

Working Papers

RESEARCH DEPARTMENT

WP 18-04

Revised October 2018
January 2018

<https://doi.org/10.21799/frbp.wp.2018.04>

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Viktar Fedaseyev

Bocconi University

Robert Hunt

Federal Reserve Bank of Philadelphia Consumer Finance Institute



ISSN: 1962-5361

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The Economics of Debt Collection: Enforcement of Consumer Credit Contracts

Viktar Fedaseyeu^a and Robert Hunt^b

October 1, 2018

Abstract

Creditors often outsource the task of obtaining repayment from defaulting borrowers to third-party debt collectors. We argue that by hiring third-party debt collectors, creditors can avoid competing in terms of their debt collection practices. This explanation fits several empirical facts about third-party debt collection and is consistent with the evidence that third-party debt collectors use harsher debt collection practices than the original creditors. Our model shows that the impact of third-party debt collectors on consumer welfare depends on the riskiness of the pool of borrowers and provides insights into which policy interventions may improve the functioning of the debt collection market.

Keywords: debt collection, contract enforcement, consumer credit markets, regulation of credit markets, credit cards, Fair Debt Collections Practices Act

JEL Classification: D18, G28, L24

^aDepartment of Finance, Bocconi University. Address: Via Roentgen 1, Milan, Italy, 20136. Email: viktar.fedaseyeu@unibocconi.it.

^bSenior Vice President and Associate Director, Consumer Finance Institute, Federal Reserve Bank of Philadelphia. Address: Ten Independence Mall, Philadelphia, PA, 19106. Email: bob.hunt@phil.frb.org.

This paper has benefited from comments by Kenneth Ahern, Thomas Chemmanur, Francesco Corielli, Lukasz Drozd, Nicola Gennaioli, Richard Hynes, Howell Jackson, Artashes Karapetyan, Jeremy Ko, Igor Livshits, Marco Ottaviani, Phil Strahan, Glen Weyl, Stephanie Wilshusen, and seminar participants at Bocconi University, the Federal Reserve Bank of Philadelphia, the 2014 NBER Summer Institute, the 2014 BEROE conference, the 2014 European Economic Association Meetings, the 2014 FDIC Annual Consumer Research Symposium, the 2015 American Economic Association Meetings, the 2015 Society of Economic Dynamics Meetings, the 2015 Meetings of the Society for the Advancement of Economic Theory, and the 2016 Meetings of the European Financial Association. Avi Peled assisted with the data. Viktar Fedaseyeu thanks CAREFIN, the Center for Applied Research in Finance at Bocconi University, for financial support.

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1. Introduction

When borrowers default on their debts, creditors use a variety of methods to try to obtain repayment. This process is called debt collection, and, according to the Consumer Financial Protection Bureau (CFPB), it “constitutes one of today’s most important consumer financial concerns” (Consumer Financial Protection Bureau, 2014, p. 2). There are several types of debt collection in consumer credit markets. Sometimes creditors collect on their debts internally (i.e., *in their own name and by using their own employees*); sometimes creditors employ third-party firms that collect *on behalf of the creditor and in the name of the creditor itself*; and sometimes these same creditors employ third-party firms to collect *on behalf of the creditor but in their own name*. In this paper, we investigate the rationale behind the existence of these distinct types of debt collection and their welfare implications.

When a creditor collects internally (i.e., by using its own employees) or hires a third-party firm to collect in the creditor’s name, the creditor typically retains considerable control over the debt collection practices that can be used. When the creditor hires third-party firms that collect in their own name, however, such firms are less constrained by the creditor in terms of the practices they use. The available empirical evidence suggests that debt collectors that use the name of the creditor (termed *first-party debt collectors*, which include both the creditor’s own employees and employees of the firms hired by the creditor and using the creditor’s name) use more lenient debt collection practices than those used by debt collectors that collect in their own name (termed *third-party debt collectors*).¹ In Section 2, we present evidence on the harshness of debt collection practices and show that a third-party debt collector generates, on average, about 10 times more complaints from consumers than a first-party debt collector. These relatively harsher collection practices used by third-party debt collectors affect millions of borrowers: In 2013, the proportion of American consumers with at least one account in third-party collections stood at 14 percent.²

¹Unless otherwise stated, we use the terms lenient and harsh in this paper to characterize the intensity of collection efforts that are used. In our notation, harsh does not necessarily imply the use of illegal, unfair, or deceptive practices. It might simply reflect a higher propensity to make phone calls or to obtain garnishments, for example.

²Source: *The Quarterly Report on Household Debt and Credit*, Federal Reserve Bank of New York, various editions. *The Quarterly Report on Household Debt and Credit* is based on a 5 percent random sample of all individuals with a credit report. These figures reflect stocks and not flows;

What can explain the observed patterns of outsourcing in the debt collection market as well as the relatively harsher debt collection practices used by third-party firms? In this paper, we argue that a key factor (but not necessarily the only one) behind the outsourcing of debt collection is creditors' concerns that harsh debt collection practices may drive away borrowers. If creditors compete for borrowers not just in terms of the interest rates that they charge but also in terms of the debt collection practices that they use, then borrowers may abandon lenders that use harsh practices in favor of lenders that use more lenient practices. In this case, employing third-party debt collectors may enable creditors to avoid competing among themselves on debt collection practices. Intuitively, when several lenders employ the same third-party debt collector, the practices that this debt collector uses (whether harsh or lenient) are applied to all borrowers, regardless of which lender they borrowed from. This precludes borrowers from being able to discriminate between lenders based on the harshness of the debt collection practices and can therefore enable third-party debt collectors to use harsher practices than creditors would use on their own.

The argument based on creditors' concerns about the harshness of debt collection practices can rationalize the coexistence of distinct types of outsourcing in the debt collection market. In particular, if third-party firms are simply more efficient than original creditors, then creditors can (and do) realize efficiency gains by hiring third-party firms and allowing them to collect in the creditor's name (while retaining substantial control over the debt collection practices of these firms). When the harshness of debt collection practices (rather than efficiency gains) is a primary consideration, however, then creditors can (and do) hire third-party firms without retaining much control over the practices of these firms. This argument can also explain many other empirically observed regularities in the debt collection industry and has implications for the market structure of the debt collection industry as well as consumer welfare.

To analyze the economics of debt collection, we build a model along the lines of the common agency framework (e.g., Bernheim and Whinston, 1985, 1986; Prat and Rustichini, 2003). In the model, banks compete for customers, who choose which bank to borrow from based on the interest rates they charge and the debt collection practices they use. These practices can be either harsh or lenient. Relative to lenient

accounts may remain in debt collection for several years. The share of consumers with at least one account in third-party collections has not fallen below 9 percent since the end of 2001, which is the earliest date for which the corresponding data are available.

debt collection practices, harsh debt collection practices generate higher nonpecuniary costs for borrowers. Because of these nonpecuniary costs, consumers prefer to borrow from banks that use lenient debt collection practices whenever possible. As a result, if there are no third-party debt collectors, then all banks use lenient debt collection practices in equilibrium.

We introduce third-party debt collectors into the model by assuming that banks have a choice of whether to use a first-party debt collector or a third-party debt collection agency.³ This agency, in turn, decides whether to use harsh or lenient debt collection practices after having been hired (or not) by the banks. Thus, a debt collection agency can condition its choice of debt collection practices on the set of banks that hired it.⁴ If all banks hire the same third-party debt collector, then there is no bank using first-party collections, and the debt collection agency can, therefore, use harsh debt collection practices without the risk of its clients losing borrowers. Under certain conditions, there exists an equilibrium in which all banks delegate their debt collection to the third-party agency, and the agency uses harsh debt collection practices. This generates the first empirical prediction of the model (i.e., that third-party debt collectors use harsher debt collection practices than first-party debt collectors).

We then extend the model to derive its implications for the structure of the debt collection industry. We show that, under certain conditions, there is no equilibrium in which there is a single debt collection agency that collects on the behalf of all banks. Instead, there is an equilibrium with multiple debt collection agencies, each collecting on the behalf of multiple banks. This is consistent with empirical evidence: The debt collection industry is large and yet relatively unconcentrated, and it is customary for creditors to hire multiple debt collection agencies at the same time, with each agency collecting on behalf of multiple creditors. We also show that the concentration in the debt collection industry is related to the concentration in the

³Since the main focus of this paper is on the relative harshness of debt collection practices used by third- versus first-party debt collectors and because the banks themselves typically constrain the practices of first-party debt collectors regardless of whether they are employees of the bank or not, we do not distinguish between first-party debt collectors hired directly by the banks from those who are not bank employees.

⁴Contractual arrangements between creditors and debt collectors generally enable the latter to predict which creditors will hire them, even *before* borrowers of those creditors default on their loans. See Section 2 for details.

banking industry, with the debt collection industry becoming more concentrated as the banking industry becomes more concentrated. This is consistent with the recent evolution of the two industries, in which consolidation in the debt collection industry followed consolidation in the banking industry, suggesting a close link between the two. Our model also predicts that the debt collection industry will become more concentrated as consumers become better informed about the debt collection practices that different banks and debt collection agencies use.

Finally, we analyze the model's implications for consumer welfare. We assume that some consumers are prone to moral hazard and will not repay their debts unless they face the threat of harsh debt collection practices. We further assume that lenders cannot identify such opportunistic consumers. In this setting, borrower moral hazard creates an adverse selection problem for banks that use lenient debt collection practices, since opportunistic consumers will be willing to borrow from such banks at any interest rate and will not repay their debt. The effect of third-party debt collectors on the market outcome and consumer welfare therefore depends on the share of opportunistic consumers.

When the share of opportunistic consumers is large, the credit market can function only with harsh collections.⁵ However, harsh debt collection practices cannot be implemented when banks collect on their own. As a result, lending is feasible only in the presence of third-party debt collectors. In this case, the presence of debt collectors produces, under certain conditions, more consumer welfare than a market without lending. The presence of debt collectors is therefore most relevant for credit markets in which the share of risky borrowers is large, because such markets may not function without third-party debt collectors. In such markets, the scope for possible policy intervention is limited, and welfare improvements may be achieved by lowering the pecuniary and nonpecuniary costs of debt collection.

The model's welfare implications are different if the share of opportunistic consumers in the credit market is not too large. In this case, lending is possible both when lenders collect on their own and use lenient debt collection practices and when lenders hire third-party debt collectors (that use harsh collection practices). Since

⁵In the absence of harsh collections, the interest rate that banks charge has to compensate them for the expected losses from opportunistic consumers. If the share of such consumers is high, then nonopportunistic consumers will not be willing to accept the interest rate that banks charge. Realizing that only opportunistic consumers are willing to borrow, banks will not lend in equilibrium.

harsh collection practices generate nonpecuniary costs to consumers, a market with third-party debt collectors produces less consumer welfare than a market without third-party debt collectors. Hence, policy interventions that shift debt collection back to creditors can improve consumer welfare in a market in which the share of opportunistic borrowers is not too large.

Thus, policy interventions that improve welfare in a credit market with a low share of opportunistic borrowers may hurt consumer welfare in a market in which the share of opportunistic borrowers is sufficiently large (because the presence of third-party debt collectors lowers consumer welfare in the former but increases consumer welfare in the latter). By pointing out the parameters that can affect consumer welfare, our model can therefore inform policymakers about the tools they can use to influence the behavior of creditors and collection agencies to maximize consumer welfare. One particularly important policy tool is personal bankruptcy laws, which put a limit on how much debt collectors and creditors can recover from defaulting borrowers.⁶ Since personal bankruptcy provides an option for households to escape debt collection activities, the availability of this option limits the ability of debt collectors to use harsh practices (if the costs of bankruptcy filings, both pecuniary and nonpecuniary, are lower than the benefits of being able to avoid harsh collections). This, in turn, may affect creditors' choice between first- and third-party collections. Another policy tool is licensing and liability costs established by regulation because such costs will be reflected in the fees charged by third-party debt collectors and may therefore affect creditors' willingness to outsource debt collection. Furthermore, the government and other organizations can promote consumer education about available consumer protections and increase borrowers' awareness of the debt collection practices that creditors and debt collectors use. This may influence consumers' choices about which banks to borrow from or the intensity of their search for the best contract terms. Finally, improvements in information availability or technology may reduce the non-pecuniary costs of debt collection, thus improving the efficacy of collections without necessarily increasing disutility to consumers.

Our model provides a baseline analysis of third-party debt collection in a fully rational framework, and this framework is sufficient to account for many empirically

⁶After a consumer files for personal bankruptcy, the law requires that all collection efforts be stopped.

observed features of the debt collection market and evaluate the implications of third-party debt collection for consumer welfare. However, our welfare implications may be modified in a straightforward way also in case consumers do not fully realize the consequences of harsh debt collection practices. For example, Coffman (2011) provides experimental evidence that the mere act of employing intermediaries may reduce punishment for undesirable behavior. Along these lines, hiring third-party debt collectors may help creditors distance themselves from harsh debt collection practices if consumers do not fully realize that harsh debt collection practices can benefit creditors. This, of course, implies that consumers' decision to borrow in the presence of third-party debt collectors may not be fully rational and may therefore generate lower welfare relative to our baseline.

