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The Economics of Payment Card Fee Structure: Policy Considerations of Payment Card Rewards

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THE ECONOMICS OF PAYMENT CARD FEE STRUCTURE: POLICY CONSIDERATIONS OF PAYMENT CARD REWARDS

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Abstract: This paper considers possible public policies that could improve efficiency and welfare distribution in the U.S. retail payments industry. Mainly, four options, i) encouraging competition; ii) allowing merchants to surcharge; iii) regulating merchant fees; and iv) regulating payment card rewards, are discussed, but each option has advantages and disadvantages. Any single option may not achieve the policymakers' objective; rather, combining several policy options may be required.

Keywords: Payment card rewards, merchant fees, competition policies, regulations

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1. Introduction

In many countries, public authorities have intervened with the payment card industry in general and the payment card fee structure in particular.[2] Some public policy interventions have directly regulated the level of the fees paid by merchants and other interventions have abolished network rules and/or encouraged competition among card networks, aiming to reduce the level of fees paid by merchants. In the United States, public authorities and legislatures have not taken actions regarding the payment card fee structure until very recently. In 2008, the U.S. legislature has introduced two bills in the Congress, which are aiming to change the balance between the merchant fee and the cardholder fee (or rewards).

Policymakers should consider three key questions, when considering public policies. First, what is the optimal balance between the merchant fee and cardholder fee (or payment card rewards)? Second, if the market cannot reach the optimal balance, what market forces cause the equilibrium fee structure to deviate from the optimal fee structure? And third, what are policy options? This paper is the last of a series of three papers. The first paper examined the optimal balance between the merchant fee and the cardholder fee from both efficiency and equity perspectives.[3] The results and available empirical evidence suggest that providing rewards may not be the most efficient; nevertheless, the rewards are prevalent in the United States. The second paper investigated what market forces drive payment card rewards.[4] The results suggest that there are three potential market forces that altogether may drive payment card rewards, and that encouraging competition among card networks—the policy commonly used in a typical one-sided market—may not work to improve efficiency and/or welfare distribution; rather, the policy

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[2] Bradford and Hayashi (2008).
[3] Hayashi (2008a).
[4] Hayashi (2008b).

may potentially deteriorate those. These results should be utilized to consider the public policies—knowing these results may reduce the risk of implementing policies that may bring unwanted outcomes for policymakers. This paper considers potential public policies that could improve efficiency and welfare distributions in the U.S. retail payment industry.

There are several viable options that would change the current balance between the merchant fee and the cardholder fee to a more desirable balance from both efficiency and equity points of view. More specifically, reducing the merchant fee and payment card rewards would likely enhance social welfare and improve its distribution. This paper discusses some of those options and addresses advantages and disadvantages of each option. Any single option might not be able to achieve the policy goal; instead, combining several options may be required. In some instances, theory and available empirical evidence give a clear policy implication. In other instances, insufficient theory or a lack of evidence makes it hard to evaluate some policy options. In these cases, this paper points to the theory and data that would be required. How to design more suitable (combinations of) policies is very challenging, yet it may not be infeasible.

The rest of the paper is organized as follows. Section 2 recaps the results in the first and the second papers—the optimal balance between the merchant fee and the cardholder fee, and equilibrium fee structures and their welfare consequences. Section 3 considers policy options and their advantages and disadvantages. Section 4 concludes.

2. Recap—Optimal Fee Structures and Equilibrium Fee Structures

2.1 Recap—Optimal Fee Structure

Efficiency and equity are two commonly used criteria to consider the "optimal" fee structures or price levels. Efficiency is often measured by social welfare, which consists of welfares of all parties involved in the market. The most efficient card fee structure, therefore,

can be defined as the fee structure that maximizes social welfare of all parties involved in the payment card market. Equity considers the distribution of social welfare among different parties. In contrast to efficiency, there is no clear way to measure equity. Because equity and efficiency do not necessarily coincide, political decision is required to define the "optimal" fee structure. Therefore, one approach to consider the "optimal" fee structure is to examine the most efficient card fee structure and its effects on welfare distribution among different parties.

