5 \text{Microfinance Programme}_i + \beta_6 \text{Business Status}_i + \varepsilon_i$$

where β_1 is the likelihood of the client accessing any of the financial services given the individual (i) educational qualification, β_2 is the likelihood of the client accessing any of the financial services given individual (i) business operated from home or not, β_3 is the likelihood of the client accessing any of the financial services given the age of the firm, β_4 is the likelihood of the client accessing any of the financial services given individual (i)'s square of the age, β_5 is the likelihood of the client accessing any of the financial services provided the individual (i) attended

the microfinance awareness programme, β_6 is the likelihood of the client accessing any of the financial service with respect to the status of the firm and ε_i is the error term in the model.

In the econometric model, the dependent variable is 'finance', which stands for access to microfinance services. We constructed three binary variables for getting access to microfinance services, institutional sources and non-institutional sources.

Results and Discussion

To understand the impact of the financial services to the small businesses in NER, we first present the descriptive statistics before moving to the regression results.

Summary Statistics

The summary statistics of the variables used in the empirical analysis are presented in Table 1.¹

The data in Table 1 reveal that, on average, 32% of the clients have access to microfinance services. While, on average, 29% of clients have accessed loans from commercial banks, 40% of the client's business is financed on an average from various informal sources.² The majority of the respondents or representatives of their respective businesses operate on a rented outlet. From Table 1, it is clearly evident that, on average, with mean value, 1.697 businesses in Nagaland are growing, with an average age of business being 19.11 years. It has also been observed that an average of 13% of firms or businesses is operating from the home or from the residence of the entrepreneur.

The correlation matrix of the determinants of the microfinance services is documented in Table 2. From the table, we can observe that the age of the entrepreneurs and microfinance services are negatively related and significant at the 5% level. However, as expected, there is a positive correlation between

Table 1. Summary Statistics.

Variables	Observations	Mean	Standard Deviation	Minimum	Maximum
Microfinance institutions	205	0.317	0.466	0	1
Commercial banks	205	0.288	0.454	0	1
Informal sources	205	0.395	0.490	0	1
Education	205	2.248	0.742	1	3
Age ²	205	1,487.2	727.45	484	3,969
Business status	205	1.697	0.922	1	3
Firm age	205	19.11	12.15	0	72
Microfinance programme	205	0.249	0.433	0	1
Business home	205	0.126	0.334	0	1

education and microfinance services and a negative correlation between informal sources with the 1% level of significance. Moreover, the positive correlation of microfinance awareness programme attended by entrepreneurs with microfinance and a negative correlation with commercial banks and informal sources advocates the positive impact of the awareness programmes. In addition, the inverse and significant relationship of microfinance programmes with commercial banks and informal sources motivates and advocates microfinance services.

Empirical Results of the Determinants: Probit Model Analysis

The results from Table 4 indicate that education qualification plays a very important role in the access of loan.³ It was found that with the increase in the qualification of the business owners, they are more likely to avail loan or credit from commercial banks, which is positively significant at the 5% level, and are less likely to take credit from the informal sources. It was found that the age of the business to be an important factor as young enterprises are more likely to access loan from MFIs. However, to capture the influence of experience, we employ the variable Age² to document the experience of the entrepreneurs and the likelihood in the accessibility of microcredit, and it was found that with increase in the age of the business owners, they are less likely to access loan from MFIs. The location of the business is another important determinant of access to financial services. It was found that the business that are operated from the home are more likely to access loan or credit from the microfinance finance due to collateral-free and less security burden in the borrowers.

It was found that both awareness programme of the microfinance services and status of business (declining) being positively significant are important factors in the access of the microfinance services. The result suggests that the entrepreneurs who have attended awareness programme of microfinance service are more likely to access loan from MFIs. Furthermore, the business-experiencing declines are more likely to access loan from the microfinance services. Among all the independent variables, awareness programme of microfinance services and status of the business from the entrepreneurs' perspective make a significant impact in the access of credit/loan from MFIs. We now report the marginal effects in Table 5, which are described in Table 3.

The results from Table 5 clearly suggest that businesses experiencing decline are more likely to access loan than man by 0.7%. The variable 'Business Run from home' yields a positive significance. To be precise, the entrepreneurs who are running their business from home are more 0.9% more likely to access loan from MFIs, this might be due to collateral-free micro-credits provided by MFIs. Firm age is another important factor in the access of the microfinance services. As expected, it is negatively significant. It means, with the increase in the age of the business, the businesses are less likely to access. The age of the entrepreneurs is another important factor in the access of microcredit. However, to document the experience of the entrepreneurs, we have squared the age of the

Table 2. Correlation Matrix of the Determinants.

Variables	Fin_Inf	Fin_Mfi	Fin_Cb	Edu	Bss_Sts	Bss_Hm	Firm_Age	Mfi_Prog	Age ²
Fin_Inf	1.0000								
Fin_Mfi	0.5507***	1.0000							
Fin_Cb	-0.5138***	0.432***	1.0000						
Edu	-0.3930***	0.3375***	0.0775	1.0000					
Bss_Sts	0.3097***	0.1955***	0.1335*	0.152**	1.0000				
Bss_Hm	-0.0082	0.1813***	0.1775**	-0.029	-0.0677	1.0000			
Firm_Age	-0.0179	-0.1107	0.1331*	-0.015	0.1936***	-0.0288	1.0000		
Mfi_Prog	-0.2574***	0.6021***	0.3409***	0.0657	0.1593**	0.1537	0.0963	1.0000	
Age²	-0.0133	-0.1690**	0.1881***	0.16**	0.1308*	-0.098	0.2119	0.1687	1.0000

Note: (a) ***, **, and * indicate significance at the 1%, 5% and 10% levels, respectively (***p < .01, **p < .05, *p < .10).

Table 3. Construction of Variables.

Variables	Definitions	Descriptions	Anticipated Relationship
Endogenous			
Fin_Mfi	Binary variable; takes loan from MFI = 1 and 0 otherwise	The business is financed through MFIs	
Fin_Cb	Binary variable; takes loan from commercial banks = 1 and 0 otherwise	The business is financed through commercial banks	
Fin_Inf	Binary variable; takes loan from informal sources = 1 and 0 otherwise	The business is financed through informal sources	
Exogenous			
Client characteristics			
Edu	Categorical variable; 1 = less than primary school. 2 = high school and below graduation, 3 = graduation and above	Education qualification of the respondent	±
Age ²	Age squared of the client's age	Square of the age of the client (in years)	±
Awareness dimension			
Mfi_Prog	Binary variable; client attended microfinance awareness programme = 1 and 0 otherwise	Microfinance awareness programme in the city/ locality	±
Business characteristics			
Bss_Sts	Categorical variable; 1 = infant, 2 = declining, 3 = growing	Status of the business	±
Bss_Hm	Binary variable; business operated from home = 1 and 0 otherwise	Business operated from home or not	±
Firm_Age	Number of years elapsed since the business began its operation	Age of the business/firm	±

Note: MFI = microfinance institution.

Table 4. Results: Probit Model Regression.

Variables	Institutional		Non-Institutional
	Microfinance Institutions	Commercial Banks	Informal Sources
Edu_HiSchBGrad	8.178 (314.65)	0.664 (0.318)**	-1.371 (0.308)***
Edu_GradAbove	8.915(314.65)	0.524 (0.319)	-1.663 (0.313)***
Bss_Hm	0.937 (0.465)**	-0.724 (0.425)*	0.165 (0.362)

(Table 4 continued)

(Table 4 continued)

Variables	Institutional		Non-Institutional
	Microfinance Institutions	Commercial Banks	Informal Sources
Firm_Age	−0.028 (0.016)*	0.019 (0.008)**	−0.005 (0.009)
Age²	−0.006 (0.002)***	0.001 (0.001)	0.001 (0.001)
Mfi_Prog	2.758 (0.440)***	−1.857 (0.426)***	−0.862 (0.303)**
Bss_Sts-Declining	1.455 (0.712)**	−0.485 (0.443)	−0.146 (0.439)
Bss_Sts_Growing	0.991 (0.739)	−1.278 (0.478)*	0.939 (0.458)**
Constant	−17.528 (314.67)	−0.099 (1.867)	2.788 (1.851)
Log likelihood	−52.72	−92.35	−90.77
Pseudo R²	0.59	0.25	0.34
No. of observations (N)	205	205	205

Notes: (a) ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively (***) $p < .01$, ** $p < .05$, * $p < .10$.

(b) Standard errors are given in the parentheses.

Table 5. Marginal Effects: Probit Model.

Variables	Institutional		Non-Institutional
	Microfinance Institutions	Commercial Banks	Informal Sources
Edu_HiSchBGrad	8.178 (314.65)	0.664 (0.318)**	−1.371 (0.308)***
Edu_GradAbove	8.915 (314.65)	0.524 (0.319)	−1.663 (0.313)***
Bss_Hm	0.937 (0.465)**	−0.724 (0.425)*	0.165 (0.362)
Firm_Age	−0.028 (0.016)*	0.019 (0.008)**	−0.005 (0.009)
Age²	−0.006 (0.002)***	0.001 (0.001)	0.001 (0.001)
Mfi_Prog	2.758 (0.440)***	−1.857 (0.426)***	−0.862 (0.303)**
Bss_Sts-Declining	1.455 (0.712)**	−0.485 (0.443)	−0.146 (0.439)
Bss_Sts_Growing	0.991 (0.739)	−1.278 (0.478)*	0.939 (0.458)**

Notes: (a) ***, ** and * indicate significance at 1%, 5% and 10% levels, respectively (***) $p < .01$, ** $p < .05$, * $p < .10$.

(b) Standard errors are given in the parentheses.

entrepreneurs. Therefore, with the increase in the experience of the entrepreneurs, they are 0.6% less likely to access loan from MFIs. The findings show that with the increase in education, the entrepreneurs are less likely to take loans from the informal sources. But with the increase in the educational level, they are more likely to access loan from the institutional sources. ‘microfinance programme’ carries the relevant signs and significance. To be defined, the variable ‘microfinance programme’ yields a negative coefficient for both commercial banks and informal sources, suggesting that the business owner who have attended microfinance programme are more likely to access loan from MFIs by 2.7%. Thus, the results from probit and marginal effects clearly suggest that

microfinance awareness programme and the status of the firm are the two major determinants of access of loan from MFIs.

Conclusion

This article examines the determinants of the microfinance services in Nagaland, India. Using a primary survey approach, data were collected from 205 small business entrepreneurs in Nagaland. The study has framed three endogenous variables, namely MFIs, commercial banks and informal sources, to document a wider horizon in understanding the accessibility of microcredit in the region. MFIs and commercial banks represented 'institutional loans' in the study and informal sources represented 'non-institutional loans'. To answer the mentioned questions and attain the core objectives of the study, we have employed six important explanatory variables. 'Business status' was employed to document the significant role of the status of the small businesses post-COVID-19 pandemic period in defining the accessibility of microcredit. Therefore, to get a holistic view of the status of the business in the region, we have categorised it into three categories, namely growing, declining and stagnant. Further, to understand the impact of the microfinance awareness programme participation in the state, we have employed it as a dichotomous variable, where an individual representing his/her business or entrepreneurs takes value 1, if he/she has participated in the awareness programmes related to microfinance services and 0 otherwise. Also, to understand the impact of rent-free enterprise, we employed another exogenous variable 'business home' which is also dichotomous in nature, where an entrepreneur takes value 1 if he/she operates his/her business from home or residence of the owner and 0 otherwise.

Our findings reveal that the business operated from home or the residences of the entrepreneurs are more likely to access microcredit. The findings also show that entrepreneurs⁴ with higher educational qualifications are less likely to access loan from the informal sources and more likely to access loan from the institutional sources. Moreover, the experience of the entrepreneurs reveals that they are less likely to access credit through microfinance services; this finding also aligns with the study of Hudon and Sandberg (2013). Again, those business owners who have attended the microfinance programme are more likely to access loan compared to those who have not attended the programme. This perhaps suggests that awareness about the programme is a major determinant of access to loans from MFIs. Although organisation like National Centre for Financial Education has launched the Financial Education Programme for Adults in 2019 to promote and create financial awareness, and bodies such as the National Bank for Agriculture and Rural Development have previously initiated programmes like Financial Literacy Awareness Programmes, which played a key role in integrating the financially excluded population into the institutional financial system, a more holistic and inclusive financial awareness programmes designed for NER, India could be

a key policy measure. Thus, from a policy perspective, there is a need to increase awareness about microfinance loans so that more individuals and businesses come forward to access loans.

Acknowledgement

I would like to extend my sincere gratitude to Dr. Rajesh Raj S. N., Associate Professor at Sikkim University, for his knowledgeable guidance and support throughout my research work. I also thank the anonymous reviewers for their valuable comments and suggestions, which greatly helped in enhancing the quality of the manuscript.

Author Notes

1. Status of the business documents the status of business (growing, declining or stagnant) in Nagaland, India, according to their entrepreneurs' or owners' prospective.
2. Informal or non-institutional sources include those loans taken by the entrepreneurs from their relatives, friends, colleagues or any other sources apart from any institutional sources (MFIs or commercial banks).
3. Since in the study, age² is taken as an explanatory variable to document the experience of the entrepreneurs. Therefore, before performing the operation of squaring the age, the average age of the owner or manager managing the firm is 37.53 years (38 years approximately).
4. The awareness programme participation also shows the effort of the state/central government in promoting financial literacy.
5. The binary variable takes the value 1 if the individual has participated in the awareness programmes of microfinance services and 0 otherwise. Results are presented in Tables 4 and 5.
6. In the present study, after documenting the correlation matrix. We have employed advance statistical methods such as principal component analysis (PCA) and variance inflation factor (VIF) test to solidify the absence of 'multicollinearity' in the data. Results are presented in Figure A1 and Table A1 in the Appendix.

Data Availability

The primary survey data will be provided by the author, when needed.

Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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Appendix A

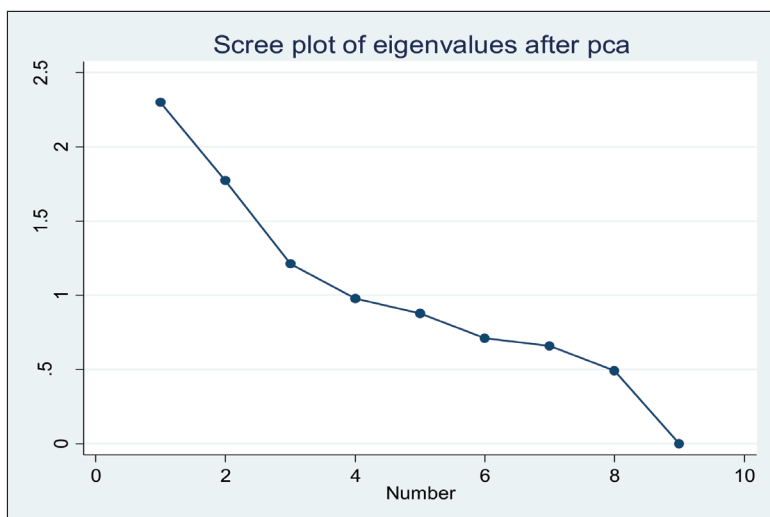


Figure A1. Plot of Eigen Values after Principal Component Analysis (PCA).

Table A1. Results of Variance Inflation Factor (VIF) Test.

Variable	VIF	1/VIF
Bss_Sts	1.09	0.918
Age²	1.11	0.829
Mfi_Prog	1.07	0.923
Firm_Age	1.09	0.919
Bss_Hm	1.03	0.928
Edu	1.07	0.937
Mean VIF	1.07	

Table A2. Awareness Index of Microfinance Institutions.

Awareness of Microfinance Institutions	Percentage
Aware	38.54
Unaware	61.46
Total	100

Table A3. Sources of Finance.

