

More, Faster, and Better? Effects of Rewards on Incentivizing the Creation of User-Generated Content ^{*}

CURRENT VERSION: SEPTEMBER 2023

Mahsa Paridar[†] Mina Ameri[‡] Elisabeth Honka[§]

Abstract

We quantify the effects of monetary and non-monetary rewards on the quantity, timeliness, and quality of user-generated content (UGC). Users can receive both types of rewards from the platform and/or other users. Understanding the effectiveness of different types of rewards provides platforms with guidance on how to design reward systems to encourage desired user content generation. Our data come from an online board game platform and consist of information on three types of UGC: initiating forum threads, replying to peers' questions, and writing game reviews. Our results show that both monetary and non-monetary peer rewards, i.e., tips and likes, lead to more, longer, politer, more complex, more informative, but less timely content. In contrast, compensation and badges, i.e., the monetary and non-monetary reward from the platform, have the opposite effects. We discuss how platforms can incentivize the production of specific types of UGC and how the UGC posting behavior of different types of users, e.g., top contributors or original content creators, is impacted by rewards.

Keywords: User-Generated Content, Monetary Rewards, Non-Monetary Rewards

JEL Classification: D83, L82, M31

^{*}We thank Anand Bodapati, Randy Bucklin, Brett Hollenbeck, Sylvia Hristakeva, Justin Huang, Jung Youn Lee, Peter Rossi, Ying Xie, and Yixiang Xu for their suggestions. We thank the participants of the 17th Annual Bass FORMS conference, the 1st Cali Quant Marketing PhD Student conference, the 2023 INFORMS/Marketing Science conference, and MARC 2023 for their comments. All errors are our own.

[†]University of California Los Angeles, mahsaparidar@ucla.edu.

[‡]University of Pittsburgh, mina.ameri@pitt.edu.

[§]University of California Los Angeles, elisabeth.honka@anderson.ucla.edu.

1 Introduction

User-generated content (UGC) plays a crucial role for social media platforms: it attracts new users to a platform and keeps existing users engaged. The more and the more engaged users a platform has, the more ads it can show and increase its revenue. Therefore, platforms are keenly interested in quickly increasing high-quality UGC production and have implemented a variety of rewards to encourage users to create UGC. For example, YouTube and Goodreads utilize “thumbs up” or “likes,” Twitch and Tiktok allow users to tip a content creator, and StackExchange and Wikipedia use badges to reward users who create a lot of content. Several of these and other social media platforms also use multiple reward types.

This variety of rewards used by platforms raises several important questions. First, are monetary and non-monetary incentives equally effective in encouraging UGC? On the one hand, non-monetary rewards enhance motivations related to social benefits of voluntary contributions, such as improved reputation and social status (Hennig-Thurau et al. 2004, Roberts, Hann, and Slaughter 2006, Toubia and Stephen 2013). On the other hand, economic theory suggests that rational individuals aim to maximize their utility and thus monetary incentives can impact content production by triggering financial motivations for content generation (Hennig-Thurau et al. 2004). However, monetary incentives may also weaken the status-enhancing effects of prosocial behaviors and crowd out users’ non-monetary motivations (e.g., Qiao et al. 2020, Liu and Feng 2021). While existing evidence supports the significant effects of both types of rewards on UGC, most studies have only examined one reward type, leaving a gap in our understanding of their relative effectiveness (see, e.g., Gallus 2017, Burtch et al. 2022). Closest to our paper is a study by Burtch et al. (2018) who compare the effects of monetary rewards and social norms on UGC. To the best of our knowledge, the relative effectiveness of monetary versus non-monetary rewards has not been studied in an empirical setting.

Second, both monetary and non-monetary rewards can be awarded either by the platform itself or by other users. Platforms can influence UGC by utilizing symbolic, non-monetary

rewards, such as badges, points, or labels (Goes, Guo, and Lin 2016; Hanson, Jiang, and Dahl 2019). For example, YouTube awards honorary YouTube Creator Awards plaques to YouTube channels with a large number of subscribers.¹ Platforms can also provide monetary compensation to content creators (Qiao et al. 2020; Yu, Khern-am nuai, and Pinsonneault 2022). For example, YouTube awards monetary compensation via the YouTube Short Fund to YouTube creators whose Shorts received high engagement and many views.²

Moreover, platforms can indirectly influence content creation by enabling users to reward content creators. Some platforms allow users to express their reaction to content through various non-monetary means such as likes, emojis, or stars (Zeng et al. 2023) or to give financial rewards through virtual tipping, virtual gifts, or purchasing premium stickers (Burtch et al. 2022). For example, on YouTube, users can like content and they can purchase access to the YouTube Super Chat.³ To recap, platforms can implement four types of rewards which vary in their prize (monetary versus non-monetary) and their source (awarded by platform versus by other users). In order for the platform to determine its optimal role, i.e., whether it should adopt a more active or a more passive approach in encouraging UGC creation, further investigation on whether and to what extent the four reward types vary in their impact when present simultaneously is needed.

Third, the effects of rewards on UGC production may not be uniform across different types of content. For instance, Xu and Li (2015) examine the effects of non-monetary extrinsic incentives on two types of contributions on Wikipedia and find that, while such incentives increase original content creation, they do not impact content posted in response to other users' contributions. We also investigate the effects of rewards on different types of content, such as writing reviews or answering questions.

And last but not least, platforms are not solely interested in generating a large volume of UGC, but also in that UGC being timely and of high quality. Timeliness captures the

¹<https://www.youtube.com/creators/how-things-work/get-involved/awards/>

²<https://blog.youtube/news-and-events/introducing-youtube-shorts-fund/>

³The proceeds from YouTube Super Chat access purchases go to the content creator (<https://support.google.com/youtube/answer/7288782?hl=en>).

idea that content should cover current topics of interest to the community and that user questions should be answered promptly. To the best of our knowledge, no previous research has investigated how rewards impact this aspect of UGC. While there is some previous research quantifying the effects of rewards on content quality (see, e.g., Burtch et al. 2022), these studies have usually focused on one or two aspects of content quality. In contrast, we take a much more comprehensive look at UGC quality also investigating aspects such as informativeness or politeness.

Studying the differential effects of rewards types across content categories and understanding the most effective ways to incentivize quantity, quality, and timeliness of UGC can provide platforms with valuable insights for designing tailored reward systems, optimizing user engagement, and maintaining the quality and relevance of the content they offer. To answer these questions, the causal effects of the different types of rewards need to be jointly measured and compared. As previously mentioned, we focus on four common rewards which differ in their prize (monetary and non-monetary) and source (awarded by platform and by other users).

One of the challenges of estimating the effects of rewards lies in their endogeneity: users do not randomly receive rewards; they receive rewards for previously produced UGC. Therefore, previous literature has mostly relied on experimental variation to measure the effects of different rewards (Burtch et al. 2018; Huang and Narayanan 2020; Burtch et al. 2022; Huang, Kaul, and Narayanan 2022). However, because of cost and complexity concerns, the experimental approach has been mostly used to study the effects of a single type of reward (Kuang et al. 2019). This makes a comparison of the effects of multiple rewards challenging. In this paper, we take advantage of our unique data which allow us to include a very large number of fixed effects to address endogeneity concerns.⁴ More specifically, we control for every source of a reward, usually a UGC post made in the past, using source-specific dummy variables in addition to individual-day fixed effects. This approach allows us to measure and

⁴We use the terms *dummies* and *fixed effects* interchangeably and, technically, we difference them out.

compare the causal effects of the four most common types of rewards in incentivizing UGC creation.⁵

Our data come from an online board game platform called BoardGameGeek.com (BGG). For a random sample of users, we observe the UGC they created over a time period of ten years and all rewards they received for the UGC. More specifically, our data contain three types of UGC: initial thread posts on the discussion forum, reply posts on the discussion forum, and game reviews. The platform rewards users with badges and monetary compensation in its virtual currency for creating UGC. Other users can also reward the focal user for UGC with likes and tips. To summarize, users can receive monetary and non-monetary rewards from both the platform and other users.

We quantify the causal effects of rewards the user received during the prior three days on the creation of UGC on the focal day using log-log linear regressions and account for endogeneity concerns using a rich set of fixed effects. We examine three aspects of the created UGC: its quantity, its timeliness, and its quality. UGC quantity refers to the number of posts of a certain type, e.g., reviews or replies, and timeliness refers to the time interval between a thread initiation and a reply or a game publication and its review. We measure eight aspects of text quality and combine them into four underlying factors ranging from text length over readability to politeness.

Our results show that any peer reward, i.e., both tips and likes, leads to more, longer, politer, more informative, and more complex content. However, peer rewards also lead to slower, less timely content production. In terms of magnitude, peer rewards have the largest effects of replies. In contrast, compensation and badges, i.e., the monetary and non-monetary reward from the platform, lead to fewer, shorter, less complex, and less informative content. However, both types of platform rewards lead more timely content production.

We then investigate the heterogenous effects of rewards for different groups of users.

⁵Our interpretation of the effects as being causal relies on the conditional independence assumption, i.e., conditional on the observed variables and fixed effects, the error term and the focal variables are independent (Angrist and Pischke 2009).

First, we differentiate between top contributors and casual users and find top contributors to be less impacted by rewards than casual users. This is particularly the case for monetary peer rewards, but also for other rewards to a lesser degree. We speculate that this might be due to top contributors' higher intrinsic motivation to write UGC compared to casual users. Casual users are rather extrinsically motivated by peer rewards. And second, we distinguish between original content creators, reactive content creators and baseline users. Original content creators are less affected by rewards than the other two groups of users. When comparing the effects of the different types of rewards, non-monetary rewards are more effective in encouraging original content creators than monetary rewards. The picture looks somewhat different for reactive content creators. These users are mostly motivated by peer rewards.

The contribution of this paper is two-fold. First, we add to managers' and academics' understanding of the effectiveness of different types of rewards. More specifically, we quantify the effects of different types of rewards within the empirical context of a platform that employs all four of them and are therefore able to compare their magnitudes. This comparison provides a holistic overview and guidance to managers on how to design reward systems to achieve desired UGC goals. And second, we contribute to the literature on text quality by measuring right quality aspects of each post and combining them into four underlying factors. Our approach provides a deeper and more comprehensive understanding of text quality than evaluated by previous research.

The remainder of this paper is organized as follows: In the next section, we review the relevant literature. In Section 3, we introduce and describe our data. We present our model in Section 4 and discuss the results in Section 5. In the following section, we review the robustness checks and conclude in Section 8.

2 Relevant Literature

In this section, we review the relevant streams of literature on user-generated content, online rewards, and special interest communities and delineate our research vis-à-vis findings from previous research.

UGC has been shown to affect a variety of consumers' decisions (e.g., Godes and Mayzlin 2004; Chevalier and Mayzlin 2006; Chen, Wang, and Xie 2011; Moe and Trusov 2011; Ameri, Honka, and Xie 2019), and to be a source of entertainment driving platform engagement (Chevalier and Mayzlin 2006; Leung 2009; Yang, Ren, and Adomavicious 2019). As a result, several papers have studied factors that impact and encourage the creation of UGC such as social norms (Burtch et al. 2018), financial incentives (Burtch et al. 2018; Khern-am nuai, Kannan, and Ghasemkhani 2018), rewards (Gallus 2017; Burtch et al. 2022), performance feedback (Huang et al. 2019), community commitment (Bateman, Gray, and Butler 2011), and audience size (Zhang and Zhu 2011). For instance, Zhang and Zhu (2011) show a positive causal relationship between audience size and individual-level contributions in the context of Chinese Wikipedia. Burtch et al. (2018) examine the effect of descriptive social norms and money to stimulate the production of online reviews. They show that money increases the number of reviews, while social norms increase review length. In this paper, we study how rewards affect the creation of UGC.

Platforms can take a direct action and use different types of rewards to encourage more UGC creation in their online communities (Woolley and Sharif 2021; Hukal et al. 2020; Qiao et al. 2020; Sun, Dong, and McIntyre 2017; Cabral and Li 2015). For instance, Burtch et al. (2018) examine the effects of monetary reward from the platform to stimulate the production of online reviews. They show that money increases the volume of the reviews, while social norms increase reviews' length. Gallus (2017) shows that non-monetary rewards, such as symbolic medals, from a platform have a positive motivational effect on contributors' retention to the platform. Hanson, Jiang, and Dahl (2019) compare the effects of multiple non-monetary rewards given by the platform such as points, labels, and badges on the

quantity of UGC produced in an online community. They show that labels and badges have a larger impact on UGC creation because they help clarify the role of contributors in the community. Additionally, platforms can also indirectly facilitate UGC creation by enabling other users to motivate content creation ((Burtch et al. 2022; Gallus, Jung, and Lakhani 2020; Restivo and van de Rijt 2014)). For example, Burtch et al. (2022) examine the effects of monetary rewards given by other users on UGC production. Through a randomized field experiment on Reddit, they find that such rewards encourage users, especially new users, to write longer and more posts. Restivo and van de Rijt (2014) explore the effects of non-monetary rewards, specifically 'barnstars' given by peers, on productivity levels across various tiers of contributors on Wikipedia by conducting a randomized experiment. They found that only the most productive contributors showed significantly higher post-treatment productivity after receiving a barnstar. In this paper, we simultaneously examine the effects of four types of rewards on the quantity, timeliness, and quality of UGC. The four types of rewards differ in their nature (monetary and non-monetary) and source (other users versus the platform). Thus, we provide a more comprehensive analysis of the effects of different types of rewards than examined by previous literature.

Lastly, our paper is related to the literature on special interest communities where interactions are based on shared enthusiasm for a specific consumption activity (Kozinets 1999). Special interest communities help people feel more connected and internet users increasingly prefer special interest online communities over general social media, such as Facebook or Instagram.⁶ Recent studies have examined user behavior in special interest communities in different contexts. For example, Hendricks and Sorensen (2009) study users' adoption of new music online, and show that new album releases on the platform lead to a substantial and permanent increase in the sales of old albums of the same artist. Zhang and Godes (2018) study Goodreads, and show that, with sufficient experience, having more ties leads to better decisions. Nevskaya and Albuquerque (2019) study the role of rewards on users'

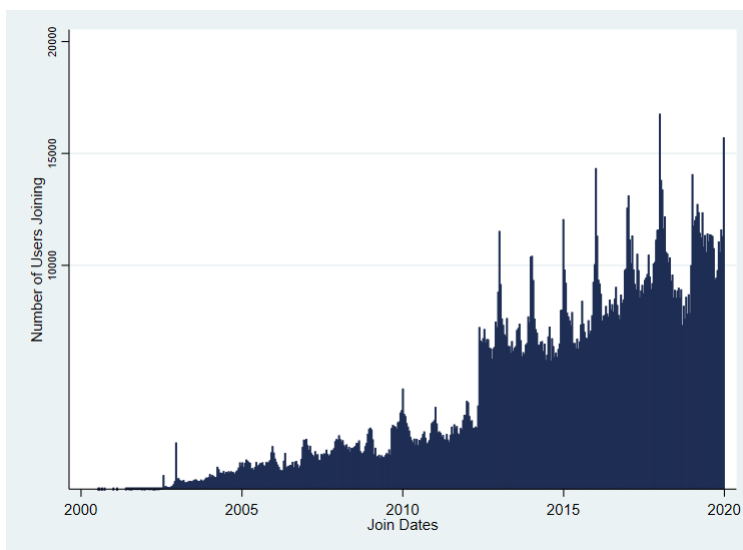
⁶<https://blog.gwi.com/chart-of-the-week/online-communities/>

consumption of a game in a massive online video game platform. They find that improving reward schedules and imposing time limits leads to shorter usage sessions and longer game subscriptions. Ameri, Honka, and Xie (2023) study how strangers become friends within an evolving online social network in an online anime-watching platform, and how this evolving network impacts users' content generation and vice versa. We contribute to this stream of literature by examining users' content generation and the factors affecting it in a board game related online community.

3 Data

Our data come from Boardgamegeek.com. This website is a consumption-related online community revolving around board games. It was established in 2000 and has become the largest online database for board games as well as the largest online community for board game fans with over 2.7M users worldwide. Figure 1 shows the number of users joining BGG over time.

Figure 1: Number of Users Joining BGG Over Time



An important aspect of BGG is that essentially all of its content is created by users. Users

provide detailed information about new and existing games via reviews and also engage in a variety of conversations with other users in the discussion forum section of the website.⁷

BGG utilizes a platform-specific virtual currency called GeekGold (GG) to reward users for their contributions. Users can earn 1 - 5 GG as compensation for writing a review or starting a new discussion thread.⁸ Users can only earn GG through contributions and cannot directly buy GG from the platform.⁹ Users can also earn GG in form of tips from other users for the content they create. Users can tip any amount they want. Aside from tipping, users can use their GG to buy virtual cosmetic items for their profile page or to buy board games from peers.

Users also receive badges for writing a certain number of threads or reviews. Each type of content has its own milestones and badges. The badge system is set up in a way that a user has to produce increasingly more content to reach the next milestone. For example, a user has to write 5 reviews to earn the first badge, 45 additional reviews to earn the second badge, etc. A list of the badges and their corresponding milestones is available in Appendix A. Lastly, users can also react to the content produced by others by giving “likes.” Figure 2 shows a thread in which the content creator received likes and tips from other users.

⁷Users can also contribute other forms of UGC such as ratings, files, and images. These forms of UGC are much less common on BGG and we therefore focus on threads, reviews, and replies.

⁸All reviews go through a process in which other volunteer users vote to approve a review and recommend an amount of 1 - 5 GG to award to the content creator. We observed this process and the approval of a review is a formality that takes less than one day. The average amount recommended by other users determines the compensation amount the content creator receives for her contribution.

⁹The platform rewards users who donate money to BGG by giving them GG. Some users may also buy GG from other users privately. However, both donations and GG purchases are not common.

Figure 2: Example of a Post for Which the Creator Received Tips and Likes



Table 1 summarizes the available rewards for threads, reviews, and replies. Non-monetary rewards (likes) and monetary rewards (tips) from other users can be given for all UGC types. Non-monetary reward (badges) and monetary reward (compensation) from the platform are only awarded for threads and reviews.

Table 1: Available Rewards

UGC Types	MONETARY		NON-MONETARY	
	Platform	Users	Platform	Users
	Compensation	Tip	Badge	Like
Threads	1-5	0.001+	20 Levels	1+
Reviews	1-5	0.001+	6 Levels	1+
Replies	-	0.001+	-	1+

3.1 Data Collection and Cleaning

We collected all activities of a random sample of 100,000 users from their join date until August 19th, 2020. The data for each user include details of all the content the user created and the rewards she received for each piece of content.

We took the following steps to construct our final estimation sample. First, to ensure a minimum level of activity, we focus on users with more than 50 contributions during their entire membership. To exclude platform administrators, who create a lot of content, we

exclude users with more than 2,000 contributions per year. Excluding very inactive and very active users left us with 47,881 users. Second, we drop users who did not create any UGC of any type after Jan 1st, 2020. We condition on at least one UGC contribution after Jan 1st, 2020, to only keep users who are still active platform members. Otherwise, if a user did not create any UGC, we cannot distinguish between the user leaving the website and the user still being an active member but deciding not to create any content.¹⁰ Our final sample contains 16,801 users with 42,819,634 daily observations of their activities of each UGC type and the rewards they received for created content from January 2010 to December 2020, our study period of 10 years.

3.2 Variable Construction

Here, we discuss the construction of the dependent variables. Our measure of UGC quantity is straightforward: it is the number of posts of a certain type (e.g., initial thread post or review) a user made on a day. The timeliness of a post captures the degree to which a post is related to current events and interests of the community. *Timeliness* is calculated differently for each UGC type. For reviews, it is the number of days between a review and the release date of the corresponding board game.¹¹ For the timeliness of thread posts, we use the difference between the date of the last post previously written by the focal post in the same subcategory and date of the focal post. And lastly, to measure the timeliness of replies, we calculate the difference between the date of the reply by the focal user and the date of the initial thread post.

Previous studies have used different measures to assess UGC quality of reviews (e.g., Goes, Lin, and Au Yeung 2014; Hong et al. 2017) and posts on discussion platforms (e.g., Weimer, Gurevych, and Mühlhäuser 2007; Shah and Pomerantz 2010). We employ eight measures capturing structure, content, and style dimensions of text quality. These eight

¹⁰We do not observe user log-ins or browsing activity.

¹¹We exclude reviews of board games that were released before 2000 since the exact release date was unavailable.

measures are commonly used in the literature and applicable to our context (e.g., Stvilia et al. 2005; Hasan Dalip et al. 2009; Shah and Pomerantz 2010). Structural features are captured by the number of words, the number of sentences in a post, the number of words per sentence, and reading time (Blumenstock 2008; Demberg and Keller 2008; Hasan Dalip et al. 2009; Anderka, Stein, and Lipka 2012). Reading time is operationalized as the time an average person needs to read a text, typically about 14.69 ms per character (Demberg and Keller 2008).

The Flesch Easing Read Index (FERI) (Kincaid et al. 1975) and the Gunning Fog Index (GFI) (Gunning 1952) are the two content-related measures we employ. They reflect the complexity of the text. In addition, we also quantify the informativeness of the text as a third content-related measure (Sun, Han, and Feng 2019). FERI is a readability/complexity score, typically between 0-100, that indicates the difficulty of understanding a passage in English (Kincaid et al. 1975), with higher scores corresponding to easier texts. The GFI measures the readability of a text by estimating the number of years of formal education a person needs to understand a text when reading it for the first time (Gunning 1952). For instance, a GFI of 12 indicates that a text requires a person to be a high school senior (around 18 years old) to understand it. To measure informativeness, we calculate the factual density of the text, i.e., the ratio of the number of facts in the text to the number of words (Lex et al. 2012; Horn et al. 2013). We use ReVerb Open Information Extraction framework to extract facts or informational relations from the text (Fader, Soderland, and Etzioni 2011).

We capture the style of the text using a measure of politeness (Yeomans, Kantor, and Tingley 2018). Politeness refers to the degree to which impolite or slang words are used in a text and is calculated as the difference between the number of positive and negative words relative to the total number of words (Yeomans, Kantor, and Tingley 2018).

While these measures are used to capture different aspects of a text, some of them are reflecting similar underlying constructs and are highly correlated with each other. As a result, we conduct a factor analysis to combine these measures into orthogonal factors. The

results from the factor analysis suggest using four factors. Table 2 shows the factor loadings of the eight quality measures on each of the factors. The number of words, the number of sentences, and reading time are grouped into one factor, which we call *Length*, reflecting the extensiveness of the text (Hong et al. 2017). The number of words per sentence, GFI and FERI are also grouped together. We refer to this factor as *Complexity* since it captures the difficulty with which a reader can understand a written text. The number of words per sentence is related to complexity since longer sentences are more complex and harder to understand. Also, note that the FREI and GFI loadings on the readability factor have different signs because easier texts correspond to higher FREI scores but lower GFI scores. Informativeness constitutes a factor by itself as does politeness.

Table 2: Rotated Factor Analysis Loadings

Variable	Factors				Uniqueness
	Length	Complexity	Informativeness	Politeness	
Number of Words	0.97	0.14	0.02	-0.01	0.05
Number of Sentences	0.93	-0.08	0.01	0.02	0.12
Reading Time	0.93	0.13	-0.02	-0.01	0.12
GFI	0.10	0.85	0.12	0.04	0.26
FREI	-0.02	-0.80	0.23	0.03	0.31
Number of Words per Sentence	0.19	0.63	0.07	-0.06	0.56
Informativeness	0.00	-0.01	0.98	-0.01	0.03
Politeness	0.00	0.00	0.00	1.00	0.00

3.3 Data Description

By the end of our study period, on average, users had been a BGG member for 8.7 years. Table 3 shows summary statistics of annual activity levels. The average user initiates three threads and writes 46 replies per year. Writing a review is much less common with the average user writing one review during the whole 10-year study period. However, there is considerable variation in activity levels across users. For example, the average maximum number of reviews and initiated threads per year is 178 and 262, respectively.

Table 3: Annual UGC Creation Activity

	Mean	SD	Min	1 st Quart.	Median	3 rd Quart.	Max	N
Threads	3.14	6.49	0.00	0.30	1.10	3.18	261.81	16,801
Reviews	0.09	1.64	0.00	0.00	0.00	0.00	178.26	16,801
Replies	46.09	132.55	0.00	2.04	7.70	30.50	1996.50	16,801

Table 4 shows the summary statistics of the four rewards for each type of UGC contribution. Users receive the highest total tip amounts for threads and most likes for reviews. Note that users only earn a badge for a certain number of contributions (and not for each contribution). Therefore, users do not receive badges frequently as opposed to the other types of rewards and the mean numbers of earned badges are small.

Table 4: Annual Earned Rewards by UGC Types

	Mean	SD	Min	1 st Quart.	Median	3 rd Quart.	Max	N
Threads								
Tips	1.36	10.09	0.00	0.00	0.00	0.17	413.60	16,801
Likes	6.33	20.55	0.00	0.18	1.30	4.90	851.70	16,801
Compensation	0.01	0.11	0.00	0.00	0.00	0.00	8.47	16,801
Badge	0.16	0.34	0.00	0.00	0.00	0.18	6.68	16,801
Reviews								
Tips	0.18	2.08	0.00	0.00	0.00	0.00	112.63	16,801
Likes	0.77	7.46	0.00	0.00	0.00	0.00	492.33	16,801
Compensation	0.30	3.64	0.00	0.00	0.00	0.00	335.63	16,801
Badge	0.01	0.08	0.00	0.00	0.00	0.00	8.49	16,801
Replies								
Tips	3.94	19.32	0.00	0.00	0.09	1.44	495.68	16,801
Likes	46.02	110.59	0.00	1.43	6.84	31.90	898.98	16,801

Table 5 shows descriptive statistics for the UGC quantity, timeliness, and quality measures. In our data, the median timeliness value for reviews is 546 days. The median initial thread post receives its first reply the same day. In our data, the median timeliness value for replies is 3 days. Reviews have the largest text length followed by threads and the highest politeness scores. And lastly, threads rate the highest in terms of readability.

Table 5: Descriptive Statistics of Quantity, Timeliness, and Quality Measures

	Mean	Median	SD	Min	Max	N
Threads						
Quantity	0.01	0.00	0.12	0.00	35.00	42,819,634
Timeliness	49.92	2.00	213.79	0.00	6,149.00	339,040
Length	0.73	0.04	2.71	-0.81	112.70	335,944
Complexity	0.17	0.09	0.87	-18.66	32.65	335,944
Informativeness	-0.06	-0.04	0.69	-6.12	18.94	335,944
Politeness	-0.08	-0.11	0.44	-13.26	12.21	335,944
Reviews						
Quantity	0.00	0.00	0.03	0.00	27.00	42,819,634
Timeliness	851.78	398.86	1,094.12	0.00	7,219.00	13,028
Length	8.72	6.95	7.17	-0.74	79.50	7,475
Complexity	-0.53	-0.45	1.23	-9.27	16.57	7,475
Informativeness	-0.17	-0.12	0.54	-4.35	3.66	7,475
Politeness	0.07	0.09	0.21	-1.99	1.98	7,475
Replies						
Quantity	0.14	0.00	0.96	0.00	191.00	42,819,634
Timeliness	131.93	3.00	400.73	0.00	6,810.00	2,680,286
Length	0.07	-0.16	1.24	-1.13	112.70	2,976,560
Complexity	0.02	-0.05	0.83	-18.66	69.83	2,976,560
Informativeness	-0.00	0.04	0.86	-6.12	32.51	2,976,560
Politeness	0.05	-0.04	0.83	-25.92	24.83	2,976,560

4 Model

Our goal is to measure the causal effects of the four types of rewards on the quantity, timeliness, and quality of initial thread posts, reviews, and replies. In interpreting the estimated effects as causal, we will rely on the conditional independence assumption, i.e., that conditional on a large number of observed variables and fixed effects, the error term and the focal variables are independent (Angrist and Pischke 2009). We start by discussing several endogeneity concerns that we address by including observables and fixed effects, and then present the model specification we employ in the empirical analysis.

4.1 Endogeneity

There are several concerns related to the endogeneity of rewards. First, a user does not randomly receive peer rewards, i.e., tips and likes from other users. A user can only receive a peer reward if she made a post in the past. Relatedly, a user who wrote multiple posts in the past is more likely to receive a peer reward than a user who wrote one post. Additionally, some posts might generate many peer rewards, while others do not. We address these concerns in two ways: by including three variables that entail the cumulative number of posts of each UGC type a user has ever written, has written in the past 365 days, and has written in the past three days, and by including *source of reward* dummies, i.e., a dummy for each post a user made in the past that results in the user receiving a peer reward on the focal day.¹²

Figure 3 visualizes the idea of these source of reward dummies and we discuss technical implementation issues in Web Appendix A.5. Suppose a user published post A on November 15, 2022. This post A received three likes on November 16, three GG in tips and two likes on November 17, and one GG in tips and one like on November 21. Then the source of reward dummy for post A equals 1 on November 16, 17, and 21 because the user received rewards for post A on those three days. Post B is another post written by the same user on November 16, 2022. The user received rewards for post B on November 17, 18, 19, and 21 and thus the source of reward dummy for post B equals 1 on those four days. Note that it is possible that multiple past posts written by a user are rewarded on one day. For example, the user in Figure 3 receives rewards generated by both sources (posts A and B) on November 17 and 21.

¹²More precisely, we include source of reward dummies for 91% of past posts (covering more than 99% of observations for which a user received a reward) because of computational limitations that arise due to users receiving rewards for more than one post in one day. The details of how the source of reward dummies are incorporated are discussed in Web Appendix A.5.

