International Journal of Education, Business and Economics Research (IJEBER)

ISSN: 2583-3006

Vol. 6, Issue 6, November-December 2026, pp 65-85

To cite this article: Moncef Belhadjali and Edward J. Luck* (2026). RE-Purposing The RBF-Model: Key Y-Variate Measures- & Graphical-Triage. International Journal of Education, Business and Economics Research (IJEBER) 6 (6): 65-85

RE-PURPOSING THE RBF-MODEL: KEY Y-VARIATE MEASURES- & GRAPHICAL-TRIAGE

Moncef Belhadjali[1]& Edward J. Lusk[*]

[1]School of Business, Norfolk State University: Norfolk, Virginia, USA.
E-mail:mbelhadjali@nsu.edu
ORCID: https://orcid.org/0009-0000-8219-8222

[2] Emeritus: The Wharton School, [Statistics], The University of Pennsylvania, USA & School of Business and Economics [Accounting], SUNY: Plattsburgh, USA &Chair: International School of Management: Otto-von-Guericke, Magdeburg, Germany
E-Mail:luskej@plattsburgh.edu
ORCID: https://orcid.org/0000-0002-6847-5956

https://doi.org/10.59822/IJEBER.2026.6605

ABSTRACT

Context The Rule Based Forecasting Model [RBF] of Collopy & Armstrong (1992) [C&A] has been the progenitor of numerous versions that have offered refinements of their RBF [99-Rules] Model. Most of these progenies offered Rule Reduction Refinements *or* Forecasting Model Consolidation Options. The pistons that drive the RBF Model are: The 99-Rules that offer conditions that suggest and rationalize:(i) *The Modification of the Y-Variate Panel Values, or (ii) The Recalibration of the Forecasting Model Weightings given certain Conditions of the Y-Variates under examination*. ***Simply*** The Decision Analyst [DA] is encouraged to modify :{ The Y-Variates or The FM-Weightings} so as to be better aligned with the FMs engaged to inform the Planning Committee**.** ***Method*** In the spirit of continuing to offer tested options to the ever-growing RBF-corpus, we suggest that the DA examine: (i)Three Y-Variate ***Measures*** that relate to the following ***Features*** suggested by C&A:{***Significant Trends***}&{***Domain Intel***}&{***Uncertainty and Stability***, *as well as* (ii) ***A Chart*** of the Y-Variate under evaluation. With this binary profile, the DA decides if that *Y-Variate* should be transferred to:

{Dossier [I]: Likely to Create Viable Forecasting Intel}, or
{Dossier [II]: Evaluation for Possible Anomalies}

Our measures for C&A's features are: {The Pearson Product Moment Correlation [PPMC]}, {The Pearson Measure of Skewness [$P_{Sk}^{\hat{y}}$]}&{The Coefficient of Variation [CoV]}.We will use:(i) The Chart of the Y-Variate, and (ii) Calibrations of these measures to inform the DA who will decide on the appropriate Dossier to populate for *each* of the Y-Variates evaluated. We will inferentially test the logic of the DA's assignment using the Absolute Percentage Forecasting Error [APE] of these two Dossiers. ***Results*** As expected, the APE-Profile of the Y-Variates in Dossier [I] tested to have superior forecasting acuity relative to the Y-Variates in Dossier [II]. In addition, *as a vetting-*

 Copyright © Author, 2026

ISSN: 2583-3006

Vol. 6, Issue 6, November-December 2026, pp 65-85

confirmation, the measures {PPMC &$P_{Sk}^{\hat{y}}$& CoV} were inferentially different in the expected direction as between :{ Dossier [I] *v.* Dossiers [II]}. We offer a VBA-Computational program, *at no cost as a download*, for creating all of the information to test our protocol: called the Triage Alignment Protocol [TAP].

KEYWORDS: Forecasting Acuity, APE, ETS.

© The Authors 2026
Published Online: November 2026

Published by International Journal of Education, Business and Economics Research (IJEBER) (https://ijeber.com/) Licensed under the Creative Commons Attribution 4.0 International License (CC BY 4.0). https://creativecommons.org/licenses/by/4.0/

1.0 INTRODUCTION: TWEAKING THE RULE BASED FORECASTING MODEL

1.1 Overview There are a plethora of statistical measures that capture various *features* of Y-Variate Panels that can be probed to glean meaningful decision-making intel that portends the ***future***. For many years, we have been actively engaged in forecasting research based largely upon the work of Collopy & Armstrong (1992)[C&A] who created the Rule Based Forecasting Expert System Model. [*See Note 1*] The RBF Model is based on identifying *features* of past data that logically can be used in the 99-Rules to:

I. *Modify the Y-Variate panel* so it better [conforms to/aligns with] the combination of the four forecasting models used to create an aggregate forecast. For example, in the Appendix B: *Adjusting the Historical Data and Identifying Features* [C&A[p. 1409]] note: *Rule* [*1*] **Truncation**: **IF** there are irrelevant early data, **THEN** delete these data. {Prior data are relevant for extrapolation only if the underlying process is stable},*or*

II. *Modify the weighting of the combination of the four forecasting models* so that they better [conform to /align with] the Y-Variate in producing forecasts. For example, Appendix B for the *Short-Range Model: Selecting Smoothing Factors for Level* [*Brown's Alpha*] [p. 1410]: *Rule* [*13*] ***Last Observation Unusual*** **IF** the last observation is unusual, **THEN** subtracts 0.2 from alpha for the short-range model. {Given uncertainty about this observation, its impact is reduced.}

This mode of bi-modification[Y-Variates &Weighting Rules] was demonstrated and tested. Over time it has attained due-acceptance in numerous peer-reviewed outlets. In closing, C&A suggest [p. 1408]:

> *The rule-based forecasting procedure offers promise. We provide our rules as a starting point. Hopefully, they will be replaced by simpler and fewer rules.*

C&A's RBF Model was the motivation for our study. Our extensive RBF-research and collaborations have piqued our interest inre-purposing the generic spirit of the RBF Model. Experientially, we have re-formed certain of C&As basic concepts to create a simple triage screen that can be used to *select Y-Variates* that would likely align with the assumption-set of the *adaptive Excel*™ Holt-Winters Linear Exponential Smoothing Forecasting Model. [See *Excel* [FORECAST.ETS]. We have selected the ETSFM as it seems to best fit in the assumption sets of

ISSN: 2583-3006

Vol. 6, Issue 6, November-December 2026, pp 65-85

the most of the four FMs used in the RBF Model. *We call our protocol*: *The Triage Alignment Protocol* [TAP]; *to wit*, our suggestions of a re-engineered version of C&As RBF Model—i.e., the TAP components offered are:

I. Our re-vision of the RBF Model is conditioned on the Nature of the Y-Variates. This is the usual screening phase in Data Analytics. *EnBref*: If there is no-evidence of association among the Measures used to characterize the Y-Variates to be forecasted, then collecting Measure-intel is a moot activity. For example, this is same screen used in Factor Analysis since Harman [1976] penned to seminal work,

II. Select key Y-Variate ***Features*** used by C&A to create the information to parameterize their RBF-Rules,

III. Select and rationalize Y-Variate ***Measures*** that capture the essential nature of each of these ***selected*** key features,

IV. For each Y-Variate selected from the collection of possible Y-Variates [*of prior data*], present to the Decision Analyst [DA]:

(i) The Graphic Profile of the longitudinal panel of the Y-Variate &
(ii) The Y-Variate Profile of the selected measures,

V. The DA will assign each Y-Variate to one of the following ***Dossiers***:

(i) Dossier[I]*:* [*Y-Variates to be Retained as Possible Candidates for use in the ETS FM*],*or*
(ii) Dossier[II]*:* [*Y-Variates to be Further Evaluated for Possible Anomalies*],

VI. The ETS FM will be used to create ***one-period-ahead forecasts*** for each of the Y-Variates in each of the Dossiers,

VII. For inferentially testing the ***Acuity*** of these forecasts, we will use the same acuity measure used by C&A—The Absolute Percentage Error [*APE*]; further, for selecting the Y-Variates, we will use a random sample of the Y-Variates from the Makridakis*et al* (1982) dataset: [***The M-Study***] which was also used by C&A to develop and test the RBF Model, *and*

VIII. Our *a prior* inferential expectation is that the APE-Profile of Dossier [I] will exhibit an APE-Profile that will test to ***Reject*** the FPE [H_o: of *No Effect*[In the obvious direction]] re: the APE-Profiles of the Y-Variates assigned to Dossiers [II].

