Costs function assessment: an empirical business analytics approach for decisional purposes

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Abstract: The aim of the present paper is, without any pretension of to be exhaustive, to propose a business analytics contribution in the elaboration of a reliable and accurate assessment of firm’s costs function for decision purposes. As a matter of fact, the analyst/consultant, the entrepreneur itself or also the manager has not always the possibility to access to the wide range of all the needed useful information to deal with this task. Income statements or general accounting documents could not record – for an appropriate and sound assessment – all relevant figures. In these (not-extraordinary) cases, supplementary and accurate data gathering is both extremely hard to carry on and not synchronised with entrepreneurial needs. Hence, an analysis developing informed business decisions seems not possible except of roughly approximations. Considering these binding constraints, business analytics tools – by recurring to their interdisciplinary versatility – can surely support managerial decision-making widening and strengthening possibilities to enhance the value of retrievable insights from traditional firm’s accounting data. Under this perspective, management accounting combines its traditional informational power with sound scientific support for a renewed, more efficient and multidisciplinary approach to business.

Keywords: management accounting; business analytics; variable costs; fixed costs; statistical analysis.


Biographical notes: Antonio Focacci joined the Management Department within the Faculty of Economics of the University of Bologna since October 1996 and main publications covered all the different kind of typical academic productions: international journals, books and proceedings of congresses both at national and international level. He is an invited member of the editorial board of two international journals. He is also serving as a referee for various international peer-reviewed journals. He taught in various courses within the School of Economics and the School of Engineering. He is a certified tax-consultant and chartered accountant and his professional experience has developed both in banking sector and in primary national company. His management consultancy activities are devoted to management control, accounting procedures, tax-consulting and start-up training courses (mainly) for SMEs in different economic branches (energy, real estate, frozen foods, etc.).
1 Introduction

In several circumstances, entrepreneurs, managers and consultants – when asked to analyse (their) business activities or to give professional advises – need to know the firm’s costs’ breakdown to undertake decisions and evaluate profitability (both at the overall level and at the single (product/service) one. In these situations, the break-even point analysis (BEP) is a widespread conceptual framework helpful for such decisional purposes. Furthermore, its wide application finds a specific relevance in start-ups’ analysis (Oe and Mitsuhashi, 2013). In literature, several examples are reported considering very different sectors and applications: financial loans and initial public offerings (Timmons and Spinelli, 2003), new venturing efforts (Lechner et al., 2006), pharmacies sector (Keast et al., 2010), lodging industry (Lesure, 1983), payment default prediction (Laitinen, 2011), conservation environmental programs (Siegel and Johnson, 1991), and education (Larimore, 1974). In its specific formulation, BEP is an ‘ad hoc’ technique aiming at calculating the sales volume – both in monetary terms (currency) and/or physical units (number of output, tons of sold commodities, etc.) – a firm must sell to equal its total costs (TC also labelled as expenses or losses). In BEP, there is equivalence between gains (revenues, R or also sales) and losses and the firm finds its first support towards long-run profitability. Total costs are traditionally separated for these goals in:

- Variable costs (VCs), whose path is – with a specific relationship (in most real cases a linear/proportional function is appropriated) – directly associated with the volume of business activity (output).

- Fixed costs (FCs), whose overall amount does not change with the increase/decrease of obtained output; their percentage decreasing reduction on total costs following an increasing sold/obtained output is the foundation of economies of scale (as a matter of fact, the more the output obtained the more the dilution of FCs on the total cost is occurring).

- Semi-VCs (conversely also labelled as semi-FCs) are composed by some variable and fixed components and have a twofold nature/origin to be treated case by case, substantially, following a reasoning included in the above mentioned (variable or fixed) domain.

Put into the well-known formulas (here rapidly reported without repeating further widespread considerations):

\[ R = TC, \]

having \( TC = VC + FC \)

Considering – that VC is equal to the multiplication of sold quantity/obtained (q) and the VC per unit (vc) hence, \( VC = vc \times q \), while R is equal to price per unit (p) multiplied for units sold (q), thus \( R = p \times q \) – the substitution of both terms, within the formula will give:

\[ p \times q = vc \times q + FC \]

Thus, the final classical solution (resolving for q) defining BEP will be as:
\[ q^* = \frac{FC}{p - vc} \]

where \( q^* \) stands for sales unit or BEP in unit. The BEP expressed in monetary terms is obtained by the multiplication of \( q^* \) with \( p \).