While we show that our model is capable of rationalizing many empirical regularities in the debt collection market, it is, of course, possible that other considerations also play a role in creditors' decision to outsource debt collection to third-party firms. For example, the nature of the debt collection process may be such that only small and highly specialized firms can engage in it successfully. This argument, however, is difficult to reconcile with the coexistence of third-party firms that use the name of the creditor and third-party firms that use their own name: If specialization were the only explanation for the existence of third-party debt collectors, then there would be little reason to expect the coexistence of these two types of debt collection. In Section 2, we present further evidence that suggests that specialization alone cannot fully explain the debt collection process. We would like to note that this paper does not take a stand on the relative efficiency of third-party debt collectors because it may be that cost savings achieved through outsourcing play an important role in the debt collection market.⁷ However, it is difficult to rationalize the observed patterns of outsourcing in this market by cost savings alone; neither can these cost savings (by themselves) explain why third-party debt collectors use harsher debt collection practices than first-party debt collectors.

This paper contributes to the literature on creditor remedies, reviewed in Hynes and Posner (2002), Athreya (2005), and Livshits (2014). Extensive research has studied contract enforcement mechanisms in consumer credit markets, such as personal

⁷As we discuss in Section 2, the available evidence on the efficiency of third-party debt collectors relative to original creditors is mixed. Therefore, our model setup is agnostic about the efficiency of third-party debt collection relative to first-party debt collection.

bankruptcy and garnishment. For example, Gropp, Scholz, and White (1997) show that high levels of bankruptcy exemptions reduce credit availability and redistribute credit toward high-asset households. White (2007) argues that the growth in revolving debt has contributed to the rise in bankruptcy filings and that bankruptcy policies that favor creditors must be accompanied by changes in credit market regulations designed to prevent overborrowing. Barth, Gorur, Manage, and Yezer (1983) show that restrictions on garnishment reduce the availability of personal loans, while Dawsey and Ausubel (2001) and Agarwal, Liu, and Mielnicki (2003) document that creditor-friendly garnishment laws increase the likelihood that borrowers will file for bankruptcy. Chatterjee, Corbae, Nakajima, and Ríos-Rull (2007) and Livshits, MacGee, and Tertilt (2007) develop rich quantitative models to study the impact of consumer bankruptcy on household debt and default and analyze welfare implications of various bankruptcy regimes. Since consumer bankruptcy provides borrowers with a protection mechanism, it restricts creditors' ability to demand repayment from borrowers. The existence of third-party debt collectors acts in the opposite direction by increasing the repayment that creditors can obtain from defaulting borrowers. This, in turn, provides a mechanism that can increase the rights of creditors relative to debtors and may therefore offset some of the protections awarded to consumers through the option to file for bankruptcy.

The literature has also explored the relationship among collections, bankruptcy, and credit supply. The earliest paper we are aware of that focuses on debt collection is Krumbein (1924), and it provides a detailed description of the debt collection market as it existed nearly 100 years ago.⁸ White (1998) argues that many households default without filing for bankruptcy because creditors may decide not to collect on defaulting borrowers since creditors lack the ability to differentiate between borrowers who will repay and those who will file for formal bankruptcy. More recently, a number of papers have established that a significant proportion of borrowers may be exposed to collections activity. Dawsey and Ausubel (2001) report that, in one large bank's portfolio, about half of the individuals who defaulted on their credit cards had not filed for bankruptcy at the time of their default or shortly thereafter, a behavior they describe as "informal bankruptcy." Hynes (2008) examines the process of debt

⁸A more recent review of the institutional detail and regulation of collections is found in Hunt (2007), Federal Trade Commission (2009, 2011a), and Zywicki (2015).

collection in state courts and finds that debt collection litigation is pervasive, that consumers who are sued by creditors and debt collectors are drawn predominantly from lower-income areas, and that very few consumers file for bankruptcy once they are sued. Dawsey, Hynes, and Ausubel (2013) document that informal bankruptcy is more prevalent in states that grant consumers a private right of action against creditors who violate debt collection laws. Athreya, Sanchez, Tam, and Young (2014) develop a model with formal bankruptcy and informal default (with renegotiation) and examine borrowers' choice between the two. Drozd and Serrano-Padial (2017) show that improvements in methods of screening defaulting borrowers can reconcile some paradoxical trends in the pricing and supply of revolving credit. Fedaseyeu (2015) shows that regulations of third-party debt collection affect credit supply, with more stringent regulations leading to fewer openings of new revolving lines of credit. Our paper complements this research by focusing on creditors' choice between first- and third-party collections and the implications of this choice for consumer welfare and policymaking.

The rest of this paper is organized as follows. Section 2 presents several stylized facts about the debt collection industry. Section 3 develops a theory of third-party debt collection based on the common agency framework and relates it to empirical evidence about the debt collection market. Section 4 contains a welfare analysis. In Section 5, we discuss policy implications of the framework developed in this paper as well as alternative explanations for the existence of third-party debt collection. Section 6 concludes. Proofs of propositions are found in the Appendix.

2. Stylized Facts

In this section, we present several stylized facts about the debt collection industry. Some of these facts describe prevalent contractual arrangements between creditors and debt collectors. The understanding of these arrangements informs the assumptions that we make in the model developed here. Other facts describe empirical regularities observed in the debt collection market, and the model developed in this paper will provide a unified conceptual framework to rationalize these empirical regularities.

Our primary focus here is on the role of third-party debt collectors in the U.S., which has perhaps the largest consumer credit market in the world, with 70.3 percent of U.S. consumers having at least one credit card (Schuh and Stavins, 2015). Further, as noted previously, 14 percent of U.S. consumers have at least one account in third-

party collections. We recognize that not all features of the U.S. credit market are necessarily universal. However, understanding the economic logic behind third-party debt collection may be important not just for the millions of U.S. borrowers who face third-party debt collection but can also provide insights into the role of relative rights of creditors and debtors in financial markets more generally. Specifically, as we will show next, the existence of third-party debt collectors may enable creditors to sustain an equilibrium with harsher debt collection practices than creditors would use when collecting on their own.

2.1. Debt collection activities can be performed by creditors collecting in their own name, by third-party firms collecting in the creditor's name, and by third-party firms collecting in their own name on behalf of the creditor.

In consumer credit markets, the party that owns the debt is not necessarily the party that engages in the debt collection activity (i.e., creditors sometimes outsource debt collection to third-party firms). As in other industries, some of this outsourcing may be due to third-party firms having a cost advantage over creditors. However, cost savings are unlikely to be the only motivation for outsourcing debt collection. This is because sometimes creditors employ third-party firms to collect *on behalf of the creditor and in the name of the creditor itself*, but sometimes these same creditors employ third-party firms to collect *on behalf of the creditor but in their own name*. The latter type of outsourcing suggests that, in consumer credit markets, the name used by the party engaged in debt collection makes a difference (or at least the market participants believe that it makes a difference).

Initial debt collection efforts are often conducted by creditors internally (i.e., by employees of the creditor) or by other firms collecting in the name of the creditor itself; these firms are termed *first-party collection firms*. According to the CFPB, “[t]he majority of issuers outsource at least some collection activities to first-party collection companies” (Consumer Financial Protection Bureau, 2015, p. 249). In such cases, the creditor typically retains substantial control over the methods that first-party collection firms use, and these firms must abide by the creditor’s internal rules. The main motivation for outsourcing first-party collections is cost savings.

If first-party collection efforts are unsuccessful, creditors often engage a firm to try to recover on the debt in its own name rather than in the name of the creditor. Firms engaged in such activities generally are known in the industry as *third-party*

collectors (Consumer Financial Protection Bureau, 2015, p. 239). Crucially, the creditor has less control over the debt collection methods that such firms use. There are two types of third-party debt collection. Most often, the creditor retains the legal ownership of the debt and hires an agency that works on commission, receiving a percentage of the proceeds it collects for the creditor. Such agencies are termed *contingency collectors*. Sometimes, however, the creditor may sell the legal ownership of previously defaulted debt to a third-party agency, termed a *debt buyer*. Debt buyers purchase debt at a discount, and this discount is the analog of the commission that creditors pay to contingency collectors. The same law regulates the debt collection practices of both types of debt collectors. Further, the agencies that regulate and supervise debt collection — the Federal Trade Commission (FTC) and the CFPB — customarily refer to both contingency collectors and debt buyers when they use the term *third-party debt collection*, as opposed to first-party debt collection. Thus, our focus in this paper is on the choice between first- and third-party collection and not between contingency collectors and debt buyers.⁹

2.2. Third-party debt collectors are primarily engaged in investigating consumers' willingness to pay; they largely rely on information and communication technology to determine consumers' ability to pay.

Direct evidence suggests that third-party debt collectors rely on the information provided by creditors and outside data vendors when they determine consumers' ability to pay. In particular, “[a]fter receiving new accounts, debt collectors typically work with one or more data vendors to supplement the account data by appending new or updated contact information and identifying consumers who may be deceased or have filed for bankruptcy [...]. Some collectors also use this process to identify consumers who may be protected by the Servicemembers Civil Relief Act as well as consumers who have filed lawsuits or other complaints against collectors. [...] This process is generally automated and takes place during the first night after the accounts are received from the creditor” (Consumer Financial Protection Bureau, 2016b, p. 41). “Apart from the process of checking incoming data against external

⁹The distinction between debt buyers and contingency collectors may give rise to strategic effects since the creditor can reallocate accounts between different contingency debt collection agencies upon observing these agencies' behavior but cannot reallocate accounts between different debt buyers once the debt has been sold. The focus of this paper, however, is on the choice between first- and third-party collectors and not on the choice between different types of third-party firms.

databases, very few respondents did any additional checks for accuracy or adequacy of the data” (Consumer Financial Protection Bureau, 2016a, p. 22). In fact, the Consumer Financial Protection Bureau (2016b, p. 6) notes that “[c]reditors generate much of the underlying information in the debt collection system.”

That creditors themselves have or can readily obtain information used by debt collectors in their collection efforts suggests that the ability of third-party debt collectors to generate new information about consumers’ ability to pay (i.e., their assets) is not a primary driver behind the outsourcing of debt collection. Third-party debt collectors do generate information about consumers’ *willingness* to pay, however. They do so by establishing contact with the consumer trying to persuade him/her to repay his/her debt. The primary mode of this contact is phone calls and letters; sometimes debt collectors also file legal actions against borrowers.

Debt collection phone calls can have a profound effect on consumers and can often be very unpleasant. For example, “the most frequent debt collection-related complaint in the FTC’s Consumer Sentinel database is that a collector is calling repeatedly or continuously. [...] 32 percent of adults have received a pattern of calls from debt collectors they viewed as harassment.” (Consumer Financial Protection Bureau, 2013, pp. 54–55). Another piece of evidence that indicates a potentially perverse nature of debt collection phone calls states: “The survey responses indicate that 62 percent of consumers who had been contacted about a debt in collection felt that they were contacted too often. Smaller but nonetheless sizable fractions of consumers who had been contacted about a debt in collection said the creditor or collector threatened them (27 percent) or reported that the creditor or collector called before 8:00 a.m. or after 9:00 p.m. (35 percent)” (Consumer Financial Protection Bureau, 2016b, p. 5).

Of course, phone calls and other types of consumer communication can be performed by any debt collector regardless of whether he/she works for the creditor or for a third-party firm. However, the intensity with which consumer contact is established need not be the same across all debt collectors. In fact, this intensity varies systematically between first- and third-party debt collectors, which is the issue we focus on next.

2.3. Third-party debt collectors use harsher debt collection practices than first-party debt collectors.

We analyze the relative harshness of collections activity used by first-party collectors (firms that collect in the name of the creditor or creditors collecting on their own accounts) and third-party collectors (third-party firms that collect in their own name) by examining two data sets on consumer complaints collected by the FTC. The first data set is assembled from a congressionally mandated annual report on the FTC’s enforcement of the main federal law that regulates debt collection activity in the U.S., the Fair Debt Collection Practices Act (FDCPA).¹⁰ It includes statistics on consumer complaints filed only with the FTC (Federal Trade Commission, 2011b).¹¹ The second data set, called Sentinel, includes consumer complaints filed with the FTC, other state and federal agencies, Better Business Bureaus, and a number of nonprofit consumer protection organizations (Federal Trade Commission, 2013a).

