

# MANAGING YOUR CUSTOMER'S TARIFF CHOICE: WHAT TO DO WHEN YOUR CUSTOMERS PAY TOO MUCH

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*Telecommunications companies traditionally offer several tariffs from which their customers can choose the tariff that best suits their preferences. Yet, customers sometimes make choices that are not optimal for them because they do not minimize their bill for a certain usage amount. We show in this paper that companies should be very concerned about choices in which customers pick tariffs that are too small for them because they lead to a significant increase in customers churn. In contrast, this is not the case if customers choose tariffs that are too big for them. The reason is that in particular flat-rates provide customers with the additional benefit that they guarantee a constant bill amount that consumption can be enjoyed more freely because all costs are already accounted for.*

Telecommunications companies traditionally offer tariffs that charge a fixed monthly fee and a price for each quantity unit that is consumed. Such strategies have become increasingly prevalent in many industries; pay TV companies, for example, offer different packages for different selections of channels, but charge an additional fee for special broadcasts such as live football games. The German national railway company, Deutsche Bahn, offers a fixed-price BahnCard that entitles the passenger to travel at a discount price for a year, and health clubs and recreation centers use similar pricing structures. Frequently, such companies offer more than one tariff to achieve better market segmentation. Deutsche Bahn, for example, offers BahnCard 25, BahnCard 50, and BahnCard 100 at yearly prices of € 55, € 220 and € 3,500 for second-class travel. The first two tariffs allow 25 and 50 percent discounts on standard fares, while BahnCard 100 allows free unlimited travel on the whole network.

Similarly, T-Mobile offers Relax 50, 100, 200 and 1000 tariffs, allowing customers to make 50, 100, 200 and 1,000 minutes of calls a month for € 10, € 20, € 30 and € 60 respectively.

Offering more tariff choices allows customers to pick those that best fit their individual preferences, but may also lead them to choose less than optimal tariffs that do not minimize their bill for a certain usage amount. For example, a customer may pick T-Mobile's Relax 1000 tariff, but regularly make less than 200 minutes of calls per month. As a consequence, they will end up with a monthly bill of € 60 when they could just as well use the Relax 200 tariff at half the price.

Such a mistake is known as flat-rate bias, because the customer picks a tariff that offers too many free minutes and pays too high a fixed fee. Put differently, the tariff is too "big" for him. In many instances, the "biggest" tariff a customer can choose would be the flat rate; hence the term "flat-rate bias".

Alternatively, another customer may pick T-Mobile's Relax 50 tariff, but frequently use 100 minutes per month. She would end up paying € 25 per month (€ 10 plus roughly € 0.30 for each of the additional 50 minutes), but could have saved € 5 per month by choosing the Relax 100 tariff at € 20 per month. Such a mistake is dubbed a "pay-per-use bias", because the customer has chosen a tariff that is too "small". The "smallest" tariff a customer can choose is often a pure pay-per-use one with no fixed fee.

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The crucial question for companies is whether these mistakes are beneficial. They allow them to charge higher bills and boost their short-term profitability, but customers may be upset when they recognize that they have paid more than if they had made a better tariff choice. In the best case, an upset customer will simply switch to the appropriate tariff. In the worst case, however, customers are so frustrated that they take their business elsewhere, in which case the boost in the company's short-term profitability substantially harms its long-term returns. We therefore wanted to explore the effects of such biases on profitability to better understand how managers should manage their customers' tariff choices.

*Customers often do not choose wisely*

Train / McFadden / Ben-Akiva (1987) observe that US households have a general preference for flat rates compared to standard measured service, and prefer flat rates for a more extended area to flat rates for a smaller area. Hobson / Spady (1988) report "a fair number of apparent 'mistakes'" when analyzing single-person household tariff choice, which for the most part involved choosing flat-rate service when the monthly billing rate under local measured service would have been lower.

Similar results are reported from an AT&T experiment where customers with zero consumption chose a block-of-time tariff instead of a standard usage-based rate (Mitchell / Vogelsang 1991). Also, 45 percent of the customers that pay a fixed monthly rate for a percentage discount on evening and weekend calls, use fewer

than the break-even volume required to have a lower bill than under standard measured service. Kridel / Lehman / Weisman (1993) find that of the 93 percent of customers having selected flat rates, nearly 65 percent would save money had they purchased local measured service, whereas of the 7 percent that selected local measured service only 10 percent would benefit from switching to the flat rate.