Although it is not always the case, in most cases the most efficient cardholder fee is the difference between the card network's costs for a card transaction and the merchant transactional benefit from the card transaction. Therefore, in most cases, providing rewards to card-using consumers is the most efficient only when the merchant transactional benefit from a card transaction exceeds the card network's costs of processing it. In some cases, the product price and the merchant fee also affect social welfare, while in other cases, they do not.

The most efficient fee structure and product price do not necessarily make all parties involved in the payment card market better off, compared with the economy where no card products are available. Especially, consumers who use the alternative payment method, such as cash and checks, would likely be worse off, if the product price they face is higher due to the introduction of the cards. Since the product price is generally positively correlated with the merchant fee, the higher the merchant fee, the worse off these consumers are. Furthermore, not all card-using consumers are better off even when the fee structure and product price are the most efficient. Card-using consumers whose transactional benefit from cards is relatively small would likely be worse off due to the higher product price. In contrast, card-using consumers whose transactional benefit from cards is relatively high would likely be better off because their

transactional benefit from cards would likely exceed the welfare losses due to the higher product price.

If merchants are allowed to set different prices according to their customers' payment method and if they actually practice such pricing, then the maximum social welfare would not be lower than that when merchants are not allowed to do so. In some cases, the merchant's ability to price discriminate their customers would increase the maximum social welfare, while in other cases, it would not affect the maximum social welfare. In either case, the merchant's practicing discriminatory pricing would likely affect welfare distribution. The most efficient card fee structure and product price would be less likely to negatively affect the surplus of a consumer who uses the alternative payment method. And all card-using consumers would likely be better off compared with the case where no card products are available. Because of the incentive compatibility constraints, the merchants and card networks would not incur losses under the most efficient fee structure and product price regardless of whether the merchants set different prices across payment methods or not.

Whether the most efficient cardholder fee is positive or negative is an empirical question. Available existing cost studies, which used relatively old information on merchant costs, suggest that the most efficient cardholder fee may likely be positive.[5] This implies providing rewards may not be the most efficient. In order for policymakers to accurately evaluate whether currently provided payment card rewards are efficient or not, collecting comprehensive and updated information on costs and benefits of various parties is required.

2.2 Recap—Equilibrium Fee Structure

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[5] Hayashi (forthcoming 2009) calculates the most efficient cardholder fees using available empirical evidence.

The second paper investigated what market forces drive payment card rewards, when providing rewards may not be the most efficient. The paper identified three factors that altogether may explain the prevalence of rewards programs in the United State today. They are oligopolistic merchants, output-maximizing card networks, and the merchant's inability to set different prices across payment methods. It is quite plausible that these three factors co-exist in the U.S. payment card market.

Arguably, some merchants may be monopolistic at least locally. Having rewards at equilibrium with monopolistic merchants is possible but in rather limited circumstances. When consumers make a fixed number of transactions (say, all consumers make an X number of transactions a year), providing rewards is unlikely to be at equilibrium. In this case, monopolistic merchants would not accept cards if the merchant fee exceeds their transactional benefit, and thus card networks cannot provide rewards without incurring losses. When a consumer's demand function for goods is downward-sloping, which implies the number of transactions the consumer makes increases as the product price decreases (or the cardholder fee decreases in the case of card users), the equilibrium cardholder fee may potentially be negative. In this case, monopolistic merchants would accept the cards even when the merchant fee exceeds their transactional benefit because accepting the cards may induce a consumer demand curve shift upwards. In contrast, oligopolistic merchants are more likely to accept cards even when the merchant fee exceeds their transactional benefit, because of their strategic motives. The higher merchant fee allows the card networks to provide rewards without incurring losses.

It may be quite intuitive that output-maximizing networks are more likely to provide rewards than profit-maximizing networks, aiming for more consumers to use the cards instead of using the alternative payment method. When merchants are oligopolistic, a profit-maximizing

monopoly network would set the most efficient cardholder fees, and thus, it would not provide

rewards when providing rewards is not the most efficient. The idea is that the profit-maximizing

monopoly network uses the cardholder fee to increase social welfare as much as possible and

uses the merchant fee to absorb the welfare gains as much as possible. This implies that the

cardholder fee set by an output-maximizing network is likely lower than the most efficient

cardholder fee. We should note that the fee structure set by the profit-maximizing monopoly

network is not generally the most efficient; although the cardholder fee coincides with the most

efficient one, the merchant fee is generally higher than the most efficient merchant fee.

