

GREEN PRACTICES AND MARKET VALUATION OF INDIAN COMPANIES

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Abstract

The focus on green or sustainable investment has become common, and is duly recognized by corporate sector. However, does emphasis on green practices really push market value of enterprise? The existing research over more than four decades has explored mixed, inconsistent, inconclusive or contradictory results. The purpose of this study is to unravel the impact of green practices on market valuation of firms in Indian perspective by using secondary data. In this study, a sample of 195 companies has been analyzed using environmental score of Credit Rating and Information Services India Limited, and other financial data sought from ProwessIQ database of the year 2020-21. The Multiple Regression analysis has discovered a positive and statistically significant relationship between the green initiatives and market valuation of the companies. The results are important for all stakeholders, specially, to the providers of funds; who aspire to widen the coverage, spending, and reporting of green practices among corporates to maximize wealth and welfare for all.

KEYWORDS- Green Score, Market Valuation, Regression, Tobin Q

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1. Introduction

Environmental or green responsibility indicates towards the realization on the part of corporates to be accountable for the impact of their industrial activities on environment and making the disclosure of the same in financial statements; which have the potential of influencing their economic performance. Good environmental practices may be defined as the sum of activities which are directed to reduce the negative environmental impact initiated by actions, processes, policies, programs, or methods undertaken in the organizations to conduct business, such as, emphasizing and implementing new options to reduce carbon emissions, pollution, waste like toxic chemical releases, and use of natural resources; incorporating new green building technologies; commitment to continuous improvement in supply chain; practicing the most efficient balance of time, effort, technique, and transport channel to get products to consumers; asking and encouraging business associates to follow environmental standards; and adhere to all applicable environmental laws and regulations. The set of these concerns should be incorporated and reflected in the strategic planning; and may be pushed through the engine of long-term planning with more inclusive bouquet of green responsibilities.

On the one hand, a remarkable shift in the perception of investors is noticed by assigning preference and investment in sustainable funds; and on the other hand, the firms are also seen as changing the way of carrying out commercial activities due to continuous environmental degradation in the form of depleting ozone layer, increased global warming, and changing climate. They have started taking note of harmful effects of their commercial operations on the environment. But, to achieve this objective, efforts made by companies differ widely. The amount spent on this aspect seems to be a function of management's vision and availability of financial resources with enterprise. According to Singal (2014) the hospitality firms invest relatively more in green activities which improve financial health of the firms; and the sound financial performance, in turn, encourages them to increased investments on sustainability front, building a virtuous cycle. At the same time, different mechanism may be followed by firms to integrate environmental dimensions into organization's policy framework. Petrini & Pozzebon (2009) have pointed out towards the importance of business intelligence systems in organizations, which play an important role in implementing and monitoring of sustainable practices; more specifically, by integrating relevant green information into reporting activities for the users.

The green initiatives are increasingly cheered up by global and domestic investors, customers, and regulatory bodies; and are supported by different theories, such as, the stakeholder theory, the agency theory, and the theory of environmental concerns. Stakeholder theory emphasizes that management has accountability towards all stakeholders because they must receive fair and just treatment. The green practices have the capability to fortify this bond between the two. Further, the agency theory is based on the relationship between principal or shareholders and agent or management. The insiders or management is privy to all vital information of business, but the outsiders are generally, not. The environmental disclosures act as an instrument in minimizing information asymmetry. It further improves decision-making and perception of investors, which enhances corporate valuations. The theory of environmental concerns centers on the protection of natural environment, as it has a utility or value to the mankind. The organizations are supposed to preserve the same while carrying out commercial operations rather than modifying or destroying it. It has suggested that environmental-friendly engagements have potential to maximize the benefits of stakeholders, and market valuation of firm. Therefore, businesses need to be sensitive to environmental concerns and embrace it voluntarily and/or mandatorily. These theories have suggested that corporates should embed green dimensions in core management policies and goals to enrich value of enterprise; and make adequate and timely disclosure of the same.

The commitment of enterprise to its green obligations is reflected in the public disclosures made through financial or sustainability reports. However, the quantum and amount of environmental information disclosed differ among companies. Sustainability practices followed by public Oil and Gas companies were examined by Orazalin & Mahmood (2018), and found that companies having share of foreign ownership disclose more information on underlying issue than their counterparts which are owned by local investors. Furthermore, Deswanto & Siregar (2018) found that such disclosures are independent of financial performance of the firm.

