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A novel trading test of predictability

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Abstract

Our paper introduces a novel out-of-sample (OOS) test designed to evaluate the predictive ability of financial return forecasts against the commonly used random walk model, a benchmark prevalent in the literature. Our proposed test, labeled WSEP, is based on modifications to the Anatolyev and Gerko (2005) Excess Profitability test (EP) by Pincheira et al. (2022) (SEP). WSEP employs a more conservative trading strategy that assigns weights to forecasts, thereby reducing risk exposure. This approach enhances statistical power due to variance reduction which compensate for the lower returns associated to our strategy. We construct weights for each forecast based on their magnitude, using either an exponential or folded normal cumulative distribution function. The WSEP test offers the advantage of providing an interpretation in terms of profitability, akin to both the EP and SEP tests. We evaluate WSEP size and power via Monte Carlo simulations, employing forecasts constructed from linear regressions estimated by ordinary least squares and random forests. Results demonstrate robust size properties and increased statistical power compared to natural benchmarks. Finally, we present an empirical application based on the commodity-currencies literature.

1. Introduction

We propose a novel out-of-sample test against the random walk hypothesis which modifies the straightforward excess profitability test (SEP) from Pincheira et al. (2022) based on the Anatolyev and Gerko's (2005) Excess profitability test (EP).

Our modification involves adjusting the trading strategy proposed by Anatolyev and Gerko (2005) by assigning weights based on the forecast magnitude and buy (sell) that portion if the forecast is positive (negative). In Anatolyev and Gerko (2005) original approach, the strategy is to buy shares worth the current wealth if the forecast for the asset is positive and to sell shares worth the current wealth otherwise.

Our test, called weighted straightforward profitability test (WSEP), employs a more pragmatic trading approach by assigning weights to each forecast based on its magnitude, using a cumulative probability distribution function, specifically the exponential or folded normal distribution. By doing this, we reduce risk by investing a portion of our wealth based on the relative size of the forecast, avoiding an "all or nothing" strategy. Although this procedure reduces returns, it also reduces variance, which is the mechanism that drives the augmented power. This out-of-sample test offers the advantage of providing return interpretations, while employing a more conservative trading strategy and showing improved statistical power.

The random walk model, renowned for the challenge posed by its null forecast to be outperformed in terms of mean squared error in out-of-sample analysis, as demonstrated by Meese and Rogoff (1983) and further supported by Rossi (2013) —who identified it as the most difficult benchmark to beat in exchange rate predictability —, has become one of the most frequently used benchmarks in forecast competitions. It is worth noting that this isn't exclusive to exchange rates but extends to financial time series in general, such as commodity prices or stock prices. This has prompted a quest for new benchmarks that can offer greater predictability. For instance, Kwas and Rubaszek (2021) in the search for better benchmarks, concluded that the random walk model should be supplemented by local projection models and futures prices justified in some of the previously mentioned tests. Therefore, tests for predictability have become a crucial resource in the literature discussing the random walk hypothesis.

We examine both size and power of our tests and their natural competitors, which are: the base test used as an inspiration to ours (SEP), the vastly used Clark and West (2006) (CW) test of adjusted mean squared prediction error and, the non-asymptotically normal test from Clark and McCracken (2001) (ENC-New). To this end we carry out Monte Carlo simulations for different data generating processes (DGP's) and sample sizes, using specifications detailed in section 3. These simulations go beyond the traditional scenarios of producing forecasts with linear regressions estimated by ordinary least squares. We also use random forests as introduced by Breiman (2001) to produce forecasts, which have become widely used in the last decade but with little knowledge of how these tests behave with this methods.

Our simulations reveal that our test is correctly sized in all DGP's for a wide variety of sample sizes with correct and incorrect specifications. In terms of power our results are mixed although our test is generally superior to SEP and CW. Furthermore, we show that power increments associated to our test are paired with higher Sharpe ratios, indicating greater risk-adjusted profitability. As a byproduct result, not previously reported in the literature, we show a superior performance of the SEP test in terms of power relative to the CW test under conditions of heteroskedasticity; this is relevant as this condition is more the rule than the exception. We observe consistent improved power in simulations, suggesting that the weighted approach is robust across different forecasting methods. When we apply WSEP to forecasts generated by Random Forest models, we observe that they still exhibit higher test power and risk-adjusted profitability than the benchmark tests but with a tighter competition depending on the conditional variance setting. Also, CW shows correct size in this case, unlike with OLS, which motivates to explore how this test behaves with different methods. This consistency across forecasting techniques enhances the generalizability and reliability of our proposed test in diverse predictive modeling scenarios.

Finally, we present an empirical application of commodity price prediction with exchange rates of different commodity-currencies. We use monthly data from October 2000 to September 2023, using the last price of each month of a variety of commodity currencies which includes Chilean peso (CLP), Canadian dollar (CAD), Australian dollar (AUD), New Zealand dollar (NZD), Norwegian krone (NOK), South African rand (ZAR) and Icelandic króna (ISK) to predict one period returns of the LMEX index, copper, Brent and WTI oil, nickel, aluminum, zinc, lead, and tin. The data is extracted from Bloomberg. Results show higher predictability in returns using the two versions of WSEP compared to CW and a tight competition between these two and SEP, suggesting, in general, an environment of conditional heteroskedasticity.

This paper is organized as follows: In section 2 we describe the econometric setup. In section 3, we present the Weighted SEP. In section 4, we introduce the data generating processes (DGP) to which the tests are subjected and the results of the Monte Carlo simulations for OLS and random forests. Section 5 consists of the empirical application, and finally, section 6 summarizes and discusses further research.

2. Econometric setup

The econometric frame is constructed upon two models for a stationary and ergodic time series y_{t+1}.

$$\textbf{Model 1: } y_{t+1} = e_{t+1} \tag{1}$$

$$\textbf{Model 2: } y_{t+1} = X'\beta + e_{t+1} \tag{2}$$

Here, X represents a vector of stationary and ergodic exogenous random variables, while e_{t+1} is a zero-mean martingale difference; thus $\mathbb{E}[e_{t+1}|\mathfrak{F}_t] = 0$, with $\mathfrak{F}_t$ the information set at time t, in simpler terms, e_{t+1} conditioned on past information equals 0.

Consider y_{t+1} as the return of a financial asset and $y_{t,t+1}^{f}$ the forecast for that return (produced only by the

information until t) and for simplicity we will denote $y_{t,t+1}^{f} = y_t^{f}$. Then the trading strategy proposed by Anatolyev and Gerko's (2005) is:

- Buy the asset if $y_t^{f} \geq 0$.
- Sell otherwise.

This means the investor buys when he has a positive forecast return and sells if it is negative. The position is modified each period by the investor and is closed once the period finishes. Then the one-period return of the trading strategy is given by.

$$r_t = sign(y_t^{f}) y_{t+1} \tag{3}$$

Note that $sign(.)$ takes the value 1 if the argument is positive and -1 if is negative.
Subsequently, we can compute the SEP test from the next statistic.

$$A_{SEP} = \frac{1}{P} \sum_{t=R+1}^{T+1} r_t \tag{4}$$

Where P is the number of forecasts, T+1 is the total sample, and R is the initial estimation window.
With stationarity and ergodicity as a supposition, under the null:

$$\begin{aligned} \mathbb{E}\big[\mathbb{E}[r_{t+1}|\mathfrak{F}_t]\big] &= \mathbb{E}\Big[\mathbb{E}\big[sign(y_t^{f}) e_{t+1}\big|\mathfrak{F}_t\big]\Big] \\ &= \mathbb{E}\Big[sign(y_t^{f})\mathbb{E}[e_{t+1}|\mathfrak{F}_t]\Big] = 0 \end{aligned}$$

This is achievable because:

$$sign(y_t^{f}) \in \mathfrak{F}_t$$

And under the alternative:

$$\begin{aligned} \mathbb{E}\big[\mathbb{E}[r_{t+1}|\mathfrak{F}_t]\big] &= \mathbb{E}\Big[\mathbb{E}\big[sign(y_t^{f}) y_{t+1}\big|\mathfrak{F}_t\big]\Big] = \mathbb{E}\Big[\mathbb{E}\big[sign(y_t^{f})(X'\beta + e_{t+1})\big|\mathfrak{F}_t\big]\Big] \\ &= \mathbb{E}\Big[\mathbb{E}\big[sign(y_t^{f})(X'\beta)\big|\mathfrak{F}_t\big]\Big] + \mathbb{E}\Big[sign(y_t^{f})\mathbb{E}[(e_{t+1})|\mathfrak{F}_t]\Big] \\ &= \mathbb{E}\big[sign(y_t^{f})(X'\beta)\big] = \mathbb{E}\big[sign(X'\widehat{\beta}_t)(X'\beta)\big] \end{aligned}$$

And if $\hat{\beta}$ is a good estimate of β, then.

$$\mathbb{E}\big[\mathrm{sign}(\mathrm{X}'\widehat{\beta}_{\mathrm{t}})(\mathrm{X}'\beta)\big] \approx \mathbb{E}[|\mathrm{X}'\beta|] > 0$$

Therefore, since under de null r_t is a martingale difference, under very general conditions, we can apply the central limit theorem for martingale differences as presented by Hamilton, (1994). These conditions are the following:

a) $E[r_t^2] = \sigma_t^2 > 0$ with $\frac{1}{T}\sum_{t=1}^{T} \sigma_t^2 \to \sigma^2$

b) $E|r_t|^m < \infty$ for some $m > 2$ and all t.

c) $\frac{1}{T}\sum_{t=1}^{T} r_t^2 \xrightarrow{p} \sigma^2$

With this we obtain:

$$SEP \equiv \sqrt{P}\frac{A_{SEP}}{\sqrt{\hat{V}}} \to N(0,1) \qquad (5)$$

And

$$\hat{\mathrm{V}} = \frac{1}{P}\sum_{t=R+1}^{T+1} r_t^2$$

In the subsequent section, we introduce the Weighted SEP along with the modifications we have incorporated to develop it.

3. Weighted straightforward excess profitability test.

Our modification to the SEP test is the employed trading strategy. The SEP test currently employs the identical trading strategy initially put forth by Anatolyev and Gerko (2005). We put forward the subsequent alternative:

- Buy a portion $\omega_t(y_t^f)$ of the asset if $y_t^f \geq 0$ and portion $\left(1 - \omega_t(y_t^f)\right)$ in a risk-free asset with r_f return.
- Sell a portion $\omega_t(y_t^f)$ of the asset if $y_t^f < 0$ and portion $\left(1 - \omega_t(y_t^f)\right)$ in a risk-free asset with r_f return.

Where $0 \leq \omega_t(y_t^f) \leq 1$, represents the proportion of wealth to be invested in the risky asset which is a function of the forecast, and r_f stands for a risk-free return which in this case we set to 0, this implies keeping a portion $\left(1 - \omega_t(y_t^f)\right)$ of your wealth under the mattress, so to speak. This trading strategy presents a more pragmatic and conservative approach compared to the one mentioned earlier, as it avoids

risking the entire wealth on the forecasts.

Taking the foregoing into consideration, the return of this trading strategy will be determined by the following expression:

$$R_t = sign\left(y_t^f\right)\omega_t\left(y_t^f\right)y_{t+1} + \left(1 - \omega_t\left(y_t^f\right)\right)r_f$$

Given that $r_f = 0$, this simplifies to:

$$R_t = sign\left(y_t^f\right)\omega_t\left(y_t^f\right)y_{t+1} \quad (6)$$

Regarding the determination of ω, we utilize the cumulative probability function of either the exponential distribution or the folded normal distribution. This approach involves employing the absolute value of the forecast divided by its standard deviation as the argument (as theoretically expected value of returns is 0). The underlying rationale is to give higher weight to forecasts with larger magnitudes and, conversely, allocate lower weights to those with smaller magnitudes. The idea is that larger forecasts may be indicative of a more likely accuracy in predicting direction. Therefore, by capitalizing on the magnitude of the forecast, we aim to enhance predictability. The selection of these distributions is attributed to their exclusive confinement to positive values. As such, ω would be ascertained through the subsequent expressions, contingent upon the scenario:
For the exponential distribution:

$$\omega_t\left(y_t^f\right) = 1 - exp\left(-\lambda\frac{\left|y_t^f\right|}{sd\left(y_t^f\right)}\right) \quad (7)$$

Or for the folded normal distribution:

$$\omega_t\left(y_t^f\right) = \frac{1}{2}\left[erf\left(\frac{\frac{\left|y_t^f\right|}{sd\left(y_t^f\right)} + \mu}{\frac{1}{\lambda} * \sqrt{2}}\right) + erf\left(\frac{\frac{\left|y_t^f\right|}{sd\left(y_t^f\right)} - \mu}{\frac{1}{\lambda} * \sqrt{2}}\right)\right] \quad (8)$$

With

$$erf(z) = \frac{2}{\sqrt{\pi}} \int_0^z e^{-t^2}\, dt$$

Which is the Gauss error function.

In expressions (7) and (8), $\hat{y}_t$ is the fitted value from the model estimated at time t, then $sd(y_t^f)$ is the standard deviation from the forecasts for which we use the standard deviation of the fitted values in each estimation window as an estimator. λ is the parameter of the exponential distribution, and μ and $\frac{1}{\lambda}$ represent the mean and standard deviation of the folded normal distribution respectively, in which μ is set to 0. It is worth noting that in the case of the exponential distribution, the mean and standard deviation are given by $1/\lambda$. Additionally, in the case of the exponential distribution, the computational simplicity is particularly evident, and as demonstrated in the subsequent section, the discrepancy from using one distribution or another is minimal, thus the first approach can be very convenient.
Another interesting point to note is that as $\frac{1}{\lambda}$ approaches 0, the return of this trading strategy becomes equal to that of the SEP trading strategy. This phenomenon arises from the fact that as the standard deviation diminishes, forecasts are treated as relatively larger, leading to the assignment of weights approaching 1. In other words, the SEP test is a particular case of the WSEP test. Due to this a natural question arises, how to choose the value for λ? We propose a safe zone based on our simulations which is $1 \leq \lambda \leq 2$. In the next section we show the reasons for that range.
Now, we can employ the following statistic to formulate our test:

$$A_{WSEP} = \frac{1}{P} \sum_{t=R+1}^{T+1} R_t$$

The same procedure used in the SEP test can also be applied here. Under the null hypothesis:

$$\mathbb{E}\left[\mathbb{E}[R_{t+1}|\mathfrak{F}_t]\right] = \mathbb{E}\left[\mathbb{E}\left[sign(y_t^f)\omega_t(y_t^f)e_{t+1}\middle|\mathfrak{F}_t\right]\right]$$

Notice that $\omega_t(y_t^f)$ is determined by the forecast, which is within the information set:

$$\omega_t(y_t^f)sign(y_t^f) \in \mathfrak{F}_t$$

This yields the following result:

$$= \mathbb{E}\left[sign(y_t^f)\omega_t(y_t^f)\mathbb{E}[e_{t+1}|\mathfrak{F}_t]\right] = 0$$

Consequently, under the null hypothesis, the statistic should equal 0. Under the alternative hypothesis:

$$\mathbb{E}\left[\mathbb{E}[R_{t+1}|\mathfrak{F}_t]\right] = \mathbb{E}\left[\mathbb{E}\left[sign\left(y_t^f\right)\omega_t\left(y_t^f\right)y_{t+1}|\mathfrak{F}_t\right]\right] = \mathbb{E}\left[\mathbb{E}\left[sign\left(y_t^f\right)\omega_t\left(y_t^f\right)(X'\beta + e_{t+1})|\mathfrak{F}_t\right]\right]$$
$$= \mathbb{E}\left[\mathbb{E}\left[sign\left(y_t^f\right)\omega_t\left(y_t^f\right)(X'\beta)|\mathfrak{F}_t\right]\right] + \mathbb{E}\left[sign\left(y_t^f\right)\omega_t\left(y_t^f\right)\mathbb{E}[(e_{t+1})|\mathfrak{F}_t]\right]$$
$$= \mathbb{E}\left[sign\left(y_t^f\right)\omega_t\left(y_t^f\right)(X'\beta)\right] = \mathbb{E}\left[sign\left(X'\widehat{\beta}_t\right)\omega_t\left(y_t^f\right)(X'\beta)\right]$$

This result just like in the SEP case, as long as $\hat{\beta}$ is a reliable estimate, then:

$$\mathbb{E}\left[\text{sign}\left(\text{X}'\widehat{\beta}_\text{t}\right)\omega_t\left(y_t^f\right)(\text{X}'\beta)\right] \approx \mathbb{E}\left[\omega_t\left(y_t^f\right)|\text{X}'\beta|\right] > 0$$

Notice that under the alternative $A_{SEP} \geq A_{WSEP}$. Nevertheless, in the next section we show higher power for the WSEP.

Given that we are testing the same hypothesis under the null, we can use the same central limit theorem for martingale differences mentioned above to construct our test:

$$WSEP \equiv \sqrt{P}\frac{A_{WSEP}}{\sqrt{\hat{V}}} \rightarrow N(0,1) \qquad (9)$$

With

$$\widehat{\text{V}} = \frac{1}{P}\sum_{t=R+1}^{T+1} R_t^2$$

Hence, the statistic defined by expression (9) corresponds to a one-sided test, as we anticipate a positive value under the alternative hypothesis. Notice that as well as SEP this is an asymptotically normal test under the null.

In the next section, we explore size and power of our test via Monte Carlo simulations.

4. Monte Carlo Simulations

In literature there are mainly 3 ways for constructing forecasts. A fixed scheme where $\widehat{\beta}_t$ is estimated once using only the first R observations, a rolling scheme, which updates the estimate of $\widehat{\beta}_t$ using a fixed value for R and updating it with the last observations, and finally a recursive scheme where $\widehat{\beta}_t$ is updated taking all past available observations and adding the new observations. This means R increases with t.

We analyze the behavior of these tests under rolling, and recursive schemes for different numbers of observations (T+1=R+P), initial estimation window sizes (R), and forecast horizons (P). Looking for a more realistic approach we use proportions of the number of observations to choose the initial estimation windows, particularly we use $\frac{R}{T+1} = 0.25, 0.5, 0.75$. For example, if the number of observations is 1000, and

we want to use the 25% of the data for estimation, then $R = 0.25 * 1000 = 250$. The number of replications is 5000. Finally, we use ordinary least squares for estimation, always without including the constant term.

We use Monte Carlo simulations for four different data generating processes (DGP's) to evaluate size and power of the WSEP test and compare it with our natural out-of-sample benchmarks. We establish two widely employed asymptotically normal tests under the null hypothesis: the SEP test and the adjusted mean squared error test devised by Clark and West (2006). The latter compares the out-of-sample mean squared prediction error in nested models, specifically within the framework outlined in equations (1) and (2). In this context, the null hypothesis posits a parsimonious martingale difference model, while the alternative hypothesis proposes a model that incorporates the parsimonious model as a nested form. They establish that, with a finite sample under the null hypothesis, the mean squared prediction error of the null model will invariably be smaller than that of the nested model. This observation becomes readily apparent through the following expression:

$$\widehat{MSPE}_1 - \widehat{MSPE}_2 = \frac{1}{P}\sum_{t=R}^{T}(y_{t+1})^2 - \frac{1}{P}\sum_{t=R}^{T}\left(y_{t+1} - X'\widehat{\beta}_t\right)^2$$
$$= \frac{2}{P}\sum_{t=R}^{T}(y_{t+1}X'\widehat{\beta}_t) - \frac{1}{P}\sum_{t=R}^{T}\left(X'\widehat{\beta}_t\right)^2$$

Notice that under the null:

$$\frac{2}{P}\sum_{t=R}^{T}(y_{t+1}X'\widehat{\beta}_t) - \frac{1}{P}\sum_{t=R}^{T}\left(X'\widehat{\beta}_t\right)^2 \overset{H_0}{=} \frac{2}{P}\sum_{t=R}^{T}(e_{t+1}X'\widehat{\beta}_t) - \frac{1}{P}\sum_{t=R}^{T}\left(X'\widehat{\beta}_t\right)^2$$

Hence, the first term is zero, nonetheless $-\frac{1}{P}\sum_{t=R}^{T}\left(X'\widehat{\beta}_t\right)^2 < 0$, due to this factor, the mean squared prediction error of the nested model will be larger, attributed to the estimation noise given by the term that under the null should be zero. Therefore, they propose a test constructed solely based on the first term:

$$CW = \sqrt{P}\ \frac{\frac{2}{P}\sum_{t=R}^{T}(y_{t+1}\,X'\widehat{\beta}_t)}{\sqrt{4E\left(y_{t+1}X'\widehat{\beta}_t\right)^2}}$$

Also, we add a comparison to the ENC-New test developed by Clark and McCracken (2001) which is a non-normal test that compares mean squared prediction errors in nested models as well as Clark and West (2006, 2007). The test in our case is computed as follows:

$$ENC - New = P\frac{P^{-1}\sum_{t=R}^{T}(y_{t+1}X'\widehat{\beta}_t)}{P^{-1}\sum_{t}^{T}\left(y_{t+1} - X'\hat{\beta}_t\right)^2}$$

However, this test has certain drawbacks. Notably, it requires different critical values, and its distribution varies for different proportions of $\pi = \frac{P}{R}$. Furthermore, it can only be applied when estimating through ordinary least squares, meaning forecasts derived from different methods cannot be evaluated using this test. Despite these disadvantages, it exhibits high power in situations that align with its conditions.

The DGP's presented in this paper comes from a variety of sources, including Pincheira et al. (2022) and Clark and West (2006), as well as our own authorship for DGP 5. All these DGP's are calibrated to match the returns of financial assets and exchange rates.

Additionally, we carry out Monte Carlo simulations using a machine-learning method. Notice that this test allows us to evaluate any forecast, whether it comes from a regression model, machine learning model, or survey, since we only need the forecast and the objective variable to construct the test. Therefore, we use Random Forest to evaluate our test with forecasts made in a misspecified environment. Specifically, we use Random Forest models with 500 decision trees each and a maximum number of nodes of 50. We subject this model to the same DGP's with rolling, and recursive schemes with the same sample sizes as mentioned above. Note that the predictors here are the same that describes the following DGP's.

