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Does Distance Influence Profitability of Bank Customers?

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Abstract

This study aims to identify whether customers who live further away from bank branches where they opened their checking accounts are as profitable as those who live closer. For this purpose, it were selected 30 bank branches of one of the largest retail banks in Brazil and it was used analysis of variance in order to compare customer mean profitability of these branches among primary, secondary and fringe trading areas for those customers who receive their salaries by the bank and also for those who don´t receive. Regardless of whether customers receive or not their salaries by the bank, those who live further from the branches where they opened their checking accounts are as profitable as those who live closer and, in some cases, they are more profitable. So, Banks must take into account all customers of a branch and not only those who live closer it in order to develop strategies for customer retention and for increasing profitability provided by customers. It was also possible to conclude that trading area theory according to which the importance of each one of three trading areas in relation to profitability provided by customer is different, isn´t applied for banks, because there aren´t no significant differences in profitability provided by customers according to the distance they live from the branches. Generalizations are limited to São Paulo (Brazil) city and active individual customers.

Index terms— bank customer profitability, trading area, peformance.

1 Introduction

n recent years, brazilian banking sector was characterized by several changes, and we can highlight the increased of competition among banksand the form of customer relationship with them. Increased of competition has basically occurred for two reasons: the first one, due to the possibility of portability among financial institutions ofall types of bank loansobtained by customers, according to the Central Bank of Brazil Resolution number 3,401/2006; the second one, due to fall in basic interest rate of the economy, Selic Rate, from 19.5% in January, 2002 to 11.65% i Regarding the form of customer relationship with banks, the possibilityof performing banking transactions remotely has decreased customer needs to go to bank branches, because they can pay their bills, check balance, in some cases invest money and obtainbank loan, and perform other transactions by alternative channels such as internet. According to table 1, the volume of transactions performed atalternative channels has been increasing and atbranches has been remaining constant, although the number of bank branches increased from 13, **??**96 in December, 2013, which reduced bank spread. Such situations have forced banks to increase their volume of loans and deposits in order to remain profitable, as well as, to identify potential customers in order to increase profitability. ii So, it is possible that customers who live further away from branches are as profitable as those who live closer. This phenomenon doesn´t occur in general retail, because customers who live in primary trading area,ie, closer to stores,are more profitable than those who live further away (Berman and Evans, 2006; Levy and Weitz, 2008). Understanding this relationship is important for banks to develop strategies for their bra nches according to potential of profitability that each customer or customer segment can provide, not considering only those who live closer to branches.

Therefore, this study aims to identify whether customers who live further away from bank branches are as profitable as those who live closer. Thus, we selected 30 bank branches located in São Paulo city (Brazil) of one of the largest retail bank in Brazil and by analysis of variance, using Bon ferroni method, we compare customer mean profitability of these branches among primary, secondary and fringe trading areas for those customers who receive their salaries by the bank and also for those who don´t receive.

2 II.

3 Review of Literature a) Banking services channel

The location of bank branches is one of the key factors that people take into account to choose the bank which they will become customers. (Clemes et al., 2010;Devlin, 2002;Dick, 2007;Lee and Marlowe, 2003;Ta and Har, 2000). However, after becoming customers, they can perform their transactions (bill payments, check balance, invest money, request bank loans, etc.) at any branch or alternative channels in which they perform their own transactions without the help of an employee, through self-service technology (Meuter et al., 2000). These alternative channels are internet banking, ATM, mobile banking and call center (in some situation, in this last case, it is necessary a contact with an employee).

Alternative channels are generally used for standard banking transactions (cash transfer, bill payments, etc.) and are rarely used for product sales (Bielski, 2007)which are usually conducted atbranches. Branches are also responsible for performing customer standardized transactions through bank tellers, when customers wish. Many banking business can be performed on line, as requesting bank loans and investing money, but the propensity to use internet to invest will depend on investor´s level of knowledge about financial investments **??**Pellinen et al., 2011), otherwise they will prefer to be served at bank branches.

On the other hand, factors as security ((Laukkanen and Kiviniemi, 2010) and habituation to perform many transactions through other channels (Iallouna and Chemingui, 2013) in hibitsuse of mobile banking, but even so, the number of transactions at alternative channels has been increasing at a higherrate than transactions performed at branches, as explained atintroduction. On the other hand, a significant part of transactions performed at bank branches can be considered remote, because 40% of customers when perform them, it is at a different branch from which they opened their accounts. (Coughlan et al., 2010).