The significance of green actions is being reflected by the increasing number of sustainable funds in India, and the sizable amount garnered by them. Realizing the importance of environmental concerns, the Securities and Exchange Board of India has made mandatory for top 1000 listed companies by market capitalization, to comply with Business Responsibility and Sustainability Reporting (BRSR) framework, as part of annual reports since 2022-23. For other companies, it is voluntary, but desirable. It is bound to benefit not only investors who prefer to park their funds in

sustainable securities; but also firms who aspire to reap advantages of improved market perception. The growing awareness among stakeholders about green engagements is cautioning that companies which continue to unaware or ignore environmental concerns; may face challenging operative environment, and find difficulties in raising required funds.

To tackle key challenges on environmental front, the Indian Government has taken various steps by providing incentives and subsidies through budgetary allocations, such as, encouragement for electrical vehicles and renewable energy sources like solar energy, awareness and maintenance of national air quality index, rules for management of industrial waste, standards for pollution emission, and discontinuation of 15-year-old vehicles to reduce air pollution. Baah et al. (2021) highlighted that regulations have pressurized positively and significantly to adopt green practices which resulted in positive influence on firm's reputation and financial indicators in manufacturing small and medium enterprises. Furthermore, Feldman et al. (1997) emphasized that the entities which go beyond mandatory adherence of green regulatory framework, enjoy higher stock prices and market valuation than the organizations that are endangered by actual or impending green regulations. It has also been observed that companies that invest in innovative pollution prevention technology are able to reap the benefits of higher market valuation than their counterparts that are entangled in the environmental controversies like chemical leaks and oil spills, which have to tolerate decline in valuation. Therefore, it may be argued that concept of green initiatives has assumed a significant importance and firms are attaining competitive edge by going greener and greener day by day.

The study has been discussed under five main heads. The present one is devoted to the introductory part; followed by the deliberations on existing literature pertaining to the core issue. The statement of problem, objectives, research hypothesis, universe, size of sample, sources of data, time period, and research design of study are some of the key issues; and discussed under the head "Research Methodology". Then, an effort has been made to analyze and interpret data and empirical results. But, no human work is without limitations; therefore, the study has been concluded by focusing on the same; along with some suggestions for future research work.

2. Literature Review

The relationship between environmental/green initiatives and financial/market value of enterprise has been a long-standing and debatable issue in the literature; and many research papers have been dedicated to find a solution for the same. But the results are still contradictory. The findings have rendered positive, negative, mixed, or even curvilinear relationship between the underlying two issues. However, the various studies have been conducted by using numerous measures of various variables, statistical tool, sample size, and time-period; therefore, differ in this respect. But, Murphy (2002), and Aggarwal (2013) performed extant literature review of the research on the underlying issue; and have underlined that a higher number of research studies have explored that adoption of green or environmental friendly practices have the potential to play a pivotal role in improving the financial or market valuation of the firm. Most studies have been devoted to assess the impact of green efforts on financial indicators rather than market one.

Cohen, Fenn, & Naimon (1995), Klassen & McLaughlin (1996), King and Lenox (2001), and Nakao et al., (2007) measured positive and strong link between stock price of firm as proxy to its market valuation and environmental performance. And Cohen (2001) measured market value of firms by Tobin Q and demonstrated higher valuation due to substantial reduction in toxic chemical releases.

The firm's environmental policy may push bottom-line upward directly or indirectly. Martín-de Castro, Amores-Salvadó & Navas-López (2016) claimed that indirect effects on financial performance of entity are observed through the green corporate image in manufacturing firms. Weber et al. (2008), Moneva & Ortas (2010), Albertini (2013), Tan, Habibullah, Lucas & Noordewier (2016), and Tan & Choon (2017) investigated that better environmental practices lead to improvement in financial performance. Ameer & Othman (2012) noticed an increase or maintenance in financial performance in terms of growth in sales volume, return on assets, profit, and cash flow of sustainable corporates. Weber (2017) observed that corporate sustainability activities have been an instrumental in affecting the financial outcome of Chinese banks.

