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Accounts Receivable Management Policy: Theory and Evidence

SHEHZAD L. MIAN and CLIFFORD W. SMITH, JR.*

ABSTRACT

This paper develops and tests hypotheses that explain the choice of accounts receivable management policies. The tests focus on both cross-sectional explanations of policy-choice determinants, as well as incentives to establish captives. We find size, concentration, and credit standing of the firm's traded debt and commercial paper are each important in explaining the use of factoring, accounts receivable secured debt, captive finance subsidiaries, and general corporate credit. We also offer evidence that captive formation allows more flexible financial contracting. However, we find no evidence that captive formation expropriates bondholder wealth.

FIRMS TYPICALLY SELL MERCHANDISE on credit rather than requiring immediate cash payment. Such credit sales generate accounts receivable. Although credit terms and credit-collection procedures have been studied (see Smith (1980)), there has been little systematic analysis of the organizational and financial structures employed to manage the firm's accounts receivable. These decisions merit more careful attention for two reasons. First, receivables are a substantial fraction of corporate assets; for example, 1986 COMPUSTAT data indicate that accounts receivable are 21.0% of U.S. manufacturing corporations' total assets. Second, we observe substantial diversity in firms' use of specialized contracts and intermediaries in their accounts receivable management policies. Firms can (1) establish a captive finance subsidiary, (2) issue accounts receivable secured debt, (3) factor, (4) employ a credit-reporting firm, (5) retain a credit-collection agency, or (6) purchase a credit-insurance policy.¹

In this paper, we demonstrate that accounts receivable management policy offers opportunities for both the development of a robust theory, as well as empirical testing of the theory's implications. Although the data necessary to

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¹ See the Appendix for a brief description of these basic accounts receivable management policy alternatives.

test all the hypotheses developed in this paper are not currently available, we believe that it is important both to provide a more unified analysis of these alternate policy choices as well as to illustrate the richness of its testable implications.

In section I we provide a functional description of the alternate accounts receivable management policies and develop hypotheses explaining the choice among these alternatives. We analyze (1) the motives for trade-credit extension, (2) the effect of the structure of sales in the industry and its impact on the decision to retain or subcontract the various functional decisions, and (3) the effect of the policy choice on incentive problems among the firm's contracting parties. In section II we perform cross-sectional tests of firms' use of factoring, accounts receivable secured debt, captive finance subsidiaries, and general corporate credit. Section III provides evidence associated with firms' announcements to establish captive finance subsidiaries. In section IV we offer our conclusions.

I. Determinants of Alternate Policies

We first offer a functional description of the basic alternatives before we analyze this policy choice. To extend trade credit, responsibilities for various aspects of the credit-administration process must be assigned: (1) the credit risk of the potential account debtor must be assessed, (2) the credit-granting decision (including setting credit terms) must be made, (3) the receivable must be financed until maturity, (4) the receivable must be collected, and (5) the default risk must be borne. As Table I illustrates, the various accounts receivable management policies are simply alternate assignments of these functional responsibilities. Establishing a captive finance subsidiary, issuing accounts receivable secured debt, and financing with general corporate credit (without the use of specialized intermediaries or liabilities explicitly linked to the firm's accounts receivable) retain the credit-administration process within the firm; they differ primarily in the structure of the firm's financial claims. Factoring subcontracts multiple facets of the credit-administration process to a single outside intermediary. Between these extremes, three specialized institutions perform externally a single credit-administration function: credit-reporting agencies, credit-collection firms, and credit-insurance companies.

Table I implies that analyzing these policy choices is equivalent to analyzing the choice to organize activities within the firm as opposed to engaging an external firm in a market transaction (see Coase (1937)). Miller (1977, p. 273) argues that: "Neutral mutations that serve no function but do not harm, can persist indefinitely . . . any experienced teacher of corporate finance can surely supply numerous examples of such neutral variations. My own favorite is the captive finance company." In contrast, we argue that systematic economic forces drive this set of decisions, and therefore the choice of accounts receivable management policy has potentially important consequences for firm value. We now offer hypotheses explaining firms' choices among

Table I
A Comparison of Functional Responsibility Assignments for Alternate Accounts Receivable Policies

Establishing a captive finance subsidiary, issuing accounts receivable secured debt, and financing with general corporate credit retain the credit-administration process within the firm; they differ primarily in the structure of the firm's financial claims.

	Functional Responsibilities			
	Credit Administration		Structure of Financial Claims	
Accounts Receivable Policy	Who does credit risk assessment?	Who makes credit granting decisions?	Who does the credit collection?	Who bears the credit risk?
General corporate credit	Firm	Firm	Firm	Firm
Accounts receivable secured debt	Firm	Firm	Firm	Firm
Captive finance subsidiary	Firm or captive ^a	Firm or captive ^a	Captive	Firm or captive ^a
Use of a credit information firm	Credit information agency	Firm	Firm	Firm
Use of a credit collection agency	Firm	Firm	Credit collection agency	Firm
Use of a credit insurance company	Firm	Firm	Firm	Credit insurance company
Non-recourse factoring	Factor	Factor	Factor	Factor
Recourse factoring	Firm	Firm	Factor or firm ^b	Firm

^a Depends on the terms of the working agreement between the parent and captive.

^b In advance factoring, the factor provides financing; in maturity factoring, the firm does.

alternate accounts receivable management policies as a function of variation in costs or revenues.

A. Incentives to Extend Trade Credit and Policy Choice

There are several nonmutually exclusive incentives for a firm to extend trade credit to its customers, rather than requiring cash sales with the buyer obtaining credit elsewhere.

A.1. Cost Advantages

Trade credit is more likely to be extended if the seller has a cost advantage over competing lenders. In such cases, the cost of supplying both merchandise and credit from a single source can be lower than supplying them through separate transactions. There are at least three potential bases for such a cost advantage. (1) The manufacturer can have a cost advantage in credit collection if the collateral is more valuable to its manufacturer than to a third party. If the credit is not repaid, the manufacturer can repossess the merchandise and resell it on more favorable terms than could a lender in another business. (2) The manufacturer can have a cost advantage in credit evaluation for at least two reasons. Monitoring of the credit worthiness of an account debtor can occur as a by-product of selling if the manufacturer's sales representative regularly visits the borrower. Also, with products which are marketed through a retailer and for which the retailer provides important promotion and maintenance services in establishing product demand, the manufacturer has a vested interest in retailer quality (see Telser (1960)). In such cases, on-going retailer evaluation produces information which the manufacturer can also employ in the credit-extension decision. (3) In transactions where it is expensive to coordinate a simultaneous exchange of merchandise and payment (for example, in transactions that require shipment of the merchandise from the manufacturer to the retailer), if the buyer (retailer) is more vulnerable to fraud, the transaction is better bonded if the retailer takes possession of the merchandise prior to making payment with the manufacturer extending credit in the interim (see Smith (1987)).² Conversely, if the manufacturer is more vulnerable to fraud—for example, if the retailer is in financial distress—the transaction is more likely to be structured with payment demanded prior to shipment or on delivery.