4.1. DGP 1

The first DGP is an autoregressive process without drift, used in Pincheira et al. (2022) and calibrated based on the returns of the S&P 500 index.

$$y_t = \rho y_{t-1} + \varepsilon_t\,,\ \ \varepsilon_t \sim i.i.d.\ \mathrm{N}(0,0.000249)$$

Where $\rho = 0$ for the simulations under the null and $\rho = 0.1256$ for the alternative.

4.2. DGP 2

This DGP comes from Clark and West (2006) and its calibration is based in exchange rate and stock data.

$$y_{t+1} = \beta x_t + e_{t+1}$$
$$x_t = 0.95x_{t-1} + u_t$$
$$e_{t+1} \sim N(0,1); u_{t+1} \sim N(0,0.025^2)$$

Where $corr(e_t, u_t) = 0$ and $\beta = 0$ for experiments under the null hypothesis and $\beta = 2$ for experiments to evaluate power.

4.3. DGP 3

Our third DGP comes from Pincheira (2021) and Pincheira et al. (2022) It is calibrated by estimating models to predict commodity returns with exchange rates of commodity-exporting countries. This DGP evaluates the test under situations where the mean under the null may be slightly deviated from zero.

$$y_{t+1} = 0.0008 + \beta x_t + \epsilon_{t+1}$$
$$x_{t+1} = -0.0004 + 0.0375 x_t + v_{t+1}$$
$$\epsilon_{t+1} \sim N(0,0.058^2); v_{t+1} \sim N(0,0.036^2); corr(\epsilon_{t+1}, v_{t+1}) = -0.49$$

Under the null hypothesis, $\beta = 0$ and under the alternative hypothesis, $\beta = 0.27$. It is important to note that in this case we have a constant $c = 0.0008$ under the null hypothesis for y_{t+1}, representing the mean deviation mentioned.

4.4. DGP 4

Here we use another configuration by Clark and West (2006). This are calibrated to the S&P excess returns and dividend price ratio, with a generalized autoregressive conditional heteroskedasticity (GARCH) in the spirit of Bollerslev (1986). The specification is as follows:

$$y_t = b x_{t-1} + e_t$$
$$x_t = 0.95 x_{t-1} + u_t$$
$$e_t = \sqrt{h_t}\epsilon_t$$
$$h_t = \eta + \alpha e_{t-1}^2 + \beta h_{t-1}$$
$$u_t \sim N(0,0.036^2);\ \epsilon_t \sim \text{i. i. d. } N(0,1)\ ; corr(e_t, u_t) = -0.9$$

Here $b = 0$ under th null hypothesis and $b = 0.365$.
We also add a heavy tails calibration (removing heteroskedasticity) using a t(6) distribution for u_t and e_t. That is $u_t \sim i.i.d.\ t(6);\ e_t \sim i.i.d.\ t(6)$. The variance of a t(6) random variable is $\frac{3}{2}$, thus, to maintain unconditional variances from the original DGP without losing the heavy tails feature we standardized e_t and u_t by dividing them by $\sqrt{\frac{3}{2}}$ and multiplying u_t by 0.036 in a similar procedure as in Diebold and Mariano (1995). Then the unconditional variances are equal in both versions of this. In the interest of brevity, we do not show results for this, as results evidence very similar behavior of the test in both cases. Also, the next DGP involves both features as it is a student t GARCH.

4.5. DGP 5

This last DGP is the most challenging for the presented tests due to its incorporation of two specific features. The first is that involves heteroskedasticity as the latter DGP, and second, at the same time, introduces errors with Student's t-distributions. This configuration represents a more realistic approach to financial asset return series, which have been reported in the literature with heavy tails and time-varying conditional variance. In fact, Abdullah et al. (2017) highlight the increased predictive capacity in volatility when estimating GARCH models with student's t distributions as opposed to the more commonly used normal

distributions in the case of exchange rate volatility in Bangladesh. Also, Gerlach and Tuyl (2006) comparing models for volatility forecasting show in a real data set of S&P 500 that the simple GARCH (1,1) with student's t errors is the best in terms of likelihood performance. Consequently, we use a GARCH (1,1)-t process according to Bollerslev (1987) to simulate these characteristics. This DGP is calibrated based on proprietary estimation using weekly data from the S&P500 index spanning from January 1, 2020, to August 4, 2023, obtained from the Federal Reserve Bank of St. Louis. The model is implemented using the R package "rugarch" by Ghalanos, (2014).
The DGP is formulated as follows:

$$y_t = \delta + \rho_1 y_{t-1} + \rho_2 y_{t-2} + \varepsilon_t$$
$$\varepsilon_t = \sqrt{h_t} u_t$$
$$h_t = \eta + \alpha \varepsilon_{t-1}^2 + \beta h_{t-1}$$
$$u_t \sim i.i.d.\ t(v)$$

The estimated parameters are:

$$\eta = 0.000018;\ \alpha = 0.254952;\ \beta = 0.66429;\ v = 6$$

Under the null hypothesis $\delta = \rho_1 = \rho_2 = 0$, and under the alternative hypothesis $\delta = 0.001658;\ \rho_1 = -0.020158;\ \rho_2 = -0.175930$.
Further details of the model estimation for the calibration of this DGP are presented in Table *A.1*

4.6. Simulation results

In Table 1 to Table 5 we provide the results on size pertaining to each Data Generating Process (DGP), ranging from 1 to 5, considering both rolling windows and recursive approaches with $\lambda = 1$. Table 6 to Table 10 display the power results for DGPs 1 to 5.

All these tables are constructed at the 10% significance level; results for the 5% and 1% levels are available in the appendix as well as the cases for the upper bound of the safe zone interval $\lambda = 2$. The reason behind this interval is based on the results across the 24 lambda's simulations. The power dynamics exhibit a consistently concave structure, albeit with considerable variability contingent upon the proportions of the initial window and DGP's, as exemplified in Figure A.1 to Figure A.3 to in the appendix.

Notably, within the safe zone, WSEP Exp and WSEP Norm consistently overcome the SEP test. When contrasted with CW, WSEP Exp and WSEP Norm show substantial power advantages, especially in heteroskedastic environments (DGP 4 and 5). This is in stark contrast to the competitive results of CW in DGPs 1, 2, and 3.

Furthermore, we formulate the test for fixed estimation windows, yielding outcomes akin to the rolling window scenario. Additional information on this matter can be provided upon request.
In terms of size, as commonly observed in the literature, CW consistently falls below the expected levels.

While this is not a problem, it suggests an opportunity for improvement in power, such as incorporating a power booster factor as developed by Pincheira (2022). On the contrary, ENC-NEW appears slightly oversized. Summarizing the size results across DGP 1 and 2 for rolling and recursive windows, the mean size in rolling (recursive) schemes is 6.6% (6.5%) for CW, 11% (11.4%) for ENC-NEW, 10.1% (9.9%) for SEP, and 9.9% (9.9%), 10% (9.9%) for both WSEP Exp and WSEP Norm, respectively. Notably, ENC-NEW shows a slight oversize influenced by DGP 1.

For DGP 3, across all observation settings, the mean size in rolling (recursive) schemes is as follows: CW 6.6% (6.3%), SEP 10.2% (9.8%), WSEP Exp 10% (9.8%), WSEP Norm 10% (9.8%), and ENC-NEW 9.6% (9.9%). This aspect works as a robustness check, particularly relevant for financial returns where the expected value may slightly deviate from zero. However, this is noteworthy as SEP and both variants of WSEP closely align with the nominal size.

Finally, In the context of heteroskedastic cases (DGP 4 and 5), the mean size under both rolling and recursive estimation windows is as follows: For CW, the mean size is 8.3% in the rolling scheme and 8.3% in the recursive scheme. Regarding SEP, it maintains a mean size of 10.1% in both rolling and recursive settings. Similarly, for both WSEP Exp and WSEP Norm, the mean size is 10.3% in the rolling scheme, and 10.3% in the recursive scheme. Nevertheless, ENC-NEW demonstrates an elevated mean size, registering at 20.1% and 20.2% in rolling and recursive scenarios respectively. This outcome is not unexpected, considering Clark and McCracken's (2001) reliance on the assumption of conditional homoskedasticity. The findings presented in Table 4 align with those reported by Clark and West (2006) for CW and ENC-NEW. However, it is worth noting that, for DGP 5, results related to ENC-NEW indicate a more substantial distortion in size, reaching a maximum of 26.72%.

Table 1. Empirical size DGP1 (Nominal size of 10%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	7,18%	6,02%	6,24%	CW	6,50%	5,64%	5,66%
SEP	10,34%	10,06%	10,08%	SEP	9,54%	10,06%	9,26%
WSEP Exp	10,22%	8,90%	9,66%	WSEP Exp	9,72%	9,72%	9,06%
WSEP Norm	10,18%	8,90%	9,62%	WSEP Norm	9,66%	9,80%	9,18%
Enc-New	12,76%	11,54%	12,70%	Enc-New	12,24%	12,50%	12,22%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	6,58%	6,04%	6,06%	CW	6,96%	7,02%	6,06%
SEP	9,58%	9,58%	10,50%	SEP	10,04%	9,82%	9,80%
WSEP Exp	9,30%	9,66%	9,74%	WSEP Exp	9,84%	9,74%	9,20%
WSEP Norm	9,46%	9,64%	9,84%	WSEP Norm	10,06%	9,84%	9,26%
Enc-New	12,30%	12,36%	12,48%	Enc-New	12,84%	13,08%	12,58%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	7,66%	6,84%	7,02%	CW	7,48%	7,42%	7,10%
SEP	9,84%	9,82%	10,00%	SEP	9,88%	10,02%	9,90%
WSEP Exp	9,46%	9,78%	9,98%	WSEP Exp	10,02%	9,62%	10,14%
WSEP Norm	9,38%	9,68%	10,08%	WSEP Norm	10,08%	9,62%	10,16%
Enc-New	12,52%	12,60%	12,90%	Enc-New	12,88%	13,46%	13,28%

Notes: CW stands for the Clark and West (2006) test. SEP. stands for Straightforward Excess Profitability test by Pincheira et al. (2022). WSEP Exp and Norm is Weighted Straightforward Excess Profitability test and Enc-New stands for Clark and McCracken (2001). T+1 is the total number of observations, R/(T+1) represents the proportion used to define the initial estimation window. All results computed in 5000 replications.

Table 2. Empirical size DGP2 (Nominal size of 10%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	7,68%	5,68%	5,72%	CW	5,98%	5,42%	5,32%
SEP	10,16%	9,12%	9,28%	SEP	10,62%	10,16%	9,70%
WSEP Exp	10,16%	9,94%	9,44%	WSEP Exp	10,22%	10,22%	9,58%
WSEP Norm	10,08%	9,90%	9,40%	WSEP Norm	10,12%	10,22%	9,44%
Enc-New	9,58%	8,54%	8,86%	Enc-New	9,70%	9,96%	10,16%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	6,44%	5,66%	5,88%	CW	6,70%	6,08%	5,56%
SEP	10,34%	10,32%	10,20%	SEP	9,82%	10,22%	9,86%
WSEP Exp	10,52%	9,92%	10,54%	WSEP Exp	10,02%	10,04%	10,12%
WSEP Norm	10,50%	10,08%	10,54%	WSEP Norm	9,90%	9,92%	10,06%
Enc-New	9,30%	9,72%	10,00%	Enc-New	10,04%	10,24%	10,00%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	8,86%	6,78%	6,86%	CW	7,22%	7,62%	6,60%
SEP	11,30%	10,24%	10,42%	SEP	9,88%	10,00%	10,10%
WSEP Exp	10,84%	10,16%	10,78%	WSEP Exp	10,10%	10,42%	10,26%
WSEP Norm	10,92%	10,02%	11,12%	WSEP Norm	10,04%	10,70%	10,30%
Enc-New	10,34%	9,82%	10,02%	Enc-New	10,14%	10,06%	10,12%

Notes: See notes of *Table 1*

Table 3. Empirical size DGP3 (Nominal size of 10%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	7,12%	6,30%	5,70%	CW	6,18%	5,18%	5,14%
SEP	9,78%	10,66%	10,50%	SEP	9,54%	9,54%	9,46%
WSEP Exp	9,80%	10,04%	10,48%	WSEP Exp	9,80%	9,24%	9,76%
WSEP Norm	9,80%	10,18%	10,22%	WSEP Norm	10,04%	9,12%	9,74%
Enc-New	9,48%	9,20%	9,20%	Enc-New	10,14%	9,26%	9,34%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	7,28%	5,40%	5,86%	CW	6,48%	6,04%	5,74%
SEP	10,08%	10,00%	10,08%	SEP	9,46%	10,06%	9,28%
WSEP Exp	10,26%	9,10%	10,08%	WSEP Exp	10,12%	9,58%	9,02%
WSEP Norm	10,32%	9,06%	10,08%	WSEP Norm	9,90%	9,66%	9,08%
Enc-New	10,36%	9,28%	9,78%	Enc-New	10,32%	9,70%	9,66%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	8,80%	6,44%	6,22%	CW	8,12%	6,98%	6,50%
SEP	10,52%	10,24%	9,84%	SEP	10,64%	10,06%	10,16%
WSEP Exp	10,72%	9,72%	9,76%	WSEP Exp	10,74%	9,90%	9,66%
WSEP Norm	10,82%	9,76%	9,62%	WSEP Norm	10,74%	9,94%	9,82%
Enc-New	10,70%	9,18%	9,44%	Enc-New	10,66%	10,44%	9,68%

Notes: See notes of *Table 1*

Table 4. Empirical size DGP4 (Nominal size of 10%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	8,54%	7,54%	7,38%	CW	8,72%	6,76%	6,62%
SEP	10,22%	9,92%	9,92%	SEP	10,00%	9,64%	10,12%
WSEP Exp	10,62%	10,22%	10,02%	WSEP Exp	11,02%	9,82%	10,12%
WSEP Norm	10,42%	10,24%	9,90%	WSEP Norm	11,04%	9,76%	10,14%
Enc-New	19,36%	18,38%	18,84%	Enc-New	19,54%	18,08%	17,72%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	8,58%	7,40%	6,48%	CW	9,22%	7,58%	7,22%
SEP	10,86%	9,80%	9,34%	SEP	10,02%	10,30%	9,92%
WSEP Exp	10,76%	9,78%	9,30%	WSEP Exp	10,82%	10,44%	9,60%
WSEP Norm	10,60%	9,82%	9,44%	WSEP Norm	10,90%	10,38%	9,68%
Enc-New	19,86%	18,38%	17,90%	Enc-New	20,50%	18,46%	17,24%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	10,78%	8,30%	7,52%	CW	10,14%	8,94%	7,66%
SEP	10,70%	9,58%	9,96%	SEP	10,08%	10,04%	10,58%
WSEP Exp	11,50%	10,40%	10,04%	WSEP Exp	10,76%	10,10%	10,20%
WSEP Norm	11,70%	10,56%	10,16%	WSEP Norm	11,10%	10,32%	10,42%
Enc-New	20,78%	17,42%	18,06%	Enc-New	20,80%	17,80%	17,34%

Notes: See notes of *Table 1*

Table 5. Empirical size DGP5 (Nominal size of 10%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	9,28%	7,88%	8,00%	CW	8,10%	7,84%	7,00%
SEP	10,46%	9,86%	9,94%	SEP	10,14%	10,30%	9,96%
WSEP Exp	11,06%	9,90%	9,92%	WSEP Exp	10,08%	10,32%	9,56%
WSEP Norm	11,04%	9,88%	9,94%	WSEP Norm	10,08%	10,18%	9,60%
Enc-New	17,64%	21,60%	25,80%	Enc-New	17,60%	21,84%	24,82%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	8,88%	7,90%	7,80%	CW	9,12%	8,04%	7,86%
SEP	10,58%	10,42%	9,42%	SEP	10,90%	10,30%	9,56%
WSEP Exp	10,76%	10,34%	9,98%	WSEP Exp	10,80%	9,98%	9,98%
WSEP Norm	10,86%	10,26%	9,94%	WSEP Norm	10,88%	10,00%	9,92%
Enc-New	18,04%	20,26%	24,90%	Enc-New	18,52%	21,14%	25,46%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	9,78%	9,00%	8,70%	CW	10,54%	8,58%	8,90%
SEP	10,42%	10,64%	9,46%	SEP	10,92%	9,64%	9,56%
WSEP Exp	10,56%	10,10%	10,14%	WSEP Exp	11,92%	9,38%	10,08%
WSEP Norm	10,74%	10,06%	9,96%	WSEP Norm	11,92%	9,42%	10,02%
Enc-New	18,80%	20,84%	25,40%	Enc-New	19,16%	21,22%	26,72%

Notes: See notes of *Table 1*

In terms of power, ENC-New clearly overcomes the other tests in terms of statistical power in homoscedastic DGP's. In the heteroskedastic scenarios this test is greatly oversized, thus his power is irrelevant. Regardless of this, we include ENC-New in the power tables for heteroskedastic cases. Pincheira et al. (2022) elucidated that, within the exclusive domain of homoscedastic environments, CW exhibits a pronounced dominance over SEP in most cases. However, in heteroskedastic settings, a discernible shift occurs, wherein SEP asserts its superiority over CW in most instances. As for WSEP Exp and WSEP Norm, in homoscedastic scenarios, these statistical measures not only prove to be highly competitive with CW, but also demonstrate a definitive superiority over SEP. Nevertheless, the introduction of heteroskedasticity precipitates a scenario wherein both CW and SEP find themselves trailing. In summary, WSEP Exp and WSEP Norm consistently overcome their normal distributed under the null counterparts across all DGP's, while CW and SEP engage in a competitive interplay, contingent upon the nuanced configuration of conditional variance. ENC-New seems to be a good alternative in homoscedastic situations, except for its complexity in terms of finding its critical values.

Table *6.* Raw Power DGP 1 (Nominal size of 10%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	19,02%	41,82%	90,52%	CW	22,08%	51,12%	94,84%
SEP	20,56%	40,28%	85,82%	SEP	23,94%	49,42%	89,76%
WSEP Exp	21,64%	44,32%	90,96%	WSEP Exp	27,24%	57,46%	95,74%
WSEP Norm	21,90%	44,88%	91,08%	WSEP Norm	27,70%	57,84%	95,76%
Enc-New	27,90%	54,02%	95,10%	Enc-New	33,70%	66,52%	97,96%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	19,78%	40,92%	88,06%	CW	21,08%	45,56%	89,48%
SEP	21,98%	39,40%	80,48%	SEP	22,52%	42,64%	80,50%
WSEP Exp	24,10%	46,68%	90,22%	WSEP Exp	25,36%	49,44%	90,38%
WSEP Norm	24,24%	46,88%	90,32%	WSEP Norm	25,46%	49,90%	90,44%
Enc-New	31,64%	58,74%	95,50%	Enc-New	34,02%	64,94%	97,48%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	18,40%	32,46%	71,08%	CW	18,88%	33,60%	71,16%
SEP	19,20%	30,26%	59,98%	SEP	18,68%	31,24%	60,22%
WSEP Exp	20,98%	35,60%	72,04%	WSEP Exp	20,70%	36,16%	71,52%
WSEP Norm	21,10%	35,78%	72,22%	WSEP Norm	20,88%	36,38%	72,00%
Enc-New	30,22%	54,66%	91,22%	Enc-New	32,04%	57,16%	92,72%

Notes: See notes of *Table 1*

Table 7. Raw Power DGP 2 (Nominal size of 10%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	26,48%	59,76%	98,18%	CW	32,88%	71,80%	99,52%
SEP	29,04%	57,12%	95,76%	SEP	35,04%	67,80%	97,80%
WSEP Exp	31,84%	63,40%	98,16%	WSEP Exp	39,50%	76,70%	99,64%
WSEP Norm	31,64%	63,30%	98,18%	WSEP Norm	39,58%	77,00%	99,64%
Enc-New	33,32%	67,00%	99,14%	Enc-New	41,98%	80,32%	99,74%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	26,80%	57,16%	96,34%	CW	29,60%	63,78%	97,28%
SEP	30,56%	55,36%	92,50%	SEP	30,78%	59,04%	92,26%
WSEP Exp	33,48%	64,62%	97,60%	WSEP Exp	34,98%	67,70%	97,40%
WSEP Norm	33,80%	64,84%	97,64%	WSEP Norm	35,22%	67,88%	97,54%
Enc-New	37,62%	70,54%	98,94%	Enc-New	40,58%	79,02%	99,58%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	22,40%	43,30%	83,42%	CW	24,02%	46,38%	85,76%
SEP	25,26%	40,18%	74,16%	SEP	25,86%	42,46%	74,98%
WSEP Exp	26,48%	46,60%	84,02%	WSEP Exp	27,38%	49,38%	86,06%
WSEP Norm	26,36%	47,06%	84,52%	WSEP Norm	27,14%	49,62%	86,22%
Enc-New	33,04%	64,32%	96,26%	Enc-New	35,26%	68,48%	97,58%

Notes: See notes of *Table 1*

Table 8. Raw Power DGP 3 (Nominal size of 10%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	31,58%	69,92%	99,46%	CW	37,64%	79,38%	99,82%
SEP	30,44%	64,56%	98,74%	SEP	37,02%	74,08%	98,96%
WSEP Exp	35,66%	72,90%	99,70%	WSEP Exp	45,36%	84,36%	99,90%
WSEP Norm	35,76%	73,18%	99,72%	WSEP Norm	45,68%	84,68%	99,90%
Enc-New	36,76%	76,28%	99,78%	Enc-New	47,58%	87,40%	99,98%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	30,48%	65,42%	98,60%	CW	33,50%	71,20%	98,52%
SEP	32,02%	60,80%	95,98%	SEP	32,44%	63,70%	94,76%
WSEP Exp	38,50%	72,68%	99,08%	WSEP Exp	38,86%	74,86%	98,60%
WSEP Norm	38,64%	73,26%	99,12%	WSEP Norm	39,32%	75,52%	98,62%
Enc-New	42,52%	79,18%	99,72%	Enc-New	46,88%	86,18%	99,90%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	26,94%	51,50%	90,32%	CW	25,96%	51,74%	89,92%
SEP	25,66%	44,56%	80,84%	SEP	25,32%	44,28%	79,36%
WSEP Exp	30,32%	54,60%	90,42%	WSEP Exp	29,32%	54,26%	89,60%
WSEP Norm	30,56%	55,04%	90,66%	WSEP Norm	29,40%	54,48%	89,82%
Enc-New	40,84%	74,80%	98,62%	Enc-New	41,72%	78,48%	98,90%