The classical graph representation is hereunder reported (Figure 1).

**Figure 1** The classical graphical representation of break-even analysis

Traditionally, in practice, this procedure is carried out after a previously analytic reclassifying effort of recorded cost accounting data included within income statements. The main purpose of such a reclassification effort is to determine a (potential) contribution margin where the specific VCs (in some situations also considering and identifying semi-variable ones) and FCs are well-defined and separated. Such a result is needed to calculate the inherent contribution to the firms’ profitability of the analysed service/product. For small and medium enterprises (SMEs), this kind of analysis usually regards the overall firm profitability considering the lack of detailed data and resources deployed to management control activities. The BEP methodology, however, is subjected to some assumptions well-pointed out in management control literature (Reichmann, 1997; White et al., 2012). These limits should be well assessed when the procedure is approached as a practical tool for a possible application case. Under a strictly academic point of view, main caveats of the methodology ground in the following assumptions (Anthony et al., 2011; Drury, 2011; Hansen et al., 2009):

a. The linear behaviour of revenues and expenses across the relevant range of volume (a more sophisticated version could be defined by considering some step-function costs, wherein between the range of a maximum and minimum value of output – changing with output/volume increases – costs maintain a constant value; however, in most of real circumstances, this assumption holds true).

b. The fitting of the strictly theoretical model to a single-product firm (also this caveat has been academically and practically overwhelmed by the adoption of a BEP analysis where a weighting average computation is applied to the whole product mix).
There are no unsold stocks (this feature must be considered in the assessment process, even if its effect can be approximated or added in calculation). All the above binding constraints are both well founded and logically undisputable, even if appropriate solutions/approaches have been academically proposed. Such answers can be successfully adopted in practical professional issues. The overwhelming hurdle remains information to gather throughout the process considering, especially as far as SMEs are concerned, the lack of adequate availability management accounting systems and a general lower level of available resources (Kadadevaramath et al., 2015). This holds true ever and ever in all those cases (but this, more than an exception, appears as the ‘rule’) where decisions must be defined without the complete set of appropriate information. Such a paper would like to propose an analytic approach to this issue trying to combine both academic scientific accuracy and ‘lacking’ of traditional accounting data to develop more accurate result/answers usually needed (and useful in real cases) following an interdisciplinary approach. Difficulties arising when there is not apparent clear assessment of the costs in their specific classification for business decision purposes. Put it crudely, there is not a clearly distinction between variable and FCs and such a misunderstanding is a binding factor for appropriate decisions. The originality of the present paper, hence, does not lie in the proposed techniques (well-known and widespread both in statistics and econometric fields, surely also with further elegant theoretical details). On the contrary, its contribution plunges its roots in a specific application to the traditional managerial environment with the intentional purpose to show the spectrum of applicable/usable firms data to pursue more accurate management decisions. Definitely, widening the possible effective solutions to adopt and insights to consider in real cases and for decision purposes.

The proposed business case (with little appropriated modifications not altering the substance of the issues) is directly derived from a real situation experienced by the author. Data and elaborations are proposed in order not to divulgate the company references for well-understandable privacy reasons. The aim is more oriented towards the explanation of the analytics features and their inherent implications and – under this perspective – company data can be considered as much as an example than a detailed representation of the specific solution informed by the business case.

2 The issue in assessing costs function

As previously pointed out, in several circumstances not the whole set of needed data are available for an appropriate analysis of existing issues in a firm. Especially and frequently, this is the case – as above mentioned – for SMEs. Traditional approaches establish their assessing efficiency on the right distinction about variable and FCs in order to evaluate contribution margins and BEP. These calculations are developed by recurring to accounting data and the subsequent inherent assessment by the expert (or by the entrepreneur itself) previously skilled in the field of application. In this context, the circle is completed by recurring to the framework: available data, experience/expertise/practice, elaborations (Figure 2).
There does not seem to exist (apparently) hurdles in this process. However, as whosoever has personally experienced in real situations, the ‘circuit’ has some drawbacks traditional accounting data can hardly help to solve (to afford). Such a limitation can be individuated in the lack of reliable relationships between costs and output in order to assess which of data – pertaining to the cost domain – could be reasonably classified as variable or fixed one (except of approximations) in a clear manner. Assuming such a constraint, a possible solution is to indirectly derive the firm’s costs function. In the present case, the relationship is developed by recurring to analytics combining widespread accounting data (total monthly costs for example) to a specific output ‘marker’ (without recurring to the abused term ‘driver’).