A.2. Market Power

Trade credit is more likely to be offered the greater the returns from exploiting market power through effective price discrimination (see Schwartz

² See also Laband and Maloney (1987) for a discussion and evidence on this hypothesis applied to credit extension at the retail level.

and Whitcomb (1979) and Brennan, Maksimovic, and Zechner (1988)). A seller might be able to lessen the legal constraints of the Robinson-Patman Act on its ability to engage in effective price discrimination by coordinating credit terms and output prices. For example, by offering customers below-market credit terms, auto companies can offer a given automobile at different effective prices to different customers.³

A.3. Taxes

If under the tax code the financing qualifies as an installment loan, the seller books manufacturing profit over the loan life rather than at the sale date. This reduces the present value of the seller's taxes. Since the tax obligation of the borrower is unaffected, this provision provides tax advantages to trade-credit extension by manufacturers.⁴ (Note that this installment-sale benefit is reduced under the 1986 tax revision; it is not an allowed deduction in calculating the alternate-minimum-taxable income.)

These motives for trade-credit extension imply several potential costs of separating the credit-extension function from marketing. (1) If the selling process generates credit information, use of factoring or a credit-reporting firm is less likely. (2) If the primary motive for extending trade credit is price discrimination, factoring is more expensive than employing internal credit-administration policies because of the higher costs of coordinating merchandise and credit prices between different firms. (3) The more differentiated the product or the more the product is specialized to the manufacturer, the less valuable it is as collateral to an alternate lender and the less likely is the firm to factor (however, the more customized is the product to a given customer, the less likely is the transaction to be seller-financed). (4) If the item can be financed as an installment sale, the gain from tax deferral is lost unless the seller provides financing.

³ Specifically, if lower income auto customers have lower valued trade-ins or are more willing to incur the time costs of selling their old auto privately, then they will want to finance a larger fraction of the value of the automobile. Since the value of the interest subsidy depends on the amount financed, offering below-market interest rates provides lower effective prices to these customers. And if lower income customers have more elastic demands, a policy of lowering credit terms rather than lowering auto prices more effectively price discriminates and thus increases firm value.

⁴ Brennan Maksimovic and Zechner (1988, p. 1139) conclude that there is no tax advantage to vendor financing. We believe that we reach a different conclusion because their analysis fails to account for the tax treatment of alternate lenders, the market participants, we argue, set the price. Brick and Fung (1984) offer an alternate tax-related motive for trade-credit extension, but their analysis does not consider alternate methods of borrowing which would achieve the same tax effects. Emery (1984) argues that trade credit is extended to avoid financial intermediary "rents" by directly conducting business outside financial markets. However, this motivation is only valid if the intermediary's rents are monopoly-based; if the rents accrue to inframarginal producers of financial services, they cannot be captured by disintermediation.

*B. Structure of Sales and Policy Choice**B.1. Industry Sales Patterns*

Factoring is expected in industries with many manufacturers selling to many retailers and with a significant overlap in the manufacturing firms' retail customers. This is driven by three major considerations. (1) The costs of subcontracting the credit-risk-assessment function vary with the pattern of sales across the industry. To illustrate, consider an industry where M manufacturing firms each sell to R retailers. With each firm extending credit there will be $M \cdot R$ credit records across the industry. In the extreme, if all manufacturing firms use the same factor, the number of credit records would be only R . The cost reductions from factoring by economizing on information investment are thus greater the larger M and R . (2) If the required investment in credit information is highly specialized, factoring is exposed to the costs of post-contractual opportunistic behavior (see Klein, Crawford, and Alchian (1978)). Firm-specific investments in credit information produce quasi-rents whose value is sensitive to contract renewal. These contracting costs affect real investment decisions; the greater the possibility of opportunistic behavior by the client, the less likely is the factor to invest in credit information. (3) If the repeat-sale frequency with a given firm is low but across a group of firms is high, factoring can reduce the costs of credit extension because the account debtor has a longer expected business relationship with the factor than with any individual manufacturer (see Telser (1980)). This lowers the credit risk for the factor compared to the manufacturer.⁵

Emery (1987) argues that firms with significant seasonals in their sales can encourage retailers to hold larger inventories during off-peak periods by changing trade-credit policies over time. By lowering the price of credit for goods sold off peak, the manufacturer lowers the inventory carrying cost, raises off-peak demand by the retailers, and reduces the costs of varying production over the cycle.

B.2. Scale Economies

Scale economies in the credit-risk-assessment function are important in the choice of accounts receivable management policy. (1) Larger firms are expected to invest in more specialized credit-administration personnel and techniques. (2) Larger firms are more likely to operate on a more decentralized basis (see Christie, Joye, and Watts (1990)). These two arguments imply that the larger firms are more likely to form specialized captive finance subsidiaries.

⁵ This benefit is reduced in the special case of private brand financing; it seems difficult to simultaneously argue that nonpayment will affect credit terms across several suppliers while masking the ultimate ownership of the subsidiary.

Scale economies in the credit-granting and credit-collection functions imply that a large factor with specialized personnel and procedures is more efficient than several smaller firm-maintained credit departments. These benefits potentially are greater if industry sales are seasonal. A factor with clients with different seasonals can more effectively employ specialized inputs. (Of course the factor must trade off this incentive to diversify across industries against the additional costs of required industry-specific knowledge.)

The cost advantage of credit-information agencies arises from supplying credit reports on a given firm to multiple users. However, the primary demands for their services appears to be when an account is opened, a customer requests a significantly larger purchase, or when the manufacturer believes that the potential account-debtor's credit worthiness has changed. Thus, a credit-information agency typically is employed only for a subset of sales.

Like credit-information agencies, credit-collection agencies are employed for only a subset of accounts—those which after-the-fact are the worst credit risks. Credit-collection agencies are more likely to be employed the greater the distance between the seller and the account debtor. By pooling requests from many lenders, they develop a network of specialized credit-collection services. For example, one service is the acquisition of information about lawyers in different areas who have a comparative advantage in pursuing this type of legal activity.

B.3. Distribution Channels

We observe wide variation in the use of marketing or distribution channels across firms. Some firms market their products (1) directly to their customers through their own sales force, (2) to retailers who market to customers, (3) to wholesalers who market to retailers who market to customers, (4) through sales agents rather than their own sales force.

While the choice of distribution channel appears to be largely driven by the size of the sale, geographic concentration of consumers, and sale frequency, it also affects firms' incentives with respect to accounts receivable management policy for at least four reasons. (1) Use of internal credit-administration policies are more likely if the manufacturer uses its own sales force rather than sales agents. With a dedicated sales force the firm has greater control over the marketing program; it thus has a comparative advantage in controlling decentralized trade-credit administration decisions. As Kaplan (1982) discusses, if the decision is decentralized, the individuals with the most direct knowledge of the account debtor make the credit-extension decision. However, in delegating these decision rights, monitoring costs increase. Situations in which decentralization appear most important are in large firms where the gains from specialization are greatest, where the sales activity generates credit information, and where trade credit is a valuable price-discrimination tool. (The more important these second and third factors, the more likely the working agreement between captive and parent is structured

so that the parent makes the credit-extension decision and the captive purchases the receivables from the parent.) (2) Credit information is more likely to be generated as a by-product of selling if sales contacts are more frequently made at the customer's business rather than by phone or mail. Note, however, that the sales agent must be motivated to monitor the credit-worthiness of the account debtor if this potential benefit is to be realized. Adjusting commissions for uncollected accounts receivable is one mechanism through which this can be accomplished. (3) Price discrimination as a motive for trade-credit extension is likely to have the greatest power in explaining financing provided directly to customers. Where trade credit is extended by manufacturers to wholesalers or retailers in the distribution system (rather than to customers directly), efforts to engage in price discrimination through financing terms are likely to lead to a successive-monopoly problem (see Hirshleifer (1964)). (4) In some industries, wholesalers play an important role between the manufacturer and the retailer. While most analyses of the wholesaler focus on its distribution function, wholesalers also extend trade credit to retailers. The interposition of a wholesaler changes the credit-extension relations within the industry; manufacturers extend trade credit to a relatively small number of wholesalers while the wholesalers extend trade credit to the retailers. The introduction of a wholesaler between a manufacturer and retailer affects the credit-extension process in ways that are basically equivalent to the use of a factor.

