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Comment on "On Estimating Current-customer Equity Using Company Summary Data"

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In this paper Phil Pfeifer presents an approach for estimating current-customer equity using company-reported summary data when the reporting period spans multiple renewal periods. We sincerely admire a number of aspects of the paper, including: (1) its focus on a problem of genuine managerial interest, (2) its use of a "real world" dataset covering a lengthy period of time (and the author's decision to publish the full dataset in the paper, which facilitates future re-analyses of it), and (3) its aim to bring clarity (and methodological improvement) to approaches used in earlier papers while still retaining a highly practical perspective on the problem at hand.

The accomplishment of such goal inevitability involves trade-offs; without access to the more disaggregated data lurking in the firm's customer databases, we cannot build models of a richness desired by many of our academic colleagues. Whenever undertaking such an exercise, we always keep in mind a saying attributed to Albert Einstein: "Make everything as simple as possible, but not simpler." So while we like what Pfeifer has tried to achieve, we feel that the approach presented in this paper has overstepped the mark: it is "too simple" to properly address the problems it aims to deal with.

One key assumption in this work, which is shared by virtually all other papers in the "valuing customers"/"customer equity" literature (e.g. Gupta and Lehmann 2003; Gupta, Lehmann, and Stuart 2004; Libai, Muller, and Peres 2009; Wiesel, Skiera, and Villanueva 2008), is that of a *constant retention rate*. Unfortunately this is not what we observe in real data. If we look at a cohort of customers acquired at a particular point in time, we (almost) always observe increasing retention rates as the cohort's tenure with the firm increases. This is routinely observed by managers of subscription-based businesses such as Netflix (which is the focal company for Pfeifer's analysis): "New subscribers are actually more likely to cancel their subscriptions than older subscribers, and therefore, an increase in subscriber age helps overall reductions in churn" (Netflix, Inc. 2006).

Unfortunately, the aggregate retention rate numbers reported by such companies (and by Pfeifer) hide this important pattern and merely reflect a weighted average of the retention rates across all cohorts at any given time (i.e., a mix of "young" and "old" customers). This weighted average will mask (and moderate) the within-cohort retention patterns, potentially giving the analyst the impression that the retention dynamics are mild (and therefore possibly ignorable).

Is this the case — can we "assume away" the within-cohort retention dynamics as a minor source of noise? The answer is absolutely not. Building on earlier work published in this journal (Fader and Hardie 2007a), we have shown how failing to account for cohort-level retention-rate dynamics will lead to systematically biased estimates of the residual value of a customer (and therefore equivalent biases in what this paper calls current-customer equity (CCE)). Our analysis (published in Fader and Hardie 2010) shows that valuations performed using an aggregate retention rate will underestimate the true value of the customer base by a magnitude of 25%–50% in standard settings. Any analysis designed to estimate CCE must be based off an underlying model of customer behaviour that captures the cohort-level retention-rate dynamics, such as the shifted-beta-geometric (sBG) model presented in Fader and Hardie (2007a) or the gamma mixture of Weibulls as used by Schweidel, Fader, and Bradlow (2008). To be fair, Pfeifer acknowledges the desirability of such an approach but stops well short of incorporating anything like it into his proposed method for "fine-tuning" the retention rates.

Perhaps one reason why he (and other researchers) chose not to capture these retention-rate dynamics is the apparent need for

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longitudinal data for each cohort in order to estimate the parameters of the duration model. However, as we show in Fader and Hardie (2007b), this need not be the case. In fact, under certain assumptions, all we require are data on the number of new subscribers and the total number of subscribers for each period.

An important requirement of this estimation approach is that we must have such data for each renewal period from the time the service of interest was launched on the market. The Netflix dataset used in Pfeifer's paper does not satisfy this requirement: the data series is left censored — we see 603,000 customers at the beginning of Q2/2002 but we don't know how old they are. This is a non-issue when we assume a constant retention rate (and Pfeifer never comments on it). However, it becomes a problem when we choose to acknowledge the reality of the retention-rate dynamics. Some of these older customers may still be "alive" when we stand at the end of Q1/2009 and attempt to compute CCE. It is important that we account for the fact that some of them will have been acquired in, say, Q1/2000 while others in Q1/2002 — the former group will be further out on the retention-rate curve and therefore have a higher residual lifetime value than the latter.

There is a reasonably straightforward solution to this problem: the analyst only needs to fit a model of customer acquisition to the observed "additions" data, then "backcast" the additions past the point of left censoring, all the way back to the launch of the service. A variety of customer adoption models (such as the Bass model) can be used for this procedure, and the data are readily available in Pfeifer's paper.

Once this adoption model has been estimated, it can be used to provide a simple and effective alternative methodology to the main contribution that Pfeifer offers in his paper: one can easily interpolate from the quarterly acquisition numbers down to the monthly level. From there, it is a straightforward (albeit tedious "accounting") exercise to extend the "Case 2" estimation approach outlined in Fader and Hardie (2007b) to compute CCE using the expressions for a customer's residual lifetime value presented in Fader and Hardie (2010). Furthermore, one can project the adoption model beyond the bounds of the observed dataset in order to obtain the estimates of future customer equity, which is an important component of many of the aforementioned "customer equity" papers.

Thus Pfeifer's effort to "fine-tune" the retention rates in a realistic setting is a well-intended exercise, but it falls short of its potential since it ignores cohort-level retention dynamics. Fortunately, the "fix" that we have briefly outlined here still qualifies as "simple" (but not "too simple"), and it offers a number of other managerial benefits as well. The key point is that one needs not rely on oversimplified assumptions about customer behaviour in order to offer practical solutions to important managerial problems. Telling the right "story" (and using appropriate mathematical constructs to implement it) can be simple and highly effective at the same time. There will always be trade-offs when building a model, but researchers should always strive to find the best balance in dealing with them.

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