Source of Finance	Percentage
Informal	39.51
Microfinance institutions (MFI)	31.71
Commercial banks	28.78
Total	100

Notes

1. Refer to Table 3 for the construction and description of the variables.
2. Here, in this study, informal sources are from family, relatives, friends, etc. Here, informal and non-institutional sources are synonyms.
3. In the case of informal sources, the education level with high school and above and that with graduation and above are negatively significant at 1% level.
4. Since the investigated clients are the entrepreneurs, entrepreneurs and clients are used concurrently.

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Globalisation of Higher Education: A Bibliometric Analysis and Future Research Directions

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Abstract

This research aims to analyse the publication pattern of academic research on globalisation of higher education. Data on globalisation of higher education was extracted from Scopus database between 2000 and 2022, and a total of 232 documents analysed data through RStudio and VOSviewer software. The research findings revealed the top producing nations, institutions, authors, journals, country scientific production, three-field plot, most relevant sources and co-authorship analysis and citation analysis. The study's primary contribution is offering an overview of globalisation trends in higher education, which can aid researchers and practitioners in understanding current patterns and identifying future research directions.

Keywords

Globalisation, higher education, RStudio, VOS viewer, bibliometric analysis

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Introduction

Globalisation describes the growing interconnectedness and interdependence of global economies, societies and cultures, fuelled by advancements in communication, transportation and trade (World Trade Organization, 2021).

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Advancements in communication and information technology have fuelled globalisation, enabling faster and more convenient access to information, goods and services worldwide. The liberalisation of trade policies, such as the reduction of trade barriers and tariffs, has also played a significant role in globalisation (International Monetary Fund, 2021).

The impact of globalisation has been both positive and negative. On one hand, globalisation has led to increased economic growth, as countries have been able to specialise in their comparative advantages, leading to greater efficiency and productivity. Globalisation has also led to an increase in the availability of goods and services, as well as lower prices for consumers. On the other hand, globalisation has led to greater inequality, as countries that are not able to compete in the global marketplace have been left behind, leading to a widening income gap. Globalisation has contributed to the exploitation of workers in developing countries, as companies capitalise on low wages and lenient labour regulations.

Higher education plays a crucial role in personal and professional growth and is widely acknowledged as a key driver of economic development and social mobility. It generally refers to education beyond the secondary level, including programmes at universities, colleges and vocational or trade schools. The benefits of higher education are numerous and well documented, including improved earnings potential, better job prospects and a higher standard of living (Organisation for Economic Co-operation and Development (OECD), 2018).

There are many factors that contribute to the importance of higher education, including increased demand for skilled workers in a rapidly changing global economy. This has led to a growing recognition of the need for individuals to have access to high-quality educational opportunities in order to succeed in today's competitive job market (National Centre for Education Statistics, 2021).

Higher education has also been shown to have a positive impact on the economy as a whole, with studies indicating that countries with higher levels of educational attainment tend to have higher levels of economic growth and a more robust workforce. For example, a study by the OECD found that higher levels of education are associated with higher levels of innovation, entrepreneurship and productivity.

Globalisation of higher education refers to the increasing internationalisation of universities and the exchange of students, faculty and knowledge across national borders. The trend has been driven by advances in communication and transportation technologies, as well as a growing demand for higher education worldwide (De Wit, 2011).

A significant aspect of globalisation in higher education is the rising number of international students studying abroad. The UNESCO Institute for Statistics reports that the number of international students increased from 2.1 million in 2000 to 5.5 million in 2019. This trend is driven by a variety of factors, including the desire for a better education, the opportunity to learn a new language and culture, and the ability to build a global network (Tiechiler, 2017).

Another aspect of globalisation in higher education is the growth of international collaborations and partnerships between universities. These partnerships allow universities to share resources, exchange ideas and collaborate on research

projects. For example, the Erasmus programme in Europe has promoted student and faculty exchanges across universities in various countries, while the Association of Pacific Rim Universities unites top institutions from the Pacific Rim region to foster collaboration and exchange (European Commission, 2012).

Globalisation's impact on higher education has been predominantly positive, offering benefits such as expanded access to education, enhanced educational quality and increased diversity within the student population. However, it has also raised some concerns, including the unequal distribution of resources and opportunities between countries, the exploitation of international students and the potential for cultural homogenisation.

Despite these challenges, globalisation in higher education is expected to continue to grow in the coming years. In order to ensure that this growth is sustainable and equitable, it is important for universities, governments and international organisations to work together to address the challenges and opportunities posed by globalisation (United Nations Educational, Scientific and Cultural Organization, 2021).

Globalisation is a phenomenon that has been transforming the world in many ways. One of the most significant areas of globalisation has been the internationalisation of higher education. This process involves the movement of students, academics and academic programmes across borders, as well as the development of international collaborations and partnerships between universities. The globalisation of higher education has become a major trend in the 21st century, with an increasing number of universities and students seeking to participate in this global movement. In this essay, I will examine the drivers of globalisation in higher education, its benefits and challenges, and the implications for the future.

The drivers of globalisation in higher education are diverse and complex. One of the main drivers is economic. With the rise of the knowledge economy, many countries have recognised the importance of education as a key driver of economic growth and competitiveness. As a result, there has been an increasing demand for higher education across the world, and this has led to the growth of a global market for education. In addition, the growth of multinational corporations and the increasing importance of global trade have created a need for a global workforce that is well-educated and mobile.

Another driver of globalisation in higher education is the increasing use of technology. Advances in communication technology have made it easier for students and academics to collaborate across borders, and for universities to offer courses and programmes online. This has led to the development of new models of global education, such as Massive Open Online Courses, which allow students to access courses from universities all over the world.

The benefits of globalisation in higher education are many. For students, it provides the opportunity to study in a different country, learn a new language and gain valuable international experience. This can be particularly valuable for students from developing countries, who may not have access to high-quality education in their own countries. For universities, globalisation offers the opportunity to attract a diverse range of students, expand their research collaborations and

enhance their international reputation. It also provides opportunities for the development of joint degree programmes, which can be mutually beneficial for both universities and students.

However, there are also significant challenges associated with globalisation in higher education. One of the main challenges is the issue of quality control. As more and more universities enter the global market for education, it becomes increasingly difficult to ensure that the quality of education is consistent across countries and institutions. This can lead to a proliferation of low-quality programmes and degrees, which can undermine the value of higher education as a whole.

Another challenge is the issue of cultural and linguistic differences. When students and academics from different countries come together, they bring with them different cultural norms and values, which can create misunderstandings and conflicts. Language barriers can also be a significant challenge, particularly for non-native English speakers who may struggle to keep up with lectures and assignments.

Despite these challenges, the globalisation of higher education is expected to persist in the future. As more and more countries recognise the importance of education as a driver of economic growth and competitiveness, they are likely to invest in their higher education systems and seek to participate in the global market for education. This will create new opportunities for students, academics and universities but will also require new approaches to quality control, cultural and linguistic diversity, and the use of technology.

In conclusion, the globalisation of higher education is a complex and multifaceted process that is transforming the world of education in many ways.

The term 'globalisation of higher education' is depicted in the line graph in Figure 1, illustrating the growing number of articles on the topic since 2016. In that year, 14 articles were published, followed by 12 in 2017, 23 in 2018, 14 in 2019, 17 in 2020, 27 in 2021 and 14 in 2022.

Methodology

To meet our research objectives, we performed a bibliometric analysis. The initial step in this approach involves identifying and collecting articles for analysis that accurately reflect the publication landscape of globalisation in higher education. The second stage presents bibliometric analysis by using RStudio and VOS viewer.

Given these reasons, a bibliometric analysis was conducted to evaluate and map the relevant literature on globalisation in higher education. This analysis will provide a comprehensive overview of existing publications by addressing the following three research questions:

- (1) What are the annual publication trends in the field of globalisation of higher education?
- (2) Who are the primary contributors, including journals, authors, countries and documents, related to the globalisation of higher education?

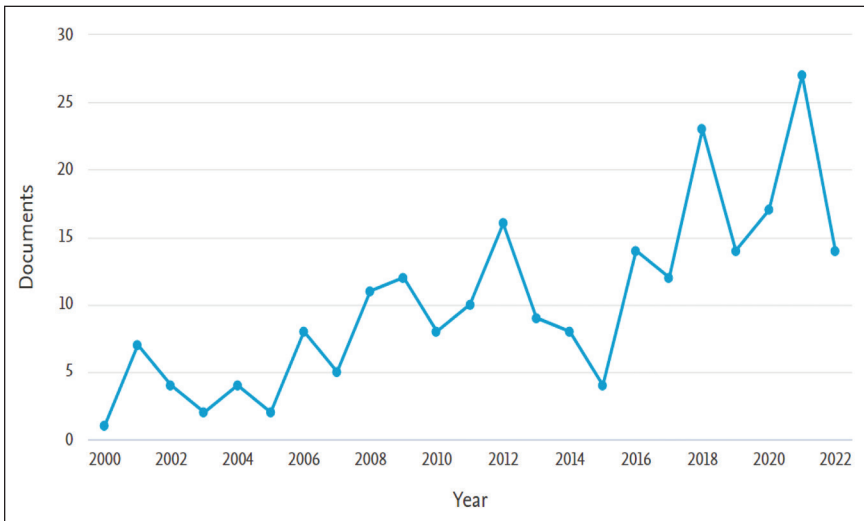


Figure 1. Simple Line Graph (Documents Per Year).

Source: Scopus.

- (3) What are the most frequently discussed themes and emerging trends in the globalisation of higher education?

Search Strategy and Data Collection

For searching the literature on globalisation of higher education, Scopus database was used with the following keywords' syntax.

'Globalisation' OR 'Transnational' OR 'Multiculturalism' AND 'Higher Education' OR 'University' OR 'Institutions'.

The search terms were applied to the TIT-ABS-KEY field in the Scopus database. We initially retrieved a total of 5,789 articles, with 232 documents selected for analysis (see Figure 2). After narrowing the search to articles published between 2000 and 2022, we found 5,623 relevant articles. Further filtering to include only those related to business management and accounting reduced the number to 306 articles.

After filtering data that belongs to articles and reviews and conference articles, then apply limits to, we got 238 articles. In the last filtering, we select only English language articles. Finally, we got 232 articles, then exported in CSV format to obtain all the data which will be analysed with the help of VOSviewer and RStudio.

Keywords ('Globalisation' OR 'Transnational' OR 'Multiculturalism' AND 'Higher Education' OR 'University' OR 'Institutions') relates to higher education.

The globalisation of higher education is a multifaceted phenomenon encompassing various dimensions such as internationalisation, cross-border collaboration, cultural diversity and the role of educational institutions in a globalised world.

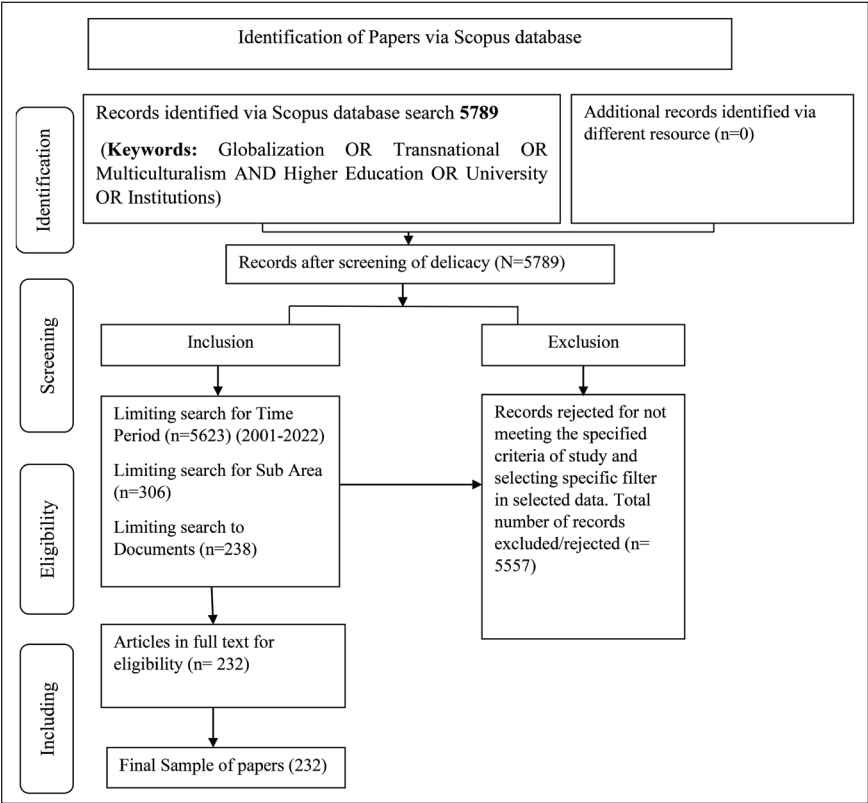


Figure 2. PRISMA Method Procedure for Identifying and Selecting the Documents.

Globalisation: This is the overarching concept that refers to the increasing interconnectedness and interdependence of countries and cultures around the world. In the context of higher education, globalisation involves the internationalisation of educational institutions, programmes and students. Citizens will have access to ever-greater educational options as a result of educational globalisation. Student mobility is one of the most obvious effects of globalisation (Ganaie & Mohi-Ud-Din, 2021).

Transnational: This term emphasises activities or phenomena that occur across national boundaries. In higher education, transnational initiatives might include partnerships between universities in different countries, joint research projects or the establishment of branch campuses abroad. Over the past 40 years, internationalisation has had a profoundly disruptive effect on higher education, affecting service delivery, research and teaching in numerous nations (Mittelmeier & Yang, 2022).

Multiculturalism: This refers to the coexistence and interaction of diverse cultural groups within a society or institution. In the context of higher education,

multiculturalism is relevant as universities strive to create inclusive environments that celebrate cultural diversity among students, faculty and staff. Due to the unprecedented effects of globalisation on higher education, educators and students must be ready to communicate in linguistically and culturally diverse settings both at home and abroad, in the classroom and in the workplace (Strotmann & Kunschak, 2022).

Higher education: This encompasses all forms of education beyond the secondary level, typically referring to colleges, universities and other post-secondary institutions. Globalisation in higher education involves international collaboration, mobility of students and scholars, and the global exchange of knowledge and ideas.

University: This specifically refers to institutions of higher learning that offer undergraduate and graduate education, research opportunities and sometimes professional training. Universities play a central role in the globalisation of higher education as they establish partnerships with foreign institutions attract international students and engage in global research collaborations.

Institutions: This term can encompass a wide range of organisations, including universities, colleges, research institutes and governmental bodies involved in education policy. In the context of globalisation, institutions shape and are shaped by international trends in higher education, including policies related to mobility, accreditation and funding.

Together, these keywords capture the diverse dimensions of globalisation in higher education, including international collaboration, cultural diversity, transnational mobility and the role of educational institutions in shaping and responding to global trends.

Sample Characteristics

A total of 232 articles are selected for analysis (Figure 3), which have been collected from 141 sources (articles, reviews etc.), and annual growth rate is 12.74%. The average citation per document is 18.36. These documents are authored by 486 researchers; there are 83 authors of single-authored documents, 16.38% international co-authorship and 2.31 co-authorship per documents. Eight hundred and 10 author's keywords found, and 11,443 is the number of references that have been cited in 232 articles.

Visualised map of countries: Figure 4 likely presents a geographical map that visually represents the countries involved in research on the globalisation of higher education. The visualisation might use different colours, shading or markers to indicate the level of involvement or significance of each country in this area of study. By portraying the global distribution of research activity, this map can offer insights into the geographical spread of scholarly interest and engagement in the topic.