C. Agency Problems and Policy Choice

C.1. Control of Borrower-Lender Conflicts

Researchers have examined the implications of the use of secured rather than unsecured debt. Security provisions change the rights of corporate claimholders so that aspects of the conflict of interest between bondholders and stockholders are better controlled. Smith and Warner (1979a) argue that securing the creditor's claim controls the asset-substitution problem and lowers administrative, enforcement, and foreclosure costs.⁶ Incentives to include security provisions in debt issues are expected to be greater the riskier the firm's debt. Stulz and Johnson (1985) suggest that the option to issue secured debt allows the firm to segregate the cash flows from its new projects and hence controls a form of Myers' (1977) underinvestment problem. These security provisions are likely to be most important in this capacity when the firm plans to increase its accounts receivable.

Since the creditors of the captive have a claim on the assets of the captive (primarily accounts receivable), the captive's unsecured debt has properties

⁶ See also Jensen and Meckling (1976) and Myers (1977). Scott (1977) argues that the higher priority of secured debt in bankruptcy should induce firms to issue as much secured debt as is possible. However, this priority adjustment does not provide a net benefit to the firm because of the offsetting reduction in prices paid by the firm's claimholders whose priority is reduced through secured-debt issuance (see Smith and Warner (1979b)).

similar to the accounts receivable secured debt of the parent. Thus captive formation is an alternative to secured debt as a means of segregating corporate cash flows for payments to bondholders and of controlling the asset substitution and underinvestment problems. Thus captive formation is important in controlling the underinvestment problem when the firm is experiencing more rapid growth in receivables, or when the firm shifts from employing an external financial intermediary in financing its accounts receivable.

Prior to the passage of the Uniform Commercial Code (UCC) the firm could not issue a "floating" or "blanket" lien against a pool of assets. The UCC allows a firm to negotiate a security agreement specifying that the secured party has a continuing security interest in all present and future collateral of the class specified in the contract. Under such a floating lien, newly created assets of the specified type are automatically subject to the security interest as they are created. Since the option of issuing accounts receivable secured debt was not available prior to the passage of the Uniform Commercial Code, captive formation had fewer contractual alternatives prior to Code adoption.⁷

C.2. Information Acquisition versus Credit Collection

We hypothesize that one mechanism to establish incentives to expend the appropriate level of resources on collecting and processing credit-granting information is to give the organization that makes the credit-granting decision the responsibility for bearing the credit risk and collecting the accounts receivable. For example, in non-recourse factoring, the factor makes the credit-granting decision and the factor bears the risk of nonpayment; in with-recourse factoring, the firm does both.

Inspection of Table I suggests that the only apparent exceptions are the use of credit-insurance companies and credit-collection agencies. However, in these cases, other control mechanisms are employed. Collection-agencies' fees are contingent on the amount collected, not the credit extended. Similarly, with credit insurance, only partial coverage is offered. The use of deductibles and coinsurance provisions in credit-insurance policies provides incentives for resource expenditures on information acquisition in credit granting, and on credit collection.⁸ Thus, the structure of these contracts reimposes the wealth

⁷ Mayers and Smith (1987) demonstrate that insurance acquired either separately or bundled through non-recourse factoring also controls an aspect of the underinvestment problem. Mayers and Smith (1982) and Smith and Stulz (1985) also demonstrate corporate insurance purchases can (1) reduce the firm's expected tax liability by reducing the volatility of taxable income given some progressivity of the corporate profits tax; (2) control the asset-substitution problem; (3) reduce the compensating differential necessary to retain risk-averse individuals with ill-diversified claims on the corporation (for example, managers, employees, customers, and suppliers); and (4) provide other administrative services.

⁸ See Mayers and Smith (1981) and Huberman, Mayers and Smith (1983) for an analysis of the incentive effects of policy limits, deductibles, and coinsurance provisions.

consequences of suboptimal resource allocations to credit-information and credit-collection activities.

C.3. Financial Flexibility and Captive Formation

Establishing a captive allows the firm to engage more easily in sophisticated financial contracting. If the optimal debt employed in financing the parent's assets differs from that for the captive's assets, covenants restricting the ratio of debt to assets in the parent's indenture agreement will differ from that restriction in the subsidiary's debt contract.⁹ Thus, for firms where the ratio of accounts receivable to total assets is more variable, the ability to restrict these two ratios separately should be more valuable and captives should be more frequently employed.

C.4. Wealth Expropriation and Captive Formation

Kim, McConnell, and Greenwood (1977) suggest that establishing a captive finance subsidiary allows the expropriation of the extant bondholders' wealth.¹⁰ They argue that segregating the cash flows from the accounts receivable cash flows by forming a captive to finance separately those assets reduces the coverage of the parent's bondholders' claim.

The magnitude of wealth transfers associated with captive formation depends on the receivable-financing policy employed prior to captive formation. For example, firms which issue accounts receivable secured debt prior to captive formation already segregate the accounts receivable cash flows from the other corporate cash flows and thus are less likely to generate wealth transfers. The Kim, McConnell, and Greenwood analysis fails to consider creditors' incentives to anticipate potential wealth transfers and their ability to structure mechanisms to control them. For example, some bond covenants restrict the transfer of assets to a subsidiary through the firm's dividend covenant (see Begley (1990)). Moreover, debt guarantees among related companies control the incentives to transfer wealth from borrowing company creditors (see Whittred (1987) or Mian and Smith (1990a)). In addition to the use of direct debt guarantees, there are also several methods of providing indirect debt guarantees: (1) Negotiate joint lines of credit between parent and subsidiary, thus obligating both to repay the credit. (2) Structure the sale of receivables to the subsidiary on a with-recourse basis,

⁹ Roberts and Viscione (1981) also argue that the separation of the firm's manufacturing and financing activities lowers the monitoring costs of debtholders. Note, however, that this benefit is only achieved if the captive is unconsolidated. In Mian and Smith (1990b) we demonstrate that captives are overwhelmingly unconsolidated prior to FAS 94, which eliminates that reporting option. We therefore believe that the financial-flexibility motive for captives is less important since this change in GAAP.

¹⁰ Malitz (1989) reexamines the wealth-expropriation evidence offered by Kim, McConnell, and Greenwood. Her analysis documents abnormal losses to bondholders for event months -6 to 0 of -2.3% as opposed to -5.6% reported by Kim, McConnell, and Greenwood.

thus providing a guarantee of the assets instead of the liabilities. (3) Negotiate an operating agreement between the parent and its captive that imposes constraints on their joint activities. These operating agreements can include income-maintenance provisions, dividend restrictions, and holdback reserves.