Advanced green management programs including environmental auditing practices have been observed to be associated with robust financial indicators. According to Miroshnychenko, Barontini, & Testa (2017) green practices followed in the organization in the form of preventing the pollution and green supply chain management, played a primary and important role in improving the financial performance. Gupta & Gupta (2020) measured a positive and significant

association between environmental sustainability and firm's value; which was measured by performance on financial indicators, customer's satisfaction, internal business process outcome, and achievement on the front of learning and growth. Yang (2012) indicated that environmental performance was not dependent on financial performance, but the financial indicators are duly affected by green pillars.

The performance of investment portfolios with superior green profiles has been found to be more profitable. Gangi, Daniele, & Varrone (2020) have enquired that environmental practices boost the reputation of entity which in turn impacted positively on profitability of the enterprise. Similarly, sustainable firms operating on larger scale are observed to be benefiting more. Yusof, Tabassi & Esa (2020) examined that large sized firms in construction industry with green business practices were able to manage higher financial performance than smaller business entities.

Many studies have also highlighted that financial or market valuation of the firm is lowered by the higher costs associated with cleaner initiatives taken by management. Brammer et al. (2006), Roy and Ghosh (2011), and Siew, Balatbat, & Carmichael (2013) found weak relationship between the environmental score and financial indicators. They also explored that the public-listed construction companies report very low on environmental issues. Sachin & Rajesh (2022) perceived that sustainable practices for supply chain management of Indian firms are not impacting positively on financial indicators, such as, Return on Assets (ROA) and Return on Equity (ROE).

There are others who cited anecdotal or mixed proof of higher performance. Molina-Azorín, Claver-Cortés, López-Gamero & Tari (2009), and Goyal, Rahman & Kazmi (2013) reported mixed relationship with respect to the environmental friendly steps and valuation of firm. Adams, Thornton & Sepehri (2012), and Deswanto & Siregar (2018) analyzed that market value of the firm is indifferent to the environmental reporting.

Ramanathan (2018) used survey data on manufacturing companies in United Kingdom, and explored the existence of curvilinear relationship between environmental practices and the valuation of firm which was measured by growth indicators i.e. increment in sales and market share.

3. Research Methodology

3.1 Statement of Problem

The interest of investors has grown manifold in recent years in firm's activities with respect to green initiatives. It is expected that businesses should not leave negative footprints on the

environment while pursuing their goals. Rather, the firm's strategic planning and policies should be directed towards the preservation and improvement of environment, which has the potential to stimulate the value of enterprise. Furthermore, businesses which ignore environmental dimensions may prone to risk in various forms, such as, boycott by stakeholders, negative press releases, and resolutions by activist shareholders; which smudge a dent on firm's reputation and value. Therefore, to make the business risk resilient, company leaders must sense the environmental risks, and play proactive role to mitigate the same to emerge as stronger and more valuable. Here, the crucial issue is to empirically establish the association between "going-green" and market value of companies.

3.2 Objectives of Study

The main objective of this study is to find out whether green companies enjoy higher market valuation or not. More specifically, the prime purpose is to empirically seek the direction and degree of association or link between green or environmental initiatives and the market valuation of the Indian companies across sectors.

3.3 Hypothesis of Study

H₀: Green practices do not affect market value of Indian companies across sectors.

H_A: Green practices affect market value of Indian companies across sectors.

3.4 Universe for Study

The universe for study is 225 companies whose environmental scores has been computed and compiled by Credit Rating and Information Services India Limited (CRISIL). It is an Indian subsidiary company of S&P Global, U.S.A., which was introduced in 1988 as first credit rating agency of India. It published a compilation of green scores, entitled as "CRISIL ESG Compendium", in June 2021. These scores have been presented on a scale of 0 to 100.

3.5 Sample Selection

A sample of 195 companies across sectors was picked up for empirical investigation. The size of sample is purely led by judgment sampling technique.

3.6 Sources of Data

The secondary sources of data has been identified and used in the present study. The cross-sectional data set includes green performance or environmental score of companies assigned by CRISIL, representing the degree of actions put in by respective firms to maintain or improve the environment. Aggarwal (2013) and Mir & Shah (2018) also referred such scores in their respective

studies. The firm-level financial data has been excavated from online query-able ProwessIQ database of Indian companies. It has been primarily built from annual reports of public or private companies, maintained by Centre for Monitoring Indian Economy Private Limited; and is a popular source of secondary data among researchers, such as, Garg (2015), Panicker (2017), Balasubramanian (2019), Dalal & Thaker (2019), and Nair & Bhattacharyya (2019).