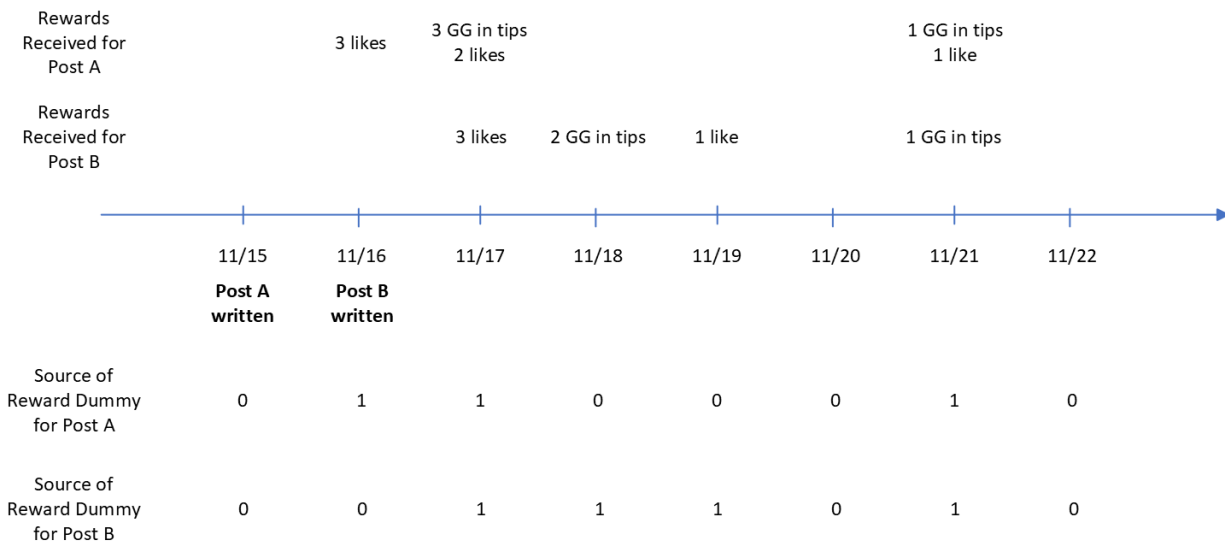


Figure 3: Source of Reward Dummies

A second concern is the non-random timing of peer rewards: users commonly receive peer rewards within the first few days after publishing a post. Older posts rarely receive peer rewards. We address this concern by including individual-day fixed effects. These fixed effects control for differences in received peer rewards across days for each user. Thus, the identifying variation for the effects of peer rewards is the within-day variation for each user.¹³

Third, a user does also not randomly receive platform rewards, i.e., compensation and badges. We start by discussing how we address endogeneity concerns related to compensation. When writing a game review, the user knows that she will receive compensation from the platform.¹⁴ Although users receive compensation for all their review posts, receiving compensation for a thread post requires the user nominating her thread post for a high

¹³We have more than 2.8 million individual-days in which a user wrote a post in one of the three UGC categories, allowing us to identify the effects of rewards despite using granular individual-day fixed effects. We test the robustness of our results by including less granular individual-week instead of individual-day fixed effects. The results are presented in Web Appendix C. We also estimated our model with neither the source of reward dummies nor individual-day fixed effects. The results are shown in Web Appendix C and are directionally robust.

¹⁴Formally, reviews have to go through GeekModding, a process in which other users read the posts, approve them, and suggest a compensation reward amount, to receive compensation. However, in practice, all reviews following basic platform guidelines get approved and compensated. The user receives a compensation reward within the allowable range that equals the average compensation amount suggested by users who read her post in GeekModding. GeekModding is fast: reviews get approved and published within a day.

quality thread reward and the thread passing evaluation by a few other users and thus is not guaranteed. Thus, while users expect to receive compensation for their review posts, the same is not true for thread posts. Furthermore, for reviews, depending on how the review is evaluated by a few random users, the amount of the awarded compensation varies. Because we control for the unobserved quality of the reviews using source of reward (past post) fixed effects, the variation in the amount of awarded compensation enables us to identify its effect.

And lastly, a user knows when she has written a certain number of reviews or initiated a certain number of threads to earn the next badge.¹⁵ We follow Goes, Guo, and Lin (2016) in addressing this concern: we include variables that capture the progress towards the next badge in terms of the remaining number of posts needed to reach the next milestone. Since previous findings suggest non-linear effort exertion to reach hierarchical milestones (Lal and Srinivasan 1993; Goes, Guo, and Lin 2016), we also include the square of the progress variables. As described in Section 3, the badge system is set up in a way that reaching the next badge gets increasingly difficult, i.e., a user has to produce more and more content to earn the next badge. This implies that the number of remaining posts needed to reach the next milestone is not comparable across badges since the same number can imply different completion levels. Therefore, we estimate separate coefficients for each badge.

4.2 Empirical Specification

We use the following set-up to infer the effects of rewards for each of the quantity, timeliness, and quality measures: For each user $i = 1, \dots, N$, we observe the user’s behavior on calendar day $t = 1, \dots, T$ related to post $p = 1, \dots, P$. Let p_{ijt} denote post p user i made on day t of UGC type $j \in \{\text{thread posts, reviews, replies}\}$. We operationalize the quantity of UGC, Y_{ijt} , as the number of posts of type j user i created on day t . Recall that we use a different operationalization of the timeliness variable for each type of UGC as discussed in Section 3.2. Lastly, for the quality of UGC, Y_{ijt} reflects one of the four quality dimensions of UGC

¹⁵The number of initiated threads and written reviews is displayed on each user’s personal page.

posts of type j user i wrote on day t .

We separately estimate the models for the six dependent variables using log-log linear regressions with the following specification:

$$\begin{aligned}
 Y_{ijt} = & \beta_{1j}Tips_{ijt} + \beta_{2j}Likes_{ijt} + \beta_{3j}Compensation_{ijt} + \beta_{4j}Badge_{ijt} \\
 & + \beta_{5j}Tips_{i,-jt} + \beta_{6j}Likes_{i,-jt} + \beta_{7j}Compensation_{i,-jt} + \beta_{8j}Badge_{i,-jt} \\
 & + \beta_{9j}C_{ijt} + \beta_{10j}B_{ijt} + \lambda_{p_{ij}} + \alpha_{it} + \epsilon_{ijt} .
 \end{aligned} \tag{1}$$

We operationalize the four reward types as follows: $Tips_{ijt}$ is the amount of tips (in GG) user i received from other users for UGC type j in the three days prior to day t , i.e., days $t - 3$ to $t - 1$. We exclude the tips user i received on day t because we cannot determine whether the reward was received before new content was produced that day and, as a result, whether receiving the reward impacted user i 's behavior. We include tips from up to three days prior to day t to account for potential lingering effects of receiving rewards as well as for the possibility that user i may not have seen the reward immediately.¹⁶ The variables $Likes_{ijt}$, $Compensation_{ijt}$, and $Badges_{ijt}$ are defined similarly: $Likes_{ijt}$ is the number of likes, $Compensation_{ijt}$ is compensation amount (in GG), and $Badges_{ijt}$ is the number of badges user i received for UGC type j in the three days prior to day t . $Tips_{i,-jt}$ is the amount of tips (in GG) user i received from other users for UGC types *other than* j in the three days prior to t . $Likes_{i,-jt}$, $Compensation_{i,-jt}$, and $Badges_{i,-jt}$ are the number of likes, the compensation amount (in GG), and the number of badges user i received for UGC types other than j in the three days prior to day t .

C_{ijt} contains other variables whose effects we control for. First, to control for unobserved factors that may prevent a user from contributing to a specific type of UGC until day t , e.g., inexperience, we include a dummy variable that indicates if user i has ever produced any content of type j before day t . Second, if a user has produced UGC of type j in the past,

¹⁶We test the robustness of our results regarding the three-day time window by re-estimating our models using one-day and six-day time windows. The results are robust and presented in Appendix C.

we control for the number of days since the last post of type j to account for users engaging in conversations lasting several days. Third, we control for the cumulative number of posts of type j user i has ever written, written in the past 365 days, and written in the three days prior to day t . For the quality regressions only, we also include three dummy variables that indicate whether user i published a post on day t . Note that we estimate UGC-type specific coefficients for all control variables.

B_{ijt} contains the variables that capture the progress of user i towards the next badge on day t in terms of the remaining number of posts needed to reach the next milestone as well as the square and cubic versions of this variable. Note that we estimate separate coefficients for the first four badges.¹⁷ Source of reward dummies $\lambda_{p_{ij}}$ address the concern that a user can only receive a reward if she previously published a post as discussed in the previous section as well as the unobserved quality of the rewarded post. α_{it} are user-day fixed effects. They serve several purposes: they address the endogeneity concern related to the timing of rewards discussed in the previous section, and they capture the inherently heterogeneous tendency of users to create UGC as well as any day-specific unobserved heterogeneity related to users. Incorporating user-day fixed effects also allows us to control for incidences when a user did not visit the platform and, as a result, did not post anything.¹⁸ And lastly, ϵ_{ijt} is the error term and is assumed to follow a normal distribution.

5 Results

Next, we present and discuss our results. Recall that we use log-log linear regression models. Thus, the estimated coefficients can be interpreted as elasticities. Technically, we estimate the effects of the four reward types for each type of UGC using interaction effects in our regression models. However, for easier interpretation and comparison, we show the calculated

¹⁷Because the number of users who reach the 5th or higher badges is small, we group the 5th and 6th badge for reviews and the 5th to 10th badges for threads together.

¹⁸We also estimated a version of our model which additionally included individual-UGC type fixed effects to control for individual users' inherent tendencies to write UGC of a specific type. The results are robust and available from the authors upon request.

main effects here and report the original interaction effect estimates in Web Appendix B.

The estimates for all six regressions are displayed in Table 6. We start with some high-level observations that apply to *all* regressions. First, rewards do not only affect the production of the focal UGC type, but in most cases also the production of other UGC types. For example, tips received for threads do only affect how many threads a user writes (column (i) in Table 6), but also how many reviews and replies a user writes (via the Tips Received for Other UGC variable). Second, each type of reward has directionally the same effects on all types of UGC. For example, in column (ii) in Table 6, the effects of likes are positive for threads, reviews, and replies.

And third, for all three types of UGC and all four types of rewards, the effects of a reward received for the *focal* UGC type and the same reward received for *other* UGC types are *directionally* consistent. For example, in column (i) in Table 6, the effects of tips received for threads (0.0634) and tips received for other types of UGC (0.0624) on the quantity of threads a user writes are both positive. However, we do not find a consistent pattern when it comes to the *magnitudes* of the effects: in some cases, the effect of the reward received for focal UGC is larger than the effect of the same reward received for other UGC and, in other cases, the effects of a reward received for other UGC is larger than the effect of the same reward received for focal UGC. For example, in column (iii), the effects of likes received for threads are smaller than the effects of likes received for other UGC on the length of threads (0.0000 vs. 0.0267), while the effects of likes received for replies are larger than the effects of likes received for other UGC on the length of replies (0.0572 vs. 0.0353).

We now turn to our results for peer rewards. Both monetary and non-monetary peer rewards have significant positive effects for all three types of UGC and in all six regressions. To put it differently, peer rewards of any kind make a user write more UGC, less timely UGC, and UGC that measures higher on the four quality variables. Looking at the magnitudes, peer rewards have the largest effects on replies.

Next, we examine our findings for platform rewards. Recall that a user can only receive

Table 6: Effects of Rewards on UGC Quantity, Timeliness, and Quality

	(i) Quantity...	(ii) Timeliness...	(iii)	(iv)	(v) Quality...	(vi)
			Length	Complexity	Informativeness	Politeness
... of Threads						
Tips Received for Threads	0.0634*** (0.0101)	0.2383*** (0.0367)	0.0105*** (0.0030)	0.0612*** (0.0116)	0.0401*** (0.0077)	0.0687*** (0.0130)
Tips Received for Other UGC	0.0624*** (0.0109)	0.2563*** (0.0404)	0.0093** (0.0032)	0.0443*** (0.0127)	0.0288*** (0.0084)	0.0503*** (0.0142)
Likes Received for Threads	0.0371*** (0.0035)	0.0309** (0.0116)	0.0000 (0.0011)	0.0216*** (0.0043)	0.0147*** (0.0028)	0.0240*** (0.0048)
Likes Received for Other UGC	0.0814*** (0.0051)	0.0200 (0.0180)	0.0267*** (0.0016)	0.0921*** (0.0065)	0.0612*** (0.0043)	0.1025*** (0.0072)
Compensation Received for Threads	-0.0131 (0.0090)	-0.1237*** (0.0181)	-0.0108 (0.0066)	-0.0018 (0.0106)	-0.0025 (0.0070)	-0.0019 (0.0117)
Compensation Received for Other UGC	-0.0106*** (0.0022)	-0.0450*** (0.0084)	-0.0032*** (0.0008)	-0.0158*** (0.0032)	-0.0101*** (0.0021)	-0.0176*** (0.0036)
Badge Received for Threads	-0.0935*** (0.0045)	-0.1159*** (0.0088)	-0.0257*** (0.0014)	-0.1179*** (0.0059)	-0.0780*** (0.0038)	-0.1303*** (0.0065)
Badge Received for Other UGC	-0.0370*** (0.0018)	-0.0381*** (0.0045)	-0.0114*** (0.0007)	-0.0495*** (0.0030)	-0.0330*** (0.0020)	-0.0549*** (0.0033)
... of Reviews						
Tips Received for Reviews	0.0695*** (0.0103)	0.1694*** (0.0385)	0.0251*** (0.0037)	0.0698*** (0.0122)	0.0460*** (0.0081)	0.0792*** (0.0137)
Tips Received for Other UGC	0.0606*** (0.0109)	0.2551*** (0.0404)	0.0086** (0.0032)	0.0420*** (0.0127)	0.0273*** (0.0084)	0.0478*** (0.0142)
Likes Received for Reviews	0.0611*** (0.0040)	0.1412*** (0.0135)	0.0048** (0.0018)	0.0746*** (0.0053)	0.0495*** (0.0035)	0.0822*** (0.0059)
Likes Received for Other UGC	0.0707*** (0.0051)	0.0143 (0.0180)	0.0227*** (0.0016)	0.0775*** (0.0065)	0.0514*** (0.0043)	0.0863*** (0.0072)
Compensation Received for Reviews	-0.0390*** (0.0127)	-0.3242*** (0.0283)	0.0316*** (0.0095)	-0.0386** (0.0152)	-0.0251** (0.0100)	-0.0407** (0.0168)
Compensation Received for Other UGC	-0.0113*** (0.0023)	-0.0499*** (0.0085)	-0.0031*** (0.0008)	-0.0161*** (0.0033)	-0.0101*** (0.0022)	-0.0180*** (0.0037)
Badge Received for Reviews	-0.0165 (0.0112)	-0.0649 (0.0389)	-0.0005 (0.0066)	-0.0116 (0.0180)	-0.0060 (0.0121)	-0.0117 (0.0200)
Badge Received for Other UGC	-0.0700*** (0.0023)	-0.0763*** (0.0053)	-0.0207*** (0.0009)	-0.0906*** (0.0036)	-0.0602*** (0.0024)	-0.1004*** (0.0039)
... of Replies						
Tips Received for Replies	0.1094*** (0.0111)	0.3432*** (0.0393)	0.0193*** (0.0034)	0.0862*** (0.0129)	0.0562*** (0.0086)	0.0966*** (0.0145)
Tips Received for Other UGC	0.0740*** (0.0111)	0.2899*** (0.0409)	0.0148*** (0.0033)	0.0695*** (0.0133)	0.0458*** (0.0088)	0.0786*** (0.0149)
Likes Received for Replies	0.1874*** (0.0044)	0.2047*** (0.0153)	0.0572*** (0.0015)	0.2321*** (0.0058)	0.1536*** (0.0038)	0.2576*** (0.0065)
Likes Received for Other UGC	0.0944*** (0.0052)	0.0228 (0.0182)	0.0353*** (0.0016)	0.1312*** (0.0067)	0.0875*** (0.0044)	0.1461*** (0.0074)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Individual-Day Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Source of Reward Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	128,458,902	128,458,902	128,458,902	128,458,902	128,458,902	128,458,902
R ²	0.14	0.20	0.53	0.48	0.46	0.47

Standard errors in parentheses.

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

them for threads and reviews, but not for replies. Interestingly, receiving rewards from the platform, either monetary (compensation) or non-monetary (badge), has *negative* or insignificant effects for threads and reviews in all regressions. In other words, receiving platform rewards makes a user write less but more timely UGC and UGC that measures lower on the four quality variables. Compensation has larger effects (in absolute terms) on reviews and badges have larger effects (in absolute terms) on threads.

Negative short-term effects of receiving a badge or, more generally reaching a milestone, have been documented by previous literature. The coefficient estimates we show in Table 6 also measure short-term effects as they capture the effects of receiving a badge on user behavior during the next three days. In the hierarchical incentives literature, Goes, Guo, and Lin (2016) found negative effects of badges on content generation and Lal and Srinivasan (1993) and Oyer (1998) found negative effects within the context of salesforce compensation. This short-term negative effect is consistent with the idea that users “take a break” after receiving a badge or reaching a milestone.

We also investigate what happens when users are inbetween badges or approach the next badge. For most badge milestones, especially the first three badges for both threads and reviews, the coefficient estimates capturing content generation behavior inbetween badges are insignificant, i.e., individuals do not change their behavior as a consequence of how far or how close they are to the next badge milestone. When the coefficients are significant, users’ behavior follows a U-shaped pattern. For example, for threads, the quantity of content first slowly decreases, but then sharply increases when the user is very close to reaching the 4th milestone, i.e., when only 15 out of the 250 posts needed for 4th milestone are left. Another example is the timeliness of reviews. It increases when only 4 out of the necessary 50 reviews are left to get the 3rd badge.

To summarize, any reward from peers, either monetary or non-monetary, for any type of UGC, leads to an immediate increase in content production, less timely content, and content that measures higher on the four quality dimensions. In contrast, receiving a reward from

the platform leads to an immediate decrease in the quantity and quality of both threads and reviews, but to more timely content production.

In the following, we discuss the effects of rewards on UGC quantity, timeliness, and quantity in more detail. To simplify the discussion, we calculate the *total* effect of each reward on each type of UGC by summing up the effect of a reward received for the focal UGC and received for other types of UGC. For example, the total effect of tips on the quantity of threads is $0.0634 + 0.0624 = 0.1258$ with a standard error of 0.0149 (computed taking the std. dev. and covariance of parameter estimates into account). The estimates of the total effects of rewards are displayed in Table 7 and visually presented in Figure 4.

5.1 Quantity

Here, we take a deep dive into our results for UGC quantity. Figure 4(a) visualizes the pattern of results and column (i) in Table 7 shows the numerical estimates. As discussed in the previous section, peer rewards, both monetary and non-monetary ones, increase UGC quantity, while both monetary and non-monetary platform rewards decrease UGC quantity. Recall that we use log-log regressions. Thus, the coefficient estimates are elasticities and capture the effects of rewards at the margin. Generally, peer rewards have the largest effects on the quantity of replies compared to the quantities of threads and reviews. Comparing the effect sizes of tips and likes, our results indicate that the effect of a like on replies is equivalent to the effect of receiving 1.5 GG in tips on replies. The effects of tips and likes on the quantity of threads and reviews are of similar magnitudes, i.e., the effect of a like is about the same as the effect of receiving an additional 1 GG in tips.

In a nutshell, we find that non-monetary peer rewards (likes) are equally effective or even more effective than monetary peer rewards (tips) in increasing the quantity of UGC. This is an interesting result because likes, in contrast to tips, are “free,” i.e., they do not cost peers GG. This finding suggests that what motivates users to write more UGC is the observable acknowledgement by peers (via the action of receiving a like or tip) and that the monetary

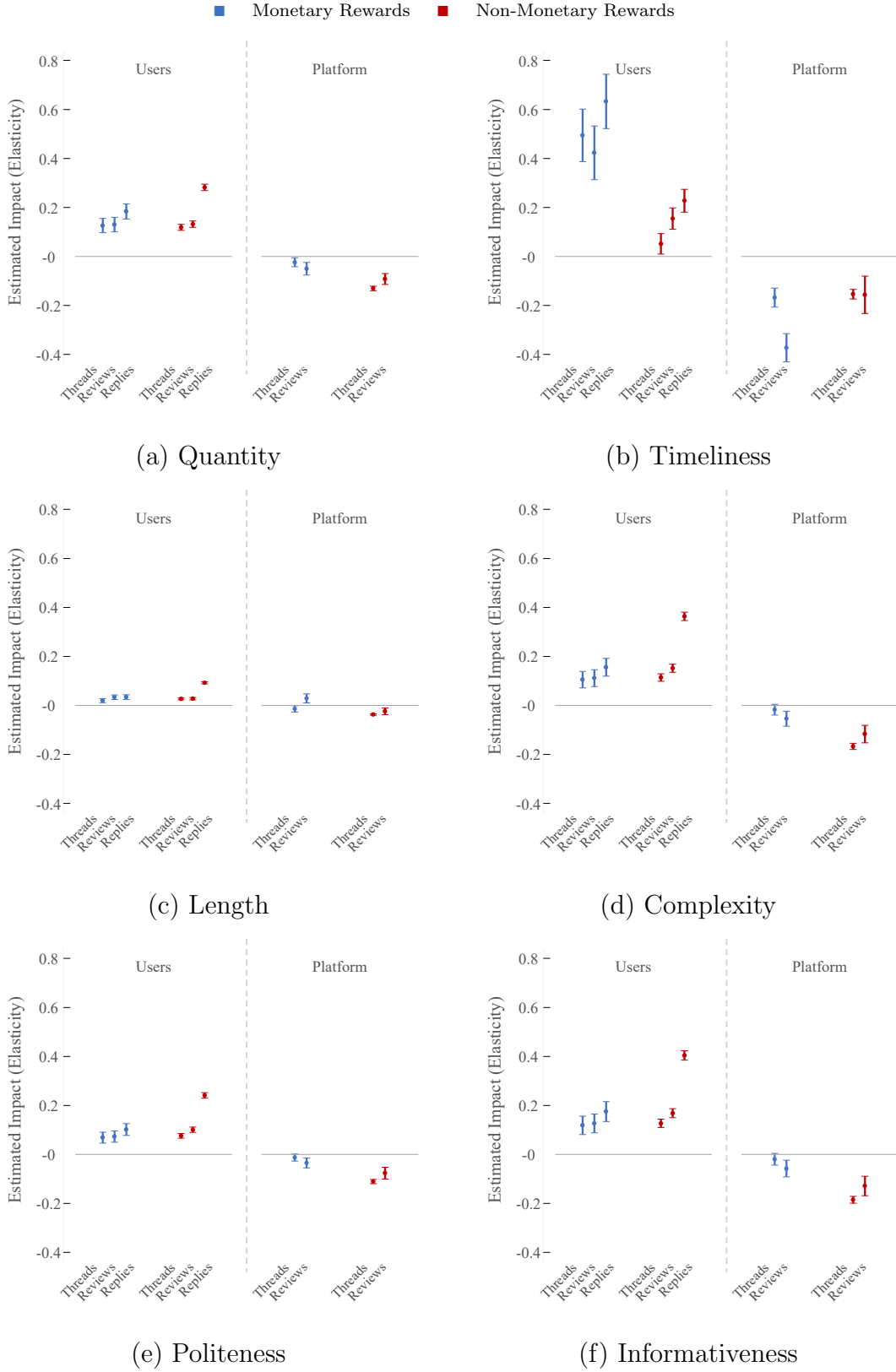


Figure 4: Total Effects of Rewards on Quantity, Timeliness, and Quality with 95% CI

Table 7: Total Effects of Rewards on UGC Quantity, Timeliness, and Quality

	(i) Quantity...	(ii) Timeliness...	(iii)	(iv)	(v) Quality...	(vi)
			Length	Complexity	Informativeness	Politeness
... of Threads						
Tips	0.1258*** (0.0149)	0.4946*** (0.0546)	0.0198*** (0.0044)	0.1055*** (0.0172)	0.0689*** (0.0114)	0.1190*** (0.0193)
Likes	0.1185*** (0.0062)	0.0509** (0.0214)	0.0267*** (0.0019)	0.1137*** (0.0078)	0.0759*** (0.0051)	0.1265*** (0.0087)
Compensation	-0.0237** (0.0093)	-0.1687*** (0.0200)	-0.0140* (0.0066)	-0.0176 (0.0111)	-0.0126 (0.0073)	-0.0195 (0.0122)
Badge	-0.1305*** (0.0048)	-0.1540*** (0.0099)	-0.0371*** (0.0016)	-0.1674*** (0.0066)	-0.1110*** (0.0043)	-0.1852*** (0.0073)
... of Reviews						
Tips	0.1301*** (0.0150)	0.4245*** (0.0558)	0.0337*** (0.0049)	0.1118*** (0.0176)	0.0733*** (0.0117)	0.1270*** (0.0197)
Likes	0.1318*** (0.0065)	0.1555*** (0.0225)	0.0275*** (0.0024)	0.1521*** (0.0084)	0.1009*** (0.0055)	0.1685*** (0.0093)
Compensation	-0.0503*** (0.0129)	-0.3741*** (0.0295)	0.0285*** (0.0095)	-0.0547*** (0.0156)	-0.0352*** (0.0102)	-0.0587*** (0.0172)
Badge	-0.0865*** (0.0114)	-0.1412*** (0.0393)	-0.0212*** (0.0067)	-0.1022*** (0.0184)	-0.0662*** (0.0123)	-0.1121*** (0.0204)
... of Replies						
Tips	0.1834*** (0.0157)	0.6331*** (0.0567)	0.0341*** (0.0047)	0.1557*** (0.0185)	0.1020*** (0.0123)	0.1752*** (0.0208)
Likes	0.2818*** (0.0068)	0.2275*** (0.0238)	0.0925*** (0.0022)	0.3633*** (0.0089)	0.2411*** (0.0058)	0.4037*** (0.0098)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Individual-Day Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Source of Reward Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	128,458,902	128,458,902	128,458,902	128,458,902	128,458,902	128,458,902
R ²	0.14	0.20	0.53	0.48	0.46	0.47

Standard errors in parentheses.

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

aspect of receiving a tip plays a secondary role.

As mentioned in the previous section, the effects of platform rewards on UGC quantity are negative. The effect of compensation on the quantity of reviews is about twice as large as the effect of compensation on the quantity of threads. We find the opposite pattern for badges: badges have a larger negative (short-term) effect on the quantity of threads than on the quantity of reviews. We conclude that platform rewards are not a suitable tool to

increase the quantity of produced UGC in the short-run. However, this does not mean that platforms should not use platform rewards: these types of rewards might incentivize different aspects of user behavior that might be desired by a platform as discussed in the next section.

5.2 Timeliness

The results for timeliness are displayed in column (ii) in Table 7 and in Figure 4(b). Recall that, for threads, timeliness is the difference between the date of the focal post and the date of the last post that was written before the focal post in the same subcategory; for reviews, it is the number of days between a review and the release date of the corresponding board game; and for replies, it is the difference between the date of the reply and the date of the initial thread post. Given the operationalization of the timeliness variable, a negative coefficient estimate means that the time difference is smaller, i.e., that the reward makes users write more timely UGC posts.

For all three types of UGC, the effects of both tips and likes on timeliness are positive, i.e., any reward from peers leads to users taking more time to write a review or writing reviews for older games, users taking more time to initiate a new thread, and users responding to older threads or taking more time to respond to current threads. Peer rewards have the largest effects (at the margin; measured as elasticities) on replies. For example, the effect of likes on replies is 50% and 350% larger than the effect of likes on threads and reviews, respectively. Comparing the magnitudes of the effects of tips and likes, our results indicate that tips have larger effects than likes for all three types of UGC. For example, the effect of tips on threads (reviews and replies) is about ten (three) times larger than the effect of likes on threads (reviews and replies).

The effects of platform rewards on timeliness are negative for both threads and reviews. In other words, any compensation from the platform incentivizes user to more quickly write reviews or reviews for more recent games and decreases the time until a new thread is

initiated.¹⁹ Comparing the magnitudes of the effects, compensation has larger (in absolute terms) negative effects on the timeliness of threads and reviews than badges have. The effects of badges on the timeliness of threads and reviews are about of the same magnitude, while the effects of compensation on reviews are more than twice as large as the effects of compensation on threads.

We conclude that platform rewards play an important role in incentivizing users to produce more timely content, e.g., publishing reviews about a newly launched game or initiating threads in different areas of interest. Having timely content is crucial for platforms to stay attractive to current and potential new users.

5.3 Quality

The results for UGC quality are displayed in columns (iii) - (vi) in Table 6 and in Figure 4(c)-(f). We observe several interesting results for peer rewards. First, receiving tips and/or likes increases all four quality dimensions of a subsequent post. In other words, any reward from peers leads to longer, politer, more complex, and more informative posts. Tips and likes have the largest positive effects on the complexity and politeness of posts and the smallest positive effects on the length of posts. For example, the effects of tips (likes) on the politeness of threads are ten (five) times larger than the effects of tips (likes) on the length of threads. And second, across the three types of UGC, both peer rewards have the largest effects on the four quality dimensions of replies compared to threads or reviews. For example, the effect of tips (likes) on the informativeness of replies is about 50% (220%) larger than the effect of tips (likes) on threads.

Next, we discuss the effects of the platform rewards. Recall that a user can only receive them for threads and reviews, but not for replies. For both types of UGC, receiving a

¹⁹Our results suggest that platform compensation encourages users to write reviews for newer games. However, another possible explanation might be that the platform deliberately offers higher rewards for reviews to newer games to motivate users. If users recognize this incentivization strategy, they might selectively review newer games. To rule out this alternative explanation, we examined the relationship between the timeliness of a review and the compensation it received (see Figure A-6 in Web Appendix A). We found no significant relation and thus believe that our initial interpretation is the more likely explanation.

reward from the platform, either monetary (compensation) or non-monetary (badge), has a negative effect (when significant) on all four dimensions of UGC quality.²⁰ In other words, any reward from the platform leads to shorter, less complex, less informative, and less polite posts. Receiving a badge has larger (in absolute terms) effects than receiving compensation.

When interpreting our results for UGC quality, it is important to keep in mind that posts that measure higher on the four quality dimensions are not necessarily better for a platform. Whether a platform would benefit from, e.g., more or less complex posts, also depends on the starting point, i.e., the current quality level of the posts. However, if a platform identifies the need to increase or decrease the quality of UGC, our results provide guidance on which rewards can help achieve this goal: peers rewards lead to longer, politer, more complex, and more informative posts, while platform rewards incentivize opposite writing style.

6 Heterogeneous Effects of Rewards

We next explore how the effects of rewards potentially differ for various groups of users. A well-known rule in social media is the 90-9-1 rule describing the common pattern that typically 90% of users are rarely active, 9% of users are somewhat active, and 1% of users is very active.²¹ Thus, the top 10% of users in terms of produced UGC volume are the users who generate the most content and are of immense importance for the platform. They are the ones who produce large portions of content that attracts other/new users and they are frequently on the platform making them attractive to advertisers. Thus, we first investigate how the behavior of these top contributors is affected by rewards compared to the behavior of casual users. And second, on many platforms, such as twitch or YouTube, users either predominantly create original content or predominantly react to others' content. Thus, we also study whether users who almost only generate original content, i.e., initiate threads or write reviews, and users who almost exclusively produce reactive content, i.e., reply to

²⁰The only exception is the significant positive effect of compensation on the length of reviews.

