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ASSET REDEPLOYABILITY AND CAPITAL STRUCTURE CHOICE: THE ROLE OF COMPETITION

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Abstract

Asset specificity and the availability of purchasers for the asset in liquidation are not merely additive factors. These factors interact in interesting ways to contribute to the underlying collateral value of assets. This paper focuses on asset redeployability, the role of competition and firms' leverage decisions. Competition captures the availability of potential purchasers of a firm's assets in liquidation. For firms in more competitive domestic industries, there exist a wider array of potential purchasers for their assets in liquidation as compared to firms operating in industries that face competition mainly from imports. It is relatively easier for firms in competitive domestic markets to sell off their assets to competing firms due to commonalities in production technologies. Thus, the assets of these firms inherently have a higher collateral value. This results in these firms having a higher leverage as compared to firms operating in import intensive industries.

Keywords: Product market competition, financing policies, capital structure, asset redeployability

INTRODUCTION

Firms do not operate in isolation. Firms are in constant strategic interaction with other firms within as well as outside of the industry that they operate in. This, to increase their customer base and market share. Numerous studies analyze a cross section of leverage ratios to study the relative merits of the various capital structure models (Rajan and Zingales, 1995; Baker and Wrugler, 2002; Titman and Wessels, 1988). As per the traditional trade-off models of

capital structure there exists a positive relation between book leverage and profitability while the negative relation in the data is a particularly strong indictment of the trade-off model (Fama and French, 2002; Myers et al. 1989; Shyam-Sunder and Myers, 1999). More recently, Leary and Roberts (2005) and Strebulaev (2007) have incorporated adjustment costs to highlight that the inverse relation between book leverage and profitability can be consistent with a dynamic trade-off model.

The theoretical literature on international trade and industrial organization emphasizes the fact that imports discipline domestic producers by lowering profit margins. Given the result that increases in competition, domestic or international, leads to significant reductions in profitability (DeRosa and Goldstein 1981; Katics and Petersen, 1994; Pagoulatos, 1976; Pugel, 1980), the effect on capital structure decisions should be comparable. Yet that is not necessarily the case as firms view domestic competition and competition from imports differently when making capital structure choices. I argue that this is a result of the fact that competition affects the underlying collateral value of a firm's assets. Competition proxies for the availability of potential buyers for the asset in the event that a firm must liquidate.

As stated earlier, competition reduces a firm's market power as well as profit margins thereby contributing to the firm's default risk. Competition captures the uncertainty that arises from the competitive environment in which the firm operates. This goes above and beyond the uncertainty that the traditional proxies of default risk capture. A rise in uncertainty raises the demand for crash proof liquidity. Thus, the liquidation value of assets is of utmost importance, especially when contracts are incomplete and transaction costs exist. Under such circumstances, from the lender's perspective, it is imperative for the debt to be secured by the firm's assets and for default to allow creditors recover the firm's liquidation value.

An asset ceases to be liquid when it suffers a capital loss. This creates a wedge between the current value of the asset and the collateral value of the asset. Asset liquidity, and thus its collateral value, is lower for industries in which this wedge is greater. These are the industries which face competition from higher import shares. On the other hand, for firms operating in a competitive domestic environment the wedge between the current value of the asset and the collateral value of the asset is smaller making the asset more liquid. Hence, assets have a higher collateral value as even in the case of a crash, the lender can get the value of the asset back in the secondary market for the asset in liquidation. Due to higher liquidity and thus the relatively easier ability to redeploy the asset, firms in more competitive domestic industries can secure additional debt against their assets compared to firms operating in import intensive industries. Thinking about this another way, in the event

of failure, firms operating in import intensive industries run the risk of the sale of their assets (to pay down debt) fetching large price discounts. This increases the cost of reversing investment thereby reducing the firm's ability to raise additional cash while at the same time making it more difficult for the firm to scale down operations to raise cash. Thus, these firms often remain burdened with unproductive assets. Given this setting, it is material and important to think about asset redeployability in terms of competition in addition to asset specificity.

The most basic question in corporate finance is what drives firms' leverage choices. In this regard there has been considerable discussion on how firm specific, industry specific or general an asset is. Thus, in terms of asset specificity, there exists a spectrum. However, in addition to this dimension there are two additional dimensions that have received less attention in this literature, namely the geographic specificity of an asset and the availability of potential buyers for the asset if the firm must liquidate. In terms of these three dimensions of the underlying collateral value of the asset, ideally, an asset will have good collateral value if it is more general, less geographically specific and if there exists a wide array of potential purchasers for the asset if the firm must liquidate. This is not always the case as sometimes an asset may be more general but also very geographically specific limiting the number of buyers for the asset if it needs to be sold. Therefore, these dimensions of the collateral value of the asset are not merely additive factors but rather that they interact in interesting ways to give more texture to the underlying collateral value of the asset.

I argue that a good proxy to capture this idea of the collateral value of assets is to look at asset redeployability within and across industries together with the competition the firm faces: essentially looking at whether a firm's competitors are mainly domestic or overseas. The main idea here pertains to the fact that when domestic competition is intense the secondary market value of the asset in liquidation is closer to the value for the liquidating firm. In other words, with more domestic competition the next highest value of the asset is easier to realize as there is a more aggressive auction in the secondary market for the asset. This contributes to the asset having a higher underlying collateral value and thus the firm can secure additional debt against it. On the opposite end of the spectrum, where most of the competition comes from imports, there are fewer bidders in the secondary market for the asset in liquidation. Thus, the asset is sold at a higher price discount making it worse collateral for additional debt and increasing the cost of financial distress.

From the market microstructure literature, the collateral value of the asset should be related to the depth of the market. To this end, it is imperative to identify that competition in and of itself is not what drives leverage. Thinking about the collateral value of the asset in

terms of asset redeployability within and across industries and the availability of potential purchasers of the asset in the light of domestic and international competition helps provide insight on the salvage value of the asset. Thus, I ask the following question: Does the geographic distribution of horizontal rivals (competitors) together with how redeployable an asset may be, have differing effects in firms' capital structure choice?

This paper contributes to the growing and inconclusive literature on the relation of increased competition as a result of more open trade on firms' capital structure policies. I document that when both domestic and international competition are factored into the leverage equation, they have opposing effects. For firms with easily redeployable assets, increased domestic competition is positively correlated with firms' leverage decisions. I hypothesize that the geographic distribution of horizontal rivals as potential buyers of the asset in the event of liquidation is important. Firms operating in these industries have a broader array of potential buyers for their asset in the face of distress. On the other hand, increased competition from imports is negatively correlated with leverage. For firms in more import intensive industries, assets are less easily redeployed to competing firms. This causes the wedge between the current value of the asset and the collateral value of the asset to be large making it less desirable as collateral. The opportunity cost of failing when faced with increased competition from imports is high resulting in a negative correlation between leverage and international competition.

The rest of the paper is organized as follows. Section 2 reviews related literature on competition and leverage. Section 3 discusses the data and variable calculations. Section 4 discusses the methods. Section 5 discusses the results and Section 6 concludes.

RELATED LITERATURE

The cost of bank debt is systematically higher for firms that operate in competitive product markets (Valta, 2012). To mitigate endogeneity concerns, Valta measures changes in the intensity of competition using exogenous reductions of industry-level import tariff rates. A reduction in tariffs causes an intensification of firms' competitive environment. This intensification of competition causes the cost of bank debt to increase. Banks factor in the risk associated with product market competition in pricing financial contracts. It is a known fact that firms with greater default risk tend to pay higher rates for their loans.

The competitive pressure that firms face reduces pledgeable income thereby increasing cash flow risk. This makes it more difficult for borrowers to raise funds (Tirole, 2010). Since competition reduces pledgeable income and increases cash flow risk, competition likely increases firms' default risk. Valta (2012) shows that firms in competitive

industries have average loan spreads which are 9.6% higher than comparable loans in less competitive environments.

When providing capital to firms, banks choose interest rates based on the probability of default over the lifetime of the loan as well as the recovery value conditional on default. Product market competition can affect both default risk and liquidation value, and therefore affect the cost of bank debt and capital structure decisions. Given that the cost of debt is significantly higher for firms that operate in competitive markets, these firms choose lower leverage as debt becomes more expensive and firms look for other sources of financing.

Benmelech et al. (2005) show that a higher liquidation value is negatively correlated with interest rates on debt contracts. The number as well as the financial strength of the buyers in the product markets and hence the asset liquidity of the industry is influenced by the competitive nature of the market itself (Ortiz and Phillips, 2012). Given that the liquidation value of assets is of utmost importance, especially when contracts are incomplete and transaction costs exist, from the lender's perspective, it is imperative for the debt to be secured by the firm's assets and for default to allow the lenders to recover the firm's liquidation value. There exists a negative relation between liquidation value and the cost of liquidation and hence a positive relation between liquidation value and debt capacity. Therefore, a higher liquidation value reduces the promised debt yield for a given debt level (Benmelech et al., 2005; Benmelech and Bergman, 2009). In this spirit, firms with more liquid assets have a lower cost of capital compared to firms with more illiquid assets.

I argue that for firms operating in more competitive industries, commonalities in production technologies allow for most assets to be transferable among firms within the industry but make it harder to transfer these assets across industries. Thinking about the competition that firms face in terms of domestic competition and international competition, in the face of a crash, firms in more competitive domestic industries can transfer their assets to other firms in these industries which are then able to redeploy them to alternative uses more efficiently. Due to the relative ease of transferring assets to other firms in the industry, assets have a higher collateral value and hence these firms can secure additional debt against their assets. On the other hand, for firms in import intensive industries, in the face of a crash, the transfer of assets to other firms is harder due to the geographic distance and possible transporting costs. In the face of distress, these firms may be forced to sell off their assets at large discounts or remain burdened with unproductive assets. This reduces the collateral value of assets. Thus, these firms are unable to secure additional debt against their assets leading to lower leverage.

