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The Association of Economics Faculties of Romania

CHALLENGES AND OPPORTUNITIES FOR A SUSTAINABLE DEVELOPMENT - THE 21st EDITION, 2025

EMPIRICAL STUDY ON EQUITY INVESTMENT IN BET AND EXCHANGE-TRADED FUND IN NEW ERA

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Introduction & importance of the study

Stock market indices provide an overview of the performance and prospects of financial markets.This paper presents a comparative empirical study of the performance of the BET index and the Patria TradeVille ETF.

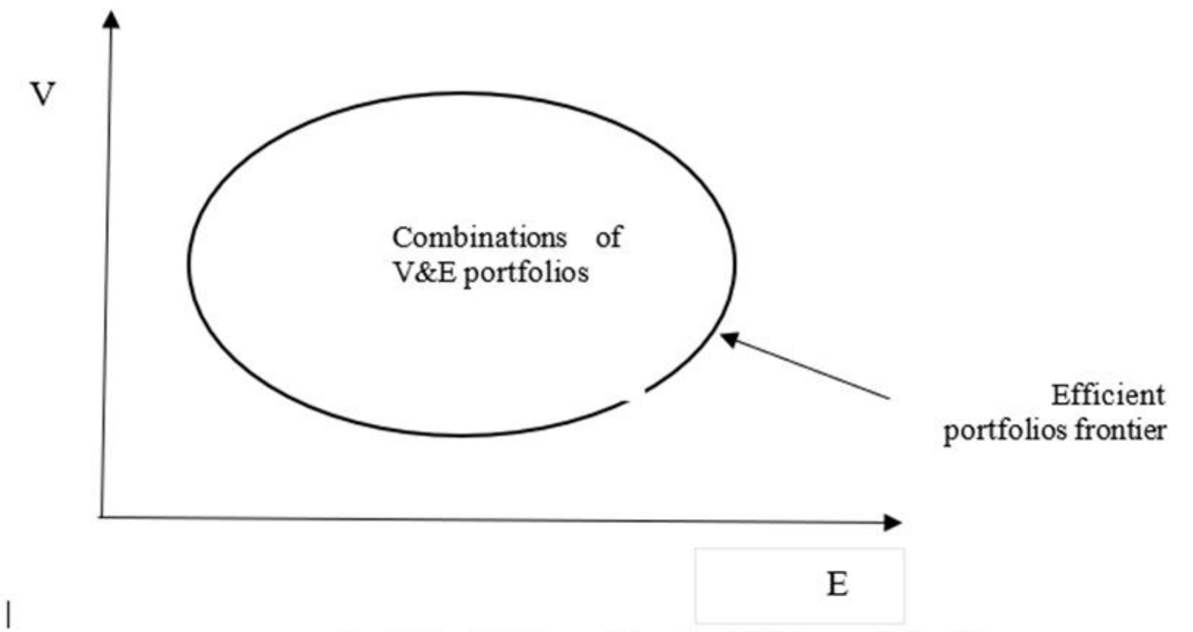
Research objective: *Testing the qualities of the ETF that tracks the composition and performance of the BET index, examining the long-term relationship between the TVBETETF price on the BSE and the BET base index, determining whether there is a semi-figurative link between the two, in accordance with ASF regulations for trading as an exchange-traded fund on the BVB.*

Importance of research: *Investors' need to secure savings through passive investments with controlled risk.*

Literature review

- **TMP**- At a certain level of tolerated risk, an investorcan optimize their expected return bydiversifying their portfolio. (MARKOWITZ, 1952)

- **ETFs**- benefits of international portfolio diversification at a relatively low cost, with low replication and composition error and greater tax efficiency. Investors can achieve medium to high returns for a medium level of risk. (Miffre,2007)



Portfolio Efficiency Frontier Efficiency-Volatility
Source: Own processing based on Markowitz (1952)

The stock market is somewhat predictable when fundamental variables such as dividend yields, market capitalization, price-to-earnings ratio, and price per value ratio are taken into account. (Malkiel, 1995) (Arshanapalli,Switzer& Arbesfeld, 2003).

Figure 1 shows the relationships between financial markets and participants, so that ETF transactions can take place.