Based on health club usage data, Malmendier / DellaVigna (2006) observe that customers choose annual contracts, even though they would pay less per visit and thus forgo an average savings of \$700 during their membership. This means they pay 70 percent more than they would have done on a per-visit basis.

All these studies indicate that flat-rate bias is much more prominent than pay-per-use bias. Only Miravete (2002) finds that 6–12 percent of customers wrongly choose the flat rate but 62–67 percent wrongly choose measured service.

*What should you do if customers do not always choose wisely?*

We wanted to know what managers should do when customers make the wrong decisions. Should they tell them, or just take the extra money? We therefore had to understand the extent of these mistakes, their causes and, most importantly, their effects on customer switching, churn, and long-term profitability.

We collected a unique set of transactional data for a representative sample of 10,882 customers of a European internet service provider (ISP), covering a sample period of up to 5 months, which could be matched to the results of a survey of 941 of the ISP's customers. This allowed us to carry out a detailed analysis of tariff choices. There was a choice of three DSL tariffs:

» Companies do not need to be concerned about customers with a flat-rate bias, though they should be worried about those with a pay-per-use bias, because the increase in short-term profitability is completely offset by the substantial increase in churn rates. «

- > Tariff 1 had a fixed fee and a low monthly allowance, with an additional charge per megabyte of data over and above the allowance.
- > Tariff 2 had a higher fixed fee and a higher allowance than tariff 1, but the same charge for usage exceeding the allowance.
- > Tariff 3 was subject to a flat rate with unlimited usage.

Because of the low allowance, tariff 1 closely resembles a pay-per use tariff.

*Do flat-rate bias and pay-per-use bias really exist?*

First, we analyzed whether the 10,882 customers picked tariffs that with hindsight were more expensive than others. We calculated how much they actually paid, and how much they would have paid for the same usage volume on alternative tariffs. We examined their actual and potential bill amounts over (i) several billing periods and (ii) every single billing period to see if they were (i) wrong overall or (ii) always wrong. "Wrong" here means that they chose a tariff that turned out to be more

expensive for them than another one. The results, shown in table 1, confirm that there was a flat-rate bias and, to a lesser extent, a pay-per-use bias. When the results were analyzed over a five-month period they showed that the flat-rate bias persisted over time, whereas the pay-per-use bias seldom did.

In this analysis, more than half the customers with a flat-rate bias paid at least 100 percent more than they would have done on the least costly tariff. More than half of those with a pay-per-use bias paid at least 20 percent more than the least costly tariff. This confirms that most customers who picked the wrong tariff did not

**TABLE 1 :**  
Existence of tariff-choice biases – Why do customers make "wrong" choices?

**CRITERION 1: "OVERALL WRONG"**

**CRITERION 2: "ALWAYS WRONG"**

*3 Months*

		Best Tariff		
		Tariff 1	Tariff 2	Flat Rate
Chosen Tariff	Tariff 1	93.7 %	5.3 %	1.0 %
	Tariff 2	48.1 %	43.4 %	8.5 %
	Flat Rate	19.8 %	8.4 %	71.8 %

N = 10,882

*3 Months*

		Best Tariff		
		Tariff 1	Tariff 2	Flat Rate
Chosen Tariff	Tariff 1	98.7 %	1.2 %	0.1 %
	Tariff 2	37.6 %	61.1 %	1.3 %
	Flat Rate	17.6 %	7.8 %	74.8 %

N = 10,882

*5 Months*

		Best Tariff		
		Tariff 1	Tariff 2	Flat Rate
Chosen Tariff	Tariff 1	94.5 %	4.7 %	0.8 %
	Tariff 2	46.4 %	47.8 %	5.8 %
	Flat Rate	14.3 %	12.0 %	73.7 %