D. Summary of Potentially Testable Hypotheses

Our analysis has produced a number of potentially testable hypotheses to explain the determinants of firms' accounts receivable policy choice. They are summarized in Table II. Examination of differences in sign patterns across alternate policies allows one to focus on the hypothesized comparative advantages of the various policies. While we do not have the requisite data to test all the hypotheses offered in this section, in section II we test some of the basic ones involving the cross-sectional variation in accounts receivable-policy choice. We discuss our data and provide some evidence from simple univariate analyses of the policy choice. We then summarize the evidence in a four-choice logit model. In section III we examine hypotheses related to incentives for captive formation.

II. Evidence on Alternate Accounts Receivable Policies

Our basic data on accounts receivable management policy choice is from the American Institute of Certified Public Accountants' 1982 sample of 600 firms reported in "Accounting Trends and Techniques." The AICPA annually surveys 600 firms' annual reports and summarizes the frequency of reported use of various policies, including factoring, captive finance subsidiaries, and accounts receivable secured debt. However current accounting procedures understate use of factoring and secured debt, and thus the residual (no reference) overestimates the use of general corporate credit. There are three primary reasons for systematic understatement. (1) While security interests in lending agreements must be noted, it can be through a very broad statement that does not indicate the nature of the collateral. (2) Sales of accounts receivable with recourse create a contingent liability; however, it must be disclosed in a footnote only if it is material. (3) There is apparently no requirement for a systematic disclosure of non-recourse sales of accounts receivable. Understatement is unlikely to be large for the use of captives, since in that case we compare the AICPA reference with *Moody's*. (By examining *Moody's* for 1982, we find thirteen firms with captives whose operations are reported on a consolidated basis and hence are omitted from the AICPA references.)

A. Scale Economies and Credit-Policy Choice

We have argued that, because of decentralization incentives and scale economies in establishing a captive, that captives are more likely formed by larger firms. To test this hypothesis, our size data are primarily from

Table II

Testable Hypotheses That Explain Determinants of Firm's Account Receivable Policy Choice

Firm, market, and accounts receivable portfolio characteristics effect on the probability of employing alternative accounts receivable management policies where + signifies an increased probability, - signifies a reduced probability, and 0 signifies no predictable change.

	Accounts Receivable Management Policies									
	General Corporate Credit	Accounts Receivable Secured Debt	Captive Finance Subsidiary	Non-recourse Factoring	Recourse Factoring	Credit Reporting Firm	Credit Collection Agency	Credit Insurance Company		
Incentives to extend trade credit										
Firm has cost advantage	+	+	+	-	+	-	-	-		
Firm has market power	+	+	+	-	+	0	0	0		
Contract taxed as installment sale	+	+	+	-	-	0	0	0		
Structure of sales										
Size	+	-	+	-	-	-	-	-		
Customer geographic diversity	-	-	-	+	+	+	+	+		
Seasonality in sales	-	-	-	+	+	+	+	+		
Manufacturer concentration	0	0	0	-	-	0	0	0		
Customer concentration	+	+	+	-	-	-	-	-		
% Repeat sales	+	+	+	-	+	-	-	0		
Marketing channel										
Firm sells direct to customers	+	+	+	-	-	0	0	0		
Firm uses wholesaler	+	+	+	-	-	0	0	0		
Firm uses sales agents	-	-	-	+	+	+	+	0		
Agency problems										
Credit standing	+	-	+	-	-	0	0	-		
Control of under-investment problem	0	+	+	0	+	0	0	+		
Passage of UCC	0	+	-	+	+	0	0	0		
Receivable variability	-	-	+	+	+	0	0	0		

COMPUSTAT (of the 600 AICPA firms, 410 are included); for the remaining 190 firms, we employ data from *Moody's*. To examine whether observed firm-size differences across alternate policies are significant, we run regressions with the dollar value of receivables, sales, and assets as the dependent variable against three dummy variables; $D_1 = 1$ if the firm uses receivables as collateral for a loan, $D_2 = 1$ if the firm has a captive finance subsidiary, and $D_3 = 1$ if the firm sells receivables to a factor. (Note that there is a potential problem with receivables as a measure of size if a firm regularly sells its accounts receivable to a factor.) Since "no reference to receivables financing" is the omitted category, the estimated coefficients test whether the firm size for firms in categories D_1 , D_2 , or D_3 is different from that of a firm using general corporate credit. The results are reported in Table III.

Using the log of receivables, sales, and assets appears to produce a better fit than the raw size measures. In each of the regressions employing the log of receivables, the log of sales, or the log of assets, the dummy variable on use of captives is significantly positive and use of accounts receivable secured debt is significantly negative.¹¹ Moreover, for the 15 two-digit SIC codes where firms employ secured debt, in only three of the industries does the average level of receivables for the firms employing secured debt exceed the industry average. Finally, in 17 of the 22 two-digit industries where firms employ captives, firms with captives have average receivables that exceed the industry average. This firm-size evidence is consistent with the hypothesis that: (1) there are significant fixed costs in establishing a captive and they tend to be incurred only by the largest firms; (2) large firms invest in more specialized credit-extension techniques and personnel; and (3) large firms operate on a more decentralized basis.

B. Credit Ratings and Credit-Policy Choice

We have argued that low credit-rated firms will more frequently employ factoring or issue accounts receivable secured debt to control incentive problems of risky debt. We examine 1982 *Moody's* bond ratings for the 600 AICPA firms. Panel A of Table IV summarizes the distribution of debt ratings for the firms with captives, with secured debt, that factor, and with no reference to receivable financing. In Table V we present the results of a logistic regression model with the firms' bond rating as the dependent variable and the firm's choice of financing policy as the independent variable. This analysis suggests that firms with captives have bond ratings that are marginally higher than the average firm with no reference to receivable financing but that firms which issue accounts receivable secured debt or factor have significantly lower ratings. This evidence is consistent with the

¹¹ Employing dummies for consolidated versus unconsolidated captives and factoring with recourse and without does not affect these basic conclusions. Furthermore, including dummies for each two-digit industry to control for inter-industry variation also leaves the basic results unaffected.

Table III
**Cross-sectional Regression of Firm Size and Three Dummy Variables Indicating
 Financing Policy Choice for 600 AICPA Firms with 1982 COMPUSTAT and**

Moody's Data

To examine whether observed firm-size differences across alternate policies are significant, we run regressions with the dollar value of receivables, sales, and assets as the dependent variable against three dummy variables: $D_1 = 1$ if the firm uses receivables as collateral for a loan, $D_2 = 1$ if the firm has captive finance subsidiary, and $D_3 = 1$ if the firm sells receivables to a factor. Since "no reference to receivables financing" is the omitted category, the estimated coefficients test whether the firm size for firms in categories D_1 , D_2 , D_3 is different from that of a firm using general corporate credit. To test this hypothesis, our size data are primarily from COMPUSTAT (of the 600 AICPA firms, 410 are included); for the remaining 190 firms, we employ data from *Moody's*. (*t*-statistics are in parentheses.)