When merchants set different prices for card-using consumers and for consumers who use

the alternative payment method, if per transaction costs and fees are fixed, then the fee structure

does not affect the number of card transactions; rather, the sum of the cardholder fee and

merchant fee affects the number of card transactions.[6] In this case, although the card networks

may provide rewards, the effect of rewards would be offset by the difference in the product

prices for card-using and for non-card-using consumers. Thus, the card networks would not have

an incentive to provide rewards. If per transaction costs and fees are proportional to the

transaction value, then even when merchants set different prices, the card fee structure still

affects the number of card transactions. Nevertheless, the merchants' ability to set different

prices induces the card networks to set their merchant fees as *low* as possible. Both profit-

maximizing and output-maximizing card networks may even set negative merchant fees. This

implies that the card networks would not provide rewards at equilibrium.

The results of the theoretical models also suggest that whether per transaction costs and

fees are fixed or proportional to the transaction value would significantly influence the

equilibrium fee structure, especially when card networks are competing. When per transaction

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[6] This is consistent with the results of previous literature, which suggested the "neutrality" of interchange fees.

costs and fees are fixed (as many theoretical models assume), the equilibrium cardholder fees would converge to the most efficient cardholder fee as more cardholding consumers become multihoming. A multihoming cardholder is indifferent among cards: if the merchant accepts all (branded) cards, then his choice of which card to use is solely dependent on the cardholder fees of the cards—he chooses the card with the lowest (highest) cardholder fee (level of rewards). In contrast, when per transaction costs and fees are proportional to the transaction value, even if all cardholders are multihoming, the equilibrium cardholder fee set by competing card networks would unlikely be the most efficient; rather it would be less efficient than the cardholder fee set by a monopoly network. This implies that competition among card networks potentially deteriorates social welfare. In fact, the results suggest that when per transaction costs and fees are proportional to the transaction value, the equilibrium social welfare would not just be lower than the maximum social welfare, but would also potentially be lower than the social welfare without cards at all. Consumers as a whole and merchants would be worse off, compared with the economy without cards. This may warrant public policy interventions.

3. Policy Considerations

This section considers possible public policies that could improve efficiency and welfare distribution in the U.S. retail payments industry. This section mainly discusses four options: i) encouraging competition; ii) allowing merchants to surcharge; iii) regulating merchant fees; and iv) regulating payment card rewards. However, this does not necessarily imply these options are better than any other options. In fact, each option has advantages and disadvantages. And any single option may not be able to achieve the policymakers' goal. Instead, combining several options may be required.

Encouraging card network competition alone may not be a good option

To achieve the efficient allocation, encouraging competition is a commonly used policy option in a typical one-sided market. However, how encouraging competition in a two-sided market affects efficiency has not been fully understood. Because of the two-sidedness, encouraging competition in one or both sides—the consumer side and merchant side—of the market may significantly affect efficiency. As credit card networks claim, they may already be quite competitive in the consumer side of the market. Card issuers (including the three-party scheme card networks) compete for card users by providing generous rewards to entice them to use the issuers' cards. The four-party scheme networks set higher interchange fees to entice card issuers to issue cards of their brands. As more issuers provide more generous rewards and differentiate their card products to compete for cardholders, more cardholders may become singlehoming, meaning they strongly prefer to use one card as much as possible. This cardholder's behavior allows for card networks to set a monopolistic merchant fee, even though they are competing in the consumer side of the market.[7] Therefore, encouraging competition in the merchant side of the market may be required to reduce the levels of merchant fees and rewards toward more efficient levels.

