International Journal of
Financial Studies

MDPI

Article

The Impact of Uncertain Welfare Quality on Equity Market Performance

Tarek Eldomiaty [1,*], Islam Azzam [1], Hoda El Kolaly [1], Nermeen Youssef [2], Marwa Anwar Sedik [3] and Rehab ElShahawy [4]

[1] Onsi Sawiris School of Business, The American University in Cairo, AUC Avenue, P.O. Box 74, New Cairo 11835, Egypt; iazzam@aucegypt.edu (I.A.); hodaelkolaly@aucegypt.edu (H.E.K.)
[2] Faculty of Business, Economics and Political Science, The British University in Egypt, P.O. Box 43, Cairo 11837, Egypt; nermeen.youssef@bue.edu.eg
[3] Faculty of Business Administration & International Trade, Misr International University, Al Obour 19648, Egypt; marwa.anwar@miuegypt.edu.eg
[4] School of Business Administration, Canadian International College in Cairo, CIC Avenue, P.O. Box 59, New Cairo 11241, Egypt; rehab_hamed@cic-cairo.com
* Correspondence: tarek_eldomiaty@aucegypt.edu; Tel.: +20-2-26153432

Abstract: Welfare quality is usually a stochastic outcome, as attempts at improving social welfare cannot be predicted in advance. The advances in stock market participation conclude that equity market performance is able to reflect investors' mass reactions and therefore can fairly reflect the empiricism of welfare quality. In this paper, the pillars of the Happy Planet Index (*hereinafter* HPI) are used as proxies for countries' welfare quality. The data cover 57 countries where equity markets exist over the annual period of 2006–2020. The results indicate that (a) the three pillars of HPIs have historical positive impacts on market capitalization and stock turnover; (b) stochastically, life satisfaction has an expected positive impact on market capitalization and stock turnover; (c) firms located in high (low) HPIs, life satisfaction, and life expectancy have significant (insignificant) stochastic impacts on market capitalization; and (d) the historical ecological footprints have positive impacts on market capitalization and stock turnover, whereas stochastic impacts are statistically insignificant.

Keywords: welfare quality; stochastic; happy plant index; equity market performance; world economies

JEL Classification: G19

Academic Editors: Khelifa Mazouz and Zied Ftiti

Received: 6 March 2025
Revised: 29 March 2025
Accepted: 10 April 2025
Published: 15 April 2025

Citation: Eldomiaty, T., Azzam, I., El Kolaly, H., Youssef, N., Sedik, M. A., & ElShahawy, R. (2025). The Impact of Uncertain Welfare Quality on Equity Market Performance. *International Journal of Financial Studies*, *13*(2), 67. https://doi.org/10.3390/ijfs13020067

1. Introduction

Uncertainty is inherent in welfare quality as long as institutionalists' initiatives and responses from individuals cannot be predicted in advance. This paper benefits from the research strand, which concludes that economic development and welfare quality must be inextricably associated (Kaldor, 1939; Hicks, 1939; Little, 1957; Atkinson, 1999; Dang, 2014; Lall, 1981; Sen, 1988, 1990; Basu et al., 2022; Nayak & Pradhan, 2024). This paper extends the contribution of theories of welfare quality to equity markets (Evans & Hnatkovska, 2007; Gromb & Vayanos, 2010; Molinari, 2014; Galina et al., 2015; Nazir et al., 2010; Wurgler, 2000) and further considers the empiricism of stochastic aspects of welfare quality (Le Breton, 1991; Bouacida & Martin, 2021). The Happy Planet Index (HPI), developed by the New Economic Foundation (2016), is the first composite

indicator that includes a measure of ecological efficiency along with human well-being (Marks et al., 2006; Abdallah et al., 2009, 2012).

The Trends of Countries' Welfare Uncertainty

The authors address the uncertainty of welfare quality by running Monte Carlo stochastic simulations for the three pillars of the HPI. The skewness of HPIs measures the potential of welfare quality. The skewness of a historical pillar is arranged in an ascending order and depicted against the associated Monte Carlo stochastic (using empirical mean and volatility) simulated estimates across the three respective pillars. Figures 1–4 show the skewness of the historical and stochastic scores of the three pillars of the HPI across 57 countries.

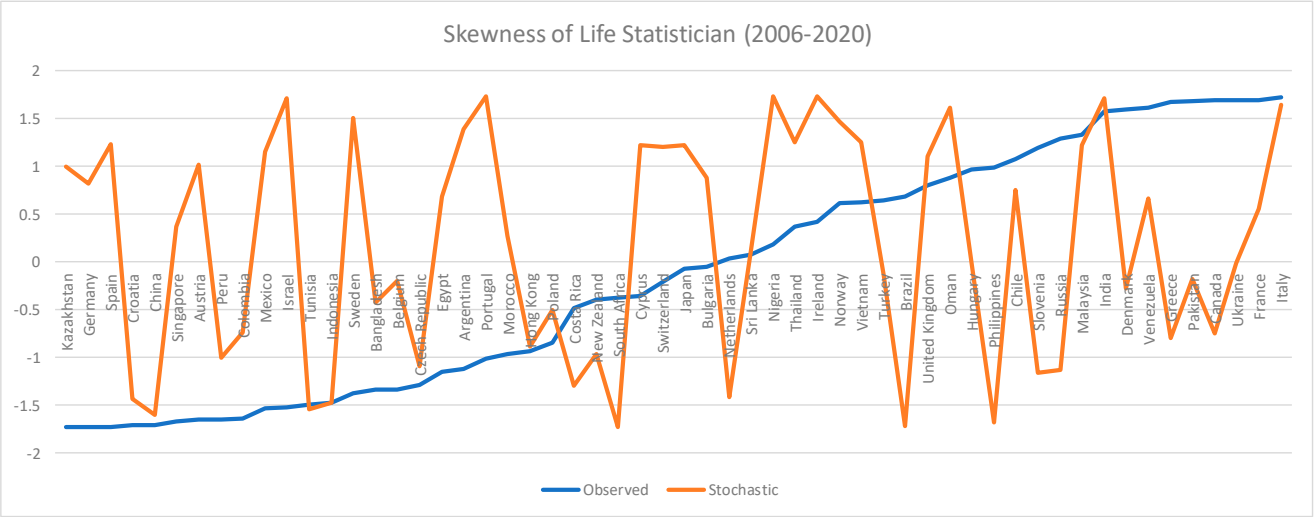

Figure 1. Fluctuations in Historical versus Stochastic Life Satisfaction across 57 Countries.