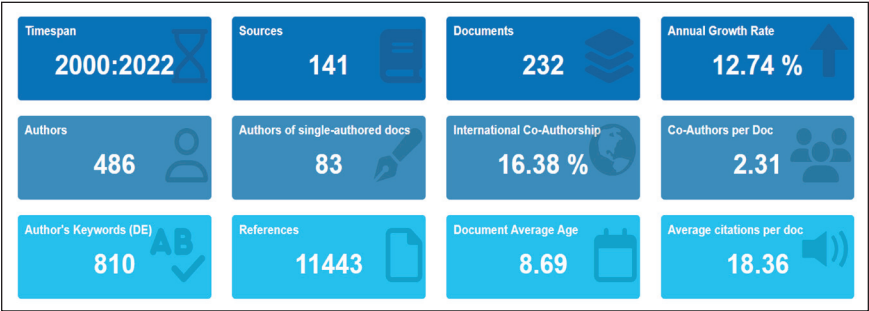


Figure 3. Main Information of the Dataset.

Source: R Studio.

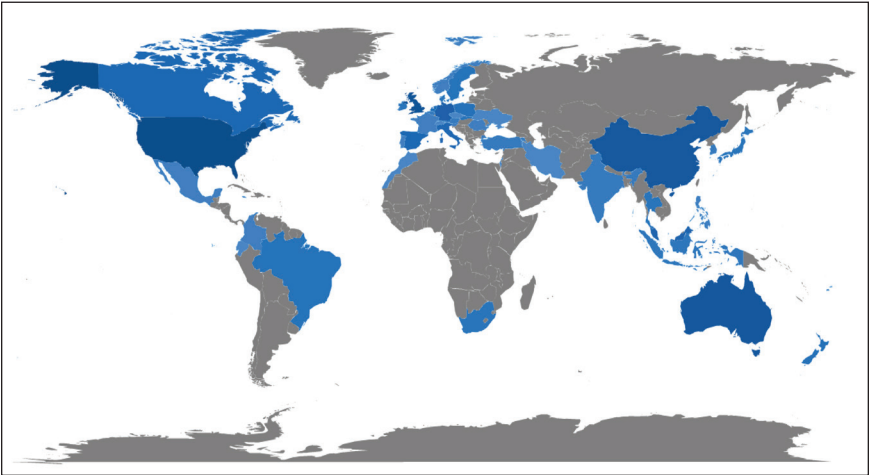


Figure 4. Country Scientific Production.

Source: R Studio.

Top 10 corresponding countries: Figure 5 lists the top 10 countries that are most prominently engaged in research on the globalisation of higher education. It likely provides numerical data or statistics regarding the contribution of each country to the body of literature in this field. This could include metrics such as the number of research articles published, citations received or funding allocated to related projects. By highlighting the leading contributors, Figure 5 offers valuable insights into the global landscape of research on higher education globalisation, shedding light on which countries are driving scholarly inquiry and innovation in this area.

Figure 6 presents the three-field analysis with keyword on the right, countries on the left and the authors on the middle side of the figure. This figure shows that Malaysia is the top most country working in the related field, then followed by Australia, the United Kingdom and Brazil. Top author is Canigha G., followed by Ku J. and Wilkins S. Then, top keywords are career development, multiculturalism and advising relationship.

region	Freq
USA	101
UK	64
AUSTRALIA	47
CHINA	45
GERMANY	29
MALAYSIA	22
ITALY	16
CANADA	15
SPAIN	15
NETHERLANDS	9

Figure 5. Top 10 Most Influencing Countries.

Source: R Studio.

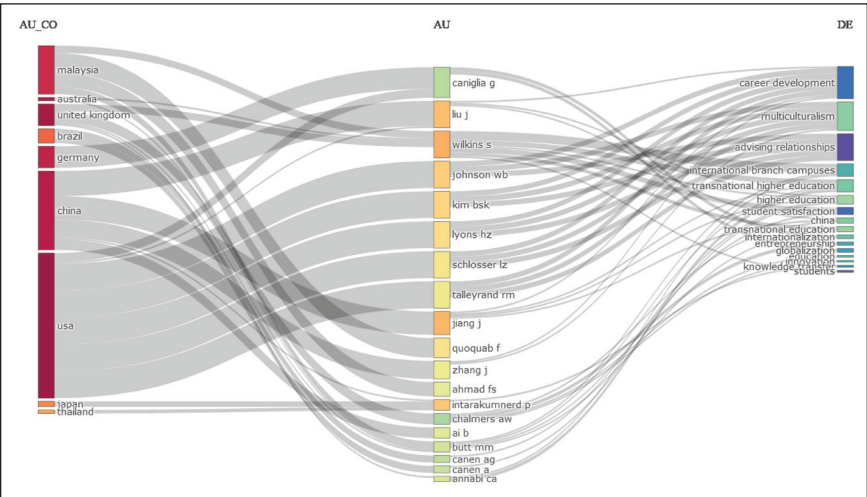


Figure 6. Three-field Plots of Authors, Countries and Keywords.

Source: R Studio.

Figures 7 and 8 show the graphical representation of most relevant affiliation. Most relevant affiliations explain university or institution that are closely related to their current field of work or research. Top three most relevant affiliations are Auckland University of Technology with six articles, Leuphana University Luneburg with five articles and Plymouth University with five articles.

Corresponding Author’s Country: The corresponding author of a scholarly publication is the individual who is primarily responsible for communicating with

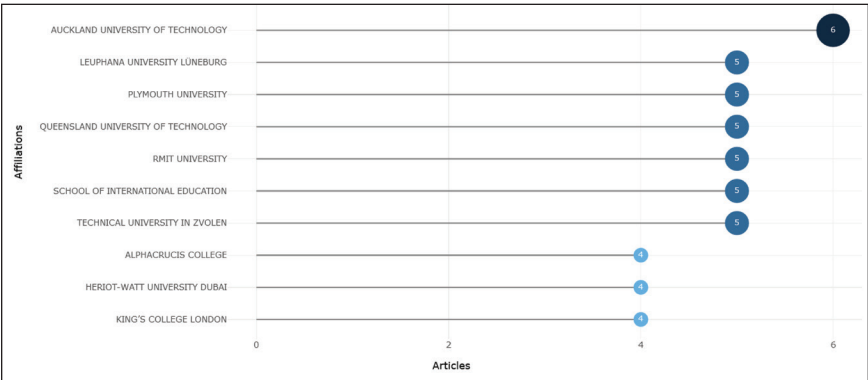


Figure 7. Most Relevant Affiliation.

Source: R Studio.

Affiliation	Articles
AUCKLAND UNIVERSITY OF TECHNOLOGY	6
LEUPHANA UNIVERSITY LÜNEBURG	5
PLYMOUTH UNIVERSITY	5
QUEENSLAND UNIVERSITY OF TECHNOLOGY	5
RMIT UNIVERSITY	5
SCHOOL OF INTERNATIONAL EDUCATION	5
TECHNICAL UNIVERSITY IN ZVOLEN	5
ALPHACRUCIS COLLEGE	4
HERIOT-WATT UNIVERSITY DUBAI	4
KING'S COLLEGE LONDON	4

Figure 8. Top 10 Most Relevant Affiliation.

Source: R Studio.

the journal editors, handling correspondence related to the submission and review process and ensuring that all authors approve the final version of the manuscript before publication. The corresponding author’s country refers to the geographical location where this author is based, typically representing their institutional affiliation or place of employment.

Publication By-line: The publication’s by-line, mentioned in the statement, is the section at the beginning of a research article that lists the names of all the authors, along with their respective affiliations and contact information. This information provides readers with crucial details about the authors’ institutional affiliations and locations, including the corresponding author’s country.

Graphical representation: Figures 9 and 10 likely present a graphical representation of data related to the corresponding author’s country across a set of academic publications. The graph may depict the distribution of corresponding authors by country, highlighting the top contributors and their respective article

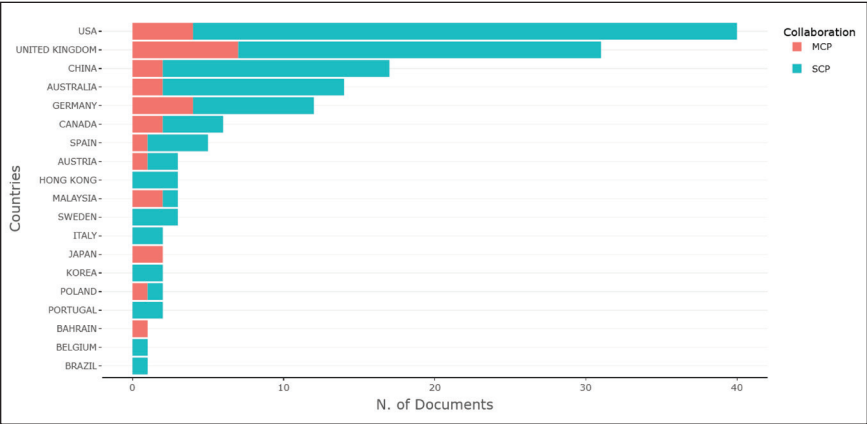


Figure 9. Corresponding Author’s Country.

Source: R Studio.

Country	Articles	SCP	MCP	Freq	MCP_Ratio
	65	57	8	0.280	0.123
USA	40	36	4	0.172	0.100
UNITED KINGDOM	31	24	7	0.134	0.226
CHINA	17	15	2	0.073	0.118
AUSTRALIA	14	12	2	0.060	0.143
GERMANY	12	8	4	0.052	0.333
CANADA	6	4	2	0.026	0.333
SPAIN	5	4	1	0.022	0.200
AUSTRIA	3	2	1	0.013	0.333
HONG KONG	3	3	0	0.013	0.000

Figure 10. Top 10 Corresponding Author’s Country.

Source: R Studio.

counts. This visualisation offers valuable insights into the geographical distribution of scholarly contributions within a particular field or research domain.

Specific data: The statement provides specific data from Figure 9, focusing on the top three corresponding author’s countries:

- (1) USA (the United States of America) with 40 articles: The United States is a leading contributor to academic research across various disciplines. With 40 articles, it indicates a significant presence of corresponding authors based in the USA, highlighting the country’s prominent role in the field under consideration.
- (2) United Kingdom with 31 articles: The United Kingdom is renowned for its contributions to scholarly research and academic publishing. With 31 articles, it demonstrates a substantial representation of corresponding

- authors affiliated with institutions in the United Kingdom, reflecting the country’s engagement in the research area examined.
- (3) China with 17 articles: China’s emergence as a major player in global research and innovation is reflected in its representation among corresponding authors. With 17 articles, it signifies a notable presence of Chinese researchers contributing to the body of literature in the field, underscoring the country’s growing influence in academic publishing.

Bradford’s law is often used in research to help identify core journals in a field, which are likely to publish the most important and influential research. Researchers may use Bradford’s law to develop a list of key journals to search when conducting a literature review or to determine which journals to target when submitting their own research for publication. Figure 11 represents the graphical representation of Bradford’s law and Figure 12 represents the table of top 10 source clustering through Bradford’s law.

Most relevant journals: The term ‘most relevant journals’ refers to scholarly or academic publications that hold significant authority and prestige within a specific discipline or field of study (Figure 13). These journals are highly respected by researchers and scholars due to their rigorous peer-review process, high editorial standards and the quality of the research they publish. Authors often target these journals to disseminate their research findings to a wide audience of peers and experts in the field.

Figure 14 likely presents data or information regarding the most relevant journals in a particular research domain. It may include metrics such as the number of articles published by each journal, citations received, impact factors or other indicators of influence and importance within the field. Examples: The statement provides specific examples of journals that are considered the most relevant in the context of research related to a particular topic or field.

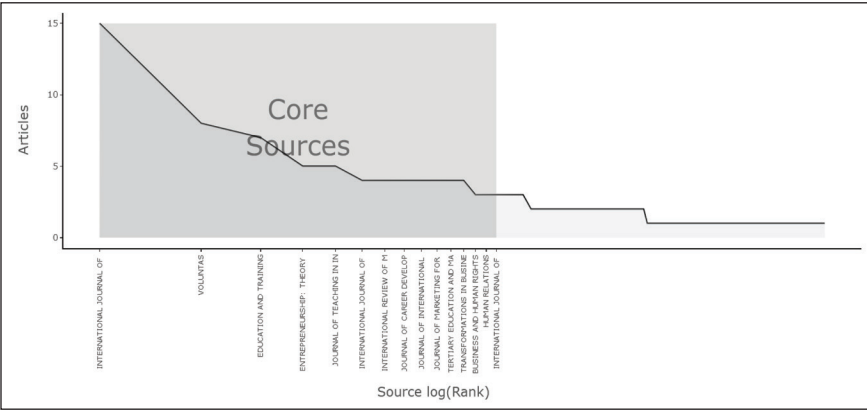


Figure 11. Source Clustering Through Bradford’s Law.

Source: R Studio.

SO	Rank	Freq	cumFreq	Zone
INTERNATIONAL JOURNAL OF EDUCATIONAL MANAGEMENT	1	15	15	Zone 1
VOLUNTAS	2	8	23	Zone 1
EDUCATION AND TRAINING	3	7	30	Zone 1
ENTREPRENEURSHIP: THEORY AND PRACTICE	4	5	35	Zone 1
JOURNAL OF TEACHING IN INTERNATIONAL BUSINESS	5	5	40	Zone 1
INTERNATIONAL JOURNAL OF INTERCULTURAL RELATIONS	6	4	44	Zone 1
INTERNATIONAL REVIEW OF MANAGEMENT AND MARKETING	7	4	48	Zone 1
JOURNAL OF CAREER DEVELOPMENT	8	4	52	Zone 1
JOURNAL OF INTERNATIONAL EDUCATION IN BUSINESS	9	4	56	Zone 1
JOURNAL OF MARKETING FOR HIGHER EDUCATION	10	4	60	Zone 1

Figure 12. Top 10 Source Clustering Through Bradford’s Law Table.

Source: R Studio.

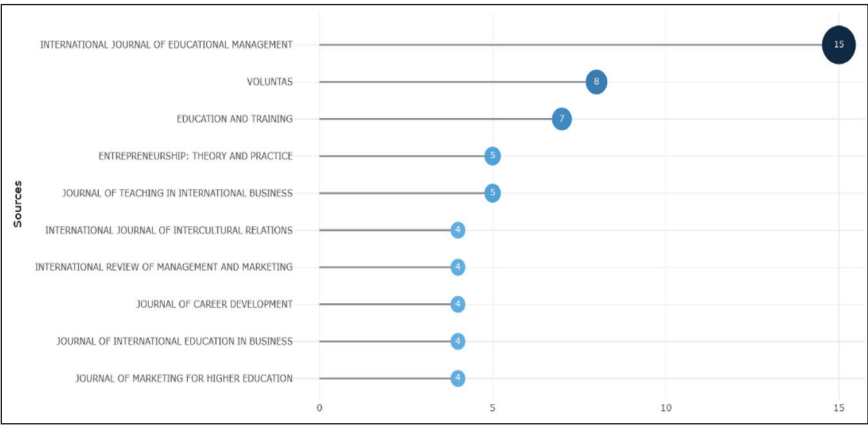


Figure 13. Main Relevant Sources.

Source: R Studio.

Sources	Articles
INTERNATIONAL JOURNAL OF EDUCATIONAL MANAGEMENT	15
VOLUNTAS	8
EDUCATION AND TRAINING	7
ENTREPRENEURSHIP: THEORY AND PRACTICE	5
JOURNAL OF TEACHING IN INTERNATIONAL BUSINESS	5
INTERNATIONAL JOURNAL OF INTERCULTURAL RELATIONS	4
INTERNATIONAL REVIEW OF MANAGEMENT AND MARKETING	4
JOURNAL OF CAREER DEVELOPMENT	4
JOURNAL OF INTERNATIONAL EDUCATION IN BUSINESS	4
JOURNAL OF MARKETING FOR HIGHER EDUCATION	4

Figure 14. List of Most Relevant Journals.

Source: R Studio.

Let us examine the examples given: *International Journal of Educational Management* (15 articles):

This journal focuses on issues related to educational management, including organisational leadership, policy, administration and governance in educational institutions. With 15 articles, it appears to be the most prominent journal in the field, indicating its significance as a forum for publishing research in educational management (Table 1).