Several options are proposed to enhance card networks' competition in the merchant side of the market. Abolishing network rules, such as honor-all-cards rule[8] and single entity rule[9], and mandating a single card to carry multiple card networks may allow merchants to influence their customers' payment choice toward less expensive payment methods for the merchants. However, how influential merchants can be is a question. Merchants may be reluctant to reject any issuers' cards if some of their customers strongly prefer those cards to use. As long as

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[7] See Guthrie and Wright (2007) and Hayashi (2008b).
[8] A merchant that accepts a network's credit (or debit) card must accept all of the network's credit (or debit) cards regardless of the card issuer or specific card programs, such as consumer credit vs. corporate credit cards or no-reward consumer credit vs. reward consumer credit cards.
[9] A merchant that accepts a network's card is required to accept it at every retail location.

consumers have a strong preference for which card network to process the transaction, merchants may have little influence even if the card carries multiple card networks.[10]

Merchants can be the most influential for their customers' payment choice when all cardholders are multihoming. As mentioned before, multihoming cardholders hold multiple cards and are indifferent among cards: their choice of which payment card to use solely depends on the cardholder fees as long as the merchant accepts all cards they hold. Even if all cardholders are multihoming, the equilibrium fee structure may not be the most efficient. As shown in the second paper (Hayashi 2008b), whether the equilibrium fee structure is the most efficient or not depends on the nature of per transaction costs and fees of the payment methods. When per transaction costs and fees are fixed amounts regardless of the transaction value, then as more cardholders become multihoming, the equilibrium fee structure converges to the most efficient fee structure. In contrast, when per transaction costs and fees are proportional to the transaction value, then even when all cardholders are multihoming, the equilibrium fee structure may not be efficient. In fact, the equilibrium fee structure in this case is less efficient than in the case where all cardholders are singlehoming. Thus, encouraging card networks' competition in the merchant side of the market may potentially deteriorate social welfare.

Because the current payment card fees are generally proportional to the transaction value, policymakers should be careful about this policy option. One thing policymakers can do before giving up this policy option is to investigate whether payment card fees need to be proportional to the transaction value or not. If the card networks' costs of a card transaction, the merchants' transaction costs and fees for the alternative payment methods, and consumers' transactional

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[10] Currently, a typical debit card in the United States carries both PIN- and signature-based debits. Some consumers strongly prefer signature debit while other consumers prefer PIN debit or are indifferent between the two. Merchants generally prefer PIN-debits due to their lower fees. There are mixed views about how influential merchants are when consumers choose between PIN- and signature-debit. Some merchants may have been successful in steering their customers toward PIN-debit, however other merchants may not.

benefit from cards are not proportional to the transaction value, then encouraging the card networks' competition in the merchant side of the market, combined with making payment card fees fixed, may be a viable policy option. If these costs, fees and benefits are actually proportional to the transaction value, then encouraging the card networks' competition alone may not be a good policy option.

Abolishing no-surcharge rule may not be enough

Many card networks have a rule that restricts merchants to set different prices based on their customers' payment methods (the so-called no-surcharge rule or no-discriminatory rule). In several countries, regulatory interventions abolished this rule and merchants are now allowed to price discriminate their customers based on their payment methods. Those countries include Australia, Netherlands, Switzerland, and the United Kingdom.

Theoretically, merchants' practicing discriminatory pricing is welfare enhancing unless either card networks or merchants are monopolistic. When per transaction costs and fees are fixed, the merchants' setting of different prices across payment methods changes the payment card market from two-sided to one-sided. That is, the fee structure does not affect the number of card transactions any more; rather, the sum of the two fees, the merchant fee and the cardholder fee, affects the number of card transactions. In a one-sided market, conventional competition policies—encouraging competition among card networks—may improve efficiency. When per transaction costs and fees are proportional to the transaction value, the fee structure still affects the equilibrium card transaction volume even if merchants set different prices across payment methods. Nevertheless, the equilibrium fee structure would likely become more efficient if neither card networks nor merchants are monopolistic. Therefore, allowing merchants to price

discriminate their customers would potentially improve social welfare if it is used with competition policies.

However, whether merchants actually practice such pricing is a question. Although the threat of setting different prices could induce card networks to lower the merchant fees, if practicing such pricing cannot be wide spread among merchants for various reasons, then this policy would not be very effective. Empirical evidence from other countries, such as Netherlands and Sweden,[11] suggests that although merchants are allowed to set different prices to their customers, many of them do not do so.[12] According to the Reserve Bank of Australia, practicing surcharging card customers is becoming more common among merchants, but larger merchants are more likely to practice surcharging than their smaller counterparts.[13] Experience in these countries may imply that setting different prices across payment methods is costly for merchants.