3.7 Period of study

The entire cross-sectional data set selected and retrieved for analysis belongs to the year 2020-21.

3.8 Research Design

The present study applies a descriptive design of research. The statistical tool, Multiple Regression Analysis has been employed to investigate and analyze the relationship between Green Score and market value of the company. The market valuation of the company has been recognized as dependent variable; and is measured by Tobin's Q (TBQ). It has been represented by natural logarithm of the ratio of "market value of equity" to "book value of total assets".

Diverse versions of Tobin Q are used by researchers to represent market value of firm in the literature. Smirlock et al., (1984), and Lee & Tompkins (1999) described Tobin Q as ratio of "market value to replacement cost of firm". El-Faitouri (2014) defined it as "total assets minus book value of equity plus market value of equity, divided by total assets". Ibrahim (2017) used it as ratio of "sum of market value of equity and book value of debt" to "total assets". Theoretically, the market value of firm should be equal to replacement cost of firm's assets. In the present study, Tobin Q has been calculated as ratio of "market value of equity" to "book value of assets". Here, it has been applied in the stricter or narrower sense from two angles, so that it may not result in overvaluation of firm. Firstly, book value or market value of debt is not included in the numerator, although, the debt capital is utilized to buy company's assets. And secondly, it is believed that the book value of assets is bound to be lower than their replacement cost in the on-going inflationary times. Therefore, if the value of Tobin Q is above one, it implies that the stock market has valued equity capital higher than the book value of assets; and entails positive perception of investors, and full confidence in the capability of management about firm's bright future prospects. Similarly, its value between 0 and 1 signifies that market has poor perception about the business, and assessed low that even book value of assets is higher than the market value of equity component of capital. The market-based measure of valuation of firm may be considered as more reliable because it reflects present and future perception of investors about the firm; and thereby, impacting the

amount of funds garnered through stock market. According to Short & Kasey (1999) market-based measures of performance of an enterprise, takes into account the prospective capability of management to generate future profits from a given asset base, and are less affected by accounting variations in terms of generally accepted accounting principles as compare to accounting-based measures, such as, return on assets, return on capital employed, and return on equity.

The environmental or green score (ENV_Score) is the central explanatory variable of analysis, and has been extracted from the CRISIL ESG Compendium. The higher score is expected to improve market valuation of firm. It ranges from zero to hundred depending upon the green dimensions met by firm. The control variables introduced in the regression equation are capital structure (Dbt_Eqty), size (SIZE_Entity), and liquidity (LIQ_Dity) of the company. They have been defined as follows:

- 1) Capital Structure (Dbt_Eqty) – This control variable has been calculated as the ratio of debt to equity capital of the entity. This variable is introduced to capture the effect of cost of capital on the value of firm. Its coefficient may turn out to be positive or negative. The higher ratio may imply more access to cheaper funds from financial institutions, and adding value to the firm. However, beyond a limit, the higher amount of funds may lead to high interest payments, and may adversely affect the entity’s valuation. Coricelli et al., (2012) showed a curvilinear link between profitability and capital structure of firm.
- 2) Size of entity (SIZE_Entity) – The natural logarithm of total assets of the company has been used as its proxy. The larger firms are supposed to fetch higher value to firm as compare to their smaller counterparts due to diverse reasons, such as, enjoying economies of scale, better informed, ability to attract highly skilled workforce, and access to financial resources.
- 3) Liquidity (LIQ_Dity) – It has been represented by the ratio of current assets to current liabilities. Ideally, liquid firms are in a better position to fulfill short-term operational needs without resorting to borrowings, and make sound planning to expand and grow. The liquidity is considered as an instrument to enhance value of firm. But, the higher liquidity may also imply that entity is not investing appropriately, and causing higher cost to business. Mohanty & Mehrotra (2018) explored statistically significant negative association between liquidity and different measures of profitability which include profit margin, return on assets, and return on capital employed.