Voluntas (eight articles): Voluntas is a scholarly journal that focuses on the study of voluntary action, philanthropy and non-profit organisations. With eight articles, it holds a notable presence in the field of voluntary sector studies, suggesting its importance as a platform for publishing research on philanthropy and non-profit management.

Education and Training (seven articles): Education and Training is likely another journal specialising in issues related to education, training and professional development. With seven articles, it is recognised as a significant publication in the field, offering researchers a platform to disseminate research on various aspects of education and training.

A tree map is a visualisation tool that is commonly used in research to display hierarchical data (Figure 15). It is a type of treemap chart that represents data in a rectangular layout. Figure 16 shows the keyword and frequency of the most frequent keyword. The word curricula has six frequency (4% contribution), higher education has six frequency (4% contribution) and innovation with five frequency (4% contribution).

Co-authorship Analysis by Authors

Co-authorship analysis involves examining and measuring the collaboration between authors, institutions and countries to assess their interconnectedness. Figure 17 illustrates the co-authorship network among authors, showing a total of 485 authors, 199 clusters, 597 links and a total link strength of 629. The top three most productive authors are Caniglia G., with two documents, 92 citations and a link strength of 15; John B., also with two documents, 92 citations and a link strength of 15; and Wiek A., with two documents, 92 citations and a link strength of 15 (Caniglia et al., 2018).

In the context of institutions (Figure 18), there are total 428 universities, 217 clusters, 387 links and 393 total link strengths. The top three institutions are Chuvash Pedagogical University, Russia with two documents, 24 citations, 12 total link strength, three clusters and 10 links, Department of Psychology, Loyola University, Baltimore, United States with three documents, 56 citations, two clusters, 12 total link strength and 10 links and Kazan State University of Architecture and Engineering, Kazan, Russian Federation with two documents, 56 citations, 12 total link strength, three clusters and 10 links.

Table 1. Descriptive Data of Latest 15 Studies (2021 and 2022).

Citations	Year	Country	Research Design	Research Methodology	Variable	Outcome
Sierra et al. (2022)	2022	Spain	Empirical study	Review-based study	Higher education and internationalisation	The (virtual exchange) VE was seen by the students as being extremely valuable, improving their overall learning and promoting internationalisation while also adding to their educational experience
Lewis et al. (2022)	2022	New Zealand	Autoethnography study	Review-based study	Higher education immigrant academics	This study found that during COVID-19, immigrants reported stress level
Otten et al. (2022)	2022	USA	Qualitative study	25 Semi-structured interview	Social innovation education	This empirical study looks at a special curriculum and instructional innovation. For educators and organisations hoping to incorporate inclusion, diversity and equality objectives into social innovation programmes, the analysis yielded fresh ideas
Azaza and Zinoubi (2022)	2022	UAE	Quantitative study (secondary data)	Analytical review	Transnational education	The study's conclusions suggest that economics is a major driving force for international education in the United Arab Emirates. More precisely, it was said that the creation of international branch campuses or IBCs was seen as a workable way to diversify the nation's economic source of income

Tharapos and O'Connell (2022)	2022	Australia	Qualitative study	Focus group	Transnational education	The results demonstrate how (transnational education) TNE students' identities are formed via ongoing dialogic process of negotiation and mediation between their pre-professional identities as accountants, institutional expectations, their own and other people's cultural values and presumptions and past and present pedagogical practices We conclude that our method to (action learning) AL is useful for the professional growth of teachers and provide our justification for why this specific AL practice is appropriate for teaching multidisciplinary courses, the Confucian culture and new scenarios
Li and Eryong (2022)	2022	USA	Evidence-based study	Question-based inquiry	Action learning and transnational universities	The study's conclusion shows that the Korean Student Association Olympics (KSA Olympics) gave Korean Americans a place to create identity and foster personal growth, both of which aid in resolving identity crises
Kim and Chepyator-Thomson (2022)	2022	USA	Experience-based study	Thematic analysis	Transnational engagement (globalisation)	

(Table 1 continued)

(Table 1 continued)

Citations	Year	Country	Research Design	Research Methodology	Variable	Outcome
Schulze and Kleibert (2021)	2021	Germany	Comparative case analysis	42 Semi-structured interview	Higher education system and transnational education	It concludes that despite the two states' seemingly comparable goals of luring in foreign universities, their approaches and results are very different. In contrast, a structural coupling in Malaysia allowed foreign companies to offer foreign degrees to local students and make money in the private higher education market
Roorda and Leader (2021)	2021	The United Kingdom	Qualitative study	Observational study	Culturally diverse university	This study makes the case that in order to better meet the needs of the modern world, the self-oriented symmetrical side of the ODC scale should be integrated with its other-oriented approach. The result of this study is extremely important since success in modern society requires young adults to be accepting of variety
Oliveira et al. (2021)	2021	Portugal	Empirical study	Ethnography case study	Regional innovation ecosystem (higher education institutions)	The empirical contribution of this study is to encourage a more thorough examination of the institutional and economic factors that may obstruct international collaboration in the education sector and consequently reduce that sector's ability to generate knowledge spillovers and promote sustainable regional development



Figure 15. Tree Map.
Source: R Studio.

Terms	Frequency
curricula	6
higher education	6
innovation	5
multiculturalism	5
nongovernmental organization	5
teaching	5
civil society	4
students	4
sustainable development	4
united states	4

Figure 16. Table of TreeMap.

Source: R Studio.

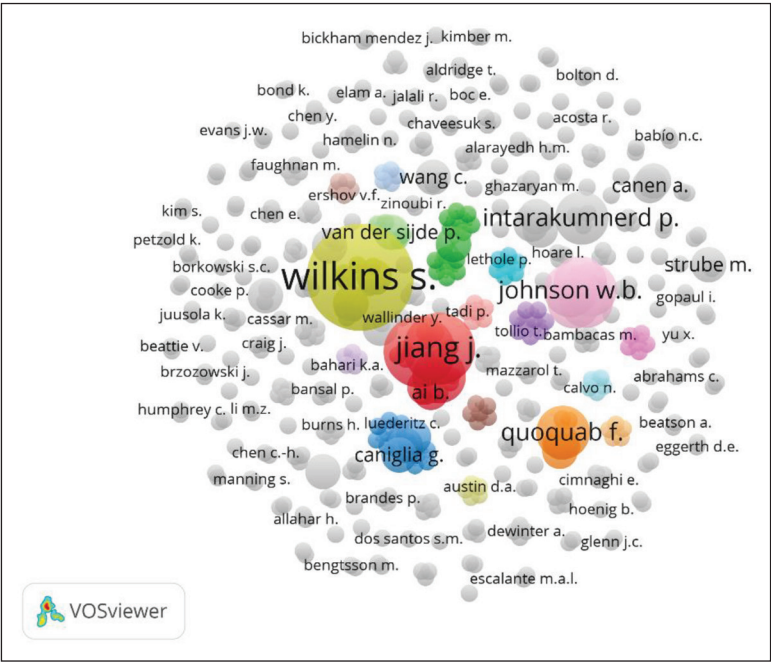


Figure 17. Co-authorship Analysis by Authors.

Source: VOSviewer.

Co-authorship Analysis by Countries

Figure 19 analyses international collaboration by examining how countries are working together to publish articles on the globalisation of higher education.

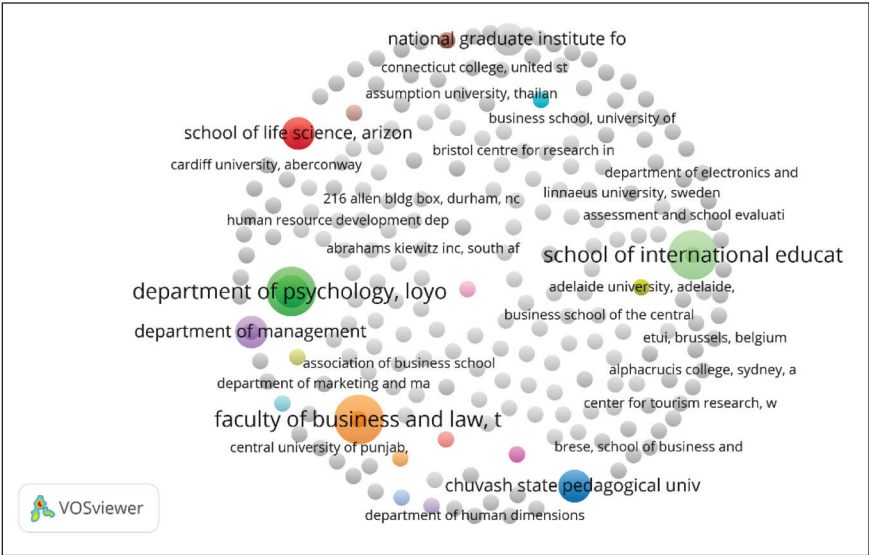


Figure 18. Co-authorship Analysis by Institutions.

Source: VOSviewer.

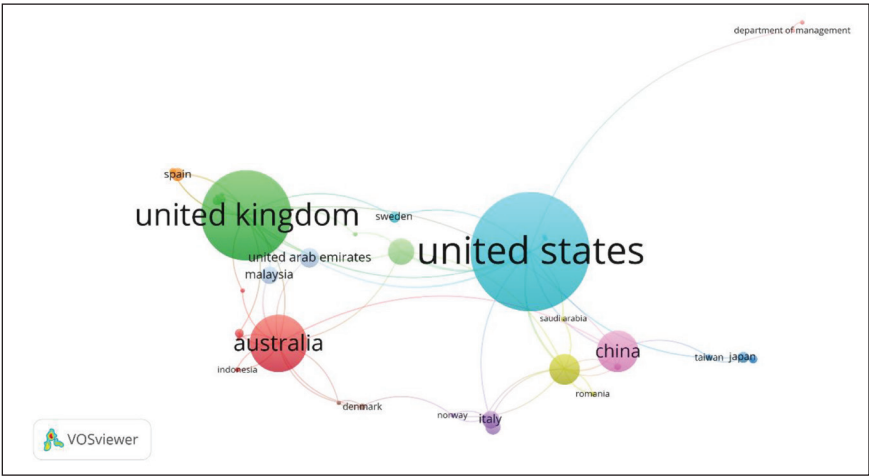


Figure 19. Co-authorship Analysis by Countries.

Source: VOSviewer.

The analysis includes a total of 43 countries, 12 clusters, 75 links and a total link strength of 91. The United Kingdom leads with 41 documents, 1,255 citations, a link strength of 21 and 17 links. The United States follows with 54 documents, 1,497 citations, a link strength of 19 and 12 links. Australia ranks third with 26 documents, 373 citations, a link strength of 15 and 13 links.

Citation Analysis

Citation analysis measures how many times articles, authors, journals, institutions and nations cite each other to assess the strength of their linkages.

In Figure 20, for countries’ citation analysis, there are total 485 items, 377 clusters, 324 links and 338 total link strengths. Top three authors have more citations, Wilkins S. with six documents, 209 citations, 25 total links strength, five clusters and 23 links, Caniglia G. with two documents, 92 citations, 22 total link strength and 18 links, and John B. with two documents, 92 citations, 22 total link strength and 18 links.

In Figure 21, there are total 15 documents, six clusters and 14 links. Top three documents are ‘assessing satisfaction in transactional higher education’; author

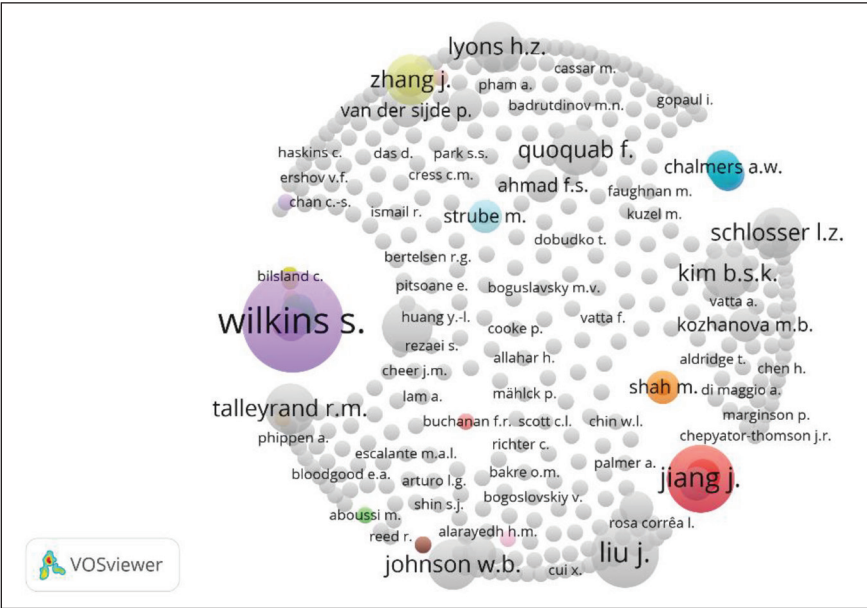


Figure 20. Citation Analysis by Authors.

Source: VOSviewer.

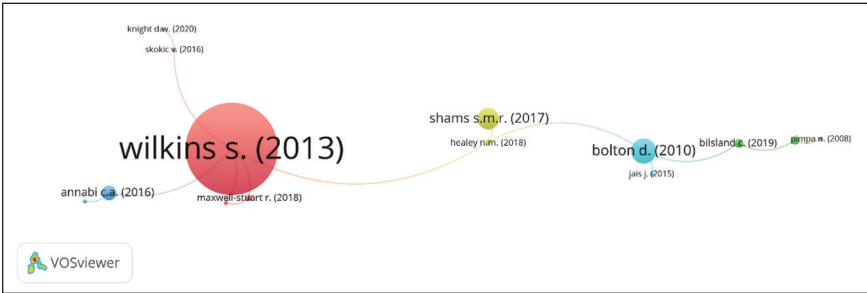


Figure 21. Citation Analysis by Documents.

Source: VOSviewer.

of this document is Wilkins S. with 128 citations and five links, 'creating value in transactional higher education: the role of stakeholder management'; author of this document is Bolton D. with 35 citations, six clusters and three links and 'transactional education and total quality management: a stakeholder-centred model'; and author of this document is Shams S. M. R. with 30 citations, four clusters and one link (Shams, 2017).

Discussion

Research methodology: The study employs bibliographic review, VOSviewer and RStudio as tools for analysing the globalisation of higher education. These tools enable the analysis of citation patterns, authorship trends, publication volumes and the origin of instructional materials using data from the Scopus database.

Emerging major clusters: Major clusters of authors, journals, nations, articles and institutions are identified in the study. However, these networks are dispersed across additional networks beyond the primary clusters, suggesting the complexity and interconnectedness of research in this field.

Scope for further research: Despite the existence of major clusters, there remains significant scope for new or additive research on globalisation of higher education. Prospective authors are encouraged to explore new avenues, indicating that the field is still in its early stage of development.

Interdisciplinary nature: The study highlights the interdisciplinary nature of research on the globalisation of higher education. Researchers from various disciplines, including business management, sociology and finance, contribute to understanding this field.

Contribution to literature: The study contributes to the literature by providing an overview of research trends in the globalisation of higher education. It aims to assist business management and other researchers in identifying areas requiring further research and in evaluating theory development.

SSS: The findings suggest that the globalisation of higher education is a dynamic and evolving field with opportunities for interdisciplinary collaboration and new research directions. The bibliometric analysis conducted in the study offers insights that can inform future research agendas and contribute to theoretical advancements in the field.

In summary, the findings indicate the complexity of the globalisation of higher education and highlight the need for continued research and interdisciplinary collaboration to advance understanding in this area. The study aims to provide valuable insights for researchers and practitioners seeking to contribute to the literature and inform future research agendas.