Xu (2012) reports a significantly negative correlation between import penetration (as a measure of competition) and leverage. To examine the relation between expected profitability and leverage, Xu proposes an empirical setting in which expected future profitability changes exogenously. Given the result that increases in import competition leads to significant reductions in domestic profitability (Derosa and Goldstein, 1981; Katics and Petersen, 1994; Pagoulatos and Sorensen, 1976; Pugel, 1980), Xu studies the impact of changes in import competition on changes in domestic firms' financial leverage, thereby providing a direct test of the traditional trade-off theory of capital structure.

Other studies find that debt increases aggressiveness in the product markets leading firms to finance riskier investments using debt (Campello and Fluck, 2006; Lyandres, 2006). Campello argues that while increasing leverage can have a positive strategic effect on product market performance, debt levels change the distribution of returns to shareholders over good and bad states thus influencing the shareholders' preferred strategy. Taking on additional debt incentivizes firms to pursue output strategies that raise returns in good states and lower returns in bad states. Brander and Lweis (1988) use the phrase ``strategic bankruptcy effect'' to describe why incumbent firms are more aggressive in their strategy in dealing with increased competition. Each firm's susceptibility to bankruptcy depends on its capital structure, and its fortune will likely improve if one or more of its rivals can be driven into financial distress. Therefore, firms are more likely to make output market decisions that increase the probability of driving their rivals into insolvency. Brander and Lewis (1986) show that when marginal profits with respect to the strategic variable is higher in better states of the world, there exists a positive relation between a firm's unilateral increase in debt and its own investment while at the same time there will be a negative relation between the firm's unilateral increase in debt and the rival's investment. Hence, as competition tightens, firms are forced to innovate to acquire a significant lead over their rivals.

The trade-off theory of capital structure suggests bankruptcy costs as the main reason that firms in many industries do not assume higher levels of leverage thereby taking advantage of the corporate tax benefits of debt. One cannot ignore the existence of considerable empirical evidence that indicates that the magnitude of direct bankruptcy costs is too low to serve as a direct disincentive preventing firms from taking on higher levels of debt.

The empirical research on capital structure-product market interactions should not be reduced to the task of merely establishing whether debt is positively or negatively correlated with firms' competitive performance as both of these outcomes can obtain in the data (Campello, 2006). Campello analyzes a simple model implying a non-monotonic relation

between firms' use of external debt and competitive behavior in the product market. Moderate debt is positively correlated with sales at the expense of industry rivals while excessive levels of debt lead to significant sales underperformance. Campello's analysis sheds light on the fact that a firm which relies more heavily on debt financing than its industry rivals can take advantage of the inefficiencies in debt contracting to influence product market outcomes. However, the addition of more and more debt does not monotonically lead to sales expansions and market share gains. At extremely high levels of industry-adjusted leverage, there is no additional performance benefit from further debt taking. In fact, the results are quite to the contrary: highly leveraged firms tend to suffer large losses.

In a similar vein, Lyandres (2006) builds a model to examine the relations between competitive behavior in output markets, capital structure decisions, and the level of aggressiveness in operating strategies. Irrespective of whether firms act like strategic substitutes or complements (as defined by Bulow et al., 1985) in product markets, firms with a stronger influence on their rivals' value functions and resulting operating strategies benefit more from taking on additional debt. The Lyandres model shows a positive relation between the competitive interaction among firms in the product markets and their leverage ratios. Lyandres shows that due to the limited liability of debt, leverage causes a firm to choose a more aggressive output strategy. All this ties back to the Brander and Lewis (1986).

Increased competition results in prices moving towards the competitive level. In perfectly competitive markets, increased competition results in an increase in supply which leads to lower prices. Dynamic and stochastic theories of increased competition deal primarily with incumbents' response to the threat of entry rather than with the resulting response to actual entry. Thus, these theories emphasize the strategic interaction between incumbents and potential entrants instead of focusing on the post-entry relationship. Furthermore, even when entry effects on pricing are considered, theoretical models seldom distinguish between the effects of increased domestic competition from that of imports.

Industrial economists did not consider the effects of capital structure on product market behavior until the mid-1980s. On the other hand, financial economists have largely ignored the role of product-market rivalry in assessing the capital structure choice. Brander and Lweis (1986; 1988) outline the “limited liability” and “strategic bankruptcy” effects of debt on product market strategies. Maksimovic (1995) analyzes the limited-liability effect further in an infinite-horizon model of collusion. These papers play a seminal role in the

product-market competition literature as they establish how a firm's capital structure choice serves as a commitment mechanism thereby influencing the aggressiveness of strategic behavior of firms in imperfectly competitive markets. Kovenock and Phillips (1997) show that firms with low productivity plants in less competitive industries are more likely to recapitalize and increase debt financing. Although the literature looks at product-market conditions and financial decisions, there has been little work that addresses how firms react to increased competition and whether there is any distinction between domestic or international competition. In the light of mixed evidence on the relation between competition and capital structure choice, I argue that it is helpful to think of competition in terms of international versus domestic and what each of these indicates about the underlying collateral value of the asset.

METHODS

It is a generally accepted fact that imports and exports will affect some industries more than others. To really be able to look at the impact of international competition as captured by import penetration it is important to look at the industry that may be most affected by trade. This leads me to focus my study on U.S. manufacturing firms (4-digit SIC varying from 2000 - 3999).

Balance sheet data are from COMPUSTAT North America. Industry import and export data are from Peter Schott's international trade database[1]. The import data are for the import value of general imports. General imports measure the total physical arrivals of merchandise from foreign countries, irrespective of whether such merchandise enters consumption channels immediately or is entered into bonded warehouses or Foreign Trade Zones under the U.S. Customs and Border Protection (CBP) custody. This measure of imports includes the customs value and the Cost, Insurance and Freight (CIF) value of imports in millions of U.S. dollars. The customs value of imports is the value of imports as appraised by the U.S. CBP. The customs value of imports is defined as the price actually paid (or payable) for merchandise when sold for exportation to the U.S. This excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the merchandise to the U.S. The CIF value of imports is the landed value of the merchandise at the first port of arrival in the U.S.

[1] Peter Schott's industry trade data can be found at \url{http://faculty.som.yale.edu/peterschott/sub_international.htm

Industry level domestic production data are from the NBER-CES's Manufacturing Industry Database[2]. Calculations of firm level controls are standard with the corporate finance literature. Detailed definitions of variables are outlined in Appendix A.1. The exchange rate and consumer price index data are from the International Financial Statistics of the International Monetary Fund (IMF).

The sample consists of an unbalanced panel of 34,681 firm-year observations pertaining to 4,561 unique firms for the years 1989-2005. At the four-digit SIC classification, 189 manufacturing industries are represented in the sample. Appendix A.6 gives the complete list of industries that are represented in the sample. The literature uses import penetration calculated as the ratio of imports to the sum of imports and domestic production as a proxy for international competition[3]. Calculating import penetration this way over-weighs domestic production. I modify the measure to account for exports by taking the ratio of imports to the sum of imports and domestic production less exports. I use the term international competition for this measure of import penetration. Domestic production is each four-digit SIC industry's value of domestic shipments in nominal dollars deflated by a price deflator. The Herfindahl-Hirschman Index (HHI) is calculated as the sum of squared market shares for each business segment for firms in the COMPUSTAT universe. For the ease of interpretation, I use one minus HHI to proxy for domestic competition. To distinguish between changes in expenditures that are a result of a change in governmental policies (such as tariffs) versus changes in relative prices that induce changes in quantities I control for exchange rate changes in the regression analyses. Changes in exchange rates make an exporting firm more (or less) competitive as foreign sales change. This change in foreign sales does not have much to do with domestic or international competition but rather to do with exchange rates. This is the basic rationale behind controlling for exchange rate changes in the regression analyses. Panel A in Table 1 gives the summary statistics for the variables used in the main analysis for the whole sample. Panel B in Table 1 summarizes the variables used in the supplementary analyses by means of robustness checks. The correlation matrix for the variables used in the main analysis are presented in Appendix A.2.

[2] Industry level domestic production data can be found at http://www.nber.org/nberces/

[3] In the literature import penetration is calculated as follows: $\frac{Imports}{Imports + Domestic\ Production}$

Table 1: **Summary Statistics (Full Sample)**

The above table provides the summary statistics for the variables used in the analyses. The data pertains to 34,681 firm-year observations pertaining to 4,561 firms in 189 U.S. manufacturing industries. Calculations of firm level controls are standard with the literature and are summarized in *Appendix A*.1. For ease of interpretation, Domestic Competition is calculated as one minus HHI. HHI is the Herfindahl-Hirschman Index for each four-digit SIC industry. The asset redeployability measure is from Kim and Kung (2014). For each asset category, redeployability is computed as the ratio of the number of industries in which the asset is used to the number of total industries.

	Mean	Median	Standard Deviation
Panel A: Main Analysis (Variables)			
Domestic Competition	0.943	0.948	0.020
International Competition	0.201	0.201	0.106
Market Leverage	0.212	0.120	0.242
Firm Size	4.149	4.051	2.230
Tangibility	0.240	0.203	0.176
Profitability	-0.012	0.093	0.289
Market-to-Book	2.357	1.537	2.035
Exchange Rate	0.121	0.110	0.083
Asset Redeployability	0.386	0.398	0.064
Panel B: Supplementary Analysis (Variables)			
$\frac{\text{Foreign Sales}}{\text{Total Sales}}$	0.175	0.144	0.148
Market Value of Equity	4.107	1.172	1.186
Change in Debt	-0.033	0.071	0.481
Change in Equity	0.014	0.001	1.032
Change in Assets	0.098	0.041	0.329
Financially Constrained Industry	0.009	0.003	0.022
$\frac{\text{Firm Size}}{\text{Industry Size}}$	0.080	0.038	0.119

The main motive of this paper is to highlight the significant correlations between the underlying collateral value of the asset and firms' leverage choice. To this end I decompose the notion of this underlying collateral value of an asset into asset specificity and the availability of potential buyers for the asset if the firm must liquidate. As mentioned earlier, there has been considerable discussion around asset specificity in the literature. In this paper I focus on the idea of market thickness or more generally, the availability of potential purchasers for the asset in liquidation. To capture the availability of potential buyers of an asset in liquidation I use competition as a proxy for the horizontal distribution of firms' rivals. The idea here is that competition, domestic versus international, captures the availability of potential purchasers of

the assets of a firm if the firm must liquidate. The current literature suggests that increased competition from imports negatively affects firms' capital structure decisions mainly via the profitability channel. I highlight that it is important to think of competition in terms of domestic competition versus competition from imports and that based on the source of competition firms adjust their capital structure differently. Firms operating in industries that face competition mainly from domestic rivals potentially have a better shot at selling off their assets to these rivals if they must liquidate. Since it is relatively easier for these firms to sell off their assets compared to firms that face competition mainly from foreign rivals, the assets of the firms operating in more competitive domestic markets inherently have a higher collateral value.

