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Abstract

Using a discrete choice random utility model and unique data from a nationwide consumer survey, we show that consumers view credit cards as highly differentiated products with both bank-level and card-level nonprice features. They select their credit cards by predominantly considering these nonprice features. Although they charge higher prices, the majority of consumers choose private banks as issuers due to their bank-level and card-level nonprice benefits. Consumers who prioritize prices tend to choose participation or public banks. Product differentiation and bundling seem to underlie banks' market power in the Turkish credit card market. Large private banks and public banks reap the benefits of bundling more than the other banks. Of card-level nonprice features, installments, bonuses/rewards/miles, and the prestige of the card seem to be particularly effective in consumers' decisions. We argue that this highly differentiated nature of credit cards can be an alternative explanation for the credit card pricing puzzles.

Keywords: Credit Card Pricing Puzzles, Discrete Choice Analysis, Nonprice Competition, Product Differentiation, Bundling, Market Power

JEL Classifications: G21, G28, O16, L11

ملخص

باستخدام نموذج المنفعة العشوائي المنفصل والبيانات المتفردة من مسح المستهلكين على مستوى البلاد ، نوضح أن المستهلكين ينظرون إلى بطاقات الائتمان على أنها منتجات متميزة للغاية مع ميزات غير مثبتة على مستوى البنوك، أو غير مرتبطة بخصائص سعر البطاقات . حيث يختار المستهلكون بطاقات الائتمان الخاصة بهم بالنظر في الغالب إلى هذه الميزات غير المرتبطة بالسعر، وعلى الرغم من أنها تفرض أسعارًا أعلى ، فإن غالبية المستهلكين يختارون البنوك الخاصة كجهات إصدار بسبب مزاياها غير مصرفية على مستوى البنوك والبطاقات. أما المستهلكون الذين يهتمون بالأسعار كأولوية بالنسبة لهم فهم يميلون إلى اختيار الشركات أو البنوك العامة. يبدو أن تمايز المنتجات وتجميعها في حزم هو مكمن قوة البنوك في سوق بطاقات الائتمان التركية. البنوك الخاصة الكبيرة والمصارف العامة تجني فوائد التجميع أكثر من البنوك الأخرى. ويبدو أن المزايا غير السعرية على مستوى البطاقات، أو الأقساط ، أو الحوافز، أو المكافآت أو الأميال ، ومكانة البطاقة نفسها أكثر جذبا خاصة في قرارات المستهلكين. نحن نخلص إلى أن هذا الطابع المميز للغاية لبطاقات الائتمان يمكن أن يكون تفسيراً بديلاً لألغاز تسعير بطاقات الائتمان.

1. **Introduction**

How consumers' preferences lead them to select credit cards out of many choices is not only a matter of interest to banks. Consumers' preferences are also a defining component of the market structure and hence critical for regulatory authorities. In this paper we identify price and non-price factors on which people place emphasis when choosing their credit cards in Turkey. We then discuss the implications of these preferences for the market structure.

The Turkish credit card market has experienced an enormous expansion in the last decade. With an average annual growth rate of 10%, the number of credit cards increased from 15.7 million in 2002 to 58.8 million in 2016, making Turkey the first country in Europe in this respect. In the same period, total transaction volume increased from 15 to 210 billion USD, amounting to a 20% annual growth rate.[1] Meanwhile, on grounds of high market concentration, high prices, high profitability, and high incidences of delinquency and default, the market underwent a series of regulations: the consumer protection law in 2003, interchange fee regulation in 2005, interest rate regulation in 2006, annual fee regulation in 2013, and the regulations on limits, installments and minimum payments in 2013 and 2014.[2] Given the complex nature of credit card markets and the widespread concerns about cardholders' financial literacy, further regulations are quite likely in the future. By identifying consumer preferences and underlying mechanisms that may lead to high prices, our study aims to contribute to future regulations in this market.

[1] The Central Bank of the Republic of Turkey and Interbank Card Center.
[2] See Akin et al. (2013) for more information about the Turkish credit card market.

There is a large and growing literature on credit card pricing puzzles, one of which is the interest rate puzzle.[3] Although numerous explanations have already been proposed as to why credit card interest rates may be "too high" and why their regulation may be warranted, there is little consensus on this issue, leaving a large space for further empirical research.

The uncollateralized nature of credit card loans that leads to higher default risk, large investments in technology that raise operating costs, and small balances that preclude a cost-effective collection process are among the intrinsic justifications for high credit card interest rates (Evans and Schmalensee, 2005). In his seminal paper, Ausubel (1991) attributes high and sticky credit card interest rates to asymmetric information and some sort of consumer irrationality. He categorizes cardholders into three groups: convenience users, who only use the payment services of credit cards; irrational but nonrisky revolvers, who do not intend to borrow on credit cards ex-ante but frequently end up doing so ex-post; and illiquid and risky revolvers, who plan to borrow on their credit cards. Only the cardholders in the last group are sensitive to interest rates. The first two groups, who do not (intend to) borrow, are not. Banks prefer the second group of cardholders. Ausubel (1991) claims that when banks are unable to observe cardholder types, they are reluctant to unilaterally lower their card rates for fear of attracting only the risky illiquid type. Calem and Mester (1995) and Calem, Gordy and Mester (2006) categorize cardholders slightly differently based on impatience, search costs, and switch costs and reach the same conclusion: When information is asymmetric, prices are sticky because if a bank lowers its interest rate, it merely attracts risky or nonprofitable customers.[4]

[3] For an extensive review of these puzzles see Scholnik et al. (2008).

[4] Among many other explanations about the credit card interest rate puzzle, Della Vigna and Malmendier (2004) argue that banks exploit cardholders' time inconsistency by charging prices below marginal costs in the short term (e.g. teaser rates) and above marginal costs in the long term; Knittel

Akin et al. (2011) argue that asymmetric information is no longer a relevant argument for the Turkish credit card market thanks to sophisticated credit-scoring and information-sharing technologies. They document that although interest rates closely follow the cost of funds in mortgage, vehicle, and consumption loan markets, credit card interest rates remain persistently high independent of the cost of funds before the regulation in 2006. Using bank-level data and regressing banks' credit card interest rates on their various bank-level and card-level attributes, they find that banks acquire market power and hence can charge high prices through nonprice competition in this market. Banks differentiate their cards by providing an array of card-level benefits such as travel miles, bonus points, rewards, installment options for payment, and travel and accident insurance. Moreover, to augment their market power, they bundle credit card services with general banking services and thus are able to further differentiate themselves by offering bank-level benefits such as expanded branch/ATM networks, and more diversified and higher-quality banking services. For a cardholder who perceives credit cards and other banking services as a bundle, switching to another card with lower rates is very costly, as this entails switching to another bank.

With bank-level data it is not possible to explore product differentiation in detail. In this study, with individual-level data from a nationwide credit card consumer survey, we test and refine the results of Akin et al. (2011). Focusing on the consumer side of the market, we aim to ascertain how individuals choose their credit cards. While efforts to explain individual decision-making process have intensified, survey evidence, like experimental evidence, provides new insights into this matter.

and Stango (2003) provide evidence of a tacit collusion among card providers to explain the clustering and stickiness of credit card interest rates; Park (2004) attributes high interest rates to the option value of credit lines, arguing that high and sticky rates might be an equilibrium response of banks to asymmetric information about cardholders' future incomes.

Specifically, we intend to determine whether consumers view credit cards as differentiated products, whether they indeed perceive credit cards and other banking services as a bundle, which specific bank-level and card-level nonprice features they value, how they assess the price features of credit cards vis a vis their nonprice features, and whether the market is segmented, that is whether certain types of consumers choose certain types of banks as issuers. The results of our analysis are of potential use to both regulators and bankers. Optimal regulation design entails the identification of underlying market failures and consumer preferences. Thus, our results may help regulators formulate effective policies that would reduce prices, protect consumers and improve welfare. On the other hand, in response to the fall in their market power after the regulations, banks have started to collect annual fees and to economize on the nonprice benefits they are offering. Hence, discovering consumers' preferences may help them design better strategies to attract new customers and satisfy the existing ones.