²¹See, e.g., https://en.wikipedia.org/wiki/1%25_rule, <https://www.nngroup.com/articles/participation-inequality/>, <https://stangarfield.medium.com/90-9-1-rule-of-thumb-fact-or-fiction-2377c12f3a79>.

others’ posts, are differently affected by rewards than users who produce a mix of original and reactive content.

6.1 Top Contributors vs. Casual Users

We classify users who are among the top 10% of users in our data in terms of produced UGC volume as *top contributors*. We refer to all other users as *casual users*. To understand whether rewards affect top contributors differently from casual users, we re-estimate our models including interaction effects between received rewards and a dummy variable that indicates whether a user is a top contributor. While we estimated the models using interaction effects between received rewards and a top contributor dummy variable, we calculated the main effects for top contributors, and present the main effects for both casual users and top contributors in Table 8.

A glance at Table 8 immediately reveals that rewards affect casual users and top contributors differently. At a high level, far fewer rewards affect top contributors’ UGC production than casual users’ UGC production. Taking a closer look, we find the effects of rewards on casual users’ posting behavior to be similar to the effects of rewards on all users’ posting behavior presented in Table 7 and discussed in Section 5. However, the picture is different for top contributors as discussed in the following paragraphs.

For top contributors, tips are much less effective in the sense that they only impact a few aspects of UGC production. Specifically, they decrease the timeliness of threads and replies and increase the number of replies. Tips do not affect any quality dimension (for any type of UGC) and do not affect review writing of top contributors. Likes incentivize both casual users and top contributors to produce more but less timely UGC. However, with the exception of replies, top contributors’ behavior is less affected by likes than casual users’ behavior. Further, likes decrease the quality of threads and reviews written by top contributors (when significant). This finding stands in contrast to the effects of likes for casual users: for casual users, likes increase the quality of their threads and reviews. And

Table 8: Effects of Rewards for Top Contributors vs. Casual Users

	Quantity...		Timeliness...		Length		Complexity		Quality...		Politeness	
	Casual	Top	Casual	Top	Casual	Top	Casual	Top	Casual	Top	Casual	Top
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)	(xi)	(xii)
... of Threads												
Tips	0.0420*** (0.0102)	0.0217 (0.0178)	0.0839* (0.0385)	0.1916** (0.0669)	0.0154*** (0.0034)	-0.0040 (0.0059)	0.0585*** (0.0140)	0.0068 (0.0235)	0.0391*** (0.0092)	0.0039 (0.0155)	0.0656*** (0.0156)	0.0084 (0.0262)
Likes	0.0195*** (0.0022)	0.0195*** (0.0051)	0.0190** (0.0059)	0.0128 (0.0157)	-0.0007 (0.0009)	-0.0087*** (0.0018)	0.0189*** (0.0032)	-0.0170* (0.0067)	0.0131*** (0.0022)	-0.0110* (0.0046)	0.0209*** (0.0036)	-0.0190* (0.0075)
Compensation	-0.0388*** (0.0087)	0.0101 (0.0201)	-0.0863*** (0.0239)	-0.1707*** (0.0452)	-0.0378*** (0.0097)	0.0129 (0.0164)	-0.0367* (0.0153)	0.0331 (0.0266)	-0.0257* (0.0102)	0.0210 (0.0176)	-0.0420* (0.0169)	0.0380 (0.0295)
Badge	-0.0400*** (0.0027)	-0.2005*** (0.0114)	-0.0751*** (0.0078)	-0.2066*** (0.0237)	-0.0179*** (0.0014)	-0.0454*** (0.0036)	-0.0816*** (0.0055)	-0.2063*** (0.0151)	-0.0539*** (0.0036)	-0.1365*** (0.0099)	-0.0902*** (0.0061)	-0.2278*** (0.0168)
... of Reviews												
Tips	0.0415*** (0.0104)	0.0287 (0.0184)	0.0191 (0.0398)	0.1049 (0.0715)	0.0253*** (0.0039)	0.0149 (0.0076)	0.0599*** (0.0147)	0.0172 (0.0251)	0.0401*** (0.0096)	0.0111 (0.0166)	0.0677*** (0.0164)	0.0212 (0.0280)
Likes	0.0586*** (0.0028)	0.0272*** (0.0064)	0.1610*** (0.0101)	0.0889*** (0.0223)	0.0092*** (0.0018)	-0.0104* (0.0041)	0.0877*** (0.0044)	0.0162 (0.0093)	0.0586*** (0.0030)	0.0104 (0.0063)	0.0969*** (0.0049)	0.0169 (0.0103)
Compensation	-0.0453*** (0.0127)	-0.0327 (0.0283)	-0.3137*** (0.0384)	-0.3533*** (0.0697)	0.0278* (0.0140)	0.0371 (0.0236)	-0.0558* (0.0220)	-0.0132 (0.0380)	-0.0369* (0.0146)	-0.0078 (0.0251)	-0.0601* (0.0243)	-0.0123 (0.0421)
Badge	-0.0196 (0.0108)	-0.0646* (0.0269)	-0.1041* (0.0500)	-0.0890 (0.0926)	-0.0043 (0.0082)	-0.0114 (0.0161)	-0.0243 (0.0207)	-0.0677 (0.0440)	-0.0155 (0.0140)	-0.0425 (0.0295)	-0.0263 (0.0230)	-0.0734 (0.0490)
... of Replies												
Tips	0.0664*** (0.0108)	0.0640*** (0.0194)	0.1356*** (0.0393)	0.3080*** (0.0713)	0.0238*** (0.0038)	-0.0016 (0.0067)	0.0880*** (0.0156)	-0.0027 (0.0264)	0.0587*** (0.0103)	-0.0031 (0.0175)	0.0984*** (0.0174)	-0.0018 (0.0295)
Likes	0.0688*** (0.0027)	0.1822*** (0.0069)	0.0509*** (0.0075)	0.2046*** (0.0237)	0.0262*** (0.0012)	0.0486*** (0.0027)	0.0943*** (0.0041)	0.1941*** (0.0099)	0.0631*** (0.0028)	0.1276*** (0.0066)	0.1048*** (0.0046)	0.2151*** (0.0111)
Individual-Day FEs	Yes		Yes		Yes		Yes		Yes		Yes	
Source of Reward FEs	Yes		Yes		Yes		Yes		Yes		Yes	
Number of Observations	128,458,902		128,458,902		128,458,902		128,458,902		128,458,902		128,458,902	
R ²	0.18		0.21		0.54		0.50		0.48		0.49	

Standard errors in parentheses.

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

lastly, receiving likes increases the quality of replies for both casual users and top contributors and this positive effect on the quality of replies is larger for top contributors than casual users. We conclude that monetary peer rewards are less effective with top contributors. The results for non-monetary peer rewards are mixed: they are less effective for threads and reviews and more effective for replies.

Turning to compensation, this type of platform reward neither affects the quantity nor the quality of UGC produced by top contributors. However, in contrast to the results for casual users, these are more “positive” effects in the sense that compensation has significant negative effects on the quantity and quality of UGC produced by casual users. Compensation also increases the timeliness of both threads and reviews more for top contributors than for

casual users. And lastly, the negative short-term effects of badges on the quantity and quality of threads are larger (in absolute terms) for top contributors than for casual users, i.e., badges increase the timeliness of threads more for top contributors than for casual users. Badges do not affect the review writing of top contributors beyond decreasing its quantity in the short-term.

To summarize, rewards impact top contributors’ UGC generation generally less than casual users’ UGC generation. This is particularly the case for monetary peer rewards, but also for other rewards to a lesser degree. We speculate that this might be due to top contributors’ higher intrinsic motivation to write UGC compared to casual users’ intrinsic motivation. Casual users are rather extrinsically motivated by peer rewards. Our results indicate two exceptions to this patterns: first, non-monetary peer rewards increase the quantity and quality of replies and decrease the timeliness of replies more for top contributors than for casual users. To put it differently, likes are important to keep top contributors engaged in conversations on the platform. And second, compensation provided by the platform more “positively” affects posting behavior of top contributors than casual users: it increases the timeliness of threads and reviews and has no effect on the quantity and quality of reviews and threads (this is in contrast to the negative effects for casual users). Our interpretation of these findings is that platforms should provide compensation to top contributors to incentive more timely reviews and threads.

6.2 Original and Reactive Content Creators

The second categorization is based on the nature of UGC a user primarily produces on the platform. We differentiate between *original content creators*, who mostly initiate threads and write reviews (representing at least 90% of their content); *reactive content creators*, who mostly post replies (representing at least 90% of their UGC); and *baseline users*, i.e., all remaining users. Among the 16,801 users in our data, 470 users are classified as original content creators, 7,405 users are classified as reactive content reactors, and the remaining

8,926 users are baseline users.

Similar to the analysis in the previous section, we create two dummy variables, one indicating whether a user is an original content creator and another one indicating whether a user is a reactive content creator. We then re-estimate our models with interaction effects between these two newly created dummy variables and the different rewards. To present the results from these regressions in Table 9, we calculated the main effects for the original and reactive content creators and show them next to the estimates for the baseline users.

Among the three types of users, rewards affect the UGC production of original content creators the least. Rewards do not affect any aspect of replies original content creators might write (if they write any replies). Compensation has no significant effects on any aspect of thread initiation or review writing. The (short-term) effects of badges are negative or insignificant – similar to the effects of badges for baseline users and all users (see Section 5). One exception is the positive effect of receiving a badge on the number of threads.²² When it comes to the peer rewards, likes increase the quantity and quality of threads and reviews (when significant), but decrease their timeliness. Tips have mostly insignificant effects with the exception of increasing the timeliness of threads. To put it differently, non-monetary rewards (likes and badges) are most effective in encouraging original content creators to initiate threads and write reviews.

Reactive content creators are strongly motivated by peer rewards – the elasticities are up to twice as large for reactive content creators as for baseline users. This finding suggests that extrinsic motivation plays an important role in encouraging reactive content creators to be active on the platform. The effects of likes are generally larger than the effects of tips. For example, receiving a like increases the number of replies written by reactive content creators as much as receiving about 2 GG in tips. This finding suggests that reactive content creators primarily care about being acknowledgement from peers.

²²The effect of receiving a badge on the quantity of reviews is also positive but insignificant.

Table 9: Effects of Rewards for Baseline Users, Original Content Creators, and Reactive Content Users

	Quantity...			Timeliness...			Length			Complexity			Quality...			Politeness		
	Baseline	Original	Reactive	Baseline	Original	Reactive	Baseline	Original	Reactive	Baseline	Original	Reactive	Baseline	Original	Reactive	Baseline	Original	Reactive
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)	(xi)	(xii)	(xiii)	(xiv)	(xv)	(xvi)	(xvii)	(xviii)
... of Threads																		
Tips	0.0244*	0.0076	0.0580**	0.0720	-0.2738*	0.2509**	0.0006	-0.0276	0.0098	0.0208	-0.1449*	0.0574*	0.0006	-0.0276	0.0098	0.0208	-0.1449*	0.0574*
	(0.0119)	(0.0242)	(0.0203)	(0.0569)	(0.1297)	(0.0905)	(0.0046)	(0.0190)	(0.0074)	(0.0177)	(0.0716)	(0.0283)	(0.0118)	(0.0481)	(0.0189)	(0.0196)	(0.0796)	(0.0283)
Likes	0.0515***	0.1048*	0.0415***	0.0668***	0.1493*	0.0405*	0.0095***	0.0189	-0.0011	0.0646***	0.0667	0.0177	0.0095***	0.0189	-0.0011	0.0646***	0.0667	0.0177
	(0.0053)	(0.0430)	(0.0084)	(0.0085)	(0.0641)	(0.0178)	(0.0017)	(0.0233)	(0.0028)	(0.0075)	(0.0731)	(0.0115)	(0.0050)	(0.0509)	(0.0077)	(0.0083)	(0.0815)	(0.0115)
Compensation	-0.0454***	0.0682	0.0037	-0.1091***	0.0120	-0.1419**	-0.0263*	0.1983	-0.0029	-0.0299	0.0862	0.0136	-0.0263*	0.1983	-0.0029	-0.0299	0.0862	0.0136
	(0.0109)	(0.0533)	(0.0207)	(0.0284)	(0.0607)	(0.0466)	(0.0126)	(0.1190)	(0.0191)	(0.0197)	(0.1475)	(0.0302)	(0.0129)	(0.0901)	(0.0199)	(0.0218)	(0.1655)	(0.0302)
Badge	-0.0112***	0.1115***	-0.1396***	-0.0180*	-0.3348**	-0.1629***	-0.0087***	-0.0756***	-0.0334***	-0.0355***	-0.3223***	-0.1558***	-0.0087***	-0.0756***	-0.0334***	-0.0355***	-0.3223***	-0.1558***
	(0.0028)	(0.0264)	(0.0077)	(0.0089)	(0.1186)	(0.0182)	(0.0018)	(0.0224)	(0.0032)	(0.0066)	(0.0770)	(0.0125)	(0.0044)	(0.0515)	(0.0083)	(0.0073)	(0.0859)	(0.0125)
... of Reviews																		
Tips	0.0366**	0.0236	0.0617**	0.0042	-0.1792	0.1818	0.0175**	-0.0189	0.0224*	0.0403*	-0.1316	0.0616*	0.0175**	-0.0189	0.0224*	0.0403*	-0.1316	0.0616*
	(0.0122)	(0.0282)	(0.0210)	(0.0591)	(0.1588)	(0.0949)	(0.0054)	(0.0221)	(0.0087)	(0.0184)	(0.0822)	(0.0299)	(0.0123)	(0.0555)	(0.0200)	(0.0204)	(0.0914)	(0.0299)
Likes	0.0908***	0.1179**	0.0545***	0.2066***	0.2932**	0.1147***	0.0176***	0.0252	0.0030	0.1357***	0.1813*	0.0611***	0.0176***	0.0252	0.0030	0.1357***	0.1813*	0.0611***
	(0.0059)	(0.0456)	(0.0098)	(0.0115)	(0.0929)	(0.0248)	(0.0027)	(0.0301)	(0.0047)	(0.0086)	(0.0780)	(0.0141)	(0.0058)	(0.0541)	(0.0094)	(0.0096)	(0.0871)	(0.0141)
Compensation	-0.0417**	-0.0088	-0.0432	-0.3388***	-0.1136	-0.3049***	0.0330	0.0155	0.0281	-0.0423	-0.0027	-0.0377	0.0330	0.0155	0.0281	-0.0423	-0.0027	-0.0377
	(0.0156)	(0.0779)	(0.0293)	(0.0425)	(0.0934)	(0.0727)	(0.0178)	(0.1688)	(0.0272)	(0.0281)	(0.2112)	(0.0437)	(0.0185)	(0.1295)	(0.0288)	(0.0311)	(0.2369)	(0.0437)
Badge	-0.0097	0.0923	-0.0521*	-0.1073*	0.5363	-0.0888	0.0015	-0.0356	-0.0099	-0.0174	0.0637	-0.0499	0.0015	-0.0356	-0.0099	-0.0174	0.0637	-0.0499
	(0.0114)	(0.0604)	(0.0260)	(0.0513)	(0.3179)	(0.0896)	(0.0088)	(0.0550)	(0.0160)	(0.0225)	(0.1374)	(0.0435)	(0.0152)	(0.0917)	(0.0292)	(0.0251)	(0.1534)	(0.0435)
... of Replies																		
Tips	0.0557***	-0.0071	0.1012***	0.1397*	-0.1859	0.3532***	0.0104*	-0.0107	0.0159*	0.0573**	-0.0741	0.0668*	0.0104*	-0.0107	0.0159*	0.0573**	-0.0741	0.0668*
	(0.0125)	(0.0260)	(0.0217)	(0.0581)	(0.1364)	(0.0938)	(0.0049)	(0.0215)	(0.0080)	(0.0188)	(0.0805)	(0.0305)	(0.0125)	(0.0539)	(0.0204)	(0.0208)	(0.0894)	(0.0305)
Likes	0.1141***	-0.0093	0.2115***	0.1001***	0.0172	0.2437***	0.0422***	-0.0108	0.0620***	0.1674***	-0.0780	0.2533***	0.0422***	-0.0108	0.0620***	0.1674***	-0.0780	0.2533***
	(0.0063)	(0.0452)	(0.0103)	(0.0131)	(0.0802)	(0.0269)	(0.0022)	(0.0265)	(0.0037)	(0.0095)	(0.0825)	(0.0152)	(0.0063)	(0.0577)	(0.0101)	(0.0105)	(0.0922)	(0.0152)
Individual-Day Fixed Effects		Yes			Yes			Yes			Yes			Yes			Yes	
Source of Reward Fixed Effects		Yes			Yes			Yes			Yes			Yes			Yes	
Number of Observations	128,458,902			128,458,902			128,458,902			128,458,902			128,458,902			128,458,902		
R ²	0.18			0.21			0.54			0.50			0.48			0.49		

Standard errors in parentheses.

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

To summarize, our results suggest that incentives impact original content creators, reactive content creators, and baseline users differently. Users who are mostly focused on creating original content are less responsive to rewards in general. When comparing the effects of the different types of rewards, non-monetary rewards are more effective in encouraging original content creators than monetary rewards. The picture looks somewhat different for reactive content creators. These users are mostly motivated by peer rewards.

7 Robustness Checks

We conduct multiple checks to show the robustness of our results. The results of all robustness checks are shown in Web Appendix C. First, we estimate our model with 1-day and 6-day time windows. Recall that we use a 3-day time window in our main specification. The results are qualitatively robust. Second, we estimate our model with the number of tips and number of compensation rewards a user received (using a 3-day window). Recall that we use the amount (in GG) of tips and compensation the user received in our main specification. The results are qualitatively robust.

Third, we estimate our model using less granular individual-week instead of individual-day fixed effects. The results are qualitatively robust. Fourth, we estimate our model without any fixed effects, i.e., we drop the source of reward dummies and the individual-day fixed effects. The results are directionally robust. And lastly, we estimate the regressions only including one type of reward at a time. The results are robust. We conclude that our results are robust to a variety of alternative specifications.

8 Conclusion

How to encourage users to write more and more timely UGC of the desired quality level is a crucial question for the survival and success of many social media platforms. In this paper, we investigate which rewards can be used to achieve these goals. Our results show that peer

rewards lead to more, more timely, longer, more complex, more informative, and more polite content, while platform rewards have the opposite effects.

From a managerial perspective, receiving peer rewards is critical for encouraging users to produce more content of any type. Thus, platforms should foster a culture in which users frequently reward each other. These peer rewards do not need to be “costly” to users in a monetary sense – we find likes to be very effective peer rewards. At the same time, our results indicate that platform rewards are not a suitable tool to encourage more UGC. This finding does not mean that platforms should not use badges and/or compensation. It rather implies that these two platform rewards might serve different purposes. For example, Hanson, Jiang, and Dahl (2019) showed that badges provide role clarity, i.e., signal the type of member an individual is.

Platform rewards are an effective tool to incentivize more timely content production. Having content be posted very timely might be more important for some platforms than others. For example, having content posted in a timely manner is more important for platforms related to fashion or news than platforms related to books or board games. Platform rewards can also be employed to encourage users to respond more quickly to others’ questions.

When it comes to the quality of UGC, it is important to keep in mind that posts that measure higher on the four quality dimensions are not necessarily better for a platform. Whether a platform would benefit from, e.g., more of less informative posts, also depends on the starting point, i.e., the current quality level of posts, and the topic of platform. Having said that, receiving peer rewards increases the quality of subsequent posts, while receiving platform rewards has the opposite effect.

Top contributors are the users who produce most of the UGC and who play a crucial role for platforms. Platforms are keenly interested in attracting, retaining, and incentivizing top contributors to remain active and use different tools to achieve these goals. Our results indicate that rewards are not a particularly effective tool managers can use to incentivize

top contributors. This is particularly the case for monetary peer rewards, but also for other rewards to a lesser degree. Based on these results, we speculate that top contributors' higher levels of UGC contributions are intrinsically motivated. There are two exceptions to this pattern: likes are important to keep top contributors engaged in conversations on the platform and compensation to top contributors incentivizes them more to write timely reviews and threads.

And lastly, original content creators are less responsive to rewards in general compared to baseline users. When comparing the effects of the different types of rewards, non-monetary rewards are more effective in encouraging original content creators than monetary rewards. The picture looks somewhat different for reactive content creators. These users are mostly motivated by peer rewards. Overall, these results indicate significant heterogeneity in how users respond to incentives based on the amount and type of content they generate. This underlines the importance of tailoring incentive strategies to different groups of users to maximize engagement and achieve the desired level of UGC quality.

Our research is not without limitations. First, we focus on UGC in text form and do not examine other forms of UGC, e.g., videos. This limitation is driven by BGG not using visual content. It is left for future research to examine whether our findings carry over for other forms of UGC. Second, we measure short-term effects of rewards, i.e., how receiving a reward affects user behavior in the following three days. While we test the robustness of our results with a longer time window of six days and find that the effects of rewards decrease, we leave studying longer-term effects for future research. Third, we measure eight dimensions of text quality and use them to construct four variables representing four dimensions of quality. However, there are other text aspects that can also reflect quality, for example, relevance of the images and links used in the text. Future research can further examine the impact of rewards on this aspect of content quality.

Forth, we do not examine the effects of rewards from the platform for replies. This is because the platform does not provide any monetary or non-monetary rewards for replies.

As a result, we are unable to analyze the potential impact of such rewards on the quantity and quality of replies. It would be interesting for future research to explore the effects of rewards from the platform on replies, and to compare these effects to those of peer rewards. And lastly, the quantity and quality of the content on the platform can also impact the platform's appeal to new visitors and their inclination towards becoming a member. We do not model platform growth. We leave it for future research to study how different types of incentives impact member acquisition and characteristics of these new members.

References

- Ameri, Mina, Elisabeth Honka, and Ying Xie (2019), “Word of Mouth, Observed Adoptions, and Anime-Watching Decisions: The Role of the Personal versus. the Community Network,” *Marketing Science*, 38 (4), 567–583.
- (2023), “From Strangers to Friends: Tie Formations and Online Activities in an Evolving Social Network,” *Journal of Marketing Research*, 60 (2), 329–354.
- Anderka, Maik, Benno Stein, and Nedim Lipka (2012), “Predicting Quality Flaws in User-Generated Content: The Case of Wikipedia,” in “Proceedings of the 35th International ACM SIGIR Conference on Research and Development in Information Retrieval,” 981–990.
- Angrist, Joshua and Joern-Steffen Pischke (2009), *Mostly Harmless Econometrics*, Princeton University Press.
- Bateman, Patrick, Peter Gray, and Brian Butler (2011), “The Impact of Community Commitment on Participation in Online Communities,” *Information System Research*, 22 (4), 841–854.
- Blumenstock, Joshua (2008), “Size Matters: Word Count as A Measure of Quality on Wikipedia,” in “Proceedings of the 17th International Conference on World Wide Web,” 1095–1096.
- Burtch, Gordon, Qinglai He, Yili Hong, and Dokyun Lee (2022), “How Do Peer Awards Motivate Creative Content? Experimental Evidence from Reddit,” *Management Science*, 68 (5), 3488–3506.
- Burtch, Gordon, Yili Hong, Ravi Bapna, and Vladas Griskevicius (2018), “Stimulating Online Reviews by Combining Financial Incentives and Social Norms,” *Management Science*, 64 (5), 2065–2082.
- Cabral, Luis and Lingfang Li (2015), “A Dollar for Your Thoughts: Feedback-Conditional Rebates on eBay,” *Management Science*, 61 (9), 2052–2063.
- Chen, Yubo, Qi Wang, and Jinhong Xie (2011), “Online Social Interactions: A Natural Experiment on Word of Mouth Versus Observational Learning,” *Journal of Marketing Research*, 48 (2), 238–254.
- Chevalier, Judy and Dina Mayzlin (2006), “The Effect Of Word-of-Mouth On Sales: Online Book Reviews,” *Journal of Marketing Research*, 43 (3), 345–354.
- Demberg, Vera and Frank Keller (2008), “Data From Eye-Tracking Corpora as Evidence for Theories of Syntactic Processing Complexity,” *Cognition*, 109 (2), 193–210.
- Fader, Anthony, Stephen Soderland, and Oren Etzioni (2011), “Identifying Relations for Open Information Extraction,” in “Proceedings of the Conference of Empirical Methods in Natural Language Processing (EMNLP ’11),” Edinburgh, Scotland, UK.
- Gallus, Jana (2017), “Fostering Public Good Contributions with Symbolic Award: A Large Scale Natural Field Experiment at Wikipedia,” *Management Science*, 63 (12), 3999–4015.

- Gallus, Jana, Olivia S Jung, and Karim R Lakhani (2020), “Recognition Incentives for Internal Crowdsourcing: A Field Experiment at NASA,” Working Paper.
- Godes, David and Dina Mayzlin (2004), “Using Online Conversations to Study Word-of-Mouth Communication,” *Marketing Science*, 23 (4), 545–560.
- Goes, Paulo, Chenhui Guo, and Mingfeng Lin (2016), “Do Incentive Hierarchies Induce User Effort? Evidence from An Online Knowledge Exchange,” *Information Systems Research*, 27 (3), 497–516.
- Goes, Paulo, Mingfeng Lin, and Ching-man Au Yeung (2014), ““Popularity Effect” in User-Generated Content: Evidence From Online Product Reviews,” *Information Systems Research*, 25 (2), 222–238.
- Gunning, Robert (1952), *Technique of Clear Writing*, McGraw-Hill.
- Hanson, Sara, Lan Jiang, and Darren Dahl (2019), “Enhancing Consumer Engagement in an Online Brand Community via User Reputation Signals: A Multi-Method Analysis,” *Journal of the Academy of Marketing Science*, 47 (5), 349–367.
- Hasan Dalip, Daniel, Marcos André Gonçalves, Marco Cristo, and Pável Calado (2009), “Automatic Quality Assessment of Content Created Collaboratively by Web Communities: a Case Study of Wikipedia,” in “Proceedings of the 9th ACM/IEEE-CS Joint Conference on Digital Libraries,” 295–304.
- Hendricks, Ken and Alan Sorensen (2009), “Information and the Skewness of Music Sales,” *Journal of Political Economy*, 117 (2), 324–369.
- Hennig-Thurau, Thorsten, Kevin P. Gwinner, Gianfranco Walsh, and Dwayne D. Gremler (2004), “Electronic Word-Of-Mouth via Consumer-Opinion Platforms: What Motivates Consumers to Articulate Themselves on the Internet?” *Journal of Interactive Marketing*, 18 (1), 38–52.
- Hong, Hong, Di Xu, Alan Wang, and Weiguo Fan (2017), “Understanding the Determinants of Online Review Helpfulness: A Meta-Analytic Investigation,” *Decision Support Systems*, 102 (C), 1–11.
- Horn, Christopher, Alisa Zhila, Alexander Gelbukh, Roman Kern, and Elisabeth Lex (2013), “Using Factual Density to Measure Informativeness of Web Documents,” in “Proceedings of the 19th Nordic Conference of Computational Linguistics (NODALIDA 2013),” 227–238.
- Huang, Justin T, Rupali Kaul, and Sridhar Narayanan (2022), “The Causal Effect of Attention and Recognition on the Nature of User-Generated Content: Experimental Results from an Image-Sharing Social Network,” Working Paper.
- Huang, Justin T and Sridhar Narayanan (2020), “Effects of Attention and Recognition on Engagement, Content Creation and Sharing: Experimental Evidence from an Image Sharing Social Network,” Working Paper.
- Huang, Ni, Gordon Burtch, Bin Gu, Yili Hong, Chen Liang, Kanliang Wang, Dongpa Fu, and Bo Yahg (2019), “Motivating User-Generated Content with Performance Feedback: Evidence from Randomized Field Experiments,” *Management Science*, 65 (1), 327–345.

- Hukal, Philipp, Ola Henfridsson, Maha Shaikh, and Geoffrey Parker (2020), “Platform Signaling for Generating Platform Content,” *MIS Quarterly*, 44 (3), 1177–1205.
- Khern-am nuai, Warut, Karthik Kannan, and Hossein Ghasemkhani (2018), “Extrinsic versus Intrinsic Rewards for Contributing Reviews in an Online Platform,” *Information System Research*, 29 (4), 871–892.
- Kincaid, J Peter, Robert Fishburne Jr, Richard Rogers, and Brad Chissom (1975), “Derivation of New Readability Formulas (Automated Readability Index, Fog Count and Flesch Reading Ease Formula) for Navy Enlisted Personnel,” Technical report, Naval Technical Training Command Millington TN Research Branch.
- Kozinets, Robert (1999), “E-Tribalized Marketing?: The Strategic Implications of Virtual Communities of Consumption,” *European Management Journal*, 17 (2), 252–264.
- Kuang, Lini, Ni Huang, Yili Hong, and Zhijun Yan (2019), “Spillover Effects of Financial Incentives on Non-Incentivized User Engagement: Evidence From an Online Knowledge Exchange Platform,” *Journal of Management Information Systems*, 36 (1), 289–320.
- Lal, Rajiv and Venkataraman Srinivasan (1993), “Compensation Plans for Single- And Multi-Product Salesforces: An Application of the Holmstrom-Milgrom Model,” *Management Science*, 39 (7), 777–793.
- Leung, Louis (2009), “User-Generated Content on the Internet: An Examination of Gratifications, Civic Engagement and Psychological Empowerment,” *New Media & Society*, 11 (8), 1327–1347.
- Lex, Elisabeth, Michael Voelske, Marcelo Errecalde, Edgardo Ferretti, Leticia Cagnina, Christopher Horn, Benno Stein, and Michael Granitzer (2012), “Measuring The Quality of Web Content Using Factual Information,” in “Proceedings of the 2nd joint WICOW/AIRWeb workshop on web quality,” 7–10.
- Liu, Yuewen and Juan Feng (2021), “Does Money Talk? The Impact of Monetary Incentives on User-Generated Content Contributions,” *Information Systems Research*, 32 (2), 394–409.
- Moe, Wendy and Michael Trusov (2011), “The Value of Social Dynamics in Online Product Ratings Forums,” *Journal of Marketing Research*, 48 (3), 444–456.
- Nevskaya, Yulia and Paulo Albuquerque (2019), “How Should Firms Manage Excessive Product Use? A Continuous-Time Demand Model to Test Reward Schedules, Notifications, and Time Limits,” *Journal of Marketing Research*, 56 (3), 379–400.
- Oyer, Paul (1998), “Fiscal Year Ends and Nonlinear Incentive Contracts: The Effect on Business Seasonality,” *The Quarterly Journal of Economics*, 113 (1), 149–185.
- Qiao, Dandan, Shun-Yang Lee, Andrew B Whinston, and Qiang Wei (2020), “Financial Incentives Dampen Altruism in Online Prosocial contributions: A Study of Online Reviews,” *Information Systems Research*, 31 (4), 1361–1375.

