

# Package ‘PWEV’

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**Type** Package

**Title** PSO Based Weighted Ensemble Algorithm for Volatility Modelling

**Version** 0.1.0

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## Description

Price volatility refers to the degree of variation in series over a certain period of time. This volatility is especially noticeable in agricultural commodities, adding uncertainty for farmers, traders, and others in the agricultural supply chain. Commonly and popularly used four volatility models viz, GARCH, Glosten Jagannatan Runkle-GARCH (GJR-GARCH) model, exponentially weighted moving average (EWMA) model and Multiplicative Error Model (MEM) are selected and implemented. PWAVE, weighted ensemble model based on particle swarm optimization (PSO) is proposed to combine the forecast obtained from all the candidate models. This package has been developed using algorithm of Paul et al. <doi:10.1007/s40009-023-01218-x> and Yeasin and Paul (2024) <doi:10.1007/s11227-023-05542-3>.

**License** GPL-3

**Encoding** UTF-8

**Imports** stats, xts, rumidas, rugarch, WeightedEnsemble, Metrics, zoo

**RoxygenNote** 7.2.1

**NeedsCompilation** no

**Repository** CRAN

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**Description**

PSO Based Weighted Ensemble Algorithm for Volatility Modelling

**Usage**

```
PWEV(Data, SplitR)
```

**Arguments**

Data	Univariate Time Series Data
SplitR	Split Ratio

**Value**

- TrainFitted: Fitted values for the train series
- TestPred: Prediction for the test series
- Accuracy: Accuracy metric of the proposed model
- Weights: Weights of the ensemble

**References**

- Paul, R.K., Das, T. and Yeasin, M., 2023. Ensemble of time series and machine learning model for forecasting volatility in agricultural prices. *National Academy Science Letters*, 46(3), pp.185-188.
- Yeasin, M. and Paul, R.K., 2024. OptiSembleForecasting: optimization-based ensemble forecasting using MCS algorithm and PCA-based error index. *The Journal of Supercomputing*, 80(2), pp.1568-1597.

**Examples**

```
library("PWEV")  
data<- as.ts(rnorm(200,100,50))  
Result <- PWEV(data, 0.9)
```

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