Asset illiquidity is costlier for firms in more competitive product markets. With more intense competition, firms that fail to quickly adapt to changes in their competitive environment are drawn out of business. To test whether competition factors into the leverage equation via the collateral value of the asset I control for asset redeployability as well as interactions of asset redeployability and competition measures in all the regression specifications in the main analysis. The asset redeployability measure is from Kim and Kung, 2016. Kim and Kung (2016) develop a measure of asset redeployability by accounting for the usability of assets within and across industries. For each asset category they compute the ratio of the number of industries in which the asset is used to the number of total industries[4]. As argued in their paper, this redeployability measure is closely related to the notion of asset specificity.

I hypothesize that the correlations between leverage and the firm's competitive environment is different based on the source of the competition as this affects the underlying collateral value of the firm's assets. I start with estimating baseline OLS regressions, first, controlling for competition captured just by imports i.e., international competition. The regression estimates are presented in specification (1) of Table 2. The regression estimated here is:

$$Leverage_{i,t} = \beta_0 + \beta_1 International\ Competition_{j,t} + \beta_2 Firm\ Size_{i,t} + \beta_3 Tangibility_{i,t} + \beta_4 Profitability_{i,t} + \beta_5 Market - to - Book_{i,t} + \gamma Year\ Dummies + \delta Industry\ Dummies + \eta_{i,j,t}$$

(Equation 4.1)

Here the subscripts *i, j* and *t* represent firm, industry, and time respectively. The regression estimates indicate that the coefficient on international competition is negative and significant at the 1% level. In specification (2) of Table 2 I include domestic competition as an additional control. The regression equation for specification (2) is as follows:

[4] Asset redeployability data at the firm-year level is available on Kim's website at http://blogs.cornell.edu/hyunseobkim/research/

$$Leverage_{i,t} = \alpha_0 + \alpha_1 Domestic\ Competition_{j,t} + \alpha_2 International\ Competition_{j,t} + \alpha_3 Firm\ Size_{i,t} + \alpha_4 Tangibility_{i,t} + \alpha_5 Profitability_{i,t} + \alpha_6 Market - to - Book_{i,t} + \gamma Year\ Dummies + \delta Industry\ Dummies + \eta_{i,j,t}$$ (Equation 4.2)

The regression estimates presented in specification (2) of Table 2 indicate that the coefficient on domestic competition is positive and significant at the 1% level while that on international competition decreases in magnitude as well as significance. A t-test for whether the coefficients on international competition in the two specifications are statistically different from each other yields a significant test statistic of -1.70, significant at the 10% level.

Table 2: **Baseline OLS Regression Estimates**

The table presents baseline OLS regressions controlling for International competition (specification (1)) only and controlling for both international as well as domestic competition. It can be seen in specification (1) that the coefficient on international competition is negative and highly significant. However, on simultaneously controlling for domestic competition (specification (2)) the coefficient on international competition is still negative and significant and that on domestic competition is positive and significant. A t-test for whether the coefficients on international competition in the two specifications are statistically different from each other yields a significant test statistic of -1.70, significant at the 10% level.
Calculations of firm level controls are standard with the literature and are summarized in *Appendix A.1*. For ease of interpretation, Domestic Competition is calculated as one minus HHI. HHI is the Herfindahl-Hirschman Index for each four-digit SIC industry.
$t - statistics$ associated with standard errors clustered by industry and year are reported in parentheses and ***,** and * indicate significance at the 1%, 5% and 10% levels respectively.

Dependent Variable:	Market Leverage (1)	Market Leverage (2)
Domestic Competition		0.292***
		(2.76)
International Competition	-0.435***	-0.202**
	(-3.96)	(-2.47)
Firm Size	0.002***	0.007**
	(2.75)	(2.08)
Tangibility	0.215***	0.293***
	(10.18)	(5.17)
Profitability	-0.076***	-0.091***
	(-5.29)	(-2.95)
Market-to-Book	-0.014***	-0.017***
	(-6.15)	(-4.26)
Year FE	Yes	Yes
Industry FE	Yes	Yes
Standard Errors Clustered by:	Industry and Year	Industry and Year
N	34,681	34,681
R^2	0.2595	0.2597

The regression estimates presented in Table 2 suggest there is a differing correlation between competition and leverage based on whether the competition is mainly from imports or from domestic competitors. I hypothesize this is because firms operating in more competitive domestic industries are able to transfer their assets to other firms in these industries relatively easily. These firms are then able to deploy the assets more efficiently to alternative uses due to commonalities in production technologies. Due to the relative ease of transferring assets to other firms within the industry, assets of firms in more competitive domestic markets have a higher collateral value and hence these firms can secure additional debt against their assets. On the other hand, for firms in import intensive industries, the transfer of assets to other firms within their industries is harder due to the limited availability of potential buyers of the asset as well transportation costs. This reduces the collateral value of the assets. Therefore, these firms are notable to secure additional debt against their assets as easily as the firms operating in more competitive domestic markets and thus have lower leverage. To highlight that competition affects firms' capital structure decisions, potentially through the collateral value of the assets I employ the Kim and Kung (2016) analysis and separate firms-years into deciles from least to most redeployable. I focus on the two extremes. I estimate OLS regressions for the lowest and highest decile of firms based on redeployability where the lowest decile consists of observations with the least redeployable (more firm specific) assets and the highest decile consists of observations with the most redeployable (more general) assets[5].The samples consist of 3,468 firm-year observations each. In the lowest decile, the data pertains to 571 firms in 82 industries. In the highest decile sample, the data pertains to 967 firms in 147 industries. Here, the regression specification is the same as that specified in equation 4.1. I find that for the observations with the least redeployable assets, the relation of the distribution of horizontal rivals seems insignificant in determining leverage. However, for the observations in the highest decile, there is a positive relation between domestic competition and leverage. These regression estimates are summarized in Table 3. Specification (1) pertains to the observations with the least redeployable assets (lowest decile) while specification (2) pertains to the observations with the most redeployable assets (highest decile).

[5] I also re-estimate the regressions for quintiles and quartiles. The results are qualitatively similar to those presented in Table 3.

Table 3: **Decile Regression Estimates for Sample Splits Based on Redeployability**

The table presents OLS regressions for the firms in the lowest (specifications (1)) and highest (specifications (2)) deciles based on asset redeployability. Calculations of firm level controls are standard with the literature and are summarized in *Appendix A.1*. For ease of interpretation, Domestic Competition is calculated as one minus HHI. HHI is the Herfindahl-Hirschman Index for each four-digit SIC industry. The asset redeployability measure is from Kim and Kung (2014). For each asset category, redeployability is computed as the ratio of the number of industries in which the asset is used to the number of total industries. $t-statistics$ associated with standard errors clustered by industry and year are reported in parentheses and ***,** and * indicate significance at the 1%, 5% and 10% levels respectively.

	Lowest Decile (based on redeployability) (1)	Highest Decile (based on redeployability) (2)
Domestic Competition	0.062	0.340**
	(1.64)	(2.57)
International Competition	-0.108*	-0.301***
	(-1.74)	(-4.23)
Firm Size	0.004*	-0.008
	(1.90)	(-1.16)
Tangibility	0.233***	0.296***
	(6.75)	(5.25)
Profitability	-0.061***	-0.090***
	(-2.92)	(-2.92)
Market-to-Book	-0.012***	-0.017***
	(-5.22)	(-4.27)
Exchange Rate	-0.441	0.209
	(-0.83)	(0.22)
Year FE	Yes	Yes
Industry FE	Yes	Yes
Standard Errors Clustered by:	Industry and Year	Industry and Year
N	3,468	3,468
R^2	0.2907	0.3803

It can be seen from the regression estimates presented in specification (1) of Table 3 that for the observations with the least redeployable assets (lowest decile), domestic competition is not significantly correlated with leverage. In the lowest decile assets are not easily redeployable (more firm-specific) and hence do not serve as good collateral as investors typically look for crash-proof liquidity so that they may be able to recover the value of the loan in the event that the firm must liquidate. However, the coefficient on international competition is marginally significantly negatively correlated with leverage. This indicates that although assets

are not easily redeployable, competition makes debt more expensive and thus lowers firms' leverage choice (Valta, 2012). The regression estimates for the sample with the most redeployable assets (highest decile) are presented in specification (2) Table 3. The regression estimates suggest a significant positive correlation between domestic competition and leverage and a significant negative correlation between international competition and leverage. A t-test for whether the coefficient on domestic competition in the lowest decile is different from that in the highest decile yields a t- statistic of -2.02, significant at the 5% level. A similar test for the difference in the coefficients on international competition in the two deciles yields a test statistic of 2.04, also significant at the 5% level of significance. The economics underlying these correlations imply that for firms with the least redeployable assets, the asset in question is more firm-specific so even if there exists a broad array of potential purchasers of the asset (as captured by domestic competition), given that the asset is not as easily redeployable (more firm specific) to begin with, its underlying collateral value is not high. On the other extreme, for firms with the most redeployable assets, the asset is less firm specific and thus more general, being in an industry with more domestic competitors makes available a broader array of potential purchasers to buy the asset. This results in the asset having a higher underlying collateral value. The negative correlation between international competition (as a proxy for the geographic distribution of horizontal rivals) and leverage suggests that for firms with the most redeployable assets, the fact that potential buyers of the asset are mainly overseas limits the availability of buyers for the asset thereby limiting its underlying collateral value which makes debt riskier (and thus expensive) for the lender. This in turn restricts these firms from securing additional debt against these assets as collateral. This ties back to the fundamental idea in corporate finance pertaining to the value of the asset as collateral for loans and the notion of how asset specificity, geographic specificity, and distribution of horizontal rivals as potential purchasers of the asset interact to give us a deeper understanding of how good an asset is as collateral. In this paper I capture asset specificity and the distribution for horizontal rivals by controlling for asset redeployability and competition – domestic and international – respectively.