1.2 Features Selected for the TAP Following is an overview of C&A's synopsis of the operational profile of their RBF Model:

> *As expected, the gains in accuracy were largest for series for* ***significant trends***, ***low uncertainly***, ***stability***, *and* ***good domain knowledge***. [p.1408 [**Bolding Added**]]

According to C&A, these features seem to be the key aspects of the Y-Variates that determine the acuity of the forecasts of their RBF Model. As consultants and in our university setting as instructors, we have worked with C&A's RBF Model and offered refinements to their basic RBF Model. In our view, these accuracy gains of the RBF Model, noted by C&A, suggest the following measures:

 Copyright © Author, 2026

ISSN: 2583-3006

Vol. 6, Issue 6, November-December 2026, pp 65-85

1.2.1 For ***Significant Trends, w****e* have selected as the measure The *Pearson Produce Moment Correlation* [PPMC] as our measure for screening the Y-Variates. In Excel, the PPMC is computed as:

PPMC≡CORREL [*Values of the Y-Variate, The matched*: *Unit-time Index*]

Rationale The PPMC is sensitive to the *monotonic* change in the Y-Variate values. The range of the PPMC is:

[**–1** Perfect Inverse Association, - - -, **0**[No Association], - - -, **+1**[Perfect Positive Association]]

We will make one change in this measure for use in the TAP. We prefer the non-directional calibration of the PPMC; in this case, we will use the Absolute Value of the PPMCs:—i.e., ABS [PPMC]; thus, for certain illustrations our range will be: ABS[PPMC[**0**,- - -, **+1]].**

1.2.2 For ***Uncertainty & Stability***, we have selected The *Coefficient of Variation* [CoV].
The definition of the CoV in the Excel is:

CoV ≡ [The STDEVA [Y-Panel]] / [AVERAGE[Y-Panel]]

Thus, by definition, the CoV is a *unit-neutral* measure. This is critical as it enables the inferential comparison of various Y-Panels unfettered by magnitude differences in the normal AIS-measures of the Y-Variates. For example, if Inventory is measured in *Dollars* and Annual Return on Investment is measured as a *Percentage* they could be logically compared by examining their CoVs over time. ***Calibration Note*** There is a general belief that that higher CoVs compromise inferential analyses. ***This begs the question:*** What is a high CoV? C&A[Table 1: **p.1402]** have used a CoV **of > 20%**as a likely an indication that the acuity of a FM would be rather low; and thus, such forecasting intel would not provide useful information to the Planning Committee However, we prefer and recommend *Investopedia*™'s opinion on calibrating the Nature of the CoV:

> *"No set value can be considered universally "good." However, generally speaking, it is often the case that a lower coefficient of variation is more desirable, as that would suggest a lower spread of data values relative to the mean.*"

Consistent with this generalization, we find that often the CoV can be used as an *ancillary measure* after {The PPMC &The$P_{Sk}^{\hat{y}}$} have been profiled and offer their joint-screening intel. For example, after {The PPMC & The$P_{Sk}^{\hat{y}}$}-joint-profile is known, *sometimes* the magnitude of the CoV of the Y-Variate offers useful benchmarking intel. In this case, it is often wise to probe that Y-Variate. In this case, the Y-Variate is usually transferred to Dossier [II].

1.2.3For ***Good Domain Knowledge****, we used Pearson's Skewness Coefficient*.
The Excel-computational definition of Pearson Skewness is:

 Copyright © Author, 2026

ISSN: 2583-3006

Vol. 6, Issue 6, November-December 2026, pp 65-85

$$[P_{Sk}^{\hat{y}}] \equiv [3 \times [\text{AVERAGE–MEDIAN}]] / [\text{STDEVA[Y-Panel]}]$$

Rationale The *Tour de Force* of the $[P_{Sk}^{\hat{y}}]$ is the detection of *outliers* in a Y-Variate panel. This occurs when the value of the Mean's displacement*wrt*to the Median is relatively large. In such cases, the DA, using experiential *domain* knowledge, decides if there were indeed Y-Variate panel values that would qualify *as aberrant observations*—i.e., *outliers* for the Y-Variate under examination.

All three of these features and measures offer *sensitive* as well as *specific* profiles over the longitudinal projection of the Y-Variate Panels. In the context of our research report, the interaction of these three measures is critical to our study goals.

2.0 THE ETS FORECASTING MODEL & THE MEASURE OF FORECASTING ACUITY

2.1 The Forecasting Model We have selected the ETS FM as it has an adaptive modular *sub-program* to screen the Y-Variates and detect: If the Holt FM[Linear [Slope &Intercept]Exponential Smoothing] *or* the [Winters Version[which is sensitive to systemic-cycles]] is the OLS-best choice for the FM. In addition, the Excel[ETS]-version has: (i)A *Missing Value Patch*-module; we used the default which is the Near-Neighbor Rule to fill in any missing values in the Y-Variate Panel, and (ii) An *Aggregation*-module that, for the default, uses the Average of the values for instances where the same time index is affixed to different data. We used these defaults for the ETS; however, neither of these instances occurred for our data. Thus, the ETS FM seems an excellent model for the TAP as it seems to align with most of the assumptions of the four FMs of the RBF Model. ***Note*** If the Y-Variate has a linear presentation, the ETS [Holt *Smoothing*] FM will usually give a different forecasting profile than will be the case for the standard OLSR Linear Regression FM.

2.2The Measure of Forecasting Acuity There are many measures that have been used to calibrate FM-acuity. We have selected the Absolute Percentage Error [APE] of the ETS FM. Traditionally; we find this measure to be simple, transparent, and meaningful in the planning context. This was one of the *many* measures used in the first M-Competition. See Makridakis*et al* (1982) [*The M-Study*] and later adopted by Collopy and Armstrong (1992). See Armstrong & Collopy (1992). In addition, the APE Measure is currently used in many forecasting peer reviewed research publications. See:[Inayati, Iriawan, Irhamah&Isnaini(2025)]. Computationally, the ETS Forecast and computes the ratio:

$$\text{APE} \equiv \text{ABS}([\text{ETS Forecast} - \text{Actual}] / \text{Actual})$$

Where: ABS is the absolute-value Excel function, the numerator is the non-directional difference between: The Forecast and the Actual Y-Variate value at the time period of the forecast, divided by the Actual Value, ***Simply*** The APE is the percentage of the non-directional error that the forecasting is relative to the Actual Value.