It mustbe also considered that because of convenience provided by alternative channels technology, it is one of the factors that influence customer satisfaction (Kaura, 2013), and it should provide a positive experience to increase word of mouth and the volume of deposits and bank loans (Klaus et al., 2013), because according to Aksoy (2014), variation in volume of deposits, one of the measures most commonly used to measure the performance of banks, is 55% explained by customer satisfaction.

4 b) Performance measures

Deville and Leleu (2008) suggestedrelativized measures to measure the performance of banks, in which expenses, number of check accounts, etc., should be divided by total of deposits, because according to the authors, they reflect the main activity of banking sector. On the other hand, despite being important to measure market share, deposits don´t either measure profitability, or consider costs.

So, Moeni et al. (2011) considering Customer Life Value -CLV definition (present value of projection profitability of future results), established a definition of performance for banking sector which consists in the present value of the sum of revenues to be generated by their customers, deducted costs, including those related to attraction, sales and services.

For this study, considering that it aims to compare customers profitability in relation to the distance they live from the branch where they opened their checking accounts, the best measure for profitability is the contribution margin provided by customers, because it considers revenue from all products and services, including interest rate payments, and bank expenses with customers.

5 c) Importance of location

A measure to check how store location is attractive to customers, it is its trading area, because according to Parente and Barki (2014, p. 330), "reflects the spatial dimension of the retail market demand [...] is defined as the geographic area containing most consumers of a store", which extension will depend on store power to attract consumers.

In general retail,usually, the market potential and the socio-demographic characteristics of trading area are factors that influence performance, sales volume, customers segmentation strategy, internal characteristics of store environment (number of cash tellers, for example) and opening hours (Kumar and Karande, 2000). Camargo Jr. and Elias (2010) identified that the potential of each store also depends on its location, because it is one of trading area determining factors and according to its extension, stores can attract customers from different places whose consumer behavior can varies a lot.

Bank branch performance is also influenced by local characteristics and its trading area. According to Deville and Leleu (2008) there are differences in branch results according to geography area of operation, which requires different development of strategies, different incentives and different performance estimation for each branch or

region. According to Applebaum (1966), trading area relates to the customers' geographical dispersion around a store, and travel time by car (or another measure of time in relation to distance). It can be divided into three segments: a. Primary area: the region closest to the store, in which most of its customers are concentrated. The percentage of customers may vary according to the type of trade and location, but it generally encompasses 60% of customers. According to Parenteand Barki (2014), the percentage ranges from 60to75%, however Levy and Weitz (2008) restrict this to 60-65%, and Berman and Evans (2006) extend it to 50-80%; b. Secondary area: the region around the primary. This is of secondary importance in terms of sales, accounting for 15 to 25% of customers (Parente and Barki, 2014; Berman and Evans, 2006); c. Fringe area: this contains the remaining customers, includes those who buy occasionally and it is considered a residual area.

III.

6 Methodology a) Data Extraction

From one of the largest bank in Brazil, we selected a sample, by judgment, of 30 bank branches located in São Paulo city, with the aim of composing a representative sample of branches according to their different sizes, regions and the socio-economic levels of their surroundings and being dispersed over all areas in the city. For each one of these branches, we obtained from the bank´s database system the following data about active individuals customers (those who are using the bank services). a. Home address; b. Contribution margin of two periods; c. If the customer receive or doesn´t his salary by the bank For every customer, through mapinfo software, we calculatedthe linear distance between customer´s home and the branch.Customers whose addresses could not be processed due to any data inconsistency, such as no number of residence, street not located by the software, and other inconsistencies, were discarded corresponding to 12% of total customers. Thus, for this study, 84,241 customers were considered.

Considering that for customers whoreceive their salaries by the bank, opening of checking account is mandatory, and in some cases, customers can´t even choose the branch in which he will open his account, we divided customers into two groups: those who receive their salaries by bank and those who don´t.