Notes: See notes of *Table 1*

Table 9. Raw Power DGP 4 (Nominal size of 10%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	7,46%	8,44%	16,34%	CW	8,54%	10,70%	20,24%
SEP	9,32%	9,98%	16,78%	SEP	9,98%	12,18%	21,02%
WSEP Exp	9,12%	10,38%	18,98%	WSEP Exp	10,90%	13,48%	25,04%
WSEP Norm	9,18%	10,52%	19,24%	WSEP Norm	10,98%	13,70%	25,22%
Enc-New	17,12%	19,70%	31,88%	Enc-New	19,06%	23,06%	37,76%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	9,36%	10,14%	17,70%	CW	9,86%	11,52%	19,88%
SEP	9,64%	10,92%	18,44%	SEP	8,96%	11,36%	19,44%
WSEP Exp	11,00%	11,98%	21,42%	WSEP Exp	11,28%	13,74%	22,82%
WSEP Norm	11,06%	12,24%	21,76%	WSEP Norm	11,54%	13,52%	22,92%
Enc-New	19,96%	22,52%	35,10%	Enc-New	19,80%	24,50%	37,68%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	10,24%	12,08%	17,50%	CW	10,76%	13,84%	18,56%
SEP	9,80%	10,72%	15,10%	SEP	9,68%	11,24%	15,24%
WSEP Exp	10,78%	12,52%	17,88%	WSEP Exp	11,22%	14,00%	19,18%
WSEP Norm	11,34%	12,46%	18,24%	WSEP Norm	11,30%	14,14%	19,38%
Enc-New	20,64%	23,10%	35,62%	Enc-New	20,58%	25,18%	36,84%

Notes: See notes of *Table 1*

Table 10. Raw Power DGP 5 (Nominal size of 10%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	24,14%	48,34%	83,74%	CW	32,30%	61,26%	90,18%
SEP	25,50%	51,92%	93,32%	SEP	33,02%	66,18%	96,74%
WSEP Exp	27,78%	56,06%	93,86%	WSEP Exp	37,68%	70,58%	96,50%
WSEP Norm	27,82%	56,24%	94,00%	WSEP Norm	37,40%	70,54%	96,52%
Enc-New	36,14%	67,72%	94,04%	Enc-New	49,80%	79,46%	97,08%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	27,84%	52,64%	85,86%	CW	31,26%	57,10%	88,48%
SEP	27,18%	54,00%	92,68%	SEP	30,04%	57,80%	94,40%
WSEP Exp	31,08%	59,70%	93,78%	WSEP Exp	34,20%	63,72%	95,18%
WSEP Norm	30,98%	59,54%	93,94%	WSEP Norm	34,06%	63,98%	95,20%
Enc-New	43,14%	73,82%	95,24%	Enc-New	50,44%	79,50%	96,90%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	25,80%	47,16%	79,70%	CW	26,58%	48,00%	79,74%
SEP	22,84%	43,34%	82,98%	SEP	24,36%	44,02%	82,90%
WSEP Exp	27,02%	49,52%	86,68%	WSEP Exp	27,22%	50,54%	86,84%
WSEP Norm	26,92%	49,42%	86,70%	WSEP Norm	27,30%	50,40%	86,82%
Enc-New	44,34%	73,34%	94,96%	Enc-New	48,00%	75,08%	95,52%

Notes: See notes of *Table 1*

We also show in Table 11 returns and Sharpe ratios for the SEP and WSEP in both normal folded and exponential distribution for DGP 5 using rolling windows for $\lambda = 1$. Note that although returns are lower for WSEP, in terms of Sharpe ratio are better than the SEP case, this means, our trading strategy gives better risk adjusted returns. Sharpe ratios are computed as:

$$S_i = \frac{A_i - r_f}{sd(A_i)}$$

Where $r_f = 0$, $A_i = \{A_{SEP}, A_{WSEP}\}$, and A_{WSEP} computed with normal folded and exponential distributions. Is interesting to notice that power is intimately related to the Sharpe ratio, generating better power for the trading strategy with bigger Sharpe ratios. This is intuitive as:

$$S_i = \frac{A_i}{sd(A_i)}$$

And as long as $E[A_i] = 0$ as theory indicates:

$$\sqrt{P^{-1}}WSEP = S_{SEP} = \frac{A_{WSEP}}{sd(A_{WSEP})}$$

And the same for:

$$\sqrt{P^{-1}}SEP = S_{SEP} = \frac{A_{SEP}}{sd(A_{SEP})}$$

The relationship is evident.

Table 11. DGP 5 returns and Sharpe ratios under rolling windows, $\lambda = 1$

Returns				Sharpe			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
SEP	0,08%	0,12%	0,17%	SEP	6,14%	8,90%	11,84%
WSEP Exp	0,05%	0,09%	0,12%	WSEP Exp	6,82%	9,72%	12,64%
WSEP Norm	0,06%	0,09%	0,13%	WSEP Norm	6,83%	9,74%	12,66%
		R/(T+1)=0.5				R/(T+1)=0.5	
SEP	0,10%	0,15%	0,19%	SEP	8,45%	11,06%	13,45%
WSEP Exp	0,07%	0,10%	0,13%	WSEP Exp	9,56%	12,23%	14,39%
WSEP Norm	0,08%	0,11%	0,14%	WSEP Norm	9,58%	12,22%	14,41%
		R/(T+1)=0.75				R/(T+1)=0.75	
SEP	0,12%	0,17%	0,20%	SEP	10,12%	12,69%	14,47%
WSEP Exp	0,08%	0,12%	0,14%	WSEP Exp	11,87%	14,28%	15,71%
WSEP Norm	0,09%	0,12%	0,15%	WSEP Norm	11,92%	14,28%	15,72%

Notes: See notes of *Table 1*

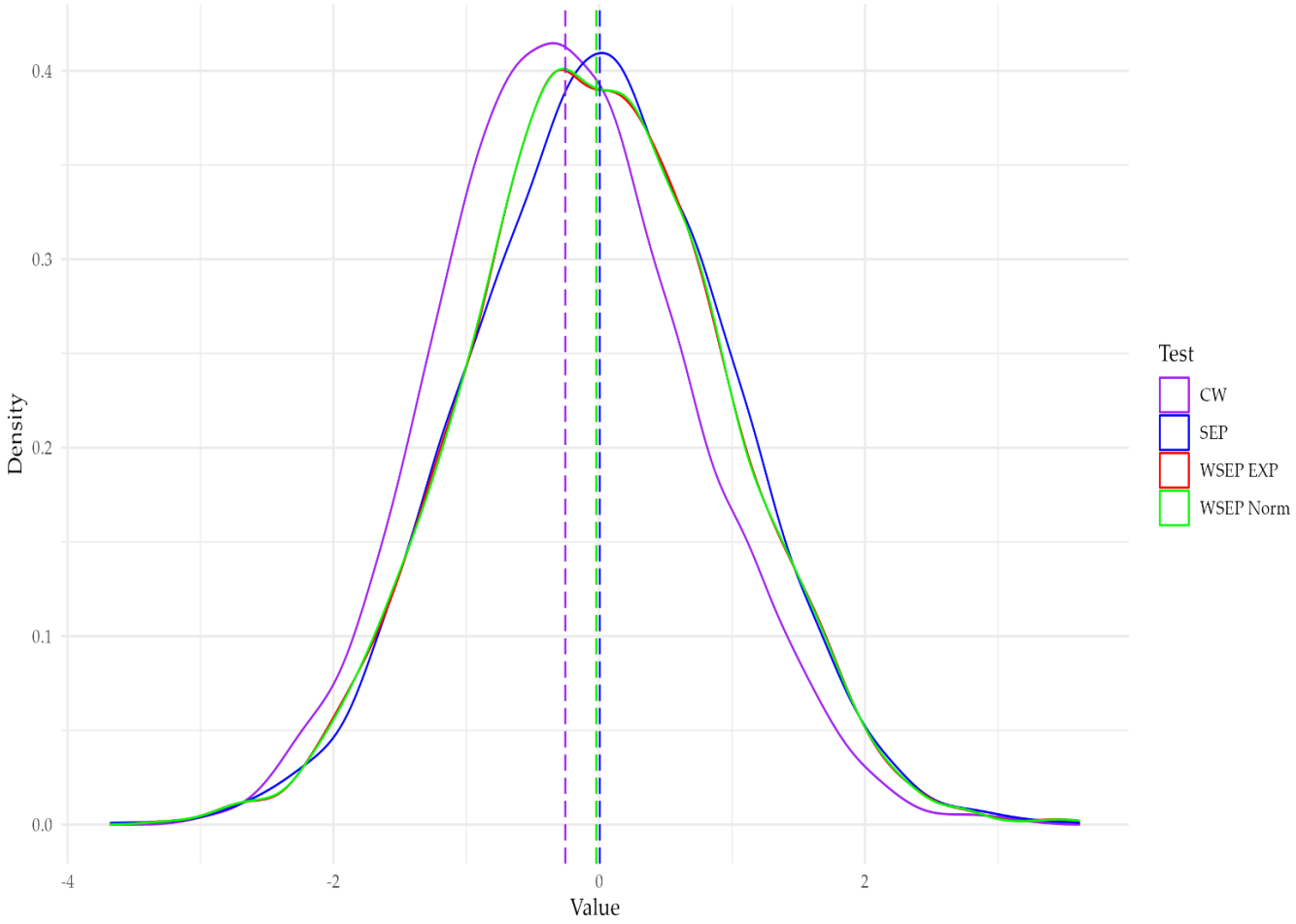
4.7. Random Forest

Random forest forecasts exhibit a favorable behavior in our assessments, considering both homoscedastic (DGP 1) and heteroskedastic (DGP 5) scenarios. ENC-New is omitted due to its limited applicability to ordinary least squares. Tables 12 and 13 present the size results for DGP 1 and DGP 5, respectively, under rolling and recursive window schemes with λ=1 at 10% significance. Additionally, Tables 14 and 15 display the power under the same conditions for DGP 1 and DGP 5.

It is noteworthy that the CW size approaches the nominal size more closely, demonstrating being less undersized compared to the OLS cases. This holds true independently of the unconditional variance setting. Across DGP 1, the mean size for CW, SEP, and both exponential and normal WSEP under rolling (recursive) schemes are 9.9% (9.9%), 10.1% (10.2%), and 10.2% (10.2%), respectively. For DGP 5, these values are 10.1% (10.2%), 10.1% (10.2%), and 10.1% (10.4%). These results indicate the robust behavior of all tests in both settings. It is worth noting that unlike for OLS, CW shows a correct size, an interesting result that suggest more research to assess how distributions of predictability test can change when different methods are applied.

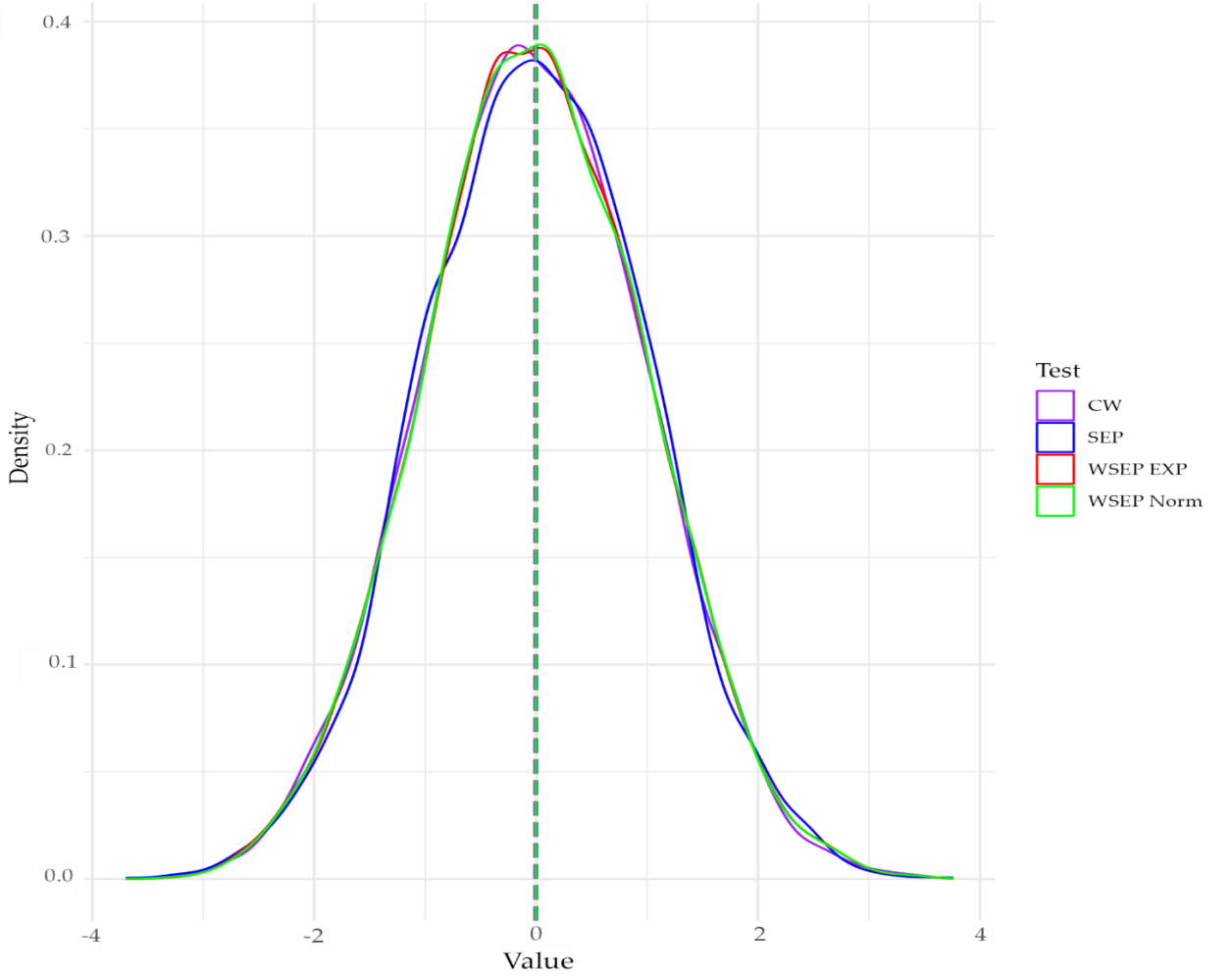
Figure 1 and Figure 2 shows the tests distribution for random forest and OLS respectively. It is evident the movement of the distribution for CW, centering in 0 when random forest is applied. Remarkably, SEP and both versions of WSEP stays centered in 0 no matter the method is used to produce forecasts.

Figure 1. Kernel Density Plot of Test using OLS, DGP 1



Notes: Dashed lines represent mean values of each test. CW stands for the Clark and West (2006) test. SEP. stands for Straightforward Excess Profitability test by Pincheira et al. (2022). WSEP Exp and Norm are both versions of Weighted Straightforward Excess Profitability test. DGP 1, rolling windows, R=300, R/T+1=0.5 $\lambda = 1$. Estimation via Random Forest.

Figure 2. Kernel Density Plot of Tests using Random Forest, DGP 1



Notes: Dashed lines represent mean values of each test. CW stands for the Clark and West (2006) test. SEP. stands for Straightforward Excess Profitability test by Pincheira et al. (2022). WSEP Exp and Norm are both versions of Weighted Straightforward Excess Profitability test. DGP 1, rolling windows, R=300, R/T+1=0.5, $\lambda = 1$. Estimation via OLS.

Regarding power, all tests exhibit a reduction relative to linear models, a consequence of the misspecification arising from employing a random forest for a linear DGP. However, the tests consistently maintain their relative results, albeit with a slight decrease. In homoscedastic scenarios, the CW and WSEP tests (both Exponential and Normal variants) overcome, with the SEP test lagging behind. There is a more intense competition within CW and WSEP, where WSEP demonstrates superior power in recursive schemes and mixed results in rolling schemes.

Similarly, under heteroskedastic conditions, the SEP test and both variants of the WSEP tests prove

superior, leaving CW far behind. However, the SEP test outperform WSEP tests when the number of observations reaches 1000. One plausible explanation for these phenomena could be that our test demonstrates reduced power in the presence of misspecification. This might stem from the possibility that forecast magnitudes are not inherently linked to improved predictability. Consequently, the assigned weights may not effectively mitigate variance and instead result in only a decrease in mean returns. While this aspect has not been explicitly tested, it presents an intriguing avenue for investigation in future research.

Table 12. Empirical size DGP 1 with random forest estimation (Nominal size of 10%, $\lambda = 1$)

Rolling				**Recursive**			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	10,50%	10,06%	9,32%	CW	9,26%	9,56%	9,94%
SEP	11,02%	9,96%	9,02%	SEP	10,28%	9,90%	10,60%
WSEP Exp	10,92%	10,44%	9,46%	WSEP Exp	9,46%	10,06%	10,38%
WSEP Norm	10,80%	10,38%	9,56%	WSEP Norm	9,50%	10,08%	10,40%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	10,46%	9,78%	9,74%	CW	9,38%	9,76%	9,98%
SEP	10,56%	9,90%	10,02%	SEP	10,30%	9,42%	10,38%
WSEP Exp	10,32%	10,58%	9,88%	WSEP Exp	10,08%	9,70%	10,92%
WSEP Norm	10,32%	10,48%	9,82%	WSEP Norm	10,00%	9,70%	11,04%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	10,00%	9,64%	9,82%	CW	10,66%	10,42%	9,78%
SEP	10,04%	9,80%	10,26%	SEP	10,88%	10,02%	9,90%
WSEP Exp	10,04%	10,20%	10,18%	WSEP Exp	10,80%	10,28%	10,20%
WSEP Norm	10,10%	9,96%	10,14%	WSEP Norm	10,80%	10,18%	10,14%

Notes: See notes of *Table 1*

Table 13. Empirical size DGP 5 with random forest estimation (Nominal size of 10%, $\lambda = 1$)

Rolling				**Recursive**			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	10,18%	10,30%	9,96%	CW	10,14%	9,74%	9,84%
SEP	10,26%	10,16%	10,36%	SEP	10,06%	10,40%	10,28%
WSEP Exp	10,22%	9,98%	10,10%	WSEP Exp	10,16%	10,44%	10,12%
WSEP Norm	10,08%	10,42%	9,96%	WSEP Norm	10,18%	10,48%	10,16%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	10,38%	9,26%	9,46%	CW	10,76%	10,08%	10,14%
SEP	10,46%	9,30%	9,60%	SEP	10,46%	10,28%	9,62%
WSEP Exp	10,10%	9,28%	10,14%	WSEP Exp	10,90%	10,30%	10,04%
WSEP Norm	10,14%	9,38%	10,24%	WSEP Norm	11,00%	10,38%	10,02%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	10,48%	9,76%	11,08%	CW	10,74%	10,34%	10,28%
SEP	10,16%	10,28%	10,18%	SEP	10,42%	10,52%	9,82%
WSEP Exp	10,42%	9,80%	10,74%	WSEP Exp	10,80%	10,38%	10,26%
WSEP Norm	10,56%	9,78%	10,72%	WSEP Norm	10,76%	10,56%	10,28%

Notes: See notes of *Table 1*

Table 14. Raw power DGP 1 with random forest estimation (Nominal size of 10%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	14,42%	19,62%	34,60%	CW	14,42%	19,08%	49,44%
SEP	14,20%	17,52%	28,80%	SEP	13,84%	18,06%	44,02%
WSEP Exp	14,56%	19,10%	33,92%	WSEP Exp	14,74%	19,90%	51,86%
WSEP Norm	14,50%	19,42%	34,18%	WSEP Norm	14,82%	19,92%	51,80%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	12,36%	18,04%	39,02%	CW	14,18%	17,80%	46,76%
SEP	12,76%	17,02%	33,52%	SEP	13,10%	16,40%	40,90%
WSEP Exp	12,68%	18,26%	39,54%	WSEP Exp	14,22%	17,96%	48,86%
WSEP Norm	12,74%	18,18%	39,22%	WSEP Norm	14,20%	18,16%	48,64%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	12,98%	15,76%	33,92%	CW	12,62%	16,48%	35,94%
SEP	12,54%	15,66%	29,52%	SEP	12,14%	15,30%	30,90%
WSEP Exp	12,96%	16,06%	33,70%	WSEP Exp	12,70%	16,22%	36,56%
WSEP Norm	13,08%	16,00%	33,44%	WSEP Norm	12,58%	16,18%	36,54%

Notes: See notes of *Table 1*

Table 15. Raw power DGP 5 with random forest estimation (Nominal size of 10%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	20,22%	33,42%	59,22%	CW	23,04%	37,82%	66,06%
SEP	19,68%	33,98%	71,12%	SEP	21,48%	39,64%	88,26%
WSEP Exp	21,38%	37,26%	72,80%	WSEP Exp	24,00%	42,60%	83,66%
WSEP Norm	21,26%	37,24%	72,50%	WSEP Norm	23,88%	42,32%	83,00%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	21,38%	32,88%	59,62%	CW	21,32%	36,10%	61,76%
SEP	20,26%	31,68%	75,96%	SEP	20,02%	35,78%	83,14%
WSEP Exp	21,76%	35,80%	72,88%	WSEP Exp	22,14%	39,40%	79,26%
WSEP Norm	21,72%	35,70%	72,48%	WSEP Norm	22,22%	39,06%	78,54%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	18,46%	27,72%	51,92%	CW	17,82%	30,38%	53,42%
SEP	17,84%	26,30%	65,42%	SEP	16,66%	28,42%	68,26%
WSEP Exp	18,62%	28,60%	64,32%	WSEP Exp	17,76%	32,16%	66,10%
WSEP Norm	18,50%	28,42%	63,28%	WSEP Norm	17,76%	32,14%	65,40%

Notes: See notes of *Table 1*

5. Empirical application

Now, we present an empirical application based on the present value approach of asset pricing in the context of commodity currencies. Specifically, the selected commodities are Copper, Brent oil, WTI oil, nickel, aluminum, zinc, lead, tin and the LMEX index, and for currencies, we selected the Chilean peso (CLP), Canadian dollar (CAD), Australian dollar (AUD), New Zealand dollar (NZD), Norwegian krone

(NOK), South African rand (ZAR) and Icelandic króna (ISK). These are the exchange rates from various commodity-exporter countries. All the data was collected in daily frequency from Bloomberg, and then transformed to monthly data by taking the last day of each month resulting in time series spanning from October 2000 to September 2023.