To examine the impact of green practices on the market value of the firm, the following regression model has been designed:

$TBQ = a + b_1 (ENV_Score) + b_2 (Dbt_Eqty) + b_3 (SIZE_Entity) + b_4 (LIQ_Dity) + e$ where, a is the intercept term; $b_1, b_2, b_3,$ and b_4 are partial slope coefficients of independent variables; and e is the regression residual.

The results of regression findings are discussed in the next section.

4. Empirical Analysis And Findings

Table 1 is revealing the descriptive statistics of regression variables. The mean values of all the identified variables are not closing to zero, and similarly, all values of standard deviation are also not moving towards one. However, the mean value of environmental score is 48.38 % with standard deviation of 12.74; which does not seem to be satisfactory enough. It is pointing out towards Indian companies to focus and spend more on environmental friendly activities to improve their green score card. Moreover, the range value of green score is quite high as 64, which is suggesting that the efforts on this front among companies vary to a large extent.

Table 1: Descriptive Statistics of Identified Variables

	TBQ	ENV_Score	Dbt_Eqty	SIZE_Entity	LIQ_Dity
Mean	0.264764	48.389744	0.219872	5.232720	4.572186
Median	0.417581	48.000000	0.132741	5.055186	4.764994
Standard Deviation	0.649082	12.748232	0.236219	0.751258	1.008430
Sample Variance	0.421307	162.517420	0.055799	0.564388	1.016931
Kurtosis	0.837108	-0.258074	0.299853	0.258157	7.397907
Skewness	-1.022608	0.275405	1.109330	0.847454	-2.376141
Range	3.291976	64.000000	0.910712	3.698279	6.598556

The Karl Pearson's coefficient of correlation has been calculated to judge for any probable occurrence of multicollinearity in independent variables, and is shown in the Table 2. It is specifying that the correlation value of independent variables is either equal to or less than 0.5. It involves that the existence of possibility of multicollinearity among independent variables of regression model is ruled out. It has been further verified by the value of Variance Inflation Factor

(VIF) which is less than 10 for all independent variables, and has been reported in Table 3 under the sub-head as “Collinearity Statistics”. It is again reiterating that multicollinearity is not an issue in the data.

The possibility of autocorrelation in the residual terms from the regression analysis is examined by the Durbin-Watson statistics. It has come up with the value of 1.613037 and reported in Table 3, which is not implying zero autocorrelation but is closer to 2. Therefore, it implies that first-order autocorrelation in error terms is not visible.

Table 2: Correlation Matrix of Variables

	TBQ	ENV_Score	Dbt_Eqty	SIZE_Entity	LIQ_Dity
TBQ	1				
ENV_Score	-0.22758	1			
Dbt_Eqty	-0.58857	0.288511	1		
SIZE_Entity	-0.77053	0.478813	0.545599	1	
LIQ_Dity	-0.01071	-0.03895	-0.20673	0.177849	1

The influence of green practices on the value of firm has been investigated through multiple regression analysis and the results have been summarized in the Table 3. The dependent or explained variable of model is Tobin Q. It has been chosen as proxy to market value of company. The value of R-square and Adjusted R-square is 66% and 67% respectively. It implies that two third of the variability in dependent variable is being explained by the selected independent variables. Further, the F statistic has been found statistically significant at 1% level of significance. It concludes that the selected regression model is fitted well to the data, and possesses explanatory power to unravel the causal association between dependent and independent variables.

It has been found that all selected independent variables have statistically significant impact on the market valuation of the firm. The coefficient values of ENV_Score, Dbt_Eqty, and SIZE_Entity have turned out statistically significant at 1% level of significance; and LIQ_Dity at 5% .

Table 3: Regression Results

Dependent Variable: TOBIN Q

	Coefficients	Standard Error	t Stat	P-value	Collinearity Statistics	
					Tolerance	VIF
Intercept	3.10394	0.22203	13.97955	0.00000		
ENV_Score	0.01046	0.00245	4.279048*	0.00003	.755	1.325
Dbt_Eqty	-0.57100	0.14716	-3.88015*	0.00014	.607	1.648
SIZE_Entity	-0.66687	0.05069	-13.15633*	0.00000	.506	1.977
LIQ_Dity	0.05896	0.02964	1.98908**	0.04813	.821	1.219
R-square	0.669289139		F-statistic	96.1299*	Durbin-Watson	1.6130
Adjusted R-square	0.662326805		Significance F	0.000000		