- Restivo, Michael and Arnout van de Rijdt (2014), “No Praise Without Effort: Experimental Evidence on How Rewards Affect Wikipedia’s Contributor Community,” *Information, Communication & Society*, 17 (4), 451–462.
- Roberts, Jeffrey A, Il-Horn Hann, and Sandra A Slaughter (2006), “Understanding The Motivations, Participation, And Performance of Open Source Software Developers: A Longitudinal Study of The Apache Projects,” *Management Science*, 52 (7), 984–999.
- Shah, Chirag and Jefferey Pomerantz (2010), “Evaluating and Predicting Answer Quality in Community QA,” in “Proceedings of the 33rd International ACM SIGIR Conference on Research and Development in Information Retrieval,” 411–418.
- Stvilia, Besiki, Michael Twidale, Les Gasser, and Linda Smith (2005), “Assessing Information Quality of a Community-Based Encyclopedia,” in “Knowledge Management: Nurturing Culture, Innovation, and Technology,” World Scientific, 101–113.
- Sun, Xinyu, Maoxin Han, and Juan Feng (2019), “Helpfulness of Online Reviews: Examining Review Informativeness And Classification Thresholds by Search Products And Experience Products,” *Decision Support Systems*, 124, 113099.
- Sun, Yacheng, Xiaojing Dong, and Shelby McIntyre (2017), “Motivation of User-generated Content: Social Connectedness Moderates the Effects of Monetary Rewards,” *Marketing Science*, 36 (3), 329–337.
- Toubia, Olivier and Andrew T. Stephen (2013), “Intrinsic vs. Image-Related Utility in Social Media: Why Do People Contribute Content to Twitter,” *Marketing Science*, 32 (3), 368–392.
- Weimer, Markus, Iryna Gurevych, and Max Mühlhäuser (2007), “Automatically Assessing the Post Quality in Online Discussions on Software,” in “Proceedings of the 45th Annual Meeting of the Association for Computational Linguistics Companion Volume Proceedings of the Demo and Poster Sessions,” 125–128.
- Woolley, Kaitlin and Marissa A Sharif (2021), “Incentives Increase Relative Positivity of Review Content and Enjoyment of Review Writing,” *Journal of Marketing Research*, 58 (3), 539–558.
- Xu, Bo and Dahui Li (2015), “An Empirical Study of The Motivations for Content Contribution And Community Participation in Wikipedia,” *Information & Management*, 52 (3), 275–286.
- Yang, Mochen, Yuqing Ren, and Gediminas Adomavicius (2019), “Understanding User-Generated Content and Customer Engagement on Facebook Business Pages,” *Information System Research*, 30 (3), 839–855.
- Yeomans, Michael, Alejandro Kantor, and Dustin Tingley (2018), “The Politeness Package: Detecting Politeness in Natural Language,” *The R Journal*, 10 (2), 489–502.
- Yu, Yanan, Warut Khern-am nuai, and Alain Pinsonneault (2022), “When Paying for Reviews Pays Off: The Case of Performance-Contingent Monetary Rewards,” *MIS Quarterly*, 46 (1), 609–625.

- Zeng, Zhiyu, Hengchen Dai, Dennis J Zhang, Heng Zhang, Renyu Zhang, Zhiwei Xu, and Zuo-Jun Max Shen (2023), “The Impact of Social Nudges on User-Generated Content for Social Network Platforms,” *Management Science*, 69 (9), 5189–5208.
- Zhang, Xiaoquan (Michael) and Feng Zhu (2011), “Group Size and Incentives to Contribute: A Natural Experiment at Chinese Wikipedia,” *American Economic Review*, 101 (4), 1601–1615.
- Zhang, Yuchi and David Godes (2018), “Learning from Online Social Ties,” *Marketing Science*, 37 (3), 424–444.

Appendix A: Data Details

A.1 Badges

Users receive badges for initiating a certain number of threads on the discussion forum and for writing a certain number of reviews. Each type of content has its own chain of milestones and badges. A list of these badges and their corresponding thresholds is shown in Figure A-1.

Figure A-1: Badge Levels for Different UGC Types



























- **Poster Level Badges (for each domain: BGG, RPGG, VGG)**
 -  - Level 01 BGG Poster (100-249 posts)
 -  - Level 02 BGG Poster (250-499 posts)
 -  - Level 03 BGG Poster (500-749 posts)
 -  - Level 04 BGG Poster (750-999 posts)
 -  - Level 05 BGG Poster (1000-1499 posts)
 -  - Level 06 BGG Poster (1500-1999 posts)
 -  - Level 07 BGG Poster (2000-2499 posts)
 -  - Level 08 BGG Poster (2500-2999 posts)
 -  - Level 09 BGG Poster (3000-3499 posts)
 -  - Level 10 BGG Poster (3500-3999 posts)
 -  - Level 11 BGG Poster (4000-4499 posts)
 -  - Level 12 BGG Poster (4500-4999 posts)
 -  - Level 13 BGG Poster (5000-5499 posts)
 -  - Level 14 BGG Poster (5500-5999 posts)
 -  - Level 15 BGG Poster (6000-6499 posts)
 -  - Level 16 BGG Poster (6500-6999 posts)
 -  - Level 17 BGG Poster (7000-7999 posts)
 -  - Level 18 BGG Poster (8000-8999 posts)
 -  - Level 19 BGG Poster (9000-9999 posts)
 -  - Level 20 BGG Poster (10000+ posts)
- **Game Reviews**
 -  Copper - 5 Reviews
 -  Silver - 50 Reviews
 -  Gold - 100 Reviews
 -  Platinum - 250 Reviews
 -  Herculean - 500 Reviews
 -  Ultimate - 1000 Reviews

Table A-1 shows summary statistics for the number of earned badges by the users in our sample within a year. BGG, on average, awarded 76 badges for writing reviews and 2,666 badges for writing threads to the 16,801 users.

Table A-1: Number of Badges Earned by Users in Our Sample Within a Year

	Mean	SD	Min	Median	Max	N
Threads	2,666.33	1,150.46	1,659.00	2,455.00	5,647.00	9
Reviews	76.40	12.66	58.00	75.00	97.00	10

A.2 Likes

Table A-2 shows the average number of likes users receive per post for each UGC type. Users, on average, receive about four likes for each reply or thread and 11 likes for writing reviews.

Table A-2: Number of Likes Received Per Post

	Mean	SD	Min	Median	Max	N
Threads	4.16	8.53	1.00	2.00	876	206,108
Reviews	11.72	15.79	1.00	7.00	339	8,019
Replies	3.80	5.85	1.00	2.00	406	3,408,180

A.3 Tips and Compensation per Post

Table A-3 reports the summary statistics for the quantity and amount of tips and compensation users receive per post. Users, on average, receive three tips for each review they write. On average, users receive a total of 5.94 tips for writing a thread, 3.42 tips for writing a review, and 2.55 tips for writing a reply. Additionally, users, on average, earn the total of 2.21 compensation per thread and 2.21 compensation per review. Note that users do not receive compensation from BGG for writing replies.

Table A-3: Tips and Compensation Per Post

	Mean	SD	Min	Median	Max	N
Tips Per Post						
<i>Threads</i>						
Quantity	2.36	3.86	1.00	1.00	121.00	26,402
Amount	5.94	43.59	0.00 ⁺	1.00	2,536.38	26,402
<i>Reviews</i>						
Quantity	3.00	3.94	1.00	2.00	78.00	6,448
Amount	3.42	7.98	0.01	1.05	152.08	6,448
<i>Replies</i>						
Quantity	1.37	1.15	1.00	1.00	57.00	278,382
Amount	2.55	53.54	0.00 ⁺	0.25	4,970	278,382
Compensation Per Post						
<i>Threads</i>						
Amount	2.21	0.66	1.00	2.09	5.00	732
<i>Reviews</i>						
Amount	2.21	0.70	1.00	2.10	5.00	15,790

Note: 0.00⁺ is a very small number greater than 0.

A.4 Construction of Quality Measures

Table A-4 provides an overview of the text quality measures and the formulas used to construct them.

Table A-4: Text Quality Measures and Their Definitions

Quality Dimension	Quality Sub Type	Formula
Length	Number of Words	
	Number of Sentences	
	Reading Time	14.69 ms Per Character
Complexity	Gunnig Fox Index	$0.4 \left[\left(\frac{\text{Words}}{\text{Sentences}} \right) + 100 \left(\frac{\text{Complex Words}}{\text{Total Words}} \right) \right]$
	FREI	$206.835 - 1.015 \left(\frac{\text{Total Words}}{\text{Total Sentences}} \right) + 84.6 \left(\frac{\text{Total Syllables}}{\text{Total Words}} \right)$
	Number of Words In Sentence	
Informativeness	Facts Per Length of Text in Words	
Politeness		$\frac{\text{Positive Words} - \text{Negative Words}}{\text{Total Words}}$

A.5 Source of Reward Dummies

In a linear regression, fixed effects are typically incorporated in one of two ways. The first method entails the researcher using a categorical variable containing a unique identifier for each set of observations that is related to a level of the fixed effect. Then, all variables in the regression model are demeaned based on this categorical variable, i.e., the fixed effects are not actually estimated. The second method entails the researcher using multiple dummy variables, one variable for each set of related observations, such that the dummy variable corresponding to each set of observations takes the value of 1 for those observations and 0 for all other observations. In this method, a coefficient for each dummy variable is estimated.

While using the second method is intuitively appealing for our case, it would require us to include 3,683,407 dummies, which is infeasible due to computational limitations. As a result, we incorporate the source of reward dummies using a modified version of the first method. Because a user may receive rewards for multiple posts in one day, we cannot use a single categorical variable that contains the IDs of the rewarded posts. Thus, we create several categorical variables that indicate the sources of rewards.

Recall that we estimate the effects of rewards received in days $t - 3$ to $t - 1$ on a user's posting behavior on day t in our model. To save additional data manipulations steps, we create the categorical variables in such a manner that they capture sources of rewards for rewards received in days $t - 3$ to $t - 1$. In other words, each categorical variable contains the ID of one of the posts that a user received a reward for during the three days prior to day t . The assignment of post IDs to categorical variables is done such that each post ID is assigned to only one categorical variable and, as a result, all observations related to that post ID are demeaned based on that categorical variable.

We illustrate our strategy using an example in Table A-5. Suppose that user A received rewards for some of her previous posts in the following pattern: rewards for post IDs x123 and x456 on day 1, rewards for posts IDs y123 and y456 on day 2, no rewards on day 3, rewards for post ID z123 on day 4, and rewards for post IDs x123, z123 and w123 on day 5.

Table A-5 shows the rewarded posts and the assigned values to the four categorical variables we created.

Table A-5: Example of Source of Reward (Past Post) ID Assignments to Categorical Variables

Day	Rewarded Posts	Categorical Variables			
		Var 1	Var 2	Var 3	Var 4
Day 1	x123, x456				
Day 2	y123, y456	x123	x456		
Day 3		x123	x456	y123	y456
Day 4	z123	x123	x456	y123	y456
Day 5	x123, z123, w123		z123	y123	y456
Day 6		x123	z123	w123	
Day 7		x123	z123	w123	
Day 8		x123	z123	w123	

The purpose of using categorical variables instead of dummy variables is to minimize the number of variables used for indicating the post IDs that received a reward in a day. As a result, in the above example, post ID z123 is assigned to an existing categorical variable instead of a new one. However, since a post ID must be assigned to only one categorical variable for the correct demeaning of the data, post ID z123 is assigned to categorical variable 2 instead of categorical variable 1. If post ID z123 were assigned to categorical variable 1 on day 5, there would be a conflict in the assignment on day 6 since the user received rewards for posts x123 and z123 on day 5 and both post IDs were already linked to the categorical variable 1.

Due to the constraint that a post ID can only be assigned to one categorical variable and due to the varying number of posts that receive a reward on the same day, some of the categorical variables are not assigned any post IDs on many days. Note that during the demeaning of the data, these unassigned cases are grouped separately from the cases in which categorical variables are unassigned due to a user not receiving any reward that day.

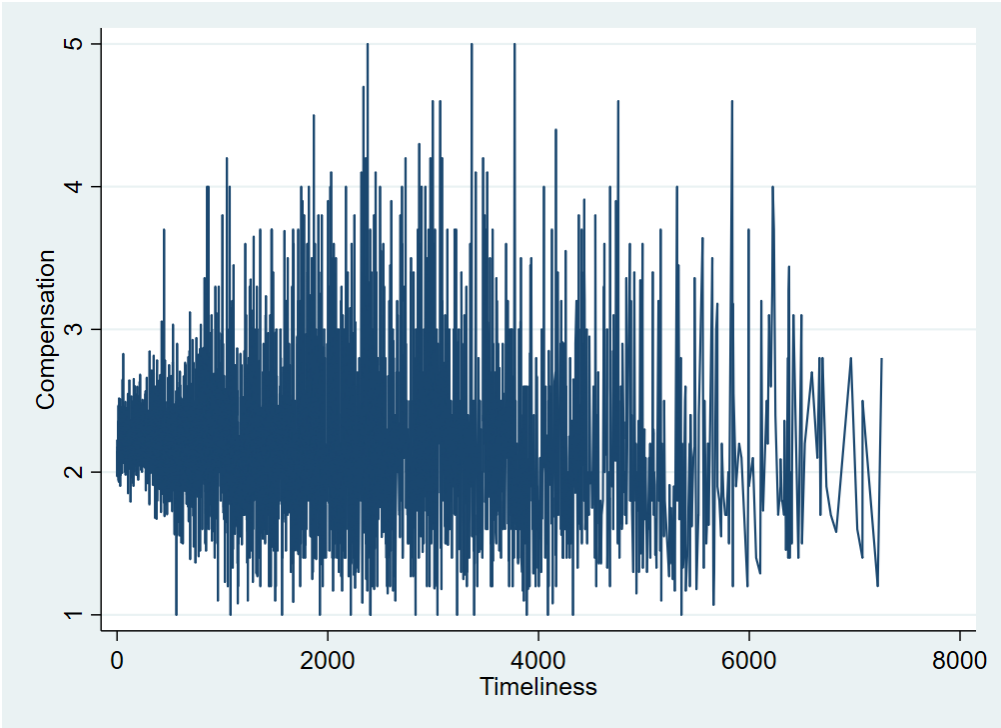
Lastly, on some days, users in our data receive rewards for more than 3,000 different posts. Since each post ID should be assigned to only one categorical variable, due to the

sheer number of post IDs, thousands of categorical variables would be needed. In this case, the size of the resulting data set would be too large (hundreds of GB) to process. To address this issue, we limit the number of categorical variables to 20 which capture 90% of posts and 99% of observations for which a user received a reward Using more categorical variables often led to server crashes. Despite that, after several attempts, we were able to estimate our base model using 100 categorical variables. The results were qualitatively consistent with our main results. ²³

A.6 Compensation and Timeliness

We examined the relationship between the timeliness of a review and the compensation it received. Our findings, shown in Figure A-2, did not reveal a meaningful relationship between these two factors.

Figure A-2: Badge Levels for Different UGC Types



²³The results are available from the authors upon request.

Appendix B: Results with Interaction Effects

Table B-1: Results for UGC Quantity, Timeliness and Quality with Interaction Effects

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Quantity	Timeliness	Quality			
			Length	Complexity	Informativeness	Politeness
Reviews	0.0070 (0.0132)	-0.0033 (0.0331)	0.0025 (0.0051)	0.0152 (0.0238)	0.0100 (0.0159)	0.0164 (0.0266)
Replies	0.0206*** (0.0064)	0.0180 (0.0169)	0.0073** (0.0030)	0.0421*** (0.0130)	0.0293*** (0.0086)	0.0462*** (0.0144)
Tips	0.0634*** (0.0101)	0.2383*** (0.0367)	0.0105*** (0.0030)	0.0612*** (0.0116)	0.0401*** (0.0077)	0.0687*** (0.0130)
Reviews × Tips	0.0061** (0.0022)	-0.0689*** (0.0115)	0.0146*** (0.0021)	0.0086** (0.0037)	0.0059** (0.0025)	0.0105** (0.0042)
Replies × Tips	0.0460*** (0.0046)	0.1049*** (0.0141)	0.0088*** (0.0015)	0.0250*** (0.0057)	0.0161*** (0.0038)	0.0279*** (0.0064)
Likes	0.0371*** (0.0035)	0.0309** (0.0116)	0.0000 (0.0011)	0.0216*** (0.0043)	0.0147*** (0.0028)	0.0240*** (0.0048)
Reviews × Likes	0.0240*** (0.0020)	0.1103*** (0.0069)	0.0048*** (0.0014)	0.0530*** (0.0031)	0.0348*** (0.0021)	0.0582*** (0.0035)
Replies × Likes	0.1503*** (0.0027)	0.1738*** (0.0100)	0.0572*** (0.0010)	0.2105*** (0.0039)	0.1389*** (0.0026)	0.2336*** (0.0044)
Compensation	-0.0131 (0.0090)	-0.1237*** (0.0181)	-0.0108 (0.0066)	-0.0018 (0.0106)	-0.0025 (0.0070)	-0.0019 (0.0117)
Reviews × Compensation	-0.0259** (0.0090)	-0.2005*** (0.0218)	0.0424*** (0.0068)	-0.0368*** (0.0109)	-0.0226*** (0.0072)	-0.0388*** (0.0121)
Badge	-0.0935*** (0.0045)	-0.1159*** (0.0088)	-0.0257*** (0.0014)	-0.1179*** (0.0059)	-0.0780*** (0.0038)	-0.1303*** (0.0065)
Reviews × Badge	0.0770*** (0.0103)	0.0510 (0.0379)	0.0252*** (0.0064)	0.1063*** (0.0170)	0.0720*** (0.0115)	0.1186*** (0.0189)
Received Tips for Other UGC Than Threads	0.0624*** (0.0109)	0.2563*** (0.0404)	0.0093** (0.0032)	0.0443*** (0.0127)	0.0288*** (0.0084)	0.0503*** (0.0142)
Received Tips for Other UGC Than Reviews	-0.0018*** (0.0003)	-0.0012 (0.0007)	-0.0007*** (0.0001)	-0.0023*** (0.0005)	-0.0015*** (0.0004)	-0.0025*** (0.0006)
Received Tips for Other UGC Than Replies	0.0116*** (0.0022)	0.0336*** (0.0061)	0.0055*** (0.0008)	0.0252*** (0.0040)	0.0170*** (0.0027)	0.0283*** (0.0045)
Received Likes for Other UGC Than Threads	0.0814*** (0.0051)	0.0200 (0.0180)	0.0267*** (0.0016)	0.0921*** (0.0065)	0.0612*** (0.0043)	0.1025*** (0.0072)
Received Likes for Other UGC Than Reviews	-0.0107*** (0.0003)	-0.0057*** (0.0007)	-0.0040*** (0.0001)	-0.0146*** (0.0004)	-0.0098*** (0.0003)	-0.0162*** (0.0005)
Received Likes for Other UGC Than Replies	0.0130*** (0.0009)	0.0028 (0.0029)	0.0086*** (0.0004)	0.0391*** (0.0017)	0.0263*** (0.0011)	0.0436*** (0.0019)
Received Compensation for Other UGC Than Threads	-0.0106*** (0.0022)	-0.0450*** (0.0084)	-0.0032*** (0.0008)	-0.0158*** (0.0032)	-0.0101*** (0.0021)	-0.0176*** (0.0036)
Received Compensation for Other UGC Than Reviews	-0.0007 (0.0005)	-0.0049*** (0.0015)	0.0001 (0.0002)	-0.0003 (0.0007)	0.0000 (0.0005)	-0.0004 (0.0008)
Received Badge for Other UGC Than Threads	-0.0370*** (0.0018)	-0.0381*** (0.0045)	-0.0114*** (0.0007)	-0.0495*** (0.0030)	-0.0330*** (0.0020)	-0.0549*** (0.0033)

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table B-2: Results for UGC Quantity, Timeliness and Quality with Interaction Effects (Cont. 1)

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Quantity	Timeliness	Quality			
			Length	Complexity	Informativeness	Politeness
Received Badge for Other UGC Than Reviews	-0.0330*** (0.0014)	-0.0382*** (0.0028)	-0.0093*** (0.0005)	-0.0411*** (0.0019)	-0.0272*** (0.0013)	-0.0455*** (0.0021)
Same Thread Activity Dummy	-0.0059*** (0.0004)	-0.0087*** (0.0012)	-0.0024*** (0.0002)	-0.0121*** (0.0007)	-0.0081*** (0.0005)	-0.0134*** (0.0008)
Same Review Activity Dummy	0.0101*** (0.0013)	0.0147*** (0.0040)	0.0029*** (0.0006)	0.0164*** (0.0025)	0.0107*** (0.0016)	0.0180*** (0.0027)
Same Reply Activity Dummy	-0.0167*** (0.0007)	-0.0306*** (0.0018)	-0.0064*** (0.0003)	-0.0299*** (0.0012)	-0.0196*** (0.0008)	-0.0330*** (0.0014)
Days Since Last Thread Posted	-0.0022*** (0.0000)	-0.0024*** (0.0001)	-0.0010*** (0.0000)	-0.0046*** (0.0001)	-0.0031*** (0.0001)	-0.0051*** (0.0001)
Days Since Last Review Posted	-0.0007*** (0.0000)	-0.0008*** (0.0001)	-0.0004*** (0.0000)	-0.0017*** (0.0001)	-0.0012*** (0.0001)	-0.0019*** (0.0001)
Days Since Last Reply Posted	-0.0037*** (0.0001)	-0.0065*** (0.0003)	-0.0017*** (0.0000)	-0.0073*** (0.0002)	-0.0049*** (0.0001)	-0.0081*** (0.0002)
Number of Written Threads so Far	0.0037*** (0.0003)	0.0067*** (0.0009)	0.0011*** (0.0001)	0.0067*** (0.0005)	0.0044*** (0.0003)	0.0074*** (0.0005)
Number of Written Reviews so Far	0.0000 (0.0012)	0.0121*** (0.0040)	0.0005 (0.0005)	0.0011 (0.0021)	0.0007 (0.0014)	0.0013 (0.0023)
Number of Written Replies so Far	0.0014*** (0.0003)	0.0049*** (0.0010)	0.0010*** (0.0001)	0.0038*** (0.0006)	0.0025*** (0.0004)	0.0043*** (0.0006)
If Posted Threads Dummy		1.1252*** (0.0129)	0.9454*** (0.0048)	2.6966*** (0.0027)	1.7458*** (0.0019)	2.9534*** (0.0029)
If Posted Reviews Dummy		5.0362*** (0.0490)	2.1604*** (0.0322)	2.7678*** (0.0096)	1.8125*** (0.0076)	3.0932*** (0.0094)
If Posted Replies Dummy		1.6525*** (0.0151)	0.6555*** (0.0025)	2.4979*** (0.0071)	1.6119*** (0.0048)	2.7509*** (0.0078)
Numer of Written Threads in Past 3 Days	0.0256*** (0.0027)	0.0369*** (0.0060)	0.0065*** (0.0011)	0.0322*** (0.0042)	0.0213*** (0.0028)	0.0355*** (0.0047)
Numer of Written Reviews in Past 3 Days	-0.0138 (0.0078)	-0.0073 (0.0215)	0.0016 (0.0042)	-0.0062 (0.0123)	-0.0027 (0.0082)	-0.0068 (0.0137)
Numer of Written Replies in Past 3 Days	0.0469*** (0.0035)	0.0873*** (0.0087)	0.0114*** (0.0012)	0.0488*** (0.0049)	0.0317*** (0.0032)	0.0538*** (0.0054)
Same Thread Activity in Past 3 Days Dummy	-0.0104*** (0.0019)	-0.0133*** (0.0042)	-0.0023** (0.0008)	-0.0121*** (0.0030)	-0.0080*** (0.0020)	-0.0133*** (0.0033)
Same Reviews Activity in Past 3 Days Dummy	0.0096 (0.0057)	0.0030 (0.0158)	-0.0027 (0.0033)	0.0014 (0.0093)	0.0000 (0.0062)	0.0015 (0.0104)
Same Replies Activity in Past 3 Days Dummy	-0.0380*** (0.0030)	-0.0750*** (0.0081)	-0.0060*** (0.0010)	-0.0257*** (0.0041)	-0.0164*** (0.0027)	-0.0283*** (0.0045)
Numer of Written Threads in Past 365 days	0.0020*** (0.0001)	0.0051*** (0.0004)	0.0004*** (0.0001)	0.0021*** (0.0002)	0.0014*** (0.0002)	0.0023*** (0.0003)
Numer of Written Reviews in Past 365 days	-0.0051*** (0.0007)	-0.0050*** (0.0016)	-0.0021*** (0.0003)	-0.0072*** (0.0011)	-0.0047*** (0.0008)	-0.0081*** (0.0013)
Numer of Written Replies in Past 365 days	0.0064*** (0.0002)	0.0060*** (0.0005)	0.0032*** (0.0001)	0.0136*** (0.0003)	0.0091*** (0.0002)	0.0151*** (0.0004)

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table B-3: Results for UGC Quantity, Timeliness and Quality with Interaction Effects (Cont. 2)

	(i) Quantity	(ii) Timeliness	(iii)	(iv)	(v) Quality	(vi)
			Length	Complexity	Informativeness	Politeness
Posts To Next Threads Badge	0.0059 (0.0073)	-0.0090 (0.0199)	-0.0012 (0.0033)	0.0072 (0.0140)	0.0060 (0.0093)	0.0074 (0.0156)
Posts To Next Threads Badge Squared	-0.0021 (0.0027)	0.0050 (0.0079)	0.0005 (0.0012)	-0.0025 (0.0051)	-0.0021 (0.0034)	-0.0025 (0.0057)
Posts To Next Threads Badge Cubic	0.0002 (0.0003)	-0.0008 (0.0009)	-0.0001 (0.0001)	0.0003 (0.0006)	0.0003 (0.0004)	0.0003 (0.0006)
Posts To Next Reviews Badge	-0.0177 (0.0203)	-0.0602 (0.0501)	-0.0092 (0.0077)	-0.0187 (0.0370)	-0.0105 (0.0248)	-0.0209 (0.0414)
Posts To Next Reviews Badge Squared	0.0178 (0.0112)	0.0526 (0.0300)	0.0083 (0.0044)	0.0214 (0.0207)	0.0134 (0.0139)	0.0239 (0.0232)
Posts To Next Reviews Badge Cubic	-0.0036* (0.0018)	-0.0107 (0.0060)	-0.0016** (0.0007)	-0.0043 (0.0033)	-0.0027 (0.0022)	-0.0048 (0.0037)
Region 2 of Threads	-0.0001 (0.0061)	-0.0136 (0.0163)	-0.0021 (0.0029)	-0.0006 (0.0123)	0.0003 (0.0082)	-0.0010 (0.0136)
Region 3 of Threads	0.0145* (0.0067)	-0.0209 (0.0230)	-0.0009 (0.0035)	0.0143 (0.0144)	0.0103 (0.0095)	0.0156 (0.0159)
Region 4 of Threads	-0.0080 (0.0197)	-0.0567 (0.0656)	-0.0048 (0.0101)	-0.0126 (0.0350)	-0.0094 (0.0231)	-0.0146 (0.0389)
Regions 5 to 10 of Threads	0.0362*** (0.0107)	0.0163 (0.0329)	-0.0193 (0.0167)	0.0026 (0.0385)	0.0024 (0.0259)	0.0006 (0.0436)
Region 2 of Reviews	-0.0024 (0.0113)	-0.0202 (0.0291)	-0.0032 (0.0041)	-0.0067 (0.0199)	-0.0033 (0.0133)	-0.0077 (0.0222)
Region 3 of Reviews	-0.0288 (0.0191)	-0.0545 (0.0382)	-0.0099 (0.0068)	-0.0628 (0.0366)	-0.0421 (0.0251)	-0.0692 (0.0406)
Region 4 of Reviews	0.0196 (0.0118)	-0.1524*** (0.0367)	-0.0108 (0.0057)	-0.0292 (0.0221)	-0.0216 (0.0152)	-0.0344 (0.0248)
Regions 5 to 6 of Reviews	0.0571** (0.0215)	0.1765 (0.1376)	0.0650* (0.0292)	0.1958* (0.0909)	0.1307* (0.0620)	0.2178* (0.0978)
Region 2 × Posts To Next Thread Badge	0.0038 (0.0088)	0.0198 (0.0254)	0.0056 (0.0040)	0.0067 (0.0171)	0.0036 (0.0114)	0.0080 (0.0190)
Region 2 × Posts To Next Thread Badge Squared	-0.0003 (0.0036)	-0.0057 (0.0103)	-0.0020 (0.0016)	-0.0016 (0.0069)	-0.0007 (0.0046)	-0.0020 (0.0076)
Region 2 × Posts To Next Thread Badge Cubic	-0.0001 (0.0004)	0.0006 (0.0012)	0.0002 (0.0002)	0.0000 (0.0008)	0.0000 (0.0005)	0.0000 (0.0009)
Region 3 × Posts To Next Thread Badge	-0.0091 (0.0137)	-0.0487 (0.0618)	0.0047 (0.0065)	-0.0057 (0.0272)	-0.0053 (0.0182)	-0.0060 (0.0303)
Region 3 × Posts To Next Thread Badge Squared	0.0050 (0.0058)	0.0245 (0.0263)	-0.0014 (0.0028)	0.0036 (0.0116)	0.0029 (0.0077)	0.0039 (0.0129)
Region 3 × Posts To Next Thread Badge Cubic	-0.0007 (0.0007)	-0.0025 (0.0029)	0.0001 (0.0003)	-0.0006 (0.0013)	-0.0004 (0.0009)	-0.0006 (0.0014)
Region 4 × Posts To Next Thread Badge	0.0688** (0.0250)	0.0634 (0.0965)	0.0217 (0.0124)	0.0945* (0.0474)	0.0558 (0.0316)	0.1046* (0.0525)
Region 4 × Posts To Next Thread Badge Squared	-0.0216* (0.0098)	-0.0124 (0.0403)	-0.0064 (0.0047)	-0.0298 (0.0182)	-0.0166 (0.0122)	-0.0329 (0.0201)
Region 4 × Posts To Next Thread Badge Cubic	0.0018 (0.0011)	0.0006 (0.0045)	0.0005 (0.0005)	0.0024 (0.0019)	0.0012 (0.0013)	0.0027 (0.0021)