Limitations of This Study

This study relies solely on the Scopus database and is restricted to the subject areas of business management and accounting. It includes only English language articles. As a result, the findings may not fully represent all research in the field of globalisation of higher education, as other databases such as Web of Science and J-Gate were not considered. The study encompasses only articles, conference articles and review articles on the topic. This analysis may be less useful for researchers without access to Scopus, as it is not open-access software. Additionally, the use of VOSviewer software is crucial for this analysis, and an understanding of VOSviewer is necessary to replicate it. We hope this study will help set the agenda for future research in the field of globalisation of higher education.

Declaration of Conflicting Interests

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Emotional Stability: Unravelling the Antecedents of University Students' Mental Well-being

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Abstract

This article explores the complex realm of emotional stability among university students and aims to unravel the underlying factors that influence their mental well-being. Recognising the importance of emotional stability in promoting positive psychological health, the study investigates various antecedents that contribute to this aspect of well-being. Through a comprehensive exploration of existing literature and empirical evidence, the article examines the role of individual characteristics, social support systems, academic pressures and coping mechanisms in shaping emotional stability among university students. By understanding these antecedents, educators, mental health professionals, and policymakers can devise effective strategies and interventions to support students in cultivating emotional resilience and maintaining optimal mental well-being throughout their college journey. This article contributes to the existing body of knowledge on emotional stability, offering valuable insights into the multifaceted nature of university students' mental health and the determinants that can impact their emotional well-being.

Keywords

Emotional stability, psychological well-being, university students

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Introduction

Background and Significance of Emotional Stability among University Students

Emotional stability plays a crucial role in the overall well-being and success of university students (Hamaideh, 2016). The transition to higher education brings about numerous challenges and stressors that can significantly impact their mental health (Auerbach et al., 2018). Understanding and promoting emotional stability among students has become an essential concern for educational institutions, mental health professionals and policymakers (Stallman, 2018). This introduction provides a background on the significance of emotional stability among university students and highlights the need to unravel the antecedents that influence their mental well-being.

University life presents a unique set of stressors and demands that can trigger emotional instability (Beiter et al., 2015). Students experience a multitude of academic pressures, such as high workload, demanding assignments and competitive environments (Leppink et al., 2016). Additionally, they face various social and personal challenges, including adjusting to new social circles, forming identity and managing financial responsibilities (Arnett, 2016). All these factors contribute to an intricate interplay that affects the emotional stability of students.

Emotional stability, defined as the ability to regulate and manage emotions effectively, is closely associated with mental well-being (Gross & John, 2017). It encompasses an individual's capacity to cope with stress, handle conflicts, maintain positive relationships and adapt to changing circumstances (Southwick et al., 2016). Students with higher levels of emotional stability are more likely to experience lower levels of anxiety, depression and psychological distress, while also demonstrating better academic performance and overall satisfaction with university life (Hamaideh, 2016).

Recognising the importance of emotional stability, universities and educational institutions are increasingly emphasising holistic approaches to student development (Stallman, 2018). By fostering emotional stability, universities aim to create supportive environments that promote student success, resilience and overall mental well-being (Conley et al., 2017). However, to effectively address emotional stability among university students, it is crucial to unravel the antecedents that shape their emotional well-being (Auerbach et al., 2018).

This article aims to contribute to the existing body of knowledge on emotional stability by exploring the various factors that influence the emotional well-being of university students (Leppink et al., 2016). Through a comprehensive review of the literature, this study seeks to uncover the individual characteristics, social support systems, academic pressures, and coping mechanisms that significantly impact emotional stability (Southwick et al., 2016). By understanding these antecedents, educators, mental health professionals, and policymakers can develop targeted strategies and interventions to support students in cultivating emotional resilience and maintaining optimal mental well-being throughout their college journey (Conley et al., 2017).

In summary, emotional stability holds great significance in the lives of university students (Hamaideh, 2016). It affects their overall mental well-being, academic performance and successful adaptation to the challenges of university life (Auerbach et al., 2018). By delving into the antecedents that influence emotional stability, this study aims to provide valuable insights that can inform the development of effective support systems and interventions for promoting emotional well-being among university students (Stallman, 2018).

The Concept of Emotional Stability and Its Relevance to Mental Well-being

Emotional stability is a fundamental aspect of human functioning that holds great relevance to mental well-being (Smith et al., 2020). It encompasses an individual's ability to regulate and manage emotions effectively, maintain a sense of equilibrium and respond resiliently to life's challenges (Jones & Heim, 2019). Within the context of university students, emotional stability plays a crucial role in their overall adjustment, academic performance and overall mental health (Chen et al., 2021). Therefore, understanding the concept of emotional stability and its impact on mental well-being is of paramount importance (Nguyen et al., 2020).

At its core, emotional stability reflects an individual's capacity to experience and express emotions in a balanced manner (Parker et al., 2019). It involves a range of factors, including emotional resilience, emotional intelligence and the ability to cope with stressors effectively (Sulaiman et al., 2020). University students face a multitude of stressors and demands as they navigate the transition into higher education (Alonso et al., 2020). Academic pressures, social adjustments, financial burdens and personal expectations can all contribute to emotional instability if not effectively managed (Khan et al., 2021).

The concept of emotional stability is closely intertwined with mental well-being (Zhang et al., 2020). Mental well-being encompasses not only the absence of mental illness but also the presence of positive psychological functioning (Wang et al., 2019). Emotional stability acts as a protective factor against mental health challenges such as anxiety, depression and psychological distress (Liu et al., 2021). Students who possess higher levels of emotional stability are better equipped to handle the various stressors they encounter during their university years, leading to improved mental health outcomes and overall life satisfaction (Gupta et al., 2020).

Understanding the concept of emotional stability among university students requires a multidimensional perspective (Martínez-Monteaudo et al., 2019). It involves exploring various theoretical frameworks and models that provide insights into the factors influencing emotional stability and its subsequent impact on mental well-being (Bakker et al., 2020). The five-factor model of personality, transactional model of stress and coping, social support theory, and resilience theory is among the theoretical frameworks that offer valuable insights into the complex nature of emotional stability (Sarid et al., 2021).

The five-factor model (FEM) posits that emotional stability is one of the core dimensions of personality, highlighting its enduring nature and influence on individual behaviour and psychological well-being (McCrae & Costa, 2020). The transactional model of stress and coping emphasises the role of cognitive appraisal and coping strategies in shaping emotional stability among university students (Lazarus & Folkman, 2019). Social support theory underscores the significance of social connections and support networks in promoting emotional well-being (Cohen & Wills, 2020). Finally, resilience theory underscores the importance of individual strengths and coping mechanisms in maintaining emotional stability in the face of adversity (Masten, 2020).

By delving into the concept of emotional stability and its relevance to mental well-being among university students, this study aims to shed light on the intricate interplay between these factors (Alsubaie et al., 2021). It seeks to explore the antecedents that shape emotional stability, including individual characteristics, social support systems, academic pressures and coping mechanisms (Yusoff et al., 2020). Through a comprehensive examination of existing literature and empirical evidence, this research aims to uncover valuable insights that can inform the development of targeted strategies and interventions to support university students in cultivating emotional resilience and maintaining optimal mental well-being throughout their college journey (Karaman et al., 2021).

By delving, emotional stability stands as a significant determinant of mental well-being among university students (Rodríguez et al., 2020). The concept encompasses various dimensions, including emotional resilience, regulation and coping abilities (Sánchez-Álvarez et al., 2021). Understanding the factors that influence emotional stability is crucial for supporting students' mental health and fostering positive adaptation to the challenges of university life (Alzahrani et al., 2020). By examining the concept of emotional stability and its relevance to mental well-being within the context of university students, this study contributes to the existing body of knowledge and provides valuable insights that can inform interventions and support systems aimed at enhancing students' emotional well-being (García et al., 2021).

Theoretical Perspectives and Models Related to Emotional Stability and Students' Mental Well-being

Understanding the complex relationship between emotional stability and students' mental well-being requires a consideration of various theoretical perspectives and models that provide insights into this dynamic interplay. The following are some key theoretical perspectives and models that are relevant to the study of emotional stability and its impact on students' mental well-being.

FEM of Personality

The FEM, also known as the big five, is a prominent theoretical framework in psychology that identifies five fundamental dimensions of personality: extraversion, neuroticism (reverse-scored as emotional stability), openness, agreeableness and

conscientiousness. Within this model, emotional stability is conceptualised as the opposite of neuroticism. According to the FFM, individuals high in emotional stability tend to experience less emotional volatility, anxiety and stress. This model provides a foundation for understanding the role of personality traits in influencing emotional stability and its implications for students' mental well-being.

Transactional Model of Stress and Coping

The transactional model of stress and coping, proposed by Lazarus and Folkman, focuses on the interaction between individuals and their environment in the appraisal and management of stress. According to this model, individuals' emotional stability and mental well-being are shaped by their cognitive appraisal of stressors and the coping strategies they employ. Appraisal processes, such as primary appraisal (evaluating the significance of a stressor) and secondary appraisal (assessing one's ability to cope), influence emotional responses and subsequent mental well-being outcomes. Exploring this model can provide insights into how students perceive and navigate stressors, as well as the strategies they employ to maintain emotional stability and mental well-being.

Social Support Theory

Social support theory emphasises the role of social relationships in promoting emotional stability and mental well-being. It posits that social support, including emotional, instrumental and informational support from family, friends and peers, can buffer the impact of stressors and enhance individuals' ability to cope with challenges. Social support provides a sense of belonging, validation and reassurance, which contributes to emotional stability and psychological well-being. Examining this theory helps illuminate the importance of social connections and supportive networks in fostering students' emotional stability and mental well-being.

Resilience Theory

Resilience theory explores the ability of individuals to adapt and bounce back from adversity. It recognises that emotional stability and mental well-being are not solely determined by the absence of stressors but also by the presence of protective factors and coping mechanisms. Resilience factors, such as self-esteem, optimism, problem-solving skills and social support, play crucial roles in promoting emotional stability and psychological well-being. Understanding resilience theory can offer valuable insights into how students can cultivate and enhance their emotional stability, thereby bolstering their mental well-being in the face of challenges.

By drawing upon these theoretical perspectives and models, researchers can delve into the complexities of emotional stability and its relationship to students' mental well-being. These frameworks provide a lens through which to examine the underlying mechanisms, antecedents and outcomes associated with emotional stability. By incorporating these perspectives into research, interventions and support systems, educators, mental health professionals and policymakers can develop effective strategies to promote emotional stability and enhance students' overall mental well-being.

Discussions and Interventions

Discussion of the Identified Antecedents Influencing Emotional Stability

Personality Traits

Individual differences in personality traits significantly influence emotional stability and students' well-being. Traits such as neuroticism (low emotional stability), extraversion, conscientiousness, agreeableness and openness to experience can impact how students perceive and respond to stressors. High levels of neuroticism, for example, may lead to greater emotional instability and vulnerability to negative emotions, while traits like extraversion and conscientiousness may promote emotional stability and resilience.

Self-esteem and Self-efficacy

Self-esteem, which refers to an individual's overall evaluation of their self-worth, and self-efficacy, which reflects one's belief in their ability to accomplish tasks and overcome challenges, play vital roles in emotional stability and students' well-being. Students with high self-esteem and self-efficacy are more likely to experience greater emotional stability, handle stressors effectively and maintain positive mental well-being.

Social Support

The presence of strong social support systems, including family, friends and peer relationships, has a significant impact on emotional stability and students' well-being. Positive and nurturing relationships provide emotional validation, understanding and a sense of belonging, which contribute to emotional stability. Conversely, a lack of social support or negative social interactions can increase emotional instability and negatively affect well-being.

Academic Pressures

Academic pressures, such as high workloads, competition, performance expectations and fear of failure, can significantly influence emotional stability and students' well-being. Excessive academic stress can lead to heightened emotional reactivity, anxiety and decreased emotional stability. Balancing academic demands with effective stress management and self-care strategies is crucial for maintaining emotional stability and promoting well-being.

Coping Mechanisms

The coping mechanisms students employ in response to stressors and challenges greatly impact their emotional stability and well-being. Adaptive coping strategies, such as problem-solving, seeking social support, positive reframing and engaging in self-care activities, enhance emotional stability and foster psychological resilience. Conversely, maladaptive coping strategies, such as avoidance, substance use and self-destructive behaviours, can undermine emotional stability and contribute to poor mental well-being.

Mindfulness and Emotional Regulation

Mindfulness, the practice of intentionally paying attention to the present moment without judgement, and emotional regulation skills are crucial for maintaining emotional stability and promoting students' well-being. Mindfulness enhances self-awareness, emotional resilience and the ability to manage and regulate emotions effectively. Students who possess mindfulness skills are better equipped to navigate stressors, reduce emotional reactivity and maintain emotional stability.

Cultural and Environmental Factors

Cultural and environmental factors can influence emotional stability and students' well-being. Cultural norms, beliefs and values shape individuals' emotional experiences and expression. Environmental factors, such as socio-economic status, access to resources and exposure to violence or trauma, can significantly impact emotional stability. Recognising and addressing these contextual factors is important in promoting emotional stability and fostering students' well-being.

By considering these antecedents that influence emotional stability, educators, mental health professionals and policymakers can develop targeted interventions and support systems to enhance emotional well-being among students. Strategies that promote self-esteem, self-efficacy, social support, adaptive coping skills, mindfulness and a supportive academic environment can contribute to fostering emotional stability and ultimately improve students' overall well-being.

Recommendations and Suggestions

Practical Recommendations for Universities and Educational Institutions

Promote Emotional Intelligence and Resilience Skills

Universities and educational institutions should incorporate programmes and initiatives that foster emotional intelligence and resilience skills among students. This can include workshops, courses or extracurricular activities that provide opportunities for students to develop self-awareness, emotional regulation, effective coping strategies and problem-solving skills. These skills can enhance emotional stability and equip students with the tools to navigate challenges and maintain positive mental well-being.

Create a Supportive and Inclusive Campus Environment

It is essential for universities to cultivate a supportive and inclusive campus environment that promotes emotional well-being. This can be achieved by implementing policies and practices that address the stigma surrounding mental health, providing access to confidential counselling services and establishing peer support programmes. By creating a culture of acceptance, understanding and support,

universities can contribute to a positive emotional climate and enhance students' emotional stability.

Integrate Stress Management and Self-care Programmes

Universities should offer stress management and self-care programmes to help students develop healthy coping mechanisms and prioritise their well-being. These programmes can include mindfulness-based interventions, relaxation techniques, time management workshops and promoting physical activity and healthy lifestyle habits. By providing students with tools and resources to manage stress effectively, universities can support their emotional stability and overall mental well-being.

Enhance Academic Support and Guidance

Educational institutions should prioritise academic support and guidance to alleviate academic pressures and promote emotional stability. This can involve offering academic advising, study skills workshops and tutoring services to help students manage their workload, set realistic goals and develop effective study habits. By providing comprehensive academic support, universities can reduce stressors that contribute to emotional instability and enhance students' overall well-being.

Foster Peer Support Networks

Facilitating peer support networks and student communities can play a significant role in enhancing emotional stability. Universities can establish student-led support groups, mentorship programmes and social events that foster a sense of belonging and connectedness among students. Peer support networks provide opportunities for students to share experiences, seek advice and offer support, contributing to their emotional well-being and promoting a sense of community.

Train Faculty and Staff on Mental Health Awareness

Educational institutions should provide training and resources for faculty and staff to increase their awareness and understanding of mental health issues. This can enable them to identify signs of emotional distress among students, offer appropriate support and refer them to relevant resources when needed. Faculty and staff members can play a vital role in creating a supportive and nurturing environment that promotes emotional stability and well-being.

By implementing these practical recommendations, universities and educational institutions can contribute to the emotional stability and overall mental well-being of their students. By prioritising emotional intelligence, resilience, supportive environments, stress management, academic support, peer networks and mental health awareness, educational institutions can create an environment that fosters emotional stability and empowers students to thrive academically, personally and emotionally.

Strategies for Enhancing Emotional Stability and Mental Well-being among Students

Promote Mental Health Awareness

Educate students about mental health, its importance and available resources. Conduct awareness campaigns, workshops and seminars to reduce stigma and increase help-seeking behaviours. Foster a campus culture that prioritises mental well-being and encourages open discussions about emotions and mental health.