Discrete choice random utility models that allow for product differentiation and consumer heterogeneity ideally serve this purpose. Our data are obtained from a credit card consumer survey, which was conducted with 2,576 credit card users in May 2009. A discrete choice multinomial probit analysis is employed. The dependent variable is the issuer of the respondent's main card. Four types of issuing banks are used: public banks, large private banks, medium and small private banks, and participation banks. We hypothesize that consumers' choice of issuer bank will depend on their preferences for the bank-level and card-level nonprice benefits, their attitudes towards the prices of credit card services, their credit card payment behaviors, their search/switch tendency, and their socioeconomic and demographic characteristics.

Our findings generally indicate that consumers view credit cards as highly differentiated products, most perceive them as bundled with general banking services, certain types of consumers indeed choose certain banks as issuers, and when selecting their credit cards, consumers predominantly emphasize the nonprice features of credit cards rather than their price features. More specifically, large private banks, which are the market leaders, are avoided on the basis of interest rates and annual fees, but are preferred on the basis of both bank-level and card-level nonprice benefits. Consumers who value expanded branch/ATM networks, bonuses/rewards/miles, and the prestige of the card are more likely to choose large private banks' cards. Convenience users and nonrisky revolvers also tend to choose the credit cards of these banks. Medium and small private banks are favored on the basis of installment conditions, are preferred by risky revolvers, and benefit from word-of-mouth advertising. Public banks, which generally have loyal customers, benefit from bundling and are preferred on the basis of low interest rates. Public sector employees and retirees are more likely to hold credit cards from these banks. Participation banks are preferred on the basis of low interest rates and annual fees, but they are avoided on the basis of bank-level and card-level nonprice benefits. These results support the findings of Akin et al. (2011) and present evidence for nonprice competition among these groups of banks. Product differentiation and bundling seem to underlie banks' market power in this market. Hence, we suggest that the highly differentiated nature of credit cards can be an alternative explanation for the credit card interest rate puzzle.

The paper is organized as follows: Section 2 reviews the applications of discrete choice models to banking. Section 3 describes the data, sampling and variables. The model and the results are presented in Section 4. Section 5 concludes with policy implications.

2. Literature review

The empirical industrial organization literature offers methods for estimating structural demand models that allow for product differentiation and consumer heterogeneity. Following the discrete choice literature, consumers' choice of firms/products is modeled by the following indirect random utility function

(1) $$U_{i,j} = X_{i,j}'.\beta + Z_i'.\gamma_j + \varepsilon_{i,j}$$

where $U_{i,j}$ is the utility of consumer i from choosing firm j, $X_{i,j}$ is the price/nonprice attributes of firm j for consumer i, Z_i is the characteristics of consumer i, (β, γ_j) are the taste parameters to be estimated, and $\varepsilon_{i,j}$ is the unobserved/unmeasured influences on utility. Consumer i chooses firm j, if $U_{i,j} > U_{i,k}, \forall k \neq j$. It has been shown that the probability that firm j will be chosen can be estimated by a multinomial logit model if $\varepsilon_{i,j}$ follows an iid extreme value distribution, and that this probability can be estimated by a multinomial probit model if $\varepsilon_{i,j}$ has a multivariate normal distribution. Since the demand model is derived from a utility function, estimation of a large number of substitution parameters across firms is avoided. Own and cross price elasticities can simply be calculated from the estimated utility parameters. Discrete choice models allow of competition and welfare analyses as well. From own price elasticities and Lerner indices, it is possible to estimate a firm's market power, and from cross price elasticities, it is possible to determine the substitutability between firms. Likewise, with the estimated utility parameters, the impact of a policy change on welfare can be assessed.

Most of the discrete choice models in banking utilize bank-level data. The dependent variable in such models is market share, which is predicted by the probability that these banks will be chosen. To determine the welfare effects of the lifting of geographic barriers in the US and the subsequent bank consolidation in the

1990s, Dick (2008) estimates a structural demand model for bank deposit services. She finds that apart from prices, consumers respond favorably to branch staffing, geographic density and diversification, and bank age and size. She concludes that despite a rise in prices, welfare increased in most regions due to improvements in nonprice factors. Ho (2009) jointly estimates discrete choice differentiated product demand equations and pricing equations and uses the estimated conduct parameters to identify the market structure in Hong Kong. He concludes that the banking industry became more competitive and consumers were better off after the deregulation in the late 1990s. Akin et al. (2014) estimate discrete choice demand models to uncover consumer preferences in the Turkish deposit and credit markets and find that consumers prefer banks with larger networks and more efficient technologies. They also conclude that banks' market power in credit markets is much lower than in deposit markets. Using a discrete choice model, Adams et al. (2007) uncover utility parameters that affect a consumer's institution choice and measure the degree of market segmentation between banks and thrifts. They find that cross price elasticities between groups of institutions (banks and thrifts) are much lower than those within groups and thus conclude that substitutability between banks and thrifts is low.

Discrete choice models that use individual-level data are extremely scarce. Our study will contribute to this part of the literature. We know of only two such studies. Using survey data, Bozcar (1978) addresses a question similar to that posed by Adams et al. (2007): Is competition between banks and finance companies limited by market segmentation on the basis of customer risk? Using a probit analysis and data on socio-economic and life-cycle characteristics of credit users, he examines whether the two institutions segment the market by serving different risk classes of borrowers. Using survey data and a multinomial probit model, Ardic and Yuzeroglu (2007) analyze

individuals' choice of bank based on the types of banking services they use, their perceptions of which factors are important in banking, and their socioeconomic characteristics.

If a discrete choice analysis is conducted with individual-level data only, it is not possible to estimate elasticities or make welfare inferences. However, if the main purpose of the study is to identify price and nonprice factors that affect demand, individual-level survey data may be more appropriate. If bank-level data is used for this purpose, endogeneity problems will complicate the analysis, since the left-hand side variable, market share, clearly affects the right-hand side variables, namely price and nonprice factors such as branching, quality, and size. With individual-level survey data, however, as the right-hand side variables consist only of consumer characteristics (preferences, attitudes, perceptions, habits, socioeconomic characteristics, etc.), which are likely to be independent of banks' actions, it is possible to isolate demand factors, temper endogeneity concerns, and elicit the important price and nonprice factors that affect consumer choices. With disaggregated individual-level data, it is also possible to explore heterogeneity in consumer preferences.

3. **Data, sampling and variables**

With the credit card consumer survey, we aimed at identifying consumers' credit card practices: How they choose and use their credit cards, their search and switch experiences, whether and why they have delinquency or default problems, and whether they have financial literacy and rationality issues, etc.[5]

The survey was conducted with 2,576 cardholders in May 2009. Interviewees were randomly selected from the urban adult population, for which the urban voter population was used as a proxy. The sample was selected from 26 regions of Turkey,

[5] The questionnaire is available upon request.

determined by the Nomenclature of Territorial Units for Statistics (NUTS) at the second level. Since there was no information available at the time about the number of credit cards by region, the allocation of the survey to regions was based on the number of POS terminals and bank branches. One province was randomly selected from each region. Each selected province's main city (in some cases one or two large towns as well) was chosen for the sample. Households were selected using the clustered random sample selection method. Cluster points were neighborhoods, and cluster size was determined as ten, so a maximum of ten interviews was targeted for each neighborhood. Using voter population as weights, 250 neighborhoods were selected randomly, aiming for a total of 2,500 interviews. After the selection of neighborhoods, streets were randomly chosen in each neighborhood using street data from the Ministry of Finance. Five primary and two backup streets were selected in each neighborhood with the aim of conducting two surveys on each street. Households were randomly selected by supervisors. Since cardholders are generally working people, face-to-face interviews with those who passed two filter questions[6] were conducted in the evenings or on weekends. The response rate among those who passed the filter questions was 65%. Later, 30% of the interviews were checked for reliability by a follow-up phone call, and in some cases through door checks.