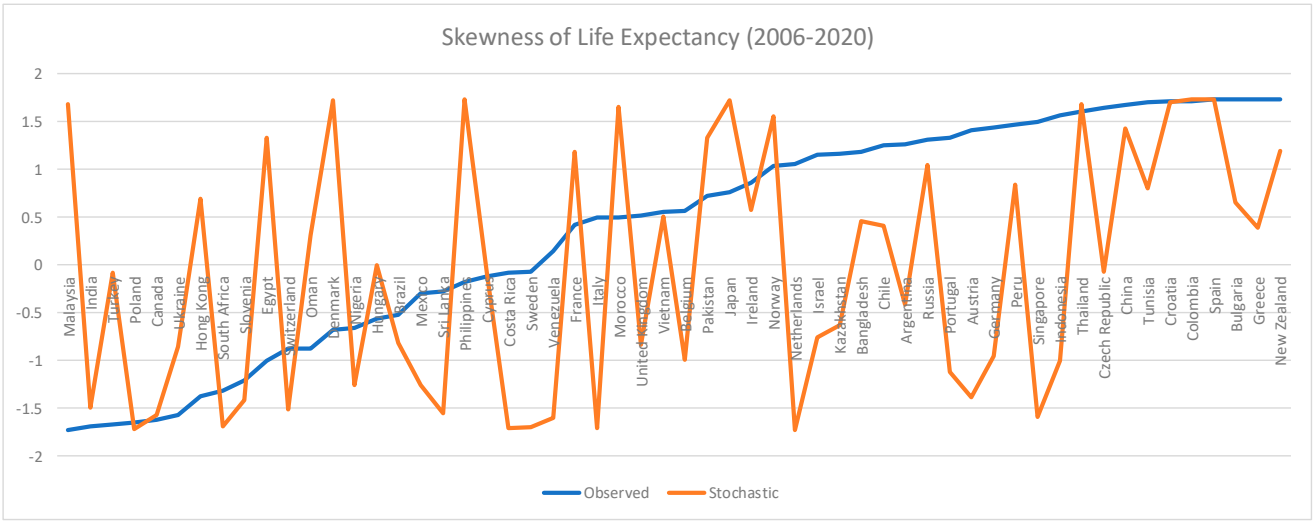

Figure 2. Fluctuations in Historical versus Stochastic Life Expectancy across 57 Countries.

Figures 1–3 show the interesting potential of welfare quality. In most countries, the negative skewness of a historical pillar is associated with an expected positive skewness reflecting the potential for improvement. The opposite is also true, highlighting a plausible motivation for further examination. These results reflect the realities of countries' welfare. That is, it is fairly argued that countries are trying to improve declining welfare, but countries associated with higher welfare quality may experience an expected decline. This

argument can be further supported by depicting the historical and stochastic skewness of the aggregate HPI ranks following the same procedures. This is shown in Figure 4.

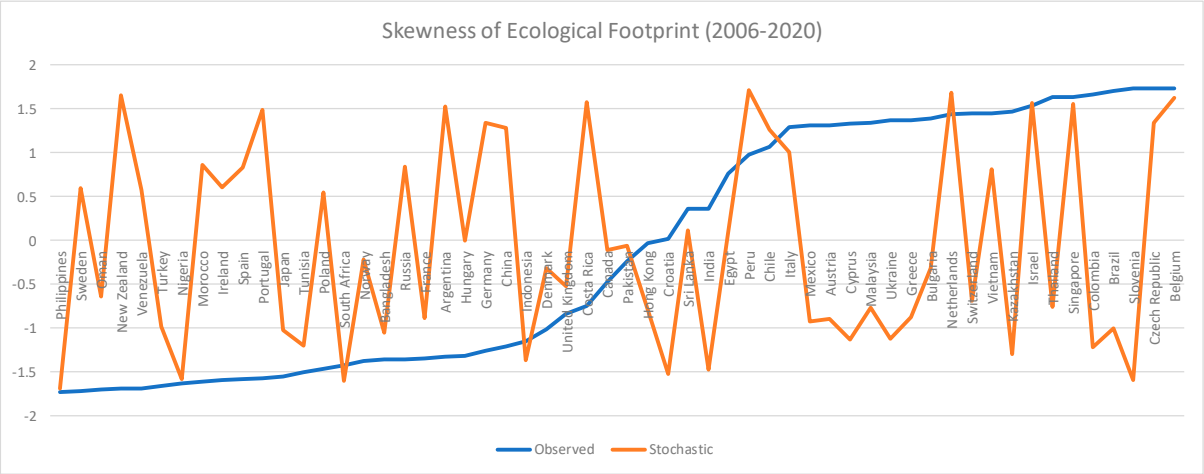

Figure 3. Fluctuations in the historical versus stochastic Ecological Footprints across 57 countries.

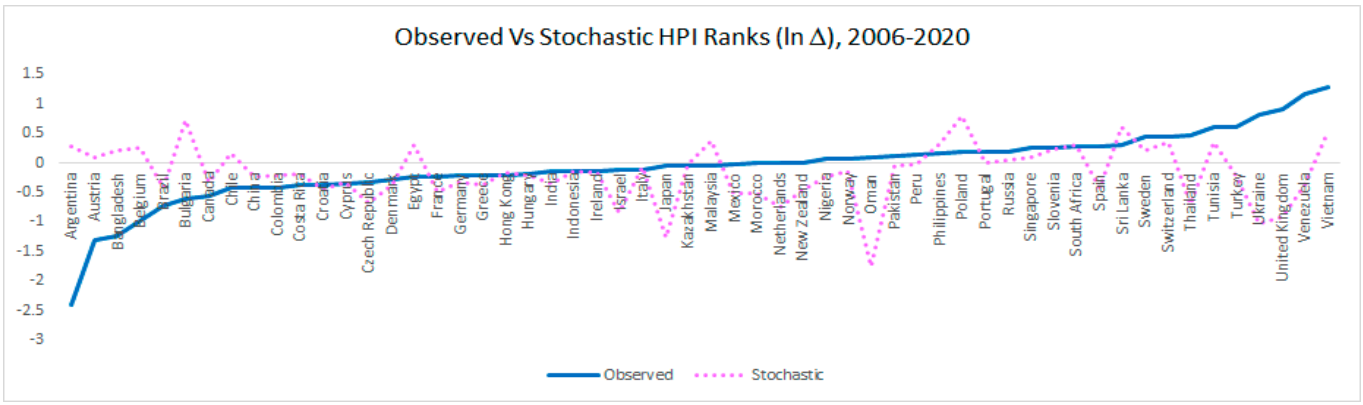

Figure 4. The Skewness of Historical versus Stochastic HPI Ranks.

This paper aims to compare the effects of historical as well as expected (stochastic) HPI pillars on widely known indicators of equity market performance, namely, the equity market risk premium, equity market capitalization as a percentage of GDP, and the market capitalization of the total number of listed domestic companies' value of stocks traded as a percentage of GDP and total listed domestic companies.

This paper contributes to the existing literature in terms of dealing with the impacts of HPI stochastically as far as institutional uncertainty is considered. That is, it is plausible to assume that past institutional efforts are subject to change as priorities of institutional changes are not known in advance. Therefore, the stochastic treatment of the components of HPI offers forward directions to policymakers.

The paper is organized as follows. Section 2 compares the effects of rational versus behavioral effects on the performance of financial markets. Section 3 discusses the effects of welfare dimensions on financial markets and develops relevant hypotheses. Section 4 discusses the common indicators of equity market performance. Section 5 describes the data and the variables. Section 6 discusses the results for the historical and stochastic effects of the three pillars of the HPI on four indicators of equity market performance. Section 7 concludes.

2. Investors' Sentiment and Stock Returns

A coherent justification of the factors driving stock price movements has been one of the most sophisticated obstacles facing financial practitioners. The classic finance theory postulates that investors are rational and that their interests are homogenous, which is referred to as the "Efficient Market Hypothesis". Therefore, there will be no role of investor sentiment (Sharpe, 1964; Lintner, 1965). However, the critics of classic finance theory created a behavioral paradigm that advocates investor sentiment in terms of optimistic or pessimistic expectations about asset prices (Keynes, 1936). De Long et al. (1990) and Akerlof and Shiller (2009) extended this paradigm to investor irrationality (noise trading), arguing that the instability of asset prices is due to behavior such as animal spirit. Kahneman and Tversky (1972) and Barberis et al. (2001) stated that human behavior in prospect theory is more strongly associated with loss than with gain, hence surplus volatility. Nevertheless, Lee et al. (1991) and Baker and Wurgler (2006) conclude that investors' optimism is positively related to the returns of the stocks that are held by noisy traders.

