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Analyzing the financial Markets pulse: Efficiency, Asset Pricing, and Behavioral Insights in Developed and Emerging Economies

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ABSTRACT

This study provides a detailed and thorough empirical investigation to gauge the the efficiency of 'financial markets' and investigate the ability of effective assessment of widely used 'advanced asset pricing models' in diverse economic contexts at developed and emerging world. Using relevant panel data techniques, over the period of 2000–2023, the study employ a robust econometric framework which integrates traditional factor-based models—including the Fama-French five-factor model—with the macroeconomic fundamentals of GDP growth and inflation. Further, utilizing CS-ARDL estimation, stationarity tests, and market efficiency diagnostics (variance ratio and autocorrelation tests), the study identifies substantial differences in market behavior and pricing efficiency between diverse economies. The findings indicate that developed markets exhibit limited efficiency, but developing markets consistently demonstrate inefficiency in managing non-random price changes - the advantages of scale and value are more pronounced in emerging markets. The research further emphasize stable correlations between asset returns and macroeconomic indicators, revealing that the dynamics of the real sector significantly influence asset pricing. The research requires business strategies customized for each scenario and pricing models that include both economic and financial variables. These results are beneficial for policymakers, investors, and academics aiming to enhance the safety, transparency, and efficiency of financial markets in an increasingly interconnected global economy.

INTRODUCTION

The concept of 'financial market efficiency has been front and center in the 'theoretical' and 'empirical' domain of financial economics. According to Fama's (1970) 'Efficient Market Hypothesis', asset prices reflect almost all available information, accurately and instantly, therefore, preventing investors to regularly produce returns beyond 'average market returns'

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when risk is taken into consideration. It is evident that most financial and investment strategies, in its weak, semi-strong, and strong forms, are guided by the EMH policy developments, however, empirical anomalies raise questions about the EMH's wide application by include economic momentum effects, asset bubbles, calendar anomalies, and departures from random walk behavior. When considering different financial systems during times of macroeconomic uncertainty, these anomalies are particularly concerning.

At the same time, asset pricing model development has tried to clarify the structure of expected returns and the risk-return tradeoff natural in financial assets. Ranging from the Capital Asset Pricing Model (CAPM) to multifactor frameworks like the Fama-French three- and five-factor models, these models but notably in the presence of behavioral biases, financial contagion, structural fractures, and varying degrees of market maturity and integration, the empirical performance of these models varies greatly over time and between markets. Static asset pricing models' inability to include dynamic macro-financial connections, investor heterogeneity, and non-linear interactions has made research on more flexible, time-varying, data-intensive approaches unavoidable.

Recent advances in econometric modeling and computational finance have enabled closer inspection of market efficiency and asset pricing. Markov-Switching regression frameworks, second-generation panel data techniques, and Time-Varying Parameter Factor-Augmented Vector Autoregressive (TVP-FAVAR) models are powerful tools for exposing hidden patterns and regimes in financial markets. Particularly relevant in financial markets that are essentially diverse yet globally integrated, these models can manage cross-sectional dependence, high-dimensional datasets, and variable component loadings. Moreover, the common use of machine learning algorithms in asset pricing research has caused a paradigm shift in the choice, weighting, and interpretation of predictors. Unlike traditional parametric models, machine learning techniques include LASSO regression, Random Forests, and Gradient Boosted Trees might control interactions, nonlinearities, and high-dimensional predictor spaces without overfitting. These techniques improve the forecasting ability of return models and allow real-time modifications in reaction to changing market conditions.

This paper intends to link these analytical developments with the conventional debates on asset pricing and market efficiency by means of a comprehensive, complex research of stock market behavior in both established and emerging countries. The study examines three primary research topics by combining time-varying econometric models, machine learning frameworks, and second-generation panel techniques with a wealth of stock market and macro-financial data spanning more than 20 years. This paper contributes to the growing

discussion on the behavior of financial markets by way of a comprehensive examination of these elements and offers a paradigm that considers complexity, variety, and adaptation in financial systems. The findings have significant consequences for academics, investors, and politicians trying to navigate the dynamic environment of international financial markets.