We evaluate the predictive ability using both versions of WSEP, SEP and CW. Thus, predictive performance of returns by our trading strategy, the SEP trading strategy and in terms of means squared prediction error. We do not include ENC-NEW in this empirical application due to its uncontrolled size in environments of heteroskedasticity, which we evaluate using Breusch and Pagan (1979) test, rejecting the null of homoscedasticity 71% of the times within our dependent and independent variables. Our procedures are like others already made by Chen et al. (2010) and Pincheira and Hardy (2019) in the case of base metal prices and Pincheira et al. (2022) with fuel prices.

The model specification for one step ahead forecasts is the following:

$$\Delta \ln(CP_t) = \beta[\ln(ER_{t-1}) - \ln(ER_{t-3})] + \varepsilon_t$$

Where CP_t is the commodity price, ER_t the exchange rate and $\Delta \ln(x_t) = \ln(x_t) - \ln(x_{t-1})$. Then, our specifications use the lagged bimonthly return as the only predictor. We are testing the null of $\beta = 0$ in our specification. In simple words, testing the random walk hypothesis.

Table A.52 reports the statistic of each test, estimated via OLS with a rolling windows scheme. The initial estimation window is selected using 25% (setting 1) and 50% (setting 2) of the total observations, this is R=69 and 137. Here we set $\lambda = 1$ for the first case and $\lambda = 2$ for the second, thus we have two different versions of this empirical illustration.

Firstly, the poor performance of CW is evident in both settings, this is in line with the simulation results on heteroskedastic environments, in fact, it rejects the null hypothesis only 13 cases against 16 and 17 from WSEP Exp and WSEP Norm and SEP respectively for setting 1 and 13 cases against 21 and 23 from both versions of WSEP and SEP respectively for setting 2 . Also, CW has lower statistics in 67% and 63% of the cases than WSEP EXP and Norm and 66% of the cases for SEP in setting 1 and for setting 2 it has lower statistics in 62% of the cases than WSEP EXP and Norm and 57% of the cases for SEP.

Upon comparing the two versions of WSEP against SEP, a nuanced competition emerges. As aforementioned, WSEP Exp and WSEP Norm rejects the null in one case less and same times in setting one, and 2 time less in setting 2. Nevertheless, the statistics for the exponential and normal versions of WSEP are greater in 54% and 56% of cases in the first setting and 51% and 52% for the second setting, respectively.

A more detailed examination of these findings is available in Table 16 and Table 17 and Figure 3 and Figure 4. Table 16 and Table 17 provides insights into the proportion of test statistics exceeding different critical values from the standard normal distribution. Meanwhile, Figure 3 and Figure 4 complements this analysis with density plots illustrating the distribution of the tests for both settings.

Table 16. Percentage of test statistics exceeding critical values in setting 1

Test	P(X>1.282)	P(X>1.645)	P(X>2.326)
CW	20.6%	12.7%	0.0%
SEP	27.0%	11.1%	1.6%
WSEP Norm	27.0%	14.3%	1.6%
WSEP Exp	25.4%	14.3%	1.6%

Note: 1.282, 1.645, and 2.326 are the usual critical values for 10%, 5%, and 1% significance levels in one-tail testing.

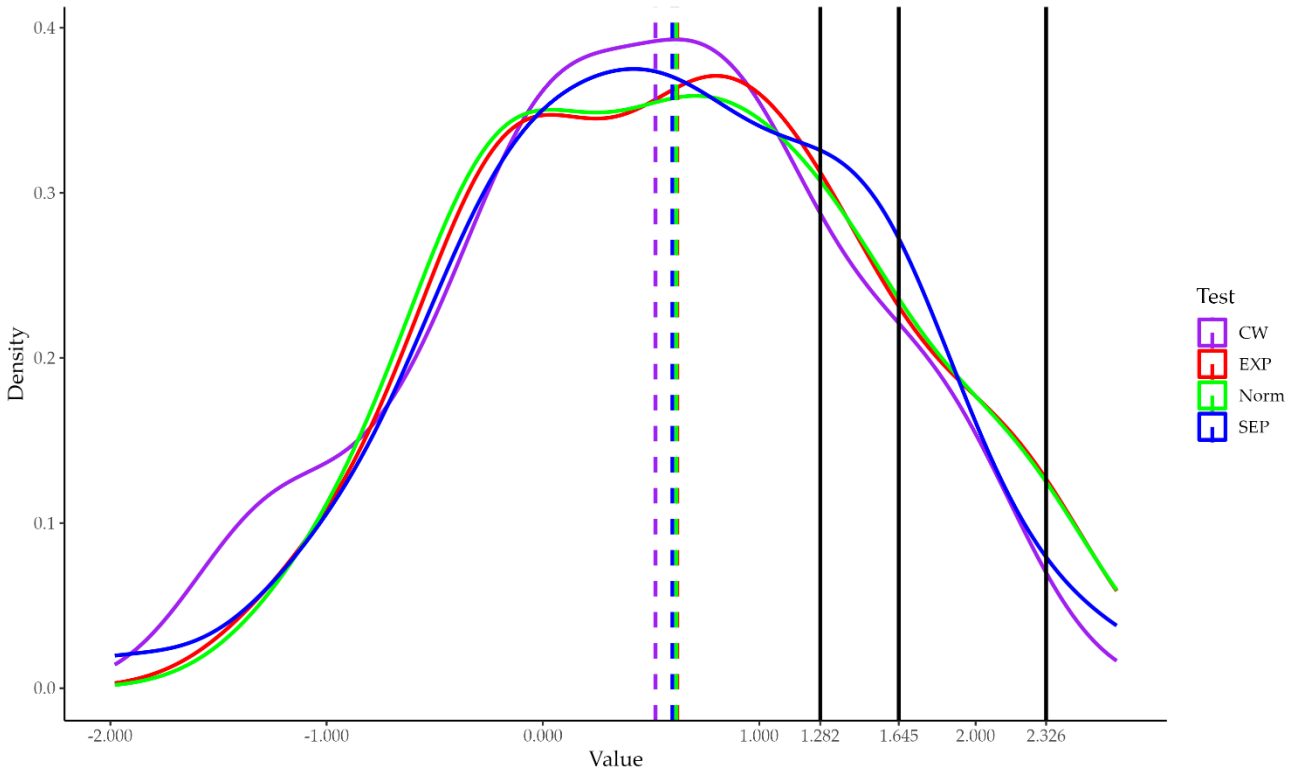
Table 17. Percentage of test statistics exceeding critical values in setting 2

Test	P(X>1.282)	P(X>1.645)	P(X>2.326)
CW	20.6%	7.9%	0.0%
SEP	36.5%	25.4%	6.3%
WSEP Norm	33.3%	22.2%	0.0%
WSEP Exp	33.3%	22.2%	0.0%

Note: See notes of Table 16.

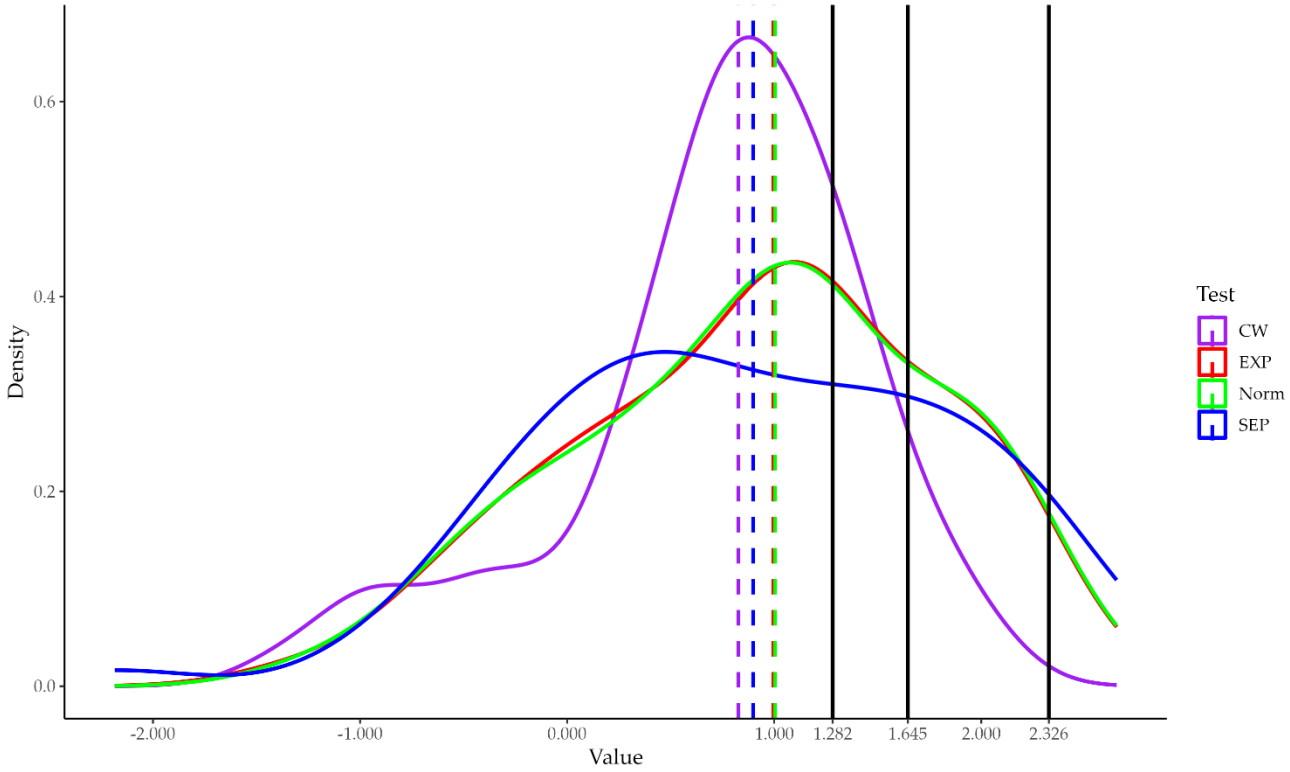
In both tables we observe lower mass for CW against our two versions of our test and SEP. Again, the competition between SEP and WSEP Exp and Norm stands out. Also, the median of each test is 0.621 0.617, 0.598 and 0.520 for WSEP Exp, Norm, SEP, and CW respectively in setting 1 and 1.004 0,995, 0.898 and 0.827 in setting 2, in the same order. Notably, although SEP tests rejects the null more times, the median test statistic is bigger for WSEP versions.

Figure 3. Kernel Density Plot of Test Statistics in Empirical Application with Medians, setting 1.



Notes: Dashed lines represent median values of each test. Solid lines are 10%, 5% and 1% critical values from left to right. CW stands for the Clark and West (2006) test. SEP. stands for Straightforward Excess Profitability test by Pincheira et al. (2022). WSEP Exp and Norm are both versions of Weighted Straightforward Excess Profitability test.

Figure 4. Kernel Density Plot of Test Statistics in Empirical Application with Medians, setting 2.



Notes: See notes of Figure 3

Finally, we present the test statistics for setting 1 and 2 with Chilean peso as a predictor, which shows better predictability in general in both settings. Table 18 illustrate these results, interestingly in this subset CW shows a greater performance against SEP, just behind WSEP Exp and Norm. This is in line with homoscedastic scenarios. Consistently, the heteroskedasticity test does not reject the null in 7 out of 9 commodities with Chilean peso as a predictor.

Rejections in WSEP Exp at 10% are 13 as well as CW, and WSEP Norm rejects the null 14 times, but SEP test only 10 times. Nevertheless, WSEP EXP and Norm, rejects one more time at 5% and at 1% significance, which suggest better power using our proposal.

Consequently, our empirical assessments affirm the superior performance of our proposed tests in contrast to CW and a good but lower result against SEP at least in heteroskedastic environments. Also, we contribute to the commodity-currencies literature with another finding of predictability.

Table 18. Test statistics for setting 1 and 2 with CLP as predictor.

WSEP EXP									
	LMEX	Copper	Brent	WTI	Nickel	Aluminum	Zinc	Lead	Tin
CLP Setting 1	2,128**	2,154**	2,473***	1,373*	0,612	1,234	0,166	1,324*	2,267**
CLP Setting 2	2,305**	2,136**	2,045**	1,848**	2,252**	0,975	0,920	1,317*	1,92**
WSEP Norm									
	LMEX	Copper	Brent	WTI	Nickel	Aluminum	Zinc	Lead	Tin
CLP Setting 1	2,17**	2,187**	2,499***	1,436*	0,640	1,318*	0,246	1,362*	2,298**
CLP Setting 2	2,301**	2,113**	2,046**	1,857**	2,23**	0,996	0,941	1,34*	1,914**
SEP									
	LMEX	Copper	Brent	WTI	Nickel	Aluminum	Zinc	Lead	Tin
CLP Setting 1	1,506*	1,645**	2,185**	0,840	0,640	-0,104	-0,122	0,786	1,769**
CLP Setting 2	1,979**	1,906**	2,255**	1,913**	2,28**	0,327	0,427	1,165	1,876**
CW									
	LMEX	Copper	Brent	WTI	Nickel	Aluminum	Zinc	Lead	Tin
CLP Setting 1	2,005**	2,011**	2,124**	1,672**	0,588	1,546*	-0,106	1,000	1,74**
CLP Setting 2	2,01**	1,303*	1,652**	1,53*	1,224	1,337*	0,710	1,673**	1,48*

6. Summary and discussion.

This paper introduces a simple modification to the test introduced by Anatolyev and Gerko's (2005), and later modified by Pincheira et al. (2022), presenting a more pragmatic trading strategy termed Weighted SEP. The WSEP assigns weights to individual forecasts based on their magnitudes, exhibiting heightened statistical power and superior risk-adjusted profitability in contrast to both SEP and other out-of-sample asymptotically normal benchmark tests, as demonstrated through simulations and empirical applications.

In terms of simulation outcomes, the Monte Carlo experiments with diverse data-generating processes and sample sizes underscore the favorable performance of WSEP. It consistently outperforms SEP and CW in terms of power, while showing correct empirical size across various forecasting methods (OLS and Random Forest), schemes (rolling and recursive windows) and weight distributions (exponential and folded normal). Particularly noteworthy is WSEP's superior power in heteroskedastic environments, a common characteristic of financial time series, and the difference in behavior of CW size when Random Forest is applied, this suggest changes in the tests distributions when other methods are used.

This is a very important feature as the search for powerful tests can help us to get us closer to a better answer about the random walk hypothesis and in a more pragmatic context to correctly evaluate quality of forecasts in different scenarios and industries.

Turning to empirical applications, our paper focuses on predicting commodity prices using exchange rates from different currencies linked to commodities. Employing monthly data spanning October

2000 to September 2023 from Bloomberg, the results reveal heightened predictability in returns using both versions of WSEP compared to CW. A competitive landscape emerges among WSEP and SEP, hinting at a condition of conditional heteroskedasticity.

While acknowledging limitations, this paper suggests avenues for future research. Specifically, proposing a criterion to choose an optimal lambda depending on the specific scenario could enhance power gains. Also, due to the popularity of new machine learning techniques, evaluating tests for predictability with these methods becomes important to avoid unexpected results.

Finally, exploring different data frequencies (daily or hourly) and conducting forecasts for multiple steps ahead could offer a more comprehensive perspective. Additionally, expanding empirical analyses to encompass various financial assets (stocks, bonds, currencies) would provide further evidence of predictability in different scenarios.

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Appendix

Table A.1. Estimated parameters for DGP 5.

Mean model				
Parameter	**Value**	**Std Error**	**t value**	**p value**
δ	0.001658	0.000606	2.73789	0.006184
ρ_1	-0.020158	0.101225	-0.19914	0.842155
ρ_2	-0.17593	0.08358	-2.10493	0.035298
Variance model				
η	0.000018	0.000008	2.13138	0.033058
α	0.254952	0.136322	1.87022	0.061454
β	0.66429	0.139962	4.74622	0.000002
v	6.308608	2.826318	2.2321	0.025609

Notes: Standard errors according to White (1982).

Table A.2. Empirical size DGP1 (Nominal size of 5%, $\lambda = 1$)

Rolling				**Recursive**			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	3,32%	3,08%	3,04%	CW	2,98%	2,70%	2,50%
SEP	5,34%	4,44%	4,92%	SEP	4,80%	4,84%	4,34%
WSEP Exp	4,70%	4,48%	4,76%	WSEP Exp	4,86%	4,72%	4,38%
WSEP Norm	4,58%	4,42%	4,68%	WSEP Norm	4,80%	4,64%	4,50%
Enc-New	6,80%	6,42%	6,84%	Enc-New	6,80%	6,50%	6,54%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	2,62%	2,78%	2,86%	CW	3,42%	3,00%	3,02%
SEP	4,54%	4,68%	5,00%	SEP	4,60%	5,22%	5,12%
WSEP Exp	4,26%	4,62%	4,90%	WSEP Exp	4,50%	4,90%	5,12%
WSEP Norm	4,24%	4,62%	4,86%	WSEP Norm	4,70%	4,96%	5,14%
Enc-New	6,58%	6,68%	6,96%	Enc-New	7,22%	7,62%	6,76%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	3,64%	3,34%	3,26%	CW	3,72%	3,58%	3,20%
SEP	4,96%	4,96%	4,72%	SEP	4,74%	5,14%	4,92%
WSEP Exp	4,58%	4,40%	5,06%	WSEP Exp	4,54%	4,92%	4,90%
WSEP Norm	4,62%	4,50%	5,12%	WSEP Norm	4,62%	4,94%	5,00%
Enc-New	7,56%	7,26%	7,34%	Enc-New	7,58%	7,86%	7,18%

Notes: CW stands for the Clark and West (2006) test. SEP. stands for Straightforward Excess Profitability test by Pincheira et al. (2022). WSEP Exp and Norm is Weighted Straightforward Excess Profitability test and Enc-New stands for Clark and McCracken (2001). T+1 is the total number of observations, R/(T+1) represents the proportion used to define the initial estimation window. All results computed in 5000 replications.

Table A.3. Empirical size DGP1 (Nominal size of 1%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	0,44%	0,50%	0,44%	CW	0,46%	0,38%	0,52%
SEP	0,84%	0,92%	0,82%	SEP	0,88%	1,14%	0,98%
WSEP Exp	0,76%	0,82%	0,84%	WSEP Exp	0,76%	0,90%	0,96%
WSEP Norm	0,74%	0,86%	0,80%	WSEP Norm	0,78%	0,90%	0,90%
Enc-New	1,34%	1,64%	1,92%	Enc-New	1,44%	1,32%	1,48%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	0,42%	0,44%	0,60%	CW	0,46%	0,56%	0,48%
SEP	0,76%	0,84%	0,96%	SEP	0,82%	1,00%	0,86%
WSEP Exp	0,68%	0,84%	0,98%	WSEP Exp	0,82%	0,86%	0,88%
WSEP Norm	0,66%	0,80%	0,98%	WSEP Norm	0,80%	0,88%	0,90%
Enc-New	1,58%	1,80%	1,86%	Enc-New	1,82%	1,78%	1,66%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	0,46%	0,56%	0,52%	CW	0,52%	0,52%	0,66%
SEP	0,68%	0,94%	1,02%	SEP	0,72%	1,02%	1,06%
WSEP Exp	0,76%	0,80%	1,16%	WSEP Exp	0,72%	0,76%	0,86%
WSEP Norm	0,70%	0,78%	1,14%	WSEP Norm	0,68%	0,76%	0,90%
Enc-New	1,94%	1,78%	1,92%	Enc-New	2,24%	2,04%	1,96%

Notes: See notes of Table A.1.

Table A.4. Empirical size DGP1 (Nominal size of 10%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	7,18%	6,02%	6,24%	CW	6,50%	5,64%	5,66%
SEP	10,34%	10,06%	10,08%	SEP	9,54%	10,06%	9,26%
WSEP Exp	10,56%	9,34%	9,74%	WSEP Exp	9,62%	9,70%	9,60%
WSEP Norm	10,58%	9,40%	9,94%	WSEP Norm	9,62%	9,78%	9,52%
Enc-New	12,76%	11,54%	12,70%	Enc-New	12,24%	12,50%	12,22%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	6,58%	6,04%	6,06%	CW	6,96%	7,02%	6,06%
SEP	9,58%	9,58%	10,50%	SEP	10,04%	9,82%	9,80%
WSEP Exp	9,48%	9,64%	9,86%	WSEP Exp	9,72%	9,70%	9,34%
WSEP Norm	9,52%	9,60%	10,16%	WSEP Norm	9,76%	9,86%	9,40%
Enc-New	12,30%	12,36%	12,48%	Enc-New	12,84%	13,08%	12,58%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	7,66%	6,84%	7,02%	CW	7,48%	7,42%	7,10%
SEP	9,84%	9,82%	10,00%	SEP	9,88%	10,02%	9,90%
WSEP Exp	9,52%	9,76%	9,70%	WSEP Exp	10,10%	9,72%	10,06%
WSEP Norm	9,64%	9,94%	9,78%	WSEP Norm	10,08%	9,76%	9,90%
Enc-New	12,52%	12,60%	12,90%	Enc-New	12,88%	13,46%	13,28%

Notes: See notes of Table A.1.

Table A.5. Empirical size DGP1 (Nominal size of 5%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	3,32%	3,08%	3,04%	CW	2,98%	2,70%	2,50%
SEP	5,34%	4,44%	4,92%	SEP	4,80%	4,84%	4,34%
WSEP Exp	5,00%	4,56%	5,04%	WSEP Exp	4,84%	4,90%	4,34%
WSEP Norm	5,14%	4,54%	4,96%	WSEP Norm	4,78%	4,78%	4,36%
Enc-New	6,80%	6,42%	6,84%	Enc-New	6,80%	6,50%	6,54%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	2,62%	2,78%	2,86%	CW	3,42%	3,00%	3,02%
SEP	4,54%	4,68%	5,00%	SEP	4,60%	5,22%	5,12%
WSEP Exp	4,32%	4,58%	5,20%	WSEP Exp	4,58%	4,86%	4,98%
WSEP Norm	4,38%	4,58%	5,12%	WSEP Norm	4,58%	4,92%	4,94%
Enc-New	6,58%	6,68%	6,96%	Enc-New	7,22%	7,62%	6,76%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	3,64%	3,34%	3,26%	CW	3,72%	3,58%	3,20%
SEP	4,96%	4,96%	4,72%	SEP	4,74%	5,14%	4,92%
WSEP Exp	4,72%	4,74%	4,94%	WSEP Exp	4,50%	5,10%	4,86%
WSEP Norm	4,74%	4,72%	5,00%	WSEP Norm	4,48%	5,12%	4,76%
Enc-New	7,56%	7,26%	7,34%	Enc-New	7,58%	7,86%	7,18%

Notes: See notes of Table A.1.