Measure of Firm Size	Intercept	Receivables as Collateral	Captive Finance Subsidiary	Use of a Factor	R^2	F-Statistic
Receivables	247.91 (6.78)	-267.92 (-1.72)	640.40 (7.97)	-62.12 (-0.45)	.10	22.21
Sales	2119.26 (6.65)	-2165.63 (-1.60)	5250.24 (7.49)	-820.29 (-0.68)	.09	19.69
Assets	1561.91 (6.82)	-1724.11 (-1.77)	4183.55 (8.30)	-378.33 (-0.43)	.10	24.10
Log receivables	4.48 (60.24)	-1.42 (-4.49)	1.44 (8.84)	-0.04 (-0.13)	.14	32.78
Log sales	6.61 (89.53)	-1.33 (-4.24)	1.43 (8.79)	-0.08 (-0.30)	.13	31.83
Log assets	6.27 (83.33)	-1.50 (-4.68)	1.47 (8.89)	-0.10 (-0.34)	.14	33.70

Table IV

Distribution of 1982 Moody's Bond Rating for the 600 AICPA Firms

Panel A summarizes the distribution of debt ratings for the firms with captives, with secured debt, that factor, and with no reference to receivable financing. Panel B provides the distribution of firms' commercial paper ratings by policy choice. Firms with long-term debt issues with different ratings are listed under each rating; thus column totals exceed the number of firms in the sample.

Rating	Captive Finance Subsidiaries	Receivables as Collateral	Use of a Factor	General Corporate Credit
Panel A: Long-term Public Debt				
Aaa	8	0	0	12
Aa	19	0	1	42
A	39	1	4	74
Baa	19	2	9	52
Ba	10	3	8	22
B	6	3	4	20
Caa or lower	2	6	4	1
No rating	21	16	10	234
Total	124	28	37	457
Panel B: Commercial Paper Rating				
P1	53	2	6	109
P2	17	1	3	45
P3	2	0	1	3
NP	1	0	1	2
No rating	42	23	22	282
Total	115	26	33	441

Table V
Summary Results of Logistic Regression Model

Bond rating is the dependent variable and types of financing policies are independent variables, for 323 AICPA firms with rated debt employing 1982 data. The logistic regression model is:

Probability [Firm with policy j has debt rating $\geq k$]

$$= 1/[1 + \exp(-a_k - b_1 D_1 - b_2 D_2 - b_3 D_3)]$$

Where $D_1 = 1$ if $j = \text{captive}$; 0 otherwise

$D_2 = 1$ if $j = \text{factor}$; 0 otherwise

$D_3 = 1$ if $j = \text{collateral}$; 0 otherwise.

Independent Variables	Dependent Variable	
	Firm's Highest Bond Rating	Firm's Lowest Bond Rating
Intercepts		
a_6 (Aaa)	-2.76	-2.92
a_5 (Aa)	-1.12	-1.24
a_4 (A)	0.41	0.30
a_3 (Baa)	1.56	1.37
a_2 (Ba)	2.34	2.31
a_1 (B)	4.48	4.63
Financing policy variables		
b_1 (captive)	0.39*	0.36
b_2 (factor)	-1.26**	-1.37**
b_3 (collateral)	-2.68**	-2.92**
R^2	0.16	0.17
Model chi-square	32.35**	37.23**

* Indicates significant at 10%.

** Indicates significant at 5%.

use of secured debt and factoring to control incentive conflicts between bondholders and stockholders.

As another measure of firms' credit standing, we also examine firms' commercial paper ratings. Employing the December 1982 *Moody's Bond Record*, we check to see whether each of the 600 AICPA firms issue commercial paper; and if so, its rating. In Panel B of Table IV we provide the distribution of firms' commercial paper ratings by policy choice. Of the firms' with captives, 63.5% issue commercial paper (either through the parent or captive). In contrast, only 12.5% of secured debt firms, 33.3% of firms that factor, and 36.1% of no-reference firms issue commercial paper. Thus it appears that firms with captives more extensively issue commercial paper.

C. Distribution Channels and Credit-Policy Choice

We have argued that there are two reasons to expect a potentially important interdependence between the firm's choice of distribution channels and its credit-extension policy. (1) If the firm has market power, it is more likely to coordinate output and credit prices to engage in rent extraction. In such circumstances we argue that the firm is also more likely to establish an internal sales organization rather than to sell through retailers and wholesalers. The increased control from the vertical integration of the distribution system enhances the firm's ability to engage in effective rent extraction. (2) Since wholesalers perform some of the same financing functions as a factor, we do not expect a firm to employ both in marketing a given product.

Our data on distribution channels comes from *Census of Manufacturers, 1977*.¹² It reports the percentage of the total sales sold directly by manufacturers in each manufacturing industry. For our firms, we used the percentage reported for its four-digit SIC code (however if four-digit figures were unavailable, we employ either three or two-digit figures). We have the requisite data for 311 firms. In Table VI, we report the results of two regressions as a measure of distribution-channel choice on three dummy variables for use of secured debt, use of a captive, and use of a factor. Consistent with our arguments, the first regression suggests a significant positive association between direct sales to customers and the use of a captive finance subsidiary and the second regression suggests a significant negative association between the use of a wholesaler and the use of a captive. However, there is no significant negative association between the use of a wholesaler and use of a factor.

D. Concentration and Credit-Policy Choice

If a firm has market power, then it is more likely to retain the trade-credit-extension function internally. We also expect that factoring is more

¹² These data are from a special survey which was conducted in 1977 (as well as in 1939, 1958, and 1967), but not in 1982.

Table VI
**Regression of Industry Concentration Ratios on Dummy Variables for the
 Financing-Policy Choices (Use of Receivables as Collateral, Use of a Captive
 Finance Subsidiary, and Use of a Factor)**

This regression is estimated with data from the subsample of 311 manufacturing firms' (SIC 20-39) from the 600 AICPA firms with 1982 data.

	Intercept	Receivables as Collateral	Captive Finance Subsidiary	Use of a Factor	$\bar{R}^2$	F-Statistic
Sales direct to customers ^a	66.61**	3.50	7.48**	1.39	0.01	2.46*
Sales to wholesalers ^a	21.69**	-2.80	-5.44**	-4.24	0.02	3.49**
Concentration ^b	27.93**	-2.71	12.39**	0.62	0.14	18.26**
Seasonality ^c	0.04**	0.02	-0.00	0.01	0.00	1.30

* Indicates significant at 10%.

** Indicates significant at 5%.

^a Marketing channel data for four-digit SIC codes reported in the *Census of Manufacturing, 1977*.

^b Concentration data for four-digit SIC codes reported in *Census of Manufacturing, 1982*.

^c Sales data for the 20 quarters for 1978 to 1982 are from COMPUSTAT.

likely to be employed in those industries where there are both a large number of manufacturers and a large number of retailers so that the firm-specific component of the credit-risk-assessment information is small. To test these hypotheses, we obtain the four-firm-concentration ratios for the manufacturing industries (SIC codes 20 to 39) from the *Census of Manufacturers, 1982*. Again, we have the requisite data for 311 firms. In Table VI we report the results of a regression of industry-concentration ratios on three dummy variables for use of secured debt, use of a captive, and use of a factor. Consistent with the market-power hypothesis, we find that captives are employed by firms in the most concentrated industries. While we find no reliable evidence of a negative association between the use of factors and seller concentration, comparable data on buyer concentration are unavailable. Thus this test of the hypothesis that factoring is less likely to be employed where customer credit information is more firm-specific lacks power.