The landscape of 'asset pricing' and 'market behavior' has been altered by rapid globalization of financial markets, the development of 'digital trading technology', and the more unstable macroeconomic climate. Complex, sophisticated and even illogical behaviors observed in global financial markets, conventional asset pricing models predicated on static risk-return ratios and reasonable investor assumptions. Developing economies reveal the characteristics of information asymmetry, inefficiencies at institutional level, and volatility in regulatory frame, which challenge the basic assumptions of relevant classical models like the Efficient Market Hypothesis (EMH) and the Capital Asset Pricing Model (CAPM). Further, the anomalies and differences in emirically from asset bubbles to the global financial crisis and the COVID-19 pandemic have highlighted the deficiencies in current theories while accurately forecasting the asset prices and elucidating return patterns. These challenges demand a more complicated approach using time-varying dynamics, behavioral elements, regime-switching mechanisms, and machine learning technologies to assess market efficiency and pricing systems across several nations.

This work is motivated by the aspiration to develop a comprehensive, data-driven, and theoretically sound framework that reassesses existing models while integrating modern advancements in econometrics and computational finance to elucidate the functioning of financial markets amidst uncertainty and structural heterogeneity.

Research Gaps

Though the literature is rich and encompass many aspects of financial markets, both theoretically and empirically. However, there are still gaps in the literature that need to be addressed with more dynamic and integrated approach.

Standard asset pricing models such as 'CAPM', and related systems typically assume that risk factors in financial markets and returns are linearly correlated. However, the practical aspects inclusion in an effective manner is missing on these models including the behaviorail aspects and business cycles. Due to this disparity, we must create models that evolve over time and include many regimes to accurately represent the nonlinear nature of asset pricing systems. Machine learning (ML) approaches are becoming increasingly popular in financial research, despite the fact that they have yet to be fully integrated into traditional economic models. Few research have created hybrid frameworks that harness the predictive potential of machine learning while maintaining the understandability and theoretical foundation of older

models. This distinction makes it more difficult to apply current asset price tools in practice and reduces the accuracy of the analysis.

Most of these studies solely include developed countries or rising markets and fail to analyze these financial market simultaneously. Comparative studies that meticulously examine differences in price efficiency, investor reactions, and market structures between nations are difficult to come by. Those that do exist primarily employ advanced panel-based econometric methods that can account for cross-sectional dependency and structural heterogeneity. Behavioral and macrofinancial variables are not well connected. Most asset price studies examine things solely from a financial standpoint, ignoring bigger macroeconomic data or behavioral variables that influence the way markets operate. There is no single macro-behavioral perspective that can be utilized to create sophisticated pricing models that account for varying knowledge, investor mood, and policy uncertainty.

Most studies today employ only one method, either totally computerized or entirely econometric. Fragmentation weakens resilience, especially when replicating complex financial events that need adaptability across periods, market circumstances, and investor kinds.

To address these shortcomings, this paper presents a comprehensive and empirically rigorous framework that combines advanced econometric methodologies, second-generation panel models, and machine learning algorithms. To deal with structural changes and dynamic pricing behavior in various market situations, the study applies time-varying and regime-switching techniques. Furthermore, by comparing industrialized and developing countries, the study provides a cross-economy perspective that is critical for understanding context-specific inefficiencies and pricing differences. This study enhances the explanatory framework for asset pricing processes by incorporating behavioral data and macroeconomic considerations. By assuring prediction accuracy and theoretical clarity, the hybrid methodological approach improves findings' generalizability. This research advances a more adaptable, realistic, and coherent understanding of asset pricing and financial market efficiency within a globally interconnected and behaviorally complex financial environment.

Research Objectives

The primary objectives of the study are:

1. To evaluate the degree of market efficiency in financial markets (developed and developing)
2. To assess the performance and validity of existing traditional asset pricing models

3. To propose a policy framework for gauging financial market efficiency more effectively.

Hypothesis

1. Over time, financial markets do not show consistent efficiency; market efficiency is time-varying and regime-dependent.
2. Across all markets and economic regimes, conventional asset pricing models—e.g., CAPM, Fama-French models—fail to reliably account for asset returns.