Provide Accessible Counselling Services

Ensure students have easy access to confidential and affordable counselling services on campus. Offer individual counselling, group therapy and crisis intervention support. Train counsellors to address a wide range of mental health concerns and provide culturally sensitive care.

Foster Positive Relationships and Social Connections

Encourage students to build strong social connections by organising social events, clubs and extracurricular activities. Promote inclusive and supportive environments that foster a sense of belonging and reduce feelings of isolation. Facilitate peer mentoring programmes to provide guidance and support.

Integrate Mindfulness and Stress Reduction Techniques

Introduce mindfulness practices, such as meditation, deep breathing exercises and yoga, to help students manage stress and cultivate emotional stability. Offer workshops or courses that teach stress reduction techniques and promote self-care strategies. Provide dedicated spaces on campus for relaxation and quiet reflection.

Enhance Time Management and Study Skills

Support students in developing effective time management and study skills to reduce academic-related stress. Offer workshops or resources on goal setting, organisation and prioritisation. Teach students strategies for managing workload and maintaining a healthy work–life balance.

Promote Physical Well-being

Encourage regular physical exercise, healthy eating habits and adequate sleep among students. Provide fitness facilities, sports programmes and wellness activities on campus. Emphasise the importance of self-care, nutrition and regular sleep patterns for optimal mental well-being.

Develop Resilience and Coping Skills

Offer workshops or courses that teach students resilience-building strategies and coping mechanisms. Focus on problem-solving skills, cognitive reframing and stress management techniques. Foster a growth mindset that encourages perseverance, adaptability and self-reflection.

Involve Faculty and Staff

Train faculty and staff members on recognising signs of emotional distress and providing appropriate support. Encourage them to create a supportive and compassionate classroom environment. Provide resources and referrals for students in need and promote collaboration between faculty, staff and mental health professionals.

Collaborate with Community Partners

Establish partnerships with local mental health organisations and community resources to expand support services for students. Develop referral networks for specialised care and crisis interventions. Collaborate on awareness campaigns and joint initiatives to promote mental well-being.

Conduct Research and Evaluation

Engage in ongoing research to assess the effectiveness of interventions and strategies implemented to enhance emotional stability and mental well-being among students. Evaluate the impact of programmes and initiatives to make informed adjustments and improvements.

By implementing these strategies, educational institutions can create an environment that supports and enhances students' emotional stability and mental well-being. Investing in comprehensive mental health services, fostering a supportive community, promoting self-care practices and equipping students with resilience and coping skills can empower them to navigate challenges and thrive academically and personally.

Conclusion

In conclusion, the significance of prioritising emotional stability and mental well-being among students cannot be overstated. Educational institutions play a vital role in shaping students' lives and preparing them for future success. By recognising the impact of emotional well-being on academic performance, personal growth and overall quality of life, institutions can create a nurturing environment that supports students in their journey towards optimal mental health. Implementing a comprehensive range of strategies is essential in addressing the multifaceted nature of emotional stability and mental well-being. By promoting mental health awareness, institutions can break down barriers, reduce stigma and encourage open conversations surrounding mental health. Providing accessible counselling services ensures that students have the support they need to navigate challenges, manage stress and foster emotional resilience. Fostering positive relationships and social connections within the campus community is equally important. Creating inclusive environments that embrace diversity, encourage collaboration and promote a sense of belonging helps students develop a support network that contributes to their emotional well-being. By integrating mindfulness and stress reduction techniques, institutions can equip students with invaluable tools for managing their emotions, reducing anxiety and maintaining a balanced perspective in the face of academic and personal pressures.

Therefore, when educational institutions prioritise emotional stability and mental well-being, they invest in the holistic development of their students. By creating a supportive and empowering environment, institutions can help students navigate the challenges of their academic journey and equip them with the necessary tools to lead fulfilling and successful lives beyond graduation. By recognising the intrinsic value of emotional well-being, we pave the way for a brighter future for our students and society as a whole.

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Navigating Capital Budgeting Dilemmas: Theory Versus Practice at Clarence Infra Projects Ltd.

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Abstract

The case study explores the capital budgeting challenges faced by Clarence Infra Projects Ltd, a company deeply committed to maximising shareholder value while navigating the complex world of capital investments. Despite their dedication to value maximisation, the company sometimes made decisions that contradicted this principle due to practical considerations. These contradictions highlight the real-world complexities of decision-making and the need to balance theory with pragmatism. The study presents three investment choices: solar power expansion, wind farm development, and hydroelectric power plant, each with distinct cash flow patterns. The managers traditionally used the payback period method, but they also employed the discounted cash flow methods, including net present value and internal rate of return, to evaluate the projects. Sensitivity analysis under various reduction scenarios is conducted to assess the resilience of the projects. Ultimately, the case highlights the importance of aligning financial theory with real-world complexities to make informed investment decisions.

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Introduction

In the bustling world of Clarence Infra Projects Ltd., where each decision carried the weight of the company's future, the finance theory was a guiding star. The Managing Director Mr Clarence Lintana held a degree in business management and had been at the helm of affairs from the last 20 years. The baton of affairs he had received from his father, a first-generation entrepreneur, a rancher's son who studied engineering and started the Clarence Infra Projects Ltd., named after his son, who is now the MD. Here, the seasoned managers understood that their choices had a direct impact on the firm's growth and prosperity. As they navigated the complex landscape of capital investments, the mantra remained clear: undertake projects only if they contribute to the company's overall value. With a singular focus on maximising shareholder value, managers of Clarence Infra Projects Ltd. were diligent in their pursuit. They combed through potential projects with a discerning eye, identifying those that promised to enhance the company's worth. This commitment to value creation was not just a philosophy; it was a commitment that ran deep within the company's culture, driving every decision and action they took.

The process of choosing corporate projects can be intricate, but organisations design capital budgeting systems to add some order to the decision-making process. A key component of this system involves categorising projects based on specific criteria. Thus, it seems evident that the primary aim of this classification system is to facilitate the selection of capital projects within an organisational setting (Piper, 1980).

However, despite Clarence's managers wholehearted commitment to wealth maximisation, there were instances where the company's legacy choices seemed to contradict the concept of value maximisation. These anomalies arose from practical considerations, as some projects were assessed using the less theoretically robust payback period method rather than the more rigorous DCF (discounted cash flow) method. The reason was the ease of computing the payback period, which provided a simpler and more practical solution, even if it diverged from the ideal of strict value maximisation (Garrett & Garrett, 1989; Oosterom & Hall, 2022).

These contradictions between theory and practice offered a glimpse into the complexities of real-world decision-making at Clarence Infra Projects Ltd. They demonstrated that while theory provided a solid foundation, the company sometimes had to make pragmatic decisions in pursuit of their long-term success.

This case provides a comprehensive view of the capital budgeting problem within a real-life scenario through the eyes of Clarence Infra Projects Ltd. It illuminates the ongoing struggle between legacy practices, which may be rooted in convenience and familiarity, and the practices that theoretically should be followed to achieve maximum value. These dilemmas highlight the practical challenges faced by companies as they strive to align their decisions with the ideal of value maximisation.

This case sheds light on some of the shortcomings of capital budgeting tools. It underscores the fact that while these tools offer valuable insights into investment decisions, they are not without limitations. In the quest for financial prudence, companies must navigate the complexities of actual decision-making, considering factors such as ease of computation and immediate practicality.

About Clarence Infra Projects Ltd.

Located at the forefront of the dynamic infrastructure development sector, Clarence Infra Projects Ltd. is a visionary company with a legacy dating back to 1995. Notably, the company made its foray into the public stock exchange a decade ago, successfully listing itself through an initial public offering (IPO). Since that pivotal moment, Clarence Infra Projects Ltd. has emerged as a distinguished leader in the industry.

The Company's Journey

Clarence Infra Projects Ltd. began its journey with a modest team of visionary engineers who collectively aspired to craft sustainable and impactful infrastructure solutions for communities. They initiated their venture with small-scale projects and a shared commitment to uncompromising excellence. Through the years, Clarence Infra Projects Ltd. has evolved into a distinguished industry leader, renowned for its steadfast devotion to quality and innovation.

The Company's Vision

The company envisions a world where infrastructure transcends conventional brick-and-mortar constructs and becomes a powerful agent of progress. The company's vision is centred on constructing sustainable, smart and community-oriented infrastructure that not only enhances the quality of life but also contributes to the broader betterment of society.

Clarence Infra Projects Ltd: A Glimpse

Book Value

Clarence Infra Projects Ltd., a leading firm in the world of infrastructure development, proudly boasts a substantial book value of \$700 million. This book value, a testament to the company's financial strength, is derived by meticulously subtracting its liabilities from its substantial asset base.

Over the years, Clarence Infra Projects Ltd. has made strategic investments in its infrastructure, assets and ongoing initiatives, resulting in consistent growth of its book value. Shareholders can take comfort in the fact that this figure reflects a firm financial footing and a promising future for the company.

Market Capitalisation

The market capitalisation of Clarence Infra Projects Ltd. is an impressive \$2,000 million, signifying its substantial standing in the financial markets. This figure is a product of the company's current stock price, multiplied by its 100

million outstanding shares. It encapsulates the market's perception of the company's value. At the current capitalisation, the per-share price of the company is \$2,000 per share.

Clarence Infra Projects Ltd's market capitalisation is a true reflection of its reputation, outstanding performance and the confidence investors place in its trajectory. As the company continues to excel in its infrastructure endeavours and uphold its promises, its market capitalisation steadily climbs, reinforcing belief in its future prospects.

Order Book

The current open order book of Clarence Infra Projects Ltd is robust, amounting to \$1,500 million for this financial year, with more than \$700 million in orders in the final stages of confirmation. The open order book represents the aggregate value of confirmed contracts and projects that the company has secured but is yet to complete. It provides a window into the company's short- to medium-term revenue and project completion timelines.

The company's order book continues to thrive due to its sterling reputation for timely project delivery and unwavering commitment to quality standards. The company's history of securing and executing projects efficiently has led to a flourishing order book, cementing its position as a foremost player in the infrastructure development sector.

Cutting-edge Technology

In light of Clarence Infra Projects Ltd.'s successful public offering a decade ago, the company has made strategic use of the proceeds from the IPO to enhance and modernise its infrastructure, including its plant and equipment. This forward-looking approach has positioned the company as a leader in the industry with state-of-the-art equipment and facilities. As a result, many of the company's existing projects benefit from cutting-edge technology and require minimal to no replacement or modernisation.

The company's dedication to maintaining and updating its infrastructure has not only improved operational efficiency but has also significantly extended the lifespan of its assets. This prudent financial strategy has allowed Clarence Infra Projects Ltd to focus on new opportunities, innovation and sustainable growth.

With the majority of its projects benefiting from top-tier equipment and facilities, the company is well prepared to continue delivering high-quality infrastructure solutions and meet the demands of an ever-evolving industry. This commitment to excellence and innovation further solidifies Clarence Infra Projects Ltd's reputation as a pioneering force in the world of infrastructure development. Subsequently, the company does not have any mid-term need for replacement, modernisation or cost-reduction investment strategies.

Recent Board Decision

In a recent board meeting, recognising the company's strong financial standing and impressive track record, the leadership of the company has made a strategic decision to explore new avenues for expansion and diversification. The primary objective is to drive revenue growth and further solidify the company's position in the market.

New Projects (Revenue Expansion Investments)

The resolution in the recent board meeting dictated the managers to come up with new projects, either for related or unrelated diversification with an aim for revenue expansion. However, there was one impediment. The initial outlay which the company can fund was limited to \$600 million. With an aim towards green energy and with the brief that the projects have to be mutually exclusive subject to the given maximum outlay, the managers came up with the following project proposals:

Investment Choice 1: Solar Power Expansion

The first investment option, the 'Solar Power Expansion', is a forward-looking project designed to harness the Sun's energy for sustainable power generation. With an initial investment of \$600 million, this venture promises a bright future. This choice aligns with the company's commitment to environment-friendly solutions and offers the potential for significant long-term returns.

Investment Choice 2: Wind Farm Development

The second investment opportunity, 'wind farm development', is a venture into wind energy, with an initial investment of \$600 million. Wind power represents a clean and renewable energy source, aligning with company's sustainability goals. This choice offers not only financial promise but also an opportunity to contribute to a greener future.

Investment Choice 3: Hydroelectric Power Plant

The third choice, 'hydroelectric power plant', involves the development of a hydroelectric facility, with an initial investment of \$600 million. Hydroelectric power is known for its reliability and minimal environmental impact, making it an attractive option. Company's investment in this sector not only promises strong financial returns but also underscores its commitment to sustainable energy solutions. Refer to Table 1 for cash flow projections.

Table 1. Cash Flows of the Alternative Projects.

Year	Choice 1: Solar Power Expansion	Choice 2: Wind Farm Development	Choice 3: Hydroelectric Power Plant
Year 0	−600	−600	−600
Year 1	201	100	−60
Year 2	120	180	250
Year 3	200	220	350
Year 4	203	250	450
Year 5	194	186	−50

Notes: Amounts are in million dollars. Negative sign shows cash outflow.

Conventional Versus Non-conventional Investments

Conventional Investment

A conventional investment exhibits a distinct cash flow pattern, commencing with an initial cash outlay that results in negative cash flows, followed by a series of positive cash inflows. Typically, in such investments, there is just a single change in the direction of cash flows, transitioning from an initial negative investment to subsequent positive cash inflows. This cash flow pattern is often symbolised as $-+++$, where the ‘ $-$ ’ denotes the initial investment and the ‘ $+$ ’ symbols represent favourable cash inflows in subsequent time periods (Bierman & Smidt, 2012).

Non-conventional Investment

On the contrary, a non-conventional investment portrays a blend of cash outflows and inflows throughout the project’s duration. In these types of investments, multiple alterations in the signs of cash flows are observed, encompassing both unfavourable and favourable cash flows occurring at diverse points in time. The cash flow pattern in non-conventional investments can be considerably more intricate, as illustrated by $-++++-+-$, in which the ‘ $-$ ’ stands for initial investments, the ‘ $+$ ’ denotes positive cash inflows and ‘ $++$ ’ represents detrimental cash outflows during specific periods (Bierman & Smidt, 2012).

Thus, for a conventional stream of cash flows, the cash flow at time $t = 0$ is negative and subsequently for $t = 1, 2, \dots, n$, is positive, whereas in a non-conventional cash-flow stream, the cash flow at time $t = 0$ is positive and subsequently for $t = 1, 2, \dots, n$, are either positive or negative.

Evaluating the Cash Flow Pattern of Alternatives

The finance managers of the company had to evaluate the three alternatives before they could present those before the board. The initial outlay for all three projects is the same, that is, \$600 million. However, the cash inflows for the three projects are quite distinct. While the solar power plant and the wind power plant have conventional cash flows, the hydro-power plant has non-conventional cash flows.

Payback Period of the Projects

Traditionally, the finance managers of the company had evaluated the projects based on their payback period. And this time also, they were adamant to find out the payback period of the project, despite knowing that this method is not consistent with the wealth maximisation criterion. Still, traditions demand it, and so do the managers.

The payback period is calculated as

Pb = Y + \left[\frac{(C_0 - \sum(CF_{-t}))}{CF_{-(Y+1)}} \right] \tag{1}

where Pb is the payback period (in years); Y is the year before full recovery (whole no. of years); C₀ is the initial investment amount; CF_{-t} is the total cash flows from year 1 to Y; CF_{-(Y + 1)} is the cash flow in the year Y + 1.

The shortest payback period in years, which is 3.14 years, is associated with Choice 3, specifically the hydroelectric power plant. This indicates that the hydroelectric power plant is expected to recover its initial investment in the shortest time compared to the other two choices. However, it is important to note that the payback period method has certain limitations and does not provide a comprehensive view of the project’s profitability. Refer to Table 2 for payback period calculations.