The first measure we use is the total number of consumer complaints against first- and third-party debt collectors. The number of complaints against third-party debt collectors far exceeds that against first-party debt collectors. According to the FTC’s annual FDCPA reports, since 1999, about three-quarters of all complaints about collections activity were associated with third-party collections firms. Since almost all collection efforts start with first-party collections, most third-party debt collectors receive the accounts on which first-party collection attempts have already taken place. Thus, third-party debt collectors receive a subset of accounts on which first-party debt collectors collect and yet generate a higher absolute volume of complaints on this subset of accounts than first-party debt collectors generate on all of the accounts on which they collect. It follows, therefore, that third-party debt collectors use practices that consumers perceive as harsher than the practices of first-party debt collectors. In fact, the FTC receives more complaints about the debt collection industry than about any other specific industry. From 2006 to 2012, complaints about collections activity accounted for about 9 percent of all complaints in the Sentinel database.¹²

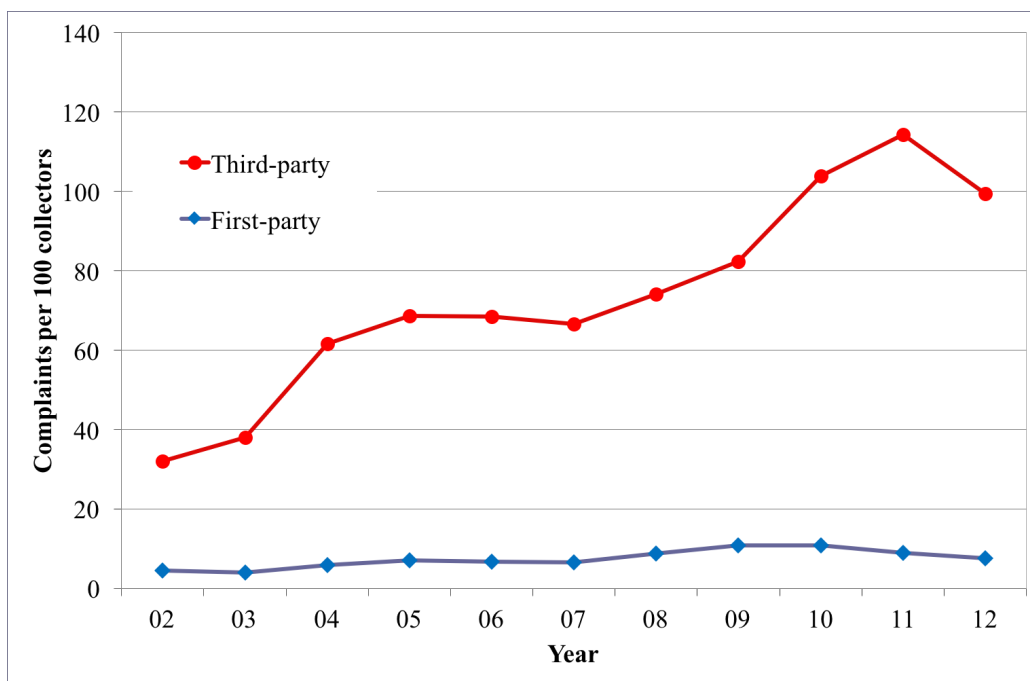
¹⁰Complaints against third-party debt collectors include complaints against both contingency collectors and debt buyers.

¹¹While the FTC uses information in these complaints to inform its surveillance and enforcement efforts, it does not have the resources to verify the accuracy of the complaints that are filed. In July 2013, the CFPB began accepting consumer complaints about debt collection. The FTC continues to receive complaints as well.

¹²In the Sentinel data, the number of recorded consumer complaints of all sorts has grown rapidly

We also compute the relative intensity of complaints against first-party collectors versus third-party collectors and plot its time series in Figure 1. To construct the intensity of complaints against first-party collectors, we normalize the total number of complaints attributed to first-party collectors in the FTC database by the total employment of bill and account collectors in the U.S. The intensity of complaints against third-party collectors is computed similarly, by using complaints attributed to third-party collectors and the employment of bill and account collectors in the Business Support Services Sector (which includes the third-party collections industry). Roughly speaking, there are 10 times more complaints per collector in the third-party collections industry than for the economy as a whole.¹³

Figure 1: Consumer Complaints Against First- and Third-Party Debt Collectors



Sources: Authors' calculations based on Federal Trade Commission Annual FDCPA Reports; U.S. Bureau of Labor Statistics, Occupational Employment Survey

during the last decade, in part because the maturation of the Internet has reduced the costs of filing complaints. The total number of complaints increased 11 percent per year during the decade ending in 2012. Collections complaints increased slightly more rapidly at about 12 percent per year.

¹³The debt collection industry does not agree with the FTC's classification of first- versus third-party collections or its measurement of collections complaints. See, for example, InsideArm (2012).

2.4. Creditors tend to allocate debt collection across many third-party agencies, and each third-party agency usually collects on behalf of several creditors.

The average collection firm, which is fairly small, serves 422 clients.¹⁴ Even the smaller agencies have more than 100 clients (ACA International, 2012). Creditors, in turn, tend to allocate their accounts across multiple collection agencies. Credit card issuers place accounts with as many as 50 agencies (Government Accountability Office, 2009).

2.5. Contracts between creditors and debt collectors are customarily forward looking.

It is not uncommon for creditors and collection firms to enter into long-term contracts. Such “servicing contracts” may last anywhere from a few months to several years, with the creditor transferring delinquent debt to the agency at regular intervals. Many contracts include an automatic renewal provision. These contracts set general terms such as pricing and the amount of time (typically six to nine months) that the agency will collect on the debt before it is returned to the creditor.¹⁵

A similar long-term arrangement exists for defaulted debts that creditors sell outright. In that case, it is very common for debt buyers and creditors to enter into “forward flow” contracts (Fitzgerald, 1999). This commits the creditor to deliver newly charged-off debt to the agency at a certain frequency, often with pricing fixed at the time of the contract. This gives the debt buyer some assurance of future supply and lets both parties avoid the volatility of the “spot” market for bad debt (Federal Trade Commission, 2013b).

In sum, existing contractual arrangements enable third-party debt collectors to anticipate which creditors will transfer their defaulted debt to them.

2.6. The debt collection industry is large and yet relatively unconcentrated.

The debt collection industry is large. In 2012, there were about 4,000 active third-party debt collection agencies in the U.S., which employed about 130,000 people (Table 1). The industry collected approximately \$55 billion in 2013 and returned about 80 percent of this amount to creditors (Ernst & Young, 2014).

¹⁴Not all clients of third-party debt collectors are financial firms. Other major users of third-party debt collectors are hospitals and utilities.

¹⁵This description is based on the authors’ discussions with representatives of several banks, collection agencies, and a trade association.

Despite the large size of the debt collection industry as a whole, there are few large debt collection agencies, with most firms being relatively small, especially when compared with the credit card industry. In 2012, three-quarters of collections firms had fewer than 20 employees; 61 percent had fewer than 10 (Table 1). In addition, concentration ratios in this industry are low. In 2012, the eight largest firms accounted for less than 25 percent of industry revenues, whereas the eight largest credit card issuers accounted for 91 percent of revenues.

The relative lack of concentration in the debt collection industry does not imply, however, that there are no economies of scale in debt collection. In fact, making phone calls (which is the main activity of debt collectors) lends itself to economies of scale, partly because of information and communications technologies such as predictive dialers.¹⁶ Although there are some large debt collection agencies, most debt collection agencies are small, suggesting that the benefits from economies of scale are not enough to fully explain the existence of third-party debt collection. Also note that, as the cost of information technology has gone down, the benefits from economies of scale may have diminished: Even smaller debt collection firms can now afford investing in relatively advanced information technology.

2.7. Consolidation in the debt collection industry followed consolidation in the banking industry.

While the collections industry remains relatively unconcentrated, its market structure has been changing. Between 1987 and 2012, the eight-firm concentration ratio in the debt collection industry increased from 17.2 percent to 22.5 percent. At the same time, the share of industry employment attributable to very small firms (fewer than nine employees) decreased from 20.2 percent in 1987 to 6.0 percent in 2012. These changes occurred when the banking industry experienced a period of rapid consolidation, with the eight-firm concentration ratio for the banks (as measured by credit card balances in Call Reports) increasing from 34.5 percent in 1987 to 79.2 percent in 2012. Thus, the moderate increase in the concentration of the debt collection industry corresponded to a period of increased concentration of consumer lending among the largest banks, perhaps suggesting a link between the two industries.

¹⁶A predictive dialer dials a list of phone numbers using an automatic algorithm that minimizes waiting time and maximizes the likelihood that the debt collector will be put in contact with the consumer he/she is trying to reach.

2.8. Evidence on the relative efficiency of first- versus third-party collections is mixed.

It is likely that relative efficiency plays an important role in the decision to outsource debt collection. However, delegating debt collection to a third party is costly for creditors. The most obvious cost that creditors have to bear when they place accounts with a third-party collection firm is that they have to share any recoveries with it.¹⁷ At the same time, outsourcing collections saves labor and other costs that would otherwise be devoted to collections in-house. All else being equal, a creditor will be better off outsourcing collections if third-party firms are either more productive or less expensive than an internal collections process.

There are a number of reasons to think that, in the absence of concerns about losing borrowers to competing banks because of debt collection practices, in-house collections may be more efficient for many creditors. To begin with, creditors generally have more information about their borrowers in their databases than third-party agencies, and this information advantage can be important for the collections process.¹⁸ Even though the degree of information loss is difficult to quantify, it does raise the question of why a creditor would attempt to transfer an account to a third party when any information loss can be avoided by collecting in-house.

It is also possible that many original creditors enjoy an absolute technological advantage over most collections firms. This is because large lenders enjoy the scale necessary to invest in sophisticated computers and models, which may be prohibitively expensive for most collections firms. Although the cost of information technology has decreased over time, widespread adoption of these technologies among smaller collection firms is a relatively recent phenomenon.

In addition, in the U.S., first-party collectors are generally less constrained by regulation than are third-party collectors. This is because federal law and many state laws pertaining to debt collection explicitly exclude from their jurisdiction the activities of the original creditors collecting on debts owed to them. In particular, the FDCPA explicitly excludes original creditors from its definition of debt collectors. Among state laws, approximately half (26) do not apply to the original creditors.

While this evidence suggests that creditors may potentially enjoy a cost advantage relative to third-party agencies, other factors also may be important. Arguments

¹⁷According to the ACA International's 2012 Benchmarking Survey, the median commission rate charged by third-party debt collectors was 26 percent (ACA International, 2012).

¹⁸See Thomas, Matuszyk, and Moore (2012).

in favor of outsourcing include the advantages of specialization and localized knowledge.¹⁹ Further, the fact that third-party firms are generally smaller than creditors suggests that they may incur smaller costs associated with litigation compared with creditors. In other words, third-party debt collectors may be relatively more “judgment proof” than many lenders.²⁰ These lower expected losses from litigation may, in turn, offer a cost advantage to third-party firms. Because of the mixed evidence, this paper does not take a stand on the relative efficiency of third-party debt collectors compared with lenders. Our model is agnostic as to whether banks or third-party collection firms have a cost advantage in collecting consumer debts.

3. The Model

3.1. *The basic model without debt collection agencies*

Our basic model consists of three dates. It starts at date 0 with a continuum of consumers of mass 1 and with N competing banks. The banks are Bertrand competitors, and their cost of funds is normalized to 0. At date 0, the banks simultaneously commit to the debt collection practices they will use. After these debt collection practices (which are assumed to be publicly observable) have been chosen, all banks simultaneously choose the interest rate they will charge on their loans to consumers. At date 1, consumers decide whether to borrow. Consumers are endowed with one unit of illiquid assets that they can’t consume until date 2. Therefore, to be able to consume at date 1, consumers need to borrow one unit of consumption good from one of the banks. Before making their decision, consumers observe the debt collection practices chosen by each bank as well as the interest rate offered by each bank. If consumers are indifferent between two or more banks, they randomize uniformly, implying that each bank receives an equal share of the market in this case. Having observed consumer demand, banks make investments in the debt collection technology (with details specified shortly) and provide the loans.

All loans obtained at date 1 have to be repaid (with interest) at date 2. Before the loan is due at date 2, with probability γ , a consumer receives labor income y (with probability $1 - \gamma$, she receives no labor income). There is no uncertainty about the

¹⁹For example, there is variation in collections law across states. See Fedaseyeu (2015).

²⁰This does not imply that third-party debt collection agencies are not sued; rather, they, compared with banks, have lower net worth that can be used to satisfy plaintiffs.

amount of labor income a consumer might receive, and we assume that this amount is always sufficient for consumers to repay their debt with interest if they decide to repay. In the basic model, we do not allow consumers to default strategically (an assumption that we will relax later), and hence, consumers who receive labor income always use it to repay their loans. To obtain repayment from consumers who borrowed at date 1 but who did not receive labor income at date 2, the banks need to persuade such consumers to liquidate their illiquid assets. The degree to which the banks can do this depends on the debt collection practices they use. These practices can be either harsh or lenient. The recoveries from lenient debt collection practices are normalized to zero (i.e., consumers without labor income do not repay anything), while harsh debt collection practices generate recoveries of $h < 1$ (i.e., consumers without labor income repay proportion h of their illiquid assets).²¹

After the debts are repaid or collected, consumers consume all of their remaining labor income and/or illiquid assets, and the game ends. There is no asymmetric information in the basic model (we will relax this assumption later). Banks and consumers are risk neutral. The discount factor between date 1 and date 2 is $\beta < 1$; β reflects consumers' impatience and therefore their desire to borrow.

To collect from defaulting consumers, banks need to invest in debt collection technology, and this investment will ultimately have to be recouped through the proceeds from loans.²² If a bank decides to implement lenient debt collection practices, this investment is normalized to zero. If a bank decides to implement harsh debt collection practices, the amount of this investment is $c > 0$.

The bank i 's break-even condition is given by

$$\gamma(1 + r_i)\mu + (1 - \gamma)\lambda_i\mu - \mathbb{1}_{\{\lambda_i=h\}}c = \mu, \quad (1)$$

where μ is the share of consumers who borrow from bank i , r_i is the interest rate charged by the bank i , $\lambda_i \in \{0, h\}$ represents the debt collection practices that the bank uses, and $\mathbb{1}_{\{\lambda_i=h\}}$ is the indicator function for whether bank i uses harsh debt

²¹As noted previously, the availability of personal bankruptcy can put a limit on the harshness of debt collection practices, since consumers that face aggressive collections can escape debt collection activities by filing for bankruptcy (if the costs of filing, both pecuniary and nonpecuniary, are lower than the benefits of being able to avoid harsh collections).