The abovementioned attempts have evolved to focus on the role of investor sentiment. Merkle and Egan (2015) offer an early attempt at the effect of welfare and equity returns, concluding that return variability for happy investors is due to overconfidence and financial literacy. S. H. Kim and Kim (2014) and Aggarwal et al. (2019) conclude that gross national happiness statistically predicts fluctuations in equity returns and trading volume.

3. Welfare Dimensions of Financial Markets

Loewenstein and Small (2007) and Rick and Loewenstein (2008) examine the impact of emotions on economic behavior. The authors of the present paper argue that investors who live in a quality environment are able to exercise expected and immediate emotions in an observed way. Risius et al. (2015), Zhang et al. (2016), and Porshnev et al. (2016) reported that negative emotions such as fear, anger, and depression have a greater explanatory effect on the volatility of stock prices. As far as uncertainty surrounds public decisions, the authors argue that further examinations of the quality of a country's welfare help reduce potential uncertainty (Mandler, 2014). Sgroi et al. (2017) examined the institutional perspective of well-being and happiness and noted that there is no direct relationship between governments' aims and individual happiness. Happiness is not precisely well defined, as Easterlin (2003) considers variables such as happiness, well-being, welfare, utility, and life satisfaction interchangeable. Deaton (2008) concludes that wealth has a positive relationship with well-being, as high-income countries have greater life satisfaction and degree of economic security than do low-income countries. Moreover, Smales (2014) confirms that US household well-being is significantly correlated with variations in equity markets in the short term. Larson and Wilford (1979) and Van Hoorn (2008) find that leisure has a greater direct impact on happiness than does GDP per capita. Deaton (2012) examines the association between well-being and the movement of stock prices and concludes that many Americans do not have financial interest in the equity market. Accordingly, testable hypotheses can be developed as follows.

H1. *A significant relationship exists between the pillars of HPIs and the equity market capitalization of listed domestic companies as a percentage of GDP.*

H2. *A significant relationship exists between pillars of HPIs and the value of equity market capitalization of listed domestic companies (in current USD).*

H3. *A significant relationship exists between pillars of HPIs and the total value of traded stocks as a percentage of GDP.*

In terms of life expectancy, Boersch-Supan and Winter (2001), Liu and Spiegel (2011), and Fellowes (2016) conclude that aging societies play an important role in changing people's saving behavior and portfolio structure. Choi (2017), Oyinlola and Adedeji (2019), and Harris (2010) conclude that when the proportion of active people in aging societies decreases, the decline in productivity results in decreases in the expected financial return. Delis and Mylonidis (2015) conclude that the effect of happiness is inversely related to the investment decisions of households, such as investment in the stock market or buying insurance. Engelberg and Parsons (2016) reported that there is a significant negative relationship between hospitalization rates and daily stock returns. However, Acemoglu and Johnson (2007) claim that there is no significant correlation between life expectancy and economic growth, although this finding aligns with the universal effort to improve poor health states in less developed countries, which is recognized as a significant reason for poverty.

According to the New Economic Foundation (2016), the ecological footprint is associated with human demand for ecological resources. In this sense, Costanza et al. (2014) and Stubbs et al. (2013) conclude that natural capital, which is usually associated with ecosystem services, plays an important role in human well-being and offers support for the establishment of sustainable stock markets for funding sustainability. Therefore, the implementation of sustainability indices plays an essential role in sustainable practices and financial market development, which relies on a country's sustainable ecosystem (Vives & Wadhwa, 2012). Accordingly, a testable hypothesis can be developed as follows.

H4. *A significant relationship exists between the number of pillars of HPIs and the number of listed domestic companies.*

4. Indicators of Equity Market Performance

The quality of a country's welfare is usually linked to equity market performance, as the latter offers financing for economic growth in both developing and developed countries (Ho & Lyke, 2017; Murphy, 2016). Accordingly, a testable hypothesis can be developed as follows.

H5. *A significant relationship exists between the pillars of HPIs and the turnover ratio of domestic shares.*

Moreover, Salomons and Grootveld (2003) and S. W. Kim and Lee (2008) conclude that, compared with developed countries, emerging countries are usually associated with a higher equity risk premium. Accordingly, a testable hypothesis can be stated as follows.

H6. *A significant relationship exists between the pillars of HPIs and the equity market risk premium.*

5. Data and Variables

5.1. Data

The data include 57 countries that are listed in the HPI and have an active trading equity market. The annual data covers the years 2006–2020. The descriptive statistics are reported in Appendix A.

5.2. Dependent Variables

The dependent variables include various equity market performance indicators, namely, the equity market risk premium, the market capitalization of listed domestic companies as a percentage of GDP, the market capitalization of listed domestic companies (in current USD), the total value of stocks as a percentage of GDP, and the turnover ratio of do-

mestic stocks (Pagano, 1993; Demirguc-Kunt & Levine, 1996; Levine & Zervos, 1998; Garcia & Liu, 1999; Thorsten & Levine, 2003; Seetanah & Ramessur, 2008; Barajas et al., 2013). The data are available from the World Bank database (https://data.worldbank.org/indicator/CM.MKT.LCAP.CD, accessed on 1 August 2024).

5.3. Independent Variables

The independent variables include the three pillars of HPIs, namely, life satisfaction (or well-being), life expectancy, and the ecological footprint (https://happyplanetindex.org, accessed on 18 January 2023). The HPIs imply elements of sustainability that offer extended benefits to further understand the economic behavior of equity markets (Bondarchika et al., 2016; Robinson, 2019; Brulé, 2022). Although Benjamin et al. (2023) raised concerns about the use of happiness data (self-reported well-being, SWB) drawn from the USA only, which holds credit for itself, the HPI actually offers fair elements of construct validity (Nunnally & Bernstein, 1994), as coverage of 57 economies is included in this paper. Larger populations also offer further construct validity (Smith et al., 2009; Straussi & Smithii, 2009).

A roadmap of the methodology can be described as follows. First, a quantification of welfare quality is to be developed and tested statistically. The objective is to make sure that different classes of quality are distinct, thus offering content validity of the statistical estimates. Second, a comparative analysis is carried out between the observed (or historical) and stochastic impacts of HPIs on different equity market indicators. The objective is to compare the impacts of historical (or observed) and stochastic (or expected) institutional efforts impeded in HPIs.

6. Results and Discussion

As quality is a qualitative aspect, it requires a differentiation between different classes of quality. Accordingly, welfare quality requires the classification of HPIs into classes, namely low, medium, and high. In so doing, the authors arranged the HPI data in ascending order and then divided it into quartiles. The 1st quartile refers to a low HPI, the 2nd and 3rd quartiles refer to a medium HPI, and the 4th quartile refers to a high HPI. To that end, the three classes of welfare quality must be tested to ensure they are independent and distinct. The authors use two relevant non-parametric tests, namely the Kruskal and Wallis (1952) test to compare medians and the Levene test (Gastwirth et al., 2009; Levene, 1960) to compare variances of the three levels of HPI ranks. The results are reported in Table 1.

Table 1. Significance of the Differences between HPI Ranks.