 Copyright © Author, 2026

ISSN: 2583-3006

Vol. 6, Issue 6, November-December 2026, pp 65-85

3.0 INTERACTIONS OF: {[PPMC] & [$P_{Sk}^{\hat{y}}$] &*COV* [$\bar{y}$]}: VALUABLE VETTING MARKERS

3.1Overview Assuming that there is association for the Y-Variates and the{[PPMC] &[$P_{Sk}^{\hat{y}}$] &*CoV* [$\bar{y}$]}, then the TAP re-vision of C&A's RBF Model uses the nature of these interactions as the parameters of the TAP screening protocol; and thus, these parameters are guidelines for populating Dossiers [I& II]. Our rationalization, and effectively our justification, for *eliminating* certain Y-Variate panels as "*not aligned with the recorded past that will offer reliably useful intel for the Planning Committee*" is drawn from C&A's suggestion: *Appendix B* [The Rule Base[Rule [3] : *Observations Adjusted* [*p.1409*]:

> *IF observations are judged to be irregular based upon domain knowledge, THEN, adjust the observations prior to analysis to remove their short-term effects. {The transitory effects of unusual events should not have an impact on the forecast, thus the observations should be adjusted.}*

3.2 Caveat Indeed, such modification recommendations as presented C&A's Rules are rarely suggested and documented in the usual peer-reviewed-context. We have taken C&A's Rules to indicate that such Y-Variate panel modifications logically extend to ***eliminations*** of Y-Variates by ***removal***. *Removal*, we argue is more objective than Y-Variate Panel Sub-section panel modification. To offer a counterpoint, most all of our forecasting colleagues have offered the following comment [*Paraphrased*]:

> *Time series forecasting has a long and valued tradition to encourage the use of any means possible: Mathematical Formulae, Stochastic Models, Experiential-Judgment, Random-Walks individually or in selected combinations as **the** Forecasting Model; however, such un-bridled freedom does not **ever** extend to altering the past data that will be used to form these forecasts. **Simply**, **if** you alter the past data, however you rationalize your intentions, **then** you are no longer in that unique forecasting domain!*

However, whether altering past data encompasses *Elimination* of Y-Variates that were in some ways judged to be "Anomalous or Irregular" and thus, logical candidates for Dossier [II] is a nontrivial, *most* interesting, question!

Consider now, these *a priori* TAP guidelines.

4.0 GUIDELINE-CODEX FOR THE TAP SCREENING OF Y-VARIATES

4.1 Overview In *Section 1.2*, we presented and discussed the three Y-Variate measures that we proffer are consistent with C&A's characterization of "useful features of Y-Variates that align with forecasting acuity"—to wit:

Profiling: {Trend & Domain-Intel &Uncertainly}

 Copyright © Author, 2026

ISSN: 2583-3006
Vol. 6, Issue 6, November-December 2026, pp 65-85

4.2 Parameterizing the Vetting Guidelines The next issue, then, is to parameterize the TAP-guidelines for screening the Y-Variates. In this regard, we will:

I. Suggest *Standard theoretical Y-Variate Profiles* that ***are likely to align*** with the ETS FM, and
II. For symmetry, we will also examine *Sets of Random Y-Variate data* that would ***very likely not align*** with the ETS FM.

As we assume that the visual acuity of the DA has been honed over extensive experiential forecasting trials, and believing in the adage that "***A Picture is Worth a Thousand Words***", we will profile *each* Y-Variate under scrutiny with the following binary-intel:

I. The Graphic of the longitudinal domain of the Y-Variate to be inputted into the FM, and
II. The Y-Variate Measures for the {[PPMC] &$[P_{Sk}^{\hat{y}}]$ &$CoV[\bar{y}]$}.

With this TAP intel, the DA will make the assessment of which of the two Dossiers:

Dossier[I]{ ***Retained*** as a viable Candidate for use in the ETS FM}*or*
Dossier[II]{ ***Archived*** *To be* ***Evaluated*** *by* the DA for use in the ETS FM},

should be populated with these Y-Variates.

Ancillary Expectation We hope that the visual- and the numeric-profiles of each of the Y-Variates will develop, and over time reinforce, an experiential anchoring that will refine the Y-Variate Dossier-assignment process.

5.0 TAP VETTING PROFILES & STATISTICAL MEASURES OF THE Y-VARIATE FEATURES

5.1 Overview Following are longitudinal profiles, that we proffer are, *likely,* aligned with the ETS FM. For each of these Y-Variate profile projections, in addition, we will offer a parametrization tableau for The Tri-Measures {[PPMC] & $[P_{Sk}^{\hat{y}}]$ &CoV $[\bar{y}]$}. This is the binary-intel offered by the TAP that the DA examines and discusses with colleagues so as to arrive at a decision as to which of the two Dossiers to populate. To provide a rich set of meaningful intel we will consider four *theoretical data*-generating processes:

Linear & Exponential & Logarithmic & Multiplicative

5.2 Caveat These Y-Variates profile projections were generated by *theoretical* generating processes. In a practical economic context, there has ***never*** been a Y-Variate that was generated over its projection domain by any of these four *theoretical* generating processes! However, we find them to be valuable indications as instructional benchmarks for evaluating and categorizing real-world Y-Variate pursuant to populating the two Dossiers of the TAP.

 Copyright © Author, 2026

ISSN: 2583-3006

Vol. 6, Issue 6, November-December 2026, pp 65-85

6.0 THE PROTO-CLASS OF OUR TRI-MEASURES: {[PPMC]&[$P^{\hat{y}}_{Sk}$] &CoV[$\bar{y}$]}

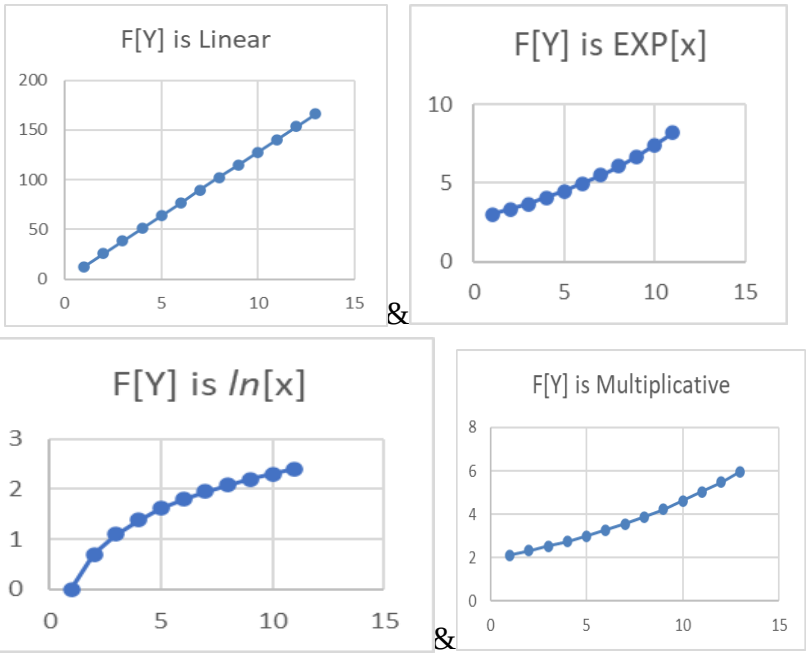
6.1The Baseline Context The calibration baseline is a Y-Variate that is a *straight-line with a Slope:*$\Delta \neq 0$ in the CC-Plane. Interestingly, the Y-Variate Panel values do not affect the nature of this baseline with respect to: The {PPMC or$P^{\hat{y}}_{Sk}$}. However, the slope [Δ], is the driver of the *CoV*[$\bar{Y}$]; thus, the *CoV* [$\bar{Y}_{\Delta}$] is: **T**o **B**e **C**omputed [TBC].The [*CoV*[$\bar{Y}_{\Delta}$]] will be different for each straight-line where the Δ-*magnitude* is different. We are very interested in the profiles and interaction of these Tri-measures. If there are Mathematical or Statistical profiles that are relatively unique to various Y-Variate generating process (*es*), then these relationships can be essential *in developing useful indications of the likely Nature of the Y-Variate*. The Tri-measures-*definition* of a straight-line is:

If The PPMC =1.0 &The$P^{\hat{y}}_{Sk}$ = 0 & The CoV is > 0,
Then, the Y-Variate charts as ***A straight-line where the $\Delta \neq 0$***.