²²See Chin and Kotak (2006) for a case study that describes the substantial costs involved in setting up debt collection operations.

collection practices (in which case the bank has to invest c). Thus, the break-even interest rate for a bank that uses debt collection practices λ is given by (for notational simplicity, we omit subscript i)

$$r_\lambda = \frac{(1 - \gamma)(1 - \lambda) + \mathbb{1}_{\{\lambda=h\}}c/\mu}{\gamma}. \quad (2)$$

In making their decision about whether to borrow, consumers maximize their expected lifetime utility of consumption, net of pecuniary and nonpecuniary costs of debt collection. The nonpecuniary costs that arise in the process of debt collection represent consumers' utility loss over and above the amount collected by the bank.²³ We use the parameter $\theta > 0$ to quantify these nonpecuniary costs. In particular, let $\lambda \in \{0, h\}$ represent the harshness of debt collection practices. Then, the total cost to consumers from debt collection is $\lambda(1 + \theta)$, which includes the direct financial cost (λ) and the nonpecuniary costs ($\theta\lambda$).

Given the assumption of risk neutrality, the date 1 expected utility for a consumer who borrows from a bank that charges interest rate r and uses debt collection practices $\lambda \in \{0, h\}$ is given by

$$\begin{aligned} E(u|\text{borrow}, \lambda, r) &= 1 + \beta \left(\gamma(1 + y - (1 + r)) + (1 - \gamma)(1 - \lambda(1 + \theta)) \right) \\ &= 1 + \beta \left(1 + \gamma(y - (1 + r)) - (1 - \gamma)\lambda(1 + \theta) \right). \end{aligned} \quad (3)$$

The intuition behind equation (3) is as follows. If the consumer borrows, then she will consume 1 unit of consumption good at date 1 and will, therefore, obtain utility 1 at date 1. At date 2, if she receives labor income (which happens with probability γ), her total financial wealth will be $1 + y$. She will use her labor income toward debt repayment (recall that y is sufficiently high to repay both the principal and interest) and will consume the remainder of her labor income and all of her illiquid assets. Consumers who receive labor income are not collected upon (since they use their labor income to repay the debt in full). With probability $1 - \gamma$, the consumer receives no labor income at date 2 and will have to repay the debt out of her illiquid assets. The amount of this repayment is given by λ , which depends on the harshness of the

²³The notion that the process of debt collection imposes nonpecuniary costs for consumers is consistent with the large number of consumer complaints against debt collectors. Also, see Leff (1970) for an account of such nonpecuniary costs.

debt collection practices used by the bank (zero if lenient debt collection practices are used and h if harsh debt collection practices are used). Her overall utility loss from being exposed to debt collection is given by $\lambda(1 + \theta)$ that includes both pecuniary (λ) and nonpecuniary ($\theta\lambda$) costs.

If the consumer doesn't borrow at date 1, then she doesn't consume at date 1. At date 2, she doesn't owe any debt. In this case, her date 1 expected utility of lifetime consumption is given by

$$E(u|\text{abstain}) = \beta(1 + \gamma y). \quad (4)$$

Clearly, the consumer will borrow if and only if $E(u|\text{borrow}, \lambda, r) \geq E(u|\text{abstain})$, or

$$1 + \beta \left(1 + \gamma(y - (1 + r)) - (1 - \gamma)\lambda(1 + \theta) \right) \geq \beta(1 + \gamma y) \Leftrightarrow \frac{1}{\beta} \geq \gamma(1 + r) + (1 - \gamma)\lambda(1 + \theta). \quad (5)$$

Intuitively, when deciding whether to borrow, consumers compare the benefits of immediate consumption (weighted by their discount rate) with the costs associated with borrowing. The latter include the pecuniary costs (given by the interest rate that the borrowers have to pay and the amount of assets they have to transfer after debt collection) and the nonpecuniary costs associated with having to face debt collection (captured by the parameter θ).

We look for symmetric pure strategy subgame perfect Nash equilibria of this game. Focusing on symmetric equilibria is natural in a setting such as ours, where all banks are ex-ante identical. Our first result is to show that the only such equilibrium of this game involves all banks choosing lenient debt collection practices.²⁴

Proposition 1. *If there are no debt collection agencies (i.e., all banks collect on their own), then all banks use lenient debt collection practices.*

The intuition behind Proposition 1 is straightforward and follows from the assumption that harsh debt collection practices generate nonpecuniary costs for borrowers.

²⁴For each equilibrium that we describe in the propositions that follow, there are parameter values under which that equilibrium exists. Table A.1 in the Appendix provides examples of such parameter values for each equilibrium.

These costs imply that every dollar borrowed from a bank that uses lenient debt collection practices is associated with lower expected welfare losses than a dollar borrowed from a bank that uses harsh debt collection practices. These welfare losses are not borne by the banks and, therefore, are not reflected in the interest rates that they charge. Thus, consumers prefer to borrow from banks that use lenient debt collection practices, whenever possible. As a result, all borrowers will switch to banks that use lenient debt collection practices, as long as there is at least one such bank. If all but one bank use harsh debt collection practices, then the bank that uses lenient debt collection practices can charge an interest rate above its break-even point and still attract borrowers from the other banks, thus generating positive profits. Since all banks have incentives to use lenient debt collection practices when other banks use harsh debt collection practices, it follows that having all banks collecting on their own and using harsh debt collection practices cannot be an equilibrium.²⁵ If, on the other hand, all banks but one use lenient debt collection practices, then the bank that uses harsh debt collection practices will not be able to attract any borrowers. Thus, all banks collecting on their own and using lenient debt collection practices is the unique [symmetric] equilibrium of this game. From now on, we will refer to this equilibrium as the *undelegated equilibrium*.

3.2. The model with a single debt collection agency

In this section, we modify our basic model by introducing a debt collection agency. We start by assuming that there is only one such agency (we will relax this assumption in the next section). To accommodate the actions of the debt collection agency, the timeline of the game needs to be modified slightly. As before, there are three dates (0, 1, and 2), but date 0 now has a morning subperiod and an evening subperiod. In the morning of date 0, banks decide whether to collect on their own or to delegate debt collection to the third-party agency. For simplicity, we assume that a bank either delegates all of its accounts to the debt collection agency or does not delegate any of

²⁵Note that precommitting ex ante to an interest rate rule cannot sustain harsh collection practices in equilibrium. In particular, to sustain harsh debt collection practices, the banks must precommit to charging a loss-making interest rate below that charged by a lenient bank upon observing at least one other bank using lenient debt collection practices. This implies losing not just c (the cost of the harsh collections technology) but also losing money on each borrower in expectation. This strategy is therefore not subgame perfect since the bank's payoff can be strictly increased by charging an interest rate that doesn't attract any borrowers (and therefore limiting the losses to c).

its accounts to the debt collection agency (i.e., there is no partial delegation). This implies that a bank that hires the debt collection agency effectively outsources the choice of debt collection practices to this agency. The debt collection agency, in turn, uses the same debt collection practices against all borrowers assigned to it.

In the evening of date 0, debt collection practices are chosen, and interest rates are set in the following manner. All banks that decided to collect on their own choose their debt collection practices simultaneously with the debt collection agency. Similar to the basic model, after the banks and the agency choose their debt collection practices, all banks simultaneously set the interest rates they will charge. From date 1 onward, the game is analogous to the basic model, with the only difference that debt collection on behalf of the banks that hired the agency is performed by the agency and not by the banks.

The banks that hired the debt collection agency no longer need to invest in the debt collection technology. Instead, they pay the agency a fee proportional to the amount collected.²⁶ We denote this fee by f , where $1 > f > 0$. If the agency decides to implement lenient debt practices, its investment in the debt collection technology is normalized to zero (just as was the case for banks). If the agency decides to implement harsh debt collection practices, it needs to invest $q > 0$. In order for the agency to make nonnegative profits, it must be that $(1 - \gamma)hf \geq q$.²⁷

In general, q (the cost of implementing harsh debt collection practices by the debt collection agency) can be different from c (the cost of implementing harsh debt collection practices by the banks that collect on their own). As discussed previously, some factors suggest that q should be greater than c , while other factors suggest that the opposite may be true. All of the results in our basic model will go through even if third-party debt collection agencies are less efficient than banks (as long these inefficiencies are not so large that the interest rate charged by banks when they hire a debt collection agency is prohibitively high for consumers to be willing to borrow).

We will now show that, under certain conditions, the game with a debt collection agency has an equilibrium in which all banks delegate their debt collection to the agency, and the agency uses harsh debt collection practices on behalf of all banks.

²⁶This assumption reflects the prevalent arrangements between creditors and debt collectors, in which most debt collection agencies work on commission.

²⁷ $(1 - \gamma)hf$ is the total amount the agency will collect if all banks hire the agency and it uses harsh debt collection practices.

Proposition 2. *Assume that there exists a third-party debt collection agency to which banks can delegate their debt collection. Also assume that $(1 - \gamma)hf \geq q$ and that $\frac{1}{\beta} \geq 1 + (1 - \gamma)h(f + \theta)$. Then, there exists an equilibrium in which all banks delegate their debt collection to the debt collection agency, and the agency uses harsh debt collection practices.*

When the debt collection agency chooses its debt collection practices, it knows which banks have allocated their debt collection to it.²⁸ Furthermore, since the agency obtains a commission that depends on the amount it collects, it generates no profits unless the banks that hired it provide credit to at least some borrowers. If at least one of the banks deviates and chooses to collect on its own, the agency realizes that the banks that hired it will lose all their customers to the deviating bank, unless the agency uses lenient debt collection practices. Additionally, investing in the debt collection technology requires a fixed upfront cost, and hence the agency will generate negative profits if it decides to use harsh debt collection practices when one of the banks deviates and collects on its own. If, on the other hand, all banks hire the agency, then it can use harsh debt collection practices without the risk of its clients losing borrowers. In this case and as long as $(1 - \gamma)hf \geq q$, using harsh debt collection practices generates nonnegative profits for the agency. It follows that the debt collection agency will use harsh debt collection practices if all banks hire it and will use lenient debt collection practices if at least one bank decides to collect on its own. Given this strategy, banks have no incentive to deviate from an equilibrium in which all of them hire the debt collection agency. This is because any such deviation will induce the agency to switch to lenient debt collection practices and will, therefore, preclude the deviating bank from being able to attract borrowers from other banks.

Thus, there exists an equilibrium in which all banks delegate their debt collection to the debt collection agency, and the agency uses harsh debt collection practices.²⁹ From now on, we will refer to this equilibrium as the *delegated equilibrium*. This equilibrium is not unique; the undelegated equilibrium (in which all banks collect on

²⁸Recall that prevalent contractual arrangements between creditors and debt collectors enable the latter to predict which creditors will hire them before specific consumers default.

²⁹A final requirement for this equilibrium to exist is that consumers are willing to borrow if all banks delegate debt collection to a third-party agency. The necessary and sufficient condition for this is that $\frac{1}{\beta} \geq 1 + (1 - \gamma)h(f + \theta)$, i.e., that the benefits of borrowing outweigh the expected costs resulting from harsh debt collection practices.

their own and use lenient debt collection practices) also exists.³⁰ Note, however, that the delegated equilibrium exists only if there is a third-party debt collection agency. Thus, it is the presence of a third-party agency collecting on behalf of all banks that makes it possible to sustain an equilibrium with harsher debt collection practices than the banks use when they collect on their own. This is consistent with empirical evidence presented previously, showing that third-party debt collectors indeed appear to use harsher debt collection practices than creditors that collect on their own.

3.3. Multiple debt collection agencies

While a single debt collection agency is sufficient to sustain the delegated equilibrium in Proposition 2, in reality, there are multiple debt collection agencies. Further, it is customary for creditors to use several debt collection agencies at the same time, while a typical debt collection agency usually collects on behalf of multiple creditors. In this section, we will show that this market structure can arise endogenously in a theory based on common agency. This theory, therefore, can potentially provide a unified framework to analyze the collections market.

We relax the assumption that all consumers observe and compare debt collection practices and interest rate offers of all banks, since it is perhaps unlikely that every consumer can compare offers from all competing banks. It seems more realistic that a consumer compares offers of several national banks and a few smaller banks in her geographical area. Formally, we assume that each consumer compares the offers from m (with $N > m \geq 2$) randomly chosen banks and chooses the bank that maximizes her expected utility from borrowing. For now, we retain the assumption that there is only one debt collection agency that collects on behalf of all banks. The following proposition shows that the delegated equilibrium may not always exist if there is only one debt collection agency and consumers are imperfectly informed.

Proposition 3. *Assume that there exists one third-party debt collection agency to which banks can delegate their debt collection and that each consumer compares the offers from m (with $N > m \geq 2$) randomly chosen banks. As before, assume that $\frac{1}{\beta} \geq 1 + (1 - \gamma)h(f + \theta)$. Additionally, assume that $\frac{N-m}{N}(1 - \gamma)hf > q$. Then, the delegated equilibrium does not exist. In this case, lenient debt collection practices are used in equilibrium.*

³⁰For a discussion of equilibrium multiplicity in common agency games, see, e.g., Martimort and Stole (2003).

When consumers are perfectly informed ($m = N$), then the delegated equilibrium can always be sustained with a monopoly debt collection agency.³¹ The intuition here is as follows. If all consumers compare debt collection practices and interest rates of all banks, then a monopoly debt collection agency has very strong incentives to switch to lenient debt collection practices if one of the banks decides to deviate from the delegated equilibrium and collect on its own. This is because the agency realizes that the deviating bank will potentially be able to attract all consumers, since all consumers will be able to observe the debt collection practices and the interest rate chosen by this bank. If the agency decides to use harsh debt collection practices, then the banks that hired it will not be able to attract any borrowers. Therefore, the agency will make negative expected profits, since it needs to spend $q > 0$ to implement harsh debt collection practices. This ensures that the agency has incentives to switch to lenient debt collection practices in response to any deviation by the banks, which in turn ensures the sustenance of the delegated equilibrium.