Anecdotal evidence on the interdependence of distribution channel and financing policy choices is provided by Ford. Although GM formed a captive finance subsidiary in 1919, Banner (1957) suggests that Ford feared antitrust action if they also established a captive. Hence, Ford factored its accounts receivable through CIT between the early 1930s and 1959. Thus, Ford's simultaneous use of a factor and a vertically integrated system of franchised dealers was, in part, a product of regulation. The factoring contract between Ford and CIT required CIT to invest in credit information about Ford dealers. And since those dealers typically sold only Ford products, the information investment had a large Ford-specific component. In 1959 when Ford announced the formation of its captive, CIT suffered a statistically significant two-day abnormal value loss of 4.58%.¹³

E. Seasonality and Credit-Policy Choice

Emery (1987) argues that seasonality is an important motive for trade-credit extension. Additionally we have argued that the greater the seasonality of sales, the more likely the firm will factor and the less likely to retain the credit-extension function internally. We measure seasonality by examining quarterly sales data for the 20 quarters from 1978 to 1982 from COMPUS-TAT. We compute the fraction of sales in each quarter and take the difference between the highest and lowest quarter average. In Table VI we report the results of a regression of this measure of seasonality on dummy variables for the financing-policy choices. These coefficients are insignificant. This evidence thus calls into question the empirical significance of seasonality in determining credit policy.

¹³ Note that this loss estimate only captures the resolution of uncertainty associated with the announced decision; prior efforts by Ford to extract rents from CIT and expectations of this move would already be capitalized in the CIT share price.

F. Summary of Cross-Sectional Evidence

We have examined separately the association between accounts receivable management policy choice and firm size, credit standing, distribution channels, industry concentration, and seasonality. However, these variables are not independent; for example, large firms tend to have higher bond ratings. We thus employ a four-choice logit model to examine these variables simultaneously. The four choices are: general corporate credit, accounts-receivable secured debt, factoring, and a captive finance subsidiary. The independent variables are firm size (measured by assets), a dummy variable that is one if the firm has investment-grade debt, a dummy variable that is one if the firm issues prime-rated commercial paper, industry concentration, industry percentage of direct sales, industry percentage of sales to wholesalers, and our seasonality measure. We estimate the model across 311 manufacturing firms (of the 600 AICPA firms, 324 have distribution-channel, seasonality, and concentration data; but 13 report multiple financing policies). Table VII reports the results. Size, distribution-channel, concentration, and credit-standing variables are all significant. This suggests that each provides an independent impact on the determination of accounts receivable management policy choice. The estimates are generally consistent with the univariate analysis: larger firms, firms in more concentrated industries, and firms with higher credit standing are more likely to establish a captive; firms that employ wholesalers are less likely to employ either a factor or a captive; again, seasonality is statistically insignificant.

We repeat the analysis employing sales, receivables, log of sales, log of receivables, and log of assets. The significance of coefficients is similar; however, the significance of the investment-grade debt and prime-rated commercial paper variables is somewhat lower where logs are employed. We also measure long-term debt ratings and commercial-paper ratings on a scale of 0 to 6 and 0 to 4 respectively; the results are unaffected.

III. Evidence from Captive Formation

We identify the captive-formation date by searching *Moody's* and annual reports. We identify 171 firms with captives. To determine the captive's year of incorporation for the 69 firms where it is not stated, a stepwise procedure is employed. We examine issues of *Moody's* to determine the year in which the name of the captive first appears among the list of subsidiaries. Finally, we search the *Wall Street Journal Index* for specific captive-formation announcements. This process yields 171 captives where the formation year is identified, 65 firms where the formation month is identified, and 31 firms where the *Wall Street Journal* announcement date is identified.

A. Wealth-Redistribution and Captive Formation

To test the Kim, McConnell, and Greenwood hypothesis that captive formation is motivated by potential wealth transfers between bondholders and

stockholders, we first examine daily abnormal returns for the 31 firms with a public announcement of the captive formation in the *Wall Street Journal*. In Table VIII we report the daily abnormal returns and cumulative abnormal returns. Although the abnormal return on event-day minus one is significantly positive, the two-day return is insignificant; hence, our estimate of the value effect is small. While this daily announcement-period abnormal return is consistent with Miller's neutral-mutation hypothesis, it also could be attributable to our relatively small sample of *Wall Street Journal* announcements, our difficulty in accurately identifying initial public-announcement dates, and our Table III evidence of industry clustering. Such clustering suggests that the unanticipated component of the announcement for more recent formations is small. However, our evidence from daily returns is quite different from the substantial positive abnormal returns reported by Kim, McConnell, and Greenwood.

Employing methods similar to Kim, McConnell, and Greenwood for our sample of 65 captives, we examine monthly abnormal returns around the formation date. In Table IX, we summarize the cumulative abnormal returns. For the twelve months preceding formation we find the cumulative abnormal returns to be 6.20%—significantly less than the 17.1% reported by Kim, McConnell, and Greenwood. Over the twelve months preceding captive formation we find a 1.53% insignificant positive abnormal return to bondholders for the 36 firms with traded debt. If we exclude convertible debt, the bondholder returns are an insignificant -0.38% . Also, the correlation coefficient between stockholder and bondholder abnormal returns is $+0.33$ (p value = 0.05), not negative as the wealth-redistribution hypothesis would imply. We also report the abnormal returns for 44 firms which form captives and a control sample of 155 firms in the same industries which already have formed captives. The cumulative difference in the returns to the two portfolios is only 0.06%. With these data one cannot distinguish between the hypotheses that: (1) firms which have been doing well form captives; (2) captive formation raises firm value, and changes in industry circumstances raise the value of firms which form captives as well as of firms with captives in existence. Finally, for the 65 firms forming captives we find no evidence of bondholder litigation in the *Wall Street Journal Index* for event months -12 to $+12$. We believe that these results cast doubt on the wealth-distribution hypothesis as an important motive for captive formation.

Of the 36 captive formation firms with traded debt, *Moody's* indicates 21 have bonds that include covenants restricting the firms' or subsidiaries' future debt. Unfortunately, as Begley (1990) demonstrates, *Moody's* does not regularly report provisions in bond contracts restricting asset transfers to subsidiaries and we do not have access to the original indenture agreements for this sample of bonds. Thus we cannot accurately assess the extent to which potential wealth transfers through captive formation were contractually controlled via covenants. (We did note that in their 1967 Annual Report, Honeywell indicates that captive formation had been infeasible under provisions in two outstanding bond issues; however, over two-thirds of the

Table VII
**Summary Results of Four-Choice Logit Model Examining Variables
 Simultaneously**

Accounts receivable management policies (captive, general corporate credit, secured debt, and factoring) are the dependent variable and measures of firm size (assets), dummy variables for credit standing, marketing channel distribution choice, industry concentration, and seasonality are independent variables for 311 AICPA manufacturing firms without multiple financing policies using 1982 data.

Independent Variables	Dependent Variable		
	Captive Finance Subsidiary	Use of a Factor	Receivables as Collateral
Intercept	-1.87	0.36	-4.32
Firm size	0.09**	-0.22	0.04
Concentration	0.03**	-0.04	0.01
Investment-grade bond	1.01**	1.16	-1.30
Prime-rated commercial paper	0.82**	-0.01	-1.01
Sales direct to customers	-0.01	-0.02	0.01
Sales to wholesalers	-0.05**	-0.08*	0.01
Seasonality	-2.51	8.32	8.13

* Indicates significant at 10%.

** Indicates significant at 5%.

Table VIII
**Daily Abnormal Returns and Cumulative Abnormal Returns for 31 Captive
 Formation Announcements, 1954-1984**

Event day 0 is the day of public announcement in the financial press.