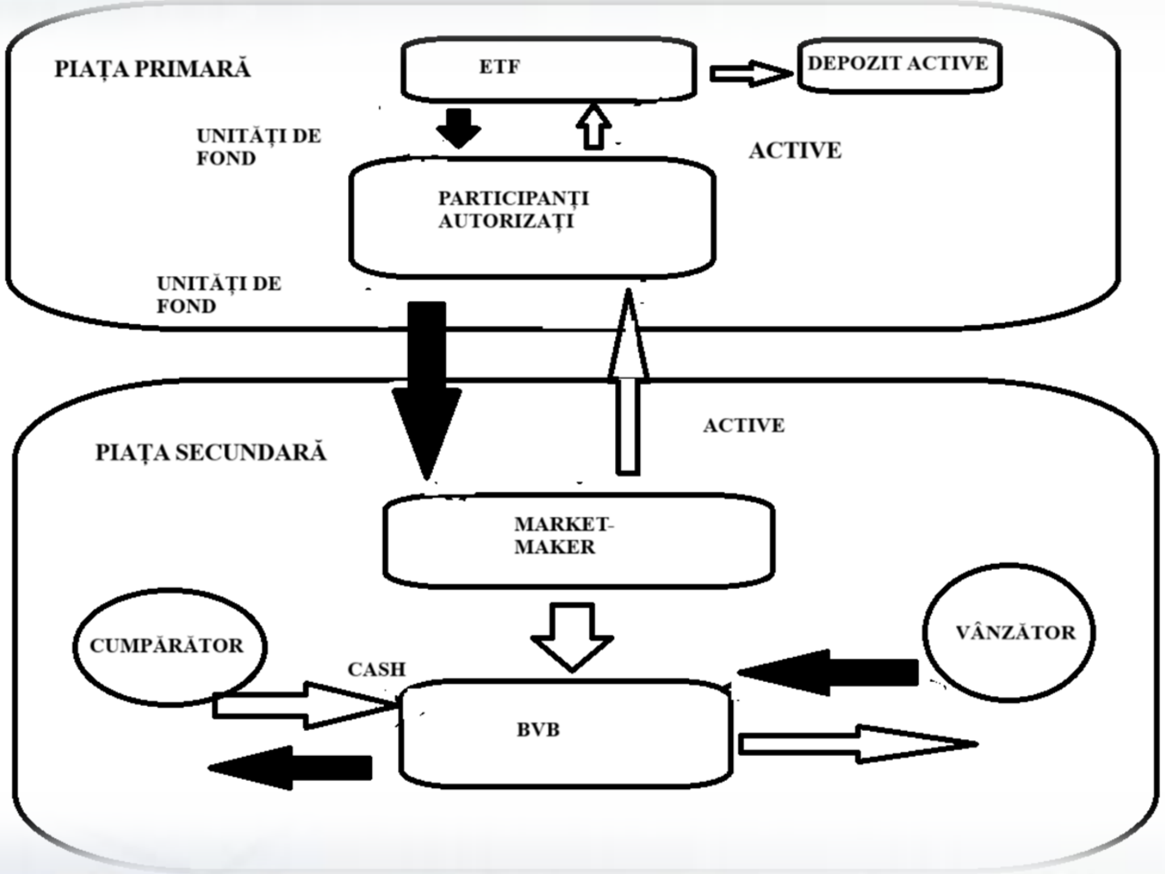
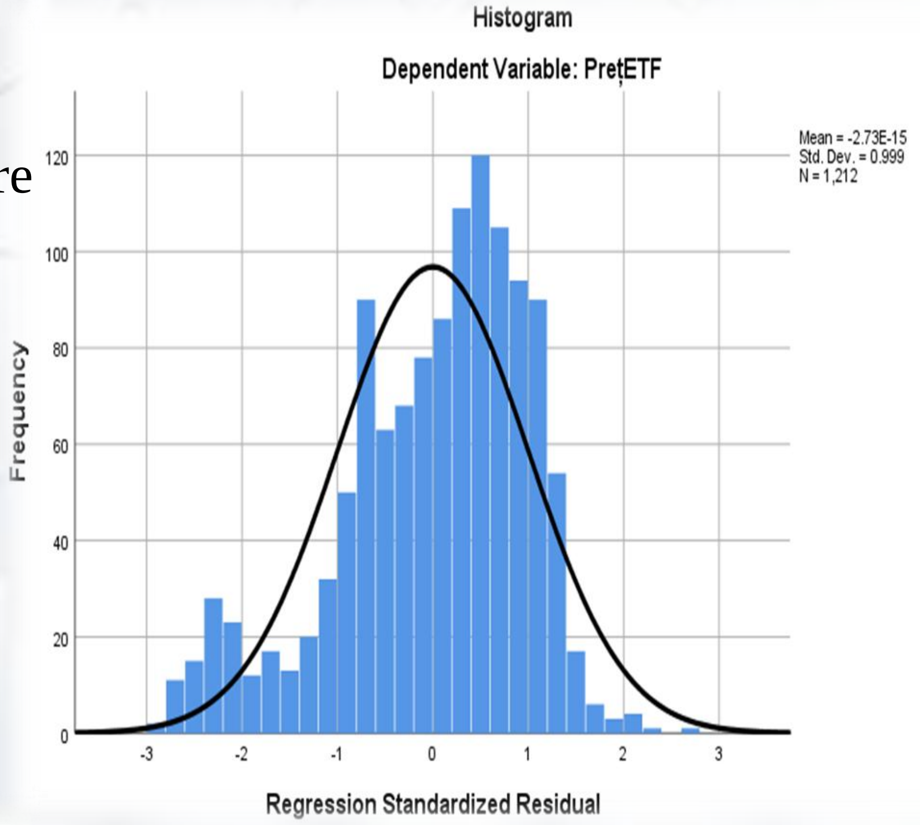