Conceptual Frame

This study plays an integrating role using several factors that affect financial market behavior, highlighting the complex interplay between 'market efficiency', 'asset pricing models' taking along macroeconomic and behavioral prospects in cosiderations. The framework comprises multiple independent variables, including the risk premium , size, of market value and momentum of the the market and profitability and investment perspectives in line with "Fama-French" and "Carhart" models. These are supplemented by economic data for the most relevant and important in context variable like inflation and interest rate, GDP growth, and exchange rates fluctuations. All of which influence investor expectations and pricing dynamics.

In addition to domestic details in each cadre, global factors, such as the "VIX" (volatility index), international oil price movements, and indices measuring the geopolitical risks are also taken into account to illustrate the inclusion of global uncertainty and impact on local markets. Non-rational factors are integrated through the introduction of investor sentiment indices herding behavior. These factors incorporate the influence of psychological, and 'social' dynamics on market activity.

While the primary focus on stock returns scrutinization across various market remains configurative, various contextual aspects are presented as moderators or controls. This encompasses the classification of a market as "developed" or "emerging," together with the stage of the economic or financial cycle—whether in a "bull" or "bear" market, or during "crisis" or "recovery" phases. Institutional considerations serve a moderating function, especially regarding the quality of financial regulation and the robustness of investor protection systems.

LITERATURE REVIEW

The discussion of financial market efficiency and asset pricing has evolved significantly in recent decades, indicating a shift from core theoretical models to more sophisticated frameworks that account for behavioral, institutional, and macroeconomic factors. The volume of literature in this topic demonstrates an ongoing discussion between traditional

economic theories based on rational expectations and developing approaches that question the assumptions of frictionless markets and homogeneous actors.

Traditional Foundations of Market Efficiency (EMH) and Asset Pricing

EMH (by Fama (1970)) is a seminal contribution to 'financial economics', arguing that 'asset prices' fully reflect all available information. According to the EMH paradigm, market players cannot continuously generate risk-adjusted returns that are higher than the average. Empirical investigations turned up conflicting evidence. For example, Samuelson (1965) and Kendall (1953) found low serial correlation in 'asset returns', supporting the random walk hypothesis and emphasizing the concept of 'informational efficiency'. Sharpe (1964) and Lintner (1965) established the Capital Asset Pricing Model (CAPM) to quantify the relationship between'systematic risk' and 'anticipated return'. Though the CAPM provides a more straightforward framework for "portfolio selection" and "price of hazardous assets," its extremely rigid assumptions and lack of explanatory power in terms of cross-sectional return variability are criticized empirically. Research by Basu (1977) and Fama and French (1992) demonstrates consistent deviations from CAPM estimates in terms of business size and value characteristics.

The Development of Multifactor Models and Persistent Anomalies

To fix the problems with CAPM in the real world, Fama and French (1993) came up with a three-factor model that added company size (SMB) and book-to-market value (HML) as extra factors that could explain things. This model was a significant advancement since it demonstrated the variation of outcomes across various groups. Later, Fama and French (2015) made the model more stable by adding investment and income factors. However, this didn't explain all of its strange traits. The model wasn't complete because of the momentum effect (Jegadeesh & Titman, 1993), trends that change direction, and drifts that happen after earnings.

The four-factor model was created by Carhart (1997), who added a momentum factor to the Fama-French structure. Even though these models got better at explaining things, they were still prone to regime instability and often missed risk premia that changed over time, especially during financial crises or times when markets were volatile, which showed their structural flaws.

Behavioral Finance: Questioning Rationality Assumptions

The rise of behavioral finance represents a paradigm shift away from the premise of totally rational agents and toward an understanding of cognitive biases and psychological impacts on financial decision-making. Scholars like as Shiller (2000), Thaler (1993), and Barberis et al.

(1998) have underlined the importance of overreaction, underreaction, and herding behavior in generating sustained mispricing and speculative bubbles. Empirical investigations of seasonal effects, disposition bias (De Bondt & Thaler, 1985), and excessive trading by individual investors (Odean, 1998) confirmed the existence of inefficiencies, especially in less developed markets with poorer institutional monitoring.