Thus, for the execution of the TAP, ***If*** the chart of ***a*** Y-Variate [ABS[PPMC]≈<1.0&ABS[$P^{\hat{y}}_{Sk}$]≈0 &[CoV]≈>0] has ***this*** Tri-measure profile, ***Then***, this would *usually* rationalize transferring that Y-Variate to Dossier [I] as it is very likely to be a relatively straight-line.

6.2 Profiling the Proto-typical Theoretical Cases As critical intel for probing the Nature of a Y-Variate so as to make an informed decision in populating the Dossiers, we will offer profiles for four Y-Variates, the generating process of which are usually identifiable by the relatively unique Y-Variable profiles of their measures: {[PPMC] &[$P^{\hat{y}}_{Sk}$] &CoV[$\bar{y}$]}. These four profiles are presented in Figure a following:

Figure A Theoretical Generating Process: Linear, or EXP, or *ln*, or Multiplicative:



 Copyright © Author, 2026

ISSN: 2583-3006

Vol. 6, Issue 6, November-December 2026, pp 65-85

Following are the Tri-Measure Profiles of these Y-Variates and the APE that results from the evaluation of the one-period-ahead ETS forecasts:

Table 1 Profiles of the theoretical generating processes of Figure A:

Profiles	Linear	EXP	*ln*	Mult
ABS[PPMC]	1.00	0.99	0.95	0.99
ABS[$P_{Sk}^{\hat{y}}$]	0.00	0.44	0.81	0.38
CoV [$\bar{Y}_{\Delta}$]	0.19	0.33	0.47	0.28
APE[ETS]	**0.00**	**0.01**	**0.00**	**0.01**

Discussion In Table 1, we have profiled measures of the features of the theoretical generating process(es) of Figure A that provide reasonable guidance in a benchmarking context to many of the Y-Variates that are found in most economic contexts. We will be using these TAP [Graphical-&Tri-Measures- profiles] to inform the DA for populating Dossiers [I] or [II]. Following are our de-constructions that are the TAP-Screening guidelines.

The Linear-case was detailed above; the {[EXP] & [*ln*] & [*Mult*]-cases have ***non****monotonic* Y-Variate generating processes. As proto-typical generating processes they are excellent benchmarking illustrations and so their profiles of: {[PPMC] &[$P_{Sk}^{\hat{y}}$] &CoV[$\bar{y}$]} are very instructive. Following, using the above proto-theoretical graphics of Figure A, we offer our experiential indications of the *usual* Nature of these Proto-typical series: [EXP] &[*ln*] & [*Mult*]}:

I. Their **ABS[PPMC]s** are very high; *usually* in the range: [≈>$\sqrt{0.5}$ to ≈<1.0], where: $\sqrt{0.5}$ is the Harman-Unique Factor Toggle-point,
II. Their **ABS[**$\boldsymbol{P_{Sk}^{\hat{y}}}$**]s** are *usually* in the range:[≈>25% to ≈75%],
III. Their **CoVs** are *usually* never in the range: [≈>0 to <25%], *and*
IV. The forecasting acuity of the ETS FM for the generating processes that are profiled in Figure A are *usually* in the APE: range: [≈>1% to ≈<20%]; for example, see Row [5]: where theone-period-ahead APEs of the ETS are reported.

Rationale This suggests that ***If*** a Y-Variate diverges from these three conditional ranges offered in Table 1 as the reference-context, ***Then***, the DA likely would transfer that Y-Variate to Dossier [II] so as to examine: (i) The data collection- *and/or* (ii) The AIS-coding- protocols. We find that these three theoretical conditional ranges *usually* capture the 80% of the Y-Variates that are found to be well recorded and downloaded in actual datasets. ***Implication*** These qualifying Y-Variates [—*i.e.*, *that are in these ranges*] often have excellent APE-forecasting profiles for forecasts in the range [one-period-ahead ***thru*** three-periods-ahead]. Having discussed benchmarking against selected *theoretical norms*—the Nature of which are Y-Variates driven by generating process (es) that are *never found as operational-drivers* in the usual economic context—we will offer the other side of the benchmarking context: We will profile these Tri-measures: {PPMC, $P_{Sk}^{\hat{y}}$ and *CoV*[$\bar{Y}_{\Delta}$]}for

 Copyright © Author, 2026

ISSN: 2583-3006
Vol. 6, Issue 6, November-December 2026, pp 65-85

Random generating processes. This is also a standard and required screening phase in activity in Factor Analysis where it is called Parallel Analysis. See: Pallant, (Ch 15[Factor Analysis] 2020).

7.0 RANDOM VALUE TRIAGE INTERVALS: OUR BENCHMARKING PROTOCOL

7.1 Overview In the preceding section, we used the usual *theoretical* Y-Variate generating processes to form alignment benchmarking intel that we will use to develop the TAP screening protocol. By the logical symmetry, it is necessary to develop TAP-Screens using Y-Variates that have *Random generating processes*. In this context, we are following the Monte Carlo screening suggestion of: Pallant (2020). We have used the following Excel-function to create random variables:

= (RANDBETWEEN(1,100))

This created a [12 × 1] vector of 12 Random draws. For each iteration, we created

I. The ***PPMC-Feature*** for the [12 × 1] vector this using the computation of: CORREL as noted above,
II. The ***Skewness-Feature*** for the [12 × 1] vector this using the computation noted above, and
III. The ***CoV-Feature*** for [12 × 1] vector this using the computation noted above.

Then, we then iterated these random protocols 45 Times. This created three *vectors*:

$$\text{PPMC } [45 \times 1] \;\&P_{Sk}^{\hat{y}}[45 \times 1] \;\&\text{CoV } [45 \times 1]$$

We proffer that the operative intel for screening Y-Variates is the 95%CI of the Sample-Mean for each of the three Tri-measures created by these 45 Random iterations. We argue this as these 95%CIs are the MLEs of the population range of the respective Mean [μ]s]. This is *exactly* the additional random information that we need to realistically screen Y-Variates for evaluation re: their inclusion in the *Y-Variate Candidate Set.*

7.2 The Feature Profiles for the Random Y-Variates

Following are the screening profiles for the selected C&A Features of the ***45-Random Profiles***:

Table 2Monte Carlo Screen for the Tri-measures

Screening	PPMC	$P_{Sk}^{\hat{y}}$	CoV
Mean	**–0.0224**	**–0.1340**	**0.5636**
Median	+0.0213	+0.0610	0.5822
95%CI	**{–0.11 : 0.07}**	**{–0.33 : 0.06}**	**{0.53 : 0.60}**
CI[μ]s	**{–0.10 : +0.10}**	**{–0.25 : +0.25}**	**{0.475 : 0.525}**

Discussion ***Note*** For this set of information, the PPMC used is not the **ABS** [PPMC]; thus, there are increasing as well as decreasing panel indications. Also, we used the $P_{Sk}^{\hat{y}}$ rather than the **AB**S [$P_{Sk}^{\hat{y}}$]; thus, there were times when the Mean was > than the Median, and *visa-versa*. For these random Y-

 Copyright © Author, 2026

ISSN: 2583-3006

Vol. 6, Issue 6, November-December 2026, pp 65-85

Variates, we computed the three Feature Measures as noted in Table 2. ***Caveat*** The intel in Table 2 is not the population profile; rather it is *but one trial* of a simple bootstrap as discussed above. This is presented as a suggestion for creating the trials that related to your datasets. Having noted this caveat, we used the variance profile of the ***random*** selections noted above to *guesstimate* the likely population Mean[μ]-95% Confidence Intervals that will, in the reference populations ***will be*** symmetric. See: Tamhane & Dunlop (The CLT[p. 170)These values are not experiential unfamiliar. This intel is provided in Row [5].