The output marker could be different from firm to firm following specific issues and cases (even if in the same economic activity sectors a repeatable path can be individuated). The only important feature to outline is that it should be effectively related to the activity/output and (definitely) to cost. The reasoning is very similar to that encountered when a cost driver is picked in an activity-based-costing analysis. In the present work, the marker is a physical number of output (for example, assuming that this output could be measured by tons). Thus, the valorised relationship is between total costs (monthly recorded and available within firm accounting) and output (also monthly recorded or easily retrievable by the firm production scheduling):

\[
\text{Costs} = f(\text{output})
\]

According to this, the further stage is to develop and define the appropriate function \( f \). For such an issue, the useful technique to try to adopt is a two-variable regression model, expressed as:

\[
Y_t = \alpha + \beta X_t + \varepsilon
\]

In this relationship:

- \( Y_t \) is a series of total costs recorded by the firm in the different periods (t) of time, representing the dependent variable of the statistical model
α, is the intercept of the cost function and – under the firm’s perspective – it represents the FCs the firm must sustain independently by the level of output/activity.

β, is coefficient representing the cv (unit VC).

X, is the output marker strictly related to the total cost sustained by the firm. Such a variable has some connoting features:

a. its amount is variable in different time of collected data
b. as aforementioned, it is represented by a physical measure of output (tons of output, t)
c. it is expression of the independent variable in the statistical model.

ε, represents a random disturbance or error term in time supposed to be normally distributed, statistically independent, having constant variance and with zero expected value. Its inclusion is necessary in most practical problems, because many uncontrollable factors are present within real world applications. Such factors renders very difficult, if not impossible, to relate the dependent variable and the independent one without some errors (Winston, 2014; Harnett and Horrell, 1998).

Obviously, as it can be reasonably considered, after the choice of the possible function cost (the pure linear relationship two-variable model) the further phase is its validation supported by real data. Towards this direction, a series of necessary steps to confirm the results for decision and analysis purposes have to be added both in order to refining it in a sound scientifically supported manner and for a specifically adapted business purpose. As far as the first aspect is concerned, it must be pointed out that the linear evaluation must be statistically validated. Moreover, for a possible better estimation of the model, main appropriated corrections have to be included considering specific actual data features. The main important issue to be analysed in this case is homoscedasticity (as opposed to heteroscedasticity). Homoscedasticity is the (desirable) assumption that dependent variable (Y) has the same level of statistical variance across the full range of the independent one (X). Consequently, error terms have a constant variance (Hair et al., 2014). Heteroscedasticity, conversely, is present in all those situations where error terms have not a constant variance. However, although homoscedasticity is the preferable (theoretical) assumption, it must be pointed out that its presence is less plausible in several real cases. Hence, the possible condition of heteroscedasticity must be firstly characterised and possibly corrected with appropriated techniques (Pindyck and Rubinfeld, 1998; Ragsdale, 2001). A further aspect to consider is serial correlation for time-series. Also for this issue, there exist some appropriated detecting test (Durbin and Watson, 1951) and estimating correction procedures (Cochrane and Orcutt, 1949; Hildreth and Liu, 1960).

3 The whole analytics applicable to the case and the corrections to estimation

In the present section, the dataset is shown and elaborated in all steps needed to cover the whole estimation procedure. The assessment begins by considering the only data easily and promptly available to analyse a firm profitability. In such a specific case they were, substantially, monthly total costs recorded and a monthly output production (chosen as a
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reliable indicator of activity – or ‘marker’ as named before – considering that in this case the sold product can be considered a commodity given its undifferentiated features). Original data for these two variables are resumed in Table 1.