Event Day	Raw Return	Abnormal Returns	t-Statistic	Cumulative Abnormal Returns
-5	0.11	0.14	0.33	0.14
-4	-0.02	-0.12	-1.24	0.01
-3	0.36	0.38	1.35	0.39
-2	0.47	0.62	1.57	1.01
-1	0.28	0.49	2.45	1.50
0	-0.38	-0.35	-1.09	1.15
1	-0.01	-0.03	0.71	1.12
2	0.35	0.52	2.47	1.64
3	-0.04	-0.22	-0.99	1.42
4	0.08	0.07	0.41	1.36
5	0.07	0.10	0.47	1.46

Table IX

Summary of Cumulative Abnormal Returns to Stockholders and Bondholders

Data cover event months -12 to 0 relative to the captive formation month for 65 firms with formation months between 1953 and 1984. Control firms are all the firms with captives in the same industry.

Sample Description	Cumulative Abnormal Returns to Stockholders			Cumulative Abnormal ^a Returns to Bondholders for Firms Forming Captives
	Firms Forming Captives	Control Firms	Difference	
65 firms	6.20**	—	—	—
44 firms with 155 control firms	6.58**	6.52**	0.06	—
36 firms with traded debt	7.54**	—	—	1.53
32 firms with traded nonconvertible debt	7.85**	—	—	-0.38
21 firms with traded debt and with controls	7.20*	4.68	2.52	1.14

* Indicates significant at 10%.

* Indicates significant at 5%.

^a We assume that the difference between the bond returns in our sample and the Ibbotson/Sinquefeld long-term corporate bond rate is stationary. To construct normal returns for event months -12 to 0 we (1) estimate the average difference between our bonds' returns and the Ibbotson/Sinquefeld bond returns computed over event months -18 to -13 and +1 to +12, and (2) add this average difference to the Ibbotson/Sinquefeld bond returns reported for event months -12 to 0. Then, to calculate abnormal returns we subtract this estimate of normal returns from the bond return for each bond. We then weight each bond equally for each firm and average across firms.

bondholders approved amending the issues in return for a 0.25% increase in the coupon.)

B. Receivables Growth and Captive Formation

Although the wealth-redistribution and underinvestment motives for captive formation are not mutually exclusive, they carry different weight depending on the receivables growth rates around formation dates. With no growth in receivables the primary effect of captive formation is more likely to be from the priority increase afforded the captive's debtholders. However with high growth in receivables, the primary effect is more likely to be from controlling the underinvestment problem.

In Table X we report the average percentage change in accounts receivable for five event years preceding captive formation. We report receivables growth rates for the 49 firms that have data on COMPUSTAT or *Moody's* and form captives between 1975 and 1984, as well as a control sample. The control sample comprises all firms on COMPUSTAT in the same 4-digit SIC code as the captive-formation firm.

The data in Table X indicate that the receivables growth rates for the firms that form captives is significantly positive in all five event years. (Note that because some firms sell receivables to their newly formed captive, there is a mechanical reduction in receivables growth for event-year zero.) Moreover, the cumulative abnormal growth rate from event years -4 to -1 is 18.63%; thus, our evidence suggests that these firms realize higher growth in receivables than other firms in the same industries. Thus, this evidence reinforces our security-price evidence and suggest that wealth redistribution is a relatively unimportant motive for captive formation.

Finally note that our data are likely to understate receivables growth for firms that form captives. Our methods do not capture growth in accounts receivable from firms switching from employing external financing of sales to captive financing. For example, Caterpillar said in its 1954 Annual Report, "Although Caterpillar dealers have earned impressive lines of bank credit to finance expanding sales, the growth of vigorous competitive conditions is placing additional burdens on them to finance time payment sales. Accordingly, in April, a wholly owned subsidiary, Caterpillar Credit Corporation, was formed to assist Caterpillar dealers in financing sales of the Company's products."

C. UCC Passage and Captive Formation

To examine the impact of the passage of the Uniform Commercial Code on the relative attractiveness of captives, we contrast the rate of captive formation before versus after UCC adoption. From *Moody's* we determine the parent's state of incorporation at the time of captive formation (Delaware is the parents' state of incorporation in 79 of the 171 captive formations). There are 59 captives formed over the 15-year period prior to UCC adoption, six in the year of UCC adoption, and 73 in the 15 years after UCC adoption. The

Table X
The Percentage Change in Accounts Receivables for Five Event Years
Proceeding Captive Formation

We examine 49 firms which form captives between 1975 and 1984 with data on COMPUSTAT or *Moody's*. The control sample includes all firms on COMPUSTAT in the same 4-digit SIC code as the captive-formation firm in the formation year.

Event Year	Receivables Growth Rates		Abnormal Receivables Growth Rate
	Captive	Control	
-4	13.77**	11.03**	2.73
-3	17.28**	15.18**	2.09
-2	21.76**	10.59**	11.17**
-1	13.05**	11.21**	1.84
0	4.60	8.45**	-3.85
-4,0	70.46	56.46	13.98

** Indicates significant at 5%.

data indicate no reduction in the rate of captive formation associated with code adoption. This reinforces the conclusion from Tables III through VII that secured debt and captive finance subsidiaries are not close substitutes, even though they each provide similar control of the underinvestment problem.

D. Financial Flexibility and Captive Formation

To examine the hypothesis that captive formation allows the firm to engage in more flexible financial contracting, we again examine the 36 firms with publicly traded long-term debt at the time of captive formation. Of these 36 firms, 17 issue long-term publicly traded debt within three years after captive formation. We examine the bond indentures of these 17 firms and identify three types of covenants which employ balance-sheet variables: dividend constraints, constraints on secured debt, and constraints on creating additional debt. Eleven firms change the covenants in their debt issues after the captive formation, three employ similar covenants, while the other three firms employ no balance-sheet data in their covenants. All of the firms report only their equity interest in their subsidiary on their consolidated balance sheet. (Note that if the parent's debt covenants apply only to consolidated variables, the degree to which a covenant is binding is reduced even if the parameters of the covenant are unchanged.) This is consistent with the hypothesis that after captive formation, the parent firm restricts the debt of the financing subsidiary differently from the rest of the firm. This evidence is also consistent with the evidence presented by Livnat and Sondhi (1986) that the volatility of financial ratios on the parent firm's balance sheet is reduced after captive formation. However Table IX implies that firms that have been doing well form captives. Thus, the observed change in covenants also could be caused by the firms' prior good performance.

IV. Conclusions

This paper analyzes the major accounts receivable management policies. The primary goal has been to provide a unified framework for analyzing this policy choice. It is important to recognize the five functions which must be performed in the credit-administration process: credit-risk assessment, credit granting, accounts receivable financing, credit collection, and credit-risk bearing. Each of these five functions can be retained by the firm or subcontracted to a specialized external agent. For example, at one extreme, the firm can manage all its credit-administration activities internally; and at the other, it can subcontract the entire credit-administration process to a specialized financial intermediary, a factor. Between these extremes there are intermediate arrangements; for example, employing a credit-insurance company, credit-reporting agency, or credit-collection firm delegates a single credit-administration function.

The examination of the available evidence suggests that although both accounts receivable secured debt and captive finance subsidiaries can control

the underinvestment problem by segregating the accounts receivable cash flows from the firm's operating cash flows, in practice, the two financing methods do not appear to be close substitutes. The larger, more credit-worthy firms establish captives, while the smaller, riskier firms issue accounts-receivable secured debt. We find evidence that captives allow more flexible contracting opportunities, and we expect these opportunities to be more important when the variability of the ratio of accounts receivable to total assets is larger.