N = 7,559

*5 Months*

		Best Tariff		
		Tariff 1	Tariff 2	Flat Rate
Chosen Tariff	Tariff 1	99.6 %	0.4 %	0.0 %
	Tariff 2	29.3 %	70.4 %	0.3 %
	Flat Rate	10.5 %	10.5 %	79.0 %

N = 7,559

Table 2:  
INCREASE IN TARIFF SWITCHING AND CHURN PROBABILITIES

		CRITERION 1: "OVERALL WRONG"					CRITERION 2: "ALWAYS WRONG"				
		Best Tariff			Significance		Best Tariff			Significance	
		Tariff 1	Tariff 2	Flat Rate	FRB	PPUB	Tariff 1	Tariff 2	Flat Rate	FRB	PPUB
Chosen Tariff	Tariff 1		+220 %	+240 %				+233 %	+183 %		***
	Tariff 2	+150 %		+250 %	-	-	+67 %		-100 %	-	-
	Flat Rate	0 %	1 % <sup>1</sup>		-		0 %	1.1 % <sup>1</sup>		*	
Chosen Tariff	Tariff 1		+340 %	+1040 %				+650 %	+833 %		***
	Tariff 2	-25 %		+538 %	-	***	-50 %		+492 %	**	***
	Flat Rate	+63 %	+25 %		-		+67 %	-100 %		-	

\*\*\* Difference is significant at 0.01

\*\* Difference is significant at 0.05

\* Difference is significant at 0.1

- Not significant at 0.1

1) Tariff switching rates or flat-rate customers for whom flat rate is least costly tariff are zero, therefore actual tariff-switching rates are listed

N = 10,882

just deviate slightly from the least costly tariff. We were able to confirm this result in additional laboratory studies (Refer to table 1).

Our additional analysis of the survey results showed that these wrong choices have three distinct causes:

- > The “insurance effect”, where customers choose a flat-rate tariff because they want to avoid any variation in their monthly bills. This would be the case on a pay-per-use tariff if their usage varied over time. Hence, the flat-rate option represents an insurance against periods when customers might use the service more than they usually do.
- > The “taxi-meter effect”, which indicates that customers enjoy their usage more when paying a flat rate than with a pay-per-use tariff. The theory of mental accounting assumes that the cost of purchasing an item leads to an immediate pain of paying which can undermine the pleasure derived from its consumption (Prelec / Loewenstein 1998). Paying per use lessens the pleasure of consumption, as the cost, and thus the pain of paying, are attributed to the consumption at the time of usage. Basically, this theory says that a taxi ride is more enjoyable if the ride is prepaid because the ticking of the taxi meter no longer reduces the pleasure of the journey.
- > The “overestimation effect”, in which customers overestimate their need for the service and consequently pick a flat-rate rather than a pay-per use tariff.

All three reasons are important in explaining why customers have flat-rate biases. Interestingly, only the overestimation effect is driven by a cognitive error on the customer’s part, whereas the insurance and taxi-meter effects indicate that customers derive additional utility from a flat-rate tariff. Additional laboratory studies confirmed our results.

The less frequent pay-per-use bias was driven by customers underestimating their own usage – in other words, it was a cognitive error.

#### *What are the consequences of those “wrong” choices?*

So what does this mean in terms of long-term profitability? If customers simply ignore their wrong choices and the fact that they are throwing money away, companies could easily use this to increase their revenue and profit.

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On the flip side, customers may realize they are paying too much, become dissatisfied, and simply walk away. We therefore calculated tariff-switching and churn probabilities for the different tariffs.

Table 2 shows the differences in these two probabilities between customers with and without tariff-choice biases. For example, the tariff-switching probability of customers on tariff 1 with a pay-per-use bias who consistently made wrong tariff choices (labeled “criterion 1”) was 220 percent higher than that of customers for whom tariff 1 was the least costly. For customers that would pay the least on the flat rate, the tariff-switching probability was 240 percent higher. The corresponding differences in tariff switching were substantially smaller for customers on the other tariffs. Thus, both biases led to a higher tariff-switching probability, though this was more likely for customers with a pay-per-use bias than for those with a flat-rate bias.

