Motability Operations | Ltd

Review of Residual Value Forecasting

Motability Operations Ltd
November 2019

1. Executive Summary

Background

This report covers the review undertaken by Motability Operations Ltd (MO) in response to a recommendation from the National Audit Office (NAO) Review of the Motability Scheme that was published in December 2018. The NAO recommendation was for Motability Operations Ltd to "review its approach to forecasting to understand why it has consistently under-estimated profit over the last decade, so that it can better plan for future distributions of profit".

Focus of the review

The review focuses on MO's Residual Value (RV) forecasting approach to establish the reasons why forecast values have been lower than actual values in the recent past. It also looks at whether these could have been reasonably predicted; whether the approach aligns with best practice; and whether any changes need to be made.

The review concentrates on the RV forecasting process since the main source of variation in MO's profit forecast within a financial year comes from differences between the forecasts of the expected future second hand value (residual value or RV) of the vehicles on the fleet, and the actual resale value when the vehicle is handed back by the customer at the end of their 3-year lease. With a total expected value at point of de-fleet of c.£6bn, this is MO's largest risk: a 1% change in outlook impacts the overall value of the fleet by £60m.

The in-depth review considers all aspects of the RV forecasting process. The review was completed over eight months and involved a number of different work streams. A combination of in house and independent experts were used.

In line with the status of the NAO's work, the NAO were not in a position to formally endorse the findings and as such this was not sought from them. MO engaged with the NAO early in, and throughout, the process in order to confirm that MO's approach reflected the underlying findings in their report so that MO would be best placed to address their recommendations. As part of the process MO met with the NAO on several occasions, presenting and discussing findings as each stage of the review progressed. All third party experts met with the NAO to present and discuss their findings.

Key findings

1. Recent used car market performance

- **Over the last decade the used car market has been subject to a number of previously unseen factors that have provided a stimulus for used car demand not seen before.** This has included the emergence of used car personal leasing through personal contract purchase (PCP) products, the effect of exchange rate weakness on new car prices in the post Brexit vote environment and, more recently, lower new car supply in 2018 as manufacturers responded to stricter emissions standards. Without hindsight it would not have been possible to accurately predict the positive effect these factors would have on used car price levels.
- **This has made this period difficult to forecast as historical supply and demand dynamics have changed.** Any forecasting model relies on historic market dynamics to predict future values so where these dynamics are in a state of flux, models by definition will lag in their response. Cambridge Econometrics (CE) note in their independent report that "a major challenge for all forecasters working with a long forecast horizon is the high level of uncertainty about unknown events and anticipated events with unknown consequences".
- **Alternative forecasts from external providers suggest a similar experience.** Indeed, these unexpected conditions have been behind many commercial leasing companies making profits over the last few years.
- **The latest version of MO's forecasting model now takes account of these factors** and is able to accurately explain almost all of the historic variation.

2. MO's forecasting approach

- **Independent external experts endorse MO's approach and conclude that best practice forecasting techniques and governance are applied throughout.** Where recommendations have been made they have all been accepted. These are all non-material and represent incremental refinements to the process rather than a change to the approach.
- The review concludes that differences seen over the last decade are in the main down to the changing demand side dynamics that would have been impossible to predict over a 3-year time horizon without the benefit of hindsight. The latest version of the forecasting model now captures these effects.

3. **Continuous Development**

- **There is considerable evidence of latest experience being incorporated into MO's forecasting approach**, with the latest data reviewed and model updated on a frequent cycle. The review also highlights examples of specific responses to developments as they occur, in addition to the historic data-driven modelling being applied.
- These forecast adjustments have been made in a timely manner and there is no evidence of areas that haven't been responded to using all available judgmental information, which can often be very limited.

4. **Link between residual value forecast and financial forecast**

- **The process which takes the output of the RV forecast through to the financial forecast is found to be appropriate, with no significant recommendations for improvement.** This also tested whether the impact of changes in the RV forecast had intuitively sound impacts on the financial forecast. Given the financial and risk materiality, this is a process that is also subject to ongoing detailed scrutiny via internal and external audit.