From the Black and Scholes (1973) options pricing application to value the debt and equity of a leveraged firm we know that while stock holders care about the right hand side of the distribution of firms' outcomes, debt holders are concerned mainly with the left hand side of this distribution. From the lender's perspective it is important to focus on what it means for them if the firm ends up on this left tail. For the lender, an asset with a higher resale value will serve as better collateral. Thus, it is imperative to get our hands around how good an asset may be as collateral and this idea of asset specificity, geographic specificity and the availability of buyers for the asset and subsequently, how these dimensions interact to influence firms' leverage

choices. I highlight the fact that the correlations between competition [as a proxy for the horizontal distribution of rivals as potential buyers for the firm's assets in liquidation] and firms' leverage choices are different based on the source of the competition that the firm faces. To this end I estimate a panel regression for the full sample. The regression estimates are summarized in Table 4.

Table 4: Competition and Capital Structure Choice (Panel Regression Estimates)

The table presents the time-series regression estimates for the full sample. Calculations of firm level controls are standard with the literature and are summarized in *Appendix A.1*. For ease of interpretation, Domestic Competition is calculated as one minus HHI. HHI is the Herfindahl-Hirschman Index for each four-digit SIC industry. The asset redeployability measure is from Kim and Kung (2014). For each asset category, redeployability is computed as the ratio of the number of industries in which the asset is used to the number of total industries. $t-statistics$ associated with standard errors clustered by industry (specification (2) and (4)) and by year (specification (1) and (3)) are reported in parentheses and ***,** and * indicate significance at the 1%, 5% and 10% levels respectively.

Dependent Variable:	Market Leverage (1)	Market Leverage (2)	Market Leverage (3)	Market Leverage (4)
Domestic Competition	0.082*** (4.08)	0.082*** (5.40)	-0.613*** (-6.33)	-0.328* (-1.72)
International Competition	-0.065** (-2.52)	-0.055* (-1.75)	-1.016*** (-10.94)	-0.498* (-1.83)
Firm Size	0.005*** (4.38)	0.002 (0.91)	0.005*** (4.60)	0.002 (0.94)
Tangibility	0.321*** (17.36)	0.218*** (10.74)	0.308*** (17.19)	0.217*** (10.74)
Profitability	-0.067*** (-8.75)	-0.082*** (-5.93)	-0.067*** (-8.89)	-0.082*** (-5.91)
Market-to-Book	-0.016*** (-9.10)	-0.014*** (-7.10)	-0.016*** (-9.06)	-0.014*** (-7.11)
Exchange Rate	0.106*** (6.66)	0.068 (0.74)	0.051*** (3.97)	0.066 (0.72)
Asset Redeployability	0.019** (2.04)	0.064* (1.95)	0.549*** (8.55)	0.179** (2.14)
Domestic Competition × Asset Redeployability			1.873*** (6.87)	1.042** (2.19)
International Competition × Asset Redeployability			-2.388*** (-12.10)	-1.179* (-1.78)
Year FE	Yes	No	Yes	No
Industry FE	No	Yes	No	Yes
Standard Errors Clustered by:	Year	Industry	Year	Industry
N	34,681	34,681	34,681	34,681
R^2	0.1455	0.2421	0.1458	0.2427

Here, I regress market leverage on firm and industry controls. The regression estimated here is:

$$\begin{aligned} Leverage_{i,t} = {} & \alpha_0 + \alpha_1 Domestic\ Competition_{j,t} + \alpha_2 International\ Competition_{j,t} \\ & + \alpha_3 Firm\ Size_{i,t} + \alpha_4 Tangibility_{i,t} + \alpha_5 Profitability_{i,t} \\ & + \alpha_6 Market - to - Book_{i,t} + \alpha_7 Exchange\ Rate_{j,t} + \alpha_8 Asset\ Redployability_{i,j,t} \\ & + \alpha_9 Domestic\ Competition_{j,t} \times Asset\ Redeployability_{i,j,t} \\ & + \alpha_{10} International\ Competition_{j,t} \times Asset\ Redeployability_{i,j,t} \\ & + \gamma Year\ Dummies + \delta Industry\ Dummies + \eta_{i,j,t} \end{aligned}$$

(Equation 4.3)

In specifications (1) and (2) I exclude the interactions for redeployability and the competition measures. In specification (1) I include year fixed effects to control for common time trends in the competition measures. In specification (2) I include industry fixed effects to control for cross-industry differences in leverage and both measures of competition, respectively. The regression estimates suggest a significant positive correlation between domestic competition and leverage. This indicates that as industries become more competitive, market leverage increases. On the other hand, the significant negative correlation between international competition and market leverage suggests that as firms face increased competition from imports, leverage decreases. In addition to this, it is important to point out the significant positive coefficient on asset redeployability. Easily redeployable assets serve as crash proof liquidity against which firms can secure additional debt.

The positive correlation between market leverage and domestic competition and the negative correlation between market leverage and international competition together with the significant positive coefficient on asset redeployability suggests that for firms in competitive domestic industries, leverage is possibly higher compared to firms in more import intensive industries. Hence, although increased competition makes it more difficult to secure debt, firms in more competitive domestic industries are able to take on additional debt as their assets are more easily redeployable compared to firms in more import intensive industries there by increasing the underlying collateral value of the asset. With more domestic competitors there exists a wider array of potential purchasers of the asset. The opportunity cost of taking on additional debt is higher for firms in more import intensive industries compared to firms in more competitive domestic industries. Another way to think about this is as follows: given that firms have easily redeployable assets, firms in more competitive domestic industries are able to transfer their assets to other firms in these

industries which are then able to efficiently deploy them to alternative uses. Due to the relative ease of transferring assets to other firms within the industry, assets have a higher collateral value and hence these firms are able to secure additional debt against their assets.

It is worth mentioning here that including the interactions of asset redeployability and the competition measures causes the sign on the coefficient of the domestic competition variable to flip while the coefficient on the interaction of domestic competition and asset redeployability is positive and significant. This evidence suggests that although competition may cause firms to lower their leverage (negative coefficients on domestic and international competition) by making debt more expensive, firms operating in competitive domestic industries with highly redeployable assets will have higher leverage (positive correlation between leverage and the interaction of domestic competition and asset redeployability) compared to firms operating in import intensive industries with redeployable assets (negative correlation between leverage and the interaction of international competition and asset redeployability). This is evidence in favor of firms operating in industries with higher levels of domestic competition having higher leverage mainly because these firms have assets that are easily redeployable to other firms within their industry and the existence of a larger number of horizontal rivals who serve as potential purchasers of the asset in liquidation. These firms are then able to more efficiently put the asset to alternate uses due to commonalities in production technologies. The coefficients on international competition as well as the interaction of international competition and asset redeployability are negative and significant. Thus, for firms in import intensive industries, the transfer of assets to other firms is harder with fewer number of firms available and willing to buy the assets in liquidation. This reduces the underlying collateral value of asset in liquidation making it harder for these firms to secure additional debt against their assets. The evidence agrees with the literature to the extent that competition in general causes debt to become riskier and thus costlier for firms. Competition reduces pledgeable income and increases cash flow risk thereby increasing firms' default risk (Valta, 2012). Banks price financial contracts by accounting for the risk associated with product market competition. Accounting for domestic and international competition as proxies for the geographic distribution and availability of potential buyers for the asset in liquidation as well as asset redeployability, firms in more competitive domestic markets are able to secure additional debt against their redeployable assets, thereby increasing leverage.

For further clarity on the fact that competition factors into the leverage equation through the collateral value of the asset I include interactions between asset redeployability and the competition measures. When I exclude the interaction terms (specifications (1) - (2) in Table 4) the coefficients on domestic and international competition are statistically significant and directionally in sync with what theory suggests: the coefficient on domestic competition is positive and significant while that on international competition is negative and significant. However, on including the interaction terms the coefficients on the main variables as well as their interactions are statistically significant but there is an added layer of texture here in terms of what the interaction terms reveal about how these various dimensions of the collateral value of the asset interact to impact firms' leverage choices. These regression estimates are summarized in specifications (3) and (4)) of Table 4. Again, in specification (3) I include year fixed effects to control for common time trends in the competition measures. In specification (4) I include industry fixed effects to control for cross-industry differences in leverage and both measures of competition, respectively.

A potential concern here is that permanently reinvested foreign earnings may drive higher leverage for firms that are operating more heavily in foreign markets. An ideal control for this would be to account for a firms' permanently reinvested foreign earnings which is stated in the firm's tax returns. However, this data is not publicly available. Thus, my next best alternative is to include the ratio of a firm's foreign sales to total sales as well as interactions of this variables with the competition measures as additional controls to address this concern. The foreign sales data is available in COMPUSTAT North America's Historical Segments Database. 22,491 firm-years of the total of 34,681 firm-years used in the panel regression presented in Table 4 have non-missing data on foreign as well as total sales. The regression estimated here is:

$$
\begin{aligned}
Leverage_{i,t} = {} & \alpha_0 + \alpha_1 Domestic\ Competition_{j,t} + \alpha_2 International\ Competition_{j,t} \\
& + \alpha_3 Firm\ Size_{i,t} + \alpha_4 Tangibility_{i,t} + \alpha_5 Profitability_{i,t} \\
& + \alpha_6 Market - to - Book_{i,t} + \alpha_7 Exchange\ Rate_{j,t} + \alpha_8 Asset\ Redployability_{i,j,t} \\
& + \alpha_9 \frac{Foreign\ Sales}{Total\ Sales}_{i,j,t} + \alpha_{10} Domestic\ Competition_{j,t} \times \frac{Foreign\ Sales}{Total\ Sales}_{i,j,t} \\
& + \alpha_{11} International\ Competition_{j,t} \times \frac{Foreign\ Sales}{Total\ Sales}_{i,j,t} + \gamma Year\ Dummies \\
& + \delta Industry\ Dummies + \eta_{i,j,t}
\end{aligned}
$$

(Equation 4.4)

The regression estimates are presented in Table 5. The regression estimates presented in Table 5 highlight that the competition measures [as a proxy for the geographic distribution of horizontal rivals] are the driving variables here. The coefficients on asset redeployability as well as the competition measures are significant in all specifications of the regressions suggesting that with an increase in domestic competition firms increase their leverage while with an increase in competition from imports firms decrease their leverage. The coefficient on the ratio of foreign sales to total sales is not significantly different from zero in all specifications presented in Table 5. Interestingly, on including the interaction of this ratio with the competition measures (specifications (3) and (4)) the coefficients on the interaction terms are significant at the 5% level of significance.