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table B-4: Results for UGC Quantity, Timeliness and Quality with Interaction Effects (Cont. 3)

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Quantity	Timeliness	Quality			
			Length	Complexity	Informativeness	Politeness
Regions 5 to 10 × Posts To Next Thread Badge	-0.0022 (0.0221)	-0.0117 (0.0550)	0.0259 (0.0150)	0.0337 (0.0594)	0.0196 (0.0406)	0.0389 (0.0659)
Regions 5 to 10 × Posts To Next Thread Badge Squared	0.0009 (0.0091)	0.0010 (0.0198)	-0.0070 (0.0055)	-0.0108 (0.0235)	-0.0063 (0.0160)	-0.0125 (0.0260)
Regions 5 to 10 × Posts To Next Thread Badge Cubic	-0.0001 (0.0010)	0.0006 (0.0019)	0.0006 (0.0006)	0.0011 (0.0025)	0.0006 (0.0017)	0.0012 (0.0027)
Region 2 × Posts To Next Review Badge	0.0333 (0.0263)	0.0265 (0.0623)	0.0113 (0.0115)	0.0259 (0.0499)	0.0136 (0.0337)	0.0285 (0.0558)
Region 2 × Posts To Next Review Badge Squared	-0.0234 (0.0150)	-0.0337 (0.0389)	-0.0087 (0.0068)	-0.0225 (0.0289)	-0.0132 (0.0195)	-0.0248 (0.0324)
Region 2 × Posts To Next Review Badge Cubic	0.0039 (0.0024)	0.0080 (0.0073)	0.0016 (0.0011)	0.0041 (0.0046)	0.0024 (0.0031)	0.0045 (0.0051)
Region 3 × Posts To Next Review Badge	0.0720 (0.0451)	0.3356* (0.1643)	0.0298 (0.0198)	0.1278 (0.0942)	0.0872 (0.0632)	0.1420 (0.1045)
Region 3 × Posts To Next Review Badge Squared	-0.0365 (0.0263)	-0.2340* (0.1060)	-0.0177 (0.0118)	-0.0704 (0.0556)	-0.0482 (0.0372)	-0.0785 (0.0616)
Region 3 × Posts To Next Review Badge Cubic	0.0054 (0.0041)	0.0396** (0.0172)	0.0028 (0.0018)	0.0109 (0.0086)	0.0074 (0.0057)	0.0121 (0.0095)
Region 4 × Posts To Next Review Badge	0.0376 (0.0287)	0.0968 (0.1044)	0.0297 (0.0223)	0.0466 (0.1092)	0.0354 (0.0740)	0.0553 (0.1224)
Region 4 × Posts To Next Review Badge Squared	-0.0237 (0.0153)	-0.0639 (0.0555)	-0.0150 (0.0117)	-0.0209 (0.0561)	-0.0159 (0.0380)	-0.0248 (0.0628)
Region 4 × Posts To Next Review Badge Cubic	0.0039 (0.0022)	0.0128 (0.0084)	0.0022 (0.0016)	0.0029 (0.0072)	0.0022 (0.0049)	0.0034 (0.0081)
Regions 5 to 6 × Posts To Next Review Badge	-0.1537*** (0.0445)	-0.6274*** (0.1434)	-0.1542*** (0.0485)	-0.2702*** (0.0580)	-0.1973*** (0.0397)	-0.3065*** (0.0652)
Regions 5 to 6 × Posts To Next Review Badge Squared	0.0427* (0.0193)	0.1917*** (0.0564)	0.0511** (0.0178)	0.0719** (0.0311)	0.0547** (0.0209)	0.0825** (0.0354)
Regions 5 to 6 × Posts To Next Review Badge Cubic	-0.0022 (0.0024)	-0.0128 (0.0079)	-0.0041* (0.0019)	-0.0044 (0.0046)	-0.0037 (0.0031)	-0.0051 (0.0052)
Constant	-0.0001 (0.0001)	0.0000 (0.0003)	-0.0001*** (0.0000)	-0.0002 (0.0002)	-0.0001 (0.0001)	-0.0002 (0.0002)
Individual-Day Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Source of Reward Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	128,458,902	128,458,902	128,458,902	128,458,902	128,458,902	128,458,902
R ²	0.14	0.20	0.53	0.48	0.46	0.47

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix C: Robustness Checks

Table C-1: Results for UGC Quantity, Timeliness and Quality with 1-Day Time Window

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Quantity	Timeliness	Quality			
			Length	Complexity	Informativeness	Politeness
Reviews	0.0148*** (0.0005)	0.0183*** (0.0009)	0.0065*** (0.0002)	0.0283*** (0.0008)	0.0189*** (0.0006)	0.0314*** (0.0009)
Replies	0.0382*** (0.0008)	0.0559*** (0.0017)	0.0166*** (0.0003)	0.0690*** (0.0015)	0.0459*** (0.0010)	0.0766*** (0.0017)
Tips	-0.0045 (0.0132)	0.2092*** (0.0537)	-0.0092 (0.0050)	-0.0437** (0.0188)	-0.0285** (0.0126)	-0.0474** (0.0210)
Reviews \times Tips	-0.0059 (0.0037)	0.0022 (0.0140)	-0.0033 (0.0026)	0.0079 (0.0067)	0.0047 (0.0045)	0.0084 (0.0074)
Replies \times Tips	0.0611*** (0.0049)	0.1599*** (0.0178)	0.0067*** (0.0019)	0.0336*** (0.0065)	0.0218*** (0.0044)	0.0377*** (0.0073)
Likes	0.0444*** (0.0063)	-0.0391 (0.0214)	0.0021 (0.0022)	-0.0101 (0.0078)	-0.0072 (0.0053)	-0.0109 (0.0087)
Reviews \times Likes	0.0005 (0.0036)	0.0176 (0.0093)	0.0020 (0.0020)	0.0331*** (0.0048)	0.0223*** (0.0032)	0.0367*** (0.0053)
Replies \times Likes	0.2725*** (0.0041)	0.4131*** (0.0188)	0.0780*** (0.0015)	0.3483*** (0.0058)	0.2306*** (0.0039)	0.3864*** (0.0064)
Compensation	0.0109 (0.0149)	-0.1783*** (0.0370)	0.0974*** (0.0171)	-0.0591** (0.0219)	-0.0415** (0.0144)	-0.0592** (0.0242)
Reviews \times Compensation	-0.0542*** (0.0155)	0.3645*** (0.0395)	-0.1411*** (0.0174)	-0.0663** (0.0227)	-0.0441** (0.0150)	-0.0809*** (0.0250)
Badge	-0.1563*** (0.0063)	-0.1850*** (0.0124)	-0.0411*** (0.0022)	-0.1928*** (0.0087)	-0.1281*** (0.0057)	-0.2138*** (0.0096)
Reviews \times Badge	0.0572*** (0.0165)	0.0998 (0.0553)	-0.0003 (0.0096)	0.0738** (0.0281)	0.0471** (0.0188)	0.0805** (0.0311)
Received Tips for Other UGC Than Threads	-0.0095 (0.0137)	0.2262*** (0.0569)	-0.0173*** (0.0052)	-0.0535** (0.0200)	-0.0350** (0.0134)	-0.0584** (0.0223)
Received Tips for Other UGC Than Reviews	-0.0028*** (0.0004)	0.0012 (0.0009)	-0.0012*** (0.0002)	-0.0047*** (0.0008)	-0.0031*** (0.0005)	-0.0052*** (0.0009)
Received Tips for Other UGC Than Replies	0.0206*** (0.0034)	0.0619*** (0.0095)	0.0086*** (0.0013)	0.0420*** (0.0063)	0.0282*** (0.0043)	0.0470*** (0.0071)
Received Likes for Other UGC Than Threads	0.0703*** (0.0081)	-0.0247 (0.0301)	0.0120*** (0.0028)	0.0336*** (0.0105)	0.0224*** (0.0071)	0.0379*** (0.0117)
Received Likes for Other UGC Than Reviews	-0.0137*** (0.0004)	-0.0033*** (0.0010)	-0.0055*** (0.0002)	-0.0202*** (0.0007)	-0.0135*** (0.0005)	-0.0225*** (0.0008)
Received Likes for Other UGC Than Replies	0.0510*** (0.0016)	0.0266*** (0.0049)	0.0226*** (0.0007)	0.1007*** (0.0031)	0.0677*** (0.0020)	0.1123*** (0.0034)
Received Compensation for Other UGC Than Threads	-0.0200*** (0.0033)	-0.0888*** (0.0159)	-0.0039*** (0.0012)	-0.0373*** (0.0055)	-0.0241*** (0.0036)	-0.0412*** (0.0061)
Received Compensation for Other UGC Than Reviews	-0.0051*** (0.0008)	-0.0070*** (0.0020)	-0.0025*** (0.0005)	-0.0020 (0.0011)	-0.0011 (0.0007)	-0.0023 (0.0012)
Received Badge for Other UGC Than Threads	-0.0678*** (0.0027)	-0.1031*** (0.0073)	-0.0213*** (0.0013)	-0.1024*** (0.0050)	-0.0681*** (0.0033)	-0.1139*** (0.0056)

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C-2: Results for UGC Quantity, Timeliness and Quality with 1-Day Time Window (Cont. 1)

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Quantity	Timeliness	Quality			
			Length	Complexity	Informativeness	Politeness
Received Badge for Other UGC Than Reviews	-0.0454*** (0.0020)	-0.0353*** (0.0044)	-0.0126*** (0.0009)	-0.0515*** (0.0030)	-0.0342*** (0.0020)	-0.0570*** (0.0034)
Same Thread Activity Dummy	-0.0034*** (0.0007)	-0.0032 (0.0018)	-0.0010*** (0.0003)	-0.0066*** (0.0013)	-0.0044*** (0.0008)	-0.0073*** (0.0014)
Same Review Activity Dummy	0.0157*** (0.0019)	0.0279*** (0.0056)	0.0043*** (0.0009)	0.0235*** (0.0039)	0.0153*** (0.0026)	0.0260*** (0.0043)
Same Reply Activity Dummy	-0.0300*** (0.0011)	-0.0544*** (0.0027)	-0.0112*** (0.0004)	-0.0527*** (0.0019)	-0.0347*** (0.0013)	-0.0584*** (0.0021)
Days Since Last Thread Posted	-0.0025*** (0.0001)	-0.0031*** (0.0001)	-0.0010*** (0.0000)	-0.0051*** (0.0001)	-0.0034*** (0.0001)	-0.0057*** (0.0001)
Days Since Last Review Posted	-0.0016*** (0.0001)	-0.0015*** (0.0001)	-0.0008*** (0.0000)	-0.0033*** (0.0001)	-0.0022*** (0.0001)	-0.0037*** (0.0001)
Days Since Last Reply Posted	-0.0075*** (0.0001)	-0.0103*** (0.0003)	-0.0032*** (0.0001)	-0.0136*** (0.0002)	-0.0090*** (0.0002)	-0.0150*** (0.0003)
Number of Written Threads so Far	0.0047*** (0.0003)	0.0094*** (0.0010)	0.0012*** (0.0001)	0.0080*** (0.0006)	0.0052*** (0.0004)	0.0088*** (0.0006)
Number of Written Reviews so Far	-0.0053*** (0.0015)	0.0013 (0.0046)	-0.0015** (0.0006)	-0.0081** (0.0028)	-0.0055** (0.0019)	-0.0089** (0.0031)
Number of Written Replies so Far	0.0033*** (0.0004)	0.0076*** (0.0011)	0.0019*** (0.0002)	0.0072*** (0.0007)	0.0047*** (0.0004)	0.0081*** (0.0007)
If Posted Threads Dummy		1.1000*** (0.0138)	0.9370*** (0.0047)	2.6412*** (0.0030)	1.7082*** (0.0020)	2.8920*** (0.0032)
If Posted Reviews Dummy		5.0925*** (0.0490)	2.1286*** (0.0314)	2.7108*** (0.0108)	1.7737*** (0.0081)	3.0284*** (0.0109)
If Posted Replies Dummy		1.6875*** (0.0155)	0.6765*** (0.0023)	2.5801*** (0.0060)	1.6667*** (0.0041)	2.8413*** (0.0066)
Numer of Written Threads in Past 3 Days	0.0286*** (0.0031)	0.0412*** (0.0073)	0.0072*** (0.0012)	0.0360*** (0.0048)	0.0238*** (0.0032)	0.0398*** (0.0053)
Numer of Written Reviews in Past 3 Days	-0.0183 (0.0099)	-0.0254 (0.0212)	-0.0014 (0.0042)	-0.0140 (0.0147)	-0.0078 (0.0097)	-0.0155 (0.0164)
Numer of Written Replies in Past 3 Days	0.0626*** (0.0041)	0.1179*** (0.0111)	0.0140*** (0.0014)	0.0617*** (0.0059)	0.0401*** (0.0039)	0.0680*** (0.0065)
Same Thread Activity in Past 3 Days Dummy	-0.0113*** (0.0021)	-0.0131** (0.0051)	-0.0025** (0.0009)	-0.0131*** (0.0034)	-0.0087*** (0.0023)	-0.0145*** (0.0038)
Same Reviews Activity in Past 3 Days Dummy	0.0127 (0.0072)	0.0172 (0.0161)	-0.0012 (0.0034)	0.0065 (0.0111)	0.0033 (0.0073)	0.0071 (0.0123)
Same Replies Activity in Past 3 Days Dummy	-0.0443*** (0.0035)	-0.0949*** (0.0102)	-0.0053*** (0.0012)	-0.0239*** (0.0050)	-0.0151*** (0.0033)	-0.0261*** (0.0055)
Numer of Written Threads in Past 365 days	0.0017*** (0.0002)	0.0059*** (0.0006)	0.0003*** (0.0001)	0.0018*** (0.0003)	0.0011*** (0.0002)	0.0020*** (0.0003)
Numer of Written Reviews in Past 365 days	-0.0065*** (0.0009)	-0.0035 (0.0021)	-0.0033*** (0.0004)	-0.0097*** (0.0015)	-0.0064*** (0.0010)	-0.0108*** (0.0017)
Numer of Written Replies in Past 365 days	0.0101*** (0.0002)	0.0088*** (0.0006)	0.0044*** (0.0001)	0.0187*** (0.0004)	0.0125*** (0.0003)	0.0208*** (0.0005)

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C-3: Results for UGC Quantity, Timeliness and Quality with 1-Day Time Window (Cont. 2)

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Quantity	Timeliness	Quality			
			Length	Complexity	Informativeness	Politeness
Region 1 × Posts To Next Thread Badge	-0.0113*** (0.0034)	-0.0121 (0.0107)	-0.0063*** (0.0014)	-0.0268*** (0.0067)	-0.0181*** (0.0044)	-0.0300*** (0.0074)
Region 1 × Posts To Next Thread Badge Squared	0.0049** (0.0018)	0.0076 (0.0057)	0.0030*** (0.0008)	0.0109*** (0.0035)	0.0073*** (0.0023)	0.0123*** (0.0039)
Region 1 × Posts To Next Thread Badge Cubic	-0.0006*** (0.0002)	-0.0012 (0.0008)	-0.0004*** (0.0001)	-0.0012** (0.0005)	-0.0008** (0.0003)	-0.0014** (0.0005)
Region 2 × Posts To Next Thread Badge	-0.0034 (0.0070)	-0.0112 (0.0199)	0.0003 (0.0028)	-0.0123 (0.0125)	-0.0084 (0.0083)	-0.0136 (0.0138)
Region 2 × Posts To Next Thread Badge Squared	0.0020 (0.0035)	0.0068 (0.0093)	-0.0004 (0.0014)	0.0039 (0.0061)	0.0026 (0.0041)	0.0044 (0.0067)
Region 2 × Posts To Next Thread Badge Cubic	-0.0003 (0.0004)	-0.0009 (0.0011)	0.0000 (0.0002)	-0.0004 (0.0008)	-0.0003 (0.0005)	-0.0005 (0.0008)
Region 3 × Posts To Next Thread Badge	-0.0013 (0.0131)	-0.1020 (0.0794)	0.0006 (0.0061)	-0.0064 (0.0266)	-0.0060 (0.0178)	-0.0073 (0.0296)
Region 3 × Posts To Next Thread Badge Squared	0.0020 (0.0059)	0.0440 (0.0346)	-0.0004 (0.0028)	0.0021 (0.0121)	0.0018 (0.0081)	0.0024 (0.0134)
Region 3 × Posts To Next Thread Badge Cubic	-0.0003 (0.0007)	-0.0047 (0.0038)	0.0000 (0.0003)	-0.0003 (0.0014)	-0.0002 (0.0009)	-0.0003 (0.0015)
Region 4 × Posts To Next Thread Badge	0.0529* (0.0250)	-0.0186 (0.1354)	0.0080 (0.0112)	0.0614 (0.0446)	0.0309 (0.0295)	0.0671 (0.0496)
Region 4 × Posts To Next Thread Badge Squared	-0.0172 (0.0110)	0.0129 (0.0603)	-0.0020 (0.0050)	-0.0215 (0.0198)	-0.0103 (0.0130)	-0.0235 (0.0219)
Region 4 × Posts To Next Thread Badge Cubic	0.0014 (0.0012)	-0.0020 (0.0067)	0.0001 (0.0006)	0.0018 (0.0022)	0.0008 (0.0014)	0.0020 (0.0024)
Region 5 × Posts To Next Thread Badge	0.0726* (0.0337)	-0.0388 (0.1216)	0.0465* (0.0225)	0.1757** (0.0748)	0.1110** (0.0476)	0.1966** (0.0834)
Region 5 × Posts To Next Thread Badge Squared	-0.0389** (0.0163)	0.0061 (0.0526)	-0.0236** (0.0095)	-0.0971** (0.0348)	-0.0630** (0.0226)	-0.1085** (0.0387)
Region 5 × Posts To Next Thread Badge Cubic	0.0050** (0.0019)	0.0003 (0.0061)	0.0028** (0.0010)	0.0122** (0.0042)	0.0080** (0.0028)	0.0136** (0.0047)
Region 6 × Posts To Next Thread Badge	0.0912* (0.0440)	0.2108 (0.1689)	0.0228 (0.0297)	0.1219 (0.1300)	0.0758 (0.0855)	0.1325 (0.1453)
Region 6 × Posts To Next Thread Badge Squared	-0.0260 (0.0191)	-0.0683 (0.0741)	-0.0054 (0.0126)	-0.0317 (0.0580)	-0.0189 (0.0380)	-0.0341 (0.0648)
Region 6 × Posts To Next Thread Badge Cubic	0.0019 (0.0020)	0.0059 (0.0075)	0.0003 (0.0013)	0.0019 (0.0062)	0.0010 (0.0041)	0.0020 (0.0070)
Region 7 × Posts To Next Thread Badge	0.3750* (0.1681)	-1.5458** (0.6559)	-2.2522** (0.9370)	1.8480** (0.6961)	0.6781** (0.2412)	2.3489** (0.8889)
Region 7 × Posts To Next Thread Badge Squared	-0.1304** (0.0559)	0.5180** (0.2173)	0.7656** (0.3113)	-0.5557** (0.2312)	-0.1866** (0.0800)	-0.7158** (0.2952)
Region 7 × Posts To Next Thread Badge Cubic	0.0116** (0.0046)	-0.0429** (0.0180)	-0.0650** (0.0258)	0.0414* (0.0192)	0.0124 (0.0066)	0.0542* (0.0245)
Region 9 × Posts To Next Thread Badge	0.0006 (0.0144)	-0.1109 (0.0603)	-0.0049 (0.0139)	-0.0315 (0.0340)	-0.0242 (0.0241)	-0.0351 (0.0383)

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C-4: Results for UGC Quantity, Timeliness and Quality with 1-Day Time Window (Cont. 3)

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Quantity	Timeliness	Quality			
			Length	Complexity	Informativeness	Politeness
Region 9 × Posts To Next Thread Badge Squared	0.0024 (0.0023)	0.0339** (0.0133)	0.0085** (0.0030)	0.0192** (0.0069)	0.0140** (0.0048)	0.0216** (0.0078)
Region 9 × Posts To Next Thread Badge Cubic	-0.0002 (0.0002)	-0.0032*** (0.0010)	-0.0012*** (0.0002)	-0.0025*** (0.0005)	-0.0018*** (0.0003)	-0.0028*** (0.0006)
Region 1 × Posts To Next Review Badge	-0.0354 (0.0198)	-0.1417** (0.0628)	-0.0188** (0.0073)	-0.0550 (0.0327)	-0.0395 (0.0221)	-0.0623 (0.0365)
Region 1 × Posts To Next Review Badge Squared	0.0413 (0.0297)	0.2081* (0.0933)	0.0239* (0.0112)	0.0700 (0.0503)	0.0502 (0.0339)	0.0797 (0.0561)
Region 1 × Posts To Next Review Badge Cubic	-0.0145 (0.0111)	-0.0802** (0.0342)	-0.0086* (0.0043)	-0.0261 (0.0190)	-0.0185 (0.0128)	-0.0297 (0.0212)
Region 2 × Posts To Next Review Badge	0.0081 (0.0195)	-0.0446 (0.0479)	-0.0028 (0.0106)	-0.0092 (0.0403)	-0.0088 (0.0276)	-0.0111 (0.0451)
Region 2 × Posts To Next Review Badge Squared	0.0005 (0.0120)	0.0317 (0.0322)	0.0023 (0.0065)	0.0094 (0.0250)	0.0078 (0.0170)	0.0110 (0.0279)
Region 2 × Posts To Next Review Badge Cubic	-0.0008 (0.0019)	-0.0055 (0.0054)	-0.0005 (0.0010)	-0.0021 (0.0040)	-0.0016 (0.0027)	-0.0024 (0.0044)
Region 3 × Posts To Next Review Badge	0.0295 (0.0477)	0.3306* (0.1599)	0.0075 (0.0233)	0.0525 (0.0999)	0.0374 (0.0665)	0.0584 (0.1105)
Region 3 × Posts To Next Review Badge Squared	-0.0088 (0.0311)	-0.2221* (0.1079)	-0.0035 (0.0146)	-0.0297 (0.0639)	-0.0215 (0.0427)	-0.0330 (0.0707)
Region 3 × Posts To Next Review Badge Cubic	0.0005 (0.0049)	0.0355* (0.0174)	0.0004 (0.0023)	0.0045 (0.0100)	0.0033 (0.0067)	0.0050 (0.0111)
Region 4 × Posts To Next Review Badge	0.0634 (0.0346)	-0.1600 (0.1075)	0.0271 (0.0303)	0.0295 (0.1453)	0.0226 (0.0988)	0.0354 (0.1631)
Region 4 × Posts To Next Review Badge Squared	-0.0222 (0.0168)	0.0636 (0.0526)	-0.0123 (0.0152)	-0.0051 (0.0722)	-0.0053 (0.0492)	-0.0070 (0.0811)
Region 4 × Posts To Next Review Badge Cubic	0.0021 (0.0020)	-0.0058 (0.0065)	0.0013 (0.0018)	-0.0004 (0.0087)	0.0000 (0.0059)	-0.0003 (0.0098)
Region 5 × Posts To Next Review Badge	-0.1071 (0.0888)	-0.1572 (0.2703)	-0.1987** (0.0672)	-0.3043 (0.2055)	-0.2161 (0.1419)	-0.3503 (0.2299)
Region 5 × Posts To Next Review Badge Squared	0.0444 (0.0456)	0.0494 (0.1475)	0.0789* (0.0363)	0.1290 (0.1063)	0.0905 (0.0738)	0.1481 (0.1191)
Region 5 × Posts To Next Review Badge Cubic	-0.0043 (0.0053)	-0.0041 (0.0179)	-0.0078 (0.0044)	-0.0135 (0.0126)	-0.0094 (0.0087)	-0.0155 (0.0141)
Constant	0.0001 (0.0001)	0.0002 (0.0002)	0.0000*** (0.0000)	0.0001 (0.0001)	0.0001 (0.0001)	0.0002* (0.0001)
Individual-Day Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Source of Reward Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	128,458,902	128,458,902	128,458,902	128,458,902	128,458,902	128,458,902
R ²	0.21	0.23	0.56	0.52	0.51	0.52

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C-5: Results for UGC Quantity, Timeliness and Quality with 6-Day Time Window

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Quantity	Timeliness	Quality			
			Length	Complexity	Informativeness	Politeness
Reviews	0.0080*** (0.0003)	0.0115*** (0.0007)	0.0040*** (0.0001)	0.0177*** (0.0006)	0.0118*** (0.0004)	0.0196*** (0.0007)
Replies	0.0191*** (0.0006)	0.0341*** (0.0015)	0.0096*** (0.0003)	0.0386*** (0.0011)	0.0257*** (0.0007)	0.0428*** (0.0012)
Tips	0.0301*** (0.0075)	0.1904*** (0.0285)	-0.0018 (0.0021)	0.0010 (0.0081)	-0.0003 (0.0054)	0.0018 (0.0091)
Reviews × Tips	0.0084*** (0.0020)	-0.0038 (0.0085)	0.0061*** (0.0015)	0.0215*** (0.0032)	0.0142*** (0.0022)	0.0241*** (0.0036)
Replies × Tips	0.0374*** (0.0036)	0.0982*** (0.0126)	0.0032*** (0.0010)	0.0088** (0.0038)	0.0054* (0.0026)	0.0101** (0.0042)
Likes	0.0323*** (0.0024)	-0.0183** (0.0080)	0.0081*** (0.0009)	0.0233*** (0.0031)	0.0155*** (0.0021)	0.0261*** (0.0035)
Reviews × Likes	-0.0098*** (0.0020)	0.0259*** (0.0086)	-0.0049*** (0.0012)	-0.0026 (0.0028)	-0.0014 (0.0019)	-0.0031 (0.0032)
Replies × Likes	0.1534*** (0.0021)	0.2252*** (0.0099)	0.0504*** (0.0008)	0.2248*** (0.0034)	0.1490*** (0.0023)	0.2492*** (0.0037)
Compensation	-0.0021 (0.0076)	-0.0561*** (0.0165)	0.0097 (0.0058)	-0.0186* (0.0091)	-0.0126* (0.0062)	-0.0203* (0.0102)
Reviews × Compensation	-0.0172* (0.0079)	0.0792*** (0.0236)	-0.0286*** (0.0058)	-0.0246** (0.0097)	-0.0167** (0.0066)	-0.0282** (0.0108)
Badge	-0.0786*** (0.0039)	-0.1051*** (0.0077)	-0.0198*** (0.0011)	-0.0935*** (0.0047)	-0.0616*** (0.0031)	-0.1034*** (0.0052)
Reviews × Badge	0.0730*** (0.0084)	0.0645 (0.0351)	0.0243*** (0.0054)	0.1020*** (0.0132)	0.0689*** (0.0090)	0.1134*** (0.0147)
Received Tips for Other UGC Than Threads	0.0366*** (0.0084)	0.2111*** (0.0324)	-0.0011 (0.0023)	0.0039 (0.0092)	0.0015 (0.0062)	0.0052 (0.0104)
Received Tips for Other UGC Than Reviews	-0.0014*** (0.0003)	-0.0005 (0.0007)	-0.0004*** (0.0001)	-0.0013** (0.0005)	-0.0009*** (0.0003)	-0.0015** (0.0006)
Received Tips for Other UGC Than Replies	0.0075*** (0.0015)	0.0328*** (0.0054)	0.0041*** (0.0006)	0.0198*** (0.0028)	0.0133*** (0.0019)	0.0222*** (0.0031)
Received Likes for Other UGC Than Threads	0.0472*** (0.0038)	-0.0136 (0.0153)	0.0137*** (0.0012)	0.0470*** (0.0050)	0.0315*** (0.0033)	0.0525*** (0.0056)
Received Likes for Other UGC Than Reviews	-0.0083*** (0.0002)	-0.0042*** (0.0006)	-0.0032*** (0.0001)	-0.0121*** (0.0003)	-0.0081*** (0.0002)	-0.0134*** (0.0004)
Received Likes for Other UGC Than Replies	0.0089*** (0.0007)	0.0001 (0.0024)	0.0066*** (0.0003)	0.0304*** (0.0013)	0.0205*** (0.0009)	0.0339*** (0.0015)
Received Compensation for Other UGC Than Threads	-0.0074*** (0.0014)	-0.0374*** (0.0064)	-0.0013** (0.0005)	-0.0111*** (0.0021)	-0.0070*** (0.0013)	-0.0123*** (0.0023)
Received Compensation for Other UGC Than Reviews	-0.0002 (0.0004)	-0.0051*** (0.0015)	-0.0001 (0.0002)	0.0009 (0.0007)	0.0008* (0.0004)	0.0010 (0.0007)
Received Badge for Other UGC Than Threads	-0.0352*** (0.0016)	-0.0457*** (0.0038)	-0.0101*** (0.0006)	-0.0464*** (0.0023)	-0.0307*** (0.0015)	-0.0514*** (0.0025)

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C-6: Results for UGC Quantity, Timeliness and Quality with 6-Day Time Window (Cont. 1)

