Applicability of the Net Promoter Score in the Energy Sector

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Abstract: In recognizing the frequent use of NPS, this work provides empirical evidence of the NPS's applicability within the energy sector. The study relies on a confidential sample of 1,250 customers of a Czech subsidiary of a European electric energy and gas provider. We found that the promoters stayed with the company for a longer time than the detractors. They were also more likely to renew their contract than did the detractors, even after a price increase. However, the study confirmed only a relatively shallow relationship between the customers' promoter scores and the time customers spent with the company. Furthermore, the customers' promoter scores differed concerning their gender and education, whereas there were no significant differences among the NPS categories in terms of age.

Keywords: net promoter score, promoters, passives, detractors, energy sector

JEL Classification codes: M31

INTRODUCTION

The Net Promoter Score (NPS) has become one of the most important measures of customer loyalty in the world of practice (Bennett and Molisani, 2020). As a management tool, NPS aims to estimate the ratio of promoters to a firm's detractors (Reichheld, 2003). NPS asks customers, "How likely is it that you would recommend our company to a friend or colleague?" Customers answer on a 0-to-10 scale, and depending on their specific rating, they are classified as "promoters" (9-10 rating), "passively satisfied" (7-8 rating), or "detractors" (0-6 rating). While promoters are expected to act as brand ambassadors for the company, passively satisfied will be neutral, and detractors will reflect on their negative experiences. The calculation of NPS requires subtracting the percentage of detractors from the percentage of promoters.

In recognizing the frequent use of NPS, this work provides empirical evidence of NPS's applicability in the energy sector, which has not been studied in the literature so far.

With the liberalization of the European energy market, customers' possibility to switch energy providers increased significantly (Capece et al., 2013). Thus, customer satisfaction and loyalty have become critical topics within the industry, previously operating in monopolistic environments (Hartmann and Ibáñez, 2007).

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Further on, the socio-economic impacts of the COVID-19 pandemic, as well as the current energy crisis in Europe, may further reinforce the competitiveness in the energy markets due to the predictable tendencies of households to look for savings (e.g., Baker et al., 2020 or Ari et al., 2022). For example, it is estimated that the recent increase in fuel prices will raise the European households' cost of living by approximately 7 percent of consumption on average (Ari et al., 2022).

The organization for the rest of this paper is as follows: First, the authors summarize the most important studies concerning the NPS concept. Then, the authors describe the research methods and develop a series of hypotheses that posit the relationship between customers' promoter scores and the time they spent with the company, their willingness to renew the contract, the number of consumption points, and their willingness to renew the contract after a price increase. Furthermore, the authors extend the analysis to test other hypotheses on the relationship between customers' promoter scores and their characteristics, specifically their gender, education level, and age. Finally, the authors summarize and discuss their findings.

1 LITERATURE REVIEW

The NPS concept, which is based on customers' declared intention to recommend a brand, has become a popular and widely used method for measuring and predicting customer loyalty (Raassens and Haans, 2017). Specifically, the likelihood of recommendation seems to be one of the two most tracked measures of customer loyalty in practice (together with customer satisfaction) (Aksoy, 2013).

Because of its simplicity, low related costs, and presumed relation to an organization's future performance, worldwide enterprises like Microsoft, General Electric, or American Express use the NPS concept (Floh et al., 2013).

Using NPS has become standard practice in a variety of productive sectors, including the brewery industry (Faltejskova et al., 2016), construction management services (Jeong and Lee, 2015), E-commerce (Jang et al., 2013; Liuqu et al., 2015; Pollak and Dorcak, 2015), tourism and hospitality services (Lathiras et al., 2011), institutions of higher education (Dvorakova and Faltejskova, 2014), social media (Xie, Putrevu and Linder, 2017), medical services (Hamilton et al., 2014; Rolbina et al., 2017; Stirling, Jenkins, Clement, Duckworth and McEachan, 2019), or even wedding services (Takami, Kitada and Ota, 2016).