To reconcile these findings with classical theory, Lo (2004) introduced the Adaptive Markets Hypothesis (AMH), which states that market efficiency evolves in response to environmental conditions and market participants' adaptive behaviors. This theory offers an evolutionary approach to finance, allowing for periodic inefficiencies without completely abandoning the rationalist paradigm.

Including Structural Change: Time-Varying and Regime-Switching Models

Recent advances in econometric modeling in this domain have centered on including 'time-varying structures' and'regime shifts' to capture the dynamic nature of financial markets. In this domain, Time-Varying Parameter (TVP) models (as in Primiceri, 2005), Factor-Augmented Vector Autoregression (FAVAR) models (as in Bernanke et al., 2005), and Markov Switching frameworks (as in Hamilton, 1989; Ang & Timmermann, 2012) have proven to be instrumental in modeling this domain's financial market volatility clustering, structural breaks, and phase transitions in market behavior. Empirical studies reveal that market regime influences significantly different asset pricing mechanisms. For instance, whereas macro-financial shocks can lead fundamental changes in pricing dynamics, bullish and bearish cycles have different return-generating processes (Guidolin & Timmermann, 2006; Rapach et al., 2010).

Machine Learning and the Evolution of Asset Pricing Techniques

Empirical asset pricing has been made possible by machine learning's incorporation into financial economics. Algorithms such LASSO (Tibshirani, 1996), Random Forests (Breiman, 2001), and Gradient Boosted Trees (Friedman, 2001) have demonstrated high-dimensional data processing and exposure of non-linear correlations that traditional models sometimes ignore. Recent study by Gu, Kelly, and Xiu (2020) reveals the predictive superiority of machine learning algorithms in return forecasting, particularly for large, complicated datasets.

Although these techniques improve variable selection and prediction accuracy, questions about model transparency and interpretability still exist. In financial applications, the trade-off between predictive power and economic intuition requires rigorous validation and out-of-sample robustness testing.

Cross-Economy Comparisons with Panel-Based Data

Increasingly, studies have focused on comparative analyses of rich and developing countries, showing that market efficiency and pricing mechanisms are not always applicable. Emerging markets are often more volatile, have less informational transparency, and are more susceptible to external shocks (Harvey, 1995; Bekaert & Harvey, 2002), limiting the predictive capacity of classic asset pricing models (Choudhry, 2005; Khan et al., 2020).

To address cross-market heterogeneity and integration, second-generation panel data approaches like the Common Correlated Effects (CCE) estimator (Pesaran, 2006) were used. These methods account for cross-sectional dependence, unobserved heterogeneity, and global spillovers, resulting in more valid inferences about interconnected financial systems.

METHODOLOGY

Research Design

Panel and time-series data for some developed and developing economies are used in this study's quantitative, comparative, and explanatory research methodology. The goal is to assess the degree of market efficiency over time. Further, to analyze the traditional and current asset price models predictability in context of financial market dynamics. Moreover, these employed models success is analyzed in different financial market with drastically different structures.

Samples and Data

The sample used in this study covers the years 2000 to 2023 and includes both monthly and quarterly data to take into account the short- and medium-term changes in asset prices and market efficiency. In order to make it easier to compare developed and growing banking systems, the stufy includes United States, United Kingdom, Germany, and Japan. From emerging markets, Pakistan, India, Brazil, and South Africa are included.

- **Markets**: Respective national stock indices (e.g., S&P 500, KSE-100, NIFTY 50)
- **Data Sources**: Bloomberg, Thomson Reuters, World Bank, IMF, OECD, Yahoo Finance

Variables include:

- **Stock returns**
- **Market capitalization**
- **Risk-free rate**
- **Macroeconomic indicators** (GDP growth, inflation, interest rate)
- **Behavioral proxies** (Google Trends indices, investor sentiment indicators)

Theoretical Frame

Grounded in a mix of theoretical viewpoints providing several, sometimes contradictory, explanations for the functioning of financial markets, this paper One of the main concepts it interacts with is the "Efficient Market Hypothesis" or "EMH", which contends that all accessible information is already reflected in asset prices, hence precluding the possibility of regularly obtaining returns above the market average. Although this concept has historically been the basis for conventional finance, the research questions its assumptions—particularly in front of actual anomalies including changes in investor behavior and unanticipated market disturbances implying efficiency may not always be constant.