There may be another reason why such pricing is difficult for merchants, especially in the United States, even if they were allowed to do so. To effectively set different prices, merchants need to know the exact level of merchant fees as well as cardholder fees. However, in reality, the U.S. merchants typically do not know their own fee level of a particular transaction due to the complex interchange/merchant fee structures. Furthermore, merchants do not know their customers' cardholder fees. Even the "average" cardholder fees in the industry as a whole are difficult to obtain.

Thus, if policymakers would want merchants to set different prices based on the payment methods, other policies that eliminate the obstacles to doing so may also be needed. For example, simplifying the card networks' fees would make it easier for the merchants to determine the price levels for card-using consumes and non-card-using consumers.

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[11] Today, surcharging is not allowed in Sweden.
[12] See IMA Market Development AB (2000) and ITM Research (2002).
[13] See Graph 2 in Reserve Bank of Australia (2008).

Again, policymakers should be careful about the option of combining two policies—allowing merchants to price discriminate customers and encouraging competition among card networks and merchants. If either one of the two policies is not effective, the equilibrium outcome after the policy intervention would likely be worse than that before the intervention. As discussed above, if merchants are reluctant to set different prices based on the payment methods, encouraging competition among card networks may potentially lower social welfare. If either the merchants set a monopolistic product price or the card networks set a monopolistic merchant fee, then the merchants' practicing discriminatory pricing may potentially lower social welfare.

Regulating the merchant fees, rather than the interchange fees, may be more reasonable but it would require measuring costs and benefits of a card transaction accurately

Direct regulations on interchange fees and/or merchant fees have been taken in many countries.[14] The regulatory authorities determine the regulated level or cap of interchange fees or merchant fees. In some of these countries, public authorities regulate interchange fees of four-party scheme networks and do not regulate merchant fees of three-party scheme networks. The same policy—regulating four-party scheme interchange fees only—may not work well in the United States for two reasons. First, three-party scheme networks, such as American Express and Discover, have relatively large market shares in the United States; and although these three-party scheme networks do not have explicit interchange fees, their organizational form is now close to the four-party scheme: their cards are now issued by financial institutions (such as Citibank and Bank of America), and their merchant acquiring services are also provided by third-parties (such as Fifth Third Bank), besides the card networks themselves. Therefore, regulating the four-party scheme interchange fees gives a competitive advantage to the three-party scheme networks, and

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[14] See Bradford and Hayashi (2008).

card issuing financial institutions would likely switch their card brands from the four-party to the three-party schemes. Second, regulating interchange fees alone allows card networks to find the other ways to transfer funds from merchants to card issuers. For instance, card networks may lower association dues for card issuing members and raise them for acquiring members, which are ultimately paid by merchants. Because the policymakers' ultimate goal is to set the appropriate balance between the fees paid by merchants and the fees paid (or rewards received) by consumers, this policy would require policymakers to monitor other fees as well.

Some regulators require interchange fees or merchant fees to be set based on the cost-based benchmarks. If the U.S. policymakers would regulate the merchant fees based on the cost-based benchmark, they need to determine which costs should be included in the cost-based benchmarks. Typically, the merchants and the card networks (and their card issuers) have different views on which costs should be covered by the fees paid by merchants. Although the cost categories that are allowed to be included in the cost-based benchmark vary by country and payment card type (credit or debit), there are mainly three cost categories considered that issuers can recover from the fees paid by merchants: One is the costs of processing a transaction, which includes both authorization and clearing/settlement processes. Two is the costs for fraud losses (including payment guarantee to the merchants) and fraud prevention. And three is the costs of free-funding period.

We should note that providing rewards is not considered as the cost of issuers in the countries that regulate the interchange fees or merchant fees. To some extent, this view is shared with the theoretical literature on the payment card industry. In the theoretical models, providing rewards is not included in the card network's costs or the joint costs of the acquirer and the issuer for a card transaction; rather, rewards are considered as negative cardholder fees. However, this

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does not necessarily justify regulating the interchange fees or merchant fees based on the cost-based benchmark.