Test	Test Value
Levene's Test for Equality of Variances	(F = 81.57); p value = 0.00
Kruskal–Wallis Test for equality of Medians	Chi-Square, df (153.9, 2); p Value = 0.00

The results in Table 1 show that the three levels of HPI differ significantly, thus reflecting the information content of welfare quality.

As the main objective of this paper is to examine the uncertainty of welfare quality, the validity of the results requires a comparison with the effects of the historical welfare quality. Therefore, two separate analyses are carried out. The first (second) analysis examines the historical (uncertain using Monte Carlo simulated estimates) effects of the three pillars of HPI on different indicators of equity market performance. Table 2 reports the results of the historical effects of welfare quality on equity market performance.

Table 2. Historical Effects of HPIs on Equity Market Indicators[1].

Variables	Life Satisfaction			Life Expectancy			Ecological Footprint		
	Y1	**Y2**	**Y3**	**Y1**	**Y2**	**Y3**	**Y1**	**Y2**	**Y3**
Constant	−0.035 (−2.7) ***	−0.007 (−0.371)	−0.025 (−1.38)	0.43 (1.1)	−0.041 (−0.92)	1.012 (0.972)	0.445 (1.51)	0.003 (0.171)	−0.27 (−0.32)
Ln Life Satisfaction score	0.589 (2.533) **	−0.463 (−1.43)	0.296 (1.991) **						
Ln Life Expectancy score				0.1326 (1.911) **	3.007 (1.226)	−0.66 (−2.39) ***			
Ln Ecological Footprint score							0.217 (2.937) **	0.183 (2.698) **	7.27 (0.69)
Low HPI (Dummy)	−0.036 (−2.96) **	−0.0014 (−0.047)	−0.021 (−2.06) **	0.3799 (0.53)	0.0075 (0.405)	2.784 (1.153)	−0.401 (−2.63) **	−0.016 (−0.46)	0.413 (0.191)
High HPI (Dummy)	0.029 (0.643)	0.125 (2.78) ***	0.037 (0.79)	−0.154 (−2.75) ***	0.101 (2.27) **	−1.38 (−0.64)	−0.169 (−0.85)	0.111 (2.65) **	−1.852 (−0.834)
Regions (Dummies)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Effect (Dummy)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	812	812	812	812	812	812	812	812	812
$\overline{R}^2$	0.135	0.115	0.143	0.1429	0.3334	0.153	0.0422	0.1332	0.14
S.E. of regression	0.2111	0.2393	0.2102	3.454	0.2414	16.992	3.450	0.237	16.59
J-statistic (Prob.)	8.72 (0.068)	6.449 (0.167)	9.548 (0.048)	9.8849 (0.0424)	4.622 (0.3282)	13.697 (0.0083)	1.269 (0.866)	15.88 (0.0071)	6.884 (0.195)
Durbin-Watson stat	2.3102	1.949	2.471	2.003	1.8368	2.942	1.997	1.929	2.968

Notes: Y1 = Market capitalization as a percentage of GDP; Y2 = Market capitalization of listed domestic companies; Y3 = Turnover ratio of domestic stocks. The estimation GMM equation includes lagged (first difference) fixed effects and nonlinear explanatory random variables and dummy variables that follow. $\mathbf{y}_{tk} = \alpha_k + \sum_{i=1}^{k} \beta_{ik}(\ln D\mathbf{X}_{itk}) + \sum_{i=1}^{k} \beta_{ik} Z_{itk} + \lambda_k + \upsilon_{tk}$, where t = 1, …, n; k = number of countries in each group; $\mathbf{y}_{tk}$ = equity market performance indicators; $D\mathbf{X}_{itk}$ = independent variables measured as lagged (first difference) values of the main pillars of HPIs; Z_{itk} = dummy variables (binary values) that capture the differences between countries (Westerlund, 2007) as well as differences between high, medium, and low HPI ranks; λ_k = individual effect; and υ_{tk} = random error. The Hansen (1982) *J* test is estimated under the hypotheses that follow. H0: The overidentification restrictions are valid. H1: The overidentification restrictions are not valid. Hayashi (2000) and Hall (2005) provide detailed coverage of GMM estimation. The results of the augmented Dickey-Fuller test (Appendix B) show that the data have to be lagged (first difference). The results of the RESET test in (Appendix C) show that nonlinearity fits the data; therefore, cubic transformation is applied (Ramsey, 1969; Thursby & Schmidt, 1977, 1979; Sapra, 2005; Wooldridge, 2025). The results for examining heteroskedasticity via the Breusch–Pagan–Godfrey test (Appendix D) reveal that homoskedasticity is plausible. The results of the Hausman test in (Appendix E) show that fixed effects fit the estimation process (Hausman, 1978; Hausman & Taylor, 1981). The results of testing for endogeneity (Appendix F) show that the three pillars of the HPI are not endogenous. The results show that the estimated Ys are free from misspecifications when adequate instrumental variables are used (Hill et al., 2011). The medium level of HPIs is excluded to avoid the problem of orthogonality. In this case, the 1st and 4th levels of HPIs offer a fair reflection of welfare quality. ** significant at the 5% level, *** significant at the 1% level.

6.1. Effects of Welfare Quality on Market Capitalization as a Percentage of GDP

In Table 2, the positive relationship with life satisfaction indicates that the elements of a satisfactory social life motivate stockholders to trade stocks; thus, market capitalization appreciates (Bernheim & Rangel, 2009; Bernheim, 2009; Hong et al., 2004; Brown & Taylor, 2010; Liang & Guo, 2015). The mechanism of life satisfaction and stock trading is illustrated through the role of mood in investment decision-making, being an integral component of the psychology of investing (Kahneman & Tversky, 1973; Kahneman & Riepe, 1998; Shleifer, 2000; Isen, 2000). That is, a satisfactory life is associated with a better mood, which motivates stock trading with higher expected prices; thus, market capitalization improves.

The same is true in the case of life expectancy. It seems that increases in life expectancy call investors for active trading that promotes greater market capitalization (Blau, 2018). A number of studies in the literature argue that the volatility of life expectancy is signifi-

cantly associated with longevity risk, which reflects changes in individuals' consumption, investment decisions, and volatility of the stock market in general.

Notably, the inclusion of low and high HPI ranks serves as an indication of the robustness of the estimates of the index pillars. The results show that the negative association with a high HPI rank supports the abovementioned argument that shareholders located in high HPIs are not concerned with high stock prices or thus high market capitalization, as they are concerned with high welfare quality (Siganos et al., 2017). Notably, the contribution of life expectancy ($\overline{R}^2$ = 0.1429) is greater than the contribution of the ecological footprint ($\overline{R}^2$ = 0.0422). It is quite apparent that shareholders' sentiments matter.

6.2. Effects of Welfare Quality on the Market Capitalization of Listed Domestic Companies

The results show that the ecological footprint and market capitalization of listed domestic companies are positively associated. A plausible interpretation is that the development of an equity market that includes sustainability-oriented firms plays an effective role in capital allocation (D. Kim et al., 2019). In addition, the positive result for the high HPI rank and market capitalization of listed domestic companies is a significant indication of investor sentiment (Blau, 2018).

6.3. Effects of Welfare Quality on the Turnover Ratio of Domestic Stocks

The results for life expectancy show a negative association with the turnover ratio of domestic stocks. This result indicates that, for example, low life expectancy motivates individual investors to be involved in more trading. That is, shareholders' consumption significantly influences equity market liquidity (Liu & Spiegel, 2011).