In this analysis the coefficients on the competition measures are significant, that on the ratio of foreign sales to total sales is insignificant and those on the interactions of these variables are significant. This suggests that the competition measures influence firms' leverage choice even when firms have no foreign sales. On the flip side, the fact that the coefficient on the ratio of foreign sales to total sales is insignificant suggests that foreign sales as a proxy for permanently reinvested earnings does not affect firms' leverage choice when competition is zero. The significant interaction term is suggestive of the fact that there are, however, certain values of competition for which foreign sales will affect firms' leverage choice. These results are indicative of the fact that changes in leverage are driven by changes in competition rather than the permanently reinvested earnings of firms operating more heavily in foreign markets.

Table 5: **Do permanently reinvested foreign earnings drive higher leverage for firms operating more heavily in foreign markets? (Panel Regression Estimates)**

A potential concern is that permanently reinvested foreign earnings may drive higher leverage for firms that are operating more heavily in foreign markets. To address this concern I include the ratio of a firm's foreign sales to total sales as well as interactions of this variable with the competition measures. The table presents the panel regression estimates for market leverage on firm and industry controls including the ratio of foreign sales to total sales as a control for permanently reinvested earnings as well as interactions of this variable and the competition measures. Calculations of firm level controls are standard with the literature and are summarized in *Appendix A.1.*

$t-statistics$ associated with standard errors clustered by year (specification (1) and (3)) and by industry (specification (2) and (4)) are reported in parentheses. ***,** and * indicate significance at the 1%, 5% and 10% levels respectively.

Dependent Variable:	Market Leverage (1)	Market Leverage (2)	Market Leverage (3)	Market Leverage (4)
Domestic Competition	0.087***	0.085**	0.078***	0.087**
	(4.85)	(2.23)	(3.87)	(2.27)
International Competition	-0.207***	-0.239**	-0.246***	-0.267*
	(-6.28)	(-2.41)	(-7.64)	(-1.86)
Firm Size	0.011***	0.006***	0.010***	0.007*
	(7.37)	(2.86)	(7.12)	(1.84)
Tangibility	0.292***	0.222***	0.286***	0.221***
	(12.68)	(6.73)	(12.06)	(6.68)
Profitability	-0.141***	-0.151***	-0.143***	-0.152***
	(-10.66)	(-6.34)	(-10.83)	(-6.38)
Market-to-Book	-0.030***	-0.025***	-0.029***	-0.025***
	(-6.97)	(-5.74)	(-6.98)	(-5.75)
Exchange Rate	0.048	0.074	0.040	0.079
	(1.48)	(0.57)	(1.22)	(0.62)
Asset Redeployability	0.110***	0.079*	0.102***	0.074*
	(3.08)	(1.73)	(3.04)	(1.78)
$\frac{\text{Foreign Sales}}{\text{Total Sales}}$	-0.002	-0.001	0.632	0.503
	(-1.48)	(-1.10)	(1.04)	(1.65)
Domestic Competition × $\frac{\text{Foreign Sales}}{\text{Total Sales}}$			-0.762**	-0.476**
			(-2.16)	(-2.49)
International Competition × $\frac{\text{Foreign Sales}}{\text{Total Sales}}$			-0.259***	-0.148**
			(-3.80)	(-2.40)
Year FE	Yes	No	Yes	No
Industry FE	No	Yes	No	Yes
Standard Errors Clustered by:	Year	Industry	Year	Industry
N	22,491	22,491	22,491	22,491
R^2	0.1973	0.2866	0.2005	0.2876

The regression estimates where I include industry fixed effects are more conservative in magnitude and significance as compared to those where I include year fixed effects. This is not surprising as the industry fixed effects soak up most of the variation in the competition as well as asset redeployability measure as these are at the industry-year level (except for multi-segment firms and year-to-year variation). For the same reason, I do not report the regression estimates from including both year and industry fixed effects in the regression specifications. However, the estimates from including both industry and year fixed effects are directionally similar to those reported in Table 4 and Table 5 but are smaller in magnitude as well as significance. This can be explained by the fact that the industry fixed effects soak up much of the variation in the redeployability and competition measures. In an attempt to isolate the time-series versus multi-segment variation that remains in the redeployability measure I include only year fixed effects going forward[6]. As a robustness check I re-estimate this baseline regression whereby I exclude the multi-segment firms from my sample. The regression estimates are larger in magnitude and significance, reaffirming my prior that competitors in the industry serve as potential purchasers for an asset in liquidation, given that the asset is an easily redeployable one to start with[7].

Using standard metrics, the coefficients on the main as well as interaction variables are statistically significant. The next concern pertains to the economic significance of these variables. The variables of interest in the regression estimates presented in Table 4 are the interaction variables. The regression estimates presented in Table 4 suggest a one standard deviation increase in the interaction of domestic competition and asset redeployability results in approximately a six-percentage point increase in leverage whereas a one standard deviation increase in the interaction of international competition and asset redeployability results in approximately a four percentage point decrease in leverage. The more interesting of the two interactions is the interaction of domestic competition and redeployability. The addition of this variable causes the coefficient on the main variable for domestic competition to flip signs[8].

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[6] The regression estimates are directionally similar but more conservative in magnitude and significance if I include firm and year fixed effects and cluster the standard errors by firm-year.

[7] The regression estimates are presented in Appendix A.3

[8] One concern may be that there exists cross-sectional correlations in the error term of the regressions presented in Table 4. To address this concern, I estimate Fama-Macbeth regressions for market leverage on control variables as a robustness. The regression estimates are presented in Appendix A.4.
I thank Professor Cliff Smith for pointing this out.
For details on this procedure please refer to Fama and MacBeth (1973).

Plosser and Schwert (1978) conduct a detailed analysis on whether economic time-series models should be estimated between levels or the changes of the variables of interest. Estimating these regressions in levels often suffers from an omitted variables problem. Hence, where the most natural first pass looked at levels, I now ensure that the results go one level deeper.

To do this I regress changes in leverage on changes in explanatory variables. I estimate probit regressions with net debt issuance and net equity issuance as dependent variables. I follow Hovakimian and Titler (2001) and Leary and Roberts (2005) and define the debt issuance dummy to take on a value of 1 if the net of long-term debt issuance and long-term debt reduction is in excess of 5% of lagged assets. I take the net of long-term debt issuance and long-term debt reduction to capture the new debt that is issued by the firm. The equity issuance dummy takes on a value of 1 if the net of the sale of common and preferred stock and the purchase of common and preferred stock is in excess of 10% of assets. Again, I take the net of the sale and purchase of common and preferred stock to capture the new stock that has been issued. While using this criterion to identify debt and equity issuances may lead to some misclassification, Hovakimian and Titler (2001) show that analyses carried out using new debt and equity issuance data from the SDC database produces results similar to those obtained under the current identification scheme. Korajczyk and Levy (2003) also confirm the accuracy of this classification scheme. The explanatory variables include annual changes in firm size, market-to-book, tangibility, profitability, domestic competition, international competition, exchange rate, the market value of equity and redeployability. All these controls are as previously defined. In addition to the first-differenced controls, I include year fixed effects. These estimates for the probit regressions for the active adjustment of capital structure are presented in specifications (1) and (2) of Table 6.[9]

[9] The regression equation for the results presented in $Table\:6$ is as follows:

$$\begin{aligned} Dependent\ Variable\ _{i,t} &= \alpha_0 + \alpha_1(\Delta Domestic\ Competition_{j,t}) + \alpha_2(\Delta International\ Competition_{j,t}) \\ &+ \alpha_3(\Delta Firm\ Size_{i,t}) + \alpha_4(\Delta Tangibility_{i,t}) + \alpha_5(\Delta Profitability\ _{i,t}) \\ &+ \alpha_6(\Delta Market - to - Book_{i,t}) + \alpha_7(\Delta Exchange\ Rate_{j,t}) \\ &+ \alpha_8(\Delta Market\ Value\ of\ Equity_{i,t}) + \alpha_9(\Delta Asset\ Redployability_{i,j,t}) \end{aligned}$$

(Equation 4.5)

Where the *Dependent Variable* in specification (1) is the probability of debt issuance and that in specification (2) is the probability of stock issuance.

Table 6: **Capital Structure Adjustment Regressions - Debt Issuance, Stock Issuance and Change in Assets**

The table presents the probit marginal effects for the regression of debt issuance (specification (1)) and stock issuance (specification (2)) and OLS estimates for the change in firms' assets (specification (3)) on firm and industry controls.

I follow Hovakimian, Opler and Titman (2001) and Leary and Roberts (2005) and define the debt issuance dummy to on a value of 1 if the net of long term debt issuance and long term debt reduction is in excess of 5% of assets. I take the net of long-term debt issuance and long-term debt reduction to capture the new debt that is issued by the firm. The equity issuance dummy takes on a value of 1 if the net of the sale of common and preferred stock and the purchase of common and preferred stock is in excess of 10% of assets. Again, I take the net of the sale and purchase of common and preferred stock to capture the new stock that has been issued. I follow the literature (Xu, 2012) and calculate the change in assets as the annual change in total assets scaled by lagged total assets. All control variables are the annual changes of the corresponding variable.