Figure 1. The relationship between the primary and secondary markets around ETFs
Source: Own processing based on "Regulated Market", BSE

Research methodology

- **Research objective:** testing the significant link between BET & ETF to confirm the eligibility of the ETF fund as a method of replicating the BET index
- **Data used**: daily data between 2018 and 2022 with 1,212 observations
- **Research method:** multiple linear regression using IBM SPSS software
  Ipotezele cercetarii
- ***H0:*** *The variables VolumeETF, PriceBET, and VAN_ETF do not significantly influence the variable PrețETF.*
- ***H1:*** *The variables VolumeETF, PriceBET, and VAN_ETF significantly influence the value of the variable PriceETF.*
- **Influencing factors:** inflation, socio-political situation, interest rates, dividends received by the fund were not taken into account.



Research methodology

- The estimated equation for the multiple linear regression of the analyzed variables and hypotheses is:
- $ETF.Price = \alpha + \beta \cdot ETF.Volume + \gamma \cdot BET.Price + \mu \cdot NAV.ETF + \varepsilon$
- Were:
- α= constant
- β = coefficient for the ETF.Volume
- γ=coefficient for BET.Price
- μ=coefficient for the NAV.ETF

Results of the analysis

- The PriceETF recorded an average standard deviation from the mean.
- The other variables recorded high standard deviation values.
- Volatility may be due to the unfavorable economic context, such as the COVID-19 pandemic and the supply/demand ratio.
- The PriceETF is much more stable to market volatility, thanks to the market maker who issues and redeems units to adjust the price.