In contrast, when consumers are imperfectly informed ($m < N$), then the delegated equilibrium does not always exist. This is because, when consumers are not perfectly informed, some of them may not observe the interest rate and collection practices of the deviating bank. As a result, not all consumers will switch to the deviating bank. This, in turn, lessens the incentives of the debt collection agency to resort to lenient debt collection practices after a bank deviates and decides to collect on its own.³² As the debt collection agency keeps using harsh debt collection practices, banks will have an incentive to deviate and collect on their own, since by doing so, they will be able to attract borrowers from the nondeviating banks and make positive profits. Somewhat surprisingly, when there is only one debt collection agency, the delegated equilibrium will be more difficult to sustain with imperfectly informed consumers.³³

³¹Note that $\frac{N-m}{N}(1-\gamma)hf > q$ implies that $(1-\gamma)hf > q$, and hence a monopoly debt collection agency collecting on behalf of all banks can make nonnegative profits.

³²The nondeviating banks may attempt to create incentives for the agency to use lenient debt collection practices by offering to pay it for using lenient debt collection practices upon observing at least one bank deviating and collecting on its own. In this case, the nondeviating banks can charge, at most, the same interest rate as the deviating bank but will also pay to the agency for using lenient debt collection practices. If the deviating bank is breaking even, the nondeviating banks make negative profits in this case, which implies that this mechanism is not feasible.

³³Note that there is no equilibrium in which all banks hire the agency, and the agency's strategy is to switch to lenient debt collection practices only after k banks deviate by collecting on their

The reason why a monopoly debt collection agency will not always switch to lenient debt collection practices after one of the banks deviates is that, with imperfectly informed consumers, deviations by individual banks may be insufficiently important for the debt collection agency to change its debt collection practices (because the share of consumers that the deviating bank is able to attract away from the nondeviating banks may be small). This logic suggests that a possible way to ensure that the delegated equilibrium can be sustained is to have multiple debt collection agencies, as long as these agencies are sufficiently small, so that deviations by individual banks are sufficiently important to induce the agencies to change their debt collection practices.

When consumers observe offers from m randomly chosen banks, then the entire credit market can always be divided into a finite number of segments in such a way that borrowers in each segment observe offers from the same set of m banks.³⁴ Denote the number of such segments by $g > 1$. We will now show that there exists an equilibrium with g third-party debt collection agencies, in which all banks delegate their debt collection to the agencies (the same bank may use several agencies) and all agencies use harsh debt collection practices.

Proposition 4. *Assume that each consumer compares the offers from m (with $N > m \geq 2$) randomly chosen banks and let g denote the number of credit market segments, such that borrowers in each segment observe offers from the same set of banks. As before, assume that $\frac{1}{\beta} \geq 1 + (1 - \gamma)h(f + \theta)$ and that $\frac{N-m}{N}(1 - \gamma)hf > q$. Further, assume that $(1 - \gamma)\frac{hf}{g} \geq q$ and that there exist g distinct third-party debt collection agencies. Then, there exists an equilibrium in which all banks delegate their debt*

own, where $k > 1$. Since $k > 1$, the agency will keep using harsh debt collection practices if a bank deviates unilaterally. However, unilateral deviations are profitable if the agency uses harsh debt collection practices, and hence, all banks will have incentives to deviate. Also note that if only a subset of banks hires the agency, then unless the agency uses lenient debt collection practices, no consumer would borrow from the banks that hired it. Finally, it may seem that, with imperfectly informed consumers, banks will be able to start using harsh debt collection practices on their own, in which case the existence of a third-party agency may no longer be necessary to sustain harsh debt collection practices in equilibrium. This, however, is not the case. Under Bertrand competition, as long as each consumer compares debt collection practices and interest rate offers from at least two banks, all banks will have an incentive to use lenient debt collection practices to attract consumers away from competing banks. Thus, lenient debt collection practices will be used in equilibrium.

³⁴There is a finite number of possible combinations of m banks out of a total of N banks, given by $\binom{N}{m} = \frac{N!}{m!(N-m)!}$. Of course, in practice, borrower segmentation can be based on geography or other factors that restrict the set of banks that they use.

collection to debt collection agencies (one bank may delegate debt collection to several agencies), and all agencies use harsh debt collection practices.

Intuitively, Proposition 4 holds because each segment of the credit market, considered separately, is essentially equivalent to the case in which all consumers observe interest rates and debt collection practices of all banks. Therefore, a debt collection agency that collects from consumers in that segment will have strong incentives to maintain the delegated equilibrium, just as in our basic model.³⁵

Proposition 4 provides a rationale for the existence of multiple debt collection agencies in a credit market in which consumers are not perfectly informed about the offers and debt collection practices of all banks. Notice that this proposition is consistent with the empirical fact that banks hire multiple debt collection agencies, which in turn collect on debts from multiple banks.

Notice further that the number of debt collection agencies needed to sustain the delegated equilibrium decreases as consumers become better informed (which leads to less market segmentation) and as the banking industry becomes more concentrated. To sustain the delegated equilibrium, there must be at least as many debt collection agencies as the number of segments in which borrowers observe offers from the same set of banks. As noted previously, the maximum number of such segments is given by $\binom{N}{m} = \frac{N!}{m!(N-m)!}$, and $\binom{N}{m}$ is increasing in N and decreasing in m . Hence, when the banking industry is more concentrated (i.e., lower N), the delegated equilibrium can be sustained with fewer debt collection agencies. Also, when borrowers are better informed and compare offers from a greater number of banks (i.e., greater m), the delegated equilibrium can be sustained with fewer debt collection agencies.

4. Welfare Analysis

In this section, we explore the welfare implications of the model developed in this paper. As we will show, these implications depend crucially on the degree of information asymmetry between banks and consumers.

³⁵Notice that Proposition 4 satisfies all of the assumptions of Proposition 3 and, therefore, the delegated equilibrium does not exist if there is only one debt collection agency.

4.1. Welfare in the basic model without asymmetric information

We start with the basic model developed so far. For expositional simplicity, we revert to the case of a single debt collection agency and of all consumers observing offers and debt collection practices of all banks (the case with multiple debt collection agencies and imperfectly informed consumers is analogous to the one described in Section 3.3).

As we showed previously (in the proof of Proposition 1), there can exist two equilibria in the basic model. In the undelegated equilibrium, banks collect on their own and use lenient debt collection practices. In the delegated equilibrium, all banks hire the debt collection agency, which uses harsh debt collection practices. In both of these equilibria, banks charge break-even interest rates. However, in the delegated equilibrium, consumers suffer nonpecuniary costs associated with harsh debt collection practices. These costs do not affect the interest rates that the banks charge and therefore lower consumer utility without a corresponding decrease in the interest rate. This implies that, in the basic model, total consumer welfare is lower in the delegated equilibrium than in the undelegated equilibrium.³⁶

Proposition 5. *In the basic model, total consumer welfare is always lower in the delegated equilibrium than in the undelegated equilibrium.*

This stark result follows from the simple structure of our basic model, which (for the purpose of expositional simplicity) abstracts from the issues of asymmetric information and heterogeneity among consumers. These issues, however, are likely to be important.³⁷ We introduce borrower heterogeneity and asymmetric information into our model by assuming that some consumers will always default on their debts unless they are faced with the threat of harsh debt collection practices and that banks cannot identify which consumers have this propensity. In this more general setting, the pecuniary and nonpecuniary costs of debt collection may be counterbalanced by

³⁶Notice that we do not need to consider the undelegated equilibrium in which all banks use harsh debt collection practices because we showed that it does not exist in our basic model. This may not always be the case if there are information asymmetries between banks and consumers, as we will discuss later.

³⁷Karlan and Zinman (2009), for example, find evidence of substantial moral hazard in the market for personal loans and estimate that roughly 13 percent to 21 percent of default is due to moral hazard. Calem, Gordy, and Mester (2006) and Agarwal, Chomsisengphet, and Liu (2010) also document adverse selection in the market for credit cards.

the fact that it mitigates moral hazard. This, in turn, may increase the welfare of at least some consumers.

4.2. Welfare in the presence of asymmetric information

Assume that proportion $\omega \leq 1$ of consumers will not repay their debt even if they receive labor income, unless they face the threat of harsh debt collection practices. We label such opportunistic consumers “bad” consumers. Such consumers do not repay anything if lenient debt collection practices are used. If harsh debt collection practices are used, however, then bad consumers repay their debt when they receive labor income and are collected upon (with recoveries h) when they do not receive labor income. The remaining share $1 - \omega$ of consumers are the same as consumers in the basic model, and we label them “good” consumers. Consumers know their type, while banks do not.

As is common in settings with asymmetric information, the presence of bad consumers may lead to a market breakdown. Since bad consumers default when lenient debt collection practices are used, the banks that use lenient practices have to increase their interest rates to compensate for losses on bad consumers. If the share of bad consumers is sufficiently high, then these interest rates may be such that good consumers are better off by not borrowing at all. Of course, banks that use harsh debt collection practices obtain repayment from both bad and good consumers; however, in a setting without third-party debt collectors, harsh debt collection practices cannot be sustained in equilibrium by an argument similar to the one in our baseline model. As a result, the credit market breaks down when the share of bad consumers is sufficiently large. If the share of bad consumers is not too large, then the interest rates that banks need to charge to compensate for the losses from bad consumers are not too high, and hence, good consumers may choose to borrow in equilibrium. The following proposition formalizes this intuition.

Proposition 6. *Assume that debt collection agencies do not exist. Then, the credit market functions only if the share of bad consumers is sufficiently small: i.e., if $\omega \leq \min\{1 - \beta, \frac{(1-\gamma)h\theta - c}{(1-\gamma)h\theta + 1}\}$. In this case, all banks use lenient debt collection practices, and all consumers borrow in equilibrium. If $\omega > \min\{1 - \beta, \frac{(1-\gamma)h\theta - c}{(1-\gamma)h\theta + 1}\}$, there is no equilibrium in which credit is provided.*

The market breakdown that occurs if the share of bad consumers is sufficiently large results from banks’ inability to use harsh debt collection practices in a setting

without third-party debt collectors. Thus, the extent of this market breakdown can be mitigated if the presence of third-party debt collectors can enable banks to sustain harsh debt collection practices in equilibrium. This, in turn, may have effects on consumer welfare. To investigate, we introduce third-party debt collectors into the model. To ensure that third-party debt collection is feasible in the first place, we will impose the restriction $(1 - \gamma)hf \geq q$ throughout (i.e., that the debt collection agency can make nonnegative profits if all banks hire it).

4.2.1. Equilibrium and welfare when the share of bad consumers is relatively large

In this section, we will assume that banks can choose whether to collect on their own or to hire a third-party debt collection agency. The following proposition describes the credit market with a third-party agency when ω is relatively large, i.e., when $\omega > \min\left\{1 - \beta, \frac{(1-\gamma)h\theta - c}{(1-\gamma)h\theta + 1}\right\}$. (Recall that, by Proposition 6, the credit market without debt collection agencies collapses when ω is relatively large.)

Proposition 7. *Assume that $\omega > \min\left\{1 - \beta, \frac{(1-\gamma)h\theta - c}{(1-\gamma)h\theta + 1}\right\}$ and that banks can choose whether to collect on their own or to hire a third-party debt collection agency. Then,*

- (i) *If $\frac{1}{\beta} \geq 1 + (1 - \gamma)h(\theta + f)$, then there exists an equilibrium in which all banks delegate debt collection to the third-party agency, and the agency uses harsh debt collection practices. All consumers borrow in this equilibrium. In this case, there is borrowing in the presence of third-party debt collectors, but there is no borrowing without third-party debt collectors. The presence of third-party debt collectors improves consumer welfare.*
- (ii) *If $\frac{1}{\beta} < 1 + (1 - \gamma)h(\theta + f)$, then no credit is provided regardless of whether there are third-party debt collectors or not. In this case, the presence of third-party debt collectors does not change consumer welfare.*

When the share of bad consumers is relatively large (as is assumed in Proposition 7), then no credit is provided if banks collect on their own (by Proposition 6). This happens because banks collecting on their own use lenient debt collection practices and therefore face large expected losses on bad consumers. If banks hire a third-party debt collection agency, on the other hand, then there exists an equilibrium in which this agency uses harsh debt collection practices (and can therefore collect on both good and bad consumers). The willingness of consumers to borrow in this equilibrium

depends on whether their impatience ($\frac{1}{\beta}$) is sufficiently high, relative to the pecuniary and nonpecuniary costs of debt collection $(1 - \gamma)h(\theta + f)$. If consumers are sufficiently impatient and therefore willing to borrow in an equilibrium with harsh debt collection practices (as in part (i) of Proposition 7), then the presence of third-party debt collectors improves consumer welfare. Otherwise (as in part (ii) of Proposition 7), consumers do not borrow in either equilibrium, and hence, the presence of third-party debt collectors does not change consumer welfare.

4.2.2. Equilibrium and welfare when the share of bad consumers is not too large

We now characterize equilibrium and welfare when ω is sufficiently low, so that $\omega \leq \min \left\{ 1 - \beta, \frac{(1 - \gamma)h\theta - c}{(1 - \gamma)h\theta + 1} \right\}$. (Recall that, when the share of bad consumers is relatively small, then there is borrowing in equilibrium even if the banks do not delegate debt collection to third-party agencies.)