Despite the popularized use of NPS, mainly based on its positive association with customers' positive word-of-mouth (Eger and Micik, 2017; Raassens and Haans, 2017), its employment has received a large number of criticisms (Artz, 2017; Bendle, Bagga, and Nastasoiu, 2019; East et al., 2011; Fisher and Kordupleski, 2019; Keiningham et al., 2008; Klaus and Maklan, 2013; Klimin et al., 2017; Korneta, 2018; Kristensen and Eskildsen, 2011; Rocks, 2016). Arguably, one of the main criticisms is the false relationship between growth and customers' loyalty (East et al., 2011) or the lack of its statistical properties (Rocks, 2016). Above and beyond these considerations, there exist other concerns about the use of NPS. For example, Kristensen and Eskildsen (2014) showed the dangers of employing NPS as input to managerial decision-making and claimed that organizations are far better off using other metrics. De Haan et al. (2015) claimed that NPS was not a good predictor of customer retention. As per van Doorn, Leeflang, and Tijs (2013), NPS was not a better alternative than other similar indices. Krol et al. (2015) questioned the validity of NPS to reflect patients' experiences with health service providers genuinely. More recently, Lewis and Mehmet (2020) observed that NPS captures the sentiment customers feel toward a brand. Still, caution should be used to classify clients into detractors, passives, and promoters. Besides, Temple, Burkhart, and Tassone

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(2020) showed that NPS collected via email campaigns consistently produces lower scores than the in-app intercept method.

An excellent summary of the criticisms about the use of NPS is the one by Fisher and Kordupleski (2019), who highlighted the following five problems: 1) NPS does not provide data on what to do to improve, 2) it focuses only on keeping customers, ignoring how to win new clients, 3) The idea of "passive" customers is misleading, 4) NPS provides no competitive data, and 5) NPS is internally focused, ignoring the role of external forces that affect the performance of a firm. These criticisms, however, seem to be ignored in recent empirical works that promote the use of NPS as a practical criterion for validating the results of sophisticated machine learning techniques (Chant and Potter, 2019; Vélez, Ayuso, Perales-González and Tinguaro Rodríguez, 2020).

2 METHODOLOGY

This study relies on a confidential sample of 1,250 customers of a Czech subsidiary of a significant European electric energy and gas provider. All customers resided in the Czech Republic when the data was collected and provided their informed consent to participate in the study. Customers were asked to fill out a survey and provide information on their age, sex, educational level, the decision to extend the contract with the company or not, and their household energy consumption points. An empirical classification of customers was done in terms of one of the following two mutually exclusive groups: those who received a price increase since they signed their last contract and those who did not.

Based on the fact that the empirical distribution of NPS scores proved to have significantly deviated from a Gaussian-like distribution, the authors conducted a series of non-parametric bivariate statistical tests to identify significant relationships among the explored variables, as suggested by previous works (Korneta, 2018). The following set of hypotheses guides the empirical analysis. As promoters are expected to act as brand ambassadors of a firm, the first hypothesis is the following:

> Hypothesis 1a: There is a positive relationship between customers' promoter scores and time spent with the company.

At the same time, promoters should be, on average, with the company for a longer time than detractors should. Therefore:

> Hypothesis 1b: Promoters stay with the company for a longer time than detractors do.

According to Reichheld and Markey (2011), promoters should be more willing to buy products of the company than are detractors and passives. The authors will, therefore, test whether the promoters within the sample are more willing to renew their contract and continue consuming the company's products than detractors are. Therefore, the second hypothesis is the following:

> Hypothesis 2: Promoters are more willing to renew their contract than detractors are.

Given the fact that some Czech Energy's clients have more than one consumption point, as the result of choosing a different provider to supply different households, it is reasonable to

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assume that they would try to have a preferred energy provider. Therefore, there should be a non-null relationship between NPS and the number of consumption points. Hypothesis number three is, thus following:

> Hypothesis 3: There is a positive relationship between customers' promoter categories and the number of customers' consumption points.

Reichheld and Markey (2011) claimed the existence of a relationship between NPS and price sensitivity. Promoters should be less price-sensitive than detractors. Thus, hypothesis four is the following:

> Hypothesis 4: Promoters are more willing to renew their contract after a price increase than detractors are.

Some studies focused on variations in response to the NPS concerning the demographic characteristics of the respondents. For instance, according to Situmorang (2016), NPS may vary depending on the age of the respondent. The authors posit the following hypothesis:

> Hypothesis 5: The NPS categories differ concerning age.

In a similar vein, given that Eskildsen and Kristensen (2011) found gender differences within the promoter scoring, with females more likely to be firm promoters, the authors posit the following hypotheses:

> Hypothesis 6: Promoter scores' differences between men and women are statistically significant,

> Hypothesis 7: Promoter scores' and customers' educational levels are significantly related.