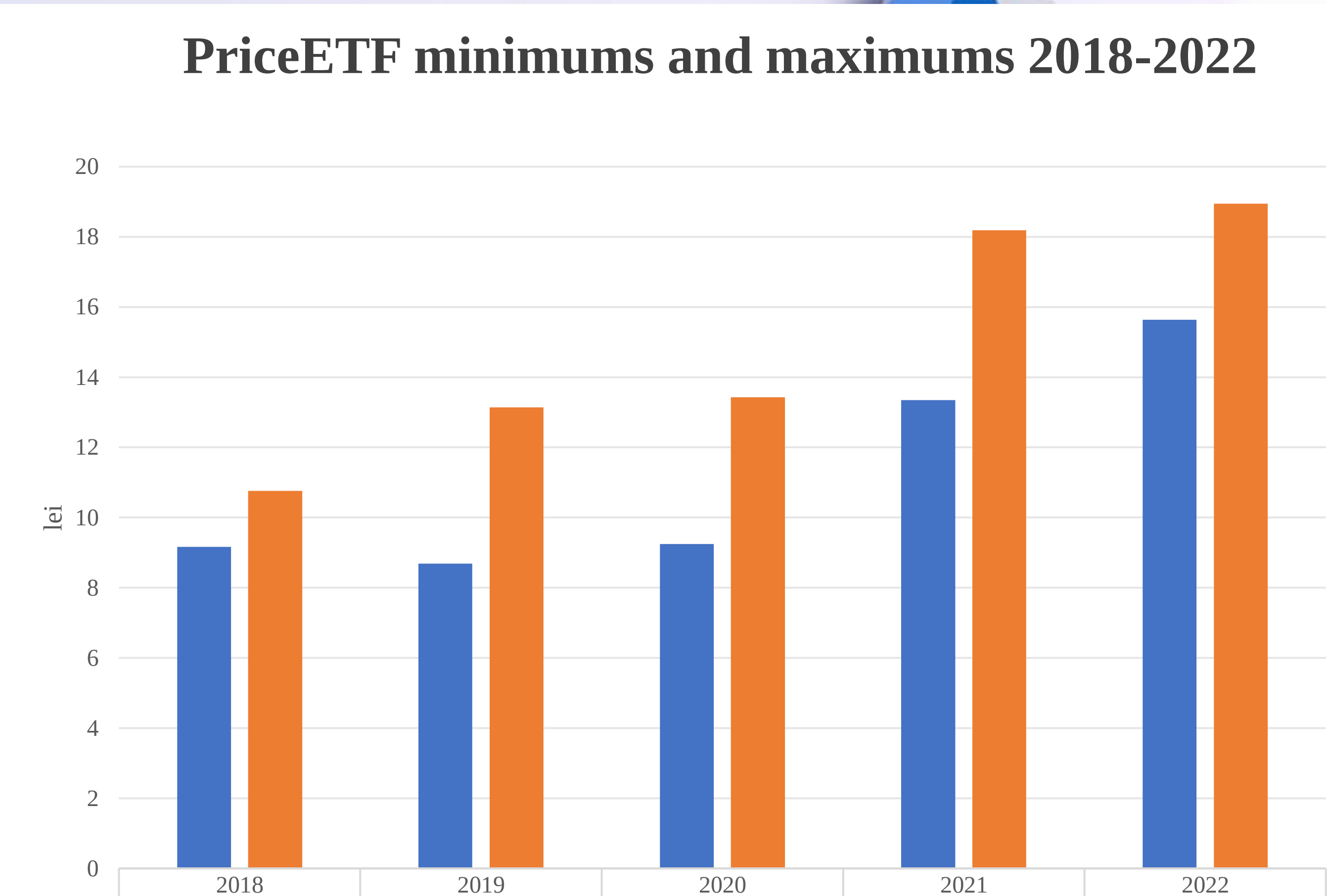
Table 1

Desctiptive Statistics

	Mean	Std.Deviation	N
Price.ETF.	13.42415	3.154478	1212
Volume.ETF	5983.24	7871.705	1212
PriceBET	9974.1997	1781.3577	1212
VAN ETF	21853038.164480	22369438.416401	1212

Results of the analysis

- PriceETF did not record values far from the MAXIMUM and MINIMUM during the period 2018-2022.



	2018	2019	2020	2021	2022
MIN	9,169	8,683	9,247	13,345	15,64
MAX	10,758	13,138	13,43	18,186	18,946

Figure 4. Minimum and maximum prices reached by TVBETET 2018-2022
Source: Own processing based on data from SAI Patria Asset Management SA

Results of the analysis

- The high standard deviations for VAN (expressed in thousands of lei) are due to the high values and significant differences between the maximum and minimum values recorded.