All regressions include year fixed effects to control for common time trends. Calculations of firm level controls are standard with the literature and are summarized in *Appendix A.1*. For ease of interpretation, Domestic Competition is calculated as one minus HHI. HHI is the Herfindahl-Hirschman Index for each four-digit SIC industry. The asset redeployability measure is from Kim and Kung (2014). For each asset category, redeployability is computed as the ratio of the number of industries in which the asset is used to the number of total industries.

$t-statistics$ associated with robust standard errors clustered by year are reported in parentheses and ***,** and * indicate significance at the 1%, 5% and 10% levels respectively.

Dependent Variable:	Debt Issuance (Probit Marginal Effects) (1)	Stock Issuance (Probit Marginal Effects) (2)	Change in Assets (OLS) (3)
ΔDomestic Competition	0.114**	-0.204**	0.268**
	(2.20)	(-2.38)	(2.01)
ΔInternational Competition	-0.095**	0.591***	-0.065**
	(-1.97)	(3.98)	(-2.34)
ΔFirm Size	0.018***	-0.011***	0.009***
	(9.38)	(-5.48)	(5.12)
ΔTangibility	0.216***	-0.157***	-0.284***
	(10.54)	(-6.40)	(-12.67)
ΔProfitability	-0.157***	-0.220***	0.402***
	(-10.80)	(-19.11)	(20.62)
ΔMarket-to-Book	0.056***	-0.023***	-0.011**
	(10.06)	(-4.92)	(-2.41)
ΔExchange Rate	0.296**	-0.088	0.018
	(2.31)	(-0.50)	(0.10)
ΔMarket Value of Equity	-0.063***	0.067***	0.063***
	(-10.76)	(16.00)	(10.14)
ΔAsset Redeployability	0.052*	0.069	0.128**
	(1.83)	(0.96)	(2.22)
N	29,385	29,385	27,174
R^2	0.0659	0.2399	0.1747

It can be seen from the probit regression estimates that the probability of debt issuance is significantly higher while that of stock issuance is significantly lower when domestic competition increases. The regression estimates presented in specification (1) of Table 6 are indicative of the existence of a positive correlation between domestic competition and leverage and a negative correlation between international competition and leverage. Asset redeployability is significantly positively correlated with leverage at the 10% level. This suggests that as domestic competition intensifies firms can secure additional debt as they have assets that can be redeployed to other firms within the industry and thus serve as relatively good collateral compared to assets of firms in import intensive industries. As international competition intensifies, the probability of debt issuance is significantly lower and that of stock issuance significantly higher. This is suggestive of the fact that with more competition from imports, firms become over leveraged. This leads them to issue equity and pay down debt to reduce operational expenses. The significant positive correlation between international competition and equity issuance agrees with what has been established in the literature. Valta and Frésard (2012) document that as competition intensifies, there is a reduction in net debt issuance together with an increase in net equity issuance. As documented in the reduced form regressions, there is a significant negative correlation between international competition and leverage. Taking the capital structure adjustment regressions together helps explain this negative correlation. For leverage changes to occur, a firm should either issue new equity (positive correlation between international competition and equity issuance) or, alternatively, pay down debt (negative correlation between international competition and debt issuance). The fact that the evidence shows up on levels and in changes provides confidence that it is important and material to pay attention to the various dimensions of the collateral value of the asset and how these dimensions interact to affect firms' leverage choices.

Another potential explanation for the differing association of domestic and international competition with equity issuance could be along the lines of signaling theory. In the face of increased competition firms struggle to maintain their market shares and profits. Assume Firm *F* that raises funds by selling stock. When the profits from the business come in, the price of Firm *F*'s stock will rise sharply. The purchasers of the new stock will benefit significantly. The current stockholders will also benefit but not as much as they would have if the firm didn't sell stock before the price went up. Therefore, a firm with positive prospects will avoid selling stock and raise any required capital by other means, even if this means using debt beyond the target capital structure. In this sense firms use their capital structure to gain market shares at the expense of their competitors. Thus, in the face of increased domestic competition firms are likely to take on additional debt and less equity to signal that

they are tough competitors. In the face of increased competition from imports, firms anticipate possibly poor performance in terms of losing market shares to cheaper rivals and thus issue more equity, presumably to share the losses.

As a robustness check I also estimate additional probit regressions with debt retirement and stock repurchase as dependent variables. I identify debt retirement and stock repurchase decisions using the issuance and retirement data drawn from the statement of cash flows.[10] Again, I follow Hovakimian et al. (2001) and Leary and Roberts (2005) to identify instances of debt retirement and stock repurchases. In the debt retirement regressions, the coefficients on domestic and international competition are not significantly different from zero. In the stock repurchase regressions, the coefficient on domestic competition is insignificant while that on international competition is negative and significant at the 10% level indicating that firms are less likely to repurchase stock. These results are consistent with the idea that in response to increased domestic competition firms issue more debt and less equity while in response to increased international competition, firms actively issue equity and pay down debt. The estimates for these regressions are presented in Appendix A.5.

A firm that foresees distress thereby failing on its interest payments is faced with a couple of options. One, the firm can choose to reschedule its debt either voluntarily or in accordance with Chapter 11; two, the firm can choose to raise cash either by issuing new securities; and finally, the firm also has the option to raise cash by selling its assets. One cannot ignore the fact that there are costs associated with each of these options. In a detailed explanation Schleifer and Vishny (1992) outline the fact that debt rescheduling involves the difficult and costly task of coordination between multiple creditors. As far as the issuance of new securities, the costs associated with the issuance increases as the buyers of new securities are skeptical regarding the assets in place as well as the quality of management. Schleifer and Vishny (1992) conduct a detailed analysis on liquidation values and debt capacity where they carefully evaluate the costs and benefits associated with each of the options that the firm is confronted with.

In the debt and equity issuance analyses presented in Table 6 I shed some light on the significant correlations between the competition measures and the probability of debt and equity issuance. While this analysis is important it is also important to look at how competition impacts the change in firms' assets. Thus, focusing on the final option that the firm is faced with, namely, raising cash by selling its assets. It has been argued that asset

[10] All results hold if I define the dummy variables using balance sheet data.

sales can better deal with some of the problems [outlined above] that plague debt rescheduling and the issuance of new securities. Often, this makes the sale of assets to raise cash a preferred choice for firms. The most discussed benefit of asset sales [to raise cash] is that typically, the proceeds from the sale of assets go towards debt repayment. Asset sales alleviates the firm from the asset substitution problem. Creditors get cash immediately following the sale of assets instead of having to wait, thus fully exposing themselves to the riskiness of the firm. The proceeds from asset sales substitute for fresh credit while at the same time reducing creditors' exposure as creditors do not have to concern themselves as much about the quality of the management or its initiatives. This reduces the severity of the asymmetric information problem surrounding debt rescheduling and issuance of new securities. With the sale of assets, the buyer gains the control of the assets. Hence, these buyers do not have to worry as much regarding the agency problems associated with the management of the assets. Most importantly, with the sale of valuable assets that do not generate current cash flows, the firm can relieve its debt burden without sacrificing its current income and ability to service other debt in the future. Given that I capture the availability of potential purchasers of a firm's assets in liquidation the analysis of competition and capital structure is incomplete if I do not look at how competition impacts a firm's assets.

The firm's competitors in the industry who serve as potential buyers of the asset in liquidation may themselves be credit constrained. In such circumstances assets with the highest fundamental values but lowest current cash flows will sell at the largest discounts. Even with its competitors being credit constrained, it is safe to assume that the credit constraints will be the highest for the liquidating firm. Therefore, it is still an attractive option for this firm to sell its assets. Doing so allows the liquidating firm to avoid default not just immediately but in the near future as well.

Given the above line of reasoning it is important to consider change in firms' assets as well as financial slack of industry players in the capital structure adjustment analyses. In specification (3) of Table 6 I estimate an OLS regression of change in firms' assets on firm and industry controls.[11] All variables are as previously defined. I follow the literature and calculate the change in assets as the annual change in total assets scaled by lagged total assets. It can be seen from the regression estimates that the coefficient on domestic competition is positive and significant while that on international competition is negative and significant. The negative coefficient on international competition corroborates what is

[11] The regression equation for the results presented in specification (3) of Table 6 is the same as equation (4.5) in footnote 9, except the dependent variable here is the firm's change in assets from year *t* to *t+1*.

outlined in the literature: Xu (2012) finds that in the face of increased competition from imports distressed firms sell assets to pay down debt and thus lower their operating costs. The positive coefficient on the domestic competition variable suggests that firms operating in more competitive domestic markets experience a positive change in assets with increased competition from rivals.

The analysis of the correlations between competition, both domestic and international, on a firm's probability of debt issuance, equity issuance and change in assets suggest that firms in more competitive domestic markets experience a higher probability of debt issuance and a positive change in assets but a lower probability of stock issuance. The analysis also sheds light on the fact that firms that face competition from imports experience a lower probability of debt issuance, a negative change in assets but a higher probability of stock issuance. This supports my hypothesis that with more domestic competition, firms have access to a broader array of potential purchasers for their assets if they must liquidate. All this, given that the firm has assets that can be relatively easily redeployable to their rivals who can then efficiently put these assets to alternative uses due to production commonalities. Firms that face competition mainly from imports do not enjoy this liberty. In this light it is helpful to think of the international competition measure more as an additional barrier that firms face in redeploying their assets.