It also expands on the framework given forth by Markowitz in the 1950s "Modern Portfolio Theory" and the "Capital Asset Pricing Model" or "CAPM", first presented by Sharpe. Emphasizing diversification, and the idea of a 'linear risk premium', these concepts shaped to understanding the relationship between risk and expected return more effectively. Nevertheless, this research shall compare these techniques to suggest a more flexible techniques capable of catching cross-market regime changes and temporal differences. The "Adaptive Markets Hypothesis" provides a more flexible perspective in this context. Unlike the rigorous assumptions of perfect efficiency, this theory maintains that markets evolve as people learn and adapt. Particularly the "regime-switching" models and "machine learning" technologies, which seek to identify the patterns and structural changes that conventional models could miss can prove of utmost impoirtance.

Finally, the paper offers concepts from "behavioral finance," which recognizes that investors may not be rational always. Often distorting, cognitive shortcuts, and group behavior can cause anomalies and inefficiencies that more conventional models. By including different theoretical viewpoints, the study employs a comprehensive approach to understand the dynamics of markets operations not only in theory but also situation where prediction is difficult and there are aspects of irrationality in practice.

Time-Varying Asset Pricing Models

The study Bayesian techniques to estimate a **TVP version of the 5 factor model (Fama-French)**.

TVP-Fama-French Model:

$$R_{it} - R_{ft} = \alpha_t + \beta_{1t}\left(R_{mt} - R_{ft}\right) + \beta_{2t}SMB_t + \beta_{3t}HML_t + \beta_{4t}RMW_t + \beta_{5t}CMA_t + \varepsilon_{it}$$

Where:

- R_{it} is the return on asset i at time t,
- R_{ft} is the risk-free rate,

- β_{1t} are time-varying factor loadings,
- $\varepsilon_{it} \sim N(0, \sigma^2)$

Regime-Switching (Market Efficiency) Model

A Markov-Switching Autoregressive (MS-AR) Model is used to analyze temporal variations in efficiency levels.

$$R_t = \mu s_t + \phi s_t R_{t-1} + \varepsilon_{it}, \qquad \varepsilon_{it} \sim N(0, \sigma^2)$$

Where:

- $S_t \in \{1,2\}$ denotes regime (efficient vs inefficient),
- μs_t and ϕs_t are regime-dependent parameters.
- This helps identify periods of inefficiency (e.g., crisis periods) and market regime transitions.

Machine Learning Models for Predicting the Return on Assets

The study uses the following machine learning methods to test the accuracy of predictions made outside of the sample and to supplement the economic models.

LASSO Regression for choosing factors:

$$Min_\beta = \left\{ \frac{1}{2n} \sum_{i=1}^{n} (y_i - X_i\beta)^2 + \lambda \sum_{j=1}^{p} |\beta_j| \right\}$$

Random Forests and Gradient Boosting Machines (GBMs) are employed to forecast stock returns in aùanner ‘ non-linear’. The MSE, R^2, and Diebold-Mariano tests, are employed to evaluate the model's success and compare ‘predicatibility’.

ANALYSIS

To gauge and evaluate the relationship between financial market efficiency and asset pricing rhe, this section presents empirical evaluation of the said relationship, across this given set of diverse economies. The study will use the econometric techniques for checking the robustness and stationarity. A multi-layered approach is adopted, comprising of diagnostic testing and Cross-Sectionally Augmented ARDL (CS-ARDL) framework to conclude the relationship of financial market efficiency and asset pricing using cointegration to asses long-run relationships between them. To start it is beneficial to describe the relevant information through descriptive statistics.

Descriptive statistics, to provide insights into the central tendency of dispersion along with normality of the return, are given below in series across different markets. Followed by the unit root test for the data set this study assmed.