*Statistically Significant at 1% Level of Significance

**Statistically Significant at 5% Level of Significance

The coefficient value of main explanatory variable i.e. ENV_Score is bearing a positive sign. It is implying the existence of positive link between the green practices and market valuation of firm, as was expected. In other words, going green pays the firm in terms of positive perception about its ability to create more wealth and value for stakeholders; and thereby, the consequence is improved market valuation. The other things being constant, the regression findings are depicting that increase in environmental score by one unit will accompany the hike in the valuation of firm by 0.01046 units. This is the underlying reason of attraction and collection of higher amount of funds from investors by environmentally conscious firm. Therefore, analysis tends to reject the null hypothesis i.e. “Green practices do not affect market value of Indian companies across sectors.” Rather, “going-green, and encouraging-green” is the need of the hour. These results are in conformity with earlier empirical research findings, investigated by various researchers, such as, Cohen, Fenn, & Naimon (1995), Klassen & McLaughlin (1996), King and Lenox (2001), and Nakao et al. (2007) and Konar and Cohen (2001). Although, all studies differ with respect to time, place or country, number of entities, the measure and number of variables, sources of data, and the statistical tool applied.

The coefficients of control variables are statistically significant but all are not positively related to company's valuation. The variables- size and capital structure of firm- have come up with negative correlation with firm's market value. It infers that larger firms are not enjoying economies of scale, and increase in organizational size is not adding to the firm's valuation. Similarly, negative association is observed between capital structure and value of enterprise. The reason may be that higher amount of debt has changed the investor's perception negatively. But, the positive sign of the variable, LIQ_Dity, is providing the evidence that more liquid firms command higher valuation.

5. Conclusion

Nowadays, a big change is seen in the opinion of investor's with regard to participation and involvement of companies, and businesses in maintain or protecting the environment. They have been compelled to take public positions on sustainable issues like climate change. The companies are increasingly reporting on this aspect to be applauded as good corporate citizens; and thereby improving their public perception to attract more investments. The present paper has been constructed on the theory of environmental concerns, which has suggested that green image of company has the potential to sustain or enhance the market value of enterprise or create wealth for shareholders. But, empirically establishing the nature of relationship between green practices and market valuation of firms has been a contentious issue. The researchers have concluded with positive, negative, or even neutral association.

This study is based purely on cross-sectional, secondary data of the year 2020-21. The sample of 195 companies was selected which found place in Compendium issued by Credit Rating and Information Services India Limited (CRISIL) in June, 2021. The green practices of firms have been represented by "environmental score" calculated by CRISIL, and other required financial data has been sourced from ProwessIQ database maintained by Centre for Monitoring Indian Economy. Tobin Q, a market-based measure has been identified as dependent variable to represent market value of the firm in multiple regression analysis. It may be described as forward-looking measure of firm's valuation as the movement in stock prices is observed with the variation in the expectations of investors about firm's future survival and growth prospects. The control variables used in the model are leverage, size, and liquidity of the firm. The empirical findings have confirmed a positive and statistically significant relationship between the green practices and market valuation of Indian companies. These outcomes are important for all stakeholders who are

interested in further augmenting the value of these firms. The results are emphasizing that corporates cannot ignore environment which is being impacted by factors ranging from Covid-19 pandemic to Ukraine invasion; rather more proactive role is required to tackle these issues on the part of company leaders to enjoy competitive edge, and emerge as more acceptable and valuable. Government policy at legislative and regulatory level may further be broadened and strengthened to implement green practices.

6. Limitations of The Study

The study is not free from limitations. It has been conducted only around cross-sectional data, which has been gathered from secondary sources. The researcher's inclination or subjectivity to include a particular variable in the analysis, and its measure is also likely to impact the results. According to Horváthová (2010), a mixed outcome about the influence of various environmental rule and regulations were noticed on the performance of the enterprise; which was dependent on the time coverage of data in the particular study, and the statistical tool employed to analyze the same.

7. Scope For Further Research

The results are beneficial to different stakeholders, but not comprehensive enough to discuss and interpret all miniscule details with respect to green initiatives and their impact on market value of the entity. Therefore, more studies may be planned with pooled or panel data covering higher sample size, different variables, and survey data. The study may further be extended to firms across countries.

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