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Quantity	Timeliness	Quality			
			Length	Complexity	Informativeness	Politeness
Received Badge for Other UGC Than Reviews	-0.0285*** (0.0012)	-0.0300*** (0.0024)	-0.0074*** (0.0004)	-0.0317*** (0.0015)	-0.0210*** (0.0010)	-0.0350*** (0.0017)
Same Thread Activity Dummy	-0.0011* (0.0005)	-0.0015 (0.0014)	-0.0001 (0.0002)	-0.0029*** (0.0009)	-0.0019*** (0.0006)	-0.0031*** (0.0010)
Same Review Activity Dummy	0.0095*** (0.0014)	0.0191*** (0.0049)	0.0023*** (0.0006)	0.0144*** (0.0029)	0.0093*** (0.0019)	0.0159*** (0.0032)
Same Reply Activity Dummy	-0.0193*** (0.0007)	-0.0358*** (0.0020)	-0.0077*** (0.0003)	-0.0367*** (0.0013)	-0.0241*** (0.0009)	-0.0406*** (0.0015)
Days Since Last Thread Posted	-0.0026*** (0.0000)	-0.0030*** (0.0001)	-0.0011*** (0.0000)	-0.0054*** (0.0001)	-0.0036*** (0.0001)	-0.0060*** (0.0001)
Days Since Last Review Posted	-0.0008*** (0.0000)	-0.0008*** (0.0001)	-0.0005*** (0.0000)	-0.0020*** (0.0001)	-0.0014*** (0.0001)	-0.0022*** (0.0001)
Days Since Last Reply Posted	-0.0040*** (0.0001)	-0.0063*** (0.0002)	-0.0019*** (0.0000)	-0.0080*** (0.0002)	-0.0053*** (0.0001)	-0.0088*** (0.0002)
Number of Written Threads so Far	0.0028*** (0.0002)	0.0067*** (0.0007)	0.0006*** (0.0001)	0.0050*** (0.0004)	0.0033*** (0.0003)	0.0055*** (0.0004)
Number of Written Reviews so Far	-0.0021 (0.0011)	0.0043 (0.0042)	-0.0003 (0.0005)	-0.0027 (0.0021)	-0.0018 (0.0014)	-0.0029 (0.0023)
Number of Written Replies so Far	0.0012*** (0.0002)	0.0037*** (0.0008)	0.0011*** (0.0001)	0.0040*** (0.0005)	0.0026*** (0.0003)	0.0044*** (0.0005)
If Posted Threads Dummy		1.0861*** (0.0137)	0.9410*** (0.0048)	2.6521*** (0.0029)	1.7158*** (0.0020)	2.9043*** (0.0032)
If Posted Reviews Dummy		5.0809*** (0.0503)	2.1320*** (0.0312)	2.7267*** (0.0108)	1.7842*** (0.0083)	3.0461*** (0.0107)
If Posted Replies Dummy		1.5748*** (0.0146)	0.6409*** (0.0026)	2.4273*** (0.0080)	1.5659*** (0.0054)	2.6724*** (0.0089)
Numer of Written Threads in Past 3 Days	0.0230*** (0.0024)	0.0301*** (0.0056)	0.0051*** (0.0012)	0.0275*** (0.0042)	0.0181*** (0.0028)	0.0304*** (0.0046)
Numer of Written Reviews in Past 3 Days	-0.0121 (0.0064)	-0.0112 (0.0212)	0.0017 (0.0036)	-0.0036 (0.0118)	-0.0008 (0.0078)	-0.0037 (0.0131)
Numer of Written Replies in Past 3 Days	0.0331*** (0.0030)	0.0728*** (0.0081)	0.0064*** (0.0012)	0.0260*** (0.0046)	0.0167*** (0.0031)	0.0285*** (0.0051)
Same Thread Activity in Past 3 Days Dummy	-0.0099*** (0.0016)	-0.0101** (0.0039)	-0.0018** (0.0008)	-0.0106*** (0.0030)	-0.0070*** (0.0020)	-0.0117*** (0.0033)
Same Reviews Activity in Past 3 Days Dummy	0.0086 (0.0047)	0.0056 (0.0162)	-0.0029 (0.0029)	-0.0010 (0.0089)	-0.0015 (0.0059)	-0.0012 (0.0099)
Same Replies Activity in Past 3 Days Dummy	-0.0275*** (0.0025)	-0.0640*** (0.0075)	-0.0023** (0.0010)	-0.0089** (0.0038)	-0.0053* (0.0025)	-0.0096** (0.0042)
Numer of Written Threads in Past 365 days	0.0020*** (0.0001)	0.0052*** (0.0004)	0.0005*** (0.0001)	0.0025*** (0.0002)	0.0016*** (0.0001)	0.0027*** (0.0002)
Numer of Written Reviews in Past 365 days	-0.0046*** (0.0006)	-0.0025 (0.0017)	-0.0025*** (0.0003)	-0.0073*** (0.0011)	-0.0048*** (0.0007)	-0.0081*** (0.0012)
Numer of Written Replies in Past 365 days	0.0052*** (0.0002)	0.0044*** (0.0005)	0.0027*** (0.0001)	0.0115*** (0.0003)	0.0078*** (0.0002)	0.0128*** (0.0003)

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C-7: Results for UGC Quantity, Timeliness and Quality with 6-Day Time Window (Cont. 2)

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Quantity	Timeliness	Quality			
			Length	Complexity	Informativeness	Politeness
Region 1 × Posts To Next Thread Badge	-0.0043 (0.0022)	-0.0033 (0.0077)	-0.0031*** (0.0010)	-0.0118** (0.0046)	-0.0081** (0.0030)	-0.0133** (0.0051)
Region 1 × Posts To Next Thread Badge Squared	0.0020 (0.0011)	0.0037 (0.0041)	0.0017*** (0.0005)	0.0050* (0.0024)	0.0033* (0.0016)	0.0057* (0.0027)
Region 1 × Posts To Next Thread Badge Cubic	-0.0003 (0.0002)	-0.0007 (0.0006)	-0.0002* (0.0001)	-0.0006* (0.0003)	-0.0004* (0.0002)	-0.0007 (0.0004)
Region 2 × Posts To Next Thread Badge	0.0010 (0.0047)	0.0043 (0.0146)	0.0028 (0.0020)	0.0015 (0.0085)	0.0007 (0.0056)	0.0018 (0.0094)
Region 2 × Posts To Next Thread Badge Squared	0.0011 (0.0023)	0.0017 (0.0070)	-0.0009 (0.0010)	0.0006 (0.0041)	0.0004 (0.0027)	0.0006 (0.0046)
Region 2 × Posts To Next Thread Badge Cubic	-0.0003 (0.0003)	-0.0005 (0.0009)	0.0001 (0.0001)	-0.0003 (0.0005)	-0.0002 (0.0003)	-0.0003 (0.0006)
Region 3 × Posts To Next Thread Badge	0.0069 (0.0095)	-0.0622 (0.0565)	0.0040 (0.0047)	0.0130 (0.0206)	0.0078 (0.0136)	0.0144 (0.0229)
Region 3 × Posts To Next Thread Badge Squared	0.0002 (0.0044)	0.0300 (0.0246)	-0.0013 (0.0021)	-0.0029 (0.0093)	-0.0018 (0.0061)	-0.0032 (0.0104)
Region 3 × Posts To Next Thread Badge Cubic	-0.0002 (0.0005)	-0.0034 (0.0027)	0.0001 (0.0002)	0.0001 (0.0010)	0.0001 (0.0007)	0.0001 (0.0012)
Region 4 × Posts To Next Thread Badge	0.0803*** (0.0234)	0.0459 (0.1118)	0.0194 (0.0121)	0.1099** (0.0453)	0.0646* (0.0296)	0.1210** (0.0502)
Region 4 × Posts To Next Thread Badge Squared	-0.0288** (0.0103)	-0.0113 (0.0494)	-0.0064 (0.0053)	-0.0391* (0.0199)	-0.0226 (0.0130)	-0.0430 (0.0220)
Region 4 × Posts To Next Thread Badge Cubic	0.0027** (0.0011)	0.0005 (0.0054)	0.0005 (0.0006)	0.0036 (0.0021)	0.0020 (0.0014)	0.0039 (0.0024)
Region 5 × Posts To Next Thread Badge	0.1170 (0.0648)	-0.0058 (0.1186)	0.0528 (0.0372)	0.2072 (0.1214)	0.1351 (0.0796)	0.2320 (0.1360)
Region 5 × Posts To Next Thread Badge Squared	-0.0518 (0.0268)	-0.0019 (0.0459)	-0.0223 (0.0154)	-0.0934 (0.0500)	-0.0619 (0.0326)	-0.1044 (0.0559)
Region 5 × Posts To Next Thread Badge Cubic	0.0059* (0.0028)	0.0008 (0.0049)	0.0024 (0.0016)	0.0106* (0.0054)	0.0071* (0.0035)	0.0119* (0.0060)
Region 6 × Posts To Next Thread Badge	0.0284 (0.0693)	0.1482 (0.1305)	0.0059 (0.0273)	0.0199 (0.1331)	0.0112 (0.0856)	0.0213 (0.1482)
Region 6 × Posts To Next Thread Badge Squared	-0.0042 (0.0318)	-0.0563 (0.0614)	-0.0009 (0.0125)	0.0004 (0.0613)	0.0010 (0.0394)	0.0007 (0.0683)
Region 6 × Posts To Next Thread Badge Cubic	0.0002 (0.0034)	0.0056 (0.0065)	0.0001 (0.0014)	-0.0003 (0.0068)	-0.0003 (0.0043)	-0.0003 (0.0075)
Region 7 × Posts To Next Thread Badge	-0.0566*** (0.0114)	0.6819*** (0.0366)	0.0923*** (0.0051)	0.2390*** (0.0178)	0.1448*** (0.0120)	0.2722*** (0.0199)
Region 7 × Posts To Next Thread Badge Squared	0.0102*** (0.0019)	-0.1138*** (0.0063)	-0.0154*** (0.0009)	-0.0395*** (0.0031)	-0.0239*** (0.0021)	-0.0451*** (0.0034)
Region 9 × Posts To Next Thread Badge	0.0142*** (0.0036)	-0.0829** (0.0277)	0.0056 (0.0066)	0.0006 (0.0107)	-0.0011 (0.0077)	0.0006 (0.0122)

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C-8: Results for UGC Quantity, Timeliness and Quality with 6-Day Time Window (Cont. 3)

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Quantity	Timeliness	Quality			
			Length	Complexity	Informativeness	Politeness
Region 9 × Posts To Next Thread Badge Squared	-0.0023 (0.0019)	0.0268*** (0.0070)	0.0052*** (0.0013)	0.0084*** (0.0028)	0.0062*** (0.0018)	0.0097*** (0.0031)
Region 9 × Posts To Next Thread Badge Cubic	0.0003 (0.0003)	-0.0028** (0.0010)	-0.0010*** (0.0001)	-0.0015*** (0.0004)	-0.0011*** (0.0002)	-0.0017*** (0.0004)
Region 1 × Posts To Next Review Badge	-0.0313* (0.0158)	-0.1295* (0.0576)	-0.0161** (0.0056)	-0.0445 (0.0256)	-0.0323 (0.0172)	-0.0506 (0.0286)
Region 1 × Posts To Next Review Badge Squared	0.0393 (0.0236)	0.1904* (0.0849)	0.0212** (0.0087)	0.0594 (0.0392)	0.0429 (0.0264)	0.0678 (0.0438)
Region 1 × Posts To Next Review Badge Cubic	-0.0140 (0.0087)	-0.0726** (0.0309)	-0.0077** (0.0033)	-0.0224 (0.0148)	-0.0160 (0.0100)	-0.0256 (0.0166)
Region 2 × Posts To Next Review Badge	0.0124 (0.0162)	-0.0322 (0.0419)	-0.0002 (0.0088)	0.0002 (0.0325)	-0.0024 (0.0223)	-0.0005 (0.0364)
Region 2 × Posts To Next Review Badge Squared	-0.0019 (0.0098)	0.0238 (0.0284)	0.0012 (0.0054)	0.0056 (0.0202)	0.0050 (0.0137)	0.0066 (0.0226)
Region 2 × Posts To Next Review Badge Cubic	-0.0004 (0.0015)	-0.0043 (0.0048)	-0.0004 (0.0008)	-0.0017 (0.0032)	-0.0013 (0.0022)	-0.0019 (0.0036)
Region 3 × Posts To Next Review Badge	0.0208 (0.0355)	0.2630 (0.1543)	0.0105 (0.0176)	0.0487 (0.0734)	0.0352 (0.0487)	0.0544 (0.0813)
Region 3 × Posts To Next Review Badge Squared	-0.0039 (0.0233)	-0.1768 (0.1034)	-0.0050 (0.0112)	-0.0259 (0.0477)	-0.0192 (0.0317)	-0.0290 (0.0528)
Region 3 × Posts To Next Review Badge Cubic	-0.0002 (0.0037)	0.0283 (0.0166)	0.0006 (0.0017)	0.0038 (0.0075)	0.0028 (0.0050)	0.0042 (0.0083)
Region 4 × Posts To Next Review Badge	0.0556*** (0.0176)	-0.1485 (0.1096)	0.0296 (0.0214)	0.0420 (0.1059)	0.0291 (0.0738)	0.0500 (0.1197)
Region 4 × Posts To Next Review Badge Squared	-0.0176 (0.0094)	0.0602 (0.0551)	-0.0129 (0.0111)	-0.0090 (0.0537)	-0.0070 (0.0375)	-0.0118 (0.0607)
Region 4 × Posts To Next Review Badge Cubic	0.0015 (0.0013)	-0.0055 (0.0070)	0.0014 (0.0014)	-0.0002 (0.0066)	0.0000 (0.0046)	0.0001 (0.0074)
Region 5 × Posts To Next Review Badge	-0.0134 (0.0387)	0.0239 (0.2118)	-0.2195*** (0.0370)	-0.0469 (0.1347)	-0.0421 (0.0932)	-0.0752 (0.1502)
Region 5 × Posts To Next Review Badge Squared	0.0068 (0.0172)	-0.0090 (0.1101)	0.0869*** (0.0206)	0.0260 (0.0654)	0.0213 (0.0456)	0.0382 (0.0731)
Region 5 × Posts To Next Review Badge Cubic	-0.0004 (0.0019)	0.0006 (0.0130)	-0.0085*** (0.0026)	-0.0031 (0.0076)	-0.0024 (0.0053)	-0.0043 (0.0085)
Constant	0.0006*** (0.0001)	0.0007** (0.0003)	0.0002*** (0.0000)	0.0009*** (0.0001)	0.0006*** (0.0001)	0.0010*** (0.0001)
Individual-Day Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Source of Reward Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	128,458,902	128,458,902	128,458,902	128,458,902	128,458,902	128,458,902
R ²	0.18	0.20	0.53	0.49	0.48	0.49

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C-9: Results for UGC Quantity, Timeliness and Quality Using Individual-Week FEs with 3-Day Time Window

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Quantity	Timeliness	Quality			
			Length	Complexity	Informativeness	Politeness
Reviews	0.0042*** (0.0003)	0.0107*** (0.0007)	0.0022*** (0.0001)	0.0122*** (0.0006)	0.0082*** (0.0004)	0.0135*** (0.0006)
Replies	0.0163*** (0.0006)	0.0396*** (0.0015)	0.0078*** (0.0003)	0.0356*** (0.0011)	0.0236*** (0.0007)	0.0393*** (0.0013)
Tips	0.0079*** (0.0010)	-0.0011 (0.0030)	0.0008 (0.0008)	0.0251*** (0.0018)	0.0167*** (0.0012)	0.0276*** (0.0020)
Reviews × Tips	-0.0092*** (0.0018)	-0.0917*** (0.0109)	-0.0042*** (0.0013)	-0.0049 (0.0027)	-0.0028 (0.0018)	-0.0061* (0.0030)
Replies × Tips	0.0438*** (0.0048)	0.0851*** (0.0126)	0.0107*** (0.0017)	0.0310*** (0.0067)	0.0202*** (0.0045)	0.0344*** (0.0075)
Likes	-0.0445*** (0.0010)	0.0033 (0.0025)	-0.0298*** (0.0006)	-0.0674*** (0.0017)	-0.0442*** (0.0012)	-0.0754*** (0.0019)
Reviews × Likes	0.0361*** (0.0016)	0.1398*** (0.0066)	0.0282*** (0.0013)	0.0665*** (0.0025)	0.0435*** (0.0017)	0.0740*** (0.0028)
Replies × Likes	0.1218*** (0.0022)	0.1458*** (0.0080)	0.0530*** (0.0009)	0.1770*** (0.0034)	0.1163*** (0.0023)	0.1969*** (0.0038)
Compensation	0.0046 (0.0081)	-0.1270*** (0.0189)	-0.0271*** (0.0074)	0.0743*** (0.0086)	0.0480*** (0.0057)	0.0814*** (0.0095)
Reviews × Compensation	-0.0556*** (0.0083)	-0.2161*** (0.0236)	0.0296*** (0.0079)	-0.0264** (0.0089)	-0.0160** (0.0060)	-0.0283** (0.0099)
Badge	-0.0478*** (0.0022)	-0.0605*** (0.0045)	-0.0120*** (0.0008)	-0.0555*** (0.0031)	-0.0367*** (0.0020)	-0.0614*** (0.0034)
Reviews × Badge	0.0221** (0.0080)	-0.0052 (0.0346)	0.0013 (0.0048)	0.0375*** (0.0101)	0.0237*** (0.0068)	0.0409*** (0.0113)
Received Tips for Other UGC Than Threads	-0.0052*** (0.0005)	-0.0166*** (0.0016)	-0.0022*** (0.0002)	-0.0052*** (0.0008)	-0.0034*** (0.0006)	-0.0059*** (0.0009)
Received Tips for Other UGC Than Reviews	-0.0031*** (0.0004)	-0.0030*** (0.0007)	-0.0011*** (0.0002)	-0.0041*** (0.0006)	-0.0027*** (0.0004)	-0.0045*** (0.0007)
Received Tips for Other UGC Than Replies	0.0152*** (0.0025)	0.0402*** (0.0064)	0.0065*** (0.0009)	0.0299*** (0.0044)	0.0200*** (0.0030)	0.0334*** (0.0049)
Received Likes for Other UGC Than Threads	-0.0271*** (0.0005)	-0.0363*** (0.0020)	-0.0081*** (0.0002)	-0.0338*** (0.0007)	-0.0224*** (0.0005)	-0.0373*** (0.0008)
Received Likes for Other UGC Than Reviews	-0.0123*** (0.0004)	-0.0074*** (0.0008)	-0.0049*** (0.0001)	-0.0168*** (0.0006)	-0.0112*** (0.0004)	-0.0187*** (0.0006)
Received Likes for Other UGC Than Replies	0.0460*** (0.0011)	0.0465*** (0.0031)	0.0201*** (0.0004)	0.0884*** (0.0019)	0.0590*** (0.0013)	0.0982*** (0.0021)
Received Compensation for Other UGC Than Threads	0.0159*** (0.0011)	0.0103** (0.0036)	0.0059*** (0.0004)	0.0326*** (0.0017)	0.0218*** (0.0011)	0.0360*** (0.0019)
Received Compensation for Other UGC Than Reviews	-0.0012* (0.0006)	-0.0055*** (0.0016)	0.0004* (0.0002)	-0.0030*** (0.0009)	-0.0018*** (0.0006)	-0.0032*** (0.0010)
Received Badge for Other UGC Than Threads	-0.0019** (0.0007)	-0.0031 (0.0018)	-0.0007 (0.0004)	-0.0009 (0.0013)	-0.0008 (0.0009)	-0.0012 (0.0015)

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C-10: Results for UGC Quantity, Timeliness and Quality Using Individual-Week FEs with 3-Day Time Window (Cont. 1)

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Quantity	Timeliness	Quality			
			Length	Complexity	Informativeness	Politeness
Received Badge for Other UGC Than Reviews	-0.0292*** (0.0011)	-0.0313*** (0.0021)	-0.0082*** (0.0004)	-0.0372*** (0.0015)	-0.0245*** (0.0010)	-0.0411*** (0.0017)
Same Thread Activity Dummy	0.0000 (0.0005)	-0.0020 (0.0015)	0.0000 (0.0002)	-0.0016 (0.0010)	-0.0011 (0.0007)	-0.0017 (0.0011)
Same Review Activity Dummy	0.0104*** (0.0016)	0.0233*** (0.0045)	0.0030*** (0.0007)	0.0175*** (0.0032)	0.0114*** (0.0021)	0.0193*** (0.0035)
Same Reply Activity Dummy	-0.0218*** (0.0008)	-0.0384*** (0.0022)	-0.0088*** (0.0003)	-0.0405*** (0.0015)	-0.0266*** (0.0010)	-0.0448*** (0.0017)
Days Since Last Thread Posted	-0.0016*** (0.0000)	-0.0018*** (0.0001)	-0.0008*** (0.0000)	-0.0036*** (0.0001)	-0.0024*** (0.0001)	-0.0040*** (0.0001)
Days Since Last Review Posted	-0.0003*** (0.0000)	-0.0007*** (0.0001)	-0.0002*** (0.0000)	-0.0013*** (0.0001)	-0.0009*** (0.0001)	-0.0014*** (0.0001)
Days Since Last Reply Posted	-0.0038*** (0.0001)	-0.0076*** (0.0002)	-0.0018*** (0.0000)	-0.0080*** (0.0002)	-0.0053*** (0.0001)	-0.0089*** (0.0002)
Number of Written Threads so Far	0.0043*** (0.0002)	0.0080*** (0.0008)	0.0014*** (0.0001)	0.0078*** (0.0005)	0.0051*** (0.0003)	0.0086*** (0.0005)
Number of Written Reviews so Far	-0.0040*** (0.0013)	0.0005 (0.0038)	-0.0012** (0.0005)	-0.0067** (0.0023)	-0.0044** (0.0015)	-0.0073** (0.0026)
Number of Written Replies so Far	0.0016*** (0.0003)	0.0049*** (0.0009)	0.0011*** (0.0001)	0.0048*** (0.0005)	0.0032*** (0.0004)	0.0054*** (0.0006)
If Posted Threads Dummy		1.0202 (0.0108)	0.9319*** (0.0050)	2.6320*** (0.0028)	1.7035*** (0.0020)	2.8831*** (0.0032)
If Posted Reviews Dummy		4.8441 (0.0486)	2.1776*** (0.0329)	2.6943*** (0.0062)	1.7652*** (0.0055)	3.0138*** (0.0073)
If Posted Replies Dummy		1.4679 (0.0136)	0.5993*** (0.0023)	2.2537*** (0.0062)	1.4492*** (0.0042)	2.4803*** (0.0069)
Numer of Written Threads in Past 3 Days	0.0077*** (0.0019)	0.0089** (0.0038)	0.0019* (0.0009)	0.0101*** (0.0031)	0.0069*** (0.0020)	0.0111*** (0.0034)
Numer of Written Reviews in Past 3 Days	-0.0033 (0.0056)	0.0041 (0.0180)	0.0013 (0.0024)	0.0017 (0.0064)	0.0014 (0.0042)	0.0018 (0.0071)
Numer of Written Replies in Past 3 Days	0.0500*** (0.0030)	0.0901*** (0.0076)	0.0138*** (0.0011)	0.0604*** (0.0042)	0.0393*** (0.0028)	0.0667*** (0.0046)
Same Thread Activity in Past 3 Days Dummy	-0.0050*** (0.0013)	-0.0047 (0.0028)	-0.0014* (0.0007)	-0.0070*** (0.0022)	-0.0048*** (0.0015)	-0.0077*** (0.0025)
Same Reviews Activity in Past 3 Days Dummy	0.0024 (0.0040)	-0.0030 (0.0132)	-0.0013 (0.0019)	-0.0004 (0.0049)	-0.0004 (0.0032)	-0.0003 (0.0054)
Same Replies Activity in Past 3 Days Dummy	-0.0342*** (0.0024)	-0.0653*** (0.0066)	-0.0066*** (0.0008)	-0.0284*** (0.0034)	-0.0182*** (0.0022)	-0.0313*** (0.0037)
Numer of Written Threads in Past 365 Days	0.0007*** (0.0001)	0.0033*** (0.0003)	-0.0001*** (0.0000)	-0.0001 (0.0002)	-0.0001 (0.0001)	-0.0001 (0.0002)
Numer of Written Reviews in Past 365 Days	-0.0043*** (0.0006)	-0.0059*** (0.0012)	-0.0019*** (0.0002)	-0.0065*** (0.0010)	-0.0043*** (0.0007)	-0.0073*** (0.0011)
Numer of Written Replies in Past 365 Days	0.0073*** (0.0002)	0.0081*** (0.0004)	0.0037*** (0.0001)	0.0161*** (0.0003)	0.0108*** (0.0002)	0.0179*** (0.0004)

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C-11: Results for UGC Quantity, Timeliness and Quality Using Individual-Week FEs with 3-Day Time Window (Cont. 2)

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Quantity	Timeliness	Quality			
			Length	Complexity	Informativeness	Politeness
Days Since Any Activity	0.0025*** (0.0001)	0.0166*** (0.0005)	0.0031*** (0.0001)	0.0142*** (0.0003)	0.0094*** (0.0002)	0.0157*** (0.0003)
Activity Dummy	-0.0024*** (0.0007)	-0.0393*** (0.0032)	-0.0036*** (0.0006)	-0.0117*** (0.0018)	-0.0079*** (0.0012)	-0.0129*** (0.0020)
Number of Collected Game in 30 Days	0.0004*** (0.0001)	-0.0001 (0.0002)	0.0002*** (0.0000)	0.0013*** (0.0001)	0.0009*** (0.0001)	0.0014*** (0.0001)
Daily Activity Dummy	0.1959*** (0.0010)	0.2854*** (0.0027)	0.0913*** (0.0006)	0.4050*** (0.0025)	0.2692*** (0.0017)	0.4498*** (0.0027)
Any Activity in Past 3 Days Dummy	-0.0276*** (0.0004)	-0.0359*** (0.0011)	-0.0128*** (0.0002)	-0.0596*** (0.0008)	-0.0397*** (0.0005)	-0.0662*** (0.0008)
Region 1 × Posts To Next Thread Badge	-0.0069** (0.0025)	-0.0055 (0.0078)	-0.0044*** (0.0012)	-0.0186*** (0.0052)	-0.0126*** (0.0035)	-0.0208*** (0.0058)
Region 1 × Posts To Next Thread Badge Squared	0.0028* (0.0013)	0.0052 (0.0042)	0.0019*** (0.0006)	0.0078** (0.0028)	0.0052** (0.0018)	0.0088** (0.0031)
Region 1 × Posts To Next Thread Badge Cubic	-0.0004* (0.0002)	-0.0010 (0.0006)	-0.0002* (0.0001)	-0.0009** (0.0004)	-0.0006*** (0.0002)	-0.0010** (0.0004)
Region 2 × Posts To Next Thread Badge	0.0004 (0.0056)	0.0038 (0.0144)	0.0004 (0.0024)	-0.0053 (0.0106)	-0.0037 (0.0071)	-0.0058 (0.0117)
Region 2 × Posts To Next Thread Badge Squared	0.0005 (0.0028)	0.0022 (0.0067)	-0.0002 (0.0012)	0.0022 (0.0051)	0.0015 (0.0034)	0.0025 (0.0057)
Region 2 × Posts To Next Thread Badge Cubic	-0.0002 (0.0003)	-0.0006 (0.0008)	0.0000 (0.0001)	-0.0003 (0.0006)	-0.0002 (0.0004)	-0.0004 (0.0007)
Region 3 × Posts To Next Thread Badge	0.0032 (0.0121)	-0.0659 (0.0602)	0.0015 (0.0057)	-0.0034 (0.0249)	-0.0029 (0.0166)	-0.0038 (0.0277)
Region 3 × Posts To Next Thread Badge Squared	0.0012 (0.0055)	0.0320 (0.0259)	-0.0002 (0.0026)	0.0036 (0.0113)	0.0025 (0.0075)	0.0041 (0.0126)
Region 3 × Posts To Next Thread Badge Cubic	-0.0003 (0.0006)	-0.0036 (0.0028)	0.0000 (0.0003)	-0.0006 (0.0013)	-0.0004 (0.0008)	-0.0007 (0.0014)
Region 4 × Posts To Next Thread Badge	0.0596** (0.0224)	0.0061 (0.0889)	0.0197* (0.0100)	0.0889** (0.0382)	0.0524* (0.0254)	0.0975** (0.0423)
Region 4 × Posts To Next Thread Badge Squared	-0.0190 (0.0098)	0.0086 (0.0404)	-0.0060 (0.0044)	-0.0298 (0.0169)	-0.0170 (0.0112)	-0.0326 (0.0187)
Region 4 × Posts To Next Thread Badge Cubic	0.0015 (0.0011)	-0.0018 (0.0045)	0.0004 (0.0005)	0.0025 (0.0018)	0.0014 (0.0012)	0.0028 (0.0020)
Region 5 × Posts To Next Thread Badge	0.0820** (0.0306)	-0.0429 (0.1107)	0.0179 (0.0261)	0.1541 (0.0940)	0.0965 (0.0603)	0.1684 (0.1030)
Region 5 × Posts To Next Thread Badge Squared	-0.0389*** (0.0129)	0.0117 (0.0416)	-0.0114 (0.0104)	-0.0811* (0.0379)	-0.0522* (0.0243)	-0.0892* (0.0415)
Region 5 × Posts To Next Thread Badge Cubic	0.0047*** (0.0015)	-0.0002 (0.0042)	0.0016 (0.0011)	0.0102** (0.0040)	0.0066** (0.0026)	0.0112** (0.0044)
Region 6 × Posts To Next Thread Badge	0.0380 (0.0502)	0.1739* (0.0839)	0.0141 (0.0240)	0.0652 (0.1053)	0.0396 (0.0693)	0.0719 (0.1177)
Region 6 × Posts To Next Thread Badge Squared	-0.0080 (0.0231)	-0.0623 (0.0378)	-0.0037 (0.0104)	-0.0160 (0.0469)	-0.0091 (0.0307)	-0.0176 (0.0524)
Region 6 × Posts To Next Thread Badge Cubic	0.0004 (0.0025)	0.0059 (0.0039)	0.0003 (0.0011)	0.0010 (0.0051)	0.0005 (0.0033)	0.0011 (0.0057)

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C-12: Results for UGC Quantity, Timeliness and Quality Using Individual-Week FEs with 3-Day Time Window (Cont. 3)