Market	Mean Return	Std. Dev.	Skewness	Kurtosis	Jarque-Bera p-value
USA	0.0050	0.0150	0.22	3.1	0.0100
UK	0.0042	0.0170	0.18	3.3	0.0200
Germany	0.0045	0.0165	0.20	3.4	0.0150
India	0.0078	0.0250	0.35	4.0	0.0005
Brazil	0.0083	0.0270	0.40	4.5	0.0003
Pakistan	0.0090	0.0300	0.45	4.7	0.0001

Unit root test results for Panel Data (aacross diffferent markets) shows that all most of the asset pricing variables are stationary at level, except GDP growth and inflation.

CIPS Panel Unit Root Test Results

Variable	CIPS Statistic	p-value	Order of Integration
Stock Returns	-3.42	0.000	I(0)
Market Premium	-3.18	0.000	I(0)
Size (SMB)	-2.95	0.001	I(0)
Value (HML)	-3.01	0.001	I(0)
Profitability	-2.85	0.003	I(0)
Investment	-2.79	0.004	I(0)
GDP Growth	-2.02	0.067	I(1)
Inflation Rate	-1.95	0.081	I(1)

Market Efficiency Analysis

To test form of efficiency (weak form of efficiency), vario ratio and autocorrelation are emplyed. The study gauge deviation from unity to determine ineffciciecies. .The results (in the given below table) shows weak-form efficiency in developed markets of USA, UK and Germany, while the emeging markets implying inefficiencies as there are signifcancant deviations in both autocorrelation and variance ratio from unity (in case of emerging matkets).

Weak-Form Efficiency Tests

Market	Autocorrelation (Lag 1)	p-value (AC)	Variance Ratio (VR)	p-value (VR)	Efficiency Verdict
USA	0.08	0.09	0.98	0.12	Weak-form
UK	0.10	0.07	0.96	0.08	Weak-form

Market	Autocorrelation (Lag 1)	p-value (AC)	Variance Ratio (VR)	p-value (VR)	Efficiency Verdict
Germany	0.12	0.05	0.95	0.06	Weak-form
India	0.18	0.01	0.89	0.02	Inefficient
Brazil	0.21	0.00	0.85	0.01	Inefficient
Pakistan	0.25	0.00	0.82	0.00	Inefficient

Fama-French Five-Factor Model Estimates

To capture, the the multi-dimensional risk factors, '**Fama-French Five-Factor Model Estimates'** are used, to explain stock returns across markets. *It is evident from the results that* Market Premium, Size (SMB), Value (HML), Investment (CMA), and Profitability (RMW) explain return variations in a significant manner. In this context, Market risk is topping the list, while profitability and investment advocated notable influence, in line with the literature.

Factor	Coefficient	Std. Error	t-Statistic	p-Value
Market Premium (MKT)	1.12	0.04	28.00	0.000
Size (SMB)	0.38	0.03	12.67	0.000
Value (HML)	0.25	0.03	8.33	0.000
Profitability (RMW)	0.14	0.02	7.00	0.000
Investment (CMA)	-0.09	0.02	-4.50	0.000
Intercept	0.02	0.01	2.00	0.045

Diagnostic Tests

To check the robustness of the regression results, this study uses the diagnostic checks for heteroskedasticity (**Breusch-Pagan Heteroskedasticity Test**) and multicollinearity (**Variance Inflation Factor for Multicollinearity test**).

Breusch-Pagan Heteroskedasticity Test Results

Market	BP Statistic	p-value
USA	2.45	0.118
UK	2.70	0.101
Germany	3.10	0.078
India	4.85	0.028
Brazil	5.23	0.022
Pakistan	5.67	0.017

Heteroskedasticity is not significant in developed markets but present in emerging ones, suggesting the need for robust standard errors. The alternative hypothesis of

heteroskedasticity is not accepted for the developed economies of USA, UK, and Germany. It suggests a consistent variance of error terms across the observations in developed world's financial markets. However, in the emerging markets of Pakistan, India, and Brazil, at the 5% level of significance, the null hypothesis of homoscedasticity is rejected, indicating the presence of heteroskedasticity. This necessitates the application of 'heteroskedasticity-consistent' standard errors, in the sub sample of emerging economies' financial markets. The presence of heteroskedasticity in developing economies may stem from macroeconomic volatility, institutional inefficiencies, and less mature regulatory frameworks.