The tests produce weak results with respect to factoring and accounts receivable secured debt. We believe that this is partially due to our use of the AICPA firms for our tests and the resulting small sample of firms that employ these alternatives. One component of this problem is likely to be a systematic under-reporting of the use of factoring and accounts receivable secured debt in our AICPA data. (For example, we believe that the use of credit-card receivables is virtually unreported in our AICPA database.) These data errors reduce the power of our tests to distinguish between the use of factoring, accounts receivable secured debt, and general corporate credit. Moreover, as Table I demonstrates, factoring can be approximated through the use of a combination of a credit-reporting firm, a credit-collection agency, and a credit-insurance policy. Since use of these services also is not reported, the power of our tests is reduced further.

In contrast to Kim, McConnell, and Greenwood (1977), we find no evidence of bondholder wealth expropriation associated with captive formation. Our estimates of bondholder returns are insignificantly different from zero; the correlation coefficient between bondholder and stockholder abnormal returns is positive, not negative; and there is no evidence of bondholder litigation. We also provide evidence of substantial growth in receivables around captive-formation dates. We believe that our evidence is consistent with the use of captives to provide additional financing flexibility and to control the underinvestment and asset-substitution problems.

Appendix: Description of Alternate Accounts Receivable Management Policies

General Corporate Credit

We take as a benchmark that the firm finances accounts receivable out of general corporate credit and manages internally the credit-risk-assessment, credit-granting, credit-collection, and credit-risk-bearing functions. With such an accounts-receivable policy, the firm does not employ specialized liability claims and must develop internally any specialized organizational capital associated with the credit-administration process.

Accounts, Receivable Secured Debt

With accounts receivable secured debt, the firm borrows using accounts receivable as collateral. Typically the secured creditor is a commercial

finance company or bank. At initiation of the contract, both a promissory note specifying the portion of the accounts receivable that can be borrowed (up to 80% of the face value) and a security agreement specifying the terms under which the collateral is provided are negotiated. When goods are shipped, a copy of the invoice plus a form of assignment conferring to the bank a pledge of specific assets are sent to the lender. Thereafter, the firm can borrow up to the agreed portion of the collateral under the note. The Federal Reserve Boards' *Annual Statistical Bulletin* reports that domestic finance companies extended \$76.8 billion in accounts receivable secured loans in 1985.

Captive Finance Subsidiary

A captive finance subsidiary issues debt which typically is not directly guaranteed by the parent corporations.¹⁴ The proceeds of the debt issue then are used to purchase the accounts receivable from the parent corporation. There are two standard ways of handling the accounts receivable. The captive can purchase the accounts receivable from the parent (the parent does the credit-risk assessment and makes the credit-granting decision). Alternately, the captive can deal directly with the parent's customer (the captive makes the credit-extension decisions). The *American Banker* reports that the 20 largest captive finance companies acquired \$279 billion in receivables in 1985; thus, captives appear to be employed by some of the largest firms.

Factoring

Factoring is the sale of accounts receivable to a financial institution (other than the firm's captive). There are several forms of the contractual agreement between the firm and the factor. Under a typical contract, when the manufacturer receives an order, it is passed to the factor. The factor does the credit-risk assessment and makes the credit-granting decision. In nonrecourse factoring the factor has no recourse to the manufacturer's other assets should the customer default. (However, nonpayment by an account debtor because of a product dispute—for example, over quality or product description—results in a charge back to the manufacturer.)¹⁵

Recourse factoring differs from non-recourse factoring in two ways: the firm makes the credit-extension decision and bears the credit risk. Recourse factoring appears most frequently employed as an option under a factoring

¹⁴ See Posner (1976) and Smith and Warner (1979a) for a discussion of the right of creditors of affiliated corporations.

¹⁵ Credit-card receivables (for example Visa and Mastercard) can be viewed as a factoring arrangement at the retail level. In a credit-card transaction the customer submits an application to a financial institution, passes the credit review, and receives a credit card. Upon presenting the card, goods are delivered to the cardholder and the seller is paid by the card issuer. The Federal Reserve reports that at the end of 1984 credit-card receivables at commercial banks totaled \$60.6 billion.

contract where the typical transaction is handled on a nonrecourse basis. If a particular order does not pass the factor's credit-extension guidelines, the manufacturer can override the factor's decision, but that account is handled on a with-recourse basis.¹⁶ The Federal Reserve's *Annual Statistical Bulletin* reports that the factoring volume of domestic finance companies in 1985 was \$38 billion.

Credit-reporting Firm

Use of a credit-reporting firm subcontracts the risk-assessment function. For example, when faced with a new customer firms frequently purchase a credit report from a credit-reporting firm such as Dun and Bradstreet. The firm acquires information about repayment history across a range of manufacturers, increasing the information on which to base its credit-extension decision. The contract specifying access to credit information typically specifies a price for a minimum number of inquiries plus an incremental charge for inquiries above that minimum. The *Wall Street Journal* (8/10/86) reported that business credit-information volume was \$590 million in 1983.

Credit-Collection Agencies

Credit-collection agencies provide collection services for past-due accounts receivable. The collection activities range from written requests for repayment to legal action to recover unpaid balances. The fee for collection services typically is contingent on the amount collected; it suggests that there are significant fixed costs in collection activities.¹⁷ The Commercial Law League of America (CLLA) reports that their affiliated agencies handled \$2 billion of commercial claims in 1985. Given their estimate that members account for 80% of volume, \$2.5 billion is an estimate of 1985 industry-claims volume.

Credit Insurance

Commercial credit insurance indemnifies firms against losses on uncollected accounts receivable. The typical credit-insurance policy contains provisions specifying: policy amounts, the amount paid for credit losses during the policy period; deductible, only losses over this aggregate amount are paid;

¹⁶ A special case of factoring is private brand financing, an innovation of General Acceptance Corporation in the early 1960s. Under this arrangement, the firm enters into a factoring agreement with a wholly owned subsidiary of the factor; but the name of the subsidiary corresponds closely with that of the firm whose accounts receivables are being factored, not with the subsidiary's parent, General Acceptance. In the promotional literature for private brand financing it is suggested that firms with captives gain a marketing advantage through greater prestige. This form of factoring provides the appearance of a captive while retaining many of the advantages of factoring. (See *Business Week*, June 13, 1964.)

¹⁷ For example, one scale was 24% of the first \$2,000 collected, 20% of the next \$8,000 collected, and 15% of the sums collected in excess of \$10,000; minimum charges \$75 of collections of \$150 to \$312 and 50% on collections of less than \$150.

account limits, typically automatically approved up to a limit set as a function of the account debtor's credit rating, but can be extended by approval of the insurer, coinsurance, the insurer typically only indemnifies the insured for a fraction of the loss (e.g., 90%). Virtually all credit insurance in the U.S. is provided by two companies: American Credit Indemnity (a subsidiary of Commercial Credit Company) and The London Guarantee and Accident Company. In addition, the Foreign Credit Insurance Association, an association of insurance companies in cooperation with the Export-Import Bank of the U.S., offers policies protecting U.S. exporters against the risk of nonpayment by foreign debtors. American Credit Indemnity estimates that credit insurance was purchased covering sales of \$52.6 billion in 1985.

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