7.3De-coding the Random Trials As expected, the PPMC [μ]& the $P_{Sk}^{\hat{y}}$[μ] hover around zero {−ε ≥ ≈ 0 ≈ ≤ +ε]. This is excellent confirmation of the expected nature of randomness—i.e., a lack of structure. Given these profiles, we will use these Random Profiles for the PPMC &$P_{Sk}^{\hat{y}}$ as Screens in the TAP. It is also the case, that the CoV [μ], for a random population, is relatively *high* as expected for a Y-Variate panel of random-draws. This also follows the logic of the CoV—i.e., overall, the STDEVA relative to the Sample Mean is **not** expected to follow C&A's calibration and be < than 20%; and inferentially this the clearly case as: The FPE[50% – 20%] produces a non-directional p-value of <0.0001.

At this point, after a comprehensive review of various issues that likely *promote* as well as *compromise* forecasting acuity, we offer a detailed *summary* of key aspects that should be considered in forming a TAP set of Dossiers.

7.4Recapitulation of the critical aspects of our Screening Triage Protocol

We introduced the nature of the measures :{ PPMC&$P_{Sk}^{\hat{y}}$&CoV} and benchmarked these Y-Variate feature-measures using *theoretically Structured* as well as *Random* generating process (es) for Y-Variates. In this section, we will offer a point-summary of this critical TAP-intel that we have drawn from the information presented above. In academic instruction, we find that students at the Masters Level found the following "bullet-points" most useful in probing the nature of the forecasting milieu:

I. *All* linear projections are *monotonic* and have: (i) an ABS[PPMC] = 1 & (ii) an ABS[$P_{Sk}^{\hat{y}}$]= 0. These are not empirical results, *they are facts*, for any *monotonic* Y-Variate, where: the Δ≠0,
II. *Most* structural ***non****monotonic* Y-Variates in: The Exponential or Logarithmic or Multiplicative classes have: (i) an ABS[PPMC] ≈>$\sqrt{0.5}$—i.e., ≈>0.70 & (ii) an ABS[$P_{Sk}^{\hat{y}}$] ≈>35%,
III. As the degree of ***non****monotonicity increases, usually*: (i) *the* ABS[PPMC] *decreases; in addition,* (ii) the ABS[$P_{Sk}^{\hat{y}}$] *usually increases,*
IV. *Most* Y-Variates where: the generating process (es) are ***random*** will have: (i) an ABS [PPMC] value in the range: [≈<10%] & (ii) an ABS[$P_{Sk}^{\hat{y}}$] value in the range:[≈<25%].
V. For the PPMC, the signs {−or +}are accurate longitudinal indications of the *overall* trajectory,

 Copyright © Author, 2026

ISSN: 2583-3006

Vol. 6, Issue 6, November-December 2026, pp 65-85

VI. The CoD of the OLSR FM is R^2; and R^2 is: $PPMC^2$,

VII. For the $P_{Sk}^{\hat{y}}$, the signs {−or +} are *often* accurate indications of the relationship [Mean *v.* Median],

VIII. There is no *single*-conditional that has a generalizable FPE [Null] for judging the "inferential severity" of the relative [Mean *v.* Median]-CC: displacement for the $P_{Sk}^{\hat{y}}$. See National Institute of Standards& Technology[NIST]

IX. For the CoV, the driver for a well-organized function is the slope [Δ]. For a relatively random function the PPMC is usually *Low* and the CoV is usually *high*. We recommend collecting the CoV-intel as contextual information.

The above nine vignettes were culled from C&A's 99-Rules as possible screening measures to aid in parameterizing the TAP; however, they are our experiential suggestions and so are *idiosyncratic*. To effectively utilize these indications, it is critical to also use the visual intel from the Excel Chart of the Y-Variate as the combinations of the {PPMC &$P_{Sk}^{\hat{y}}$& CoV} are *often* important in informed screening of the Y-Variate. To codify these discussion points into a screening protocol, we were guided by the following C&A's RBF synthesis:

> *As expected, the gains in accuracy were largest for series with* ***Significant Trends****,* ***Low Uncertainly****, --i.e., stability of the Y-Panel, and* ***Good Domain Knowledge****.* [p.1408]

We took the liberty to interpret these vignettes in the context of C&A's synthesis and to offer detailed experiential expectations for the Y-Variate measures that will constitute ***heuristics*** that *we have found useful* for operationalizing the screening codex for the TAP. We now detail our screening heuristics:

7.4.1 Heuristic [I]

For ***Significant Trends***, we used: The PPMC of the Y-Variate Panel. This is the gold standard measure; it is simple to understand, sensitive, and a specific-calibrator for the acuity of the OLSR FM as the:$PPMC^2$is the OLSR[R^2] and is certainly not unrelated to the acuity of the ETS FM.For the *PPMC*, the TAP suggested heuristic is:

> ***IF*** *the* [*PPMC*]⊂**{*–0.10 :+0.10*}**,***THEN*** *likely Transfer that Y-Variate to: Dossier*[II]: *as the Y-Variate is likely Random.* ***Rationale*** *This profile aligns with the random draws presented in Table 2. If this is the case, then there is not likely an ETS FM that would align with this sort of Y-Variate.*

7.4.2 Heuristic [II]

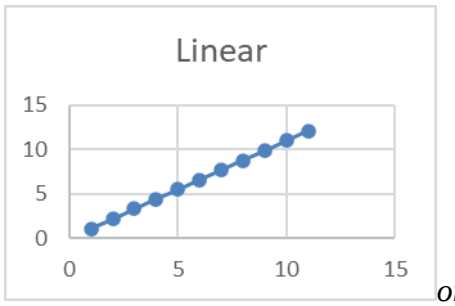
For ***Good Domain Knowledge*** we used: The Pearson [Mean *v.* Median] Skewness: [$P_{Sk}^{\hat{y}}$] ***and*** a condition for the PPMC. ***Rationale*** The Mean *v.* Median is largely driven by outliers as can be seen in Figure B:

 Copyright © Author, 2026

ISSN: 2583-3006

Vol. 6, Issue 6, November-December 2026, pp 65-85

Figure B [Mean=Median] & B[Median>Mean]



or

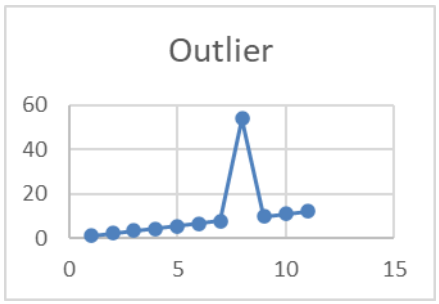


Figure B {Mean = Median] Figure B {Mediain> Mean]

Table 3 The Domain Illustration of Figure B: The Outlier Effect

TAP Measures	**Mean=Median**	**Median > Mean**
PPPM	1.0	0.4852
$P_{Sk}^{\hat{y}}$	0.0	0.8072
CoV	0.5527	1.2135

Discussion Figure [B-Outlier] is Figure [B-Linear] with $Y_{t=7}$as the outlier. ***Usually***, where there is a stable generating processes such as those presented in Figure A the *ABS*[PPMC]in the range [$\sqrt{0.5}$ to ≈<1.0], and the *ABS*[$P_{Sk}^{\hat{y}}$]: skewness often hovers around [≈0.75%]. Thus, if the DA just examines the *ABS* [$P_{Sk}^{\hat{y}}$], this can suggest that the Y-Variate is being driven by a stable generating process such as those profiled in Figure A! This likely would suggest that the Y-Variate is in the class of Y-Variates profiled in Figure A! This *erroneous* impression can occur as an outlier can create a not dissimilar profile where the *ABS* [$P_{Sk}^{\hat{y}}$] is in the range: [$\sqrt{0.5}$ to ≈<1.0]. Of course, the reason that the TAP produces an Excel Chart so as to aid in de-coding the likely Nature of the Y-Variate.