The dependent variable is the type of the issuer bank of the respondent's main card. There were 25 issuing banks in Turkey in 2009. Based on their share of the credit card market, their ownership structures, and their operations, we categorized the banks into four groups: public banks, large private banks, medium and small private banks, and participation banks.

[6] Do you have a credit card? Do you make the decisions about the choice of credit cards and the payment of credit card bills yourself?

The public banks in Turkey, namely Ziraat Bankası, Vakıfbank, and Halk Bankası, are state-owned banks that were originally established to provide financial services to farmers, tradesmen and craftsmen. In general, these banks are not as responsive to market conditions as private banks and are not particularly active in the credit card market. They are not only-for-profit organizations. Due to welfare concerns, they may set lower prices than private banks and may have economically nonviable branches in remote and small places. They also dispense public sector employee salaries and retiree pensions.

Private banks adopted modern banking practices earlier than public banks, placed more emphasis on retail banking, and invested heavily in information technology. They are divided into two groups based on market share. The large private banks each have a market share of above 10% in the credit card market. Table 1 illustrates the market share of the top ten banks. Ziraat Bankası and the large private banks have the largest branch/ATM networks and are also the market leaders in the deposit and credit markets. The remaining banks (other than participation banks) are medium and small private banks.[7]

Table 1. Market share of the top ten banks based on the number of credit cards

Bank	Share (%) December 2008	Bank	Share (%) December 2008
Yapı Kredi Bankası	17.9	HSBC	7.0
Garanti Bankası	17.3	Ziraat Bankası	5.3
İş Bankası	11.5	Vakıfbank	4.7
Akbank	10.4	Halkbank	3.5
Finansbank	7.8	Denizbank	3.0

Source: Banking Regulation and Supervision Agency[8]

[7] Large private banks are Yapı Kredi Bankası, Garanti Bankası, İş Bankası, and Akbank. Medium and small private banks are Finansbank, HSBC, Denizbank, Anadolubank, Citibank, Eurobank Tekfen, Fortisbank, ING, Millenium Bank, Şekerbank, TEB, Tekstilbank, Turkish Bank, and Turkland Bank.

[8] Market shares of the top ten banks based on the cards possessed by respondents are Garanti Bankası 19.4%, Yapı Kredi Bankası 15.3%, İş Bankası 14.1%, Akbank 13.7%, Finansbank 8.2%, HSBC 6.3%, Ziraat Bankası 4.3%, Vakıfbank 4.0%, Fortisbank 3.1%, Bank Asya 2.4%. These shares indicate that our sample is quite representative.

The fourth group is participation banks: Albaraka Türk, Bank Asya, Kuveyt Türk and Türkiye Finans. They have interest-free operations and supply differentiated products, primarily to customers with religious sensibilities. These banks are treated separately from the other three groups due to their different modes of operation.

More than half of the respondents in the sample held more than one card, but we concentrated on what they considered to be their main card. In our sample, 70.02% of respondents chose a large private bank as their main card issuer, while 18.19% preferred medium or small private banks. The share of public banks and participation banks was 9.62% and 2.16%, respectively.

Table 2. Four categories of issuers based on cardholders' main card

Dependent Variable Category	Number of Cardholders	Share (%)
Public Banks	218	9.62
Large Private Banks	1,586	70.02
Medium and Small Private Banks	412	18.19
Participation Banks	49	2.16
Total	2,265	100.00

We aim to determine price and nonprice factors that affect consumer credit card choice. For this purpose, respondents were directly asked to rate *how influential the following 18 factors were in their decision to choose their main card*. They rated each factor on a five-level Likert scale, with 1 being the least influential and 5 the most influential. In Table 3, these factors are grouped in seven categories: bank-level benefits, card-level benefits, card-level advanced benefits, price, influence, loyalty and advertising.

Table 3. Price and nonprice factors affecting credit card choice

Groups	Factors
Bank-level benefits	Widespread branch/ATM network Card of the patronized bank
Card-level benefits	Installment conditions High credit limit More bonus points/rewards/traveler miles Prestigious card Promotion for oil/gas purchases More extensive discount campaigns

Card-level advanced benefits	Extra benefits: insurance, vale parking, etc. Virtual card services Internet and telephone service quality
Price	Low interest rate No or low annual fee
Loyalty	First card of the cardholder Affinity card
Influence	Recommendation from acquaintances Family patronage
Advertising	Informative and effective advertising

Table 4 summarizes and sorts participants' responses given to this question. These responses reflect participants' preferences for price and nonprice factors, that is, the value or importance they attach to these factors. As expected, when choosing a credit card, consumers attach the highest value to bank-level benefits. This finding is prima facie evidence for the bundling hypothesis of Akin et al. (2011). That is, most people perceive credit card services and other banking services as a bundle. Hence, they first choose their bank and/or use the credit card of the bank they already patronize. The testable implication of this hypothesis is that people who value bank-level benefits are likely to choose the credit card of a large private bank or a public bank, as these have a comparative advantage in terms of their bank-level services.

Table 4. Summary statistics of consumer preferences for price and nonprice factors

Characteristic	Range	Mean	Std. Dev.
Widespread branch/ATM network	1, 2, 3, 4, 5	3.21	1.38
Card of the patronized bank	1, 2, 3, 4, 5	3.10	1.43
Installment conditions	1, 2, 3, 4, 5	3.06	1.40
More extensive discount campaigns	1, 2, 3, 4, 5	2.87	1.41
Prestigious card	1, 2, 3, 4, 5	2.63	1.43
More bonus/money point/traveler miles	1, 2, 3, 4, 5	2.62	1.42
High credit limit	1, 2, 3, 4, 5	2.52	1.43
First card of the cardholder	1, 2, 3, 4, 5	2.50	1.49
No or low annual fee	1, 2, 3, 4, 5	2.36	1.43
Low interest rates	1, 2, 3, 4, 5	2.32	1.37
Promotion for oil/gas purchases	1, 2, 3, 4, 5	2.23	1.39
Informative and effective advertising	1, 2, 3, 4, 5	2.19	1.34
Internet and telephone service quality	1, 2, 3, 4, 5	2.13	1.36
Recommendation from acquaintances	1, 2, 3, 4, 5	2.02	1.31
Extra benefits like insurance, promotion, valet parking etc.	1, 2, 3, 4, 5	1.84	1.22
Family patronage	1, 2, 3, 4, 5	1.81	1.25
Virtual Card Services	1, 2, 3, 4, 5	1.69	1.15
Affinity card	1, 2, 3, 4, 5	1.67	1.15

2,265 observations

Card-level nonprice benefits such as installments, discounts, prestige, bonus points, rewards, and travel miles are revealed to be the second most influential group of factors. On the other hand, despite prevalent complaints about prices, most consumers do not seem to pay much attention to them when choosing a credit card: Annual fees and interest rates rank only 9th and 10th out of the 18 factors. The fact that consumers prioritize nonprice benefits rather than prices suggests that banks have managed to establish nonprice competition in the credit card market and have acquired market power through product differentiation. The testable implication of this hypothesis is that people who value card-level nonprice benefits are likely to choose the credit card of a large private bank, because large private banks have the largest POS terminal networks and cardholders can enjoy these benefits only if their transactions are processed through a POS terminal of their issuer bank.