While it may be true that distressed firms will sell off assets to pay down debt and thus lower their operating costs, there must exist firms that buy the assets that distressed firms look to sell. In this vein I study the effect of competition as well as the financial slack of industry players on the firm's leverage decision. In the analyses presented in Table 7. I estimate OLS regressions for market leverage on firm and industry controls. In addition to the firm and industry controls previously mentioned I include a financially constrained industry variable. This is the ratio of the industry-year K-Z measure to the K-Z measure across industries each year. The K-Z index is calculated in accordance with Kaplan and Zingales (1997). For the analysis I divide this variable by the standard deviation simply for scaling purposes. The sample consists of 21,148 firm-year observations with non-missing values for all the variables employed in calculating the K-Z index.[12]

[12] The regression equation for the results presented in Table 7 is as follows:

$$Leverage_{\ i,t} = \alpha_0 + \alpha_1 Domestic\ Competition_{j,t} + \alpha_2 International\ Competition_{j,t} + \alpha_3 Firm\ Size_{i,t} + \alpha_4 Tangibility_{i,t} + \alpha_5 Profitability_{\ i,t} + \alpha_6 Market - to - Book_{i,t} + \alpha_7 Exchange\ Rate_{j,t} + \alpha_8 Asset\ Redeployability_{i,j,t} + \alpha_9 Financially\ Constrained_{j,t} + \alpha_{10} Financially\ Constrained_{j,t} \times Domestic\ Competition_{j,t} + \alpha_{10} Financially\ Constrained_{j,t} \times International\ Competition_{j,t} + \gamma Year\ Dummies + \eta_{i,j,t}$$

(Equation 4.6)

Table 7: **Financially Constrained Industries and Market Leverage: OLS Regression Estimates**

For distressed firms to sell their assets, there must exist firms that buy the assets that these firms look to sell. The analyses so far suggest that for competition to affect leverage, industry players must have some flexibility. If the industry as a whole is financially constrained, then the sale of redeployable assets shuts down. In this vein I study the effect of competition as well as the financial slack of industry players on the firm's leverage decision. I estimate OLS regressions of market leverage on firm and industry controls. In addition to the firm and industry controls previously mentioned I include a variable to identify financially constrained industries. To construct this variable, I take the ratio of each industry-year K-Z index to the K-Z index across industries for a given year. For the analysis I divide this variable by the standard deviation simply for scaling purposes. I calculate the K-Z index as outlined in Kaplan and Zingales (1997). In addition to The financially constrained (industry) variable, I include an interaction of this variable and the competition measures.

Calculations of firm level controls are standard with the literature and are summarized in $Appendix\ A.1$. For ease of interpretation, Domestic Competition is calculated as one minus HHI. HHI is the Herfindahl-Hirschman Index for each four-digit SIC industry. The asset redeployability measure is from Kim and Kung (2014). For each asset category, redeployability is computed as the ratio of the number of industries in which the asset is used to the number of total industries.

$t-statistics$ associated with robust standard errors clustered by year are reported in parentheses and ***,** and * indicate significance at the 1%, 5% and 10% levels respectively.

Dependent Variable:	Market Leverage
Domestic Competition	0.089***
	(3.04)
International Competition	-0.144**
	(-2.18)
Firm Size	0.005**
	(2.14)
Tangibility	0.195***
	(7.40)
Profitability	-0.144***
	(-9.75)
Market-to-Book	-0.027***
	(-12.08)
Exchange Rate	0.011
	(0.10)
Asset Redeployability	0.066**
	(2.22)
Financially Constrained (Industry)	0.335*
	(1.77)
Financially Constrained (Industry) × Domestic Competition	-0.763**
	(-2.09)
Financially Constrained (Industry) × International Competition	-0.056*
	(-1.72)
Year FE	Yes
Standard Errors Clustered by:	Year
N	21,148
R^2	0.1600

The coefficients on the explanatory variables are qualitatively similar to those in previous analyses. The variables I want to focus on in this analysis are the additional controls namely, the financially constrained (industry) variable and the interaction of this variable with the domestic competition measure. The analysis thus far leads into the question of who is available to buy the assets of a distressed firm and thus it is important and material to pay some heed to the financial slack of industry players and it is these players that serve as potential purchasers of the assets of a firm in distress. The analyses so far suggest that for competition to affect leverage, industry players must have some flexibility. If the industry as a whole is financially constrained, then the sale of redeployable assets shuts down. The results presented in Table 7 corroborate this intuition. The coefficient on the financially constrained industry measure is also positive and significant while that on the interaction of this variable is negative and significant. It is also important to note that the coefficient on the domestic competition is positive and significant. These estimates imply that although the domestic competition measure serves as a proxy for the availability of potential purchasers of the asset in liquidation thereby resulting in the asset having a higher collateral value against debt, if the industry is financially constrained the redeployability and sale of assets to competitors falls through and leverage actually decreases (negative and significant coefficient on the interaction of financially constrained industry and domestic competition).

To acquire a deeper understanding of the underlying collateral value of a firm's assets I have thus far studied the relations between market leverage and competition as a proxy for the horizontal distribution of rivals as potential purchasers of a firm's assets in liquidation. In addition to this baseline analyses, I have also analyzed how competition plays into the active adjustment of the firm's capital structure by means of debt and equity issuance as well as change in firm's assets and the financial slack of industry players. The analysis thus far leads into the question of who is really available to buy the assets of a distressed firm. To this extent, it may seem like being a small firm in a large industry may be the “best strategy”. Thus, in the following regression, in addition to asset redeployability and the competition measures I include additional controls to account for the firm size relative to the size of the industry in which it operates as well as interactions of this measure with the competition measures. It can be seen from the regression estimates presented in specification (1) of Table 8 that in general, increasing the firm size relative to the size of the industry in which it operates will result if a higher leverage.[13]

[13] The regression equation for the results presented in specification (1) Table 8.

However, on controlling additionally for the interaction of the ratio of firm size to industry size and the competition measures it is evident that that leverage is significantly positively correlated with smaller firms operating in larger industries and higher levels of domestic competition Table 8, specification (2).[14]

$$Leverage_{i,t} = \alpha_0 + \alpha_1 Domestic\ Competition_{j,t} + \alpha_2 International\ Competition_{j,t} + \alpha_3 Firm\ Size_{i,t} + \alpha_4 Tangibility_{i,t} + \alpha_5 Profitability_{i,t} + \alpha_6 Market - to - Book_{i,t} + \alpha_7 Exchange\ Rate_{j,t} + \alpha_8 Asset\ Redeployability_{i,j,t} + \alpha_9 \left(\frac{Firm\ Size}{Industry\ Size}\right)_{i,j,t} + \gamma Year\ Dummies + \eta_{i,j,t}$$

[14] The regression equation for the results presented in specification (2) $Table\:8$ is as follows:

$$Leverage_{i,t} = \alpha_0 + \alpha_1 Domestic\ Competition_{j,t} + \alpha_2 International\ Competition_{j,t} + \alpha_3 Firm\ Size_{i,t} + \alpha_4 Tangibility_{i,t} + \alpha_5 Profitability_{i,t} + \alpha_6 Market - to - Book_{i,t} + \alpha_7 Exchange\ Rate_{j,t} + \alpha_8 Asset\ Redeployability_{i,j,t} + \alpha_9 \left(\frac{Firm\ Size}{Industry\ Size}\right)_{i,j,t} + \alpha_{10} \left(\frac{Firm\ Size}{Industry\ Size}\right)_{i,j,t} \times Domestic\ Competition_{j,t} + \alpha_{11} \left(\frac{Firm\ Size}{Industry\ Size}\right)_{i,j,t} \times International\ Competition_{j,t} + \gamma Year\ Dummies + \eta_{i,j,t}$$

Table 8: **Who is ready to buy assets in the case of default: Is being a small firm in a large industry the "best strategy"? - OLS Regression Estimates**

The analysis thus far leads into the question of who is really available to buy the assets of a distressed firm. To this extent, it may seem like being a small firm in a large industry may be the "best strategy". Thus in the following regression, in addition to asset redeployability and the competition measures I include additional controls to account for the firm size relative to the size of the industry in which it operates as well as interactions of this measure with the competition measures. Calculations of firm level controls are standard with the literature and are summarized in *Appendix A*.1.

Although this idea of being a small firm in a large industry may seem like what is driving firms' leverage choice and not merely the fact that competition captures the existence of potential purchasers of the asset in liquidation, and this this may be an interesting source of heterogeneity, it is the presence of a larger array of potential purchasers of the asset in liquidation [as captured by domestic competition] that is driving firms' leverage choices. This intuition is evident in the regression estimates provided in the table above.

$t-statistics$ associated with robust standard errors clustered by year are reported in parentheses and ***,** and * indicate significance at the 1%, 5% and 10% levels respectively.

Dependent Variable:	Market Leverage (1)	Market Leverage (2)
Domestic Competition	0.076***	0.068***
	(4.12)	(3.82)
International Competition	-0.055**	-0.029**
	(-2.48)	(-2.29)
Firm Size	0.001**	0.001**
	(2.21)	(2.29)
Tangibility	0.218***	0.218***
	(10.75)	(10.74)
Profitability	-0.081***	-0.082***
	(-5.86)	(-5.84)
Market-to-Book	-0.014***	-0.014***
	(-7.11)	(-7.11)
Exchange Rate	0.071	0.070
	(0.78)	(0.76)
Asset Redeployability	0.063**	0.061**
	(2.03)	(2.09)
$\frac{\text{Firm Size}}{\text{Industry Size}}$	0.097**	-1.216
	(2.09)	(-1.23)
$\frac{\text{Firm Size}}{\text{Industry Size}} \times$ Domestic Competition		-1.139**
		(-2.05)
$\frac{\text{Firm Size}}{\text{Industry Size}} \times$ International Competition		-0.387**
		(-2.18)
Year FE	Yes	Yes
Standard Errors Clustered by:	Year	Year
N	34,681	34,681
R^2	0.2427	0.2430

The fact that the main variable namely, the firm size relative to the industry loses significance on controlling for the interaction terms is comforting to the extent that although this

idea of being a small firm in a large industry may seem like what is driving firms' leverage choice and not merely the fact that competition captures the existence of potential purchasers of the asset in liquidation, and this may be an interesting source of heterogeneity, it is the presence of a larger array of potential purchasers of the asset in liquidation [as captured by domestic competition] that is driving firms' leverage choices.[15]

RESULTS

The most basic question in corporate finance is what drives firms leverage choices. In this literature there has been considerable discussion on asset specificity in terms of whether assets are firm specific, industry specific or general. In addition to this dimension there are two additional dimensions that have received less attention - the geographic specificity of assets and the availability of potential purchasers of the asset in liquidation. In this paper I focus on the later of these additional dimensions namely, the availability of potential purchasers of the asset in liquidation. I use competition, both domestic and international, as a proxy for the horizontal distribution of rivals as potential purchasers for the asset in liquidation. Essentially, the competition that the firm faces acts as an additional barrier in redeploying assets in liquidation and this affects the underlying collateral value of the asset in liquidation. An asset ceases to be liquid when it suffers a capital loss. This creates a wedge between the current value of assets and the collateral value of assets. Asset liquidity is lower for industries in which the wedge between the current value of assets and the collateral value of assets is higher. These are the industries which face competition from higher import shares. For firms operating in a competitive domestic environment the wedge between the current value of assets and the collateral value of assets is low making the assets more desirable as collateral. Due to relatively higher asset redeployability together with the availability of a wider array of potential buyers for the asset as captured by domestic competition, firms can secure additional debt against their assets compared to firms operating in import intensive industries.