Customer loyalty has often been defined from a strictly behavioral perspective. Under these conditions, loyalty is equalized with observed purchase behavior (Storbacka et al., 1994). Another approach is combining both attitudinal and behavioral perspectives. Contrary to focusing only on actual (repeat) purchasing behavior, both repeat purchases and favorable attitudes are required to define loyalty in this case (Bandyopadhyay and Martell, 2007).

In this study, the authors assume the NPS concept as a measure of the attitudinal dimension of loyalty, whereas for measuring behavioral loyalty they apply several components of actual purchase behavior, i.e. action measures such as time spent with the company, willingness to renew the contract, or willingness to renew the contract after a price increase.

Several studies indicate that perceived switching costs may cause unsatisfied customers to continue with the same provider only because these customers believe that switching would be difficult or expensive (Cheng, 2011). The perceived switching cost is thus an important factor concerning customer loyalty (Storbacka et al., 1994), which may lead to "false loyalty" (Jones and Sasser, 1995) and to substantial differences between the attitudinal dimension of loyalty and actual behavior.

Perceived switching costs for energy providers tend to be relatively high (Pomp and Shestalova, 2007). Thus, the relationship between the NPS concept and actual behavioral outcomes, i.e. applicability of NPS within the energy sector, may theoretically be lower than in the case of other sectors.

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All these reasons make the energy sector an interesting context for studying customer loyalty and the possible use of the NPS concept.

3 RESULTS AND DISCUSSION

The main results of this study are summarized in Figure 1. The correlation between customers' promoter scores and the time customers spent with the company proved to be relatively shallow but still statistically significant ($r_{xy} = 0.085$, $p < 0.05$).

Other insights stem from the box plot depicting time spent with the company within the three NPS categories (panel A of Figure 1). The first and the third quantiles among passives and promoters seem to be similar, ranging between four and seven years. However, when the median within the categories is considered (displayed by the thicker black bar in the box), it is evident that the median of the promoter category is significantly higher. The detractor category ranks in last place. Results of the Kruskal-Walli's rank-sum test revealed significant differences concerning the time spent with the company. Furthermore, the Wilcoxon test verified differences between NPS categories (e.g., promoter x detractor), confirming that there are significant differences between all categories in terms of time spent with the company ($p < 0.05$).

With these results, Hypothesis 1a cannot be adequately supported. However, it can be concluded that promoters stay with the company longer than passives and detractors, and passives remain with the company longer than detractors do. Hypothesis 1b, in this sense, proved to be supported by the data.

Further on, the Wilcoxon test results confirmed statistically significant differences between the group of customers who decided to renew the contract with the company and those who chose not to ($p < 0.05$); this difference is illustrated in panel B of Figure 1.

The detractors' category is strongly associated with the "non-renewing" group, whereas the promoters' category is strongly associated with the "renewing" group and vice versa (panel C of Figure 1). Henceforth, Hypothesis 2 is supported: Promoters are more willing to renew their contract than detractors are.

As for the relationship between customers' promoter scores and the number of consumption points, the authors found no significant relationships, neither for electricity ($r_{xy} = 0.016$; $p > 0.05$) nor for gas ($r_{xy} = 0.057$ $p > 0.05$). The results of the Kruskal-Wallis rank-sum test revealed that differences between consumption points of promoters, passives, and detractors were not statistically significant, which leads us to reject Hypothesis 3.

The authors filtered the sample of customers who have been addressed with a company's price increase since they signed their last contract. Then they analyzed the differences between the "renewing" and "non-renewing" groups and the NPS categories. The mosaic plot in panel D of Figure 1 depicts the differences between renewing and non-renewing customers after a price increase. This difference proved to be statistically significant ($p = 0.009$) and lead to supporting hypothesis 4, according to which promoters were more willing to renew their contract after a price increase than were detractors.

Fig. 1 (A) Customers' time spent with the company as a function of NPS categories (B) Customers' promoter scores as a function of their willingness to renew the contract.