6.4. Expected Welfare Quality and Equity Market Performance: Implications from Stochastic Simulation

The three pillars of HPIs offer a very relevant chance to examine their expected role as indicators of welfare quality. As the measurement of each component reflects countries' institutional efforts to improve quality of life, examining the expected outcomes of improvements in welfare quality remains relevant (Feduzi & Runde, 2011). To that end, the authors run a stochastic Monte Carlo simulation on the three pillars to produce the expected stochastic values. Therefore, the regression of the stochastic values on the same equity market indicators as reported in Table 2 produces the effects of the expected changes in HPIs on equity market indicators. The results are reported in Table 3.

Table 3. Stochastic effects of HPIs on equity market indicators.

Variables	Life Satisfaction			Life Expectancy			Ecological Footprint		
	Y1	Y2	Y3	Y1	Y2	Y3	Y1	Y2	Y3
Constant	−0.1612 (−3.17) ***	0.0628 (1.874) **	0.035 (0.11)	0.7527 (1.447)	−0.004 (−0.04)	0.4428 (0.514)	1.1685 (0.597)	0.1835 (0.593)	1.7290 (0.300)
Ln Life Satisfaction	2.78 (2.68) ***	1.162 (2.103) **	1.2192 (3.367) ***						
Ln Life Expectancy				−29.795 (−0.823)	3.12582 (0.414)	−40.559 (−0.5939)			
Ln Ecological Footprint							−7.8612 (−0.38)	−1.871 (−0.581)	−18.386 (−0.308)
Low HPI (Dummy)	0.072 (2.71) **	−0.032 (−0.540)	−0.065 (−2.84) **	2.147 (1.385)	−0.0309 (−0.525)	6.0715 (1.049)	1.710 (0.550)	−0.1698 (−0.546)	5.889 (0.701)
High HPI (Dummy)	−0.0102 (−0.096)	0.094 (3.340) ***	0.0870 (0.497)	0.21889 (0.5538)	0.0846 (2.29) **	0.4115 (0.594)	0.326 (0.28)	0.2217 (1.05)	0.9543 (0.294)

Table 3. *Cont.*

Variables	Life Satisfaction			Life Expectancy			Ecological Footprint		
	Y1	**Y2**	**Y3**	**Y1**	**Y2**	**Y3**	**Y1**	**Y2**	**Y3**
Regions (Dummies)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Effect (Dummy)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	812	812	812	812	812	812	812	812	812
$\overline{R}^2$	0.1625	0.4024	0.1971	0.1331	0.1550	0.1309	0.1727	0.1290	0.1529
S.E. of regression	0.3679	0.2813	0.3188	9.4094	0.2439	35.09	9.5868	0.4695	35.467
J-statistic (Prob.)	3.9382 (0.047)	4.1878 (0.0407)	4.17977 (0.0401)	0.1377 (0.7105)	1.5358 (0.215)	1.2303 (0.2673)	0.0814 (0.7752)	0.9868 (0.320515)	1.05204 (0.305)
Durbin-Watson stat	2.2115	1.9039	2.244	2.0082	1.9041	2.0112	1.9635	1.9216	1.998

Notes: Y1 = Market capitalization as a percentage of GDP; Y2 = Market capitalization of listed domestic companies; Y3 = Turnover ratio of domestic stocks. ** significant at the 5% level, *** significant at the 1% level.

The results in Table 3 offer significant insights into the effects of the HPI pillars. The results show that the stochastic and expected effects of "life expectancy" and "ecological footprint" are not statistically significant. Nevertheless, the historical and stochastic effects of "Life Satisfaction" are positive and significant, reflecting the underlying effects of welfare quality. That is, the more that investors enjoy welfare quality, the greater their willingness to participate in equity trading (Orlitzky, 2005). As Bramoullé and Treich (2009) reported a negative relationship between uncertainty and emissions (as an indicator of the ecological footprint), the results of the present study suggest that the expected effect is statistically insignificant. This result offers a significant call for public policymakers to improve elements of life satisfaction, which eventually leads to significant progress in equity market participation in aggregate financing.

7. Conclusions

This paper offers further insights into institutional uncertainty as efforts for improving the three pillars of HPI remain usually expected and uncertain. Therefore, the relevant treatment being carried out in this paper compares the impacts of historical and stochastic simulation of the impacts of HPI on equity market development indicators.

The methodology examines the cross-country associations between HPI composite indicators and equity market performance indicators across 57 countries covering the annual period from 2006 to 2020. The pillars of HPIs are treated in this paper as measures of a country's welfare. The findings of this paper address the behavioral and institutional dimensions of equity market performance and development. These two dimensions can be summarized as follows.

7.1. The Behavioral Perspectives of Equity Market Development

This dimension refers to the effects of welfare quality on aspects of equity market development. The overall results show that a country's rank is significantly related to investors' sentiment. That is, progress in life satisfaction leads to increases in equity market participation, thus increasing market capitalization.

7.2. Institutional Perspectives on Equity Market Development

The aggregate results identify the determinants of stock market participation. The improvement in equity holders' life satisfaction tends to widen the pool of equity market participants. The results of this paper offer an extended call for policymakers to consider improvement in the quality of social life as a determinant of the size of the equity market, which is an ultimate objective for any country apart from being developed or developing.

This conclusion parallels the conclusions reached by Angeletos and Pavan (2009) and Karp and Traeger (2024) that policymakers must have robust knowledge about the significant factors that enhance welfare quality. Given that firms may consider the ecological footprint when making investment decisions, the stochastic results show that the ecological footprint may not have a statistically significant impact. Equity holders with low HPIs are not heavily involved in the protection of the environment or well-being.

The historically significant (and stochastic simulated insignificant) impacts of ecological footprints on market capitalization and stock turnover offer insightful institutional perspectives. That is, policymakers must exert continuous efforts supporting the ecological impact on financial investment.

Author Contributions: Conceptualization, T.E. and I.A.; methodology, T.E.; software, H.E.K.; validation, M.A.S., R.E. and N.Y.; formal analysis, T.E.; investigation, H.E.K.; resources, N.Y.; data curation, T.E.; writing—original draft preparation, I.A.; writing—review and editing, T.E.; visualization, H.E.K.; supervision, T.E.; project administration, T.E.; funding acquisition, T.E., I.A., H.E.K., N.Y., M.A.S. and R.E. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Data Availability Statement: The data of this study has been collected from Bloomberg Finance (https://www.bloomberg.com), Google Finance (https://www.google.com/finance), EDGAR (https://www.sec.gov/edgar.shtml), the Happy Planet Index (https://happyplanetindex.org) and the World Bank (https://www.worldbank.org) (all accessed on 1 August 2024). The original contributions presented in this study are included in the article. Further inquiries can be directed to the corresponding author.

Acknowledgments: The authors acknowledge the comments received from the participants of the Brown Bag seminar at the American University in Cairo. The authors extend sincere appreciation to the editor of IJFS and two anonymous reviewers for insightful comments and understanding without which advances in welfare quality could have been very limited.

Conflicts of Interest: All the authors of this manuscript declare that they have no conflicts of interest. The authors confirm that there are no relevant financial or non-financial competing interests to report.

Appendix A

Table A1. Descriptive Statistics.