We do not expect a serious reverse causality problem in our model. Recall that respondents were asked to state how much they cared about the price and nonprice factors in their decision to choose their main card. These preferences are consumers' intrinsic characteristics and hence are unlikely to be affected by banks' actions. Advertisements can be seen as a channel through which banks may affect consumer preferences. We think that such effects are limited. Banks advertise their important characteristics, some emphasize their nonprice benefits, and some stress their prices. Consumers are exposed to those advertisements symmetrically. But they differ in their preferences, and hence make their choices differently, depending on whether they prioritize nonprice benefits or prices. It can also be argued that choices may affect preferences. Some consumers might have chosen their credit cards somewhat arbitrarily without paying much attention to cards' attributes. They can then give the features that they have later discovered as the reasons to choose their credit cards. The

use and familiarity of a specific card might also have shaped their preferences and perceptions. To check this possibility, we formed three subsamples: Those who had multiple cards among which they picked their main card[9], those who acquired their main card from a bank other than the one they have already patronized, and those who acquired their main card by switching from another card. Consumers in these subsamples are quite likely to have chosen the cards that would best fit to their preferences. We tested these subsamples separately and altogether. The results of the latter are given in the appendix. In all these robustness checks our qualitative results remained intact.[10] Hence, we conclude that endogeneity is not a serious concern for our analysis, and take that, as the economic theory suggests, the direction of causation is from preferences to choices.

It is interesting to know whether credit card payment behaviors are also likely to affect consumers' credit card choice. Similar to Ausubel (1991) and Calem, Gordy and Mester (2006), we categorize cardholders based on their credit card payment behaviors. Our survey provides information on cardholders' behaviors in the 12 months preceding the interview. Accordingly, we categorize the cardholders into four groups: Convenience users, who never borrow on their credit cards and always pay their balance in full and on time; nonrisky revolvers, who borrow on their cards but who always pay at least the minimum amount on their bills so that they never experience delinquency or default problems; delinquent revolvers, who failed to pay the minimum amount on their bills at least once in the previous 12 months (this does

[9] Some respondents had multiple cards from the same bank. We separately checked both those who had multiple cards and those who had cards from multiple banks.

[10] Since probit analysis could not produce results for the subsamples, we used a multinomial logit model for this purpose. The results are presented in Appendix1. For consistency with the current results, we had the same logit analysis for the whole sample. As can be seen in Appendix2, the results from the logit regression are almost identical to those from the probit regression, which are presented in Tables 7, 8, and 9.

not include those who stated "I missed the payment due date" as the sole reason for this failure); and defaulted revolvers, who failed to pay the minimum amount in two consecutive months and hence had collection procedures initiated on them by banks.[11] Table 5 shows that 69% of the respondents are categorized as convenience users, 9% as nonrisky, 20% as delinquent, and 5% as defaulted revolvers.

In addition to the above cardholder types, we include two variables that are related to customers' search and/or switch tendency: new customer and change card. If a customer obtained his credit card from a bank where he already had an account, he is considered an existing customer. However, if the individual's first contact with a bank was through the acquisition of the card, he is considered a new customer. "Change card" indicates whether the respondent has ever changed her main card. We use both these variables as a proxy for low search/switch costs. Such cardholders are expected to hold the credit cards of issuers that offer more favorable terms. As Table 5 shows, 43% of the respondents are new customers and 15% previously switched cards.[12]

Table 5. Summary statistics of credit card payment behavior and search/switch tendency

Variable	Range	Mean	Std. Dev.
Convenience user	1=Yes, 0=No	0.69	0.46
Nonrisky revolver	1=Yes, 0=No	0.09	0.30
Delinquent revolver	1=Yes, 0=No	0.20	0.40
Defaulted revolver	1=Yes, 0=No	0.05	0.05
New customer	1=Yes, 0=No	0.43	0.50
Change card	1=Yes, 0=No	0.15	0.36

2,265 observations

[11] To determine the default category, answers to two questions "Have you ever gone through a collection process initiated by banks?" and "If yes, in which year?" are used. It is not possible to determine exactly the ones who defaulted in the previous 12 months. Since the survey was conducted in May 2009, to be consistent with the other groups, those who defaulted in 2008 and 2009 are included in this group.

[12] The low incidence of changing main card suggests that switching costs are high. Interviewees are asked about the factors that make switching to another card difficult. "Not wanting to change my bank" is found to be the most important factor. Additionally, those who have changed their main card are asked about the main reason for changing. The most common answer, marked by 55% of the respondents, is "Because I changed my bank." These findings support the bundling hypothesis as well.

Standard socioeconomic and demographic control variables include occupation, education, age, income, wealth, gender, marital status, and region of residence. Except for occupation and region of residence, we have no a priori expectations about how these characteristics are likely to affect consumers' credit card choices. We expect that public sector employees and retirees who receive their salaries and pensions from public banks are more likely to hold a credit card of a public bank. Craftsmen, tradesmen and farmers are also likely to hold credit cards of public banks, as special services are extended to them. Private banks are largely present in the economically more developed coastal regions, namely the Marmara, Aegean and Mediterranean regions. Hence, we expect that residing in these regions will increase the probability of holding a credit card of a private bank. Public banks, on the other hand, have larger networks in the economically less developed regions, in line with their policy of being present in almost every town. We therefore expect that residing in the Eastern Anatolian Region will increase the likelihood of holding a credit card of a public bank. Summary statistics of these characteristics are given in Table 6.[13]

Table 6. Summary statistics of demographic and socioeconomic variables

Variable	Range	Mean	Std. Dev.
Private sector	1=Yes, 0=No	0.39	0.49
Public sector	1=Yes, 0=No	0.19	0.39
Self employed	1=Yes, 0=No	0.16	0.37
Farmer/Seasonal worker	1=Yes, 0=No	0.03	0.18
Unemployed	1=Yes, 0=No	0.03	0.18
Retired out-of-labor-force	1=Yes, 0=No	0.16	0.36
Unretired out-of-labor-force	1=Yes, 0=No	0.03	0.17
No/Primary/Middle school	1=Yes, 0=No	0.33	0.47
High school	1=Yes, 0=No	0.35	0.47
University	1=Yes, 0=No	0.31	0.46
Age	[18, 80]	37.83	11.92
Household income*	[0, 34.40]	2.20	17.77
Wealth*	[0, 7507.00]	58.85	198.42

[13] Note that we have two out-of-labor-force groups: retired and unretired. The reason is that some retirees continue to work and still receive their pension.

Female	1= Female, 0= Male	0.28	0.45
Married	1=Married, 0= Not married	0.71	0.45
Divorced/Separated/Widowed	1= Divorced/Separated/Widowed, 0= Not	0.03	0.19
Single	1=Single, 0= Not single	0.26	
Coast (Marmara-Aegean-Mediter.)	1=Yes, 0=No	0.68	0.47
Black Sea	1=Yes, 0=No	0.09	0.28
Eastern Anatolia	1=Yes, 0=No	0.08	0.26
Central Anatolia	1=Yes, 0=No	0.16	0.36

2,265 observations. * in thousand Turkish Liras.

4. Model and results

Using a discrete choice random utility model and survey data, we identify price and nonprice factors affecting the likelihood that the credit card of a certain type of issuer is chosen. As explained before, we do not have bank-level data for price and nonprice characteristics of credit cards, but instead we have consumers' preferences for those characteristics. Hence, the model in (1) reduces to

$$U_{i,j} = Z_i'.\gamma_j + \varepsilon_{i,j} \quad (2)$$

where $U_{i,j}$ is the utility of consumer i from choosing issuer j (j=public banks, large private banks, medium and small private banks, participation banks). Z_i denotes the characteristics of consumer i and γ_j denotes the set of taste parameters to be estimated. Note that γ_j varies across choices.[14] Hence, consumer characteristics may affect the likelihood of choosing different types of issuers differently. For instance, age may increase the likelihood of consumers' choosing a public bank and decrease the likelihood of their choosing a medium or small private bank for a credit card. $\varepsilon_{i,j}$ represents the unobserved/unmeasured influences on utility. Consumer i chooses issuer j, if $U_{i,j} > U_{i,k}$, $\forall$ $k \neq j$. To avoid the problems associated with the IIA (independence of irrelevant alternatives) properties of logit models, we assume that $\varepsilon_{i,j}$

[14] For identification, γ_j should vary across choices (Greene 2008).

has a mean-zero multivariate normal distribution. Thus, a multinomial probit model is used to estimate the probability that issuer j will be chosen.