Proposition 8. *Assume that $\omega \leq \min \left\{ 1 - \beta, \frac{(1 - \gamma)h\theta - c}{(1 - \gamma)h\theta + 1} \right\}$ and that banks can choose whether to collect on their own or to hire a third-party debt collection agency. In this case, there exists an undelegated equilibrium (in which all banks collect on their own and use lenient debt collection practices), and all consumers borrow in this equilibrium. In the delegated equilibrium (in which banks delegate debt collection to the third-party agency, which uses harsh debt collection practices), consumers borrow if and only if $\frac{1}{\beta} \geq 1 + (1 - \gamma)h(\theta + f)$. Consumer welfare is always greater in the undelegated equilibrium than in the delegated equilibrium.*

When the share of bad consumers is not too large (as is assumed in Proposition 8), then, by Proposition 6, credit is provided even in the undelegated equilibrium (in which the banks collect on their own and use lenient practices). In the delegated equilibrium (in which the banks hire third-party debt collectors that use harsh debt collection practices), the willingness of consumers to borrow depends on whether their impatience ($\frac{1}{\beta}$) is sufficiently high, relative to the pecuniary and nonpecuniary costs of debt collection $(1 - \gamma)h(\theta + f)$. Because harsh debt collection practices entail nonpecuniary losses, whereas lenient debt collection practices do not, total consumer welfare is always higher in the undelegated equilibrium.

Thus, the impact of debt collection agencies on consumer welfare depends on the share of bad consumers (i.e., the magnitude of ω). This implies that some credit markets (where borrowers are riskier, on average) may benefit from the presence of debt collection agencies, while in other credit markets (with relatively less risky

borrowers), the presence debt collection agencies may lead to adverse consequences for consumers. Thus, regulations of the debt collection industry need to take into account these differential effects. The ability of policymakers to enact such regulations is where we turn our attention next.

5. Discussion and Policy Implications

The policy implications of our model depend on the nature of the equilibrium that prevails (delegated or undelegated), the riskiness of the pool of borrowers (ω), and the ability of policymakers to influence the parameters that affect consumer welfare. These parameters include h (the recovery rate that harsh debt collection practices generate), f (the fee charged by the debt collection agencies), and θ (the nonpecuniary costs stemming from harsh debt collection practices).³⁸ For example, bankruptcy and garnishment laws restrict the ability of creditor and debt collectors to access borrowers' assets; furthermore, the availability of personal bankruptcy protection enables consumers to escape collection practices and may therefore limit the harshness of debt collection practices. The efficacy of collection practices can be also influenced by regulations that specify what conduct is unfair, deceptive, or abusive. Licensing and liability costs established by regulation will affect the operating costs of debt collection agencies and the fees they charge. Improvements in information availability or technology may improve the efficacy of collections without necessarily increasing disutility to consumers by ensuring, for example, that debt collectors have the correct information when they contact borrowers.

We assume that the goal of policy intervention is to maximize consumer welfare. Our discussion, therefore, will focus on whether welfare-improving policy interventions are possible and how they might be implemented. We start with the case in which the mass of “bad” consumers (who, when faced with lenient collections, will default with certainty regardless of the realization of their income) is relatively large. In this case, the interest rate that is charged if lenient debt collection practices are used is so high that “good” consumers (who repay whenever they receive income) would prefer to be exposed to harsh collections and benefit from the lower interest rates associated with

³⁸The other parameters of the model, namely, β and γ , also affect the equilibrium and welfare. However, these parameters reflect consumer preferences and their likelihood of receiving labor income and are, therefore, unlikely to be within the power of regulators to change.

them. However, to implement harsh debt collection practices, the banks need to hire third-party debt collectors — without third-party agencies, all banks will use lenient debt collection practices, and consumers will not borrow. As a result, the presence of third-party debt collection agencies improves consumer welfare in this case. In this environment, the only potential role for policy is to reduce the losses associated with harsh collections. In the model developed here, this can be accomplished by lowering pecuniary and nonpecuniary costs associated with collections (i.e., by reducing h , f , and θ).

Now, consider the case in which the share of bad consumers is relatively small. In this case, all consumers prefer interest rates associated with lenient collections, which are implemented in the undelegated equilibrium (in which banks collect on their own). As a result, the delegated equilibrium (in which banks hire third-party debt collectors using harsh debt collection practices) produces lower consumer welfare relative to the undelegated equilibrium. Here, policy intervention might result in a potentially discontinuous increase in consumer welfare by making third-party collections uncompetitive relative to first-party collections.³⁹

An important caution follows from these results. Policy interventions that improve welfare in a credit market with a low share of opportunistic borrowers may hurt consumer welfare if the share of opportunistic borrowers is sufficiently large. For example, regulations that make third-party debt collection agencies uncompetitive relative to banks may improve consumer welfare if the share of opportunistic borrowers is small but may hurt consumer welfare if the share of opportunistic borrowers is large. Thus, regulating debt collection requires a clear understanding of the nature of the equilibrium that prevails in the credit market. This indicates that good policy should assist consumers entering into credit contracts to better understand the implications of their exposure to potential collections activity. For instance, the government and other organizations can promote consumer education — better disclosures — about available consumer protections (such as bankruptcy and garnishment laws) and increase borrowers' awareness of the debt collection practices that creditors and debt collectors use; this may influence consumers' choices about which banks to borrow

³⁹For example, holding θ constant, if regulations increase q (third-party agencies' costs of implementing harsh collections), then the fees charged by the agencies to remain profitable (f) may also have to increase. If these fees rise sufficiently, consumers will no longer be willing to borrow if exposed to harsh collections by third-party firms.

from or the intensity of their search for the best terms.

The results we derive in this paper are subject to some caveats. The first is that the assumption of Bertrand competition among lenders implies that recoveries from defaulted borrowers are passed entirely to consumers in the form of lower interest rates. If this pass-through is smaller and consumers are perfectly rational, then the set of parameters for which consumers will be willing to borrow when faced with harsh collections will be smaller.

Second, the model we develop assumes that consumers are fully rational. Therefore, it provides a baseline for understanding the economics of third-party debt collection and its welfare implications. Of course, it can be argued that consumers do not (or cannot) fully recognize the consequences of collections strategies at the time they select their lender and contract. This may be due to, among other things, incomplete information, lack of salience, overoptimism, or time-inconsistent preferences.⁴⁰ If consumers do not fully internalize the effect of harsh collections or do not retaliate against banks that use them, then their willingness to borrow under harsh debt collection practices would be higher than in our baseline. As a result, ex post, some consumers may regret the borrowing decisions they made ex ante. Harsh debt collection practices may, therefore, affect consumer welfare to a larger extent than in the fully rational framework developed here. If this is indeed the case, there could be more scope for improving consumer welfare through careful regulation of collections.

Note that the model we develop here is not intended to provide the only rationale for the existence of third-party debt collectors. It does, however, provide a unified framework for the analysis of third-party debt collection that is consistent with the observed empirical regularities in the debt collection market. Other factors may also affect creditors' decision to outsource debt collection to third-party firms. For example, if consumers are not fully rational, then the mere act of hiring third-party debt collectors may help creditors distance themselves from harsh debt collection practices (by a logic similar to Coffman (2011)). This explanation would be consistent with third-party debt collectors using harsher debt collection practices than first-party debt collectors, but it cannot, by itself, account for the fact that creditors hire multiple debt collection agencies who, in turn, collect on behalf of multiple creditors.

⁴⁰See for example, Laibson (1997); DellaVigna and Malmendier (2004), and Gabaix and Laibson (2006).

Neither can this explanation account for the relative lack of concentration in the debt collection industry and the coevolution of the credit and debt collection markets (i.e., under this explanation one would expect to either have one debt collection agency serving all banks or each bank establishing a separate agency collecting on its behalf without overlapping with other banks).

Another potential explanation for the existence of third-party debt collectors may be their superior capacity (relative to banks) to determine consumers' ability to pay, perhaps by engaging in investigative activities and locating consumers' assets. Although this explanation may be true for some debt collectors, evidence presented in Section 2 indicates that most third-party debt collection efforts do not involve these types of activities.⁴¹ Rather, the ability of debt collectors to recover debts relies on establishing contact with consumers and persuading them to repay.

Finally, as with all types of outsourcing, relative efficiency may provide an important incentive for creditors to hire third-party debt collectors. While this explanation may play a role (we discuss some empirical evidence in this regard in Section 2), it cannot account for the coexistence of collection firms that collect in the name of the creditor and collection firms that collect in their own name. Overall, while a variety of factors may affect creditors' decision to outsource debt collection to third-party firms, the model developed in this paper is able to account for more of the observable regularities in the debt collection market than any of these individual factors alone.

6. Conclusion

In the U.S., creditors often outsource the task of recovering debts from defaulting borrowers to third-party debt collection agencies. In this paper, we argue that by hiring third-party debt collectors, creditors can avoid competing in terms of their debt collection practices. We develop a model along the lines of the common agency framework and show that it implies that debt collection agencies use harsher debt collection practices than original creditors, which is consistent with empirical evi-

⁴¹In contrast with unsecured consumer debts discussed in this paper, locating assets is important for secured consumer debts, in which a separate category of intermediaries (termed *repossession agencies*) has evolved. Unlike debt collectors that collect unsecured debts, repossession agencies do attempt to discover the collateral that borrowers are trying to hide. This task involves a substantial amount of investigative activity because the information about the location of collateral a consumer is trying to hide is rarely available from external data providers. Repossession agencies are not the focus of this paper.

dence. The model is also consistent with empirical facts about the structure of the debt collection industry and its evolution over time. We show that the existence of third-party debt collectors may improve consumer welfare if credit markets contain a sufficiently large share of opportunistic borrowers who would not repay their debts unless faced with “harsh” debt collection practices. In other cases, the presence of third-party debt collectors can result in lower consumer welfare. The model provides insight into which policy interventions may improve the functioning of the collections market.

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Table 1: Some Descriptive Statistics About the Debt Collection, Credit Card, and Banking Industries

	1972	1977	1982	1987	1992	1997	2002	2007	2012
Collections Industry (NAICS 56144)									
Receipts (\$2012, millions)	400	422	657	1,157	2,146	3,700	5,083	8,852	12,265
Employment	30,415	34,596	37,978	52,644	71,867	84,333	129,822	143,879	129,392
Firms	n/a	n/a	n/a	4,530	5,178	4,658	4,547	4,506	3,994
Establishments	4,201	4,246	4,363	5,204	5,814	5,250	5,265	5,179	4,652
Concentration ratio (%)									
4 firms	n/a	n/a	n/a	11.4	9.9	14.0	19.2	14.9	15.2
8 firms	n/a	n/a	n/a	17.2	14.3	17.9	25.6	23.1	22.5
20 firms	n/a	n/a	n/a	24.7	22.1	24.9	35.2	34.3	32.6
Share of firms by size (%)									
9 or fewer employees	n/a	n/a	n/a	68.8	64.7	61.4	58.3	57.7	61.3
20 or fewer employees	n/a	n/a	n/a	86.6	83.4	80.0	76.4	75.4	76.0
Share of industry employment (%)									
firms with 9 or fewer employees	n/a	n/a	n/a	20.2	15.9	12.1	7.0	6.1	6.0
firms with 20 or fewer employees	n/a	n/a	n/a	38.6	32.1	24.6	14.5	12.9	12.2
Credit Card Industry (NAICS 52221)									
Receipts (\$2005, millions)	n/a	n/a	n/a	n/a	n/a	24,503	35,856	56,596	106,343
Concentration ratio (% of receipts, Census of Services)									
4 firms	n/a	n/a	n/a	n/a	n/a	53.8	75.8	79.2	77.6
8 firms	n/a	n/a	n/a	n/a	n/a	74.5	87.0	87.4	90.8
20 firms	n/a	n/a	n/a	n/a	n/a	93.4	96.6	96.5	99.0
Concentration ratio (% of credit card balances, Call Reports)									
4 firms	15.7	16.7	23.5	24.1	21.0	24.0	52.4	53.2	54.1
8 firms	24.0	25.7	31.2	34.5	34.6	39.7	74.3	78.1	79.2
20 firms	35.3	39.7	45.7	50.6	56.8	65.2	92.3	95.5	97.0

Sources: U.S. Census Bureau of the Census; Census of Services and Annual Services Survey; FDIC Quarterly Banking Profiles; Call Reports; U.S. Bureau of Labor Statistics, Occupational Employment Survey

Appendix A: Proofs of Propositions

Proof of Proposition 1. Consider a candidate equilibrium in which all banks use harsh debt collection practices and offer the same interest rate. Using (2) and noting that $\mu = 1/N$, if all banks use the same debt collection practices and charge the same interest rate, we can derive the break-even interest rate in the conjectured equilibrium:

$$\begin{aligned} r_h &= \frac{(1-\gamma)(1-h) + c/\mu}{\gamma} \Rightarrow \\ r_h &= \frac{(1-\gamma)(1-h) + cN}{\gamma}. \end{aligned} \quad (\text{A.1})$$

Consider a bank that deviates by using lenient debt collection practices. This bank will break even if it charges its borrowers:

$$r_l = \frac{1-\gamma}{\gamma}. \quad (\text{A.2})$$

Notice that:

$$\begin{aligned} E(u|\text{borrow}, \lambda = 0, r_l) \geq E(u|\text{borrow}, \lambda = h, r_h) &\Leftrightarrow \\ 1 + \beta \left(1 + \gamma(y - (1 + r_l)) \right) \geq 1 + \beta \left(1 + \gamma(y - (1 + r_h)) - (1 - \gamma)h(1 + \theta) \right) &\Leftrightarrow \quad (\text{A.3}) \\ (1 - \gamma)h\theta + cN \geq 0. \end{aligned}$$

Since $\gamma < 1$, $h > 0$, $\theta > 0$, $N > 0$, and $c > 0$ by assumption, it follows that $(1 - \gamma)h\theta + cN > 0$. Thus, $E(u|\text{borrow}, \lambda = 0, r_l) \geq E(u|\text{borrow}, \lambda = h, r_h)$, and hence, consumers are always better off by borrowing from the deviating bank that charges r_l and uses lenient debt collection practices than from a nondeviating bank that charges r_h and uses harsh debt collection practices. Denote by r_{sw} the interest rate that would make consumers indifferent between the deviating bank and the nondeviating banks. For consumers to be indifferent between the banks, it must be that:

$$\begin{aligned} E(u|\text{borrow}, \lambda = 0, r_{sw}) = E(u|\text{borrow}, \lambda = h, r_h) &\Leftrightarrow \\ 1 + \beta \left(1 + \gamma(y - (1 + r_{sw})) \right) = 1 + \beta \left(1 + \gamma(y - (1 + r_h)) - (1 - \gamma)h(1 + \theta) \right) &\Leftrightarrow \quad (\text{A.4}) \\ r_{sw} = \frac{(1 - \gamma)(1 + h\theta) + cN}{\gamma}. \end{aligned}$$

Clearly, $r_{sw} \geq r_l$ (since $h > 0$, $c > 0$, $N > 0$, and $\theta > 0$). Thus, a deviating bank that uses lenient debt collection practices can charge an interest rate that is higher than its break-even rate. It will therefore generate positive profits, which are higher than the zero

profits in the conjectured equilibrium. It follows that the equilibrium in which all banks use harsh debt collection practices does not exist.

