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WORKING PAPER

Comparing the accuracy of ABC and time-driven ABC in complex and dynamic environments: a simulation analysis

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Abstract

This paper compares the accuracy of traditional ABC and time-driven ABC in complex and dynamic environments through simulation analysis. First, when unit times in time-driven ABC are known or can be flawlessly estimated, time-driven ABC coincides with the benchmark system and in this case our results show that the overall accuracy of traditional ABC depends on (1) existing capacity utilization, (2) diversity in the actual mix of productive work, and (3) error in the estimated percentage mix. In particular, we find that when error in the estimated percentage mix is low (that is, when the ABC model is regularly adjusted to changes in activity driver volumes), growing unused capacity raises the inaccuracy of ABC, especially when diversity in the actual mix of productive work is high. When error in the estimated percentage mix is high, unused capacity may counterbalance some of the impact of this error but not entirely; the offsetting effect is highest when diversity in the actual mix of productive work is also high. Second, when unit times in time-driven ABC are subject to measurement error, we compare the overall accuracy of traditional ABC versus time-driven ABC and detect that when diversity in the actual mix of productive work is low, time-driven ABC tends to be more accurate than traditional ABC, especially at higher levels of unused capacity. Alternatively, when diversity in the actual mix of productive work is high, traditional ABC tends to be more accurate than time-driven ABC, especially at lower levels of unused capacity. Finally, it is noteworthy that the accuracy of traditional ABC compared to time-driven ABC increases in case of biased unit time estimates.

Keywords: ABC, time-driven activity-based costing, costing system design, costing errors, simulation