	Market Capitalization as a Percentage of GDP	Market Capitalization of Listed Domestic Companies (ln)	Y6 = Turnover Ratio of Domestic Stocks	Ln Life Satisfaction Score	Ln Life Expectancy Score	Ln Ecological Footprint Score	Africa	Middle East & North Africa	Caribbean & West Pacific	Western World	Central & South America	Asia	Former Communist Countries	Sub-Saharan Africa
Mean	1.445	25.732	50.927	1.831	4.310	1.140	0.009	0.111	0.111	0.316	0.031	0.036	0.160	0.027
Standard Error	0.318	0.064	1.933	0.006	0.003	0.022	0.003	0.011	0.011	0.016	0.006	0.006	0.012	0.005
Mode	0.038	21.115	60.700	1.932	4.297	0.182	0	0	0	0	0	0	0	0
Kurtosis	120.933	−0.332	12.564	−0.190	7.423	−0.268	109.9	4.245	4.245	−1.374	27.816	23.712	1.500	33.289
Skewness	10.038	−0.260	3.072	−0.648	−2.322	−0.769	10.53	2.492	2.492	0.799	5.438	5.050	1.867	5.916
Range	124.257	8.506	348.208	0.859	0.655	2.785	1	1	1	1	1	1	1	1
Minimum	−2.926	21.115	1.803	1.281	3.770	−0.554	0	0	0	0	0	0	0	0
Maximum	121.330	29.622	350.011	2.140	4.426	2.231	1	1	1	1	1	1	1	1
Count	869	869	869	869	869	869	869	869	869	869	869	869	869	869

Appendix B

Table A2. Results for the Augmented Dickey–Fuller Algorithm.

	Market Capitalization as a Percentage of GDP	Ln Market Capitalization of Listed Domestic Companies	Turnover Ratio of Domestic Stocks
F stat (MacKinnon one-sided *p* values)	167.4 ***	137.9 ***	485.6 ***

*** Significant at the 1% level.

Appendix C

Table A3. Results of the linearity test (RESET).

Stock Market Performance Indicators	Test Statistic (Significance)
Market capitalization of listed domestic companies (% of GDP)	F (3, 793) = 2.8538 **
LN Market capitalization of listed domestic companies (current USD)	F (3, 793) = 5.5654 ***
Turnover Ratio of Domestic Stocks	F (3, 793) = 4.7783 ***

** Significant at the 5% level; *** Significant at the 1% level.

Appendix D

Table A4. The Results for the Breusch–Pagan–Godfrey Test.

Stock Market Performance Indicators	Market Capitalization as a Percentage of GDP	LN Market Capitalization of Listed Domestic Companies	Turnover Ratio of Domestic Stocks
Test Statistic (significance)	$\chi^2(3) = 0.9851$	$\chi^2(3) = 4.157$	$\chi^2(3) = 5.83$

Appendix E

Table A5. The Results for Testing Fixed and Random Effects (Hausman Test).

Stock Market Performance Indicators	Test Statistic (Significance)
Market capitalization of listed domestic companies (% of GDP)	$\chi^2(3) = 8.32446$ **
LN Market capitalization of listed domestic companies (current USD)	$\chi^2(3) = 9.66267$ **
Turnover Ratio of Domestic Stocks	$\chi^2(3) = 9.76335$ **

** Significant at 5%.

Appendix F

Table A6. Results of the Endogeneity Test.

Pillars of Happy Planet Index	Market Capitalization as a Percentage of GDP	LN Market Capitalization of Listed Domestic Companies	Turnover Ratio of Domestic Stocks
Ln Life Satisfaction score	−2.3766 **	−0.6766	2.55911 **
Ln Life Expectancy score	0.5119 *	2.13256 **	−1.2289
Ln Ecological Footprint score	1.19602	1.26895	2.438 **

** Significant at 5%, * Significant at 10%.

Notes

[1] It is worth noting that two indicators of equity market development turn out to be impractical in this paper as they are insignificant statistically across the three pillars of HPI. The two indicators are (1) Total Value of Traded Stocks as percentage of GDP and (2) Total Number of Listed Domestic Companies

References

Abdallah, S., Michaelson, J., Shah, S., Stoll, L., & Marks, N. (2012). *The happy planet index 2012 report. A global index of sustainable well-being*. New Economics Foundation.

Abdallah, S., Sam, H., Michaelson, J., & Marks, N. (2009). *The happy planet index 2.0: Why good lives don't have to cost*. The New Economics Foundation.

Acemoglu, D., & Johnson, S. (2007). Disease and development: The effect of life expectancy on economic growth. *Journal of Political Economy*, *115*(6), 925–985. [CrossRef]

Aggarwal, S., Kumar, S., & Goel, U. (2019). Stock market response to information diffusion through internet sources: A literature review. *International Journal of Information Management*, *45*, 118–131. [CrossRef]

Akerlof, G. A., & Shiller, R. J. (2009). *Animal spirits: How human psychology drives the economy, and why it matters for global capitalism*. Princeton University Press.

Angeletos, G. M., & Pavan, A. (2009). Policy with dispersed information. *Journal of the European Economic Association*, *7*(1), 11–60. [CrossRef]

Atkinson, A. B. (1999). The contributions of amartya sen to welfare economics. *Scandinavian Journal of Economics*, *101*(2), 173–190. [CrossRef]

Baker, M., & Wurgler, J. (2006). Investor sentiment and the cross-section of stock returns. *Journal of Finance*, *61*, 1645–1680. [CrossRef]

Barajas, A., Chami, R., & Yousefi, S. R. (2013). *The finance and growth nexus re-examined: Do all countries benefit equally* [IMF Working Papers, WP/13/130]. International Monetary Fund.

Barberis, N., Huang, M., & Santos, T. (2001). Prospect theory and asset prices. *The Quarterly Journal of Economics*, *116*(1), 1–53. [CrossRef]

Basu, S., Pascali, L., Schiantarelli, F., & Serven, L. (2022). Productivity and the welfare of nations. *Journal of the European Economic Association*, *20*(4), 647–1682. [CrossRef]

Benjamin, D. J., Guzman, J. D., Fleurbaey, M., Heffetz, O., & Kimball, M. (2023). What do happiness data mean? Theory and survey Evidence. *Journal of the European Economic Association*, *21*(6), 2377–2412. [CrossRef]

Bernheim, B. D. (2009). Behavioral welfare economics. *Journal of the European Economic Association*, *7*(2–3), 267–319. [CrossRef]

Bernheim, B. D., & Rangel, A. (2009). Beyond revealed preference: Choice-theoretic foundations for behavioral welfare economics. *The Quarterly Journal of Economics*, *124*(1), 51–104. [CrossRef]

Blau, B. (2018). Income inequality, poverty, and the liquidity of stock markets. *Journal of Development Economics*, *130*, 113–126. [CrossRef]

Boersch-Supan, A. H., & Winter, J. K. (2001). *Population aging, savings behavior and capital markets* [NBER Working Paper No. 8561]. National Bureau of Economic Research.

Bondarchika, J., Nska-Sabukab, M. J., Linnanena, L., & Kauranne, T. (2016). Improving the objectivity of sustainability indices by a novel approach for combining contrasting effects: Happy planet index revisited. *Ecological Indicators*, *69*, 400–406. [CrossRef]

Bouacida, E., & Martin, D. (2021). Predictive power in behavioral welfare economics. *Journal of the European Economic Association*, *19*(3), 1556–1591. [CrossRef]

Bramoullé, Y., & Treich, N. (2009). Can uncertainty alleviate the commons problem? *Journal of the European Economic Association*, *7*, 1042–1067. [CrossRef]

Brown, S., & Taylor, K. (2010). *Social interaction and stock market participation: Evidence from British panel data* [IZA Discussion Papers, No. 4886]. Institute for the Study of Labor (IZA).