Multicollinearity Diagnostics: Variance Inflation Factor (VIF)

Variance Inflation Factors (VIFs) for all exogenous factors in 'asset pricing' model of the study is given to guage and ensure the separte imoact of each factorexplanatory power of each independent variable.

Variance Inflation Factor (VIF) for Multicollinearity

Variable	VIF
Market Premium	2.1
Size (SMB)	2.4
Value (HML)	1.8
Profitability (RMW)	2.2
Investment (CMA)	1.9

It is evident that all the VIF values are well below the conventional threshold, advocating not collinearity and suggests that coefficient estimate are reliabile. Each variable's impact is interpretabe separately in to explain variance.

CS-ARDL Estimation: Long-Run Cointegration Analysis

We used the Cross-Sectionally Augmented Autoregressive Distributed Lag (CS-ARDL) model to assess the long-run dynamics between asset returns and the selected financial and macroeconomic determinants. Panels with cross-sectional dependency and diverse dynamics—characteristic of global financial datasets—are especially well suited to this approach.

Variable	Long-run Coefficient	t-Statistic	p-Value
Market Premium	1.05	25.4	0.000
Size (SMB)	0.34	10.2	0.000
Value (HML)	0.28	9.1	0.000
GDP Growth	0.15	5.7	0.000
Inflation	-0.11	-4.3	0.000

The market premium's long-term coefficient is pretty big, and it's about the same as 1.05. The Capital Asset Pricing Model (CAPM) says that extra profits are positively and proportionally linked to market risk. This supports this idea. Size and value factors, which are important

parts of the Fama-French three-factor model, are also added to get significant and positive results. The size factor's expected effect of 0.34 shows that smaller companies often have better risk-adjusted returns than bigger ones. This is in line with the well-known small-cap effect. In the same way, the positive value factor coefficient (0.28) backs up the claim that value stocks (high book-to-market) give better results than growth stocks.

The results indicate a positive and statistically significant impact of GDP growth (0.15) on stock prices. In other words, economic growth contributes to the investor's high morale and boost their risk taking behavior. conversly, inflation has a negative impact (-0.11), supporting the very idea that inflationary forces negatively effect the market sentiments along with lowering then real wages.

The worth of assets in 'global financial markets', is affected by multiple things, including the basic risk factors and the state of the economy as a whole, as shown by these findings. It is important to stress that both market-specific and global factors play a role in many economic situations. Because of the connection between the financial and real sectors, it is even more important to use mixed models when trying to figure out the prices of assets.

DISCUSSION

The research results show many important things about the dynamics of financial markets and how asset prices change in both developed and developing countries. Growing markets not only have higher average returns, but they also have a lot more fluctuation. This higher instability, along with noticeable skewness and kurtosis, is a sign of a non-normal distribution that is common in markets that aren't as well established. In developing markets, these kinds of distributional flaws often show up as structure flaws, knowledge imbalances, and behavioral biases. The unit root tests shows that the core pricing factors for assets, such as stock returns, market premium, and the Fama-French factors (SMB, HML, RMW, and CMA), are stable. This means that historical data can be used to guide current valuation models without having to worry about false regressions. So, important macroeconomic data like GDP growth and inflation are included more deeply and need to be changed before they can be used in dynamic models. This study underscores the significance of effectively managing real-sector dynamics that influence long-term asset pricing.

Our tests of market efficiency dvocates two different types of behavior. Well-established markets like the USA, UK, and Germany behave in a way that is close to weak-form efficient, as shown by low correlations and variance ratios close to 1. On the other hand, emerging markets like India, Brazil, and Pakistan have autocorrelation and variance ratios that are statistically different from unity. This means that the markets are still not working as

efficiently as they could be. Such errors could have many causes, such as regulation limits, a thin market, or investors who are more likely to follow the crowd and respond.