Setting the level (or cap) of the merchant fees at the cost-based benchmarks would be welfare enhancing if the most efficient cardholder fee—the card network's costs (or the joint costs of the acquirer, the issuer and the card network) for a card transaction minus the merchant's transactional benefit from a card transaction—is positive but the market equilibrium cardholder fee is negative (i.e., rewards are provided). The resulting cardholder fees due to this regulation are likely to be still lower than the most efficient cardholder fee, but they are likely to be closer to the most efficient cardholder fee than the pre-regulation equilibrium cardholder fees.

In contrast, if the most efficient cardholder fee is negative (i.e., providing rewards at a certain level is the most efficient), the same policy may either improve or worsen social welfare.[15] The resulted cardholder fees due to the regulation are likely to be higher than the most efficient cardholder fee, while the market equilibrium cardholder fees are likely to be lower than the most efficient cardholder fee. Thus, whether the regulation improves or worsens social welfare depends on the difference between the cardholder fees under the regulation and the most efficient cardholder fee and the difference between the equilibrium cardholder fees and the most efficient cardholder fee. If the former is greater than the latter (i.e., the resulted cardholder fees are much higher than the most efficient cardholder fee), then the cost-based merchant fee would likely worsen social welfare. On the other hand, if the latter is greater than the former (i.e., the current rewards at the market are too generous compared with the most efficient rewards level), then the regulated merchant fee would likely improve social welfare.

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[15] Although the available empirical evidence in the United States suggests that the most efficient cardholder fee is likely positive.

The potential negative effects of this policy option on social welfare would be diminished if policymakers use this option with policies that encourage competition among card networks and among merchants. Except for some special cases (when per transaction costs and fees for the payment methods are fixed and consumers make a fixed number of transactions regardless of the price of the goods), the product prices affect social welfare, and generally, social welfare increases as the product prices are lowered. Thus, encouraging competition among merchants to reduce the product prices would positively affect social welfare. And encouraging competition among card networks (especially when card networks are profit-maximizing) would reduce the risk that the resulted cardholder fees due to the regulation become too high compared with the most efficient cardholder fee.

Nevertheless, setting the merchant fees based on the cost-based benchmarks may still negatively impact social welfare, and therefore, policymakers should be careful about this policy option. It would be safer for policymakers to implement this policy option if it is certain that the most efficient cardholder fee is positive or it is negative but close enough to zero.

Another downside of this policy option is that it requires accurately measuring the joint costs of the acquirer, the issuer, and the card network for a card transaction (if three-party scheme, then simply the card network's costs) and it also requires policymakers to determine which *level* of the costs should be used to set the merchant fees. According to several industry studies, the issuer's costs vary by issuer: larger card issuers tend to have lower costs than their smaller counterparts.[16] Policymakers need to decide whether the highest, the average, or the lowest costs among issuers should be used to determine the level (or the cap) of the merchant fees. If policymakers choose the cost level that is lower than the highest, then the highest cost

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[16] According to various industry sources. For instance, Star Network's *POS Debit Issuer Cost Studies (2006, 2007)* and Visa's *Credit Card Issuer Functional Cost studies*.

issuers may need to exit the market. But if policymakers choose the highest costs, then some issuers, presumably larger issuers, might still be able to provide too generous rewards to their customers.

Ideally, policymakers would want to set the merchant fees at the most appropriate level, instead of setting the merchant fees at the cost-based benchmarks. However, depending on the market environment, such as competition among card networks and their objective and competition among merchants, the regulated merchant fees would not necessarily result in the appropriate levels of cardholder fees and product prices. If card networks are output-maximizing and merchants are quite competitive, then setting the merchant fees at the merchant's transactional benefit from a card would make the cardholder fees and the product prices close to the most efficient levels. Therefore, setting the merchant fees at the most appropriate level is more effective if it is used with policies encouraging competition among card networks and among merchants.

Setting the merchant fees at the merchant transactional benefit from cards does not require accurately measuring the joint costs of the acquirer, the issuer, and the card network; however, it requires accurately measuring the merchant's transactional benefit from a card, which may be more challenging. Merchants may have an incentive to underreport their transactional benefit from a card in order to reduce the merchant fee. Therefore, policymakers need to obtain the merchants' transactional benefit from the other sources (for example, comprehensive studies on merchant's costs and benefits that can also be used to set fees for the alternative payment methods, such as cash and checks, or the merchant tax information that reflects the costs of alternative payment method).