The churn figures point to a different conclusion: customers with flat-rate bias did not have a significantly higher probability of taking their business elsewhere. In contrast, the monthly churn rates for customers with pay-per-use bias were 340 to 1,040 percent higher than those of customers that had chosen the least costly tariff. The pay-per-use bias, but not the flat-rate bias, increases customer churn. When deciding whether to switch or go elsewhere, customers with a flat-rate bias tend to switch to another tariff with the same provider, whereas customers with a pay-per-use bias tend to leave (Refer to table 2).



» Customers with a flat-rate bias are not unhappy about paying more than they would have done under the least costly tariff. «

Next, we analyzed the long-term impact on profits by calculating customer lifetime values in a customer migration model. We assumed that those with tariff-choice biases could choose between keeping the tariff, switching to the least costly tariff, or going elsewhere, and we used the observed switching and churn rates as the probabilities of moving from one state to another. We discounted future profits by 10 percent and compared the lifetime value of customers with tariff-choice biases to their lifetime value if they had chosen the least costly tariff from the beginning.

The results show that, in the short term, profitability is higher for customers with pay-per-use bias than for those with flat-rate bias. However, in the long term the lifetime value of customers with flat-rate bias is substantially higher than that of customers with a pay-

per-use bias. This is a result of the higher switching rates, and in particular the higher churn rates, of customers with pay-per-use bias.

#### *What are the implications of our results?*

Our results indicate that customers with a flat-rate bias are not unhappy about paying more than they would have done under the least costly tariff. This remarkable outcome is driven by the particular characteristic of flat-rate tariffs: they guarantee that the bill amount is constant and customers can more freely enjoy their consumption because all costs are already accounted for. While some customers with a flat-rate bias also suffer from an overestimation effect, this cognitive error is not so large as substantially to increase churn rates.

Consequently, companies do not need to be concerned about customers with a flat-rate bias, though they should be worried about those with a pay-per-use bias, because the increase in short-term profitability is completely offset by the substantial increase in churn rates. We therefore recommend that companies inform these customers of their apparent mistake in picking the wrong tariff, which is driven by an underestimation of usage. This strategy should allow them to lower their churn rate.

All in all, customers seem to have a general preference for flat rates, which is in line with the results of other studies. Prelec/Loewenstein (1998), for example, analyzed several products and services (such as public transportation, food during a cruise, health clubs and long-distance phone calls), asking customers whether they preferred flat rates, payment per use or neither. They found that on average 52 percent preferred the flat rate whereas only 28 percent preferred payment per use.

We believe that the results of our analyses are valid across a range of products and services, such as cell-phones and fixed-line services, access to wireless local area networks, car rental and public transportation. For services where customers pre-commit to a certain amount of usage, such as exercising twice a week in a health club, pre-commitment may also affect tariff choice. Pre-commitment is likely to occur when customers need to make a considerable short-term investment, for example in terms of physical effort, and receive long-term benefits such as better health. So instead of looking for the minimum billing rate for a given usage,

these customers intend to force themselves to follow a certain type of behavior. This attitude results in a strong flat-rate bias.

A key message from our analyses is that companies should carefully consider any pricing decisions that may affect flat-rate customers, such as withdrawing the flat-rate option. They should encourage them to take up this option by emphasizing the benefits, such as the pleasure and independence that a flat rate brings (the taxi-meter effect), or the reliability of the billing rate (the insurance effect). In addition, companies also have an incentive to increase customers' perceptions of usage intensity (the overestimation effect) by highlighting the different ways in which they could use the product or service.

Flat-rate tariffs may present a risk if the company serves a significant segment of extremely heavy users. To avoid dramatic increases in costs, many businesses have introduced a fair use policy that caps usage at a level which exceeds that of the average user but makes the offering substantially less attractive for heavy users.

Importantly, a company will not only reduce its profits when customers suffer from pay-per-use bias, but will also be in danger of negatively affecting its reputation. Customers who realize they have chosen the wrong tariff may blame the company rather than themselves for paying too much. In addition, the high churn rates of pay-per-use customers may adversely affect the company's reputation. Therefore, businesses should steer new customers towards the flat-rate option or tariffs with high usage allowances and suggest that existing customers with a pay-per-use bias switch to a tariff with a higher fixed fee and usage allowance. •

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