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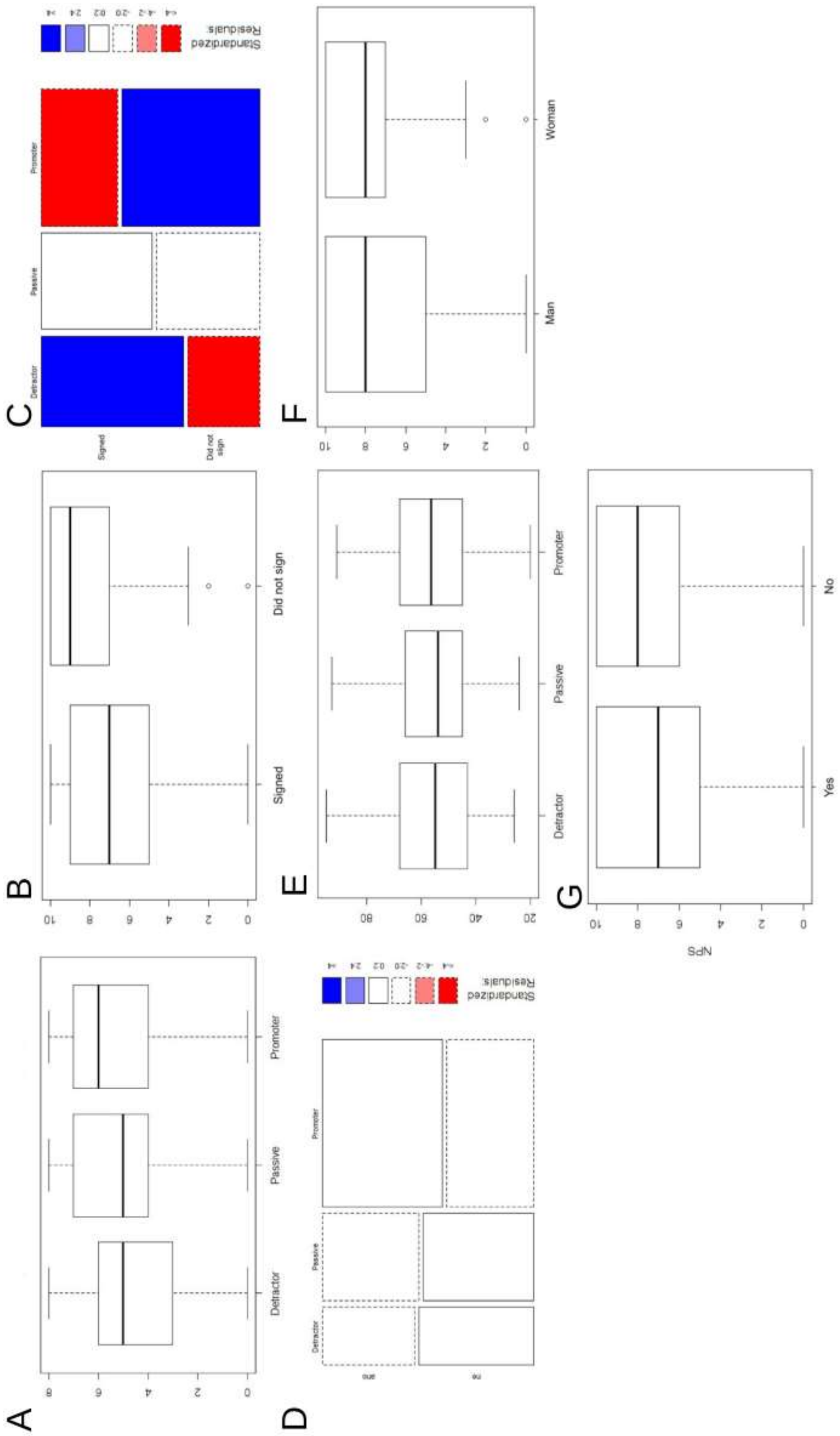
(C) Mosaic plot on the relationship between NPS categories and contract renewal, (D) Mosaic plot on the differences between renewing and non-renewing customers, (E) Customers' age differences as a function of NPS categories, (F) NPS score differences between men and women, and (G) NPS score differences for customers with and without a university education



Source: Authors

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Panel E of Figure 1 shows the statistical distribution of age for promoters, passives, and detractors. The results of the Kruskal-Wallis test leads to rejecting Hypothesis 5, according to which NPS categories would differ concerning customers' age.

Panel F of Figure 1 illustrates the promoter score differences between men and women. Even though the promoter score median for both genders looks similar, the values of the first and the third quartiles differ significantly, as revealed by the results of the non-parametric Wilcoxon rank-sum test ($p < 0.05$) and the Welch Two Sample t-test ($p < 0.05$). These results allow us to support Hypothesis 6 on the existence of significant differences between genders' promoter scores.