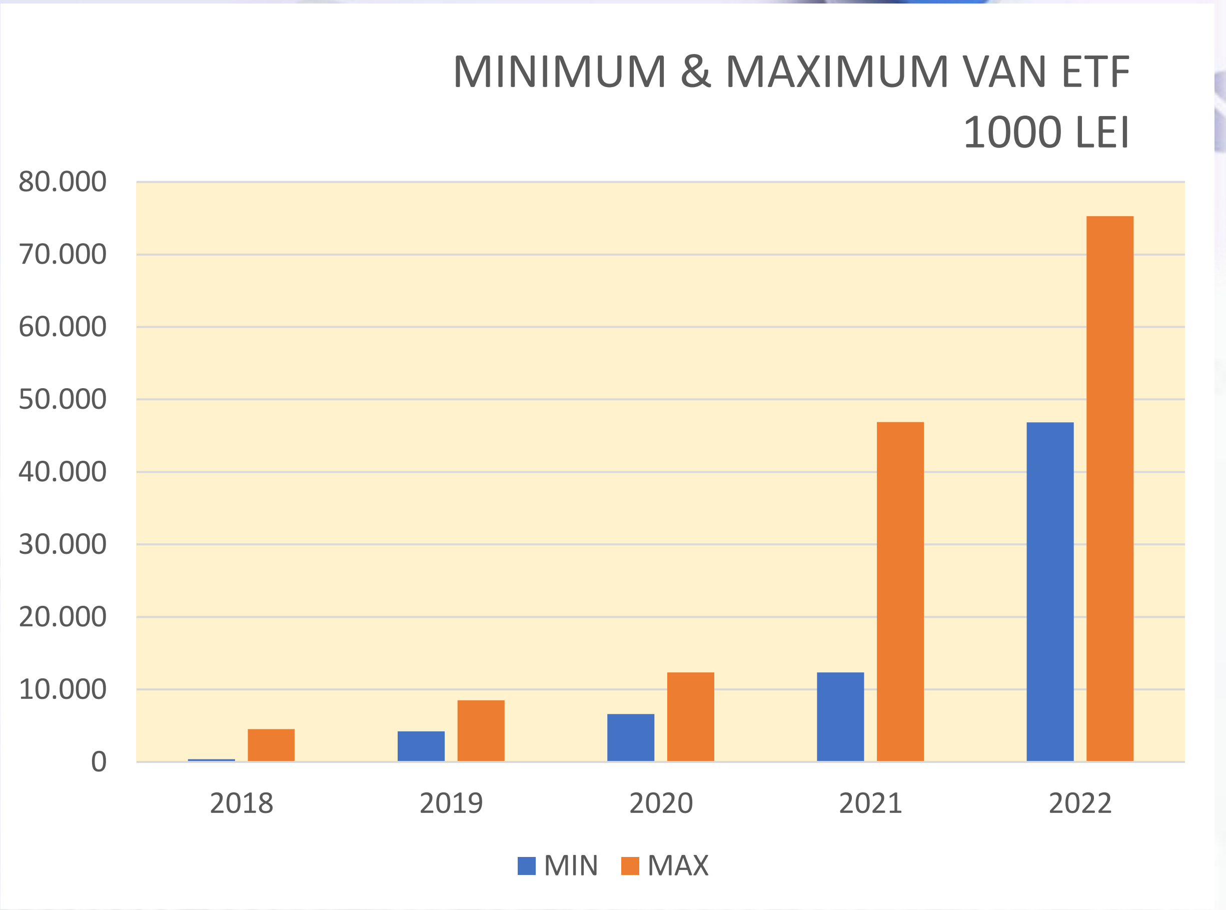


Figure 5. Minimum and maximum prices reached by VAN.ETF 2018-2022
Source: Own processing based on data from SAI Patria Asset Management SA

Results of the analysis

- **R de 0.99** ➡ very strong correlation
- **RSquare 0.98** ➡ The variation of independent variables influences the variation of the PriceETF variable by 98%.

Table 2

Model Summary

Model	R	Rsquare	Adjusted R-Square	Std.Error of the Estimate	Durbin-Watson
1	.990a	0.981	0.981	0.435248	0.158
a. Predictors: (Constant), VAN.ETF (RON), VolumeETF, PriceBET.					
b. Dependent Variable: PriceETF					

Results of the analysis

- **Sig.<0.05** ➡ The model is statistically significant, with an error of 0.05 accepted to reject the H0 hypothesis, although correct.