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Quantity	Timeliness	Quality			
			Length	Complexity	Informativeness	Politeness
Region 7 × Posts To Next Thread Badge	2.0864 (1.3878)	-12.8758 (6.7922)	-4.8070 (2.5140)	-9.3147 (4.8931)	-6.6487 (3.5013)	-10.0024 (5.2500)
Region 7 × Posts To Next Thread Badge Squared	-0.7172 (0.4612)	4.2863 (2.2578)	1.5972 (0.8356)	3.0993 (1.6262)	2.2129 (1.1636)	3.3277 (1.7448)
Region 7 × Posts To Next Thread Badge Cubic	0.0618 (0.0383)	-0.3563 (0.1876)	-0.1326 (0.0694)	-0.2575 (0.1351)	-0.1839 (0.0967)	-0.2764 (0.1449)
Region 9 × Posts To Next Thread Badge	0.0138* (0.0069)	-0.0893* (0.0433)	0.0020 (0.0088)	-0.0002 (0.0204)	-0.0015 (0.0141)	-0.0004 (0.0230)
Region 9 × Posts To Next Thread Badge Squared	-0.0019 (0.0015)	0.0396*** (0.0104)	0.0038** (0.0015)	0.0080** (0.0035)	0.0059** (0.0024)	0.0091** (0.0040)
Region 9 × Posts To Next Thread Badge Cubic	0.0002 (0.0002)	-0.0044*** (0.0007)	-0.0007*** (0.0001)	-0.0013*** (0.0004)	-0.0009*** (0.0002)	-0.0015*** (0.0004)
Region 1 × Posts To Next Review Badge	-0.0397* (0.0181)	-0.1201** (0.0531)	-0.0171** (0.0063)	-0.0549 (0.0286)	-0.0390* (0.0192)	-0.0619 (0.0319)
Region 1 × Posts To Next Review Badge Squared	0.0481 (0.0269)	0.1709* (0.0785)	0.0212* (0.0097)	0.0677 (0.0436)	0.0482 (0.0293)	0.0768 (0.0486)
Region 1 × Posts To Next Review Badge Cubic	-0.0166 (0.0099)	-0.0645* (0.0287)	-0.0073* (0.0037)	-0.0242 (0.0164)	-0.0171 (0.0110)	-0.0274 (0.0183)
Region 2 × Posts To Next Review Badge	0.0203 (0.0210)	-0.0234 (0.0369)	0.0027 (0.0100)	0.0114 (0.0388)	0.0056 (0.0263)	0.0119 (0.0432)
Region 2 × Posts To Next Review Badge Squared	-0.0079 (0.0129)	0.0184 (0.0245)	-0.0006 (0.0061)	-0.0011 (0.0238)	0.0003 (0.0161)	-0.0008 (0.0266)
Region 2 × Posts To Next Review Badge Cubic	0.0006 (0.0020)	-0.0035 (0.0041)	-0.0001 (0.0009)	-0.0007 (0.0037)	-0.0006 (0.0025)	-0.0009 (0.0041)
Region 3 × Posts To Next Review Badge	0.0398 (0.0364)	0.2714 (0.1481)	0.0190 (0.0188)	0.0678 (0.0808)	0.0474 (0.0538)	0.0760 (0.0895)
Region 3 × Posts To Next Review Badge Squared	-0.0173 (0.0230)	-0.1820 (0.0986)	-0.0104 (0.0118)	-0.0377 (0.0511)	-0.0267 (0.0341)	-0.0424 (0.0567)
Region 3 × Posts To Next Review Badge Cubic	0.0020 (0.0036)	0.0289 (0.0157)	0.0015 (0.0018)	0.0055 (0.0079)	0.0039 (0.0053)	0.0062 (0.0088)
Region 4 × Posts To Next Review Badge	0.0380 (0.0245)	-0.0567 (0.0845)	0.0150 (0.0211)	0.0155 (0.1022)	0.0127 (0.0692)	0.0189 (0.1143)
Region 4 × Posts To Next Review Badge Squared	-0.0091 (0.0128)	0.0189 (0.0431)	-0.0046 (0.0112)	0.0070 (0.0526)	0.0032 (0.0357)	0.0068 (0.0588)
Region 4 × Posts To Next Review Badge Cubic	0.0004 (0.0017)	-0.0012 (0.0054)	0.0003 (0.0014)	-0.0022 (0.0066)	-0.0013 (0.0045)	-0.0023 (0.0074)
Region 5 × Posts To Next Review Badge	-0.1020 (0.0648)	-0.3666* (0.1851)	-0.1827*** (0.0537)	-0.2473 (0.1736)	-0.1785 (0.1168)	-0.2873 (0.1937)
Region 5 × Posts To Next Review Badge Squared	0.0450 (0.0315)	0.1321 (0.1048)	0.0734** (0.0285)	0.1094 (0.0871)	0.0782 (0.0589)	0.1265 (0.0973)
Region 5 × Posts To Next Review Badge Cubic	-0.0046 (0.0036)	-0.0120 (0.0131)	-0.0073* (0.0034)	-0.0117 (0.0101)	-0.0083 (0.0069)	-0.0135 (0.0113)
Constant	-0.0002* (0.0001)	-0.0001 (0.0003)	-0.0001*** (0.0000)	-0.0003 (0.0002)	-0.0002* (0.0001)	-0.0003 (0.0002)
Individual-Week Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Source of Reward Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	128,458,902	128,458,902	128,458,902	128,458,902	128,458,902	128,458,902
R ²	0.21	0.21	0.56	0.52	0.51	0.52

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C-13: Results for UGC Quantity, Timeliness and Quality Using Number of Rewards with 3-Day Time Window

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Quantity	Timeliness	Quality			
			Length	Complexity	Informativeness	Politeness
Reviews	0.0075*** (0.0003)	0.0118*** (0.0007)	0.0036*** (0.0001)	0.0160*** (0.0006)	0.0107*** (0.0004)	0.0178*** (0.0007)
Replies	0.0159*** (0.0006)	0.0335*** (0.0015)	0.0075*** (0.0003)	0.0316*** (0.0011)	0.0209*** (0.0007)	0.0349*** (0.0012)
Tips	0.1006*** (0.0139)	0.3207*** (0.0503)	0.0188*** (0.0036)	0.1051*** (0.0143)	0.0682*** (0.0096)	0.1185*** (0.0161)
Reviews × Tips	0.0046 (0.0033)	-0.1211*** (0.0173)	0.0224*** (0.0023)	0.0052 (0.0048)	0.0035 (0.0032)	0.0072 (0.0053)
Replies × Tips	0.1152*** (0.0071)	0.2268*** (0.0251)	0.0229*** (0.0020)	0.0796*** (0.0078)	0.0510*** (0.0053)	0.0881*** (0.0087)
Likes	0.0336*** (0.0034)	0.0245* (0.0115)	-0.0009 (0.0011)	0.0175*** (0.0043)	0.0119*** (0.0028)	0.0193*** (0.0047)
Reviews × Likes	0.0238*** (0.0019)	0.1161*** (0.0069)	0.0036** (0.0014)	0.0524*** (0.0030)	0.0343*** (0.0020)	0.0575*** (0.0034)
Replies × Likes	0.1394*** (0.0025)	0.1558*** (0.0091)	0.0546*** (0.0009)	0.2001*** (0.0038)	0.1321*** (0.0025)	0.2221*** (0.0042)
Compensation	-0.0195 (0.0145)	-0.1857*** (0.0291)	-0.0186 (0.0111)	0.0009 (0.0182)	-0.0017 (0.0120)	0.0011 (0.0201)
Reviews × Compensation	-0.0356** (0.0150)	-0.3071*** (0.0371)	0.0711*** (0.0114)	-0.0529** (0.0189)	-0.0320** (0.0125)	-0.0556** (0.0209)
Badge	-0.0932*** (0.0045)	-0.1152*** (0.0089)	-0.0257*** (0.0014)	-0.1178*** (0.0059)	-0.0780*** (0.0038)	-0.1302*** (0.0065)
Reviews × Badge	0.0724*** (0.0102)	0.0533 (0.0375)	0.0195*** (0.0064)	0.0925*** (0.0170)	0.0624*** (0.0114)	0.1029*** (0.0189)
Received Tips for Other UGC Than Threads	0.1033*** (0.0160)	0.3704*** (0.0583)	0.0164*** (0.0041)	0.0816*** (0.0163)	0.0520*** (0.0109)	0.0927*** (0.0183)
Received Tips for Other UGC Than Reviews	-0.0034*** (0.0005)	0.0002 (0.0011)	-0.0007*** (0.0002)	-0.0018** (0.0008)	-0.0012** (0.0005)	-0.0020** (0.0008)
Received Tips for Other UGC Than Replies	0.0210*** (0.0026)	0.0426*** (0.0070)	0.0109*** (0.0010)	0.0481*** (0.0047)	0.0324*** (0.0032)	0.0539*** (0.0053)
Received Likes for Other UGC Than Threads	0.0760*** (0.0049)	0.0102 (0.0176)	0.0253*** (0.0016)	0.0862*** (0.0064)	0.0574*** (0.0043)	0.0959*** (0.0071)
Received Likes for Other UGC Than Reviews	-0.0104*** (0.0003)	-0.0058*** (0.0006)	-0.0039*** (0.0001)	-0.0145*** (0.0004)	-0.0097*** (0.0003)	-0.0162*** (0.0005)
Received Likes for Other UGC Than Replies	0.0144*** (0.0008)	0.0035 (0.0028)	0.0090*** (0.0004)	0.0404*** (0.0016)	0.0272*** (0.0011)	0.0451*** (0.0018)
Received Compensation for Other UGC Than Threads	-0.0046** (0.0019)	-0.0448*** (0.0089)	-0.0002 (0.0006)	-0.0048 (0.0030)	-0.0027 (0.0019)	-0.0054 (0.0033)
Received Compensation for Other UGC Than Reviews	0.0001 (0.0005)	-0.0048** (0.0017)	0.0003 (0.0002)	0.0005 (0.0007)	0.0005 (0.0004)	0.0006 (0.0008)
Received Badge for Other UGC Than Threads	-0.0372*** (0.0018)	-0.0379*** (0.0045)	-0.0116*** (0.0007)	-0.0501*** (0.0030)	-0.0334*** (0.0020)	-0.0555*** (0.0033)

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C-14: Results for UGC Quantity, Timeliness and Quality Using Number of Rewards with 3-Day Time Window (Cont. 1)

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Quantity	Timeliness	Quality			
			Length	Complexity	Informativeness	Politeness
Received Badge for Other UGC Than Reviews	-0.0330*** (0.0014)	-0.0382*** (0.0028)	-0.0092*** (0.0005)	-0.0411*** (0.0019)	-0.0272*** (0.0013)	-0.0455*** (0.0021)
Same Thread Activity Dummy	-0.0010* (0.0005)	-0.0007 (0.0014)	-0.0004* (0.0002)	-0.0027** (0.0010)	-0.0018*** (0.0006)	-0.0030** (0.0011)
Same Review Activity Dummy	0.0104*** (0.0015)	0.0199*** (0.0046)	0.0028*** (0.0007)	0.0162*** (0.0030)	0.0105*** (0.0020)	0.0179*** (0.0034)
Same Reply Activity Dummy	-0.0218*** (0.0008)	-0.0387*** (0.0021)	-0.0085*** (0.0003)	-0.0397*** (0.0015)	-0.0261*** (0.0010)	-0.0439*** (0.0016)
Days Since Last Thread Posted	-0.0023*** (0.0000)	-0.0025*** (0.0001)	-0.0010*** (0.0000)	-0.0047*** (0.0001)	-0.0031*** (0.0001)	-0.0052*** (0.0001)
Days Since Last Review Posted	-0.0007*** (0.0000)	-0.0009*** (0.0001)	-0.0004*** (0.0000)	-0.0018*** (0.0001)	-0.0012*** (0.0001)	-0.0020*** (0.0001)
Days Since Last Reply Posted	-0.0037*** (0.0001)	-0.0065*** (0.0002)	-0.0017*** (0.0000)	-0.0072*** (0.0002)	-0.0048*** (0.0001)	-0.0080*** (0.0002)
Number of Written Threads so Far	0.0033*** (0.0002)	0.0065*** (0.0008)	0.0010*** (0.0001)	0.0059*** (0.0004)	0.0038*** (0.0003)	0.0065*** (0.0005)
Number of Written Reviews so Far	-0.0029** (0.0012)	0.0029 (0.0040)	-0.0008 (0.0005)	-0.0045* (0.0022)	-0.0030* (0.0015)	-0.0049* (0.0024)
Number of Written Replies so Far	0.0019*** (0.0003)	0.0050*** (0.0009)	0.0011*** (0.0001)	0.0048*** (0.0005)	0.0031*** (0.0003)	0.0053*** (0.0006)
If Posted Threads Dummy		1.1248*** (0.0129)	0.9453*** (0.0048)	2.6962*** (0.0027)	1.7455*** (0.0019)	2.9529*** (0.0029)
If Posted Reviews Dummy		5.0341*** (0.0491)	2.1606*** (0.0322)	2.7671*** (0.0097)	1.8120*** (0.0076)	3.0925*** (0.0094)
If Posted Replies Dummy		1.6512*** (0.0151)	0.6553*** (0.0025)	2.4970*** (0.0071)	1.6113*** (0.0048)	2.7499*** (0.0078)
Numer of Written Threads in Past 3 Days	0.0252*** (0.0027)	0.0358*** (0.0060)	0.0064*** (0.0011)	0.0316*** (0.0042)	0.0209*** (0.0028)	0.0349*** (0.0047)
Numer of Written Reviews in Past 3 Days	-0.0132 (0.0078)	-0.0058 (0.0215)	0.0016 (0.0042)	-0.0053 (0.0123)	-0.0020 (0.0082)	-0.0057 (0.0137)
Numer of Written Replies in Past 3 Days	0.0463*** (0.0035)	0.0863*** (0.0087)	0.0112*** (0.0012)	0.0484*** (0.0048)	0.0314*** (0.0032)	0.0534*** (0.0053)
Same Thread Activity in Past 3 Days Dummy	-0.0102*** (0.0019)	-0.0128*** (0.0042)	-0.0023** (0.0008)	-0.0118*** (0.0030)	-0.0079*** (0.0020)	-0.0130*** (0.0033)
Same Reviews Activity in Past 3 Days Dummy	0.0092 (0.0057)	0.0019 (0.0159)	-0.0027 (0.0033)	0.0008 (0.0094)	-0.0004 (0.0062)	0.0008 (0.0104)
Same Replies Activity in Past 3 Days Dummy	-0.0371*** (0.0030)	-0.0734*** (0.0081)	-0.0058*** (0.0010)	-0.0251*** (0.0041)	-0.0159*** (0.0027)	-0.0275*** (0.0045)
Numer of Written Threads in Past 365 days	0.0020*** (0.0001)	0.0051*** (0.0004)	0.0004*** (0.0001)	0.0021*** (0.0002)	0.0013*** (0.0001)	0.0023*** (0.0003)
Numer of Written Reviews in Past 365 days	-0.0054*** (0.0007)	-0.0062*** (0.0016)	-0.0022*** (0.0003)	-0.0080*** (0.0012)	-0.0052*** (0.0008)	-0.0089*** (0.0013)
Numer of Written Replies in Past 365 days	0.0064*** (0.0002)	0.0062*** (0.0005)	0.0032*** (0.0001)	0.0137*** (0.0003)	0.0092*** (0.0002)	0.0152*** (0.0003)

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C-15: Results for UGC Quantity, Timeliness and Quality Using Number of Rewards with 3-Day Time Window (Cont. 2)

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Quantity	Timeliness	Quality			
			Length	Complexity	Informativeness	Politeness
Region 1 × Posts To Next Thread Badge	-0.0063** (0.0025)	-0.0054 (0.0080)	-0.0040*** (0.0011)	-0.0172*** (0.0051)	-0.0116*** (0.0034)	-0.0192*** (0.0057)
Region 1 × Posts To Next Thread Badge Squared	0.0031** (0.0013)	0.0053 (0.0043)	0.0019*** (0.0006)	0.0077*** (0.0027)	0.0051** (0.0018)	0.0087** (0.0030)
Region 1 × Posts To Next Thread Badge Cubic	-0.0004* (0.0002)	-0.0010 (0.0006)	-0.0003*** (0.0001)	-0.0010** (0.0004)	-0.0006*** (0.0002)	-0.0011** (0.0004)
Region 2 × Posts To Next Thread Badge	0.0019 (0.0053)	0.0059 (0.0145)	0.0010 (0.0022)	-0.0023 (0.0096)	-0.0018 (0.0064)	-0.0026 (0.0107)
Region 2 × Posts To Next Thread Badge Squared	0.0002 (0.0027)	0.0009 (0.0068)	-0.0004 (0.0011)	0.0012 (0.0047)	0.0008 (0.0031)	0.0013 (0.0052)
Region 2 × Posts To Next Thread Badge Cubic	-0.0001 (0.0003)	-0.0004 (0.0008)	0.0000 (0.0001)	-0.0002 (0.0006)	-0.0001 (0.0004)	-0.0003 (0.0006)
Region 3 × Posts To Next Thread Badge	0.0034 (0.0108)	-0.0653 (0.0568)	0.0019 (0.0051)	0.0019 (0.0219)	0.0006 (0.0146)	0.0020 (0.0244)
Region 3 × Posts To Next Thread Badge Squared	0.0013 (0.0049)	0.0313 (0.0247)	-0.0005 (0.0024)	0.0012 (0.0101)	0.0008 (0.0067)	0.0014 (0.0112)
Region 3 × Posts To Next Thread Badge Cubic	-0.0003 (0.0006)	-0.0035 (0.0027)	0.0000 (0.0003)	-0.0003 (0.0011)	-0.0002 (0.0008)	-0.0003 (0.0013)
Region 4 × Posts To Next Thread Badge	0.0622** (0.0209)	0.0057 (0.0899)	0.0159 (0.0094)	0.0814** (0.0359)	0.0462 (0.0239)	0.0892** (0.0396)
Region 4 × Posts To Next Thread Badge Squared	-0.0204* (0.0093)	0.0068 (0.0409)	-0.0047 (0.0042)	-0.0273 (0.0158)	-0.0149 (0.0106)	-0.0299 (0.0175)
Region 4 × Posts To Next Thread Badge Cubic	0.0017 (0.0010)	-0.0015 (0.0046)	0.0003 (0.0005)	0.0023 (0.0017)	0.0012 (0.0012)	0.0025 (0.0019)
Region 5 × Posts To Next Thread Badge	0.0816** (0.0294)	-0.0351 (0.1072)	0.0175 (0.0244)	0.1615 (0.0920)	0.1027 (0.0595)	0.1765 (0.1006)
Region 5 × Posts To Next Thread Badge Squared	-0.0386*** (0.0123)	0.0066 (0.0408)	-0.0110 (0.0100)	-0.0839** (0.0371)	-0.0546** (0.0239)	-0.0921** (0.0405)
Region 5 × Posts To Next Thread Badge Cubic	0.0047*** (0.0014)	0.0004 (0.0042)	0.0015 (0.0011)	0.0104** (0.0039)	0.0068** (0.0025)	0.0114** (0.0043)
Region 6 × Posts To Next Thread Badge	0.0472 (0.0449)	0.1710 (0.0912)	0.0133 (0.0225)	0.0640 (0.1018)	0.0381 (0.0668)	0.0706 (0.1135)
Region 6 × Posts To Next Thread Badge Squared	-0.0108 (0.0207)	-0.0598 (0.0410)	-0.0032 (0.0098)	-0.0148 (0.0459)	-0.0080 (0.0300)	-0.0163 (0.0512)
Region 6 × Posts To Next Thread Badge Cubic	0.0007 (0.0022)	0.0055 (0.0042)	0.0002 (0.0010)	0.0008 (0.0050)	0.0004 (0.0033)	0.0009 (0.0056)
Region 7 × Posts To Next Thread Badge	0.9612 (0.7705)	-11.9029 (6.5991)	-5.1655 (2.7453)	-6.9676 (3.6733)	-5.3792 (2.8435)	-7.5516 (3.9824)
Region 7 × Posts To Next Thread Badge Squared	-0.3397 (0.2561)	3.9892 (2.1941)	1.7185 (0.9125)	2.3175 (1.2208)	1.7895 (0.9451)	2.5118 (1.3236)
Region 7 × Posts To Next Thread Badge Cubic	0.0301 (0.0213)	-0.3339 (0.1823)	-0.1428 (0.0758)	-0.1924 (0.1014)	-0.1486 (0.0785)	-0.2085 (0.1099)
Region 9 × Posts To Next Thread Badge	0.0116 (0.0071)	-0.0910* (0.0429)	0.0051 (0.0067)	0.0032 (0.0177)	0.0005 (0.0124)	0.0035 (0.0199)

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C-16: Results for UGC Quantity, Timeliness and Quality Using Number of Rewards with 3-Day Time Window (Cont. 3)

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Quantity	Timeliness	Quality			
			Length	Complexity	Informativeness	Politeness
Region 9 × Posts To Next Thread Badge Squared	-0.0016 (0.0015)	0.0390*** (0.0103)	0.0029** (0.0011)	0.0056 (0.0036)	0.0044 (0.0024)	0.0064 (0.0040)
Region 9 × Posts To Next Thread Badge Cubic	0.0002 (0.0002)	-0.0043*** (0.0007)	-0.0006*** (0.0001)	-0.0010*** (0.0003)	-0.0008*** (0.0002)	-0.0012*** (0.0004)
Region 1 × Posts To Next Review Badge	-0.0345* (0.0173)	-0.1203* (0.0538)	-0.0156** (0.0060)	-0.0495 (0.0273)	-0.0354 (0.0184)	-0.0560 (0.0305)
Region 1 × Posts To Next Review Badge Squared	0.0426 (0.0257)	0.1747* (0.0795)	0.0202* (0.0092)	0.0633 (0.0418)	0.0453 (0.0281)	0.0719 (0.0466)
Region 1 × Posts To Next Review Badge Cubic	-0.0150 (0.0095)	-0.0666** (0.0290)	-0.0072* (0.0035)	-0.0232 (0.0157)	-0.0164 (0.0106)	-0.0263 (0.0176)
Region 2 × Posts To Next Review Badge	0.0102 (0.0167)	-0.0430 (0.0375)	-0.0006 (0.0087)	-0.0041 (0.0336)	-0.0048 (0.0229)	-0.0053 (0.0376)
Region 2 × Posts To Next Review Badge Squared	-0.0006 (0.0102)	0.0301 (0.0254)	0.0017 (0.0053)	0.0082 (0.0208)	0.0065 (0.0141)	0.0096 (0.0232)
Region 2 × Posts To Next Review Badge Cubic	-0.0006 (0.0016)	-0.0052 (0.0042)	-0.0005 (0.0008)	-0.0021 (0.0033)	-0.0015 (0.0022)	-0.0024 (0.0037)
Region 3 × Posts To Next Review Badge	0.0228 (0.0349)	0.2444 (0.1433)	0.0122 (0.0165)	0.0439 (0.0755)	0.0314 (0.0502)	0.0494 (0.0835)
Region 3 × Posts To Next Review Badge Squared	-0.0056 (0.0224)	-0.1679 (0.0964)	-0.0058 (0.0105)	-0.0232 (0.0483)	-0.0169 (0.0322)	-0.0261 (0.0535)
Region 3 × Posts To Next Review Badge Cubic	0.0001 (0.0036)	0.0271 (0.0154)	0.0007 (0.0016)	0.0033 (0.0076)	0.0025 (0.0051)	0.0038 (0.0084)
Region 4 × Posts To Next Review Badge	0.0514** (0.0195)	-0.0518 (0.0946)	0.0167 (0.0210)	0.0192 (0.1029)	0.0160 (0.0699)	0.0231 (0.1153)
Region 4 × Posts To Next Review Badge Squared	-0.0161 (0.0099)	0.0118 (0.0490)	-0.0057 (0.0110)	0.0029 (0.0521)	0.0000 (0.0355)	0.0022 (0.0584)
Region 4 × Posts To Next Review Badge Cubic	0.0013 (0.0013)	0.0001 (0.0063)	0.0005 (0.0014)	-0.0016 (0.0064)	-0.0008 (0.0044)	-0.0016 (0.0072)
Region 5 × Posts To Next Review Badge	-0.0599 (0.0622)	-0.3312 (0.1904)	-0.1392** (0.0492)	-0.2049 (0.1540)	-0.1526 (0.1045)	-0.2377 (0.1719)
Region 5 × Posts To Next Review Badge Squared	0.0246 (0.0307)	0.1178 (0.1069)	0.0571** (0.0252)	0.0903 (0.0770)	0.0663 (0.0525)	0.1043 (0.0859)
Region 5 × Posts To Next Review Badge Cubic	-0.0022 (0.0035)	-0.0107 (0.0133)	-0.0057 (0.0030)	-0.0096 (0.0090)	-0.0070 (0.0061)	-0.0111 (0.0100)
Constant	-0.0001 (0.0001)	0.0000 (0.0003)	-0.0001*** (0.0000)	-0.0002 (0.0002)	-0.0001 (0.0001)	-0.0002 (0.0002)
Individual-Day Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Source of Reward Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	128,458,902	128,458,902	128,458,902	128,458,902	128,458,902	128,458,902
R ²	0.14	0.20	0.53	0.48	0.46	0.48

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C-17: Results for UGC Quantity, Timeliness and Quality with Tips Reward Only

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Quantity	Timeliness	Quality			
			Length	Complexity	Informativeness	Politeness
Reviews	0.0145*** (0.0005)	0.0204*** (0.0008)	0.0058*** (0.0002)	0.0249*** (0.0008)	0.0166*** (0.0005)	0.0276*** (0.0008)
Replies	0.0353*** (0.0009)	0.0601*** (0.0017)	0.0133*** (0.0003)	0.0559*** (0.0014)	0.0370*** (0.0010)	0.0619*** (0.0016)
Tips	0.1358*** (0.0137)	0.3300*** (0.0433)	0.0262*** (0.0038)	0.1422*** (0.0159)	0.0938*** (0.0105)	0.1586*** (0.0178)
Reviews × Tips	-0.0113*** (0.0030)	-0.1381*** (0.0143)	0.0243*** (0.0019)	0.0010 (0.0041)	0.0005 (0.0027)	0.0025 (0.0045)
Replies × Tips	0.1625*** (0.0091)	0.2777*** (0.0223)	0.0492*** (0.0026)	0.1887*** (0.0111)	0.1242*** (0.0074)	0.2095*** (0.0124)
Received Tips for Other UGC Than Threads	0.1380*** (0.0152)	0.3382*** (0.0479)	0.0323*** (0.0042)	0.1403*** (0.0177)	0.0924*** (0.0117)	0.1568*** (0.0199)
Received Tips for Other UGC Than Reviews	-0.0119*** (0.0008)	-0.0092*** (0.0011)	-0.0038*** (0.0002)	-0.0150*** (0.0010)	-0.0100*** (0.0007)	-0.0166*** (0.0011)
Received Tips for Other UGC Than Replies	0.0305*** (0.0037)	0.0619*** (0.0076)	0.0118*** (0.0013)	0.0531*** (0.0062)	0.0354*** (0.0041)	0.0592*** (0.0069)
Same Thread Activity Dummy	-0.0080*** (0.0004)	-0.0138*** (0.0011)	-0.0027*** (0.0002)	-0.0132*** (0.0007)	-0.0086*** (0.0005)	-0.0146*** (0.0008)
Same Review Activity Dummy	0.0117*** (0.0013)	0.0246*** (0.0031)	0.0035*** (0.0005)	0.0197*** (0.0023)	0.0128*** (0.0015)	0.0218*** (0.0025)
Same Reply Activity Dummy	-0.0250*** (0.0009)	-0.0424*** (0.0020)	-0.0088*** (0.0003)	-0.0419*** (0.0015)	-0.0276*** (0.0010)	-0.0463*** (0.0017)
Days Since Last Thread Posted	-0.0018*** (0.0000)	-0.0023*** (0.0001)	-0.0008*** (0.0000)	-0.0040*** (0.0001)	-0.0027*** (0.0001)	-0.0044*** (0.0001)
Days Since Last Review Posted	-0.0015*** (0.0001)	-0.0018*** (0.0001)	-0.0007*** (0.0000)	-0.0028*** (0.0001)	-0.0019*** (0.0001)	-0.0031*** (0.0001)
Days Since Last Reply Posted	-0.0070*** (0.0001)	-0.0111*** (0.0003)	-0.0027*** (0.0001)	-0.0114*** (0.0002)	-0.0076*** (0.0002)	-0.0126*** (0.0003)
Number of Written Threads so Far	0.0052*** (0.0002)	0.0104*** (0.0005)	0.0015*** (0.0001)	0.0077*** (0.0003)	0.0050*** (0.0002)	0.0085*** (0.0003)
Number of Written Reviews so Far	-0.0051*** (0.0009)	-0.0030 (0.0019)	-0.0018*** (0.0004)	-0.0082*** (0.0016)	-0.0055*** (0.0011)	-0.0091*** (0.0018)
Number of Written Replies so Far	0.0035*** (0.0002)	0.0062*** (0.0006)	0.0017*** (0.0001)	0.0077*** (0.0004)	0.0051*** (0.0003)	0.0085*** (0.0005)
If Posted Threads Dummy		1.1302*** (0.0130)	0.9526*** (0.0048)	2.7196*** (0.0027)	1.7610*** (0.0019)	2.9790*** (0.0030)
If Posted Reviews Dummy		5.0272*** (0.0495)	2.1638*** (0.0320)	2.7752*** (0.0095)	1.8174*** (0.0076)	3.1015*** (0.0092)
If Posted Replies Dummy		1.6988*** (0.0157)	0.6648*** (0.0023)	2.5394*** (0.0060)	1.6394*** (0.0041)	2.7969*** (0.0067)
Numer of Written Threads in Past 3 Days	0.0357*** (0.0033)	0.0489*** (0.0067)	0.0087*** (0.0012)	0.0433*** (0.0048)	0.0284*** (0.0032)	0.0478*** (0.0053)
Numer of Written Reviews in Past 3 Days	-0.0135 (0.0077)	-0.0075 (0.0216)	0.0023 (0.0043)	-0.0059 (0.0125)	-0.0022 (0.0083)	-0.0063 (0.0140)

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C-18: Results for UGC Quantity, Timeliness and Quality with Tips Reward Only (Cont. 1)

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Quantity	Timeliness	Quality			
			Length	Complexity	Informativeness	Politeness
Numer of Written Replies in Past 3 Days	0.0645*** (0.0045)	0.1174*** (0.0102)	0.0171*** (0.0014)	0.0731*** (0.0059)	0.0479*** (0.0039)	0.0808*** (0.0065)
Same Thread Activity in Past 3 Days Dummy	-0.0140*** (0.0022)	-0.0172*** (0.0046)	-0.0030*** (0.0008)	-0.0158*** (0.0033)	-0.0104*** (0.0022)	-0.0175*** (0.0036)
Same Reviews Activity in Past 3 Days Dummy	0.0088 (0.0058)	0.0005 (0.0162)	-0.0033 (0.0034)	0.0002 (0.0096)	-0.0010 (0.0064)	0.0001 (0.0107)
Same Replies Activity in Past 3 Days Dummy	-0.0494*** (0.0037)	-0.0943*** (0.0092)	-0.0096*** (0.0011)	-0.0409*** (0.0048)	-0.0265*** (0.0032)	-0.0451*** (0.0053)
Numer of Written Threads in Past 365 days	0.0032*** (0.0002)	0.0065*** (0.0004)	0.0006*** (0.0001)	0.0032*** (0.0003)	0.0021*** (0.0002)	0.0036*** (0.0003)
Numer of Written Reviews in Past 365 days	-0.0074*** (0.0010)	-0.0109*** (0.0022)	-0.0029*** (0.0004)	-0.0112*** (0.0016)	-0.0075*** (0.0011)	-0.0125*** (0.0018)
Numer of Written Replies in Past 365 days	0.0084*** (0.0002)	0.0092*** (0.0005)	0.0039*** (0.0001)	0.0167*** (0.0004)	0.0112*** (0.0002)	0.0185*** (0.0004)
Constant	-0.0002 (0.0002)	-0.0001 (0.0004)	-0.0001 (0.0001)	-0.0002 (0.0002)	-0.0001 (0.0001)	-0.0002 (0.0002)
Individual-Day Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Source of Reward Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	128,458,902	128,458,902	128,458,902	128,458,902	128,458,902	128,458,902
R ²	0.09	0.19	0.52	0.47	0.46	0.47