Table A.6. Empirical size DGP1 (Nominal size of 1%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	0,44%	0,50%	0,44%	CW	0,46%	0,38%	0,52%
SEP	0,84%	0,92%	0,82%	SEP	0,88%	1,14%	0,98%
WSEP Exp	0,86%	0,84%	0,90%	WSEP Exp	0,76%	0,90%	0,92%
WSEP Norm	0,86%	0,94%	0,98%	WSEP Norm	0,80%	0,82%	0,84%
Enc-New	1,34%	1,64%	1,92%	Enc-New	1,44%	1,32%	1,48%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	0,42%	0,44%	0,60%	CW	0,46%	0,56%	0,48%
SEP	0,76%	0,84%	0,96%	SEP	0,82%	1,00%	0,86%
WSEP Exp	0,64%	0,82%	0,98%	WSEP Exp	0,80%	0,96%	0,86%
WSEP Norm	0,62%	0,80%	1,10%	WSEP Norm	0,80%	0,96%	0,86%
Enc-New	1,58%	1,80%	1,86%	Enc-New	1,82%	1,78%	1,66%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	0,46%	0,56%	0,52%	CW	0,52%	0,52%	0,66%
SEP	0,68%	0,94%	1,02%	SEP	0,72%	1,02%	1,06%
WSEP Exp	0,80%	0,78%	1,14%	WSEP Exp	0,82%	0,82%	0,86%
WSEP Norm	0,76%	0,90%	1,14%	WSEP Norm	0,80%	0,84%	0,84%
Enc-New	1,94%	1,78%	1,92%	Enc-New	2,24%	2,04%	1,96%

Notes: See notes of Table A.1.

Table A.7. Empirical size DGP2 (Nominal size of 5%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	3,18%	2,60%	2,62%	CW	2,94%	2,66%	2,30%
SEP	4,98%	4,58%	4,48%	SEP	5,10%	4,74%	4,74%
WSEP Exp	5,08%	5,06%	4,76%	WSEP Exp	5,08%	4,70%	4,76%
WSEP Norm	5,10%	5,04%	4,88%	WSEP Norm	5,00%	4,62%	4,76%
Enc-New	4,72%	4,14%	4,32%	Enc-New	4,98%	4,92%	4,42%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	2,78%	2,44%	2,44%	CW	3,06%	2,98%	3,10%
SEP	5,22%	4,68%	5,02%	SEP	4,82%	4,84%	4,82%
WSEP Exp	5,14%	4,50%	4,82%	WSEP Exp	5,20%	5,24%	5,06%
WSEP Norm	5,20%	4,60%	4,88%	WSEP Norm	5,10%	5,34%	4,94%
Enc-New	4,42%	4,74%	4,64%	Enc-New	5,48%	4,94%	4,78%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	4,56%	2,90%	3,40%	CW	3,28%	3,70%	3,26%
SEP	5,72%	5,02%	5,28%	SEP	5,04%	5,14%	4,84%
WSEP Exp	5,54%	4,54%	5,34%	WSEP Exp	4,38%	5,26%	5,12%
WSEP Norm	5,62%	4,64%	5,36%	WSEP Norm	4,38%	5,24%	5,12%
Enc-New	5,84%	5,18%	5,46%	Enc-New	5,58%	5,46%	5,26%

Notes: See notes of Table A.1.

Table A.8. Empirical size DGP2 (Nominal size of 1%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	0,50%	0,36%	0,42%	CW	0,40%	0,48%	0,50%
SEP	0,92%	1,18%	0,88%	SEP	0,90%	0,94%	0,82%
WSEP Exp	1,16%	0,98%	0,72%	WSEP Exp	0,92%	0,74%	0,94%
WSEP Norm	1,12%	0,94%	0,74%	WSEP Norm	0,84%	0,80%	0,96%
Enc-New	1,02%	0,90%	0,92%	Enc-New	0,82%	0,82%	0,76%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	0,50%	0,36%	0,38%	CW	0,28%	0,52%	0,58%
SEP	1,02%	0,90%	0,82%	SEP	0,86%	0,90%	0,92%
WSEP Exp	0,90%	0,62%	0,82%	WSEP Exp	0,62%	0,88%	1,08%
WSEP Norm	0,90%	0,68%	0,84%	WSEP Norm	0,58%	0,90%	1,10%
Enc-New	1,22%	0,88%	0,98%	Enc-New	1,02%	0,90%	0,94%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	0,56%	0,52%	0,62%	CW	0,30%	0,62%	0,58%
SEP	0,98%	0,94%	1,00%	SEP	0,74%	0,76%	0,92%
WSEP Exp	0,82%	1,00%	1,12%	WSEP Exp	0,58%	1,02%	0,86%
WSEP Norm	0,76%	1,00%	1,10%	WSEP Norm	0,60%	1,02%	0,92%
Enc-New	1,54%	0,90%	1,06%	Enc-New	1,36%	1,28%	1,22%

Notes: See notes of Table A.1.

Table A.9. Empirical size DGP2 (Nominal size of 10%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	7,68%	5,68%	5,72%	CW	5,98%	5,42%	5,32%
SEP	10,16%	9,12%	9,28%	SEP	10,62%	10,16%	9,70%
WSEP Exp	10,06%	9,64%	9,36%	WSEP Exp	10,24%	10,18%	9,62%
WSEP Norm	10,04%	9,60%	9,38%	WSEP Norm	10,22%	10,24%	9,58%
Enc-New	9,58%	8,54%	8,86%	Enc-New	9,70%	9,96%	10,16%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	6,44%	5,66%	5,88%	CW	6,70%	6,08%	5,56%
SEP	10,34%	10,32%	10,20%	SEP	9,82%	10,22%	9,86%
WSEP Exp	10,52%	9,90%	10,24%	WSEP Exp	10,06%	9,80%	10,24%
WSEP Norm	10,48%	9,72%	10,16%	WSEP Norm	10,06%	9,88%	10,20%
Enc-New	9,30%	9,72%	10,00%	Enc-New	10,04%	10,24%	10,00%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	8,86%	6,78%	6,86%	CW	7,22%	7,62%	6,60%
SEP	11,30%	10,24%	10,42%	SEP	9,88%	10,00%	10,10%
WSEP Exp	10,84%	10,30%	10,90%	WSEP Exp	10,02%	10,42%	10,16%
WSEP Norm	10,94%	10,38%	10,70%	WSEP Norm	9,96%	10,70%	10,12%
Enc-New	10,34%	9,82%	10,02%	Enc-New	10,14%	10,06%	10,12%

Notes: See notes of Table A.1.

Table A.10 Empirical size DGP2 (Nominal size of 5%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	3,18%	2,60%	2,62%	CW	2,94%	2,66%	2,30%
SEP	4,98%	4,58%	4,48%	SEP	5,10%	4,74%	4,74%
WSEP Exp	4,86%	4,66%	4,80%	WSEP Exp	5,32%	4,60%	4,40%
WSEP Norm	4,88%	4,70%	4,70%	WSEP Norm	5,30%	4,76%	4,40%
Enc-New	4,72%	4,14%	4,32%	Enc-New	4,98%	4,92%	4,42%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	2,78%	2,44%	2,44%	CW	3,06%	2,98%	3,10%
SEP	5,22%	4,68%	5,02%	SEP	4,82%	4,84%	4,82%
WSEP Exp	5,24%	4,40%	4,74%	WSEP Exp	5,16%	5,08%	4,74%
WSEP Norm	5,20%	4,36%	4,72%	WSEP Norm	5,10%	5,06%	4,70%
Enc-New	4,42%	4,74%	4,64%	Enc-New	5,48%	4,94%	4,78%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	4,56%	2,90%	3,40%	CW	3,28%	3,70%	3,26%
SEP	5,72%	5,02%	5,28%	SEP	5,04%	5,14%	4,84%
WSEP Exp	5,48%	4,56%	5,44%	WSEP Exp	4,52%	5,34%	5,02%
WSEP Norm	5,42%	4,54%	5,34%	WSEP Norm	4,52%	5,24%	5,00%
Enc-New	5,84%	5,18%	5,46%	Enc-New	5,58%	5,46%	5,26%

Notes: See notes of Table A.1.

Table A.11. Empirical size DGP2 (Nominal size of 1%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	0,50%	0,36%	0,42%	CW	0,40%	0,48%	0,50%
SEP	0,92%	1,18%	0,88%	SEP	0,90%	0,94%	0,82%
WSEP Exp	1,14%	1,04%	0,82%	WSEP Exp	0,86%	0,90%	0,84%
WSEP Norm	1,16%	1,04%	0,80%	WSEP Norm	0,86%	0,86%	0,92%
Enc-New	1,02%	0,90%	0,92%	Enc-New	0,82%	0,82%	0,76%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	0,50%	0,36%	0,38%	CW	0,28%	0,52%	0,58%
SEP	1,02%	0,90%	0,82%	SEP	0,86%	0,90%	0,92%
WSEP Exp	0,90%	0,62%	0,70%	WSEP Exp	0,76%	0,84%	0,98%
WSEP Norm	0,88%	0,70%	0,74%	WSEP Norm	0,72%	0,86%	0,94%
Enc-New	1,22%	0,88%	0,98%	Enc-New	1,02%	0,90%	0,94%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	0,56%	0,52%	0,62%	CW	0,30%	0,62%	0,58%
SEP	0,98%	0,94%	1,00%	SEP	0,74%	0,76%	0,92%
WSEP Exp	0,88%	1,06%	1,18%	WSEP Exp	0,58%	0,92%	0,86%
WSEP Norm	0,88%	1,04%	1,14%	WSEP Norm	0,60%	0,88%	0,86%
Enc-New	1,54%	0,90%	1,06%	Enc-New	1,36%	1,28%	1,22%

Notes: See notes of Table A.1.

Table A.12. Empirical size DGP3 (Nominal size of 5%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	3,46%	3,14%	2,78%	CW	2,94%	2,40%	2,54%
SEP	4,54%	5,24%	5,48%	SEP	4,90%	4,66%	4,54%
WSEP Exp	4,86%	5,24%	5,28%	WSEP Exp	4,88%	4,46%	4,70%
WSEP Norm	4,88%	5,10%	5,20%	WSEP Norm	4,96%	4,50%	4,74%
Enc-New	4,88%	4,70%	4,42%	Enc-New	5,32%	4,84%	4,76%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	3,42%	2,64%	2,60%	CW	3,38%	2,62%	2,76%
SEP	4,88%	5,22%	5,38%	SEP	5,22%	5,24%	4,86%
WSEP Exp	5,08%	4,52%	5,10%	WSEP Exp	5,04%	4,90%	4,72%
WSEP Norm	4,92%	4,40%	5,06%	WSEP Norm	4,96%	4,94%	4,70%
Enc-New	5,02%	4,76%	4,76%	Enc-New	5,26%	4,70%	4,68%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	3,68%	3,02%	2,98%	CW	3,90%	3,12%	3,32%
SEP	5,18%	5,10%	5,08%	SEP	4,96%	5,30%	5,08%
WSEP Exp	5,20%	4,52%	5,04%	WSEP Exp	5,18%	5,18%	5,04%
WSEP Norm	5,18%	4,62%	5,10%	WSEP Norm	5,12%	5,22%	5,16%
Enc-New	5,78%	4,88%	5,16%	Enc-New	5,66%	5,32%	4,80%

Notes: See notes of Table A.1.

Table A.13. Empirical size DGP3 (Nominal size of 1%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	0,52%	0,62%	0,42%	CW	0,34%	0,44%	0,56%
SEP	0,82%	1,06%	1,30%	SEP	1,02%	1,12%	0,86%
WSEP Exp	1,00%	0,94%	1,06%	WSEP Exp	0,98%	1,02%	1,06%
WSEP Norm	0,98%	0,90%	1,02%	WSEP Norm	0,92%	1,00%	1,02%
Enc-New	0,94%	1,00%	0,88%	Enc-New	0,96%	0,78%	0,66%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	0,36%	0,44%	0,30%	CW	0,48%	0,54%	0,64%
SEP	0,92%	0,88%	1,26%	SEP	1,00%	1,02%	1,02%
WSEP Exp	0,86%	0,92%	0,84%	WSEP Exp	0,90%	1,00%	1,06%
WSEP Norm	0,78%	0,92%	0,80%	WSEP Norm	0,94%	1,10%	1,06%
Enc-New	1,20%	1,08%	1,06%	Enc-New	1,16%	0,82%	0,90%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	0,44%	0,46%	0,50%	CW	0,52%	0,48%	0,58%
SEP	0,96%	0,90%	1,04%	SEP	0,70%	0,92%	1,14%
WSEP Exp	0,64%	0,82%	1,08%	WSEP Exp	0,76%	0,92%	1,14%
WSEP Norm	0,68%	0,80%	0,96%	WSEP Norm	0,70%	0,88%	1,06%
Enc-New	1,56%	0,96%	0,98%	Enc-New	1,74%	1,22%	1,02%

Notes: See notes of Table A.1.

Table A.14. Empirical size DGP3 (Nominal size of 10%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	7,12%	6,30%	5,70%	CW	6,18%	5,18%	5,14%
SEP	9,78%	10,66%	10,50%	SEP	9,54%	9,54%	9,46%
WSEP Exp	9,88%	10,18%	10,38%	WSEP Exp	9,96%	9,32%	9,46%
WSEP Norm	9,92%	10,18%	10,48%	WSEP Norm	9,90%	9,38%	9,48%
Enc-New	9,48%	9,20%	9,20%	Enc-New	10,14%	9,26%	9,34%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	7,28%	5,40%	5,86%	CW	6,48%	6,04%	5,74%
SEP	10,08%	10,00%	10,08%	SEP	9,46%	10,06%	9,28%
WSEP Exp	10,34%	9,54%	10,18%	WSEP Exp	10,04%	9,74%	9,18%
WSEP Norm	10,28%	9,28%	10,08%	WSEP Norm	10,20%	9,78%	9,24%
Enc-New	10,36%	9,28%	9,78%	Enc-New	10,32%	9,70%	9,66%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	8,80%	6,44%	6,22%	CW	8,12%	6,98%	6,50%
SEP	10,52%	10,24%	9,84%	SEP	10,64%	10,06%	10,16%
WSEP Exp	10,56%	9,88%	9,68%	WSEP Exp	10,68%	10,16%	9,76%
WSEP Norm	10,56%	9,84%	9,60%	WSEP Norm	10,68%	10,30%	9,92%
Enc-New	10,70%	9,18%	9,44%	Enc-New	10,66%	10,44%	9,68%

Notes: See notes of Table A.1.

Table A.15. Empirical size DGP3 (Nominal size of 5%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	3,46%	3,14%	2,78%	CW	2,94%	2,40%	2,54%
SEP	4,54%	5,24%	5,48%	SEP	4,90%	4,66%	4,54%
WSEP Exp	4,78%	5,18%	5,24%	WSEP Exp	4,74%	4,54%	4,64%
WSEP Norm	4,82%	5,20%	5,18%	WSEP Norm	4,78%	4,56%	4,74%
Enc-New	4,88%	4,70%	4,42%	Enc-New	5,32%	4,84%	4,76%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	3,42%	2,64%	2,60%	CW	3,38%	2,62%	2,76%
SEP	4,88%	5,22%	5,38%	SEP	5,22%	5,24%	4,86%
WSEP Exp	5,04%	4,46%	5,08%	WSEP Exp	4,76%	5,22%	4,74%
WSEP Norm	5,10%	4,56%	5,02%	WSEP Norm	4,88%	5,20%	4,80%
Enc-New	5,02%	4,76%	4,76%	Enc-New	5,26%	4,70%	4,68%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	3,68%	3,02%	2,98%	CW	3,90%	3,12%	3,32%
SEP	5,18%	5,10%	5,08%	SEP	4,96%	5,30%	5,08%
WSEP Exp	5,32%	4,62%	4,96%	WSEP Exp	5,28%	5,08%	5,14%
WSEP Norm	5,18%	4,56%	4,94%	WSEP Norm	5,28%	5,08%	5,16%
Enc-New	5,78%	4,88%	5,16%	Enc-New	5,66%	5,32%	4,80%

Notes: See notes of Table A.1.

Table A.16. Empirical size DGP3 (Nominal size of 1%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	0,52%	0,62%	0,42%	CW	0,34%	0,44%	0,56%
SEP	0,82%	1,06%	1,30%	SEP	1,02%	1,12%	0,86%
WSEP Exp	0,90%	0,98%	1,16%	WSEP Exp	0,96%	1,00%	0,90%
WSEP Norm	0,94%	1,04%	1,14%	WSEP Norm	0,98%	0,94%	0,94%
Enc-New	0,94%	1,00%	0,88%	Enc-New	0,96%	0,78%	0,66%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	0,36%	0,44%	0,30%	CW	0,48%	0,54%	0,64%
SEP	0,92%	0,88%	1,26%	SEP	1,00%	1,02%	1,02%
WSEP Exp	0,94%	1,00%	0,90%	WSEP Exp	0,90%	1,18%	1,10%
WSEP Norm	0,88%	0,98%	0,84%	WSEP Norm	0,94%	1,22%	1,04%
Enc-New	1,20%	1,08%	1,06%	Enc-New	1,16%	0,82%	0,90%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	0,44%	0,46%	0,50%	CW	0,52%	0,48%	0,58%
SEP	0,96%	0,90%	1,04%	SEP	0,70%	0,92%	1,14%
WSEP Exp	0,72%	0,82%	1,02%	WSEP Exp	0,80%	0,86%	1,14%
WSEP Norm	0,72%	0,86%	1,06%	WSEP Norm	0,84%	0,90%	1,14%
Enc-New	1,56%	0,96%	0,98%	Enc-New	1,74%	1,22%	1,02%

Notes: See notes of Table A.1.

Table A.17. Empirical size DGP4 (Nominal size of 5%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	4,10%	3,38%	3,14%	CW	4,36%	3,32%	3,42%
SEP	5,22%	4,48%	4,96%	SEP	5,14%	4,76%	5,04%
WSEP Exp	5,64%	4,86%	5,12%	WSEP Exp	5,28%	4,64%	4,78%
WSEP Norm	5,62%	4,92%	5,10%	WSEP Norm	5,32%	4,74%	4,72%
Enc-New	12,38%	11,96%	11,58%	Enc-New	12,22%	10,80%	10,88%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	4,34%	3,58%	2,80%	CW	4,62%	3,68%	3,56%
SEP	5,16%	4,76%	4,54%	SEP	5,24%	4,74%	4,66%
WSEP Exp	5,24%	4,60%	4,44%	WSEP Exp	5,68%	4,68%	4,90%
WSEP Norm	5,24%	4,54%	4,54%	WSEP Norm	5,70%	4,78%	4,92%
Enc-New	12,06%	11,10%	10,26%	Enc-New	13,08%	11,32%	10,54%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	5,00%	4,30%	3,52%	CW	4,66%	4,06%	3,44%
SEP	5,40%	4,50%	4,68%	SEP	4,62%	4,60%	4,94%
WSEP Exp	5,56%	4,80%	4,94%	WSEP Exp	5,02%	4,78%	4,92%
WSEP Norm	5,78%	4,90%	5,02%	WSEP Norm	5,16%	4,92%	4,86%
Enc-New	13,52%	10,76%	11,18%	Enc-New	12,74%	11,56%	10,68%

Notes: See notes of Table A.1.

Table A.18. Empirical size DGP4 (Nominal size of 1%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	0,66%	0,64%	0,60%	CW	0,94%	0,64%	0,48%
SEP	1,18%	0,88%	0,94%	SEP	1,06%	0,92%	1,02%
WSEP Exp	1,00%	0,86%	0,84%	WSEP Exp	1,20%	0,90%	1,06%
WSEP Norm	1,00%	0,84%	0,88%	WSEP Norm	1,20%	0,90%	1,02%
Enc-New	4,16%	4,42%	3,92%	Enc-New	3,78%	3,32%	3,06%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	0,80%	0,56%	0,40%	CW	0,90%	0,70%	0,38%
SEP	1,00%	0,76%	0,86%	SEP	0,88%	0,84%	0,98%
WSEP Exp	1,06%	1,04%	0,82%	WSEP Exp	1,10%	0,80%	0,92%
WSEP Norm	1,04%	1,00%	0,80%	WSEP Norm	1,12%	0,84%	0,90%
Enc-New	4,00%	3,34%	3,12%	Enc-New	3,68%	3,18%	2,82%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	0,56%	0,72%	0,68%	CW	0,74%	0,62%	0,74%
SEP	0,88%	0,88%	1,00%	SEP	1,02%	0,60%	0,88%
WSEP Exp	0,72%	0,92%	0,96%	WSEP Exp	0,98%	0,62%	0,96%
WSEP Norm	0,70%	0,92%	0,90%	WSEP Norm	0,88%	0,68%	0,94%
Enc-New	4,32%	3,34%	3,10%	Enc-New	4,38%	3,64%	3,10%

Notes: See notes of Table A.1.

Table A.19. Empirical size DGP4 (Nominal size of 10%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	8,54%	7,54%	7,38%	CW	8,72%	6,76%	6,62%
SEP	10,22%	9,92%	9,92%	SEP	10,00%	9,64%	10,12%
WSEP Exp	10,30%	10,38%	9,70%	WSEP Exp	10,74%	9,66%	10,14%
WSEP Norm	10,18%	10,22%	9,54%	WSEP Norm	10,68%	9,70%	10,10%
Enc-New	19,36%	18,38%	18,84%	Enc-New	19,54%	18,08%	17,72%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	8,58%	7,40%	6,48%	CW	9,22%	7,58%	7,22%
SEP	10,86%	9,80%	9,34%	SEP	10,02%	10,30%	9,92%
WSEP Exp	10,56%	9,86%	8,96%	WSEP Exp	10,68%	10,58%	9,38%
WSEP Norm	10,54%	9,92%	9,10%	WSEP Norm	10,66%	10,58%	9,48%
Enc-New	19,86%	18,38%	17,90%	Enc-New	20,50%	18,46%	17,24%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	10,78%	8,30%	7,52%	CW	10,14%	8,94%	7,66%
SEP	10,70%	9,58%	9,96%	SEP	10,08%	10,04%	10,58%
WSEP Exp	11,20%	10,04%	9,92%	WSEP Exp	10,72%	9,86%	10,28%
WSEP Norm	11,10%	10,18%	10,00%	WSEP Norm	10,80%	9,94%	10,12%
Enc-New	20,78%	17,42%	18,06%	Enc-New	20,80%	17,80%	17,34%

Notes: See notes of Table A.1.