- **Multiple linear regression equation**

Table 3

Coefficients

Model	Unstandardized.Coefficients		StandardizedCoefficients	t	Sig.	95.0%Confidence Interval for B	
	B	Std.Error	Beta			Lower Bound	Upper Bound
(Constant)	-1.306	0.116		-11.25	0	-1.534	-1.078
VolumeETF	-8.93E-06	0	-0.022	-4.507	0	0	0
PriceBET	0.001	0	0.795	103.391	0	0.001	0.001
VAN.ETF	3.37E-08	0	0.239	33.087	0	0	0
a. Dependent Variable: PriceETF							

➡ **PriceETF=-1.306-(8.932*10^{-6})*VolumeETF+0.001*PriceBET+(3.370*10^{-8})*VAN.ETF**

Model validation

- **R -** Very strong correlation between the independent variables and the dependent variable (PriceETF).
- An R Square of 0.98 suggests that the model explains 98% of the variation in PriceETF.
- The Sig. value <0.05 from ANOVA validates the model to a degree of 95%.
- **The null hypothesis H0 is rejected and the alternative hypothesis H1 is confirmed:** the independent variables Volume ETF, PriceBET, and VAN.ETF significantly influence the dependent variable PriceETF**.**
- **The PriceBET variable has the greatest positive influence on the ETF, confirming its effectiveness in tracking the performance of the BET index.**
- **ETFPatriaTradeville can be used as a strategy to replicate the performance of the BET index.**

Conclusions

- The variables recorded relatively low coefficients, but as financial indicators, they record variations of one unit with a higher frequency.

- The negative influence of the VolumeETF variable may indicate a slight tendency for investors to sell assets. As an instrument for replicating the BET index, it is preferable that the most influential variable be PriceBET.

Conclusions

- A very strong correlation and a significance level below 5% for the independent variable VAN.ETF suggests that ETF units are neither undervalued nor overvalued on the stock market.
- Exchange-traded funds are a highly sought-after investment product by foreign investors, but also by domestic investors, due to the benefits of the underlying assets, broad exposure to a particular asset class (TMP), increased liquidity, low costs, and the time-saving passive management strategy.

INVESTITII FOND		
TLV	Banca Transilvania	21,3%
SNP	OMV Petrom	17,8%
H2O	SPEEH Hidroelectrica	17,1%
SNG	SNGN Romgaz	8,8%
BRD	BRD – Gr. Societe Gen.	8,2%
SNN	SN Nuclearelectrica	4,4%
DIGI	DIGI Communications	3,0%
TGN	SNTGN Transgaz	2,7%
FP	Fondul Proprietatea	2,5%
EL	SE Electrica	2,5%
ONE	One United Properties	2,2%
M	MedLife	2,1%
TTS	Transport Trade Serv.	1,7%
TEL	CNTEE Transelectrica	1,3%
TRP	Teraplast	1,1%
AQ	Aquila Part Prod Com.	0,8%
BVB	Bursa de Valori Buc.	0,8%
WINE	Purcari Wineries	0,7%
SFG	Sphera Franchise Grp.	0,6%
COTE	Conpet	0,4%
Lichiditati si alte active		0,0%

Limitations of the study

- The data collected and processed on the TradeVille platform does not have records for each day of the 2018-2022 period.
- The ETF has a replication error, but also a composition error compared to BET.
- The implementation of such investment products for the passive replication of other indices (BET-TR, BET-XT) could increase trading volumes and liquidity on the BVB.

Performances	VAN	PriceETF	BET	Replication error(TE)	Composition error
2022	-3.71%	-2.66%	-10.70%	0.3%	0.7%
2021	+36.22%	+36.69%	+33.20%	1.04%	2.38%
2020	+2.2%	+1.07%	-0.8%	3.15%	12.44%
2019	+42.88%	+41.10%	+35.13%	0.205%	5.88%
2018	+1.94%	+3.69%	-4.77%	0%	8.98%
otal average annual performance	15.124%	15.978%	10.028%	0.94%	6.076%
From launch (2012) until 31.12.2022 Total average annual performance	+243.43%	+245.58%	+142.08%		

Source: Processed by the author based on data available on the Bucharest Stock Exchange (BSE)

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THANK YOU FOR YOUR ATTENTION!