Brulé, G. (2022). Evaluation of existing indices of sustainable well-being and propositions for improvement. *Sustainability*, *14*, 1027. [CrossRef]

Choi, H. (2017). The effect of longevity risks on the performance of stock market. *Investment Management and Financial Innovations*, *14*(1.1), 173–180. [CrossRef]

Costanza, R., de Groot, R., Sutton, P., van der Ploeg, S., Anderson, S. J., Kubiszewski, I., Farber, S., & Turner, K. R. (2014). Changes in the global value of ecosystem services. *Journal of Global Environmental Change*, *26*, 152–158. [CrossRef]

Dang, A.-T. (2014). Amartya sen's capability approach: A framework for well-being evaluation and policy analysis? *Review of Social Economy*, *72*(4), 460–484. [CrossRef]

Deaton, A. (2008). Income, health and wellbeing around the world: Evidence from the gallup world poll. *Journal of Economic Perspectives*, *22*, 53–72. [CrossRef]

Deaton, A. (2012). The financial crisis and the well-being of Americans. *Oxford Economic Papers*, *64*(1), 1–26. [CrossRef]

Delis, M., & Mylonidis, N. (2015). Trust, happiness, and households' financial decision. *Munich Personal RePEc Archive*, *9*, 64906. [CrossRef]

De Long, J. B., Shleifer, A., Summers, L. H., & Waldmann, R. J. (1990). Noise trader risk in financial markets. *Journal of Political Economy*, *98*, 703–738. [CrossRef]

Demirguc-Kunt, A., & Levine, R. (1996). Stock market development and financial intermediaries: Stylized facts. *The World Bank Economic Review*, *10*, 291–321. [CrossRef]

Easterlin, R. A. (2003). Explaining happiness. *Proceedings of the National Academy of Science*, *100*(19), 11176–11183. [CrossRef] [PubMed]

Engelberg, J., & Parsons, C. (2016). Worrying about the stock market: Evidence from hospital admissions. *Journal of Finance*, *71*(3), 1227–1250. [CrossRef]

Evans, M. D., & Hnatkovska, V. V. (2007). Financial integration, macroeconomic volatility, and welfare. *Journal of the European Economic Association*, *5*(2–3), 500–508. [CrossRef]

Feduzi, A., & Runde, J. (2011). The uncertain foundations of the welfare state. *Journal of Economic Behavior & Organization*, *80*, 613–627.

Fellowes, M. (2016). *Living too frugally? Economic sentiment & spending among older americans*. United Income Inc.

Galina, A., Iryna, S., & Sergii, K. (2015). Analysis of the global stock market trends. *Journal of Finance and Economics*, *3*(4), 67–71.

Garcia, V., & Liu, L. (1999). Macroeconomic determinants of stock market development. *Journal of Applied Economics*, *2*(1), 29–59. [CrossRef]

Gastwirth, J. L., Gel, Y. R., & Miao, W. (2009). The impact of levene's test of equality of variances on statistical theory and practice. *Statistical Science*, *24*(3), 343–360. [CrossRef]

Gromb, D., & Vayanos, D. (2010). A model of financial market liquidity based on intermediary Capital. *Journal of the European Economic Association*, *8*(2–3), 456–466. [CrossRef]

Hall, A. R. (2005). *Generalized method of moments*. Oxford University Press Inc.

Hansen, L. P. (1982). Large sample properties of generalized method of moments estimators. *Econometrica*, *50*(4), 1029–1054. [CrossRef]

Harris, R. (2010). Life expectancy and ecological footprint: Societal sustainability and health equity. *The International Journal of Environmental, Cultural, Economic, and Social Sustainability: Annual Review*, *6*(4), 187–200. [CrossRef]

Hausman, J. A. (1978). Specification tests in econometrics. *Econometrica*, *46*(6), 1251–1271. [CrossRef]

Hausman, J. A., & Taylor, W. E. (1981). Panel data and unobservable individual effects. *Econometrica*, *49*(6), 1377–1398. [CrossRef]

Hayashi, F. (2000). *Econometrics*. Princeton University Press.

Hicks, J. R. (1939). The foundations of welfare economics. *The Economic Journal*, *49*(196), 711–712. [CrossRef]

Hill, R. C., Griffiths, W. E., & Lim, G. C. (2011). *Principles of econometrics* (4th ed.). John Wiley & Sons, Inc.

Ho, S. Y., & Lyke, B. N. (2017). Determinants of stock market development: A review of the literature. *Studies in Economics and Finance*, *34*(1), 143–164. [CrossRef]

Hong, H., Kubik, J. D., & Stein, J. C. (2004). Social interaction and stock-market participation. *The Journal of Finance*, *59*(1), 137–163. [CrossRef]

Isen, A. M. (2000). Positive Affect and Decision Making. In M. Lewis, & J. M. Haviland-Jones (Eds.), *Handbook of emotions* (pp. 417–435). Guilford Press.

Kahneman, D., & Riepe, M. W. (1998). Aspects of investor psychology. *Journal of Portfolio Management*, *24*, 52–65. [CrossRef]

Kahneman, D., & Tversky, A. (1972). Subjective probability: A judgment of representativeness. *Cognitive Psychology*, *3*, 430–454. [CrossRef]

Kahneman, D., & Tversky, A. (1973). On the psychology of prediction. *Psychological Review*, *80*, 237–251. [CrossRef]

Kaldor, N. (1939). Welfare propositions of economics and interpersonal comparisons of utility. *The Economic Journal*, *49*(195), 549–552. [CrossRef]

Karp, L., & Traeger, C. (2024). Smart cap. *Journal of the European Economic Association*, *23*(2), 554–593. [CrossRef]

Keynes, J. M. (1936). *The general theory of employment, interest and money*. McMillan.

Kim, D., Chung, C. Y., Kim, K. S., & Sul, H. K. (2019). Daily stock trading by investor type and information asymmetry: Evidence from the korean market. *Emerging Markets Finance & Trade*, *55*, 13–28.

Kim, S. H., & Kim, D. (2014). Investor sentiment from internet message postings and the predictability of stock return. *Journal of Economic Behavior & Organization*, *107*, 708–709.

Kim, S. W., & Lee, B. S. (2008). Stock returns, asymmetric volatility, risk aversion, and business cycle: Some new evidence. *Journal of Economic Inquiry*, *46*(2), 48–131. [CrossRef]

Kruskal, W. H., & Wallis, W. A. (1952). Use of ranks in one-criterion variance analysis. *Journal of the American Statistical Association*, *47*(260), 583–621. [CrossRef]

Lall, S. (1981). Welfare economics and development problems. In *Developing countries in the international economy: Selected papers*. The Macmillan Press Ltd.