5. **Latest RV model development**

- **The latest version of the RV forecasting methodology is appropriate and fit for purpose.** This methodology is subject to ongoing continuous development to ensure actual experience and the latest data are used to determine the different model coefficients and parameters. This analysis is carried out on a regular basis in conjunction with external third party experts, Timberlake Consultants[1] and Dr Jurgen Doornik[2]. This process also looks at the overall structure of the model to ensure that it remains appropriate.
- This analysis was timed to coincide with this wider review and the evaluation found that over the period since implementation of the latest model in 2017 (for vehicles being sold from 2020 onwards), it remained well specified, with the latest data having a very limited impact on modelling estimation. As a result, there was no requirement to change the model structure. Recommendations for improvement were minimal and focussed on minor refinements at the granular sector level.

6. **Independent, third party end-to-end review**

- MO commissioned third party forecasting experts, Cambridge Econometrics (CE)[3], to carry out an independent review of the forecasting process in its entirety. This concluded that there was **"no evidence of systemic bias that results in either under or over forecasting"**.
- CE noted that "MO's forecasting approach uses sophisticated techniques, is robust, fit-for-purpose and aligns to forecasting best practice" and that "MO exhibit a deep understanding of the market in which they are producing forecasts for".
- This review also looked at the role of other proprietary forecasts in the process and concluded "that MO's forecasting approach uses appropriate information including comparisons to wider industry benchmarks as a validation method". CE were also keen to point out the risks on relying on these as the basis of a forecast due to "the problem of forecaster herding."
- Recommendations from this review were non-material and focussed on formalising elements of the process to ensure ongoing consistency in the process.
- All recommendations were accepted by MO and will be incorporated into future forecasts.

Concluding remarks

1. MO believe that this review provides a comprehensive response to the NAO recommendation, and that the Residual Value Forecasting process is fit for purpose. The variances in performance seen in the recent past are a function of a structural change in demand side dynamics rather than any systemic issues with the process; these dynamics are now reflected in the forecasting model.
2. The review has highlighted that over the last decade the used car market has been subject to a number of previously unseen factors that have provided a stimulus for used car demand not previously experienced and impossible to predict over a 3 year time horizon. This has included the emergence of used car personal leasing through PCP products, the effect of exchange rate weakness on new car prices in the post Brexit vote environment and, more recently, lower new car supply in 2018 as manufacturers responded to stricter emissions standards.
3. This has made this period difficult to forecast as historical supply and demand dynamics have changed. Any forecasting model by definition relies on historic market dynamics to predict future values so that where these dynamics are in a state of flux models will lag in their response. Cambridge Econometrics note in their independent report that “a major challenge for all forecasters working with a long forecast horizon is the high level of uncertainty about unknown events and anticipated events with unknown consequences”.
4. As part of the review, independent external experts have endorsed MO’s approach and concluded that best practice forecasting techniques and governance have been applied throughout. Where recommendations have been made they have all been accepted but it is worth noting that they are all non-material and represent incremental refinements to the RV Forecasting process rather than a change to the approach.
5. As a principle all recommendations are to be adopted within a 6-month maximum period of the review being completed.

1: Timberlake Consultants
Timberlake Consultants Ltd has delivered consultancy, software and training solutions for over 35 years with recent clients including HM Treasury, Bank of England and the European Central Bank. Timberlake work in conjunction with a wide range of leading academics and professionals who specialise in statistics, econometrics and forecasting. (Further details in appendix 1)

2: Dr Jurgen Doornik
Jurgen A. Doornik is a Research Fellow at the Economics Department of the University of Oxford at Nuffield College, and a director of OxMetrics Technologies Ltd. He has published several recent books and articles on subjects including econometric methods, forecasting, modelling and software, and is in top 4% of authors worldwide by citations. (Further details in appendix 1)

3: Cambridge Econometrics
Cambridge Econometrics are an independent, analytical and modelling consultancy with over 30 years’ experience. Their work includes that for governments, local authorities, the European Commission, NGOs and businesses. (Further details in appendix 1)