We now verify that the equilibrium in which all banks use lenient debt collection practices does exist. In this equilibrium, all banks will charge the interest rate r_l . Any bank that deviates and uses harsh debt collection practices will have to charge at least r_h to break even. However, as we showed in (A.3), consumers prefer to borrow from a bank that uses lenient debt collection practices and charges r_l than from a bank that uses harsh debt collection practices and charges r_h . Thus, the deviating bank will not be able to attract any consumers. Hence, there is no incentive for any bank to deviate and use harsh debt collection practices.

To verify that consumers will be willing to borrow when all banks use lenient debt collection practices, substitute $r_l = \frac{1-\gamma}{\gamma}$ and $\lambda = 0$ into equation (5) to obtain:

$$\frac{1}{\beta} \geq \gamma \left(1 + \frac{1-\gamma}{\gamma} \right) + (1-\gamma) \times 0 \times (1+\theta) \Leftrightarrow \frac{1}{\beta} \geq 1. \quad (\text{A.5})$$

Since $\beta < 1$ by assumption, (A.5) holds, and therefore, consumers choose to borrow when all banks use lenient debt collection practices. Because only two symmetric pure strategy equilibria are possible when banks collect on their own, the equilibrium in which all banks use lenient debt collection practices is unique. ■

Proof of Proposition 2. The conjectured equilibrium involves the following strategies for the banks and the agency. All banks delegate their debt collection to the agency. The agency uses harsh debt collection practices if all banks hired it and uses lenient debt collection practices otherwise. All banks charge the break-even interest rate (since they are Bertrand competitors). There are five possible unilateral deviations from the conjectured equilibrium, which we consider in turn:

1. A bank deviates by charging an interest rate that is different from the other banks, even though it and all other banks hire the debt collection agency.
2. A bank collects on its own and uses lenient debt collection practices.
3. A bank collects on its own and uses harsh debt collection practices.
4. The agency uses lenient debt collection practices even if all banks hired it.
5. The agency uses harsh debt collecting practices even if not all banks hired it.

Consider the first possible deviation, in which, even though all banks hire the debt collection agency, one of the banks charges an interest rate different from the other banks.

It is easy to see that both the deviating bank and the nondeviating banks have the same break-even interest rate in this case (since they all delegate debt collection to the agency). Using (2), replacing h with $h(1 - f)$ (since the agency will retain hf as its commission) and noting that the banks no longer directly bear the fixed cost of implementing harsh debt collection practices, we have:

$$r_d = \frac{(1 - \gamma)(1 - h(1 - f))}{\gamma}. \quad (\text{A.6})$$

It follows that the deviating bank will make a negative profit if it charges an interest rate lower than that charged by the other banks and will not be able to attract any consumers if it charges an interest rate that is higher than that charged by the other banks. Thus, a bank cannot make a positive profit by following the first deviation.

Now, consider the next possible deviation, in which a bank decides to collect on its own and uses lenient debt collection practices. Since the agency and all other banks are assumed to follow their equilibrium strategies, it implies that all other banks have delegated their debt collection to the agency and that the agency uses lenient debt collection practices. To break even, the deviating bank needs to charge its borrowers at least r_l (derived in (A.2)). Since the agency also uses lenient debt collection practices, the nondeviating banks will also need to charge their borrowers r_l to break even. Thus, all banks charge their borrowers the same interest rate and all borrowers face the same (lenient) debt collection practices, either from the debt collection agency or from the deviating bank collecting on its own. All banks, including the deviating bank, will make zero profits in this case, just as in the conjectured equilibrium. Hence, banks have no incentives to deviate by collecting on their own and using lenient debt collection practices.

Now, consider the deviation in which a bank collects on its own and uses harsh debt collection practices. Because of the fixed cost c involved in implementing harsh debt collection practices, the break-even interest rate for the deviating bank depends on the share of borrowers it can attract from other banks: The higher this share, the lower the break-even interest rate (because the fixed costs can be spread over a larger number of borrowers). The minimum break-even interest rate will thus correspond to the case in which the deviating bank attracts all borrowers. Using (2) and noting that $\mu = 1$ if the deviating bank can attract all borrowers, we can calculate the minimum break-even interest rate as:

$$r_h^d = \frac{(1 - \gamma)(1 - h) + c}{\gamma}. \quad (\text{A.7})$$

Notice that:

$$\begin{aligned}
E(u|\text{borrow}, \lambda = 0, r_l) \geq E(u|\text{borrow}, \lambda = h, r_h^d) &\Leftrightarrow \\
1 + \beta\left(1 + \gamma(y - (1 + r_l))\right) \geq 1 + \beta\left(1 + \gamma(y - (1 + r_h^d)) - (1 - \gamma)h(1 + \theta)\right) &\Leftrightarrow \quad (\text{A.8}) \\
(1 - \gamma)h\theta + c \geq 0. &
\end{aligned}$$

Since $\gamma < 1$, $h > 0$, $\theta > 0$, and $c > 0$ by assumption, it follows that $(1 - \gamma)h\theta + c > 0$. Thus, $E(u|\text{borrow}, \lambda = 0, r_l) \geq E(u|\text{borrow}, \lambda = h, r_h^d)$, and hence, consumers prefer to borrow from a bank that uses lenient debt collection practices and charges r_l than from a bank that uses harsh debt collection practices and charges r_h^d . As a result, the deviating bank will not be able to attract any consumers. Thus, banks have no incentives to deviate by collecting on their own and using harsh debt collection practices.

Now, consider the debt collection agency. If all banks hired it, then the agency makes nonnegative profits if it uses harsh debt collection practices (since $(1 - \gamma)hf - q \geq 0$ by assumption). If the agency deviates and uses lenient debt collection practices, its profits are zero. Thus, it has no incentives to deviate by using lenient debt collection practices.

Finally, consider the case in which not all banks hired the debt collection agency. Since the agency and the deviating bank(s) choose their debt collection practices simultaneously, the subgame that starts after at least one bank decides to collect on its own is analogous to our basic model. By logic similar to the proof of Proposition 1, the only equilibrium in this subgame is for both the agency and the deviating bank(s) to use lenient debt collection practices. To see this, first recall that, if the agency uses harsh debt collection practices, then the break-even rate for the banks that hired it is given by r_d , derived in (A.6). At this interest rate, the nondeviating banks (those that hired the agency) will not be able to compete with a deviating bank that uses lenient debt collection practices:

$$\begin{aligned}
E(u|\text{borrow}, \lambda = 0, r_l) \geq E(u|\text{borrow}, \lambda = h, r_d) &\Leftrightarrow \\
(1 - \gamma)h(1 + \theta) \geq \gamma(r_l - r_d) &\Leftrightarrow \quad (\text{A.9}) \\
(1 - \gamma)h(\theta + f) \geq 0, &
\end{aligned}$$

since $\gamma < 1$, $h > 0$, $\theta > 0$, and $f > 0$ by assumption. This results in zero revenues for the nondeviating banks and agency. Since the agency needs to invest $q > 0$ to implement harsh debt collection practices, its profits are negative in this case. The agency therefore has no incentives to deviate from its equilibrium strategy.

In sum, neither banks nor the debt collection agency have incentives to deviate from their strategies in the conjectured equilibrium. Further, the conjectured equilibrium is subgame perfect because it does not involve moves that are not credible: The agency's

threat to switch to lenient debt collection practices after at least one of the banks deviates by collecting on its own is credible (as previously shown). To verify that consumers choose to borrow if all banks delegate their debt collection to the agency and the agency uses harsh debt collection practices, substitute $r_d = \frac{(1-\gamma)(1-h(1-f))}{\gamma}$ and $\lambda = h$ into (5) to obtain:

$$\begin{aligned} \frac{1}{\beta} \geq \gamma \left(1 + \frac{(1-\gamma)(1-h(1-f))}{\gamma} \right) + (1-\gamma)h(1+\theta) &\Leftrightarrow \\ \frac{1}{\beta} \geq 1 + (1-\gamma)h(f+\theta). & \end{aligned} \tag{A.10}$$

Recall that $\frac{1}{\beta} \geq 1 + (1-\gamma)h(f+\theta)$ by assumption. ■

Proof of Proposition 3. Consider the case in which one of the banks decides to collect on its own. If the debt collection agency switches to lenient debt collection practices (as in the delegated equilibrium), it will make zero profits. If this agency does not switch to lenient debt collection practices, then the maximum share of consumers that the deviating bank can attract from the nondeviating banks is given by m/N (since each consumer observes the offers of only m banks out of a total of N banks). Therefore, the minimum share of consumers borrowing from the nondeviating banks will be $(N-m)/N$. If the agency uses harsh debt collection practices, then its minimum expected profit is given by:

$$\frac{N-m}{N}(1-\gamma)hf - q > 0. \tag{A.11}$$

Since $\frac{N-m}{N}(1-\gamma)hf - q > 0$ by assumption of this proposition, it follows that the debt collection agency generates positive expected profits if it uses harsh debt collection practices when one bank deviates and collects on its own. Since the agency uses harsh debt collection practices, the deviating bank can charge its borrowers r_{sw} (derived in (A.4)) and generate positive expected profits. Thus, every bank will have an incentive to deviate and collect on its own. Therefore, the delegated equilibrium does not exist.

We will now show that lenient debt collection practices are used in equilibrium. First, note that there is no equilibrium in which all banks hire the agency, and the agency's strategy is to switch to lenient debt collection practices if k banks deviate by collecting on their own, where $k > 1$. Since $k > 1$, the agency will use harsh debt collection practices if a bank deviates unilaterally. As we have shown, unilateral deviations are profitable if the agency uses harsh debt collection practices.

Now, consider a candidate equilibrium in which only a subset of banks hires the agency. By logic similar to the proof of Proposition 2, no consumer would borrow from the banks that hired the agency, unless the agency uses lenient debt collection practices.

Finally, consider the case in which all banks collect on their own. By logic analogous to the proof of Proposition 1, all banks use lenient debt collection practices in this case: Since $m \geq 2$ by assumption, each bank that uses lenient debt collection practices will be able to attract consumers from at least one other competing bank, unless that bank also uses lenient debt collection practices. ■

Proof of Proposition 4. In the conjectured equilibrium, each of the g debt collection agencies collects from consumers in one and only one of the g credit market segments. Further, all banks operating in a given credit market segment hire the agency from that segment, and each agency uses harsh debt collection practices if all of the banks that operate in its segment hired it but uses lenient debt collection practices otherwise. If a bank operates in several credit market segments, it hires debt collection agencies from each segment in which it operates, so that consumers from a particular segment are collected upon by the debt collection agency from that segment.

Consider a debt collection agency operating in a particular segment. By logic similar to that of Proposition 2, if any of the banks operating in this agency's segment deviates from the conjectured equilibrium, then the agency will switch to lenient debt collection practices. This is because all consumers from a particular segment observe the debt collection practices of the deviating bank, and hence, this bank will be able to attract all borrowers from the nondeviating banks unless the agency switches to lenient debt collection practices. If all of the banks from a particular credit market segment do hire the agency from that segment, then this agency will generate positive profits by using harsh debt collection practices and zero profits by using lenient debt collection practices. This is because consumers from a particular segment do not observe debt collection practices used by banks in other segments, and hence, these consumers will not switch to other banks as long as all of the banks in their segment use the same debt collection agency.