Since the nonlinearity of discrete choice models makes it difficult to interpret the regression coefficients, in Table 7 we present marginal effects, which indicate the impact of an infinitesimal increase in an explanatory variable on the probability that a certain issuer type will be chosen. Marginal effects are calculated at the sample averages for continuous variables and at 0 for dummy variables.

Table 7. Marginal effects of preferences for price and nonprice factors on the probability of choosing an issuer (computed at sample averages for continuous variables, at 0 for dummy variables).

	Public Banks	Large Private Banks	Medium and Small Private Banks	Participation Banks
Variable	Mrg Effect	Mrg Effect	Mrg Effect	Mrg Effect
Widespread branch/ATM network	-0.009*	0.039***	-0.026***	-0.004**
	(-1.89)	(4.28)	(-3.16)	(-2.18)
Card of the patronized bank	0.013***	0.006	-0.018***	-0.001
	(3.05)	(0.78)	(-2.69)	(-0.55)
Installment conditions	-0.004	-0.017*	0.021**	0.000
	(-0.65)	(-1.80)	(2.41)	(0.03)
High credit limit	-0.009*	0.004	0.006	-0.001
	(-1.69)	(0.43)	(0.72)	(-0.46)
More bonus/rewards/miles	-0.008	0.052***	-0.039***	-0.004**
	(-1.60)	(5.47)	(-4.57)	(-2.33)
Prestigious card	-0.007	0.023***	-0.017**	0.001
	(-1.46)	(2.65)	(-2.15)	(0.62)
Promotion for oil/gas purchases	0.009*	-0.016*	0.004	0.003
	(1.85)	(-1.75)	(0.45)	(1.59)
More extensive discount campaigns	-0.006	0.008	0.001	-0.003*
	(-1.08)	(0.79)	(0.17)	(-1.78)
Low interest rate	0.016***	-0.028***	0.007	0.006***
	(3.02)	(-2.91)	(0.78)	(3.17)
No or low annual fee	0.007	-0.020***	0.009	0.004**
	(1.53)	(-2.31)	(1.16)	(2.49)
First card of the cardholder	0.006	-0.002	-0.003	-0.001
	(1.42)	(-0.30)	(-0.47)	(-0.37)
Affinity card	0.013***	-0.006	-0.007	-0.001
	(2.27)	(-0.50)	(-0.66)	(-0.37)
Recommendation from acquaintances	-0.009*	-0.007	0.015*	0.002
	(-1.67)	(-0.78)	(1.79)	(1.06)
Family patronage	-0.002	0.021**	-0.017*	-0.002
	(-0.43)	(2.08)	(-1.84)	(-0.93)
Benefits like insurance, vale parking	0.005	-0.015	0.011	-0.001
	(0.77)	(-1.31)	(1.10)	(-0.60)
Virtual card services	-0.008	0.002	0.006	0.000
	(-1.25)	(0.21)	(0.55)	(0.20)
Internet and telephone service quality	0.000	0.003	-0.005	0.002
	(0.06)	(0.32)	(-0.57)	(0.94)
Informative and effective advertising	0.001	0.001	-0.001	-0.001

	(0.14)	(0.15)	(-0.09)	(-0.84)

2,265 observations, t-statistics are in parentheses. *, ** and *** denote significance levels at 10%, 5% and 1%, respectively.

Bank-level nonprice characteristics, which are the most important factors for the majority of cardholders (Table 4), are also significant in the multinomial probit analysis. If the importance of the branch/ATM network of the issuer increases by one unit for an average consumer, the probability that he will choose a large private bank's credit card increases by 3.9%. More generally, we can say that consumers who value widespread networks are more likely to choose a credit card of a large private bank, and they are less likely to choose a credit card of a medium or small private bank, public bank or participation bank. Lending credence to the bundling hypothesis, credit card customers of large private banks seem to be enticed by their banks' general banking services. Although public banks also have large branch/ATM networks, this variable seems to reduce their appeal. Since a significant number of the branches and ATMs of public banks are located in towns where economic activity is not very high, cardholders probably do not perceive public banks as having networks as large as their private counterparts.

Another piece of evidence for bundling comes from public banks, which have a high market share in deposit and credit markets. Cardholders who declare that they prefer to use the credit card of the bank they patronize are more likely to hold a credit card of a public bank. That is, the patrons of public banks are more likely than the patrons of other banks to view credit card services and general banking services as a bundle. Equivalently, given that public banks generally have well-established customer bases that consist mostly of civil servants and elderly/retired people, their patrons are likely to be more loyal/captive than patrons of other banks. Cardholders with such preferences are less likely to hold a credit card of medium and small private banks.

Among card-level nonprice benefits, bonuses/rewards/miles seem to be economically and statistically the most significant one. A one-unit increase in the importance attached to this characteristic increases the probability that a large private bank will be chosen by 5% and decreases the probability that a medium or small bank or a participation bank will be chosen by 4% and 0.5%, respectively. As explained before, cardholders are able to enjoy these benefits only if their transactions are processed through a POS terminal of their issuer bank. So, consumers who value such benefits are likely to choose the credit card of a large private bank because these banks have the largest POS terminal networks. Likewise, the comparative advantage of large private banks being able to make co-branding agreements with popular brands, department stores, and airline companies can explain why consumers who care about the prestige of their cards are more likely to choose a credit card of a large private bank. The fact that preferences for card-level nonprice benefits significantly affect consumers' choice of credit cards substantiates the hypothesis of nonprice competition in the Turkish credit card market.

Medium and small private banks seem to be favored on the basis of installment conditions. Among those banks, Finansbank is particularly well known for its innovative and aggressive installment promotions such as "*Taksit Atlat"* (postpone your installment payments). On the basis of high credit card limits, public banks seem to be avoided; on the basis of promotion for oil/gas purchases, large private banks seem to be avoided; and on the basis of discount campaigns, participation banks seem to be avoided.

Price factors provide important insights too. Consumers who prioritize low interest rates tend to avoid large private banks and to choose public or participation banks instead. Likewise, consumers who value no/low annual fees tend to avoid large

private banks and to favor participation banks instead. After the interest rate regulation in 2006, although credit card rates mostly converged to the cap imposed by the Central Bank, some public banks and participation banks charged lower rates than the other banks.[15] Annual fees collected by participation banks were also much lower than those of other banks (ibid). Noticeably, large private banks seem to lose market share on the basis of interest rates and annual fees. However, given that they are the market leaders, they seem to compensate for those losses by market share gained though bank-level and card-level nonprice benefits.[16]

We conclude that consumers view credit cards as highly differentiated products with both bank-level and card-level nonprice features. Most consumers value these nonprice features more than prices. Although they charge higher prices, the majority of consumers choose private banks due to their bank-level and card-level nonprice benefits, whereas consumers who prioritize prices tend to choose participation or public banks. These preferences provide evidence for nonprice competition among these groups of banks. Product differentiation and bundling seem to underlie banks' market power in the Turkish credit card market. So, the results of Akin et al. (2011) are supported by individual-level data as well. These results offer an alternative explanation as to why credit card interest rates can be much higher than interest rates of other types of credit. Credit cards are highly differentiated products, whereas other types of credit such as mortgage, vehicle, or consumption loans are relatively

[15] While the cap imposed on monthly credit card rates was 3.96% at the time of the survey, the interest rates charged by, e.g., Ziraat Bankası, Halkbank, Al Baraka Türk, and Kuveyt Türk were 2.75, 3.90, 2.28, and 3.75%, respectively. Source: Banking Regulatory and Supervisory Agency.

[16] About 70% of the respondents stated that they had acquired their cards in the pre-regulation period, during which large private banks used to charge much higher interest rates than other banks. After the regulation, as explained above, the dispersion in interest rates declined and most converged to the cap imposed by the Central Bank. But the interest rates charged by large private banks were still higher than those of participation banks and some public banks.

homogeneous products, for which price competition is more likely to prevail.[17] Banks can exercise market power especially over those consumers who perceive credit cards and general banking services as a bundle, because switching to another credit card with more favorable conditions amounts to switching to another bank for them.