Larson, D. A., & Wilford, W. T. (1979). On the physical quality of life index and evaluating economic welfare between nations. *Economics Letters*, *3*, 193–197. [CrossRef]

Le Breton, M. (1991). Stochastic orders in welfare economics. Stochastic orders and decision under risk. *Stochastic Orders and Decision under Risk*, *19*, 190–206.
Lee, C., Shleifer, A., & Thaler, R. (1991). Investor sentiment and the closed-end fund puzzle. *The Journal of Finance*, *46*(1), 75–109.
Levene, H. (1960). Robust tests for equality of variances. In I. Olkin (Ed.), *Contributions to probability and statistics* (pp. 278–292). Stanford University Press.
Levine, R., & Zervos, S. (1998). Capital control liberalization and stock market development. *World Development*, *26*, 1169–1183. [CrossRef]
Liang, P., & Guo, S. (2015). Social interaction, internet access and stock market participation: An empirical study in China. *Journal of Comparative Economics*, *43*, 883–901. [CrossRef]
Lintner, J. (1965). Security prices, risk and maximal gains from diversification. *Journal of Finance*, *20*, 587–616.
Little, I. M. D. (1957). *A critique of welfare economics*. Clarendon Press.
Liu, Z., & Spiegel, M. M. (2011). Boomer retirement: Headwinds for US equity markets? *FRBSF Economic Letter*, *26*. Available online: https://www.frbsf.org/wp-content/uploads/el2011-26.pdf (accessed on 21 July 2023).
Loewenstein, G., & Small, D. A. (2007). The scarecrow and the tin man: The vicissitudes of human sympathy and caring. *Review of General Psychology*, *11*, 112–126. [CrossRef]
Mandler, M. (2014). Indecisiveness in behavioral welfare economics. *Journal of Economic Behavior & Organization*, *97*, 219–235.
Marks, N., Abdallah, S., Simms, A., & Thompso, S. (2006). *The happy planet index*. New Economics Foundation.
Merkle, C., & Egan, D. (2015). Investor happiness. *Journal of Economic Psychology*, *49*, 167–186. [CrossRef]
Molinari, M. C. (2014). A second best theory of institutional quality. *Public Organization Review: A Global Journal*, *14*(4), 545–559. [CrossRef]
Murphy, D. (2016). Welfare consequences of asymmetric growth. *Journal of Economic Behavior & Organization*, *126*, 1–17.
Nayak, A. R., & Pradhan, K. C. (2024). Institutional quality and economic performance: A study of asian countries. *Millennial Asia*. [CrossRef]
Nazir, M., Nawaz, M., & Gilani, U. (2010). Relationship between economic growth and stock market development. *African Journal of Business Management*, *4*(16), 3473–3479.
New Economic Foundation. (2016). *The happy planet index 2016: A global index of sustainable wellbeing*. Available online: https://happyplanetindex.org (accessed on 18 January 2023).
Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory*. McGraw-Hill.
Orlitzky, M. (2005). Payoffs to social and environmental performance. *Journal of Investing*, *14*(3), 48–51. [CrossRef]
Oyinlola, M. A., & Adedeji, A. (2019). Human capital, financial sector development and inclusive growth in sub-Saharan Africa. *Journal of Economic Change and Restructuring*, *52*(1), 43–66. [CrossRef]
Pagano, M. (1993). Financial markets and growth: An overview. *European Economic Review*, *37*, 613–622. [CrossRef]
Porshnev, A. V., Lakshina, V. V., & Redkin, I. E. (2016). Using emotional markers' frequencies in stock market ARMAX-GARCH Model. *CEUR Workshop Proceeding: Experimental Economics and Machine Learning*, *1627*, 61–72.
Ramsey, J. B. (1969). Tests for specification errors in classical linear least squares regression analysis. *Journal of Royal Statistical Society B*, *31*(2), 350–371. [CrossRef]
Rick, S., & Loewenstein, G. (2008). *The role of emotion in economic behavior* (3rd ed.). Guilford Press.
Risius, M., Akolk, F., & Beck, R. (2015). *Differential emotions and the stock market—The case of company-specific trading*. [ECIS 2015 Completed Research Papers. Paper 147]. AIS Electronic Library (AISeL). [CrossRef]
Robinson, J. (2019). *A socioecological approach to measure progress for ontario's transition to a green economy: The use of the happy planet index* [Master's thesis, York University].
Salomons, R., & Grootveld, H. (2003). The equity risk premium: Emerging vs. developed markets. *Emerging Markets Review*, *4*, 121–144. [CrossRef]
Sapra, S. (2005). A regression error specification test (RESET) for generalized linear models. *Economics Bulletin*, *3*(1), 1–6.
Seetanah, B., & Ramessur, S. (2008). Financial development and economic growth. *Journal of Economic Studies*, *36*, 124–134. [CrossRef]
Sen, A. K. (1988). Freedom of choice, concept and content. *European Economic Review*, *32*(2–3), 269–294. [CrossRef]
Sen, A. K. (1990). Justice: Means versus freedoms. *Philosophy & Public Affairs*, *19*(2), 111–121.
Sgroi, D., Hills, T., O'Donnell, G., Oswald, A., & Proto, E. (2017). *Understanding happiness: A CAGE Policy report*. Social Market Foundation.
Sharpe, W. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *Journal of Finance*, *19*, 425–442.
Shleifer, A. (2000). *Inefficient markets: An introduction to behavioral finance*. Oxford University Press.
Siganos, A., Vagenas-Nanos, E., & Verwijmeren, P. (2017). Divergence of sentiment and stock market trading. *Journal of Banking and Finance*, *78*, 130–141. [CrossRef]
Smales, L. (2014). The relationship between financial asset returns and the well-being of US households. *Applied Economics Letters*, *21*(17), 1184–1188. [CrossRef]

Smith, G. T., McCarthy, D. M., & Zapolski, T. C. B. (2009). On the value of homogeneous constructs for construct validation, theory testing, and the description of psychopathology. *Psychological Assessment*, *21*(3), 272–284. [CrossRef] [PubMed]

Straussi, M. E., & Smithii, G. T. (2009). Construct validity: Advances in theory and methodology. *Annual Review of Clinical Psychology*, *5*(1), 1–25. [CrossRef]

Stubbs, W., Higgins, C., & Milne, M. (2013). Why do companies not produce sustainability reports? *Business Strategy and the Environment*, *22*, 456–470. [CrossRef]

Thorsten, B., & Levine, R. (2003). Stock markets, banks, and growth: Panel evidence. *Journal of Banking and Finance*, *28*, 423–442.

Thursby, J. G., & Schmidt, P. (1977). Some properties of tests for specification error in a linear regression. *Journal of the American Statistical Association*, *72*(359), 635–641. [CrossRef]

Thursby, J. G., & Schmidt, P. (1979). Alternative specification error tests: A comparative study. *Journal of the American Statistical Association*, *74*(365), 222–225. [CrossRef]

Van Hoorn, A. (2008). *Income, leisure, and happiness*. Nijmegen Center for Economics (NICE).

Vives, A., & Wadhwa, B. (2012). Sustainability indices in emerging markets: Impacts on responsible practices and financial market development. *Journal of Sustainable Finance and Investment*, *2*, 318–337.

Westerlund, J. (2007). Testing for error correction in panel data. *Oxford Bulletin of Economics and Statistics*, *69*(6), 709–748. [CrossRef]

Wooldridge, J. M. (2025). *Introductory econometrics—A Modern approach* (8th ed.). Cengage Learning.

Wurgler, J. (2000). Financial markets and the allocation of capital. *Journal of Financial Economics*, *58*, 187–214. [CrossRef]

Zhang, W., Li, X., Shen, D., & Teglio, A. (2016). Daily happiness and stock return: Some international evidence. *Physica A*, *460*, 201–209. [CrossRef]