For *Good Domain Knowledge*, re: the joint:{PPMC &$P_{Sk}^{\hat{y}}$}-Measures, the TAP suggested heuristic is:

> ***When*** *there is a High PPMC & the* $P_{Sk}^{\hat{y}}$ *is in the 75%-neighborhood,* ***Then****, this is likely evidence to suggest a quasi-Exponential-class generating function. However,* ***When*** *there is a PPMC in the range of:* [≈<50%], *& the* $P_{Sk}^{\hat{y}}$ *is in the 75%-neighborhood,* ***Then****, this is likely evidence to suggest the existence of* ***an Outlier or Level-Shift*** *in the Y-Variate panel. The* ***only reasonable way*** *to decode the reality is to examine the Graphical profiles.*

7.4.3 Heuristic [III]

For ***Low Uncertainly*** we used: The Coefficient of Variation. As indicated by *Investopedia*, calibrating the CoV as High or Low is not likely to provide reliable intel for decision-making purposes. Also, do not confuse the Coefficient of Determination [CoD] with the CoV; they move in

 Copyright © Author, 2026

ISSN: 2583-3006
Vol. 6, Issue 6, November-December 2026, pp 65-85

opposite inferential directions. However, the CoV is a useful and reliable measure when used in combination with the {PPMC or$P_{Sk}^{\hat{y}}$} measures.

For Uncertainty the TAP suggested Heuristic [III] is:

> For *the CoV, we find that if the PPMC is <15%* ***and*** *the CoV is >≈40%, this is often a near-random Y-Variate. The implication is usually this Y-Variate is a candidate for inclusion in* Dossier [II] *as there is very little predictive intel in these Y-Variate panel values.*

7.5Summary These three heuristics are often useful in ferreting out the Nature of the intel offered by a Y-Variate. They are best used in conjunction with the following information elements of the TAP:

> *A Graphic of the Y-Variate* that is to be the input of the FM, and
> *The Profile of the* {[PPMC]&[$P_{Sk}^{\hat{y}}$]&CoV} for that Y-Variate.

to inform and assist the DA *who is responsible for using experiential-intel* to make the assessment of which of the two Dossiers:

> Dossier [I]{ ***Retained*** as a viable Candidate for use in the ETS FM} *or*
> Dossier [II]{ ***Archived*** *To be* ***Evaluated*** *by* the DA for use in the ETS FM},

should be populated with this particular the Y-Variate.

8.0 APPLICATION OF THE Y-VARIATE TRIAGE ALIGNMENT PROTOCOL [TAP]: COMPUTATIONAL RESULTS

8.1 Overview We have used the same M-Study dataset that was used by C&A to develop their RBF Model. There were 181 Y-Variates; we randomly selected 45% of these Y-Variates where there were 12 or more continuous observations. **This yielded 77 Y-Variates.** We used the 12th observation as the holdback for computing the APE that will be used to evaluate the forecasting acuity of the TAP. The ETS FM[n=11] is the model that we are using as this FM aligns very well with:(i) The four FMs used in the RBF Model, and (ii) Many of the 99-Rules of the RBF Model. We then evaluated these **77 M-Study** Y-Variates as follows:

Initially, we tested for the associations needed to effectively utilize the TAP as follows:
The associations of the Tri-Measures of the Y-Variates, [n=77] with the ETS [APE]s are:

> PPMC [Mean [0.69] & Median [0.90]],
> $P_{Sk}^{\hat{y}}$ [Mean [0.54] & Median [0.42]], and
> CoV [Mean [0.27] & Median [0.17]]

 Copyright © Author, 2026

ISSN: 2583-3006

Vol. 6, Issue 6, November-December 2026, pp 65-85

Implication This suggests a very well-organized set of Y-Variates that exhibit the expected profiles over the accrued M-Study Y-Variates.

In addition, we measured the Inter-Correlation Matrix Associations following:

Table 4, n=77 The Inter-Correlations of the ETS [APEs] with the Tr-Measures

	PPMC	$P_{Sk}^{\hat{y}}$	CoV	
PPMC	1	–	–	
$P_{Sk}^{\hat{y}}$	–0.07	1	–	
CoV	0.19	0.41	1	

Implication The intercorrelations are likely indications that there are not strong inter-associations that would call into questions the relative independence of the three Tri-Measures.

Final Assessment The TAP is likely a useful protocol to Screen Y-variates re: their fit with the ETS FM.

8.2 Execution of the TAP

We used a VBA Program [TAP[VBA]]: [*Available from the corresponding author as an e-download*] for each Y-Variate to produce: (i) The Excel Chart&(ii) Table 5, that is VBA: presented next to the Excel Chart in the VBA-Excel Worksheet:

Table 5 Mean and Median Profile *for each of the V-Variates* posted by the TAP [VBA]

Profile	Values
PPMC	*
$P_{Sk}^{\hat{y}}$	*
CoV	*

After the DA has considered the Excel Chart & Table 5 relative to the following TAP-Benchmarks:

(i) The Profiles of the *Structural* Y-Variates of Figures A& the related Table 1,
(ii) The Tri-Measure Monte Carlo *Random* Profiles of Table 2,
(iii) The *Re-Capitulation* Points of Interest,
(iv) The Suggested *Heuristics, then and only then*

the VBA-program launches a *User Form*® to ask the DA to select a Dossier to which the Y-Variate under examination is most likely to be assigned.

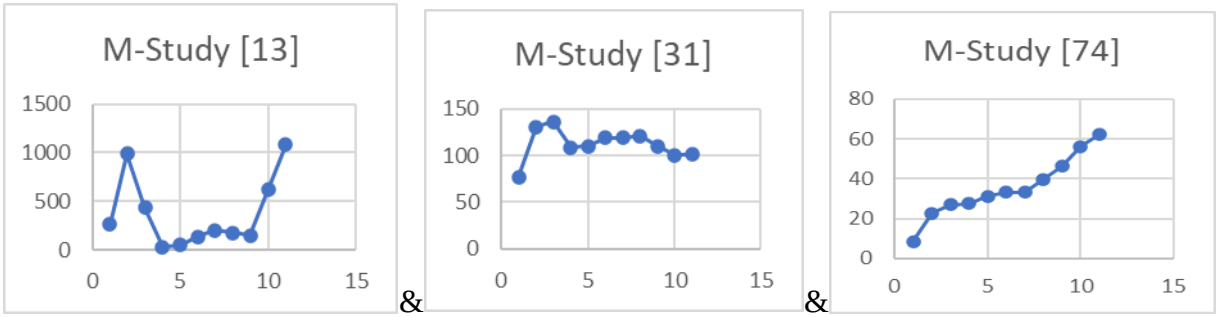
8.2 *Illustration of the TAP VBA Displays* At this point, we will present three VBA-examples taken from the 77M-Study Y-Variates:

 Copyright © Author, 2026

ISSN: 2583-3006

Vol. 6, Issue 6, November-December 2026, pp 65-85

Figure C Selected V-Variates: [13 & 31 & 74] from the M-Study



The following VBA Profiles are produced *when* the Excel Chart is displayed:

Table 6 The Tri-Profiles of the M-Studies selected as an illustration

Tri-M	M-Study [13]	M-Study [31]	M-Study [74]
PPMC	+0.179539	–0.07622	+0.961541
$P_{Sk}^{\hat{y}}$	+1.409783	+0.334534	+0.386236
CoV	+0.973640	+0.143020	+0.432520

TAP: *De-constriction of Table 6*

M-Study [13] The PPMC is relatively low due to the pervasive nature of the irregular observations. This is reinforced by the $P_{Sk}^{\hat{y}}$ that in in the range: [>1.0:≤3.0] indicating profound Skewness. This is the case, as the Mean is 378whereas the Median is 205. And finally, the CoV is very high; in fact, the CoV is about 4-times that of the PPMC! This aligns almost exactly with the *Outlier Chart* of Figure B. In this case, we transferred the Y-Variate[M-Study [13]] to Dossier [II] for further evaluation.