As for the other variables, family patronage positively affects large private banks and negatively affects medium and small private banks; recommendations from acquaintances positively affect medium and small private banks and negatively affect public banks; affinity cards positively affect public banks. As influential family members are generally parents, and as large private banks are generally older than their medium and small competitors, it is more likely that the cards used by parents are those issued by large private banks. In contrast, acquaintance recommendations are usually word-of-mouth and are based on recent experiences. For this reason, they are more likely to affect medium and small private banks since those banks' cards have been in the market for a relatively short time. Card-level advanced benefits are found not to be influential, probably because they are enjoyed by a small, specific segment of customers. Advertisements are not found to be influential either. Banks spend substantial amounts on advertising to make themselves visible to customers, to convey their positioning strategy, and to explain their promotions and offerings, all of which are found to be influential in credit card choice, yet individuals indicate that they are not affected by the advertisements. It is likely that consumers pay attention to the features presented in the advertisements rather than the advertising itself.

The marginal effects of cardholder type and search/switch tendency on probabilities are presented in Table 8. Convenience users are omitted in the regression,

[17]Akin et al. (2011 and 2014) document that in mortgage, vehicle, and consumption loan markets competition was quite high, demand was elastic, and interest rates closely followed the cost of funds, whereas in the credit card market interest rates remained persistently high independent of the cost of funds before the regulation in 2006.

so the marginal effects of other types should be interpreted with respect to this group. The striking result is that compared to convenience users, risky revolvers (delinquent and defaulted revolvers) are less likely to choose large private banks and more likely to choose medium and small private banks. More specifically, compared to a convenience user, a delinquent revolver is 4.4% less likely to choose the credit card of a large private bank, and a defaulted revolver is 12% less likely to do so; these delinquent and defaulted revolvers are more likely to choose the credit card of a medium or a small private bank (delinquent ones 5.7% and defaulted ones 9.1% more likely). Defaulted revolvers are also less likely to choose a participation bank's card. Consumer type does not predict the selection of public banks. Apparently, risky revolvers perceive that medium and small private banks offer more favorable terms or apply more lenient standards to them than large private banks.[18]

The new customer variable shows that using the credit card of a bank other than the bank one patronizes decreases the probability that a credit card of a public bank or a large private bank will be chosen by 6.7% and 5%, respectively, and it increases the probability that a credit card of a medium or small bank will be chosen by 12%. By the same token, if a cardholder states she has previously changed her main card, she is less likely to be a cardholder of a public bank and more likely to be a cardholder of a medium or small private bank. These results suggest that those with lower search/switch costs tend to obtain credit cards from medium and small private banks, which are likely to be perceived to offer more favorable conditions.[19]

[18] If medium and small private banks indeed apply more lenient standards to risky revolvers, this outcome may suggest that the adverse selection argument of Ausubel (1991) and Calem and Mester (1995) is at work here. However, we think that asymmetric information is not a serious problem for the Turkish banking sector. More plausibly, medium and small private banks may be intentionally targeting risky revolvers to gain market share and/or to increase their interest revenues. Stavins (2000) documents that targeting risky revolvers can be a profitable strategy, at least in good economic cycles.

[19] Correlations among variables and variance inflation factors suggest no multicollinearity issues in our regressions.

Table 8. Marginal effects of types and search/switch tendency on the probability of choosing an issuer (computed at sample averages for continuous variables, at 0 for dummy variables)

	Public Banks	Large Private Banks	Medium and Small Private Banks	Participation Banks
Variable	Mrg Effect	Mrg Effect	Mrg Effect	Mrg Effect
Nonrisky revolver	0.004	-0.006	-0.004	0.006
	(0.22)	(-0.19)	(-0.16)	(0.90)
Delinquent revolver	-0.007	-0.044*	0.057**	-0.005
	(-0.56)	(-1.77)	(2.47)	(-1.45)
Defaulted revolver	0.036	-0.120**	0.091**	-0.007*
	(1.22)	(-2.57)	(2.11)	(-1.88)
New customer	-0.067***	-0.050**	0.120***	-0.003
	(-6.11)	(-2.43)	(6.53)	(-1.04)
Change card	-0.024*	-0.036	0.050*	0.009
	(-1.89)	(-1.28)	(1.92)	(1.31)

2,265 observations, t-statistics are in parentheses. *, ** and *** denote significance levels at 10%, 5% and 1%, respectively.

Table 9 presents the marginal effects of demographic and socioeconomic characteristics. Private sector employees, university graduates, singles and coastal region residents were omitted in the regression, so the marginal effects should be interpreted with respect to these omitted groups. As we expected, public sector employees, compared to private sector employees, are 8% more likely to choose the credit card of a public bank and 7.8% less likely to choose the credit card of a medium or small private bank. They are also less likely to choose the credit card of a participation bank. Similarly, retirees are 15.5% more likely to hold the credit card of a public bank and 16.1% less likely to hold the credit card of a large private bank. They are also less likely to hold the credit card of a participation bank. Moreover, the farmer, seasonal worker, and unretired out-of-labor-force groups are less likely to choose large private banks' credit cards. Compared to university graduates, high school graduates are more likely to hold the credit card of a public bank. Age and income seem to affect choices only slightly. Compared to singles, married consumers are more likely to choose participation banks. The effects of regional dummies are as expected. Compared to the residents of the coastal regions, residents of the Eastern and Central

Anatolian regions are more likely to hold the credit cards of a public bank and less likely to hold the credit cards of a large private bank.

Table 9. Marginal effects of socioeconomic and demographic characteristics on the probability of choosing an issuer (computed at sample averages for continuous variables, at 0 for dummy variables).

	Public Banks	Large Private Banks	Medium and Small Private Banks	Participation Banks
Variable	Mrg Effect	Mrg Effect	Mrg Effect	Mrg Effect
Public sector	0.080***	0.006	-0.078***	-0.008**
	(3.48)	(0.22)	(-3.63)	(-2.44)
Self employed	0.004	0.000	-0.005	0.001
	(0.21)	(0.00)	(-0.20)	(0.18)
Farmer/Seasonal worker	0.063	-0.104*	0.045	-0.004
	(1.30)	(-1.69)	(0.87)	(-0.73)
Unemployed	-0.012	0.034	-0.016	-0.005
	(-0.40)	(0.68)	(-0.38)	(-1.04)
Retired out of labor force	0.155***	-0.161***	0.014	-0.008**
	(4.06)	(-3.63)	(0.39)	(-2.08)
Unretired out of labor force	0.062	-0.126**	0.071	-0.007
	(1.22)	(-1.96)	(1.27)	(-1.51)
No/Primary/Middle school	0.023	-0.031	0.005	0.003
	(1.39)	(-1.13)	(0.22)	(0.57)
High school	0.026*	-0.006	-0.022	0.002
	(1.73)	(-0.24)	(-1.02)	(0.47)
Age	0.001*	0.000	-0.001	0.000
	(1.89)	(0.38)	(-1.25)	(-1.17)
Household income	0.006	-0.018*	0.023***	0.000
	(-1.02)	(-1.91)	(2.85)	(0.22)
Household income squared	0.000	0.000	0.000***	0.000
	(1.08)	(0.41)	(-3.26)	(.)
Wealth	0.000	0.000	0.000	0.000
	(-0.84)	(1.02)	(0.81)	(-1.60)
Female	-0.013	0.004	0.007	0.002
	(-1.10)	(0.18)	(0.35)	(0.46)
Married	-0.012	0.013	-0.009	0.008**
	(-0.74)	(0.50)	(-0.40)	(2.23)
Divorced/Separated/Widowed	-0.001	-0.052	0.043	0.010
	(-0.02)	(-0.87)	(0.77)	(0.46)
Eastern Anatolia	0.063**	-0.095**	0.023	0.009
	(2.14)	(-2.32)	(0.65)	(0.96)
Black Sea	0.011	-0.035	0.022	0.001
	(0.55)	(-1.00)	(0.71)	(0.19)
Central Anatolia	0.036**	-0.053*	0.019	-0.002
	(2.02)	(-1.88)	(0.76)	(-0.40)

2,265 observations, t-statistics are in parentheses. *, ** and *** denote significance levels at 10%, 5% and 1%, respectively.