Now, consider the incentives of banks. We need to consider two cases: one for a bank that operates in a single credit market segment and another for a bank that operates in multiple credit market segments. Consider a bank that operates in a single credit market segment first. If this bank decides to deviate and use lenient debt collection practices, then the agency operating in this bank's credit market segment will also switch to lenient debt collection practices, and the deviating bank will not be able to attract consumers away from the nondeviating banks. Thus, this bank has no incentives to deviate from the conjectured equilibrium. Now, consider a bank that operates in several credit market segments. If this bank decides to collect on its own in any of the credit market segments, then the agencies operating on those segments will switch to lenient debt collection practices. Hence, the

deviating bank will not be able to make positive profits in any of the segments in which it collects on its own. Thus, this bank has no incentives to deviate from the conjectured equilibrium either. It follows that the conjectured equilibrium exists. ■

Proof of Proposition 5. Let W_u denote total consumer welfare in the undelegated equilibrium and let W_d denote total consumer welfare in the delegated equilibrium. In the undelegated equilibrium, all consumers borrow and are charged $r_l = \frac{1-\gamma}{\gamma}$. We have:

$$W_u = 1 + \beta(1 + \gamma(y - (1 + r_l))) = 1 + \beta\gamma y. \quad (\text{A.12})$$

Now, consider the delegated equilibrium. If $\frac{1}{\beta} < 1 + (1 - \gamma)h(f + \theta)$, then there will be no borrowing in this equilibrium, and therefore $W_d = \beta(1 + \gamma y)$. It is easy to see that in this case $W_u > W_d$, since $1 + \beta\gamma y > \beta(1 + \gamma y)$ as long as $\beta < 1$.

If $\frac{1}{\beta} \geq 1 + (1 - \gamma)h(f + \theta)$, then all consumers borrow in the delegated equilibrium and are charged $r_d = \frac{(1-\gamma)(1-h(1-f))}{\gamma}$. In this case,

$$W_d = 1 + \beta \left\{ 1 + \gamma(y - (1 + r_d) - (1 - \gamma)h(1 + \theta)) \right\} = 1 + \beta\gamma y - \beta h(1 - \gamma)(f + \theta). \quad (\text{A.13})$$

Since $\beta h(1 - \gamma)(f + \theta) > 0$, it follows that $W_u > W_d$ also in this case. ■

Proof of Proposition 6. Consider first a candidate equilibrium in which all banks use harsh debt collection practices. Banks that use harsh debt collection practices obtain repayment from both good and bad consumers, as long as those consumers receive labor income. Thus, a bank's payoff does not depend on the type of consumers it faces if this bank uses harsh debt collection practices, and it follows that the break-even interest rate in this case doesn't depend on the share of bad consumers. If all banks use harsh debt collection practices and charge the same interest rate, then they need to charge $r_h = \frac{(1-\gamma)(1-h)+cN}{\gamma}$ to break even (derived in (A.1)).

Consider a bank that deviates by using harsh debt collection practices but is charging an interest rate lower than r_h . Since the deviating bank uses the same debt collection practices as other banks but charges a lower interest rate, it will be able to attract all consumers from the other banks. Setting $\mu = 1$ and using (2), the bank's break-even interest rate is $r_h^d = \frac{(1-\gamma)(1-h)+c}{\gamma}$ (derived in (A.7)). It is clear that $r_h^d < r_h$. Thus, the deviating bank will be able to make a positive profit as long as it charges an interest rate between r_h and r_h^d . All banks, therefore, have an incentive to deviate. However, if all banks deviate, then none of them will be able to break even (since all of them will charge interest rates below r_h). This implies that the only possible equilibrium in which all banks use harsh debt collection

practices involves them offering low interest rates initially and then providing no credit (since they are not going to break even). Thus, no credit is provided if all banks use harsh debt collection practices.

Now consider a candidate equilibrium in which all banks use lenient debt collection practices. Since bad consumers do not repay anything if lenient debt collection practices are used, the banks that use lenient debt collection practices have to account for the presence of bad consumers in the interest rates they charge. If all banks use lenient debt collection practices, then their break-even rate (we use superscript ω to make it clear that this interest rate depends on the share ω of bad consumers) is given by:

$$\gamma(1 - \omega)(1 + r_l^\omega) = 1 \Rightarrow r_l^\omega = \frac{1 - \gamma(1 - \omega)}{\gamma(1 - \omega)}. \quad (\text{A.14})$$

Consider a bank that deviates and uses harsh debt collection practices. Since it is the only bank using harsh debt collection practices, bad consumers will keep borrowing from the nondeviating banks (because in this case, they do not repay their loans). Thus, the deviating bank can only attract good consumers (i.e., it can attract the share $1 - \omega$ of all consumers). By setting $\mu = 1 - \omega$ in (2), we can derive the break-even interest rate that the deviating bank needs to charge:

$$r_d^\omega = \frac{(1 - \gamma)(1 - h) + c/(1 - \omega)}{\gamma}. \quad (\text{A.15})$$

Conditional on borrowing, good consumers will prefer the offers of the nondeviating banks as long as:

$$\begin{aligned} E(u|\text{borrow}, \lambda = 0, r_l^\omega) &\geq E(u|\text{borrow}, \lambda = h, r_d^\omega) \Leftrightarrow \\ &(1 - \gamma)h(1 + \theta) \geq \gamma(r_l^\omega - r_d^\omega) \Leftrightarrow \\ (1 - \gamma)h(1 + \theta) &\geq \gamma \left(\frac{1 - \gamma(1 - \omega)}{\gamma(1 - \omega)} - \frac{(1 - \gamma)(1 - h) + c/(1 - \omega)}{\gamma} \right) \Leftrightarrow \\ (1 - \gamma)h(1 + \theta) &\geq \frac{1}{1 - \omega} - \gamma - (1 - \gamma)(1 - h) - \frac{c}{1 - \omega} \Leftrightarrow \\ (1 - \gamma)h(1 + \theta) + \gamma + (1 - \gamma)(1 - h) &\geq \frac{1 - c}{1 - \omega} \Leftrightarrow \\ 1 + (1 - \gamma)h\theta &\geq \frac{1 - c}{1 - \omega} \Leftrightarrow \\ \omega &\leq \frac{(1 - \gamma)h\theta - c}{(1 - \gamma)h\theta + 1}. \end{aligned} \quad (\text{A.16})$$

Thus, no bank will have incentives to deviate from the conjectured equilibrium if $\omega \leq \frac{(1 - \gamma)h\theta - c}{(1 - \gamma)h\theta + 1}$. Finally, we need to verify that good consumers borrow in the conjectured

equilibrium:

$$\frac{1}{\beta} \geq \gamma \left(1 + \frac{1 - \gamma(1 - \omega)}{\gamma(1 - \omega)} \right) + (1 - \gamma) \times 0 \times (1 + \theta) \Leftrightarrow \omega \leq 1 - \beta. \quad (\text{A.17})$$

Thus, all banks will use lenient debt collection practices, and all consumers will borrow in equilibrium if and only if $\omega \leq 1 - \beta$ and $\omega \leq \frac{(1-\gamma)h\theta-c}{(1-\gamma)h\theta+1}$, which is equivalent to $\omega \leq \min \left\{ 1 - \beta, \omega \leq \frac{(1-\gamma)h\theta-c}{(1-\gamma)h\theta+1} \right\}$. ■

Proof of Proposition 7. Part (i). Recall that the credit market doesn't function if the share of bad consumers is large and banks collect on their own (by Proposition 6). Now consider the case in which banks delegate debt collection to a third-party agency. Since there is no distinction between good and bad borrowers when harsh debt collection practices are used, the proof that there exists a delegated equilibrium in which all banks hire the debt collection agency and the agency uses harsh debt collection practices is analogous to the proof of Proposition 2. In this equilibrium, consumers borrow if $\frac{1}{\beta} \geq 1 + (1 - \gamma)h(\theta + f)$, which is true by assumption.

Since there is no borrowing without third-party debt collectors, total consumer welfare without third-party debt collectors is given by $W_u = \beta(1 + \gamma y)$. Total consumer welfare in the delegated equilibrium is given by $W_d = 1 + \beta\gamma y - \beta h(1 - \gamma)(f + \theta)$.

$W_d \geq W_u$ if and only if:

$$1 + \beta\gamma y - \beta h(1 - \gamma)(f + \theta) \geq \beta(1 + \gamma y) \Leftrightarrow \frac{1}{\beta} \geq 1 + (1 - \gamma)h(f + \theta), \quad (\text{A.18})$$

which is true by assumption (naturally, this is the same condition that ensures that consumers are willing to borrow in the delegated equilibrium).

Part (ii). Under the assumptions of this part, consumers are not willing to borrow in the delegated equilibrium, and hence, there is no borrowing with or without third-party debt collectors. Thus, the presence of debt collectors does not affect the credit market outcome or consumer welfare. ■

Proof of Proposition 8. Under the assumptions of this proposition, there exists an undelegated equilibrium in which all banks use lenient debt collection practices and all consumers borrow (by Proposition 6). By logic analogous to Proposition 2, there also exists a delegated equilibrium in which all banks hire the debt collection agency and the debt collection agency uses harsh debt collection practices. Thus, two equilibria are possible in this case. Either all banks collect on their own and use lenient debt collection practices, or all of them hire the debt collection agency, which uses harsh debt collection practices.

All consumers borrow in the undelegated equilibrium, but only good consumers repay their debt (and only if they have labor income). The total consumer welfare in this case is, therefore, given by:

$$W_u = (1 - \omega) \left[1 + \beta(1 + \gamma(y - (1 + r_l^\omega))) \right] + \omega(1 + \beta(1 + \gamma y)) = 1 + \beta\gamma y. \quad (\text{A.19})$$

Consumers borrow in the delegated equilibrium as long as $\frac{1}{\beta} \geq 1 + (1 - \gamma)h(\theta + f)$. Thus, if $\frac{1}{\beta} \geq 1 + (1 - \gamma)h(\theta + f)$, then the total consumer welfare in the delegated equilibrium is given by:

$$W_d = 1 + \beta\gamma y - \beta h(1 - \gamma)(f + \theta). \quad (\text{A.20})$$

Since $\beta h(1 - \gamma)(f + \theta) > 0$, it follows that $W_u > W_d$.

If $\frac{1}{\beta} < 1 + (1 - \gamma)h(\theta + f)$, then consumers are not willing to borrow in the delegated equilibrium, and therefore $W_d = \beta(1 + \gamma y)$. It is easy to see that $W_u > W_d$ also in this case, since $1 + \beta\gamma y > \beta(1 + \gamma y)$ as long as $\beta < 1$. ■

Table A.1: Equilibria in the Extended Model

Panel A: Possible equilibria and consumer welfare		
	The share of opportunistic consumers is relatively large $\left[\omega > \min \left\{1 - \beta, \frac{(1-\gamma)h\theta - c}{(1-\gamma)h\theta + 1}\right\}\right]$	The share of opportunistic consumers is relatively small $\left[\omega \leq \min \left\{1 - \beta, \frac{(1-\gamma)h\theta - c}{(1-\gamma)h\theta + 1}\right\}\right]$
Consumers are relatively impatient $\left[\frac{1}{\beta} \geq 1 + (1 - \gamma)h(\theta + f)\right]$	Delegated harsh with borrowing: $W_d = 1 + \beta\gamma y - \beta h(1 - \gamma)(f + \theta);$ Undelegated lenient without borrowing: $W_u = \beta(1 + \gamma y);$ $W_d \geq W_u$	Delegated harsh with borrowing: $W_d = 1 + \beta\gamma y - \beta h(1 - \gamma)(f + \theta);$ Undelegated lenient with borrowing: $W_u = 1 + \beta\gamma y;$ $W_d < W_u$
Consumers are relatively patient $\left[\frac{1}{\beta} < 1 + (1 - \gamma)h(\theta + f)\right]$	No borrowing $W_d = W_u = \beta(1 + \gamma y)$	Delegated harsh without borrowing: $W_d = \beta(1 + \gamma y);$ Undelegated lenient with borrowing: $W_u = 1 + \beta\gamma y;$ $W_d < W_u$

Panel B: Existence of equilibria		
	The share of opportunistic consumers is relatively large $\left[\omega > \min \left\{1 - \beta, \frac{(1-\gamma)h\theta - c}{(1-\gamma)h\theta + 1}\right\}\right]$	The share of opportunistic consumers is relatively small $\left[\omega \leq \min \left\{1 - \beta, \frac{(1-\gamma)h\theta - c}{(1-\gamma)h\theta + 1}\right\}\right]$
Consumers are relatively impatient $\left[\frac{1}{\beta} \geq 1 + (1 - \gamma)h(\theta + f)\right]$	$\omega = 0.6; \gamma = 0.5; \beta = 0.4; \theta = 0.6;$ $h = 0.6; f = 0.2; c = 0.05; q = 0.05.$	$\omega = 0.1; \gamma = 0.5; \beta = 0.4; \theta = 0.6;$ $h = 0.6; f = 0.2; c = 0.05; q = 0.05.$
Consumers are relatively patient $\left[\frac{1}{\beta} < 1 + (1 - \gamma)h(\theta + f)\right]$	$\omega = 0.6; \gamma = 0.5; \beta = 0.85; \theta = 0.6;$ $h = 0.6; f = 0.2; c = 0.05; q = 0.05.$	$\omega = 0.1; \gamma = 0.5; \beta = 0.85; \theta = 0.6;$ $h = 0.6; f = 0.2; c = 0.05; q = 0.05.$

Note: For each set of restrictions, Panel A of this table shows the possible equilibria and total consumer welfare in those equilibria; W_d denotes consumer welfare in the delegated equilibrium, while W_u denotes consumer welfare in the undelegated equilibrium. Panel B shows, for each set of restrictions, one set of parameter values that satisfy all corresponding restrictions. We ensure throughout that third-party debt collectors, if hired, can make nonnegative profits (i.e., $(1 - \gamma)hf \geq q$) and that banks can choose whether to collect on their own or to delegate debt collection to a third-party agency.