M-Study [31] This is the classic case of a "Outlier/Start-up-Issue" in the Y-Variate panel. Some of our colleagues have mentioned that leaving the start-up in the panel is not likely to affect forecasts in the later stages of the panel. We are of another experiential-mind! ***Case in Point***: After eliminating the single-start up point—*if in fact that is what it was*—the PMMC *resets* to 0.74386!Thus, including the single point at the beginning of the panel factored down the PPMC by about 90%. However, the CoV& the $P_{Sk}^{\hat{y}}$ are only slightly affected by the start-up point. In this case, we transferred the Y-Variate [M-Study [31]] to Dossier [II] for further evaluation.

M-Study [74] This Y-Variate is basically aligned with the {EXP *or* Multiplicative-cases as presented in Figure A. In this case, we transferred Y-Variate [M-Study [74]] to Dossier [I] as it is likely a viable candidate for use in the FM.

 Copyright © Author, 2026

ISSN: 2583-3006
Vol. 6, Issue 6, November-December 2026, pp 65-85

8.3 Summary the VBA-TAP offers: Visual Graphics & Computed Measures as extensively benchmarked to aid in the productive Introspection of DAs guided their extensive forecasting experience to select, *wisely*, the Y-Variates most likely to create intel to empower the decision-making of the Planning Committee. Hopefully, over time, the VBA-TAP will enhance forecasting acuity. This of course begs testing to determine if this is likely to be the *Inferential Reality* rather than an *Unfounded Esperance*. Following, we offer the inferential test of the VBA-TAP.

9.0 ANALYSIS OF THE PERFORMANCE OF THE TRIAGE ALIGNMENT PROTOCOL

9.1 Overview The test of the VBA-TAP is simple and logical. We flipped a coin as to which one of the authors would use the VBA-TAP program to evaluate the random sample of 77M-Study[Y-Variates]. Following is our research question:

Is there inferential evidence to reject the following Null:

> H_o[*The Y-Variates in Dossier* [I]*have APEs that are not different from the APEs in Dossiers* [II]]?

Recall, our *a priori* expectation is that H_o will have a directional FPE[p-values] that will suggest Rejection of H_o in favor of:{H_a: That the evidence suggests that the Y-Variates in Dossier [I] outperformed the Y-Variates in Dossier {II] relative to their APEs.} If so, then this suggests that the TAP is a *Decision Aid of Value* in the informing the Planning Committee.

The next issue is to select the Inference Model for addressing the test of the H_o.

9.2 The Inference Model There is an interesting inferential conditional that is often referred to as the Skewness-Screen—the *gist* of which is:

> ***If*** *there is inferential evidence of:*{[*Mean –Median*]:*Skewness*}*in a sampled population as indicated by its random sample,* ***then*** *the inferential preference, where: the decision, as to whether to Accept or Reject the FPE*[H_o[*Null*]] *based upon the non-directional p-value, is to utilize distribution-free inferential methods.*

The classic test for skewness is the Normality Screen, initially penned by Kolmogorov (1933)& Kolmogorov &Smirnov (1939) [K-S],that offers the following FPE[p-value] test:

H_o *Where: the FPE* [*Null*] *is: The Mean* [μ] *is not different from the Median* [μ]

These K &S references span a non-trivial timeframe. For this reason, we offer the Massey, Jr. (1951) research report that offers integrations that are later taken-up by: Lilliefors (1967) who addresses the bias nature of their formulations that were based on the assumption that the Population: Mean[μ] & Standard Deviation[σ] were *a priori* known; when in fact the N{μ&σ} must be estimated from the un-*knowable* population. K-S's assumption created a created an inference model that was *biased* to Rejection of the H_o! The K-S's measure was re-tooled by:

 Copyright © Author, 2026

ISSN: 2583-3006

Vol. 6, Issue 6, November-December 2026, pp 65-85

Lilliefors (1967) [LK-S], thus eliminating this rejection bias. Later, a more powerful test was offered by: Shapiro-Wilk(1965) [S-W].

In our study context, we are testing two independent samples that are used to create {Mean &Median}-profiles}. The standard two inferential options are:

The Parametric Option: [Welch [ANOVA[***Means***[*t*-Test]]],*or*
The Distribution-Free Option: Mann Whitney-U[***Medians***[MW-U]]Test

In the inferential presence of skewness, the recommendation is to Not-use the [Means[*t*-test]] as these inference calibrations assume a sample from a Normal population—where:{The Mean[μ] = The Median[μ]}. As this is not likely where skewness is likely, the logical option is the Medians-test of Mann-Whitney-U [M-W U] test See Mann & Whitney (1947).

9.3 The Inferential Models We tested for Non-Normal sampled populations using: The LK-S &The S-W screens for the following C&A's measures: {APE, PPMC, $P_{Sk}^{\hat{y}}$, CoV}. Not surprisingly, as the sample sizes are relatively small, for these eight non-directional FPE: p-values, there were seven that were <0.01. Thus, clear is: the logical choice for the inference model is the MW-U[Median]-Test over the Welch[ANOVA[*t*]]-Test as the decision-making intel to address our research question: [Dossier[I] *v.* Dossiers[II]. However, Tabachnick&Fidell (2013) question the utility of creating any decisions based upon the Test of Normality. Experientially, we find this to be the case. For this reason, we will also present the parametric results as *a contextual benchmark for the MW-U inferential results*. Incidentally, in all of our inferential studies, we have aired both parametric as well as their distribution free profiles. See [Note[1]]

9.4 Testing Method The VBA-TAP program generated for *each* of 77 Y-Variates: (i) An Excel-Chart ***and*** (ii) The related Tri-Measures {PPMC, $P_{Sk}^{\hat{y}}$, CoV}. There was no time limitation regarding evaluation of this information. ONLY when the DA made the decision as to which of the Dossiers [I]*or*[II] was to be populated was the next Y-Variate presented by the VBA-TAP program. To control for experimental fatigue, only eight Y-Variates were presented in each day that the VBA-TAP program was engaged. The total number of days require to consider and process all 77 Y-Variates was 12 days. ***Clarification***: For these 12 VBA Sessions, the average time from [Log In to Log Out] was 22 Minutes—*about three minutes per Series*. ***Critical Intel*** The APEs of the ETS FM were not computed during this inferential testing of the VBA-TAP; only after the TAP-testing was completed were the APEs made available for the inferential testing. However, for the general use, the VBA: TAP does indicate the ETS APEs for the Holt & The Winters versions. They are usually, but not always, the same. When it was the case that there was a difference re: the Holt *v.* The Winters Models, we recorded the APE that was the lowest. The inferential results are presented following:

 Copyright © Author, 2026

ISSN: 2583-3006

Vol. 6, Issue 6, November-December 2026, pp 65-85

Table 7 The Tri-Measures: {PPMC &$P_{Sk}^{\hat{y}}$& CoV} and the Testing Measure :{***APE***] For Dossier [I]: n=55 &Dossiers[II]: n =22

Results	***Dossier* [I]**	***Dossiers* [II]**	**p-value***	p-value+
Profile	Mean **: Median**	Mean :**Median**	**MW-U**	Welch-*t*
PPMC	0.852 :**0.959**	0.299 :**0.353**	**<0.001**	*<0.0001*
$\boldsymbol{P_{Sk}^{\hat{y}}}$	0.448 :**0.404**	0.657 :**0.494**	**0.038**	*0.143*
CoV	0.228 :**0.146**	0.363 :**0.287**	**0.195**	*0.060*
APEs	0.056 :**0.042**	0.164 : **0.115**	**<0.001**	*0.004*

*The Mann-Whitney U was used for the non-directional p-value for testing the FPE [Null].+The Welsh[t-Test] was provided as a robustness benchmark.