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C-19: Results for UGC Quantity, Timeliness and Quality with Compensation Reward Only

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Quantity	Timeliness	Quality			
			Length	Complexity	Informativeness	Politeness
Reviews	0.0158*** (0.0005)	0.0224*** (0.0009)	0.0062*** (0.0002)	0.0266*** (0.0008)	0.0178*** (0.0005)	0.0296*** (0.0009)
Replies	0.0390*** (0.0009)	0.0665*** (0.0018)	0.0145*** (0.0003)	0.0611*** (0.0015)	0.0404*** (0.0010)	0.0677*** (0.0017)
Compensation	-0.0322*** (0.0104)	-0.1260*** (0.0178)	-0.0278*** (0.0066)	-0.0497*** (0.0113)	-0.0342*** (0.0074)	-0.0554*** (0.0125)
Reviews × Compensation	-0.0349*** (0.0104)	-0.1709*** (0.0206)	0.0427*** (0.0068)	-0.0320** (0.0114)	-0.0199** (0.0075)	-0.0338** (0.0127)
Received Compensation for Other UGC Than Threads	-0.0438*** (0.0034)	-0.0830*** (0.0091)	-0.0160*** (0.0012)	-0.0705*** (0.0051)	-0.0465*** (0.0034)	-0.0785*** (0.0057)
Received Compensation for Other UGC Than Reviews	-0.0114*** (0.0010)	-0.0133*** (0.0020)	-0.0030*** (0.0003)	-0.0133*** (0.0013)	-0.0087*** (0.0009)	-0.0147*** (0.0015)
Same Thread Activity Dummy	-0.0083*** (0.0004)	-0.0143*** (0.0011)	-0.0028*** (0.0002)	-0.0137*** (0.0007)	-0.0089*** (0.0005)	-0.0151*** (0.0008)
Same Review Activity Dummy	0.0120*** (0.0014)	0.0251*** (0.0031)	0.0036*** (0.0005)	0.0202*** (0.0023)	0.0131*** (0.0015)	0.0222*** (0.0026)
Same Reply Activity Dummy	-0.0257*** (0.0009)	-0.0435*** (0.0021)	-0.0090*** (0.0003)	-0.0426*** (0.0015)	-0.0281*** (0.0010)	-0.0472*** (0.0017)
Days Since Last Thread Posted	-0.0017*** (0.0000)	-0.0022*** (0.0001)	-0.0008*** (0.0000)	-0.0039*** (0.0001)	-0.0026*** (0.0001)	-0.0043*** (0.0001)
Days Since Last Review Posted	-0.0016*** (0.0001)	-0.0020*** (0.0001)	-0.0007*** (0.0000)	-0.0030*** (0.0001)	-0.0020*** (0.0001)	-0.0033*** (0.0001)
Days Since Last Reply Posted	-0.0076*** (0.0001)	-0.0121*** (0.0003)	-0.0029*** (0.0001)	-0.0122*** (0.0002)	-0.0081*** (0.0002)	-0.0135*** (0.0003)
Number of Written Threads so Far	0.0053*** (0.0002)	0.0107*** (0.0005)	0.0015*** (0.0001)	0.0079*** (0.0003)	0.0051*** (0.0002)	0.0087*** (0.0003)
Number of Written Reviews so Far	-0.0051*** (0.0010)	-0.0030 (0.0020)	-0.0018*** (0.0004)	-0.0082*** (0.0017)	-0.0055*** (0.0011)	-0.0091*** (0.0018)
Number of Written Replies so Far	0.0035*** (0.0003)	0.0062*** (0.0006)	0.0017*** (0.0001)	0.0076*** (0.0004)	0.0051*** (0.0003)	0.0084*** (0.0005)
If Posted Threads Dummy		1.1323*** (0.0129)	0.9528*** (0.0048)	2.7206*** (0.0027)	1.7617*** (0.0019)	2.9801*** (0.0030)
If Posted Reviews Dummy		5.0097*** (0.0488)	2.1652*** (0.0321)	2.7714*** (0.0096)	1.8149*** (0.0077)	3.0974*** (0.0093)
If Posted Replies Dummy		1.7034*** (0.0157)	0.6656*** (0.0023)	2.5426*** (0.0059)	1.6415*** (0.0040)	2.8004*** (0.0066)
Numer of Written Threads in Past 3 Days	0.0365*** (0.0034)	0.0504*** (0.0067)	0.0089*** (0.0012)	0.0443*** (0.0048)	0.0292*** (0.0032)	0.0490*** (0.0053)
Numer of Written Reviews in Past 3 Days	-0.0135 (0.0079)	-0.0067 (0.0219)	0.0022 (0.0043)	-0.0059 (0.0126)	-0.0023 (0.0084)	-0.0064 (0.0140)
Numer of Written Replies in Past 3 Days	0.0665*** (0.0045)	0.1206*** (0.0103)	0.0177*** (0.0014)	0.0753*** (0.0060)	0.0494*** (0.0039)	0.0832*** (0.0066)
Same Thread Activity in Past 3 Days Dummy	-0.0144*** (0.0023)	-0.0179*** (0.0046)	-0.0031*** (0.0008)	-0.0163*** (0.0033)	-0.0107*** (0.0022)	-0.0179*** (0.0037)

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C-20: Results for UGC Quantity, Timeliness and Quality with Compensation Reward Only (Cont. 1)

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Quantity	Timeliness	Quality			
			Length	Complexity	Informativeness	Politeness
Same Reviews Activity in Past 3 Days Dummy	0.0088 (0.0059)	0.0009 (0.0163)	-0.0034 (0.0035)	0.0002 (0.0097)	-0.0009 (0.0064)	0.0001 (0.0108)
Same Replies Activity in Past 3 Days Dummy	-0.0511*** (0.0038)	-0.0970*** (0.0093)	-0.0101*** (0.0011)	-0.0429*** (0.0049)	-0.0278*** (0.0032)	-0.0472*** (0.0054)
Numer of Written Threads in Past 365 days	0.0033*** (0.0002)	0.0066*** (0.0004)	0.0007*** (0.0001)	0.0034*** (0.0003)	0.0022*** (0.0002)	0.0037*** (0.0003)
Numer of Written Reviews in Past 365 days	-0.0075*** (0.0011)	-0.0101*** (0.0023)	-0.0031*** (0.0004)	-0.0114*** (0.0017)	-0.0076*** (0.0011)	-0.0127*** (0.0019)
Numer of Written Replies in Past 365 days	0.0083*** (0.0002)	0.0091*** (0.0005)	0.0039*** (0.0001)	0.0166*** (0.0004)	0.0111*** (0.0002)	0.0184*** (0.0004)
Constant	-0.0002 (0.0002)	-0.0001 (0.0004)	-0.0001 (0.0001)	-0.0002 (0.0002)	-0.0001 (0.0001)	-0.0002 (0.0002)
Individual-Day Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Source of Reward Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	128,458,902	128,458,902	128,458,902	128,458,902	128,458,902	128,458,902
R ²	0.09	0.19	0.52	0.47	0.46	0.47

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C-21: Results for UGC Quantity, Timeliness and Quality with Like Reward Only

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Quantity	Timeliness	Quality			
			Length	Complexity	Informativeness	Politeness
Reviews	0.0076*** (0.0003)	0.0117*** (0.0007)	0.0037*** (0.0001)	0.0161*** (0.0006)	0.0108*** (0.0004)	0.0179*** (0.0007)
Replies	0.0160*** (0.0006)	0.0326*** (0.0016)	0.0076*** (0.0003)	0.0320*** (0.0011)	0.0212*** (0.0007)	0.0354*** (0.0013)
Likes	0.0402*** (0.0035)	0.0402*** (0.0115)	0.0002 (0.0011)	0.0260*** (0.0043)	0.0175*** (0.0029)	0.0287*** (0.0048)
Reviews × Likes	0.0149*** (0.0020)	0.0012 (0.0059)	0.0175*** (0.0013)	0.0450*** (0.0028)	0.0296*** (0.0019)	0.0501*** (0.0031)
Replies × Likes	0.1525*** (0.0028)	0.1746*** (0.0104)	0.0585*** (0.0010)	0.2120*** (0.0040)	0.1400*** (0.0027)	0.2354*** (0.0045)
Received Likes for Other UGC Than Threads	0.0831*** (0.0052)	0.0222 (0.0182)	0.0273*** (0.0016)	0.0940*** (0.0065)	0.0625*** (0.0044)	0.1047*** (0.0073)
Received Likes for Other UGC Than Reviews	-0.0111*** (0.0003)	-0.0064*** (0.0007)	-0.0041*** (0.0001)	-0.0150*** (0.0004)	-0.0100*** (0.0003)	-0.0167*** (0.0005)
Received Likes for Other UGC Than Replies	0.0168*** (0.0007)	0.0185*** (0.0019)	0.0096*** (0.0004)	0.0452*** (0.0015)	0.0303*** (0.0010)	0.0505*** (0.0017)
Same Thread Activity Dummy	-0.0067*** (0.0003)	-0.0123*** (0.0010)	-0.0025*** (0.0001)	-0.0120*** (0.0006)	-0.0079*** (0.0004)	-0.0133*** (0.0007)
Same Review Activity Dummy	0.0090*** (0.0010)	0.0211*** (0.0028)	0.0029*** (0.0004)	0.0167*** (0.0018)	0.0107*** (0.0012)	0.0184*** (0.0020)
Same Reply Activity Dummy	-0.0157*** (0.0006)	-0.0265*** (0.0016)	-0.0063*** (0.0003)	-0.0299*** (0.0012)	-0.0197*** (0.0008)	-0.0330*** (0.0013)
Days Since Last Thread Posted	-0.0022*** (0.0000)	-0.0024*** (0.0001)	-0.0010*** (0.0000)	-0.0046*** (0.0001)	-0.0031*** (0.0001)	-0.0051*** (0.0001)
Days Since Last Review Posted	-0.0007*** (0.0000)	-0.0008*** (0.0001)	-0.0004*** (0.0000)	-0.0018*** (0.0001)	-0.0012*** (0.0001)	-0.0019*** (0.0001)
Days Since Last Reply Posted	-0.0037*** (0.0001)	-0.0064*** (0.0003)	-0.0017*** (0.0000)	-0.0073*** (0.0002)	-0.0048*** (0.0001)	-0.0081*** (0.0002)
Number of Written Threads so Far	0.0040*** (0.0002)	0.0093*** (0.0005)	0.0012*** (0.0001)	0.0064*** (0.0003)	0.0041*** (0.0002)	0.0070*** (0.0003)
Number of Written Reviews so Far	-0.0012* (0.0006)	0.0010 (0.0018)	-0.0006* (0.0003)	-0.0030** (0.0012)	-0.0021** (0.0008)	-0.0033** (0.0014)

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C-22: Results for UGC Quantity, Timeliness and Quality with Like Reward Only (Cont.1)

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Quantity	Timeliness	Quality			
			Length	Complexity	Informativeness	Politeness
Number of Written Replies so Far	0.0011*** (0.0002)	0.0022*** (0.0005)	0.0009*** (0.0001)	0.0042*** (0.0003)	0.0028*** (0.0002)	0.0046*** (0.0004)
If Posted Threads Dummy		1.1237*** (0.0130)	0.9456*** (0.0048)	2.6966*** (0.0027)	1.7457*** (0.0019)	2.9533*** (0.0029)
If Posted Reviews Dummy		5.0349*** (0.0494)	2.1611*** (0.0320)	2.7691*** (0.0098)	1.8133*** (0.0077)	3.0946*** (0.0095)
If Posted Replies Dummy		1.6539*** (0.0151)	0.6557*** (0.0025)	2.4987*** (0.0071)	1.6124*** (0.0048)	2.7518*** (0.0078)
Numer of Written Threads in Past 3 Days	0.0287*** (0.0030)	0.0383*** (0.0063)	0.0073*** (0.0011)	0.0356*** (0.0044)	0.0234*** (0.0029)	0.0393*** (0.0049)
Numer of Written Reviews in Past 3 Days	-0.0141 (0.0078)	-0.0071 (0.0214)	0.0016 (0.0043)	-0.0076 (0.0123)	-0.0034 (0.0082)	-0.0083 (0.0137)
Numer of Written Replies in Past 3 Days	0.0438*** (0.0038)	0.0862*** (0.0091)	0.0107*** (0.0012)	0.0455*** (0.0051)	0.0297*** (0.0034)	0.0502*** (0.0057)
Same Thread Activity in Past 3 Days Dummy	-0.0120*** (0.0020)	-0.0138*** (0.0044)	-0.0027*** (0.0008)	-0.0139*** (0.0031)	-0.0091*** (0.0021)	-0.0153*** (0.0034)
Same Reviews Activity in Past 3 Days Dummy	0.0103 (0.0057)	0.0007 (0.0159)	-0.0025 (0.0034)	0.0026 (0.0094)	0.0007 (0.0062)	0.0028 (0.0104)
Same Replies Activity in Past 3 Days Dummy	-0.0365*** (0.0031)	-0.0750*** (0.0082)	-0.0057*** (0.0010)	-0.0240*** (0.0042)	-0.0153*** (0.0028)	-0.0263*** (0.0046)
Numer of Written Threads in Past 365 days	0.0024*** (0.0001)	0.0058*** (0.0004)	0.0005*** (0.0001)	0.0024*** (0.0002)	0.0015*** (0.0002)	0.0026*** (0.0003)
Numer of Written Reviews in Past 365 days	-0.0049*** (0.0007)	-0.0091*** (0.0020)	-0.0022*** (0.0003)	-0.0082*** (0.0012)	-0.0054*** (0.0008)	-0.0091*** (0.0013)
Numer of Written Replies in Past 365 days	0.0061*** (0.0002)	0.0056*** (0.0004)	0.0031*** (0.0001)	0.0135*** (0.0003)	0.0091*** (0.0002)	0.0150*** (0.0004)
Constant	-0.0001 (0.0001)	0.0000 (0.0003)	0.0000*** (0.0000)	-0.0002 (0.0002)	-0.0001 (0.0001)	-0.0002 (0.0002)
Individual-Day Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Source of Reward Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	128,458,902	128,458,902	128,458,902	128,458,902	128,458,902	128,458,902
R ²	0.13	0.20	0.53	0.48	0.46	0.47

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C-23: Results for UGC Quantity, Timeliness and Quality with Badge Reward Only

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Quantity	Timeliness	Quality			
			Length	Complexity	Informativeness	Politeness
Reviews	0.0149*** (0.0005)	0.0209*** (0.0008)	0.0059*** (0.0002)	0.0254*** (0.0008)	0.0169*** (0.0005)	0.0282*** (0.0009)
Replies	0.0366*** (0.0009)	0.0621*** (0.0018)	0.0137*** (0.0003)	0.0574*** (0.0015)	0.0380*** (0.0010)	0.0635*** (0.0016)
Badge	-0.1505*** (0.0050)	-0.2102*** (0.0093)	-0.0434*** (0.0015)	-0.1965*** (0.0062)	-0.1299*** (0.0041)	-0.2175*** (0.0069)
Reviews × Badge	0.0227* (0.0111)	-0.1763*** (0.0389)	0.0390*** (0.0068)	0.0398** (0.0173)	0.0271** (0.0116)	0.0458** (0.0192)
Received Badge for Other UGC Than Threads	-0.0820*** (0.0024)	-0.1052*** (0.0053)	-0.0267*** (0.0008)	-0.1158*** (0.0034)	-0.0769*** (0.0023)	-0.1285*** (0.0038)
Received Badge for Other UGC Than Reviews	-0.0545*** (0.0016)	-0.0641*** (0.0028)	-0.0150*** (0.0005)	-0.0665*** (0.0021)	-0.0440*** (0.0014)	-0.0736*** (0.0023)
Same Thread Activity Dummy	-0.0052*** (0.0007)	-0.0065*** (0.0017)	-0.0017*** (0.0003)	-0.0083*** (0.0012)	-0.0055*** (0.0008)	-0.0092*** (0.0013)
Same Review Activity Dummy	0.0178*** (0.0023)	0.0306*** (0.0052)	0.0050*** (0.0009)	0.0258*** (0.0040)	0.0169*** (0.0027)	0.0285*** (0.0045)
Same Reply Activity Dummy	-0.0290*** (0.0011)	-0.0517*** (0.0025)	-0.0102*** (0.0004)	-0.0483*** (0.0018)	-0.0317*** (0.0012)	-0.0534*** (0.0020)
Days Since Last Thread Posted	-0.0018*** (0.0000)	-0.0023*** (0.0001)	-0.0008*** (0.0000)	-0.0040*** (0.0001)	-0.0027*** (0.0001)	-0.0044*** (0.0001)
Days Since Last Review Posted	-0.0015*** (0.0001)	-0.0018*** (0.0001)	-0.0007*** (0.0000)	-0.0028*** (0.0001)	-0.0019*** (0.0001)	-0.0031*** (0.0001)
Days Since Last Reply Posted	-0.0072*** (0.0001)	-0.0115*** (0.0003)	-0.0028*** (0.0001)	-0.0117*** (0.0002)	-0.0077*** (0.0002)	-0.0129*** (0.0003)
Number of Written Threads so Far	0.0061*** (0.0003)	0.0102*** (0.0009)	0.0019*** (0.0001)	0.0097*** (0.0005)	0.0064*** (0.0003)	0.0107*** (0.0006)
Number of Written Reviews so Far	-0.0090*** (0.0018)	-0.0050 (0.0043)	-0.0028*** (0.0007)	-0.0128*** (0.0031)	-0.0085*** (0.0020)	-0.0141*** (0.0034)
Number of Written Replies so Far	0.0030*** (0.0004)	0.0072*** (0.0010)	0.0014*** (0.0001)	0.0062*** (0.0006)	0.0041*** (0.0004)	0.0069*** (0.0007)
If Posted Threads Dummy		1.1316*** (0.0130)	0.9530*** (0.0048)	2.7207*** (0.0027)	1.7618*** (0.0019)	2.9802*** (0.0030)
If Posted Reviews Dummy		5.0288*** (0.0497)	2.1629*** (0.0321)	2.7736*** (0.0094)	1.8164*** (0.0074)	3.0997*** (0.0092)
If Posted Replies Dummy		1.7053*** (0.0158)	0.6659*** (0.0023)	2.5440*** (0.0059)	1.6424*** (0.0040)	2.8020*** (0.0066)
Numer of Written Threads in Past 3 Days	0.0344*** (0.0030)	0.0503*** (0.0065)	0.0087*** (0.0011)	0.0426*** (0.0046)	0.0281*** (0.0031)	0.0470*** (0.0051)
Numer of Written Reviews in Past 3 Days	-0.0150 (0.0078)	-0.0102 (0.0216)	0.0016 (0.0042)	-0.0072 (0.0125)	-0.0033 (0.0083)	-0.0078 (0.0140)
Numer of Written Replies in Past 3 Days	0.0691*** (0.0042)	0.1215*** (0.0100)	0.0180*** (0.0013)	0.0777*** (0.0056)	0.0508*** (0.0037)	0.0859*** (0.0062)
Same Thread Activity in Past 3 Days Dummy	-0.0131*** (0.0020)	-0.0177*** (0.0044)	-0.0029*** (0.0008)	-0.0150*** (0.0032)	-0.0100*** (0.0021)	-0.0165*** (0.0035)
Same Reviews Activity in Past 3 Days Dummy	0.0087 (0.0058)	0.0025 (0.0160)	-0.0031 (0.0034)	0.0000 (0.0096)	-0.0010 (0.0064)	-0.0002 (0.0107)

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C-24: Results for UGC Quantity, Timeliness and Quality with Badge Reward Only (Cont.1)

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Quantity	Timeliness	Quality			
			Length	Complexity	Informativeness	Politeness
Same Replies Activity in Past 3 Days Dummy	-0.0526*** (0.0037)	-0.0975*** (0.0092)	-0.0103*** (0.0011)	-0.0445*** (0.0047)	-0.0287*** (0.0031)	-0.0490*** (0.0052)
Numer of Written Threads in Past 365 days	0.0032*** (0.0002)	0.0064*** (0.0004)	0.0007*** (0.0001)	0.0035*** (0.0003)	0.0023*** (0.0002)	0.0039*** (0.0003)
Numer of Written Reviews in Past 365 days	-0.0082*** (0.0010)	-0.0091*** (0.0018)	-0.0029*** (0.0004)	-0.0114*** (0.0016)	-0.0076*** (0.0011)	-0.0127*** (0.0018)
Numer of Written Replies in Past 365 days	0.0085*** (0.0002)	0.0096*** (0.0005)	0.0039*** (0.0001)	0.0166*** (0.0004)	0.0111*** (0.0002)	0.0185*** (0.0004)
Region 1 × Posts To Next Thread Badge	-0.0103*** (0.0030)	-0.0138 (0.0085)	-0.0054*** (0.0012)	-0.0230*** (0.0057)	-0.0154*** (0.0037)	-0.0256*** (0.0063)
Region 1 × Posts To Next Thread Badge Squared	0.0035* (0.0016)	0.0069 (0.0046)	0.0020** (0.0007)	0.0082** (0.0030)	0.0054** (0.0020)	0.0092** (0.0033)
Region 1 × Posts To Next Thread Badge Cubic	-0.0003 (0.0002)	-0.0009 (0.0006)	-0.0002* (0.0001)	-0.0008* (0.0004)	-0.0005 (0.0003)	-0.0009** (0.0004)
Region 2 × Posts To Next Thread Badge	-0.0063 (0.0063)	-0.0086 (0.0161)	-0.0021 (0.0025)	-0.0155 (0.0109)	-0.0105 (0.0072)	-0.0172 (0.0121)
Region 2 × Posts To Next Thread Badge Squared	0.0019 (0.0032)	0.0040 (0.0075)	0.0002 (0.0012)	0.0040 (0.0053)	0.0027 (0.0036)	0.0045 (0.0059)
Region 2 × Posts To Next Thread Badge Cubic	-0.0002 (0.0004)	-0.0005 (0.0009)	0.0000 (0.0002)	-0.0003 (0.0007)	-0.0002 (0.0004)	-0.0004 (0.0007)
Region 3 × Posts To Next Thread Badge	-0.0053 (0.0140)	-0.0883 (0.0649)	-0.0015 (0.0059)	-0.0128 (0.0265)	-0.0089 (0.0177)	-0.0142 (0.0295)
Region 3 × Posts To Next Thread Badge Squared	0.0029 (0.0063)	0.0374 (0.0279)	0.0002 (0.0028)	0.0040 (0.0122)	0.0027 (0.0081)	0.0045 (0.0135)
Region 3 × Posts To Next Thread Badge Cubic	-0.0004 (0.0007)	-0.0040 (0.0030)	0.0000 (0.0003)	-0.0004 (0.0014)	-0.0003 (0.0009)	-0.0005 (0.0015)
Region 4 × Posts To Next Thread Badge	0.0596* (0.0279)	-0.0024 (0.1002)	0.0121 (0.0102)	0.0690 (0.0426)	0.0381 (0.0284)	0.0754 (0.0470)
Region 4 × Posts To Next Thread Badge Squared	-0.0206 (0.0123)	0.0084 (0.0449)	-0.0038 (0.0046)	-0.0246 (0.0186)	-0.0131 (0.0125)	-0.0268 (0.0206)
Region 4 × Posts To Next Thread Badge Cubic	0.0017 (0.0014)	-0.0017 (0.0050)	0.0003 (0.0005)	0.0021 (0.0020)	0.0011 (0.0014)	0.0023 (0.0023)
Region 5 × Posts To Next Thread Badge	0.0722 (0.0412)	-0.0329 (0.1276)	0.0132 (0.0269)	0.1315 (0.0900)	0.0825 (0.0586)	0.1434 (0.0997)
Region 5 × Posts To Next Thread Badge Squared	-0.0406** (0.0162)	-0.0043 (0.0482)	-0.0116 (0.0101)	-0.0805** (0.0356)	-0.0521** (0.0230)	-0.0884* (0.0393)
Region 5 × Posts To Next Thread Badge Cubic	0.0054*** (0.0017)	0.0023 (0.0049)	0.0018 (0.0010)	0.0107** (0.0038)	0.0070** (0.0025)	0.0118** (0.0042)
Region 6 × Posts To Next Thread Badge	0.0499 (0.0613)	0.1907** (0.0750)	0.0142 (0.0256)	0.0669 (0.1182)	0.0398 (0.0775)	0.0738 (0.1317)
Region 6 × Posts To Next Thread Badge Squared	-0.0123 (0.0284)	-0.0689* (0.0333)	-0.0038 (0.0111)	-0.0170 (0.0533)	-0.0094 (0.0347)	-0.0187 (0.0593)
Region 6 × Posts To Next Thread Badge Cubic	0.0008 (0.0031)	0.0064 (0.0034)	0.0002 (0.0012)	0.0010 (0.0058)	0.0005 (0.0038)	0.0011 (0.0065)
Region 7 × Posts To Next Thread Badge	9.2340 (5.1261)	-1.3294 (1.1868)	-2.6045 (1.4200)	4.3126 (2.2631)	2.0906 (1.0947)	4.9571 (2.6005)

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C-25: Results for UGC Quantity, Timeliness and Quality with Badge Reward Only (Cont.2)

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Quantity	Timeliness	Quality			
			Length	Complexity	Informativeness	Politeness
Region 7 × Posts To Next Thread Badge Squared	-3.0888 (1.7037)	0.4967 (0.3940)	0.8705 (0.4719)	-1.4242 (0.7520)	-0.6887 (0.3637)	-1.6375 (0.8642)
Region 7 × Posts To Next Thread Badge Cubic	0.2584 (0.1415)	-0.0457 (0.0327)	-0.0727 (0.0392)	0.1177 (0.0625)	0.0568 (0.0302)	0.1354 (0.0718)
Region 9 × Posts To Next Thread Badge	-0.0050 (0.0136)	-0.0978* (0.0492)	-0.0020 (0.0085)	-0.0230 (0.0251)	-0.0171 (0.0174)	-0.0256 (0.0281)
Region 9 × Posts To Next Thread Badge Squared	0.0034 (0.0023)	0.0405*** (0.0108)	0.0051*** (0.0015)	0.0132** (0.0050)	0.0095** (0.0034)	0.0148** (0.0056)
Region 9 × Posts To Next Thread Badge Cubic	-0.0003 (0.0003)	-0.0044*** (0.0007)	-0.0009*** (0.0001)	-0.0019*** (0.0006)	-0.0013*** (0.0004)	-0.0021*** (0.0006)
Region 1 × Posts To Next Review Badge	-0.0518* (0.0260)	-0.1410** (0.0622)	-0.0209** (0.0087)	-0.0718 (0.0379)	-0.0502* (0.0254)	-0.0807 (0.0422)
Region 1 × Posts To Next Review Badge Squared	0.0614 (0.0386)	0.1967* (0.0922)	0.0261* (0.0131)	0.0881 (0.0573)	0.0618 (0.0383)	0.0994 (0.0639)
Region 1 × Posts To Next Review Badge Cubic	-0.0205 (0.0143)	-0.0728* (0.0337)	-0.0090 (0.0049)	-0.0305 (0.0214)	-0.0213 (0.0143)	-0.0345 (0.0239)
Region 2 × Posts To Next Review Badge	0.0164 (0.0220)	-0.0242 (0.0401)	-0.0007 (0.0094)	-0.0025 (0.0368)	-0.0038 (0.0250)	-0.0036 (0.0411)
Region 2 × Posts To Next Review Badge Squared	-0.0060 (0.0142)	0.0164 (0.0268)	0.0013 (0.0058)	0.0049 (0.0232)	0.0044 (0.0157)	0.0059 (0.0258)
Region 2 × Posts To Next Review Badge Cubic	0.0003 (0.0023)	-0.0029 (0.0045)	-0.0004 (0.0009)	-0.0014 (0.0038)	-0.0011 (0.0025)	-0.0016 (0.0042)
Region 3 × Posts To Next Review Badge	0.0968 (0.0630)	0.3238 (0.1899)	0.0383 (0.0270)	0.1410 (0.1171)	0.0958 (0.0781)	0.1574 (0.1303)
Region 3 × Posts To Next Review Badge Squared	-0.0529 (0.0394)	-0.2189 (0.1262)	-0.0224 (0.0172)	-0.0853 (0.0735)	-0.0581 (0.0491)	-0.0952 (0.0818)
Region 3 × Posts To Next Review Badge Cubic	0.0074 (0.0061)	0.0349 (0.0200)	0.0033 (0.0027)	0.0129 (0.0113)	0.0088 (0.0075)	0.0144 (0.0126)
Region 4 × Posts To Next Review Badge	-0.0041 (0.0649)	-0.1003 (0.1006)	-0.0041 (0.0345)	-0.0547 (0.1557)	-0.0330 (0.1046)	-0.0590 (0.1735)
Region 4 × Posts To Next Review Badge Squared	0.0138 (0.0346)	0.0390 (0.0487)	0.0052 (0.0183)	0.0422 (0.0807)	0.0260 (0.0543)	0.0459 (0.0899)
Region 4 × Posts To Next Review Badge Cubic	-0.0026 (0.0045)	-0.0036 (0.0058)	-0.0010 (0.0024)	-0.0067 (0.0103)	-0.0042 (0.0069)	-0.0073 (0.0114)
Region 5 × Posts To Next Review Badge	-0.1673 (0.0943)	-0.4057 (0.2272)	-0.1728*** (0.0563)	-0.3262 (0.1817)	-0.2337 (0.1232)	-0.3721 (0.2025)
Region 5 × Posts To Next Review Badge Squared	0.0744 (0.0481)	0.1591 (0.1264)	0.0729** (0.0293)	0.1482 (0.0926)	0.1049 (0.0631)	0.1685 (0.1033)
Region 5 × Posts To Next Review Badge Cubic	-0.0079 (0.0056)	-0.0159 (0.0155)	-0.0076* (0.0034)	-0.0164 (0.0108)	-0.0115 (0.0074)	-0.0186 (0.0121)
Constant	-0.0002 (0.0002)	-0.0001 (0.0004)	-0.0001 (0.0001)	-0.0002 (0.0002)	-0.0001 (0.0002)	-0.0002 (0.0003)
Individual-Day Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Source of Reward Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	128,458,902	128,458,902	128,458,902	128,458,902	128,458,902	128,458,902
R ²	0.09	0.19	0.52	0.47	0.45	0.47

Standard errors in parentheses

The dependent and independent variables are in logarithmic form.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$