For each branch andforeach group of customers, we calculated the mean of contribution margin of two periods, the primary trading area, corresponding to a radius that encompasses 50% of customers who live closer to the branch, the secondary trading area (around primary one) which encompasses 40% of customers and the fringe one, containing 10% of remaining customers (Hanna, 2011).

In order to identify whether there is any significant difference in profitability provided by customer amongthree trading areas, a comparison of meanprofitabilityamong these areas by branch and by customer group was performed at 5% significance level, using for this purpose, analysis of variance byBonferroni method, since the number of customers in each trading area is different. We performed 180 comparisons, because they were performed among three trading areas (primary -secondary, primary -fringe, secondary -fringe), for two groups of customers for each one of 30 branches.

IV.

7 Data Analysis, Results and Discussion

For both groups of customers, the contribution margin varies a lot, because for those whodon´t receive their salaries by the bank, the variationcoefficient (standard deviation / mean) of the contribution margin resulted in 290%, and for those who receive,in 193%. Contribution margin is negative for 4% of total customers because of several factors, such as default. This variation of profitability can also be observed in relation to all customers of the same branch, varying from 182 to 419%, for customers who don´t receive their salaries by the bank, and from 144% to 344% for those who receive.

One factor that may explain this variation in contribution margin among customers is the high extent of trading area that enables branches to attract customers from different parts of the city with different socio-demographic profiles. Thus the income of customers of a branch varies a lot, and the higher the income, greaterthe possibility of investing higher values or obtaining higher values of bank loans, and this increases the profitability provided by customers.

The mean contribution margin provided by customerswho receive their salaries by the bank (M (33,865) = 123.52) is higher than for those who don´t receive (M (50,376) = 62.63), and the difference between these means is significant (t (84,239) = 41.95, p <.01).

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9 A

Considering just customers who don´t receive their salaries by the bank, we compared customer mean contribution marginamong three trading areas by branch, using for this purpose analysis of variance by Bonferroni method,and we concluded that for 17 branches there aren´t significant differences at 5% significance level.

10 A

So there are 13 branches with some significant difference in mean profitability by customer between at least two trading areas: as we can see at table 5, forfivebranches (4, 9, 11, 21 and 26)significant differences (p <.05) arebetween primary and secondary trading area, with no significant differences betweeneach one of these two areas and the fringe one.

Therefore, we canconclude that, proportionally, the fringearea is as important as the primary and secondary one and it can´t be considered a residual area. In addition, customer mean profitability in secondary area is higher than in primary one for branches 4 and 26,as evident from the negative sign resultant from difference betweenmean profitability by For other four branches **??**3, 5, 7 and 27), significant differences are between the primary and secondary area, and between the primary and fringe one, with no significant differences between the secondary and fringe area. So, we can conclude again that fringe area isn´t a residual one, because it is, proportionally, as important as the secondary area which represents 40% of customers.

For branch 8,significant difference is between secondary and fringe area, and for branches 12 e 16, significant differences are between primary and fringe one. In these cases, we can´t also say that fringe area is residual, because, proportionally, in first case,it is as important as primary one, and in the second case it is as important as secondary one.For these three branches, we can´t also say thatthe secondary area is less important than primary one, because there isn´t significant difference of customer mean profitability between these two areas.

Finally, for branch 15 there are two significant differences: between primary and fringearea and between secondary and fringe one, however, mean profitability by customer is higher in fringe area, as evident from the negative sign resultant from difference between primary and fringe area and between secondary and fringe one.

Table **??** : Branches with Difference in Customer Mean Profitability among Trading Area: customers who don´t receive their salaries by the bank Thus, although in some situations there are differences in customer mean profitability among primary, secondary and fringe trading areas, we can´t say that mean decreases from primary tofringe area such as in general retail. But even if it decreases, for more than half of analyzed branches, 17, there aren´t significant differences in customer mean profitability among trading areas. Therefore we can conclude that profitability provided by customer is not related to the distance they live from the branch where they opened their checking accounts.

We can observe the same phenomenon for customers whoreceive their salaries by the bank, including the number of branches (13) with significant differences in customer mean profitability between at least two trading areas. In these 13 branches, as show in tables6 and 7, which are not necessarily the same when we considered only those customers who don´t receive their salaries by the bank, fringe area can´t also be considered a residual one and, in some cases, customer mean profitability in secondary area is higher than in primary one (branches 8 and 23); and in other customer of primary and secondary area. So, we can also conclude that for these twobranches, the secondary is not an area of less importance than the primary one.