Discussion The principal results for decision-making are **Bolded**]. For Table 7, we presented both the Welsh [*t*-tests] as well as the MW-U results. Our results for decision-making purposes are the MW-U results. *The Welch* [*t-tests*] *results are presented to offer a context for the inferentially correct MW-U model*.

*9.5 Decoding the Results as Presented in Table 7*Using the MW-U[Median] results in Column [4] as **Bolded**, the inferential results are interesting and certainly follow our expectations. Specifically, the APE for Dossier [I] offers ***clear*** indications that using the VBA-TAP, the Deselected a set of Y-Variates that were more *attuned to* and *aligned with* the ETS FM than were the Y-Variates that were judgmentally routed to Dossier [II] as the MW-U test **directional** p-value for the test of Dossier[I; Y-Variates, n=55] *v.* Dossier[II]; Y-Variates, n=22] was <[0.001/2] and the directional indication was that the APE[Medians] of Dossier [I] were inferentially lower than APE[Medians] of Dossier [II]. This was the case for both the Distribution Free-& the Parametric-tests. ***Simply*** The Excel Chart & the Measures developed from the C&A's RBF Model:{[PPMC] & [$P_{Sk}^{\hat{y}}$] &CoV} *in conjunction* with the Benchmarks & Re-capsulations& Heuristics were likely useful in the VBA TAP-Triage that was used to populate Dossier [I] that in turn created EST-forecasts that would likely have informed the Planning Committee. Finally, C&A [Table 3, p.1405] that there RBF results were:
Median APE [1-Yr] were: **3.2%**& Mean APE [1-Yr] were: **6.3%**

9.6 Final Assessment **The VBA-Triage Alignment Protocol seems an effective way to select Y-Variates that are aligned with the ETS FM and as such are likely reliable intel useful to the Planning Committee.**

10.0 OUTLOOK

As Bob Dylan has apply noted: "***The times, they are a-changin'***". We are now in the Brave New World of: {DA & AI} that seems to be the logical result of the launch of the WWW/Internet, *Circa* 1992. This has had the following implication for this research report:

 Copyright © Author, 2026

ISSN: 2583-3006

Vol. 6, Issue 6, November-December 2026, pp 65-85

If we are in: *The Brave New e-World*, then, operationally, it should be the case that an AI-Forecasting-Bot [AI-FB] could do the Forecasting! This seems not unlikely as according to the BBC: China recently offered a **Robot Olympics,** where: a robot bested Husain Bolt's world record in the 100 meters! Additionally, according to *Rockwell Automation, Inc* [2026]:

> "*Digital transformation is no longer a strategic priority; it's a strategic necessity. Leaders aren't piloting anymore. They're scaling and executing.*"

The skill set needed for the AI-FB hinges on the sensitivity and specificity of the AI-VBA-coding. As *VBA-junkies*, this is an irresistible challenge. Thus, in the normal due course, we will offer the results of our: VBA-TAP [AI-FB].

Appendix A Note

Note 1 For our previous research reports that add to the corpus of the C&A's RBF Model see: See <https://edwardlusk.com/>.

Appendix B Y-Variate from the M-Study[M-Series 13]

263	992	437	35	55	140
205	175	150	620	1085	**358**

The EST FM fits the first 11 Values; the bolded value is the Holdback to create the APE. The ETS FM forecast for $Y_{t=12}$ is: 483.3068. Thus, the APE is: ABS[[0.– 358] / 358] = 0.35 The PPMC[11] was: 0.18; the $P_{Sk}^{\hat{y}}$[11] was: 1.41 & The CoV[11] was: 0.97.

REFERENCES

Armstrong, J.S.& Collopy, F. (1992). The selection of error measures for generalizing about forecasting methods: empirical comparisons. *International Journal of Forecasting*, *8*, 69–80.

The BBC [British Broadcasting Corporation]: <https://www.youtube.com/watch?v=FGBLzMESBAo> *Sited*: 20Oct 2026.

Collopy, F., &Armstrong, J.S. (1992).Rule-based forecasting: Development and validation of an expert systems approach to combining time series extrapolations. *Management Science*,*38*, 1394–1414. https://doi.org/10.1287/mnsc.38.10.1394

Harry H. Harman, H. (1976). "*Modern Factor Analysis*", University of Chicago Press, ISBN-13:978-0226316529.

Inayati, S., Iriawan, N., Irhamah, &Isnaini, U. (2025). A Bayesian Markov switching autoregressive model with time-varying parameters for dynamic economic forecasting. *Forecasting*, *79*, 1- 33.

 Copyright © Author, 2026

ISSN: 2583-3006

Vol. 6, Issue 6, November-December 2026, pp 65-85

Investopedia(2026): https://www.investopedia.com/ 9*Sited*: 29 Aug 2026.

Lilliefors, H. (1967). "On the Kolmogorov-Smirnov test for normality with mean and variance unknown". *J. American Statistical Association, 62*, 399–402. <https://doi.org/10.1080/01621459>

Mann, H. B. & Whitney, D. R. (1947). On a test of whether one of two random variables is stochastically larger than the other. *The Annals of Mathematical Statistics, 18*, 50–60.

Massey, F. Jr. (1951). The Kolmogorov-Smirnov Test for Goodness of Fit. *J. American Statistical Association, 46*, 68-78.

Makridakis, S., Andersen, A., Carbone, R., Fildes, R., Hibon, M., Lewandowski, R., Newton, J.,&Parzen, E. (1982). The accuracy of extrapolation (time series) methods: Results of a forecasting competition. *Journal of Forecasting,1*, 111–153. https://doi.org/10.1002/for.3980010202

NIST: https://www.itl.nist.gov/div898/handbook/eda/section3/eda35b.htm.Sited: 24 Oct 2026.

Pallant, J. (2020). "*SPSS: Survival Manual*", McGraw-Hill: 7th Ed, ISBN-13: 978-0-3352-4949-7.

Rockwell Automation, Inc: <https://www.rockwellautomation.com/> Sited:20 Oct 2026.

Shapiro, S. & Wilk, M. (1965). "An analysis of variance test for normality". *Biometrika, 52*, 591–611.

Tabachnick, B. &Fidell, L. (2010). "*Using Multivariate Statistics"*, Pearson: 5th Ed. ISBN-13: 978-0-2054-5938-4.

Tamhane, A.& Dunlop, D. (2000). "*Statistics and Data Analysis*" Prentice-Hall: ISBN 0-13-744426-5.

Welch, B. L. (1951). On the comparison of several mean values: An alternative approach. *Biometrika, 38*, 330–336.

 Copyright © Author, 2026