In sum, the choice of a public bank as a credit card issuer is positively affected by the preference for the patronized bank's credit card and lower interest rates; it is negatively affected the by the preference for a widespread branch/ATM network and high credit card limits. Patrons of other banks are unlikely to acquire or switch to the

credit card of public banks. Being a public sector employee, retiree, high school graduate, and residing in Eastern or Central Anatolia are other factors that increase the appeal of public banks.

Large private banks' cards are preferred on the basis of widespread branch/ATM networks, bonuses/rewards/miles, the prestige of the card, and family patronage. They are avoided on the basis of interest rates, annual fees and installment conditions. Risky revolvers are less likely to hold the credit card of a large private bank. Being a farmer or seasonal worker, a retired/unretired person who is out of the labor force, or a resident of the Eastern or Central Anatolian regions are factors that lower the probability that a large private bank's card will be chosen.

Emphasis on installments and recommendations increases the probability that a card from a medium or small private bank will be chosen, while emphasis on bank-level nonprice features, bonuses/rewards/miles, the prestige of the card, and family patronage lowers this probability. Public sector employees are less likely to acquire the credit cards of medium or small private banks, but risky revolvers and cardholders with low search/switch costs are more likely to do so.

Participation banks' credit cards are preferred on the basis of low interest rates and no/low annual fees, but are avoided on the basis of bank-level and card-level nonprice benefits. Being a public sector employee, defaulted revolver, or retiree reduces the probability that a consumer will choose a participation bank's card, while being married increases it.

5. Conclusion

Using discrete choice analysis and individual-level survey data, we identify price and nonprice factors that affect consumers' credit card choices. Specifically, we aim to understand whether consumers view credit cards as differentiated products,

whether they value bank-level and card-level nonprice benefits offered by banks, and whether they differ in their preferences for credit cards.

We conclude that consumers view credit cards as highly differentiated products with both bank-level and card-level nonprice benefits. They select their credit cards by predominantly considering these nonprice benefits. Although they charge higher prices, the majority of consumers choose private banks as issuers due to their bank-level and card-level nonprice features. Consumers who prioritize prices, on the other hand, tend to choose participation or public banks. Product differentiation and bundling seem to underlie banks' market power in the Turkish credit card market. Bundling is an important aspect of the market structure. Most consumers first choose their bank and/or use the credit card of the bank they already patronize. Large private banks and public banks seem to reap the benefits of bundling more than the other banks. Of card-level nonprice benefits, installments, bonuses/rewards/miles, and the prestige of the card seem to be particularly effective in consumers' decisions. Those who value installments tend to choose medium and small private banks, and those who value bonuses/rewards/miles and the prestige of the card tend to choose large private banks. We argue that the highly differentiated nature of credit cards as such can be an alternative explanation for the credit card pricing puzzles.

A few policy recommendations emerge from our analysis. Product differentiation may be welfare enhancing, so market power obtained in this way does not generally warrant regulation. To foster competition in product differentiation with card-level nonprice benefits, large private banks can be encouraged or forced to share their POS terminal networks, so that other banks can also offer such benefits. Bundling, on the other hand, necessitates regulatory measures. Any such deliberate attempt by large private banks, if any, should be restrained. For example, consumers

should be allowed to easily pay their credit card balances at other banks by electronic transfers and/or on an automated basis from their accounts. This will make it easier for consumers to switch to other credit cards with more favorable terms without being obliged to switch their banks. Public banks also seem to be benefiting from bundling due to their loyal customers. Allowing public sector employees and retirees to receive their salaries from other banks can hence be welfare improving.

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Appendix-1. Average marginal effects of variables on the probability of choosing an issuer (Multinomial logit analysis of the subsample).

	Public Banks	Large Private Banks	Medium and Small Private Banks	Participation Banks
Variable	Av.Mrg.Eff.	Av.Mrg.Eff.	Av.Mrg.Eff.	Av.Mrg.Eff.
Widespread branch/ATM network	-0.008	0.034***	-0.020**	-0.006*
	(-1.37)	(3.31)	(-2.24)	(-1.76)
Card of the patronized bank	0.012**	0.008	-0.017**	-0.003
	(2.48)	(0.96)	(-2.31)	(-1.06)
Installment conditions	-0.006	-0.015	0.019**	0.002
	(-0.98)	(-1.41)	(2.05)	(0.66)
High credit limit	-0.004	-0.003	0.010	-0.003
	(-0.76)	(-0.26)	(1.11)	(-0.86)
More bonus/rewards/miles	-0.011*	0.060***	-0.043***	-0.006
	(-1.88)	(5.68)	(-4.56)	(-1.63)
Prestigious card	-0.013**	0.029***	-0.019**	0.003
	(-2.32)	(2.93)	(-2.13)	(0.91)
Promotion for oil/gas purchases	0.007	-0.010	-0.001	0.003
	(1.23)	(-0.90)	(-0.12)	(0.95)
More extensive discount campaigns	0.002	0.002	0.002	-0.006*
	(0.34)	(0.19)	(0.23)	(-1.84)
Low interest rate	0.013**	-0.023**	0.001	0.009***
	(2.23)	(-2.08)	(0.15)	(2.81)
No or low annual fee	0.008	-0.027***	0.011	0.007***
	(1.54)	(-2.71)	(1.28)	(2.62)
First card of the cardholder	0.000	0.009	-0.005	-0.004
	(0.05)	(1.08)	(-0.72)	(-1.36)
Affinity card	0.020***	-0.007	-0.013	0.000
	(3.11)	(-0.53)	(-1.06)	(-0.03)
Recommendation from acquaintances	-0.011	-0.009	0.016*	0.005
	(-1.60)	(-0.85)	(1.65)	(1.50)
Family patronage	-0.008	0.031**	-0.017	-0.006
	(-1.14)	(2.55)	(-1.60)	(-1.27)
Benefits like insurance, valet parking	0.002	-0.020	0.020*	-0.002
	(0.21)	(-1.54)	(1.82)	(-0.51)
Virtual card services	-0.008	0.003	0.006	0.000
	(-1.05)	(0.20)	(0.53)	(-0.10)
Internet and telephone service quality	-0.001	0.004	-0.008	0.005
	(-0.15)	(0.37)	(-0.81)	(1.43)
Informative and effective advertising	0.005	-0.005	0.003	-0.002
	(0.80)	(-0.46)	(0.25)	(-0.72)
Nonrisky revolver	0.007	-0.007	0.001	-0.001
	(0.36)	(-0.19)	(0.03)	(-0.09)
Delinquent revolver	-0.008	-0.035	0.052**	-0.009
	(-0.52)	(-1.33)	(2.34)	(-0.99)
Defaulted revolver	0.041**	-0.098**	0.069*	-0.012
	(1.96)	(-2.34)	(1.93)	(-0.68)
New customer	-0.047***	-0.080***	0.127***	0.000
	(-3.66)	(-3.29)	(5.84)	(0.07)
Change card	-0.016	-0.041	0.045*	0.012
	(-1.03)	(-1.50)	(1.86)	(1.56)
Public sector	0.059***	0.039	-0.082**	-0.017
	(3.25)	(1.13)	(-2.55)	(-1.61)
Self employed	0.014	-0.007	-0.004	-0.003
	(0.62)	(-0.20)	(-0.15)	(-0.29)
Farmer/Seasonal worker	-0.047	0.018	0.025	0.004
	(-0.80)	(0.27)	(0.50)	(0.20)
Unemployed	0.004	0.188	0.040	-0.233
	(0.00)	(0.02)	(0.01)	(-0.02)
Retired out of labor force	0.070***	-0.067	0.013	-0.016
	(3.07)	(-1.50)	(0.33)	(-1.00)