11 one (branch 23

). There is also a specific case: branch 29 whose significant difference between means are among three trading areas; thefringe area has the highest mean profitability by customer and the primary one, the lowest, as evident from the negative sign resultant from difference between mean profitability by customer of: primary and secondary area, primary and fringe one and secondary and fringe area. V.

12 Conclusion

The study aimed to identify whether profitability provided by a bank customer is related to distance he lives from the branch where he opened his checking account. As measure of customer profitability, we used contribution margin because it reflects revenues from all purchased products and services by customers, including payment of fees, of interest rate, etc., and considers all expenses with them.

Thus, we selected a sample of 30 bank branches located in São Paulocity (Brazil) and from these branches we selected all active individual customers, totaling 84,241. From the bank´s database system, we obtained the following data by customer: home address, contribution margin and whether the salary´s customer was or not received by the bank. Through map info software, we calculated the linear distance between customer´s home and the branch, enabling usto calculate primary, secondary and fringe trading area, considering customers who receive their salaries by the bank and those who don´t receive.

Customers were divided into groups: those who receive their salaries by the bank and those who don´t. Mean profitability provided by customers who receive their salaries by the bank is higher than those who don´t receive. For each group of customers and for branch, we compared mean profitability by trading area, using for this purpose analysis of variance, and we could conclude that for most cases there aren´t significant differences among three trading areas and when there was a significant difference, generally, fringe trading area couldn´t be considered a residual one, and in some cases, mean profitability by customer in this area was higher than in primary, as well as, in some cases, mean profitability in secondary area was higher than in primary one.

So, we could conclude that customers profitability is not related to the distance they live from the branch where they opened their checking accounts, therefore trading area theory doesn´t apply for banking sector, because according to this theory: customers who live closer to store (primary trading area) are more profitable than those

who live far away (in secondary or fringe trading area), fringe area is considered a residual one and secondary area is considered of less importance, compared to primary one.

Bank managers must take into account all customers and not just those who live closer to the branch or who go there frequently in developing customers retention and loyalty strategies. Branch employees should establish regular and personalized contacts with those customers who live further away or rarely go to the branch, since they are profitability or are potential to be so. Whenever possible, the evolution in the remote service or self-service technology should take these aspects into account.

The study was limited to São Paulo city and considered only individual customers. This same study could be replicated to other major cities of the country and cities abroad, also considering legal entities. Regarding variables, other could be considered as level of loyalty, types of purchased products and services, and so on.

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Branch	Customers	Mean Contribution Margin (US$)	Variation Coefficient (%)	Primary Trading Area (Km)	Secondary Trading Area (Km)	Fringe Trading Area (Km)
1	580	19	419	10.6	23.8	2,369
2	3,328	63	235	3.3	11.1	2,195
3	1,669	55	182	5.2	19.8	1,474
4	2,036	77	275	2.7	16.4	2,311
5	2,611	69	344	8,7	25.5	2,368
6	1,711	82	351	5.8	24.1	2,370
7	1,433	74	269	9.0	27.1	1,493
8	2,589	60	302	1.5	12.3	2,320
9	2,155	51	213	2.6	12.5	2,461
10	1,676	76	289	4.3	19.0	2,371
11	765	116	242	7.9	22.9	1,460
12	1,775	61	351	2.6	17.3	421
13	1,130	52	284	1.6	16.0	2,095
14	1,271	48	295	14.5	25.9	2,240
15	2,594	69	320	2.6	7.7	2,196
16	1,062	96	259	6.7	19.7	888
17	1,384	56	244	1.6	10.7	2,298
18	1,347	68	234	0.9	21.7	2,694
19	1,439	64	230	7.6	21.9	2,368
20	2,674	63	233	2.4	9.0	2,831
21	1,396	86	325	9.5	22.7	2,365
22	1,446	43	258	1.5	7.2	2,275
23	1,743	44	243	2.0	6.7	1,346
24	1,720	61	214	1.7	10.4	2,698
25	618	80	383	2.7	18.3	492
26	1,517	57	241	2.0	9.5	1,386
27	2,143	55	234	10.1	25.3	1,454
28	712	62	305	9.4	22.6	2,371
29	2,976	42	253	2.9	16.1	2,360
30	876	58	369	2.6	11.2	1,700
Minimum	580	19	182	0.9	7.2	421
Maximum	3,328	116	419	14.5	27.1	2,831