Although regulating the merchant fees may not be infeasible and may potentially improve social welfare, this option requires policymakers to accurately measure the card network's costs or the merchant's transactional benefit from cards. Policymakers may need to periodically revise this information on costs/benefits. The administration costs of this policy option might not be negligible.

Regulating the rewards with abolishing no-surcharge rule and encouraging competition may work

As an alternative to directly regulating the merchant fees, policymakers have an option of directly regulating payment card rewards. They could cap the reward level at either zero or the difference between the merchant transactional benefit from cards and the card network's cost for a card transaction (whichever is higher). This would improve social welfare when the equilibrium payment card rewards are much more generous than the most efficient level. An advantage of this option is that the rewards level is always at or closer to the most efficient level, regardless of the market environment, such as the card networks' competition and the merchants' competition. However, a downside is that policymakers need to know both the card network's costs (or the joint costs of the acquirer, the issuer, and the card network) and the merchant's transactional benefit from a card. As discussed earlier, accurately measuring the card network's costs and the merchant's transactional benefit is very challenging.

Another way to regulate the payment card rewards is setting the rewards level at zero. This does not require policymakers to measure either the card network's costs or the merchant's transactional benefits. Obviously, this option alone may negatively impact social welfare if providing rewards is the most efficient. However, if this option is used with competition policies and abolishing no-surcharge rules, then social welfare would likely be improved. Consider the

case where the most efficient cardholder fee is negative (i.e., providing rewards is the most efficient). Competitive card networks may want to maximize their output, the number of card transactions, but they now need to do so by *reducing* the merchant fees. The lowest merchant fee they can set is at their cost of a card transaction (otherwise they make losses). Since the most efficient cardholder fee is negative, this implies that the merchant transactional benefit from a card is greater than the card network's costs of a card transaction. The merchants would save more if their customers use the cards instead of using the alternative payment methods. Thus, if they are allowed to price discriminate their customers, they would set a *lower* product price for card-using customers and a *higher* product price for customers who use the alternative payment methods, such as cash and checks. The card networks may want to encourage the merchants to set different prices for card-using consumers and non-card-using consumers: they may simplify their fee schedule so that the merchants can easily determine the product prices by payment method. In order for product prices to effectively reflect the merchant's benefit from a card, merchants need to be quite competitive. Thus, policymakers need to encourage competition among merchants.

If, on the other hand, the most efficient cardholder fee is positive, setting payment card rewards level at zero alone would improve social welfare, although it would not be the most efficient. Combining the other two policies—abolishing no-surcharge rule and encouraging competition among card networks and among merchants—to this option would be unlikely to harm social welfare.

A downside of this option may be the unattractiveness of the option for some card-using consumers: This option would be welfare reducing for those consumers whose transactional benefit from cards is relatively high, although the option would be welfare enhancing for

consumers as a whole. Even for consumers who would benefit from this policy, it may be difficult to recognize their welfare gains, because they usually do not observe how much product prices are raised and thus how much their welfare is reduced due to higher merchant fees.

Another downside of regulating the payment card rewards level at zero may be its enforcement. Although they may not be as effective as the current generous rewards programs, card issuers may find other ways to reward their customers. For example, extending the warranty of the products purchased with their cards or waiving annual fees of the credit cards or fees of other products the card issuers offer. Thus, this option may potentially require policymakers to monitor card issuers' behavior closely.

4. Conclusion

This paper considered the policy options that are available to the U.S. policymakers. Four main options—encouraging competition among card networks and among merchants, abolishing no-surcharge rule, regulating the merchant fees, and regulating the payment card rewards—were discussed. Since each option has advantages and disadvantages, any single option may not achieve the policymakers' objective—to improve efficiency and welfare distribution among parties involved in the retail payment system. Rather, combining several policy options may potentially work.

Because of the complexity of the payment card markets, the potential effects of any policy interventions may vary by market environments, such as competition among card networks and their objectives, competition among merchants, consumer's demand for goods, and so on. Although the paper tried to consider many different plausible market environments, it may still overlook some key market characteristics that may significantly change the effects of policy

interventions. Further theoretical developments as well as comprehensive data gathering may be

required to accurately assess the potential effects of policy interventions.

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