Table 1  Original data

<table>
<thead>
<tr>
<th>Month</th>
<th>Costs (thousand €)</th>
<th>Output (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>601</td>
<td>175</td>
</tr>
<tr>
<td>2</td>
<td>501</td>
<td>132</td>
</tr>
<tr>
<td>3</td>
<td>381</td>
<td>58</td>
</tr>
<tr>
<td>4</td>
<td>371</td>
<td>51</td>
</tr>
<tr>
<td>5</td>
<td>501</td>
<td>118</td>
</tr>
<tr>
<td>6</td>
<td>566</td>
<td>158</td>
</tr>
<tr>
<td>7</td>
<td>653</td>
<td>210</td>
</tr>
<tr>
<td>8</td>
<td>667</td>
<td>227</td>
</tr>
<tr>
<td>9</td>
<td>677</td>
<td>233</td>
</tr>
<tr>
<td>10</td>
<td>725</td>
<td>253</td>
</tr>
<tr>
<td>11</td>
<td>787</td>
<td>256</td>
</tr>
<tr>
<td>12</td>
<td>753</td>
<td>246</td>
</tr>
</tbody>
</table>

Source:  Personal case

Applying the two-variable regression model with (ordinary least squares method-OLS) to these data in the simpler manner the results are:

\[ Y = 1.85 \times \text{vc} + 271.67 + \epsilon \]

Summary of relevant resulting statistics is reported within Table 2.

Table 2  Statistics summary of first linear regression of the two-variable model

<table>
<thead>
<tr>
<th>Coef. of var</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>( R^2 )</td>
<td>0.979</td>
</tr>
<tr>
<td>( \text{Adj } R^2 )</td>
<td>0.977</td>
</tr>
<tr>
<td>Df</td>
<td>11</td>
</tr>
<tr>
<td>( \sigma )</td>
<td>20.90</td>
</tr>
<tr>
<td>( \sigma^2 ) residuals</td>
<td>364.00</td>
</tr>
<tr>
<td>( t \text{ stat} )</td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>271.67</td>
</tr>
<tr>
<td>( \text{vc coefficient} )</td>
<td>1.85</td>
</tr>
<tr>
<td>Lower 95%</td>
<td>16.68</td>
</tr>
<tr>
<td>Upper 95%</td>
<td>307.96</td>
</tr>
</tbody>
</table>

Source:  Personal elaboration on data

At this point, starting from these first regression results, the main aspect to consider is the possibility of heteroscedasticity (conversely, homoscedasticity) of the data as previously mentioned. In this specific case, the Breusch and Pagan (1979) test could be applied. Additionally, the White (1980) test and the Goldfeld-Quandt test (Goldfeld and Quandt 1965) have been run, in order to have further confirmations.

The Breusch-Pagan test is considered appropriated for this application and is briefly described for explanatory reasons. Firstly, the regression between the original \( X_t \) and \( Y_t \) must be run (see data within Table 1 and Table 2) with a calculation/estimation of the
variance of residuals/errors (in the case $\sigma^2 = 364.00$). After this step, the normalised residuals ($\varepsilon^2 / \sigma^2$) have to be calculated, a second regression between original $X_t$ and normalised residuals must be run and the half of error sum of squares ($\text{RSS}_i = 7.96/2 = 3.98$) have to be individuated.

**Table 3** Statistics summary of linear regression between original $X_t$ and normalised residuals

<table>
<thead>
<tr>
<th></th>
<th>$\text{RSS}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R^2$</td>
<td>0.396</td>
</tr>
<tr>
<td>$\sigma$</td>
<td>1.10</td>
</tr>
<tr>
<td>$\text{Adj R}^2$</td>
<td>0.335</td>
</tr>
<tr>
<td>$\text{F stat}$</td>
<td>6.549</td>
</tr>
<tr>
<td>DF</td>
<td>11</td>
</tr>
<tr>
<td>$\sigma^2$ residuals</td>
<td>0.917</td>
</tr>
</tbody>
</table>

*Source: Personal elaboration on data*

This half RSS follows a chi-square ($\chi^2$) distribution with 1 degree of freedom (DF). The critical value of $\chi^2$ at the 5% level and 1 DF is easily retrieved by statistical $\chi^2$ tables and is equal to 3.84. Half of RSS – as previous elaborated – is 3.98. As can be seen, the calculated value is higher than critical one at 95% and, hence, the null hypothesis of homoscedasticity must be rejected in favour of heteroscedasticity.

To confirm such a result, the White procedure is calculated and shown. As far as this method is concerned, firstly, it is necessary to take the $R^2$ from the regression of the normalised residuals (in this case 0.396). At this point, the $R^2$ must be multiplied by $N$ (number of observations; in this case 12); the result will be $0.396 \times 12 = 4.75$. Also, this statistic follows a $\chi^2$ with 1 DF and the critical level at 5% is – as previously cited – 3.84. Thus, considering that calculated value (4.75) is higher than critical value (3.84) it is possible to reject the null hypotheses of homoscedasticity favoring the alternative one (heteroscedasticity).