Figure 1: Table 2 :

3

b) Analysis Process

Figure 2: Table 3 :

4

Does Distance Influence Profitability of Bank Customers?												
Branch		df Total			df F Between Groups				Sig			
	22	1,445			2	.244			.783			
	19	1,438			2	.278			.758			
	20	2,673			2	.609			.544			
	24	1,719			2	.729			.482			
	25	617			2	.891			.411			
Year	6 18	1,71	1,346		2 2	1.147	1.246		.318	.288		
6 Volume XV	2 10 1	3,327	1,675	579	2 2 2 2	1.318	1.512	1.519	.268	.221	.221	
Issue XI Version I ( )	23 17	1,742	1,383	1,270	2 2 2 2	1.540	2.294	2.510	.215	.101	.082	
	14 28	711	1,129	2,975	2 2 2	2.530	2.591	2.588	.081	.075	.075	
	13 29	875	2,588			2.879	3.667		.057	.026		
	30 8											
Global Journal	16 9 26	1,061	2,154	1,516	2 2 2 2	4.157	4.176	4.536	.016	.015	.011	
of Management	4 12 11	2,035	1,774	764	2 2 2 2	4.738	5.334	5.469	.009	.005	.004	
and Business	5 21 7 3	2,61	1,395	1,432	2 2 2 2	6.525	6.686	8.498	.001	.001	.000	
Research	27 15	1,668	2,142	2,593		9.162		10.577	.000	.000	.000	
						17.142						

Figure 3: Table 4 :

6

	Branch	df Total			df	F Between Groups			P		
	11	287			2	.003			.997		
	4	1,359			2	.027			.974		
	18	556			2	.133			.876		
Year	6 17	984	1,171		2 2	.223	.344		.800	.709	
	22	453			2	.390			.677		
Volume	1 19 20	1,043	202	570	2 2 2 2	.686	.838	.913	1.048	.505	.433	.402
XV	24 25 3	1,034	1,74	329	2 2 2 2	1.375	1.747	1.929		.351	.254	.175
Issue XI	15 16 14	1,253	1,009	431	2 2	2.054	2.198	2.326		.146	.130	.112
Version I	26	1,035								.098		
( )	7	1,047			2	2.909				.055		
Global	13 30 9 8	2,556	359	1,831	2 2 2 2	3.450	3.571	3.703		.032	.029	.025
Journal	21 23 2	1,258	739	308 995	2 2 2 2	5.324	6.236	6.777		.005	.002	.001
of Management	10 28 12	755	2,109	1,457	2 2 2 2	7.644	7.839	8.734		.000	.000	.000
and Business Research	27 5 29	1,237	1,212	4,516	2	8.729	9.651	15.299		.000	.000	.000
						31.355				.000		

[Note: A case this mean in fringe area is higher than in primary]

Figure 4: Table 6 :

7

Branch	Difference Between Trading Areas	Mean Diference	Sig
9		20.75	.028
13	Primary -Secondary	43.58 115.38	.029 .001
21			
30		38.42	.047
2	Primary -Secondary Primary -Fringe	33.57 59.66	.009 .004
5	Primary -Secondary Primary -Fringe	65.97 47.67	.000 .047
10	Primary -Secondary Primary -Fringe	71.14 78.26	.001 .041
12	Primary -Secondary Primary -Fringe	85.34 90.95	.000 .034
23	Primary -Secondary Primary -Fringe	-35.45 -50.11	.005 .020
27	Primary -Secondary Primary -Fringe	50.79 62.87	.000 .009
28	Primary -Secondary Primary -Fringe	118.1 134.55	.000 .024
8	Primary -Secondary Secondary -Fringe	-29.11 49.6	.026 .021
	Primary -Secondary	-40.24	.000
29	Primary -Fringe	-83.5	.000
	Secondary -Fringe	-43.26	.001

Figure 5: Table 7 :

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