Unretired out of labor force	0.025	0.030	0.182	-0.237
	(0.02)	(0.00)	(0.04)	(-0.01)
No/Primary/Middle school	0.020	-0.003	-0.006	-0.011
	(1.09)	(-0.08)	(-0.21)	(-1.16)
High school	0.023	0.006	-0.027	-0.003
	(1.43)	(0.23)	(-1.05)	(-0.32)
Age	0.001*	-0.001	-0.001	0.000
	(1.87)	(-0.40)	(-0.54)	(-0.26)
Household income	-0.011	-0.014	0.020**	0.004
	(-1.59)	(-1.23)	(2.25)	(0.95)
Household income squared	0.000	0.000	0.000	0.000
	(0.92)	(0.38)	(-0.79)	(-0.42)
Wealth	0.000	0.000	0.000	0.000
	(0.35)	(0.56)	(0.86)	(-1.31)
Female	-0.002	0.003	0.003	-0.003
	(-0.14)	(0.11)	(0.12)	(-0.38)
Married	-0.026	0.014	-0.001	0.013
	(-1.41)	(0.45)	(-0.04)	(1.36)
Divorced/Separated/Widowed	-0.011	0.067	0.159	-0.215
	(-0.01)	(0.01)	(0.04)	(-0.01)
Eastern Anatolia	0.037*	-0.061	0.015	0.009
	(1.82)	(-1.49)	(0.40)	(0.85)
Black Sea	0.003	-0.014	0.021	-0.010
	(0.14)	(-0.36)	(0.64)	(-0.55)
Central Anatolia	0.022	-0.039	0.023	-0.006
	(1.37)	(-1.29)	(0.85)	(-0.56)

1,692 observations, t-statistics are in parentheses. *, ** and *** denote significance levels at 10%, 5% and 1%, respectively.

Appendix-2. Average marginal effects of variables on the probability of choosing an issuer (Multinomial logit analysis of the whole sample).

	Public Banks	Large Private Banks	Medium and Small Private Banks	Participation Banks
Variable	Av.Mrg.Eff.	Av.Mrg.Eff.	Av.Mrg.Eff.	Av.Mrg.Eff.
Widespread branch/ATM network	-0.012**	0.039***	-0.020***	-0.007**
	(-2.11)	(4.35)	(-2.68)	(-2.22)
Card of the patronized bank	0.016***	0.003	-0.017***	-0.002
	(3.27)	(0.44)	(-2.86)	(-0.65)
Installment conditions	-0.002	-0.015	0.017**	0.000
	(-0.37)	(-1.57)	(2.14)	(0.13)
High credit limit	-0.010*	0.004	0.006	-0.001
	(-1.65)	(0.51)	(0.84)	(-0.35)
More bonus/rewards/miles	-0.009	0.053***	-0.035***	-0.008**
	(-1.53)	(5.62)	(-4.47)	(-2.40)
Prestigious card	-0.009*	0.023***	-0.016**	0.002
	(-1.68)	(2.63)	(-2.15)	(0.77)
Promotion for oil/gas purchases	0.008	-0.018*	0.004	0.005
	(1.38)	(-1.88)	(0.54)	(1.54)
More extensive discount campaigns	-0.006	0.011	0.002	-0.007**
	(-0.95)	(1.11)	(0.26)	(-2.04)
Low interest rate	0.018***	-0.032***	0.004	0.010***
	(3.13)	(-3.35)	(0.54)	(3.32)
No or low annual fee	0.006	-0.021**	0.007	0.008***
	(1.16)	(-2.43)	(0.91)	(3.05)
First card of the cardholder	0.008*	-0.003	-0.004	-0.001
	(1.84)	(-0.47)	(-0.61)	(-0.45)
Affinity card	0.013**	-0.006	-0.006	-0.001
	(2.07)	(-0.54)	(-0.63)	(-0.31)
Recommendation from acquaintances	-0.009	-0.007	0.013*	0.003
	(-1.48)	(-0.76)	(1.68)	(1.15)
Family patronage	-0.002	0.021**	-0.015*	-0.003
	(-0.38)	(2.00)	(-1.68)	(-0.97)
Benefits like insurance, valet parking	0.006	-0.013	0.010	-0.003
	(0.86)	(-1.15)	(1.02)	(-0.73)
Virtual card services	-0.009	0.002	0.005	0.001
	(-1.12)	(0.21)	(0.56)	(0.27)
Internet and telephone service quality	-0.002	0.003	-0.004	0.002
	(-0.25)	(0.29)	(-0.45)	(0.78)
Informative and effective advertising	0.002	0.002	-0.001	-0.003
	(0.29)	(0.17)	(-0.10)	(-0.81)
Nonrisky revolver	0.009	-0.013	-0.005	0.008
	(0.48)	(-0.42)	(-0.17)	(0.96)
Delinquent revolver	-0.007	-0.035	0.053***	-0.010
	(-0.46)	(-1.47)	(2.84)	(-1.16)
Defaulted revolver	0.039*	-0.096**	0.077**	-0.020
	(1.65)	(-2.43)	(2.53)	(-0.97)
New customer	-0.081***	-0.026	0.114***	-0.008
	(-5.63)	(-1.24)	(7.06)	(-1.29)
Change card	-0.029	-0.023	0.040*	0.012
	(-1.58)	(-0.86)	(1.84)	(1.64)
Public sector	0.073***	0.020	-0.073***	-0.021**
	(4.10)	(0.67)	(-2.79)	(-1.99)
Self employed	0.002	-0.002	-0.003	0.002
	(0.09)	(-0.05)	(-0.12)	(0.27)
Farmer/Seasonal worker	0.060*	-0.092*	0.044	-0.012
	(1.78)	(-1.78)	(1.10)	(-0.58)
Unemployed	-0.020	0.043	-0.008	-0.015
	(-0.42)	(0.75)	(-0.20)	(-0.72)

Retired out of labor force	0.117***	-0.116***	0.027	-0.028
	(5.44)	(-3.05)	(0.85)	(-1.64)
Unretired out of labor force	0.060	-0.105*	0.063	-0.018
	(1.64)	(-1.95)	(1.57)	(-0.79)
No/Primary/Middle school	0.028*	-0.031	-0.002	0.005
	(1.65)	(-1.15)	(-0.08)	(0.53)
High school	0.032**	-0.010	-0.023	0.001
	(2.02)	(-0.39)	(-1.10)	(0.1)
Age	0.001*	0.000	-0.001	-0.001
	(1.92)	(0.32)	(-1.19)	(-1.21)
Household income	-0.006	-0.016*	0.021***	0.001
	(-0.87)	(-1.66)	(2.80)	(0.32)
Household income squared	0.000	0.000	0.000	0.000
	(0.59)	(0.51)	(-1.15)	(-0.24)
Wealth	0.000	0.000	0.000	0.000
	(-0.64)	(1.31)	(0.91)	(-1.55)
Female	-0.015	0.003	0.007	0.004
	(-1.01)	(0.13)	(0.40)	(0.57)
Married	-0.013	0.005	-0.012	0.020**
	(-0.72)	(0.18)	(-0.54)	(2.16)
Divorced/Separated/Widowed	0.002	-0.056	0.037	0.017
	(0.08)	(-1.03)	(0.82)	(0.74)
Eastern Anatolia	0.052**	-0.087**	0.021	0.014
	(2.53)	(-2.48)	(0.68)	(1.48)
Black Sea	0.011	-0.035	0.021	0.003
	(0.56)	(-1.08)	(0.78)	(0.26)
Central Anatolia	0.032**	-0.047*	0.014	0.000
	(2.10)	(-1.80)	(0.65)	(-0.01)

2,265 observations, t-statistics are in parentheses. *, ** and *** denote significance levels at 10%, 5% and 1%, respectively.