Disregarding Cash Flows

The payback period method is inadequate for assessing the profitability of an investment project because it disregards crucial aspects of the project’s financial performance. In the case of Choice 3, the payback period fails to consider the entire sequence of cash flows. This means it does not account for the full scope of financial returns generated by the project (Lefley, 1996).

Table 2. Payback Period Calculations (\$ Millions).

Year	Choice 1: Solar Power Plant	Cumulative Cash Flows Choice 1	Choice 2: Wind Farm Development	Cumulative Cash Flows Choice 2	Choice 3: Hydroelectric Power Plant	Cumulative Cash Flows Choice 3
0	-600	–	-600	–	-600	–
1	201	201	100	100	-60	-60
2	120	321	180	280	250	190
3	200	521	220	500	350	540
4	203	724	250	750	450	990
5	194	918	186	936	-50	940

PBP for Choice 1: payback period = 3 years + (79/203) years = 3.39 years or 3 years and 4.5 months.
PBP for Choice 2: payback period = 3 years + (100/250) years = 3.4 years or 3 years and 4.8 months.
PBP for Choice 3: payback period = 3 years + (60/450) years = 3.14 years or 3 years and 1.6 months.

Neglecting Cash Flow Patterns

Another limitation of the payback period method is its disregard for the patterns of cash inflows, including their magnitudes and timing. It treats returns of equal amounts equally, even when they occur in different time periods. To illustrate, all three choices involve equal initial investments and generate equivalent total cash inflows over nearly identical time periods. However, a closer examination of the cash flows reveals significant differences (Lefley, 1996; Yard, 2000).

Discounted Cash Flow Methods

Net Present Value Method

NPV, which stands for net present value, is a widely utilised financial metric for assessing the profitability of an investment or project. It takes into consideration the concept of the time value of money, recognising that a rupee received or spent in the future is inherently worth less than a rupee received or spent today. NPV is a measure that quantifies the disparity between the present value of cash inflows and the present value of cash outflows over the entire lifespan of an investment or project. In simpler terms, it calculates the net gain or loss of an investment in today's monetary terms (Osborne, 2010).

The formula used to compute NPV is as follows (Fabozzi & Peterson, 2003):

$$NPV = \sum_{t=0}^t \left(\frac{Cf_t}{(1+r)^t} \right) - C_0 \quad (2)$$

where NPV signifies the net present value; Cf_t represents the cash flow at a specific time ' t '; C_0 is the initial investment amount; ' r ' denotes the discount rate, which reflects the time value of money and ' t ' is the time period.

In NPV analysis, a positive NPV indicates that the investment is expected to generate more cash flows than its costs, signifying a financially prudent decision. Conversely, a negative NPV suggests that the investment may not generate adequate cash flows to cover its costs and may not be a viable project. NPV serves as a valuable decision-making tool in finance and investment, enabling an assessment of the attractiveness and profitability of diverse projects or investments by offering a comprehensive view of their potential impact on the financial position of a company (Osborne, 2010). The basic opportunity cost of capital was this trade-off, the subtle reminder that for every rupee committed to a particular project, there was another path not taken. A path leading to an alternative opportunity with a guaranteed return of 10%.

As far as the cost of capital of the funds which the Clarence Infra Projects Ltd could avail had been discerningly computed by their finance managers, the capital they could have invested here could have been diverted elsewhere, a different endeavour that might have brought forth a 10% return on investment. This 10% benchmark, this opportunity cost of capital, was the silent sentinel of financial strategy. It stood as a reference point against which all investment opportunities

were measured. Was this project, with its promises and potential, more alluring than the certainty of a 10% return elsewhere?

Tables 3–5 exhibit the NPV of the three projects computed at a discount rate of 10%, and Figure 1 represents the NPV profile of the investments.

The NPV of Project 3 (hydroelectric power plant) is marginally higher than the other two alternatives. Based on NPV, therefore, the choice is clear, Clarence Infra Projects Ltd should go with the third choice. But does it? Or further brainstorming remains?

Table 3. NPV for Choice 1.

Solar Power Plant (Cash Flows in Million \$)	PVIF@10%	Present Value
–600	1.000	–600.000
201	0.909	182.727
120	0.826	99.174
200	0.751	150.263
203	0.683	138.652
194	0.621	120.459
NPV		91.274
Profitability index (PV of cash inflow/PV of cash outflows)		1.1521

Note: PVIF—Present value interest.

Table 4. NPV for Choice 2.

Wind Farm Development (Cash Flows in Million \$)	PVIF@10%	PV
–600	1.000	–600.000
100	0.909	90.909
180	0.826	148.760
220	0.751	165.289
250	0.683	170.753
186	0.621	115.491
NPV		91.203
Profitability index (PV of cash inflow/PV of cash outflows)		1.1520

Table 5. NPV for Choice 3.

Hydroelectric Power Plant (Cash Flows in Million \$)	PVIF@10%	PV
–600	1.000	–600.000
–60	0.909	–54.545
250	0.826	206.612
350	0.751	262.960
450	0.683	307.356
–50	0.621	–31.046
NPV		91.336
Profitability index (PV of cash inflow/PV of cash outflows)		1.1522

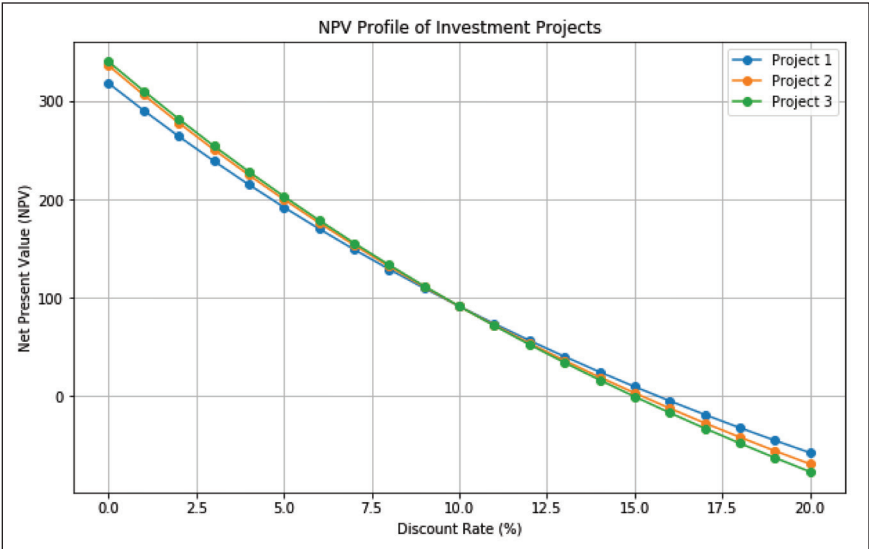


Figure 1. Graph of the NPV Profile.

The Internal Rate of Return

The internal rate of return (IRR) is the discount rate at which the NPV of a series of cash flows becomes zero (Fabozzi & Peterson, 2003; Van Horne, 2002). The IRR is typically found through an iterative approach, and there is not a simple algebraic equation to calculate it directly. The general approach to finding the IRR is as follows:

Set up the NPV equation:

$$NPV = \sum_{t=0}^n \frac{C_t}{(1+r)^t} = 0 \tag{3}$$

where C_t is the cash flow at time t ; r is the IRR (which we wish to determine) and n is the time period (numbers).

Subsequently, solve for ‘ r ’ by using numerical methods like Newton–Raphson iteration or trial-and-error. The iterative process involves making successive guesses for ‘ r ’ and checking if the NPV becomes zero.

We solve Equation 3 by the hit-and-trial method to determine as below.

NPV Versus IRR

No capital budgeting problem can be complete without the discussion on the comparison between NPV and IRR. Please refer to Tables 6–8 for NPV Profile, IRR & Scenario Projection. In our choices too, the NPV and IRR give divergent results. While Project 3 has the highest NPV, it has the lowest IRR. While choosing IRR, the yardstick is that it should be greater than the hurdle rate, in this case, 10%, which it is. While using the IRR method, common problems (Lohmann, 1988; Mackevičius & Tomaševič, 2010; Osborne, 2010; Weber, 2014) are first,

Table 6. NPV Profile.

S. No.	Rate (%)	Project 1	Project 2	Project 3
1	0	318	336	340
2	5	192.05	199.95	202.99
3	10	91.27	91.20	91.33
4	15	9.541	3.12	−0.57
5	20	−57.56	−69.03	−76.92

Table 7. IRR for the Projects.

Choices	IRR (%)
Project 1	15.65
Project 2	15.20
Project 3	14.97

Table 8. Scenario Impact on Cash Flows.

Reduction Scenario (%)	NPV Project 1	NPV Project 2	NPV Project 3
5	56.71	56.64	56.76
10	22.14	22.08	22.20
20	−46.98	−47.03	−46.93

multiple IRRs—the non-conventional cash flows may lead to a polynomial which when solved may have more than one positive roots, that is, two IRRs which will be spurious. Second, the IRR ignores the timings of the cash flows; rather it is focused on the rate of return of the cash flows and this creates a further problem, if the reinvestment rate is different than the assumed internal rate. And lastly and more challengingly, the divergent signals which the NPV and IRR have generated, case in point the third choice Project 3. What will the company do?

Assessing Investment Projects Under Different Reduction Scenarios

Corporate managers engaged in the capital budgeting process employ a variety of techniques. These methods encompass both intuitive, experience-based approaches and analytical strategies, such as sensitivity analysis, scenario analysis, decision-tree analysis and the Monte Carlo method (Karanovic et al., 2010).

Investment decisions are rarely static in the world of finance, and uncertainties often lead to dynamic strategies. As part of Clarence Infra Projects Ltd’s financial analysis, the team explored how three different investment projects fare when subjected to various reduction scenarios. These scenarios involve reducing the expected cash flows of the projects by 5%, 10% and 20%. Let us delve into the implications of these scenarios on their investment choices and how they interpreted the sensitivity towards the three scenarios.

Reduction Scenario 1 (5% Reduction)

In this scenario, we consider a 5% reduction in the expected cash flows for each of our three investment projects. This reflects a moderate-risk outlook, recognising

that business conditions may not be as favourable as initially anticipated. The 5% reduction serves as a buffer, allowing us to evaluate how resilient our projects are in the face of a slight downturn.

Reduction Scenario 2 (10% Reduction)

Increasing the level of risk, the 10% reduction scenario presents a more significant challenge. Here, we explore the possibility of a 10% reduction in expected cash flows across the projects. This scenario simulates the impact of a more adverse economic environment, where operational efficiency or market conditions might not align with our initial projections. By reducing cash flows by 10%, we aim to assess whether the projects can still maintain positive NPV values or if they face financial headwinds that call their viability into question.

Reduction Scenario 3 (20% Reduction)

The 20% reduction scenario represents a high-risk exposure. It envisions a substantial setback in cash flows for the investment projects, indicating a scenario where economic conditions have taken a turn for the worse. This serves as a stress test for our investments, intended to evaluate their resilience in the face of severe financial adversity. A 20% reduction in cash flows pushes the projects to their limits, challenging their ability to continue generating positive NPV values. It forces us to consider the worst-case scenario and the potential need for adjustments or mitigating strategies.

Impact on Project 1

Figure 2 exhibits, the sensitivity of Project 1 (solar power plant) NPV, if the cash flows are reduced as depicted in the three scenarios. The percentage reduction in the value of cash-flow slides along the horizontal axis and corresponding NPV values slides along the vertical axis is shown. As exhibited by Figure 2, a decrease of around 13% in the cash flows will render the project untenable.

Figure 3 exhibits NPV profile for Project 1 for the given three reduction scenarios and profiles are compared with the original cash flows, as depicted by the red indicator on Figure 3. The perpendiculars dropped on the horizontal axis represent the IRR for that particular scenario, for example, the original cash flow's IRR is a tad greater than 15%, while for Scenario 3, it is around 6%.

Impact on Project 2

Figure 4 exhibits the sensitivity of Project 2 (wind farm development) NPV, if the cash flows are reduced as depicted in the three scenarios. The percentage reduction in the value of cash-flow slides along the horizontal axis and corresponding NPV values slides along the vertical axis is shown. As exhibited by Figure 4, a decrease

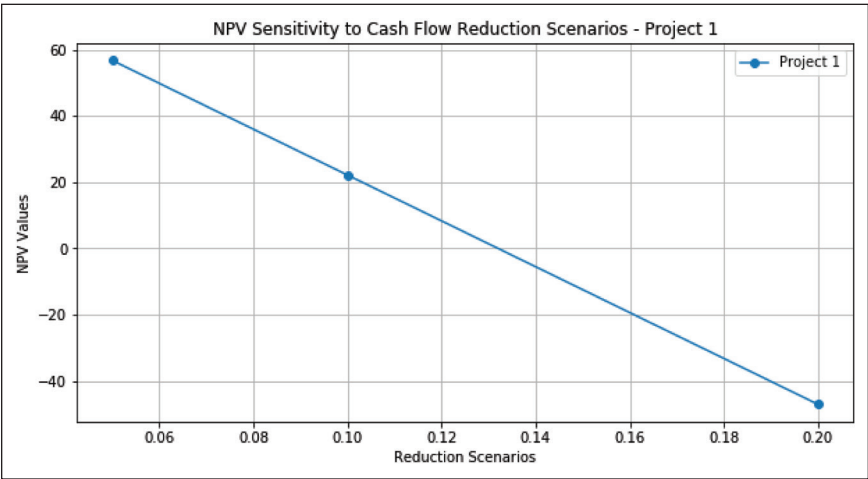


Figure 2. NPV Sensitivity - Project 1.

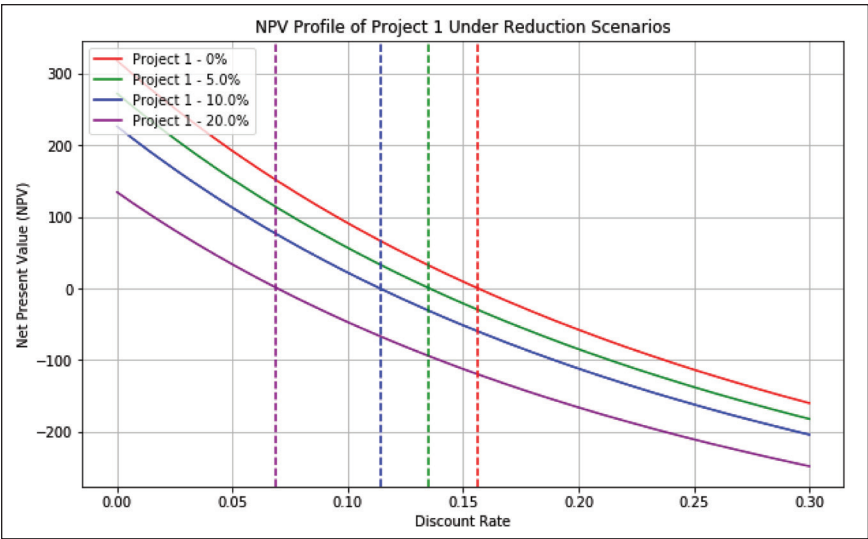


Figure 3. NPV Profile - Project 1, Under Different Scenarios.

of around 13% in the cash flows will render the project untenable, the same as Project 1.

Figure 5 exhibits NPV profile for Project 2 for the given three reduction scenarios and profiles are compared with the original cash flows, as depicted by the red indicator on Figure 5. The perpendiculars dropped on the horizontal axis represent the IRR for that particular scenario, for example, the original cash flow's IRR is a tad greater than 15%, while for Scenario 3, it is around 7%.