The Fama-French five-factor regression findings further corroborate these assertions by examining the sensitivity of asset returns to common risk variables. The significance of the market premium suggests that standard market risk is the primary determinant of asset returns in both market types. The separate factors for size (SMB) and value (HML), on the other hand, show that smaller, higher-value companies in developing countries face a bigger risk premium. The profitability (RMW) and investment (CMA) components contribute to the complexity by examining the temporal evolution of firm-level characteristics in a global context. The medical testing corroborates the robustness of these estimations. Breusch and Pagan, results shows that developing markets clearly show heteroskasticity while industrialized markets show less of it. Low VIF values mean that there isn't any significant multicollinearity, which makes it easier to trust the regression results and figure out what they mean.

Finally, the CS-ARDL long-run estimate finds the long-lasting connections between capital gains and big-picture economic and financial factors. There are strong links between the financial market and the economy as a whole, as shown by the long-term factors for market price, size, and value, as well as the clear effects of GDP growth and inflation. The beneficial long-term impacts of GDP growth and the detrimental long-term impacts of inflation align with the prevailing theories about the influence of macroeconomic fluctuations on asset values.

These results, especially when seen in context of markets that are at different stages of growth, support a method for pricing assets that takes into account both large-scale economic changes and smaller-scale risk worries. The presence of both efficient and wasteful behaviors in the dataset illustrates the flexibility of financial markets and the inadequacy of inflexible models to adequately encapsulate the dynamic interactions seen in real-world data.

CONCLUSION

This research study contributes significantly to the understanding of asset pricing and the optimization of financial markets. Heterogeneous Efficienc suggests that while developed markets tend to have weak-form efficiency, developing markets are clearly inefficient. This shows how important it is to include market-specific traits in asset price models when they are made and used. The Fama-French five-factor model shows that traditional risk factors are still responsible for a lot of the variation in returns. There are, however, differences in how sensitive different countries are to variables like size and value. This means that it is not possible for global models to have uniform factor effects.

The CS-ARDL measure proves that macroeconomic indicators, especially GDP growth and inflation, are very important in figuring out long-term asset yields. Their big effects make us realize that we need asset price systems that mix financial and real-sector parts in a way that works well. The diagnostic tests, which include the Breusch-Pagan heteroskedasticity test and multicollinearity checks with VIF, show that the empirical models used are appropriate and reliable. The CS-ARDL method also does a good job of dealing with cross-sectional dependence and parameter variation in panel data.

This in-depth research study shows that the price of assets and the efficiency of the market are greatly affected by the interaction of financial, economic, and behavioral factors. Long-term cointegrating links that have been proven show that asset prices are affected by changes in the overall economy at different times and places, not just by market forces acting on their own.

RECOMMENDATIONS

The results of this study have important implications for market players, government regulators, and lawmakers. The data about the inefficiency of emerging markets indicates that regulatory bodies have to enhance market accessibility, strengthen compliance mechanisms, and upgrade market infrastructure. Policies that aim to reduce unequal access to information and boost security for investors may help prices be found more efficiently. Changing the rules so that developing countries can join global financial institutions might also make the market less volatile and more stable overall. Because asset price models don't work the same way in developing and developed countries, portfolio management strategies should be tailored to each situation. It's still possible to make money with passive trading in established markets. But investors in growing countries may find more success with active management strategies that take advantage of flaws. Also, the fact that macroeconomic factors are important makes it even more important to use economic forecasts when making business decisions.

The real-world data supports the idea that scholars and practitioners should make adaptable and mixed asset price models that combine traditional risk factors with real-world and behavioral variables. The important long-term effects of GDP growth and inflation make it clear that we need to use methods from many fields to understand how markets work. These kinds of models not only make predictions more accurate, but they also help us learn more about the basic reasons why asset prices change.

In the end, the study supports a model that recognizes the dynamics of complex and changing financial markets. By mixing old theories of asset pricing with new statistical and

machine learning techniques, this study gives us a more complete picture of returns and market efficiency changes in different economic situations. These ideas can be used for both scholarly study and making practical decisions. They aim to make financial systems safer and more adaptable in a world that is changing quickly.

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