Finally, panel G of Figure 1 shows the statistical distribution of promoter scores for customers with and without a university education. The results of the unpaired two-sample Wilcoxon test revealed that customers with university education scored significantly lower than customers with lower education levels. Thus, Hypothesis 7 on the relationship between promoter scores and customers' education level is supported. Table 1 summarizes the empirical status of all hypotheses tested.

Tab. 1 The empirical status of tested hypotheses

Hypothesis: Assumed relationship	**Empirical status**
1A. There is a positive relationship between customers' promoter scores and time spent with the company	Inconclusive
1B. Promoters stay with the company for a longer time than detractors	Supported
2. Promoters are more willing to renew their contract than detractors	Supported
3. There is a positive relationship between customers' promoter categories and customer's consumption points	Rejected
4. Promoters are more willing than detractors to renew their contract after a price increase	Supported
5. NPS categories differ significantly as a function of customers' age	Rejected
6. Promoter scores' differences between men and women are statistically significant	Supported
7. Promoter scores and customers' educational levels are significantly related	Supported

Source: Authors

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3.1. Discussion

Among all hypotheses tested, the authors found relatively weak evidence on the relationship between customers' promoter scores and their time spent as customers of the energy supplier. Contrary to expectations, this relationship's magnitude, albeit statistically significant, proved to be relatively shallow.

Besides, the authors rejected the hypothesis of the positive relationship between customers' promoter scores and consumption points and possible statistically significant differences in customers' age as a function of NPS categories. Altogether, these results suggest that it is not necessarily correct all that has been claimed around the NPS, at least in the energy sector.

However, most hypotheses proved to be true for the sample of Czech customers of the energy supplier. The confirmation of the rest of the hypotheses suggests that promoters' ratio to detractors is a sensitive metric to discriminate customers who are willing to renew their contract with the company from those who do not. This fact is useful for practitioners and those in charge of leading customer relationship management departments (Bendle et al., 2019).

As some of the hypotheses were not confirmed, it might be possible that practitioners feel the need to complement the results that provide the application of NPS with other customer-oriented data collection techniques. The authors argue that this need opens the doors for different approaches that do not rely on scales and instead analyze customers' comments spontaneously expressed on social media or customer-providers commercial platforms. Practices inspired by this orientation are already available, for example, in the food industry (Teichert et al., 2020). The authors think that they could be used for the energy sector as well.

CONCLUSION

Two dominant positions characterize the literature on NPS; namely, those who accept and use NPS highlighting its applicability for practical purposes, and those who criticize its use by recalling its problems. The use of NPS in the energy sector remained unexplored. This study was the first one to show the empirical results of NPS in the energy sector.

The authors concur with the idea proposed by Grisaffe (2007), since NPS may be a valuable, applied diagnostic metric. Still, it is not the only thing a company needs to manage for success. Thus, NPS is far from being an ideal operationalization of accepted theoretical formulations of customers' loyalty or customer satisfaction concepts.

The findings also support the idea that companies should not focus primarily on the overall NPS of their customer base. Instead, they should focus on the size of the three NPS segments (promoters, passives, and detractors) and their development over time. The authors proved that promoters have a higher potential for the company than passives and detractors. They display the most desired behavior, as they are more loyal and willing to renew their contracts. They also show a lower price sensitivity. Contrary, detractors are less loyal and less willing to renew the contracts. Therefore, focusing on increasing the number of promoters and at the same time decreasing the number of detractors within the customer base seems to be a highly reasonable goal.

As mentioned before, the analysis of customers' spontaneous word-of-mouth data might also be a promising complement to NPS. The available literature on the connection between NPS and word-of-mouth data lacks exciting opportunities recently proposed by the framework of applied complexity (Correa, 2020). The unstructured word-of-mouth data is subject to analysis

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from natural language processing techniques. Applications of this sort in the food industry (Teichert et al., 2020) might be easily generalizable and used in the energy sector. However, this use might require the participation of a data science team in charge of producing executive reports for managers to make decisions on customer relationships.

The present study is not free of limitations. As this study focused on the energy sector and one company, in particular, any pretension of generalizing to other companies or sectors may fail.

Above and beyond this limitation, it is worth mentioning the opportunities for further empirical studies tackling the relationship between NPS and word-of-mouth data within the energy sector as well as other sectors.

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