Table A.20. Empirical size DGP4 (Nominal size of 5%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	4,10%	3,38%	3,14%	CW	4,36%	3,32%	3,42%
SEP	5,22%	4,48%	4,96%	SEP	5,14%	4,76%	5,04%
WSEP Exp	5,52%	4,90%	4,94%	WSEP Exp	5,22%	4,88%	4,62%
WSEP Norm	5,50%	4,88%	4,98%	WSEP Norm	5,16%	4,92%	4,70%
Enc-New	12,38%	11,96%	11,58%	Enc-New	12,22%	10,80%	10,88%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	4,34%	3,58%	2,80%	CW	4,62%	3,68%	3,56%
SEP	5,16%	4,76%	4,54%	SEP	5,24%	4,74%	4,66%
WSEP Exp	5,24%	4,52%	4,62%	WSEP Exp	5,50%	4,74%	4,50%
WSEP Norm	5,26%	4,56%	4,58%	WSEP Norm	5,54%	4,72%	4,54%
Enc-New	12,06%	11,10%	10,26%	Enc-New	13,08%	11,32%	10,54%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	5,00%	4,30%	3,52%	CW	4,66%	4,06%	3,44%
SEP	5,40%	4,50%	4,68%	SEP	4,62%	4,60%	4,94%
WSEP Exp	5,62%	4,92%	4,96%	WSEP Exp	4,84%	4,62%	5,08%
WSEP Norm	5,66%	4,82%	4,92%	WSEP Norm	4,76%	4,64%	5,04%
Enc-New	13,52%	10,76%	11,18%	Enc-New	12,74%	11,56%	10,68%

Notes: See notes of Table A.1.

Table A.21. Empirical size DGP4 (Nominal size of 1%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	0,66%	0,64%	0,60%	CW	0,94%	0,64%	0,48%
SEP	1,18%	0,88%	0,94%	SEP	1,06%	0,92%	1,02%
WSEP Exp	0,96%	0,92%	0,88%	WSEP Exp	1,12%	0,88%	1,02%
WSEP Norm	1,02%	0,88%	0,96%	WSEP Norm	1,12%	0,86%	1,04%
Enc-New	4,16%	4,42%	3,92%	Enc-New	3,78%	3,32%	3,06%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	0,80%	0,56%	0,40%	CW	0,90%	0,70%	0,38%
SEP	1,00%	0,76%	0,86%	SEP	0,88%	0,84%	0,98%
WSEP Exp	1,18%	1,00%	0,82%	WSEP Exp	1,04%	0,78%	0,96%
WSEP Norm	1,12%	1,02%	0,88%	WSEP Norm	1,04%	0,78%	0,96%
Enc-New	4,00%	3,34%	3,12%	Enc-New	3,68%	3,18%	2,82%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	0,56%	0,72%	0,68%	CW	0,74%	0,62%	0,74%
SEP	0,88%	0,88%	1,00%	SEP	1,02%	0,60%	0,88%
WSEP Exp	0,78%	0,98%	1,08%	WSEP Exp	1,12%	0,56%	0,96%
WSEP Norm	0,80%	0,96%	1,06%	WSEP Norm	1,04%	0,62%	0,92%
Enc-New	4,32%	3,34%	3,10%	Enc-New	4,38%	3,64%	3,10%

Notes: See notes of Table A.1.

Table A.22. Empirical size DGP5 (Nominal size of 5%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	4,20%	3,44%	3,20%	CW	3,68%	3,88%	3,12%
SEP	5,00%	5,06%	4,46%	SEP	4,66%	4,66%	4,78%
WSEP Exp	5,64%	5,14%	4,64%	WSEP Exp	4,74%	4,96%	4,52%
WSEP Norm	5,68%	4,96%	4,64%	WSEP Norm	4,82%	4,96%	4,54%
Enc-New	12,68%	15,90%	21,28%	Enc-New	11,56%	15,36%	19,38%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	3,66%	3,38%	3,70%	CW	4,34%	4,20%	3,78%
SEP	4,92%	5,30%	4,64%	SEP	5,28%	5,20%	4,22%
WSEP Exp	5,42%	5,14%	4,46%	WSEP Exp	5,16%	5,14%	4,68%
WSEP Norm	5,42%	5,10%	4,54%	WSEP Norm	5,08%	5,08%	4,70%
Enc-New	11,82%	15,04%	19,98%	Enc-New	11,98%	15,60%	20,06%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	3,80%	4,20%	4,04%	CW	5,06%	4,20%	4,08%
SEP	4,86%	5,08%	4,94%	SEP	5,56%	4,92%	4,86%
WSEP Exp	4,46%	5,18%	5,06%	WSEP Exp	5,62%	4,82%	4,68%
WSEP Norm	4,54%	5,06%	4,92%	WSEP Norm	5,58%	4,78%	4,66%
Enc-New	12,20%	15,18%	20,34%	Enc-New	13,34%	15,56%	20,80%

Notes: See notes of Table A.1.

Table A.23. Empirical size DGP5 (Nominal size of 1%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	0,52%	0,40%	0,58%	CW	0,42%	0,62%	0,48%
SEP	1,34%	1,00%	0,82%	SEP	0,88%	1,04%	0,98%
WSEP Exp	0,96%	0,78%	0,70%	WSEP Exp	0,60%	1,02%	0,78%
WSEP Norm	0,92%	0,78%	0,74%	WSEP Norm	0,64%	1,06%	0,74%
Enc-New	5,58%	8,72%	13,66%	Enc-New	4,62%	8,20%	11,72%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	0,36%	0,44%	0,62%	CW	0,48%	0,68%	0,34%
SEP	0,92%	0,74%	1,02%	SEP	0,66%	1,12%	0,68%
WSEP Exp	0,58%	0,86%	0,96%	WSEP Exp	0,72%	1,04%	0,52%
WSEP Norm	0,62%	0,92%	0,96%	WSEP Norm	0,70%	1,02%	0,58%
Enc-New	4,50%	7,16%	11,38%	Enc-New	4,24%	7,48%	10,92%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	0,46%	0,60%	0,42%	CW	0,56%	0,52%	0,54%
SEP	0,84%	0,86%	1,04%	SEP	0,88%	0,82%	0,70%
WSEP Exp	0,54%	0,80%	0,94%	WSEP Exp	0,66%	0,76%	0,80%
WSEP Norm	0,52%	0,80%	0,96%	WSEP Norm	0,62%	0,82%	0,78%
Enc-New	4,52%	6,88%	11,60%	Enc-New	5,52%	7,26%	11,30%

Notes: See notes of Table A.1.

Table A.24. Empirical size DGP5 (Nominal size of 10%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	9,28%	7,88%	8,00%	CW	8,10%	7,84%	7,00%
SEP	10,46%	9,86%	9,94%	SEP	10,14%	10,30%	9,96%
WSEP Exp	10,98%	9,98%	9,84%	WSEP Exp	10,06%	10,14%	9,46%
WSEP Norm	11,12%	9,86%	9,82%	WSEP Norm	10,06%	10,08%	9,42%
Enc-New	17,64%	21,60%	25,80%	Enc-New	17,60%	21,84%	24,82%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	8,88%	7,90%	7,80%	CW	9,12%	8,04%	7,86%
SEP	10,58%	10,42%	9,42%	SEP	10,90%	10,30%	9,56%
WSEP Exp	10,70%	10,42%	9,42%	WSEP Exp	11,10%	10,12%	9,80%
WSEP Norm	10,82%	10,42%	9,26%	WSEP Norm	10,92%	10,16%	9,86%
Enc-New	18,04%	20,26%	24,90%	Enc-New	18,52%	21,14%	25,46%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	9,78%	9,00%	8,70%	CW	10,54%	8,58%	8,90%
SEP	10,42%	10,64%	9,46%	SEP	10,92%	9,64%	9,56%
WSEP Exp	10,22%	10,38%	10,04%	WSEP Exp	11,54%	9,54%	10,08%
WSEP Norm	10,26%	10,36%	10,08%	WSEP Norm	11,60%	9,54%	10,04%
Enc-New	18,80%	20,84%	25,40%	Enc-New	19,16%	21,22%	26,72%

Notes: See notes of Table A.1.

Table A.25. Empirical size DGP5 (Nominal size of 5%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	4,20%	3,44%	3,20%	CW	3,68%	3,88%	3,12%
SEP	5,00%	5,06%	4,46%	SEP	4,66%	4,66%	4,78%
WSEP Exp	5,60%	5,04%	4,52%	WSEP Exp	4,66%	5,12%	4,80%
WSEP Norm	5,52%	4,92%	4,60%	WSEP Norm	4,68%	5,10%	4,86%
Enc-New	12,68%	15,90%	21,28%	Enc-New	11,56%	15,36%	19,38%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	3,66%	3,38%	3,70%	CW	4,34%	4,20%	3,78%
SEP	4,92%	5,30%	4,64%	SEP	5,28%	5,20%	4,22%
WSEP Exp	5,32%	5,28%	4,46%	WSEP Exp	5,16%	5,12%	4,64%
WSEP Norm	5,26%	5,40%	4,54%	WSEP Norm	5,14%	5,10%	4,56%
Enc-New	11,82%	15,04%	19,98%	Enc-New	11,98%	15,60%	20,06%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	3,80%	4,20%	4,04%	CW	5,06%	4,20%	4,08%
SEP	4,86%	5,08%	4,94%	SEP	5,56%	4,92%	4,86%
WSEP Exp	4,62%	5,04%	4,88%	WSEP Exp	5,72%	4,62%	4,62%
WSEP Norm	4,64%	5,04%	4,86%	WSEP Norm	5,64%	4,68%	4,64%
Enc-New	12,20%	15,18%	20,34%	Enc-New	13,34%	15,56%	20,80%

Notes: See notes of Table A.1.

Table A.26. Empirical size DGP5 (Nominal size of 1%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	0,52%	0,40%	0,58%	CW	0,42%	0,62%	0,48%
SEP	1,34%	1,00%	0,82%	SEP	0,88%	1,04%	0,98%
WSEP Exp	1,08%	0,92%	0,76%	WSEP Exp	0,86%	1,04%	0,88%
WSEP Norm	1,14%	0,96%	0,68%	WSEP Norm	0,88%	1,12%	0,92%
Enc-New	5,58%	8,72%	13,66%	Enc-New	4,62%	8,20%	11,72%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	0,36%	0,44%	0,62%	CW	0,48%	0,68%	0,34%
SEP	0,92%	0,74%	1,02%	SEP	0,66%	1,12%	0,68%
WSEP Exp	0,68%	0,92%	1,00%	WSEP Exp	0,70%	1,18%	0,60%
WSEP Norm	0,74%	0,96%	0,98%	WSEP Norm	0,76%	1,20%	0,56%
Enc-New	4,50%	7,16%	11,38%	Enc-New	4,24%	7,48%	10,92%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	0,46%	0,60%	0,42%	CW	0,56%	0,52%	0,54%
SEP	0,84%	0,86%	1,04%	SEP	0,88%	0,82%	0,70%
WSEP Exp	0,66%	0,80%	0,96%	WSEP Exp	0,76%	0,80%	0,70%
WSEP Norm	0,60%	0,80%	1,04%	WSEP Norm	0,72%	0,84%	0,78%
Enc-New	4,52%	6,88%	11,60%	Enc-New	5,52%	7,26%	11,30%

Notes: See notes of Table A.1.

Table A.27. Raw Power DGP 1 (Nominal size of 5%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	11,32%	29,52%	84,74%	CW	14,26%	38,76%	90,36%
SEP	12,36%	28,82%	77,80%	SEP	14,84%	36,18%	81,62%
WSEP Exp	13,00%	33,36%	85,58%	WSEP Exp	17,26%	44,20%	91,68%
WSEP Norm	13,12%	33,82%	86,08%	WSEP Norm	17,48%	44,36%	91,88%
Enc-New	18,68%	42,76%	91,76%	Enc-New	22,92%	54,56%	96,06%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	11,56%	27,96%	79,28%	CW	12,72%	32,48%	82,26%
SEP	13,00%	26,94%	69,20%	SEP	13,06%	29,54%	69,78%
WSEP Exp	14,90%	33,10%	83,16%	WSEP Exp	15,32%	36,26%	83,58%
WSEP Norm	14,96%	33,54%	83,28%	WSEP Norm	15,26%	36,68%	83,94%
Enc-New	9,22%	24,44%	75,76%	Enc-New	24,20%	53,06%	96,04%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	9,90%	20,68%	57,62%	CW	9,82%	21,98%	58,04%
SEP	10,68%	19,04%	45,88%	SEP	10,32%	19,54%	46,38%
WSEP Exp	11,68%	23,34%	58,84%	WSEP Exp	11,68%	24,18%	58,74%
WSEP Norm	11,62%	23,38%	59,52%	WSEP Norm	11,58%	23,96%	59,20%
Enc-New	22,46%	44,42%	87,46%	Enc-New	22,94%	46,80%	89,42%

Notes: See notes of Table A.1.

Table A.28. Raw Power DGP 1 (Nominal size of 1%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	2,60%	12,90%	67,22%	CW	4,18%	18,62%	76,16%
SEP	3,90%	12,28%	57,00%	SEP	4,72%	14,94%	61,16%
WSEP Exp	3,72%	15,80%	70,76%	WSEP Exp	5,54%	22,18%	78,18%
WSEP Norm	3,76%	15,88%	71,14%	WSEP Norm	5,58%	22,18%	78,74%
Enc-New	6,82%	23,30%	80,82%	Enc-New	8,90%	30,14%	87,96%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	2,60%	10,40%	56,22%	CW	3,28%	12,54%	59,78%
SEP	3,74%	9,56%	44,18%	SEP	3,24%	10,72%	43,36%
WSEP Exp	4,08%	13,38%	61,02%	WSEP Exp	4,42%	15,44%	61,26%
WSEP Norm	4,06%	13,56%	61,58%	WSEP Norm	4,46%	15,64%	61,62%
Enc-New	8,84%	26,04%	82,00%	Enc-New	9,88%	30,12%	86,78%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	1,66%	6,04%	30,36%	CW	1,68%	6,64%	30,82%
SEP	2,30%	5,84%	20,54%	SEP	2,06%	5,72%	21,22%
WSEP Exp	2,30%	7,24%	31,58%	WSEP Exp	2,04%	7,88%	31,48%
WSEP Norm	2,30%	7,26%	31,82%	WSEP Norm	2,14%	8,10%	31,92%
Enc-New	21,54%	47,10%	92,78%	Enc-New	9,82%	26,76%	77,54%

Notes: See notes of Table A.1.

Table A.29. Raw Power DGP 1 (Nominal size of 10%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	19,02%	41,82%	90,52%	CW	22,08%	51,12%	94,84%
SEP	20,56%	40,28%	85,82%	SEP	23,94%	49,42%	89,76%
WSEP Exp	21,94%	43,98%	90,40%	WSEP Exp	26,56%	56,00%	94,80%
WSEP Norm	22,00%	43,92%	90,28%	WSEP Norm	26,56%	55,56%	94,58%
Enc-New	27,90%	54,02%	95,10%	Enc-New	33,70%	66,52%	97,96%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	19,78%	40,92%	88,06%	CW	21,08%	45,56%	89,48%
SEP	21,98%	39,40%	80,48%	SEP	22,52%	42,64%	80,50%
WSEP Exp	23,88%	45,18%	88,54%	WSEP Exp	24,86%	48,18%	88,84%
WSEP Norm	23,74%	44,62%	88,34%	WSEP Norm	24,78%	47,82%	88,66%
Enc-New	31,64%	58,74%	95,50%	Enc-New	34,02%	64,94%	97,48%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	18,40%	32,46%	71,08%	CW	18,88%	33,60%	71,16%
SEP	19,20%	30,26%	59,98%	SEP	18,68%	31,24%	60,22%
WSEP Exp	20,74%	34,46%	70,02%	WSEP Exp	20,60%	35,00%	69,36%
WSEP Norm	20,70%	34,46%	69,36%	WSEP Norm	20,56%	34,90%	68,72%
Enc-New	30,22%	54,66%	91,22%	Enc-New	32,04%	57,16%	92,72%

Notes: See notes of Table A.1.

Table A.30. Raw Power DGP 1 (Nominal size of 5%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	11,32%	29,52%	84,74%	CW	14,26%	38,76%	90,36%
SEP	12,36%	28,82%	77,80%	SEP	14,84%	36,18%	81,62%
WSEP Exp	13,36%	33,04%	84,90%	WSEP Exp	16,80%	42,64%	90,42%
WSEP Norm	13,74%	32,92%	84,82%	WSEP Norm	16,86%	42,50%	90,20%
Enc-New	18,68%	42,76%	91,76%	Enc-New	22,92%	54,56%	96,06%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	11,56%	27,96%	79,28%	CW	12,72%	32,48%	82,26%
SEP	13,00%	26,94%	69,20%	SEP	13,06%	29,54%	69,78%
WSEP Exp	14,50%	32,00%	80,30%	WSEP Exp	14,78%	34,92%	80,54%
WSEP Norm	14,54%	31,84%	79,82%	WSEP Norm	14,60%	34,42%	80,16%
Enc-New	9,22%	24,44%	75,76%	Enc-New	24,20%	53,06%	96,04%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	9,90%	20,68%	57,62%	CW	9,82%	21,98%	58,04%
SEP	10,68%	19,04%	45,88%	SEP	10,32%	19,54%	46,38%
WSEP Exp	11,30%	22,40%	56,26%	WSEP Exp	11,38%	23,12%	56,18%
WSEP Norm	11,40%	22,28%	55,78%	WSEP Norm	11,50%	22,80%	55,88%
Enc-New	22,46%	44,42%	87,46%	Enc-New	22,94%	46,80%	89,42%

Notes: See notes of Table A.1.

Table A.31. Raw Power DGP 1 (Nominal size of 1%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	2,60%	12,90%	67,22%	CW	4,18%	18,62%	76,16%
SEP	3,90%	12,28%	57,00%	SEP	4,72%	14,94%	61,16%
WSEP Exp	3,92%	15,44%	69,00%	WSEP Exp	5,30%	20,56%	75,02%
WSEP Norm	4,08%	15,72%	68,58%	WSEP Norm	5,40%	20,42%	74,64%
Enc-New	6,82%	23,30%	80,82%	Enc-New	8,90%	30,14%	87,96%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	2,60%	10,40%	56,22%	CW	3,28%	12,54%	59,78%
SEP	3,74%	9,56%	44,18%	SEP	3,24%	10,72%	43,36%
WSEP Exp	3,98%	12,68%	57,26%	WSEP Exp	4,44%	14,48%	57,64%
WSEP Norm	4,00%	12,68%	56,54%	WSEP Norm	4,22%	14,20%	56,60%
Enc-New	8,84%	26,04%	82,00%	Enc-New	9,88%	30,12%	86,78%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	1,66%	6,04%	30,36%	CW	1,68%	6,64%	30,82%
SEP	2,30%	5,84%	20,54%	SEP	2,06%	5,72%	21,22%
WSEP Exp	2,40%	6,84%	28,88%	WSEP Exp	2,00%	7,28%	29,14%
WSEP Norm	2,36%	6,76%	28,46%	WSEP Norm	2,04%	7,32%	29,04%
Enc-New	21,54%	47,10%	92,78%	Enc-New	9,82%	26,76%	77,54%

Notes: See notes of Table A.1.

Table A.32. Raw Power DGP 2 (Nominal size of 5%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	17,32%	49,40%	96,46%	CW	23,40%	61,10%	98,74%
SEP	19,86%	45,92%	93,02%	SEP	24,12%	55,46%	95,48%
WSEP Exp	21,96%	53,52%	96,86%	WSEP Exp	28,64%	67,16%	98,90%
WSEP Norm	22,04%	53,60%	97,00%	WSEP Norm	28,58%	67,18%	99,04%
Enc-New	23,34%	57,56%	98,14%	Enc-New	31,40%	71,10%	99,58%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	17,40%	45,28%	92,96%	CW	19,56%	50,56%	94,62%
SEP	19,90%	42,46%	86,00%	SEP	20,68%	45,20%	86,94%
WSEP Exp	22,44%	52,00%	94,94%	WSEP Exp	23,44%	55,04%	94,54%
WSEP Norm	22,50%	52,56%	95,10%	WSEP Norm	23,30%	55,16%	94,90%
Enc-New	26,74%	60,78%	98,24%	Enc-New	30,18%	70,22%	99,28%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	13,54%	30,22%	74,02%	CW	14,92%	32,94%	76,50%
SEP	15,50%	28,02%	61,84%	SEP	15,70%	29,66%	63,02%
WSEP Exp	16,12%	33,52%	74,26%	WSEP Exp	17,08%	35,50%	76,02%
WSEP Norm	16,26%	33,82%	74,78%	WSEP Norm	16,96%	35,66%	76,32%
Enc-New	24,56%	55,06%	94,66%	Enc-New	26,52%	59,48%	96,34%

Notes: See notes of Table A.1.