The third validation to propose is the Goldfeld-Quandt test. In this case, the previous needed elaboration to apply this procedure is dividing data in two groups (respectively associated with low and high variance errors) in relation with the magnitude of the independent variable $X$. In the present example the first group can be considered including the months (2, 3, 4, 5, and 6) and the second one including remaining months (1, 7, 8, 9, 10, 11, and 12). Respectively $\sigma^2$ of $X$ values for group 1 is 1,763.84 and for group 2 is 698.53. Such a difference in variance seems support the application of this kind of test. Hence, the subsequent step is to fit two separate regressions considering the two different groups – and calculating the respective errors sum of squares ($\text{ESS}_i$). From this elaboration, the two values are respectively: $\text{ESS}_1 = 341.32$ and $\text{ESS}_2 = 3,791.06$ and, thus, the ratio $\text{ESS}_2/\text{ESS}_1$ is equal to 11.11. This statistics is distributed as an $F$ statistics with 5 DF at the numerator and 3 DF at the denominator; the critical value is 9.01 at the 5% level is lower than the calculated. Hence, it is possible to conclude that the null hypothesis (homoscedasticity) can be rejected in favour of the alternative (heteroscedasticity).

As can be seen, all the three tests give the same result confirming heteroscedasticity of original data. At this point, the further activity to carry on to obtain a more accurate estimation and a scientific elaboration of data, is to deal and correct this heteroscedasticity. Briefly, the procedure indicated in modelling literature – in case of error variances varying directly with the independent variable (Pindyck and Rubinfeld, 1998) – consists of a transformation of the original model ($Y_t = \alpha + \beta X_t + e$) into a new revised one where each term is divided by $X_t$: 

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\[ Y_t / X_t = \alpha \times 1 / X_t + \beta + \varepsilon^* \]

\( \varepsilon^* \) is the error term having the same statistic features of \( \varepsilon \) in the original regression (as previously reported) but referred to the transformation.

In Table 4, all transformed data are reported for clarity.

Table 4  Transformed two-variable regression model

<table>
<thead>
<tr>
<th>( Y_t / X_t )</th>
<th>( 1 / X_t )</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.27</td>
<td>0.0196</td>
</tr>
<tr>
<td>6.57</td>
<td>0.0172</td>
</tr>
<tr>
<td>4.25</td>
<td>0.0085</td>
</tr>
<tr>
<td>3.80</td>
<td>0.0076</td>
</tr>
<tr>
<td>3.58</td>
<td>0.0063</td>
</tr>
<tr>
<td>3.43</td>
<td>0.0057</td>
</tr>
<tr>
<td>3.11</td>
<td>0.0048</td>
</tr>
<tr>
<td>2.94</td>
<td>0.0044</td>
</tr>
<tr>
<td>2.91</td>
<td>0.0043</td>
</tr>
<tr>
<td>3.06</td>
<td>0.0041</td>
</tr>
<tr>
<td>2.87</td>
<td>0.0040</td>
</tr>
<tr>
<td>3.07</td>
<td>0.0039</td>
</tr>
</tbody>
</table>

Source: Personal elaborations

The subsequent regression results obtained by OLS elaboration of the above data are resumed within Table 5.

Table 5  Statistics summary of transformed two-variable linear regression model

<table>
<thead>
<tr>
<th>Coef. of var</th>
<th>( R^2 )</th>
<th>( \sigma )</th>
<th>( \sigma^2 ) residuals</th>
<th>MAPE</th>
<th>( \sigma )</th>
<th>( t ) stat</th>
<th>( \text{Lower 95%} )</th>
<th>( \text{Upper 95%} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>1.82</td>
<td>37.13</td>
<td>1.71</td>
<td>1.93</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coefficient of independent variable</td>
<td>276.70</td>
<td>51.27</td>
<td>264.68</td>
<td>288.73</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Personal elaboration on data

Considering the previous elaboration, the resulting formula will be:

\[ \frac{TC}{vc} = 1.82 + 276.70 \times \frac{1}{vc} + \varepsilon^* \]

thus, after the multiplication for \( cv \) of both equation member in order to report the original formula, the ultimate result will be:

\[ TC = 1.82 \times vc + 276.70 + \varepsilon. \]
Finally, as far as the serial correlation is concerned (a further analysis needed to validate the procedure), it must be considered that the set of data used in this example are not a time-series in strictly sense, hence any analysis of possible errors correlated directly with errors in the ensuing periods appears as not appropriated. As a matter of fact, costs data are regressed with units of output and, hence, there is not a sequence of values in time to forecast the subsequent.