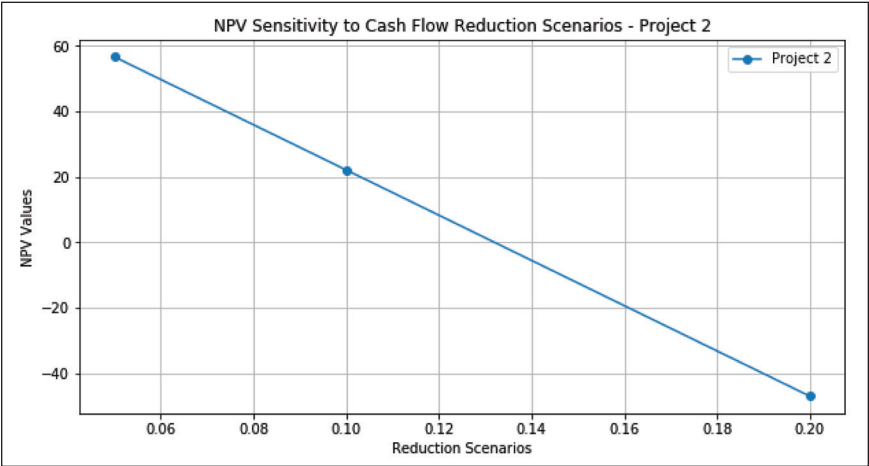


Figure 4. NPV Sensitivity - Project 2.

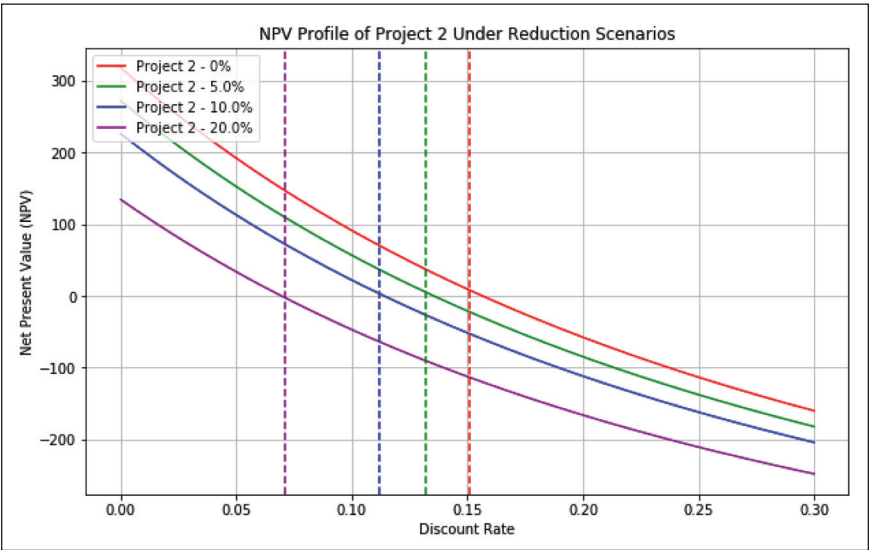


Figure 5. NPV Profile - Project 2, Under Different Scenarios.

Impact on Project 3

Figure 6 exhibits the sensitivity of Project 3 (hydro-electric power plant) NPV, if the cash flows are reduced as depicted in the three scenarios. The percentage reduction in the value of cash-flow slides along the horizontal axis and corresponding NPV values slides along the vertical axis is shown. As exhibited by Figure 6, a decrease of around 13% in the cash flows will render the project untenable, the same as Projects 1 and 2.

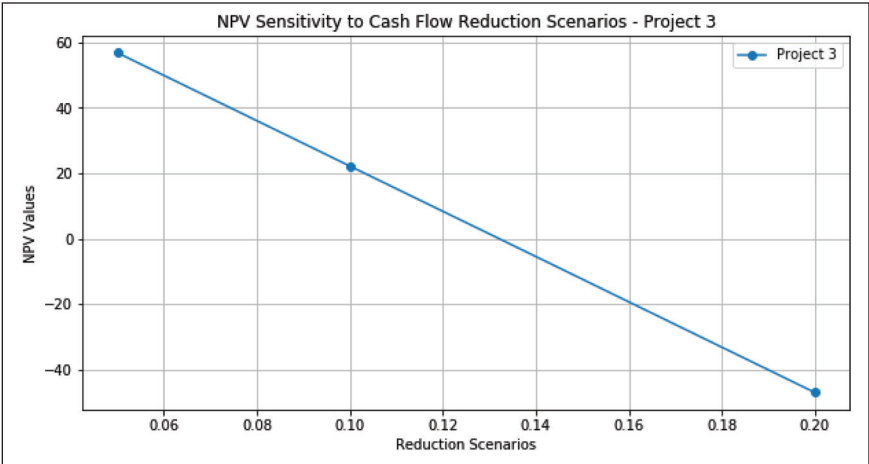


Figure 6. NPV Sensitivity - Project 3.

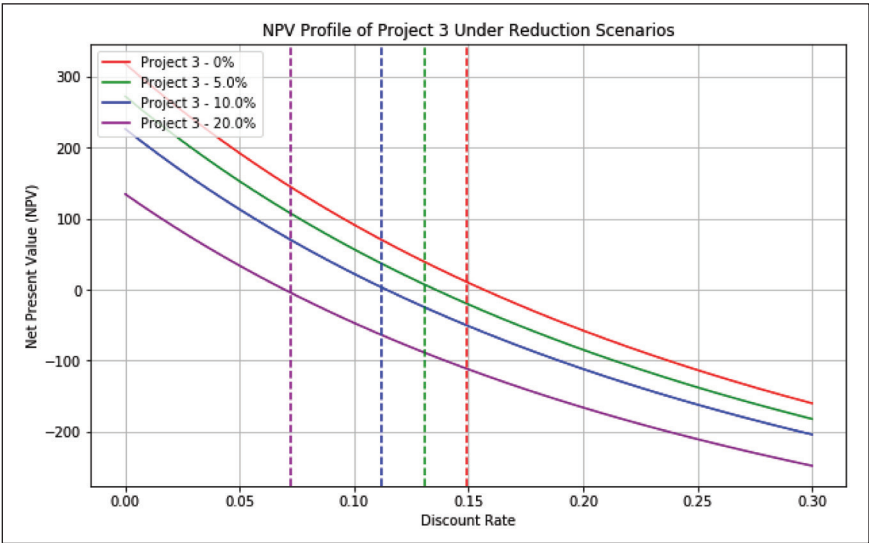


Figure 7. NPV Profile - Project 3, Under Different Scenarios.

Figure 7 exhibits NPV profile for Project 3 for the given three reduction scenarios and profiles are compared with the original cash flows, as depicted by the red indicator on Figure 7. The perpendiculars dropped on the horizontal axis represent the IRR for that particular scenario, for example, the original cash flow’s IRR is a tad greater than 15%, while for Scenario 3, it is around 7%.

Critical Review

Clarence Infra Projects Ltd faces a crucial decision regarding green energy investment. While the company has identified three potential projects and analysed

them using payback period, NPV and IRR, some aspects require further scrutiny. The limited investment capital of \$600 million restricts options, and the focus solely on revenue expansion might overlook other strategic objectives. Additionally, the chosen discount rate significantly impacts NPV and IRR calculations, highlighting the need for sensitivity analysis. The conflicting rankings between NPV and IRR for the projects further complicate the decision-making process. This gives rise to several key questions. First, how will the company handle the discrepancy between NPV and IRR rankings? Are there established tie-breaking factors or is a pre-defined decision rule needed? Second, exploring additional scenarios beyond cash flow reduction (e.g., energy price changes and regulations) would provide a more robust risk assessment. Finally, investigating the long-term confidence in cash flow projections and potential environmental concerns for each project is crucial. Furthermore, ensuring in-house expertise or strategic partnerships for project development and assessing government incentives and regulations are essential steps before moving forward.

Conclusion

Amid the intricacies of capital budgeting, the Clarence Infra Projects Ltd case serves as a compelling narrative, reminding us of the intricate dance between financial theory and pragmatic reality. While the North Star of shareholder value maximisation guided every decision, the case illuminated the necessity of balancing theory with practical considerations in the corporate landscape.

This tale underscores the importance of employing a multifaceted approach to project evaluation, one that harmonises traditional metrics like the payback period with sophisticated DCF methods, particularly NPV and IRR. The resonance of the time value of money in these methods provides a holistic perspective on project profitability.

NPV consistently spotlighted the hydroelectric power plant as the most lucrative choice, even when faced with non-conventional cash flow patterns. Sensitivity analysis underscored the resilience of projects under various reduction scenarios, accentuating the significance of accounting for risk and uncertainty in investment decisions.

This case is a symphony of financial theory and real-world pragmatism, resonating with the challenges companies face as they pursue the ideal of value maximisation. It shines a light on the limitations of capital budgeting tools, urging financial experts to consider both computational ease and practicality when evaluating investments. The case of Clarence Infra Projects Ltd is a reminder that value maximisation is an art that combines theory with the practicality of today's business world.

Questions for Discussion

1. The case study highlights the company's dilemma between choosing conventional and non-conventional investments, each with unique cash flow patterns. How can an organisation effectively incorporate both types

of investments into its capital budgeting strategy to optimise value creation while managing financial risk?

2. The case emphasises the significance of considering the time value of money through the NPV method. Discuss the advantages and limitations of NPV as a primary decision-making tool for evaluating capital projects. What challenges can arise when applying NPV in scenarios with unconventional cash flows?
3. Clarence Infra Projects Ltd conducts scenario analysis by reducing expected cash flows by 5%, 10% and 20% to assess project resilience. How can scenario analysis enhance decision-making in capital budgeting, and what are the implications for financial risk management? What other sensitivity analyses or scenarios might be relevant in this context?
4. The case underscores the importance of aligning capital budgeting decisions with an organisation's strategic objectives, including environmental and social sustainability. How can companies ensure that their investments not only maximise financial value but also contribute to broader societal and environmental goals? What role should sustainability criteria play in project evaluation and selection?

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Book Review

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Susan D. Blum (Ed.), *Ungrading: Why Rating Students Undermines Learning (and What to Do Instead)*. West Virginia University Press, 2020, 269 pp., ₹2,160.00. ISBN 10-1949199827, ISBN 13978-1949199826.

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Ungraded Learning

What is the purpose of education? Is it to mould students into compliant recipients of information, their worth measured by a system of quantifiable rewards? Or is it something much broader and wider? Susan D. Blum and her fellow contributors in the book '*Ungrading: Why Rating Students Undermines Learning (and What to Do Instead)*' invite us to imagine learning as a self-discovery unconstrained by grades.

Many books argue for the improvement of and strategies for grading approaches. For example, Hierck and Larson (2018) attempts to change the grading practices from punitive measures to feedback-centred systems. But such works stay within the standard-based system. Away from this, *Ungrading* takes a critical lens and radical approach of assessment to education, with cases of specific course implementations.

Susan D. Blum is not the first to argue for ungrading in education. Alfie Kohn, in *Punished by Rewards* (1993) and *The Schools Our Children Deserve* (1999), critiques traditional grading. Deservingly, Kohn wrote the foreword for *Ungrading*. Starr Sackstein in *Hacking Assessment* (2015) provides strategies for ungraded classrooms. He too has contributed a chapter to this book. Susan has assembled a group of authors with nonconformist ideas on grading for this collection.

In an age obsessed with quantification, we have come to accept grades as the arbiters of intellectual worth. Yet, the book, *Ungrading*, convinces us that this seemingly objective measure often obscures the real learning. This collection of



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essays is authored by a diverse cohort of educators. Together they challenge the deep notion that grades are synonymous with achievement and they propose a radical shift—a move towards ungrading.

In three sections, Blum and her contributors illuminate the insidious ways in which traditional grading can warp the educational experience and what can be done. The first part, Foundations and Models, provides the theoretical basis and various approaches to ungrading. The second part, Practices, provides practical examples of ungrading implemented in real classrooms across different disciplines. The third part, Reflections, comprises case studies on the ungrading experiences.

They argue that the pursuit of high marks can trigger a performance-oriented mindset which will rely on rote learning. Genuine understanding will be undermined. Driven by the fear of failure, students become preoccupied with the outcome rather than the process. This, the authors contend, hijacks the very purpose of education, which is essentially to cultivate a lifelong love of learning and critical inquiry.

Key Themes

The book first looks at the inherent limitations of grades as a true reflection of abilities of students. Reducing the complexities of learning to a single letter or number or grade fails to capture the realities of individual learning and their progress. In this way, the approach of grading not only overlooks the unique learning journeys of students but can also be demoralising.

But, that is about the problem.

Ungrading argues for self-reflections, portfolios, and peer evaluations and similar alternative approaches as the solution to the problem. This shift, the authors suggest, allows and equips students to take intellectual risks to go deeper into the subject matter.

The proposal of ungrading is not limited to assessment and evaluation. The book portrays the potential of ungrading to address systemic inequities inherent in traditional grading systems. For instance, standardised assessments, which are mostly ignorant of the diverse backgrounds and learning styles of students, can perpetuate bias and be devoid of inclusivity. By re-imagining how we measure success, educators can create a more equitable classroom where every student has the opportunity to grow.

The book does not shy away from the challenges of implementing the ungrading approach in our educational settings. It acknowledges the likely resistance from institutions, parents, and even students accustomed to the familiar metrics of grades. So, the authors provide practical strategies and real-world examples to guide educators in ungrading approach in classrooms.

The core of the book can be told as the joy of discovery and the pursuit of knowledge should not be overshadowed by the anxiety of evaluation. For building that argument and providing practical strategies for upgrading, the book presents a variety of themes.

One is the *illusion of objectivity*. The book challenges the assumption that traditional grades are objective measures of learning. In reality, grades are often influenced by subjective factors, such as the bias of the teacher or background of the student and many other variables that confound or hinder the accurate reflection of true understanding.

Reclaiming student agency is another theme that authors of different essays point out in this book. *Ungrading* encourages a focus on effort, progress, and self-reflection and growth mindset in students. By removing the pressure of grades, students take ownership of their learning. It encourages them to set their own goals, pursue their own interests, and engage with the material in more meaningful ways.

Ungrading promotes a shift from competition to collaboration by building a community of learners. The book advocates for assessment practices that are designed to support learning through collaboration, rather than simply measuring it at the individual level. This involves recognising the *hidden curriculum* of grading, where seemingly objective assessments can inadvertently nudge a competitive mindset and extrinsic motivation. By exposing these unintended consequences, educators can adopt alternative assessment practices embedded with student agency. In this context, the idea of ‘assessment *for* learning, not *of* learning’ is a recurring theme in the work. This includes using feedback to guide progress of students, providing opportunities for self-assessment, and using a variety of assessment methods to capture the diverse ways in which students learn. This is not to say that assessment has no place in education, but rather that it should serve as a guide, not a gatekeeper.

Ungrading is not just an argument for the abolition of grades. It is a plea for a more holistic and humane approach to assessments in the educational context. The core need comes from the recognition that the real worth of every student, regardless of their ability to conform to arbitrary standards, cannot be measured by a grade. If we really value the often repeated phrases in educational discourses such as well-rounded individuals, critical thinking, intellectual curiosity, educational resilience and the like, we need to think beyond the current forms of grading.

Evidence and Explorations

The book offers rich anecdotal evidence. But there are less researches with robust methodology. The science of educational evaluation—*whether through traditional grading, ungrading, or anything in between*—demands strong empirical grounding. Perhaps this is because the research in this area remains limited. Therefore, the studies in this book can also be a call for future works that are contextual, research-driven, and grounded in diverse educational settings.

The fear of increased workload for faculty members due to the ungrading approach and the need to address resistance from stakeholders accustomed to traditional grading also require further studies. The core practical question remaining is how to live in the complexities of standardised testing within an ungraded framework? This also demands more work.

Ungrading emerges as a pedagogical philosophy that de-centres the traditional role of grades, shifting the focus from performance-oriented evaluation to a more holistic understanding of student growth. We are in a society which is increasingly defined by metrics and measurements. As an oasis, *Ungrading* provides a radical proposition: that true learning flourishes not in the shadow of judgment, but in the light of exploration. This proposition challenges us to (re)imagine the very foundations of our educational systems.

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