Table A.33. Raw Power DGP 2 (Nominal size of 1%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	6,42%	28,40%	90,42%	CW	9,26%	37,70%	94,40%
SEP	7,60%	26,20%	83,18%	SEP	9,60%	31,32%	85,74%
WSEP Exp	9,42%	34,46%	92,40%	WSEP Exp	11,74%	42,80%	95,36%
WSEP Norm	9,34%	34,70%	92,54%	WSEP Norm	11,80%	43,24%	95,48%
Enc-New	11,02%	38,18%	94,74%	Enc-New	14,80%	48,50%	97,88%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	5,50%	22,12%	81,00%	CW	6,26%	26,34%	84,10%
SEP	6,74%	20,46%	67,18%	SEP	6,90%	21,46%	68,04%
WSEP Exp	7,66%	27,92%	83,40%	WSEP Exp	8,10%	29,64%	84,40%
WSEP Norm	7,76%	28,18%	83,86%	WSEP Norm	8,04%	29,82%	84,78%
Enc-New	12,76%	40,26%	94,28%	Enc-New	15,22%	46,40%	96,86%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	3,36%	11,64%	50,58%	CW	3,42%	13,14%	51,68%
SEP	4,16%	11,12%	37,10%	SEP	4,50%	12,18%	37,96%
WSEP Exp	4,16%	13,90%	51,08%	WSEP Exp	4,52%	14,84%	52,64%
WSEP Norm	4,14%	13,70%	51,60%	WSEP Norm	4,40%	15,02%	53,06%
Enc-New	12,70%	35,04%	87,70%	Enc-New	14,46%	39,68%	91,32%

Notes: See notes of Table A.1.

Table A.34. Raw Power DGP 2 (Nominal size of 10%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	26,48%	59,76%	98,18%	CW	32,88%	71,80%	99,52%
SEP	29,04%	57,12%	95,76%	SEP	35,04%	67,80%	97,80%
WSEP Exp	31,24%	61,76%	97,86%	WSEP Exp	38,34%	75,18%	99,38%
WSEP Norm	30,90%	61,58%	97,64%	WSEP Norm	38,10%	74,56%	99,38%
Enc-New	33,32%	67,00%	99,14%	Enc-New	41,98%	80,32%	99,74%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	26,80%	57,16%	96,34%	CW	29,60%	63,78%	97,28%
SEP	30,56%	55,36%	92,50%	SEP	30,78%	59,04%	92,26%
WSEP Exp	32,52%	62,88%	97,02%	WSEP Exp	34,26%	66,24%	96,54%
WSEP Norm	32,52%	62,24%	96,74%	WSEP Norm	33,96%	65,92%	96,44%
Enc-New	37,62%	70,54%	98,94%	Enc-New	40,58%	79,02%	99,58%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	22,40%	43,30%	83,42%	CW	24,02%	46,38%	85,76%
SEP	25,26%	40,18%	74,16%	SEP	25,86%	42,46%	74,98%
WSEP Exp	26,08%	45,24%	82,36%	WSEP Exp	26,88%	47,96%	83,94%
WSEP Norm	25,98%	45,04%	82,02%	WSEP Norm	26,84%	47,78%	83,92%
Enc-New	33,04%	64,32%	96,26%	Enc-New	35,26%	68,48%	97,58%

Notes: See notes of Table A.1.

Table A.35. Raw Power DGP 2 (Nominal size of 5%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	17,32%	49,40%	96,46%	CW	23,40%	61,10%	98,74%
SEP	19,86%	45,92%	93,02%	SEP	24,12%	55,46%	95,48%
WSEP Exp	21,26%	51,98%	96,16%	WSEP Exp	27,46%	65,16%	98,46%
WSEP Norm	21,22%	51,40%	96,00%	WSEP Norm	27,02%	64,32%	98,40%
Enc-New	23,34%	57,56%	98,14%	Enc-New	31,40%	71,10%	99,58%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	17,40%	45,28%	92,96%	CW	19,56%	50,56%	94,62%
SEP	19,90%	42,46%	86,00%	SEP	20,68%	45,20%	86,94%
WSEP Exp	22,06%	50,36%	93,34%	WSEP Exp	23,10%	53,18%	93,50%
WSEP Norm	21,86%	49,40%	93,32%	WSEP Norm	22,76%	52,84%	93,48%
Enc-New	26,74%	60,78%	98,24%	Enc-New	30,18%	70,22%	99,28%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	13,54%	30,22%	74,02%	CW	14,92%	32,94%	76,50%
SEP	15,50%	28,02%	61,84%	SEP	15,70%	29,66%	63,02%
WSEP Exp	16,10%	32,56%	72,46%	WSEP Exp	16,62%	34,20%	73,80%
WSEP Norm	16,04%	32,20%	72,06%	WSEP Norm	16,62%	34,00%	73,30%
Enc-New	24,56%	55,06%	94,66%	Enc-New	26,52%	59,48%	96,34%

Notes: See notes of Table A.1.

Table A.36. Raw Power DGP 2 (Nominal size of 1%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	6,42%	28,40%	90,42%	CW	9,26%	37,70%	94,40%
SEP	7,60%	26,20%	83,18%	SEP	9,60%	31,32%	85,74%
WSEP Exp	8,76%	32,98%	90,92%	WSEP Exp	11,26%	40,28%	94,00%
WSEP Norm	8,56%	32,62%	90,66%	WSEP Norm	11,12%	39,74%	93,76%
Enc-New	11,02%	38,18%	94,74%	Enc-New	14,80%	48,50%	97,88%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	5,50%	22,12%	81,00%	CW	6,26%	26,34%	84,10%
SEP	6,74%	20,46%	67,18%	SEP	6,90%	21,46%	68,04%
WSEP Exp	7,30%	26,74%	80,58%	WSEP Exp	7,98%	27,94%	81,50%
WSEP Norm	7,26%	26,12%	80,10%	WSEP Norm	7,78%	27,60%	81,16%
Enc-New	12,76%	40,26%	94,28%	Enc-New	15,22%	46,40%	96,86%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	3,36%	11,64%	50,58%	CW	3,42%	13,14%	51,68%
SEP	4,16%	11,12%	37,10%	SEP	4,50%	12,18%	37,96%
WSEP Exp	4,40%	13,22%	48,04%	WSEP Exp	4,50%	14,46%	49,72%
WSEP Norm	4,28%	13,10%	47,50%	WSEP Norm	4,62%	14,36%	49,22%
Enc-New	12,70%	35,04%	87,70%	Enc-New	14,46%	39,68%	91,32%

Notes: See notes of Table A.1.

Table A.37. Raw Power DGP 3 (Nominal size of 5%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	20,68%	57,84%	98,80%	CW	26,56%	69,18%	99,62%
SEP	20,66%	52,54%	96,94%	SEP	25,14%	61,28%	97,80%
WSEP Exp	25,30%	63,78%	99,18%	WSEP Exp	32,36%	75,74%	99,60%
WSEP Norm	25,40%	63,96%	99,16%	WSEP Norm	32,68%	75,80%	99,68%
Enc-New	26,40%	66,26%	99,46%	Enc-New	35,68%	79,00%	99,94%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	19,56%	52,30%	96,98%	CW	21,54%	58,00%	96,78%
SEP	20,48%	47,34%	91,38%	SEP	20,64%	49,32%	89,78%
WSEP Exp	25,78%	59,84%	97,78%	WSEP Exp	26,10%	62,14%	96,72%
WSEP Norm	25,94%	60,10%	97,94%	WSEP Norm	26,24%	62,70%	96,90%
Enc-New	30,14%	69,70%	99,50%	Enc-New	35,66%	78,86%	99,82%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	15,50%	37,28%	81,96%	CW	13,98%	36,94%	81,80%
SEP	14,70%	31,22%	68,02%	SEP	14,38%	31,00%	67,76%
WSEP Exp	18,16%	39,80%	81,88%	WSEP Exp	16,76%	39,22%	81,32%
WSEP Norm	18,34%	40,24%	82,30%	WSEP Norm	16,78%	39,46%	81,78%
Enc-New	30,50%	66,68%	97,90%	Enc-New	31,36%	69,46%	98,08%

Notes: See notes of Table A.1.

Table A.38. Raw Power DGP 3 (Nominal size of 1%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	6,82%	34,14%	95,50%	CW	9,00%	44,02%	97,42%
SEP	7,44%	31,26%	89,68%	SEP	8,40%	35,14%	89,90%
WSEP Exp	10,24%	43,38%	96,78%	WSEP Exp	12,26%	49,80%	97,88%
WSEP Norm	10,36%	43,68%	96,98%	WSEP Norm	12,40%	50,76%	98,10%
Enc-New	11,52%	44,28%	97,92%	Enc-New	16,18%	57,26%	99,28%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	5,46%	26,96%	88,56%	CW	5,64%	30,48%	89,22%
SEP	6,24%	22,54%	74,52%	SEP	6,20%	23,68%	73,80%
WSEP Exp	8,10%	33,16%	90,30%	WSEP Exp	7,96%	34,28%	89,54%
WSEP Norm	8,06%	33,62%	90,56%	WSEP Norm	8,06%	34,52%	89,92%
Enc-New	14,22%	48,00%	97,62%	Enc-New	16,20%	56,90%	98,74%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	2,64%	14,14%	58,40%	CW	2,18%	13,60%	57,74%
SEP	3,76%	11,82%	41,06%	SEP	3,06%	11,56%	41,18%
WSEP Exp	3,92%	15,88%	58,60%	WSEP Exp	3,24%	15,38%	57,90%
WSEP Norm	3,88%	15,96%	59,02%	WSEP Norm	3,22%	15,42%	58,10%
Enc-New	14,00%	45,66%	95,00%	Enc-New	14,64%	48,44%	95,44%

Notes: See notes of Table A.1.

Table A.39. Raw Power DGP 3 (Nominal size of 10%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	31,58%	69,92%	99,46%	CW	37,64%	79,38%	99,82%
SEP	30,44%	64,56%	98,74%	SEP	37,02%	74,08%	98,96%
WSEP Exp	34,08%	71,58%	99,62%	WSEP Exp	43,78%	82,48%	99,76%
WSEP Norm	33,94%	71,24%	99,54%	WSEP Norm	43,38%	82,18%	99,80%
Enc-New	36,76%	76,28%	99,78%	Enc-New	47,58%	87,40%	99,98%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	30,48%	65,42%	98,60%	CW	33,50%	71,20%	98,52%
SEP	32,02%	60,80%	95,98%	SEP	32,44%	63,70%	94,76%
WSEP Exp	36,94%	69,90%	98,72%	WSEP Exp	37,90%	72,86%	98,20%
WSEP Norm	36,68%	69,42%	98,74%	WSEP Norm	37,74%	72,30%	98,14%
Enc-New	42,52%	79,18%	99,72%	Enc-New	46,88%	86,18%	99,90%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	26,94%	51,50%	90,32%	CW	25,96%	51,74%	89,92%
SEP	25,66%	44,56%	80,84%	SEP	25,32%	44,28%	79,36%
WSEP Exp	29,12%	52,74%	88,72%	WSEP Exp	28,52%	52,46%	88,06%
WSEP Norm	29,20%	52,58%	88,46%	WSEP Norm	28,36%	52,28%	87,80%
Enc-New	40,84%	74,80%	98,62%	Enc-New	41,72%	78,48%	98,90%

Notes: See notes of Table A.1.

Table A.40. Raw Power DGP 3 (Nominal size of 5%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	20,68%	57,84%	98,80%	CW	26,56%	69,18%	99,62%
SEP	20,66%	52,54%	96,94%	SEP	25,14%	61,28%	97,80%
WSEP Exp	24,46%	61,80%	98,92%	WSEP Exp	30,72%	72,80%	99,40%
WSEP Norm	24,36%	61,36%	98,84%	WSEP Norm	30,80%	72,16%	99,38%
Enc-New	26,40%	66,26%	99,46%	Enc-New	35,68%	79,00%	99,94%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	19,56%	52,30%	96,98%	CW	21,54%	58,00%	96,78%
SEP	20,48%	47,34%	91,38%	SEP	20,64%	49,32%	89,78%
WSEP Exp	24,98%	57,36%	97,16%	WSEP Exp	24,84%	59,58%	95,70%
WSEP Norm	24,86%	56,82%	96,96%	WSEP Norm	24,74%	58,90%	95,62%
Enc-New	30,14%	69,70%	99,50%	Enc-New	35,66%	78,86%	99,82%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	15,50%	37,28%	81,96%	CW	13,98%	36,94%	81,80%
SEP	14,70%	31,22%	68,02%	SEP	14,38%	31,00%	67,76%
WSEP Exp	17,24%	38,30%	79,74%	WSEP Exp	16,48%	36,94%	78,58%
WSEP Norm	17,04%	38,10%	79,00%	WSEP Norm	16,30%	36,72%	78,24%
Enc-New	30,50%	66,68%	97,90%	Enc-New	31,36%	69,46%	98,08%

Notes: See notes of Table A.1.

Table A.41. Raw Power DGP 3 (Nominal size of 1%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	6,82%	34,14%	95,50%	CW	9,00%	44,02%	97,42%
SEP	7,44%	31,26%	89,68%	SEP	8,40%	35,14%	89,90%
WSEP Exp	9,90%	40,82%	96,10%	WSEP Exp	11,70%	46,76%	97,02%
WSEP Norm	9,76%	40,28%	95,98%	WSEP Norm	11,34%	46,14%	96,90%
Enc-New	11,52%	44,28%	97,92%	Enc-New	16,18%	57,26%	99,28%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	5,46%	26,96%	88,56%	CW	5,64%	30,48%	89,22%
SEP	6,24%	22,54%	74,52%	SEP	6,20%	23,68%	73,80%
WSEP Exp	7,92%	31,14%	87,76%	WSEP Exp	7,66%	31,54%	86,84%
WSEP Norm	7,98%	30,70%	87,18%	WSEP Norm	7,60%	31,16%	86,46%
Enc-New	14,22%	48,00%	97,62%	Enc-New	16,20%	56,90%	98,74%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	2,64%	14,14%	58,40%	CW	2,18%	13,60%	57,74%
SEP	3,76%	11,82%	41,06%	SEP	3,06%	11,56%	41,18%
WSEP Exp	3,94%	15,10%	54,86%	WSEP Exp	3,36%	14,90%	54,68%
WSEP Norm	3,86%	14,84%	54,24%	WSEP Norm	3,30%	14,70%	54,02%
Enc-New	14,00%	45,66%	95,00%	Enc-New	14,64%	48,44%	95,44%

Notes: See notes of Table A.1.

Table A.42. Raw Power DGP 4 (Nominal size of 5%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	3,92%	3,96%	9,20%	CW	4,36%	5,88%	11,92%
SEP	4,70%	4,70%	9,26%	SEP	5,10%	6,16%	12,34%
WSEP Exp	4,84%	4,90%	11,04%	WSEP Exp	5,44%	7,44%	15,16%
WSEP Norm	4,84%	5,12%	11,20%	WSEP Norm	5,54%	7,66%	15,40%
Enc-New	10,42%	13,06%	21,80%	Enc-New	11,48%	14,60%	26,58%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	4,16%	5,16%	10,54%	CW	4,92%	6,14%	12,24%
SEP	4,32%	5,18%	10,46%	SEP	4,30%	5,62%	10,56%
WSEP Exp	5,46%	5,86%	12,62%	WSEP Exp	5,20%	6,92%	13,66%
WSEP Norm	5,40%	5,98%	12,82%	WSEP Norm	5,46%	7,04%	13,72%
Enc-New	12,24%	13,68%	24,58%	Enc-New	12,58%	15,10%	27,50%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	5,06%	6,04%	9,80%	CW	5,22%	7,14%	10,04%
SEP	4,90%	5,36%	7,54%	SEP	4,96%	5,12%	7,72%
WSEP Exp	5,44%	6,12%	9,62%	WSEP Exp	5,34%	6,96%	10,48%
WSEP Norm	5,44%	6,10%	9,78%	WSEP Norm	5,52%	7,38%	10,68%
Enc-New	12,52%	14,42%	25,40%	Enc-New	12,94%	15,10%	25,56%

Notes: See notes of Table A.1.

Table A.43. Raw Power DGP 4 (Nominal size of 1%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	0,80%	0,78%	2,62%	CW	0,90%	1,18%	3,86%
SEP	0,94%	0,78%	2,44%	SEP	0,82%	1,40%	3,02%
WSEP Exp	0,92%	1,10%	3,32%	WSEP Exp	1,10%	1,64%	4,56%
WSEP Norm	0,96%	1,18%	3,34%	WSEP Norm	1,08%	1,66%	4,54%
Enc-New	3,68%	4,44%	9,10%	Enc-New	3,64%	4,94%	10,34%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	0,78%	0,94%	2,78%	CW	0,70%	1,34%	3,56%
SEP	0,84%	0,76%	2,68%	SEP	0,68%	0,96%	2,84%
WSEP Exp	0,92%	0,94%	3,42%	WSEP Exp	0,80%	1,38%	3,96%
WSEP Norm	0,96%	0,96%	3,44%	WSEP Norm	0,78%	1,40%	4,12%
Enc-New	3,94%	4,16%	9,98%	Enc-New	3,74%	4,50%	10,34%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	0,48%	0,88%	2,18%	CW	0,44%	1,08%	2,48%
SEP	0,72%	0,98%	1,60%	SEP	0,74%	1,00%	1,70%
WSEP Exp	0,50%	1,00%	2,08%	WSEP Exp	0,56%	1,08%	2,60%
WSEP Norm	0,54%	1,12%	2,14%	WSEP Norm	0,56%	1,06%	2,64%
Enc-New	3,98%	4,00%	9,04%	Enc-New	4,40%	4,36%	9,36%

Notes: See notes of Table A.1.

Table A.44. Raw Power DGP 4 (Nominal size of 10%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	7,46%	8,44%	16,34%	CW	8,54%	10,70%	20,24%
SEP	9,32%	9,98%	16,78%	SEP	9,98%	12,18%	21,02%
WSEP Exp	9,34%	10,18%	18,48%	WSEP Exp	10,78%	13,04%	24,02%
WSEP Norm	9,32%	10,16%	18,30%	WSEP Norm	10,78%	13,00%	23,74%
Enc-New	17,12%	19,70%	31,88%	Enc-New	19,06%	23,06%	37,76%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	9,36%	10,14%	17,70%	CW	9,86%	11,52%	19,88%
SEP	9,64%	10,92%	18,44%	SEP	8,96%	11,36%	19,44%
WSEP Exp	10,60%	11,34%	20,76%	WSEP Exp	10,58%	12,90%	22,08%
WSEP Norm	10,74%	11,48%	20,58%	WSEP Norm	10,62%	13,06%	21,78%
Enc-New	19,96%	22,52%	35,10%	Enc-New	19,80%	24,50%	37,68%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	10,24%	12,08%	17,50%	CW	10,76%	13,84%	18,56%
SEP	9,80%	10,72%	15,10%	SEP	9,68%	11,24%	15,24%
WSEP Exp	10,48%	11,96%	17,14%	WSEP Exp	11,10%	13,04%	17,78%
WSEP Norm	10,58%	12,02%	16,96%	WSEP Norm	10,96%	13,02%	17,62%
Enc-New	20,64%	23,10%	35,62%	Enc-New	20,58%	25,18%	36,84%

Notes: See notes of Table A.1.

Table A.45. Raw Power DGP 4 (Nominal size of 5%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	3,92%	3,96%	9,20%	CW	4,36%	5,88%	11,92%
SEP	4,70%	4,70%	9,26%	SEP	5,10%	6,16%	12,34%
WSEP Exp	4,98%	5,22%	10,68%	WSEP Exp	5,34%	6,96%	14,56%
WSEP Norm	5,00%	5,20%	10,70%	WSEP Norm	5,32%	6,78%	14,28%
Enc-New	10,42%	13,06%	21,80%	Enc-New	11,48%	14,60%	26,58%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	4,16%	5,16%	10,54%	CW	4,92%	6,14%	12,24%
SEP	4,32%	5,18%	10,46%	SEP	4,30%	5,62%	10,56%
WSEP Exp	5,12%	5,58%	12,00%	WSEP Exp	4,82%	6,62%	12,90%
WSEP Norm	5,14%	5,42%	11,98%	WSEP Norm	4,88%	6,54%	12,82%
Enc-New	12,24%	13,68%	24,58%	Enc-New	12,58%	15,10%	27,50%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	5,06%	6,04%	9,80%	CW	5,22%	7,14%	10,04%
SEP	4,90%	5,36%	7,54%	SEP	4,96%	5,12%	7,72%
WSEP Exp	5,28%	5,96%	9,06%	WSEP Exp	5,18%	6,54%	9,86%
WSEP Norm	5,24%	6,00%	9,18%	WSEP Norm	5,14%	6,56%	9,72%
Enc-New	12,52%	14,42%	25,40%	Enc-New	12,94%	15,10%	25,56%

Notes: See notes of Table A.1.

Table A.46. Raw Power DGP 4 (Nominal size of 1%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	0,80%	0,78%	2,62%	CW	0,90%	1,18%	3,86%
SEP	0,94%	0,78%	2,44%	SEP	0,82%	1,40%	3,02%
WSEP Exp	0,96%	0,98%	3,18%	WSEP Exp	1,00%	1,56%	4,40%
WSEP Norm	0,92%	0,96%	3,14%	WSEP Norm	1,04%	1,56%	4,34%
Enc-New	3,68%	4,44%	9,10%	Enc-New	3,64%	4,94%	10,34%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	0,78%	0,94%	2,78%	CW	0,70%	1,34%	3,56%
SEP	0,84%	0,76%	2,68%	SEP	0,68%	0,96%	2,84%
WSEP Exp	0,90%	0,90%	3,54%	WSEP Exp	0,78%	1,34%	3,70%
WSEP Norm	0,92%	0,82%	3,42%	WSEP Norm	0,72%	1,30%	3,80%
Enc-New	3,94%	4,16%	9,98%	Enc-New	3,74%	4,50%	10,34%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	0,48%	0,88%	2,18%	CW	0,44%	1,08%	2,48%
SEP	0,72%	0,98%	1,60%	SEP	0,74%	1,00%	1,70%
WSEP Exp	0,56%	0,94%	2,18%	WSEP Exp	0,62%	1,08%	2,42%
WSEP Norm	0,54%	0,96%	2,08%	WSEP Norm	0,58%	1,08%	2,52%
Enc-New	3,98%	4,00%	9,04%	Enc-New	4,40%	4,36%	9,36%

Notes: See notes of Table A.1.