4 Conclusions

Growing role of analytics has been recently emphasised as an opportunity to enhance the value from available data both in public and private sectors (Bayrack, 2015; Acito and Vijay, 2014). Different documented analytics applications for various sectors are presented in literature as successful examples of positive contribution to real cases: restaurants (Demydyuk et al., 2015), healthcare (Ward et al., 2014), real estate (Phumchusri and Swann, 2014), security (McCue, 2006) and trade shows (Chongwatpol, 2015) among the others. In this paper, an application to BEP analysis and improving estimation of firm’s costs curve for a more accurate contribution margin analysis is presented. From the whole elaboration applied, some observation and insights can be drawn. First of all, the possibility of supporting traditional accounting data with analytics enhancing the inherent information power. This feature assumes an increasing value during economic crisis periods. The interesting aspect is, however, in the possibility to obtain – from apparently not usable data – a different (and hopefully) useful information for decisional purposes. The application of statistical techniques allows to elaborate and refine the first obtained results (the very first regression) improving the overall estimation. In this specific case, delta in vc estimation is 1.65% (passing from 1.85 of the initial regression equation to 1.82 of the last estimation after correction for heteroscedasticity) and delta in FC is 1.82% (passing from 271.67 to 276.70). For all professional involved in business analysis, this result could also be of some added value (especially as far as sales value increases are concerning, because margins’ estimation improves). The higher level of FC, for example, should make the entrepreneur better to assess the contribution margin in order to raise up the BEP for precautionary reasons. Other positive features could be outlined by considering the statistics corroborating results; in fact all significant fitting common indicators (R², adj R², σ, σ² of residuals, coefficient of variation, mean absolute percentage error) are improving passing from the first regression estimate to the more accurate and corrected for heteroscedasticity one. Maybe, considering the classical needs of business environment, drawbacks can be pointed out in the necessary expertise to run and interpret the analysis. Education levels and skills are not so widespread (especially as far as the SMEs are concerned). Also, within business consultants field such a knowledge is not a very common skill. On the counterpart, calculation power is not a barrier anymore and can easily be implemented (even if specific software can be adopted, a common spreadsheet can be profitably applied to several real cases if appropriately exploited). The last resource to employ (and deploy) is just a little further time in implementing and empowering business procedures, management culture and awareness towards analytics possibilities. Economic crises should spur enterprises’ and inherent professional consultant services to improve tools and methodologies to apply to real cases considering the harder environment to live in. A further possible critics to the present work can be individuated in the fact that a
single-presented case could not be considered valid for all situations. This is an acceptable point of view, but it is not appropriate to the scope of the paper. As a matter of fact, the aim of the present work is to propose a more refined method to analyze (traditional accounting) business data. The goal is more on the method and not merely on the results. Probably, if an analyst/entrepreneur has not heteroscedasticity in his/her own cost-marker relationship all corrections are not necessary. However, this fact does not diminish the importance of a first regression analysis helping in elaborating a reliable function of costs without forcing (creative) efforts in variable-FCs distinctions.

The paper is strictly focused on the increasing retrievable information by mixing empirical methods (well widespread in practice following business literature) and a more accurate analytical modelling. Numerical example, taken from a real case, is an explanatory application defining the boundaries of its (specific) results. Such results are, however, remarkable considering that original estimations have been improved enhancing their firstly information power in cost management. Methodology can be applied in all circumstances and situations with appropriate (and skilled) adaptations. The path is towards the reduction of an intuitive global investment appraisal towards a more rational evaluation under condition of rapid change, uncertain outcomes, limited information and a critical economic environment as in literature outlined (Sims et al., 2015).

Definitely, business analytics can be used as a methodological tool able to support decision makers in their work and activity. Trust in this approach should be based in its reliability to improve overall business performance assessment, a firm need more and more perceived in critical economic circumstances.

References