Table A.47. Raw Power DGP 5 (Nominal size of 5%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	14,80%	35,74%	77,44%	CW	21,52%	50,30%	86,10%
SEP	15,66%	40,02%	89,58%	SEP	22,24%	53,14%	94,66%
WSEP Exp	18,16%	44,28%	90,62%	WSEP Exp	25,72%	60,18%	94,64%
WSEP Norm	17,92%	44,18%	90,78%	WSEP Norm	25,82%	60,18%	94,60%
Enc-New	27,58%	60,36%	93,12%	Enc-New	38,76%	73,54%	96,34%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	16,98%	40,02%	79,30%	CW	19,78%	44,78%	82,90%
SEP	16,96%	40,80%	87,92%	SEP	19,00%	44,28%	90,26%
WSEP Exp	20,10%	46,90%	89,86%	WSEP Exp	21,96%	50,62%	92,02%
WSEP Norm	20,10%	46,96%	90,00%	WSEP Norm	22,04%	50,90%	91,90%
Enc-New	33,06%	67,88%	94,50%	Enc-New	40,70%	73,46%	96,40%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	14,68%	34,02%	70,40%	CW	15,28%	34,36%	70,58%
SEP	13,32%	30,10%	73,44%	SEP	14,54%	31,26%	72,54%
WSEP Exp	14,90%	35,80%	78,96%	WSEP Exp	16,00%	36,82%	78,80%
WSEP Norm	15,04%	35,80%	78,76%	WSEP Norm	16,10%	37,10%	78,82%
Enc-New	35,78%	67,52%	93,70%	Enc-New	39,44%	69,02%	94,50%

Notes: See notes of Table A.1.

Table A.48. Raw Power DGP 5 (Nominal size of 1%, $\lambda = 1$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	3,78%	16,98%	62,38%	CW	7,06%	27,76%	74,28%
SEP	4,26%	19,60%	77,54%	SEP	7,62%	28,80%	87,18%
WSEP Exp	5,02%	23,50%	80,36%	WSEP Exp	9,14%	35,34%	89,02%
WSEP Norm	5,02%	23,52%	80,74%	WSEP Norm	9,28%	35,48%	89,02%
Enc-New	15,16%	45,00%	89,92%	Enc-New	23,56%	61,00%	94,70%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	4,30%	18,74%	62,36%	CW	5,24%	21,28%	66,18%
SEP	4,96%	18,42%	73,26%	SEP	5,48%	21,16%	76,06%
WSEP Exp	5,36%	23,50%	77,96%	WSEP Exp	6,40%	26,18%	81,42%
WSEP Norm	5,38%	23,48%	78,14%	WSEP Norm	6,34%	26,30%	81,18%
Enc-New	17,94%	51,68%	91,72%	Enc-New	23,10%	59,36%	94,66%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	2,36%	11,70%	46,94%	CW	2,50%	12,80%	45,92%
SEP	3,14%	10,54%	48,18%	SEP	2,92%	11,56%	47,28%
WSEP Exp	2,98%	13,92%	56,78%	WSEP Exp	2,78%	14,62%	55,52%
WSEP Norm	2,96%	14,08%	56,96%	WSEP Norm	2,96%	14,60%	55,38%
Enc-New	19,90%	51,96%	90,46%	Enc-New	24,04%	56,20%	92,00%

Notes: See notes of Table A.1.

Table A.49. Raw Power DGP 5 (Nominal size of 10%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	24,14%	48,34%	83,74%	CW	32,30%	61,26%	90,18%
SEP	25,50%	51,92%	93,32%	SEP	33,02%	66,18%	96,74%
WSEP Exp	27,46%	56,52%	94,66%	WSEP Exp	36,52%	70,40%	96,98%
WSEP Norm	27,42%	56,44%	94,72%	WSEP Norm	36,42%	70,16%	97,08%
Enc-New	36,14%	67,72%	94,04%	Enc-New	49,80%	79,46%	97,08%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	27,84%	52,64%	85,86%	CW	31,26%	57,10%	88,48%
SEP	27,18%	54,00%	92,68%	SEP	30,04%	57,80%	94,40%
WSEP Exp	30,42%	59,26%	94,16%	WSEP Exp	33,48%	63,44%	95,46%
WSEP Norm	29,98%	59,08%	94,10%	WSEP Norm	33,36%	63,12%	95,50%
Enc-New	43,14%	73,82%	95,24%	Enc-New	50,44%	79,50%	96,90%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	25,80%	47,16%	79,70%	CW	26,58%	48,00%	79,74%
SEP	22,84%	43,34%	82,98%	SEP	24,36%	44,02%	82,90%
WSEP Exp	25,82%	48,28%	86,98%	WSEP Exp	26,88%	49,68%	87,06%
WSEP Norm	25,76%	47,92%	86,84%	WSEP Norm	27,00%	49,58%	86,92%
Enc-New	44,34%	73,34%	94,96%	Enc-New	48,00%	75,08%	95,52%

Notes: See notes of Table A.1.

Table A.50. Raw Power DGP 5 (Nominal size of 5%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	14,80%	35,74%	77,44%	CW	21,52%	50,30%	86,10%
SEP	15,66%	40,02%	89,58%	SEP	22,24%	53,14%	94,66%
WSEP Exp	17,48%	44,32%	91,36%	WSEP Exp	25,38%	59,88%	95,42%
WSEP Norm	17,24%	44,12%	91,52%	WSEP Norm	25,04%	59,66%	95,46%
Enc-New	27,58%	60,36%	93,12%	Enc-New	38,76%	73,54%	96,34%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	16,98%	40,02%	79,30%	CW	19,78%	44,78%	82,90%
SEP	16,96%	40,80%	87,92%	SEP	19,00%	44,28%	90,26%
WSEP Exp	19,22%	46,42%	90,74%	WSEP Exp	21,34%	50,12%	92,62%
WSEP Norm	18,86%	46,06%	90,76%	WSEP Norm	21,12%	49,68%	92,66%
Enc-New	33,06%	67,88%	94,50%	Enc-New	40,70%	73,46%	96,40%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	14,68%	34,02%	70,40%	CW	15,28%	34,36%	70,58%
SEP	13,32%	30,10%	73,44%	SEP	14,54%	31,26%	72,54%
WSEP Exp	14,58%	34,86%	79,36%	WSEP Exp	15,88%	35,80%	79,04%
WSEP Norm	14,52%	34,72%	79,32%	WSEP Norm	15,66%	35,68%	78,88%
Enc-New	35,78%	67,52%	93,70%	Enc-New	39,44%	69,02%	94,50%

Notes: See notes of Table A.1.

Table A.51. Raw Power DGP 5 (Nominal size of 1%, $\lambda = 2$)

Rolling				Recursive			
T+1	100	300	1000	T+1	100	300	1000
		R/(T+1)=0.25				R/(T+1)=0.25	
CW	3,78%	16,98%	62,38%	CW	7,06%	27,76%	74,28%
SEP	4,26%	19,60%	77,54%	SEP	7,62%	28,80%	87,18%
WSEP Exp	4,84%	23,38%	81,52%	WSEP Exp	9,06%	34,70%	89,86%
WSEP Norm	4,84%	23,38%	81,80%	WSEP Norm	9,08%	34,78%	89,94%
Enc-New	15,16%	45,00%	89,92%	Enc-New	23,56%	61,00%	94,70%
		R/(T+1)=0.5				R/(T+1)=0.5	
CW	4,30%	18,74%	62,36%	CW	5,24%	21,28%	66,18%
SEP	4,96%	18,42%	73,26%	SEP	5,48%	21,16%	76,06%
WSEP Exp	5,58%	22,64%	78,46%	WSEP Exp	6,38%	25,80%	82,38%
WSEP Norm	5,60%	22,64%	78,54%	WSEP Norm	6,32%	25,56%	82,42%
Enc-New	17,94%	51,68%	91,72%	Enc-New	23,10%	59,36%	94,66%
		R/(T+1)=0.75				R/(T+1)=0.75	
CW	2,36%	11,70%	46,94%	CW	2,50%	12,80%	45,92%
SEP	3,14%	10,54%	48,18%	SEP	2,92%	11,56%	47,28%
WSEP Exp	3,14%	13,42%	56,86%	WSEP Exp	3,00%	14,60%	55,94%
WSEP Norm	3,18%	13,34%	56,50%	WSEP Norm	3,00%	14,42%	56,00%
Enc-New	19,90%	51,96%	90,46%	Enc-New	24,04%	56,20%	92,00%

Notes: See notes of Table A.1.

Figure A.1: Power dynamics for lambda. DGP 5, rolling windows R/(T+1)=0.25. T+1=300 (Nominal size 10%)

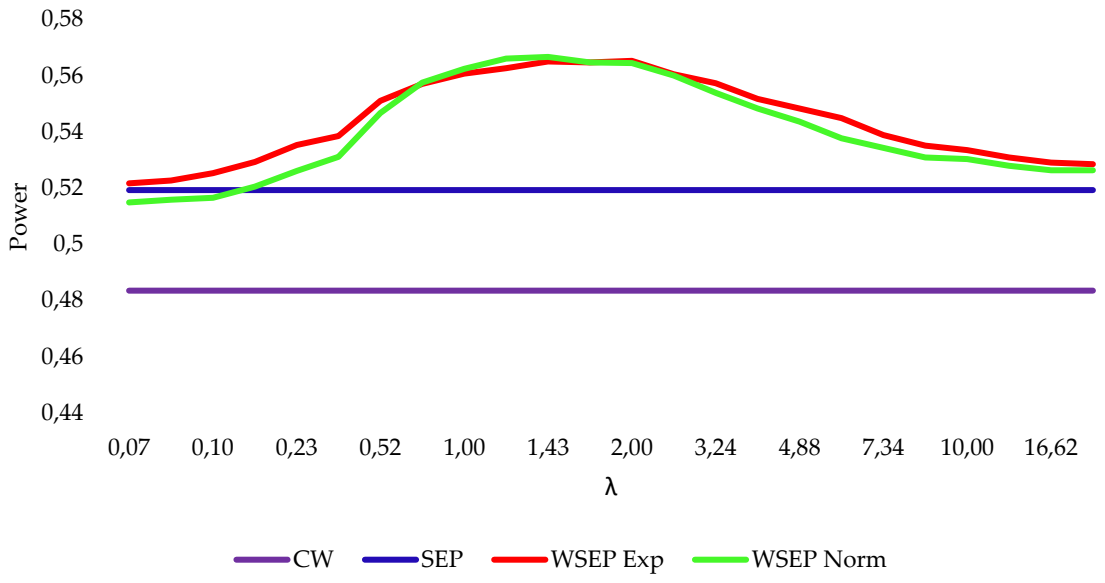

Figure A.2*:* Power dynamics for lambda. DGP 5, rolling windows R/(T+1)=0.5. T+1=300 (Nominal size 10%)

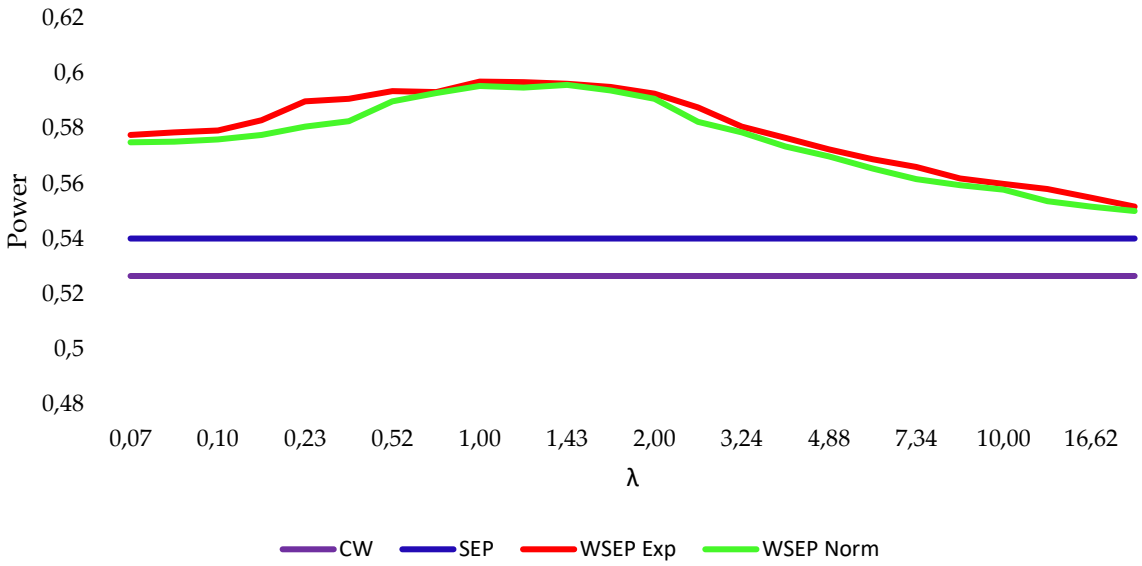

Figure A.3: Power dynamics for lambda. DGP 5, rolling windows R/(T+1)=0.75. T+1=300 (Nominal size 10%)

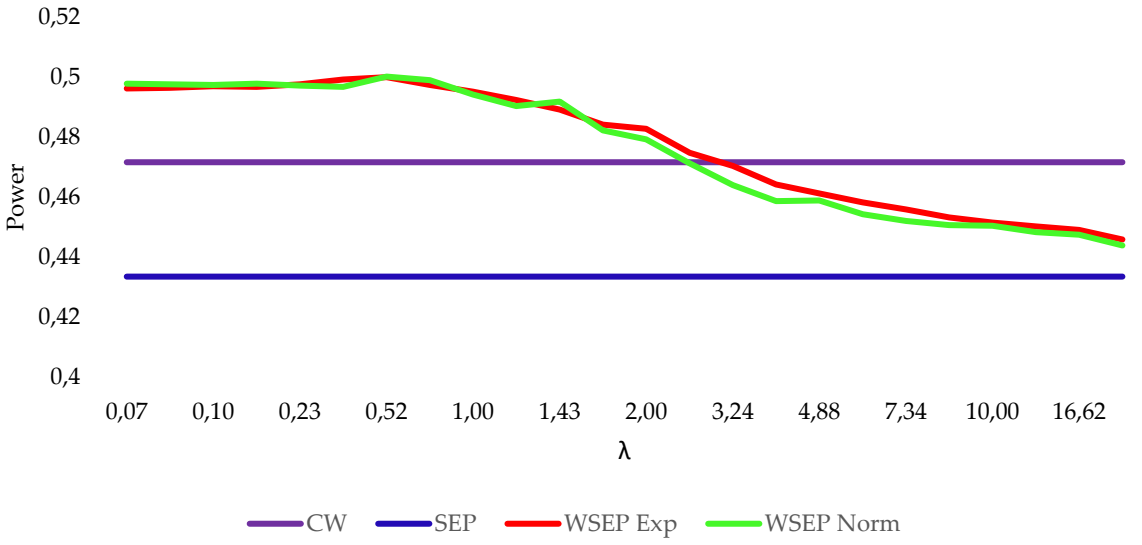

Table A.52. Empirical application tests statistics, setting 1

WSEP EXP									
	LMEX	Copper	Brent	WTI	Nickel	Aluminum	Zinc	Lead	Tin
CLP	2,128**	2,154**	2,473***	1,373*	0,612	1,234	0,166	1,324*	2,267**
CAD	0,608	0,772	1,503*	0,052	0,400	0,667	0,866	1,625*	-0,271
AUD	0,987	-0,080	1,807**	1,011	0,792	0,536	-0,292	0,642	2,197**
NZD	-0,198	-0,939	0,948	-0,677	-1,098	-0,004	-1,217	1,166	2,177**
NOK	0,172	0,828	1,97**	1,091	0,173	-0,169	-0,212	-0,199	-0,021
ZAR	0,999	0,500	1,256	0,006	0,220	-0,685	-0,376	1,42*	1,43*
ISK	-0,383	-0,564	0,566	0,621	-0,443	1,744**	-0,172	1,416*	0,888
WSEP NORM									
	LMEX	Copper	Brent	WTI	Nickel	Aluminum	Zinc	Lead	Tin
CLP	2,17**	2,187**	2,499***	1,436*	0,640	1,318*	0,246	1,362*	2,298**
CAD	0,495	0,647	1,483*	0,048	0,388	0,557	0,844	1,63*	-0,287
AUD	1,022	-0,049	1,792**	0,964	0,819	0,488	-0,283	0,617	2,132**
NZD	-0,181	-0,914	1,000	-0,627	-1,022	-0,017	-1,144	1,252	2,163**
NOK	0,156	0,829	1,917**	1,040	0,166	-0,247	-0,266	-0,244	-0,077
ZAR	0,958	0,426	1,248	-0,017	0,191	-0,657	-0,399	1,424*	1,367*
ISK	-0,370	-0,553	0,601	0,654	-0,503	1,752**	-0,186	1,419*	0,895
SEP									
	LMEX	Copper	Brent	WTI	Nickel	Aluminum	Zinc	Lead	Tin
CLP	1,506*	1,645**	2,185**	0,840	0,640	-0,104	-0,122	0,786	1,769**
CAD	1,304*	1,67**	1,717**	-0,134	0,216	0,882	0,964	1,076	-0,276
AUD	1,612*	0,672	1,388*	0,506	0,983	0,643	0,693	1,189	2,652***
NZD	-0,306	-1,096	0,375	-1,013	-1,073	-0,165	-1,980	0,540	1,572*
NOK	0,113	0,158	2,193**	1,153	-0,101	0,056	0,598	-0,512	0,136
ZAR	1,479*	1,265	1,382*	0,233	0,756	-0,658	-0,485	1,607*	1,847**
ISK	-0,247	-0,626	0,381	0,365	0,473	1,286*	-0,373	-0,255	0,286
CW									
	LMEX	Copper	Brent	WTI	Nickel	Aluminum	Zinc	Lead	Tin
CLP	2,005**	2,011**	2,124**	1,672**	0,588	1,546*	-0,106	1,000	1,74**
CAD	0,541	0,506	1,090	0,154	0,040	0,841	-0,524	0,950	0,086
AUD	1,158	1,094	1,801**	1,346*	-0,478	1,077	-1,315	0,912	1,837**
NZD	0,095	-0,295	0,909	0,079	-0,891	0,800	-1,304	0,870	1,849**
NOK	0,658	0,643	1,467*	0,767	-0,049	0,236	-1,410	0,156	-0,083
ZAR	-0,136	-0,586	0,420	-0,423	-0,486	0,048	-1,157	-0,169	0,520
ISK	0,573	0,512	0,151	0,023	-1,294	1,346*	-0,852	1,345*	0,793

Notes: CLP, CAD, AUD, NZD, NOK, ZAR, and ISK stand for Chilean peso, Canadian dollar, Australian Dollar, New Zealand dollar and Norwegian krone, South African Rand, and Icelandic Krona respectively. * $p < 10\%$, ** $p < 5\%$, *** $p < 1\%$.

Table A.53. Empirical application test statistics, setting 2

WSEP EXP									
	LMEX	Copper	Brent	WTI	Nickel	Aluminum	Zinc	Lead	Tin
CLP	2,318**	2,199**	1,947**	1,806**	2,077**	1,060	0,962	1,34*	1,908**
CAD	-0,008	-0,179	1,324*	1,011	-0,632	-0,137	-0,827	0,493	-0,354
AUD	1,214	-0,204	1,339*	1,396*	0,490	0,559	0,890	0,859	1,711**
NZD	0,344	-0,758	1,084	0,983	1,359*	0,136	0,051	1,183	1,069
NOK	0,973	-0,559	1,281	0,941	1,162	0,222	-0,811	0,008	1,159
ZAR	2,016**	0,987	1,708**	1,308*	1,76**	1,172	0,754	1,952**	1,83**
ISK	0,318	0,280	1,95**	1,51*	0,282	0,932	-1,080	0,403	1,514*
WSEP NORM									
	LMEX	Copper	Brent	WTI	Nickel	Aluminum	Zinc	Lead	Tin
CLP	2,335***	2,22**	1,908**	1,795**	2,018**	1,117	1,011	1,376*	1,912**
CAD	-0,020	-0,111	1,322*	1,024	-0,708	-0,182	-0,894	0,536	-0,442
AUD	1,203	-0,243	1,344*	1,421*	0,488	0,516	0,821	0,824	1,658**
NZD	0,303	-0,796	1,164	1,097	1,42*	0,122	0,001	1,270	1,036
NOK	0,956	-0,616	1,228	0,893	1,128	0,194	-0,843	0,000	1,116
ZAR	1,922**	0,925	1,67**	1,282*	1,728**	1,186	0,724	1,96**	1,746**
ISK	0,292	0,213	1,912**	1,469*	0,238	1,002	-0,979	0,464	1,48*
SEP									
	LMEX	Copper	Brent	WTI	Nickel	Aluminum	Zinc	Lead	Tin
CLP	1,979**	1,906**	2,255**	1,913**	2,28**	0,327	0,427	1,165	1,876**
CAD	-0,254	-0,790	1,456*	0,919	-0,126	-0,155	-0,415	-0,418	0,072
AUD	1,394*	0,363	0,992	0,684	0,393	1,118	1,714**	1,107	2,448***
NZD	0,707	-0,324	0,323	0,010	0,434	0,266	0,172	0,672	1,056
NOK	0,898	-0,241	1,888**	1,482*	1,648**	0,501	-0,933	-0,118	1,473*
ZAR	2,349***	1,253	2,335***	1,907**	1,571*	1,005	0,517	1,529*	2,653***
ISK	0,112	0,185	2,287**	2,081**	0,626	0,748	-2,185	-0,544	1,42*
CW									
	LMEX	Copper	Brent	WTI	Nickel	Aluminum	Zinc	Lead	Tin
CLP	2,01**	1,303*	1,652**	1,53*	1,224	1,337*	0,710	1,673**	1,48*
CAD	0,414	-0,479	0,860	0,863	-0,948	0,497	-1,361	1,079	-0,310
AUD	1,074	0,306	1,244	1,396*	0,373	1,056	0,269	1,298*	1,34*
NZD	0,658	-0,634	1,028	0,955	0,751	0,975	-0,993	1,912**	0,827
NOK	0,851	0,321	0,903	0,715	0,632	0,791	-0,953	0,547	0,381
ZAR	0,921	0,073	0,746	0,231	1,224	0,744	-0,336	1,764**	0,818
ISK	1,152	0,580	1,239	0,588	-0,163	0,959	0,749	1,453*	1,232

Notes: CLP, CAD, AUD, NZD, NOK, ZAR, and ISK stand for Chilean peso, Canadian dollar, Australian Dollar, New Zealand dollar and Norwegian krone, South African Rand, and Icelandic Krona respectively. * $p < 10\%$, ** $p < 5\%$, *** $p < 1\%$.