To gain a deeper understanding of the relation between the capital structure choice and the interaction of various dimensions of the collateral value of the asset, namely, asset specificity and the availability of potential buyers for the asset as captured by the competition that the firm faces, I break up competition into domestic and international. I estimate OLS regressions first controlling solely for international competition followed by controlling for both international and domestic competition. A t-test for the difference in the coefficients on

[15] I re-estimate this regression using identifier variables for larger industries, small firms, and small firms in large industries. The regression estimates are qualitatively similar to those presented in Table 8 and are summarized in Appendix A.7. The construction of each of these identifier variables is outlined in Appendix A.1.

international competition yields a significant test statistic suggesting that it is important to account for both international and domestic competition.

To highlight the significant positive correlation between domestic competition and leverage and the significant negative correlation between international competition and leverage by means of the collateral value of the asset I estimate baseline OLS regressions of market leverage on firm and industry controls for firms with the most redeployable and least redeployable assets. These regressions suggest that for firms with the least redeployable assets the relation of the distribution of horizontal rivals seems insignificant in determining leverage. For firms with the most redeployable assets, domestic competition is significantly positively correlated with leverage while international competition is negatively correlated with leverage. A test for the difference in the respective coefficients suggests that the coefficients on domestic competition for the two deciles are significantly different from each other. A similar test for the coefficients on international competition also yields a significant test statistic.

For the lender, an asset with a higher resale value will serve as better collateral. To this end I estimate a panel regression for the full sample where I control for asset redeployability, domestic competition, international competition as well as their interactions in addition to firm and industry controls. The regression estimates suggest a significant positive correlation between domestic competition and leverage. This indicates that as industries become more competitive, market leverage increases. On the other hand, the significant negative correlation between international competition and market leverage suggests that as firms face increased competition from imports, leverage decreases. In addition to this, it is important to point out the significant positive coefficient on asset redeployability. Easily redeployable assets serve as crash proof liquidity against which firms can secure additional debt. Due to the relative ease of transferring assets to other firms within the industry, assets have a higher collateral value and hence these firms can secure additional debt against their assets.

To gain additional clarity on the issue I include the interactions of asset redeployability and the competition measures as explanatory variables in the regression specifications. This causes the sign on the coefficient of the domestic competition variable to flip while the coefficient on the interaction of domestic competition and asset redeployability is positive and significant. This evidence suggests that although competition may cause firms to lower their leverage (negative coefficients on domestic and international competition) by making debt more expensive, firms operating in competitive domestic industries with highly redeployable assets will have higher leverage (positive correlation between leverage and the interaction of domestic competition and asset redeployability) compared to firms operating in import intensive industries with redeployable assets (negative correlation between leverage and the interaction of

international competition and asset redeployability). The coefficients on international competition as well as the interaction of international competition and asset redeployability are negative and significant. Thus, for firms in import intensive industries, the transfer of assets to other firms is harder with fewer number of firms available and willing to buy the assets in liquidation. This reduces the underlying collateral value of asset in liquidation making it harder for these firms to secure additional debt against their assets. Including the interaction terms in the regression specifications provides an added layer of texture in terms of what the interaction terms reveal about how these various dimensions of the collateral value of the asset interact to impact firms' leverage choices. An alternate theory is that permanently reinvested earnings is what drives higher leverage for firms operating more heavily in foreign markets. To rule out this explanation I use the ration of foreign sales to total sales to screen for firms operating more heavily in foreign markets. I find no significant correlation between firms' leverage choice and the ratio of foreign sales to total sales. In this analyses the coefficients on the competition measures are significant, that on the ratio of foreign sales to total sales is insignificant and those on the interaction of these variables is significant. This suggests that the competition measures influence firms' leverage choice even when firms have no foreign sales but foreign sales as a proxy for permanently reinvested earnings does not affect leverage when competition is zero. The significant interaction term suggests that changes in leverage are driven by changes in competition rather than the permanently reinvested earnings of firms operating more heavily in foreign markets.

A potential concern in empirical studies pertains to estimating regressions in levels as these often suffers from an omitted variables problem. Hence, to ensure that the results go one level deeper I regress changes in leverage on changes in explanatory variables. I estimate probit regressions with net debt issuance and net equity issuance as dependent variables. The explanatory variables include annual changes in firm size, market-to-book, tangibility, profitability, domestic competition, international competition, exchange rate, the market value of equity and redeployability. The regression estimates suggest that the probability of debt issuance is significantly higher while that of stock issuance is significantly lower when domestic competition increases. As international competition intensifies, the probability of debt issuance is significantly lower and that of stock issuance significantly higher.

It has been argued that asset sales can better deal with some of the problems surrounding debt rescheduling and the issuance of new securities. Often, this makes the sale of assets to raise cash a preferred choice for firms. To this end I estimate an OLS regression of change in firms' assets on firm and industry controls. The negative coefficient on international competition corroborates what is outlined in the literature: the literature suggests that in the face

of increased competition from imports distressed firms sell assets to pay down debt and thus lower their operating costs. The positive coefficient on the domestic competition variable suggests that firms operating in more competitive domestic markets experience a positive change in assets with increased competition from rivals.

My main analysis hinges on the availability of potential purchasers of assets in distress. In addition to the availability of potential purchasers, these purchasers must also have some financial slack to take on the assets of distressed firms. In this vein I study the effect of competition and the financial slack of firms operating in competitive industries on firms' leverage. If the industry as a whole is financially constrained, then the sale of redeployable assets shuts down. This analysis sheds light on the fact that although the domestic competition measure serves as a proxy for the availability of potential purchasers of the asset in liquidation thereby resulting in the asset having a higher collateral value against debt, if the industry is itself financially constrained the asset redeployability falls through as the sale of assets to competitors shuts down and leverage actually decreases (negative and significant coefficient on the interaction of financially constrained industry and domestic competition).

Finally, the analysis so far suggests that being a small firm in a large industry may be the "best strategy" as what I am looking at really has to do with the idea of who is available to buy the assets in the case of default. There may be concerns regarding whether the competition is the best measure for this phenomenon. To address this, I include the firm size relative to the industry size as well as interactions of this variable and the competition measures as additional controls. The regression estimate is suggestive of the fact that though it may be the case that in general firm size relative to industry size is positively correlated with firm's leverage choice, on accounting for the interactions, there is added granularity in the sense that smaller firms in larger industries that face high levels of domestic competition are the ones that will take on higher leverage. Hence, being a small firm in a large industry in and of itself does not drive firms' leverage choice but rather being a small firm in a large industry with high domestic competition.

In studying what drives firms' leverage choices it is important and material to address not just the asset specificity channel but also account for the availability of potential purchasers for the asset in distress. Thus, given the competition in the markets in which firms operate, firms adjust their capital structure differently. The fact that the results show up in levels as well as changes makes further research in this topic is imminent. I discuss some avenues for further study in the following section.

CONCLUSION

The literature on what drives firms' leverage choices has overlooked geographic specificity as well as availability of potential purchasers of an asset in liquidation in determining the collateral value of the asset. In discussing the collateral value of assets, considerable attention has been given to how firm specific, industry specific or general an asset is. In this paper I present a novel approach to capture the availability of potential purchasers for an asset by means of the geographic distribution of the firm's horizontal rivals by means of controlling for domestic and international competition individually. Although the literature has, to some extent, looked at the relations between competition and capital structure choice and the cost and availability of debt, it only accounts for competition by means of imports and how this impacts domestic firms' profitability and thus their leverage. To the best of my knowledge, the effect of competition, both domestic and international, on capital structure choice by means of the collateral value of the asset has not been studied. The cost of debt should be lower when firms have easily redeployable assets together with a broader array of potential purchasers of the asset in liquidation. Intuitively this should be true for firms operating in industries with a larger number of domestic competitors as commonalities in production technologies allow most assets to be relatively easily and efficiently transferable among firms within the same industry compared to transferring assets to firms internationally. In import intensive industries, firms are at the risk of selling their assets at large price discounts. This increases the cost of reversing investment thereby reducing the firm’s ability to raise cash, either by the sale of assets or by securing additional debt against their assets as collateral. This makes it difficult for firms to scale down operations and they are often left burdened with unproductive assets. In a nutshell, the opportunity cost of failing in the face of increased import competition is higher than failing in the face of increased domestic competition.

Although I have specifically mentioned three dimensions of the collateral value of the asset, I have in the regression analyses, only controlled for two of those three dimensions and their interactions. In the regression analyses I explore the asset specificity channel by means of asset redeployability and the availability of potential purchasers of the asset by means of domestic and international competition. For the current iteration of the paper, I do not have a good measure, nor data for how geographically specific an asset may be. I am cognizant of the fact that not accounting for this channel may result in the omitted variable showing up either in the error term or the intercept of the regression which is concerning and thus needs close attention and careful consideration.

In theory, not accounting for geographic specificity should lower the power of the tests but given that there is still statistical significance at the 5% level in the current tests leads me to

believe that there are interesting interaction effects among the various dimensions of the collateral value of the asset and thus it is both, important and material to discuss these while acknowledging that one cannot completely ignore the impact of geographic specificity. Exploring geographic specificity and its interactions with the other dimensions is something that is left for future research. As mentioned earlier, ideally, an asset will have good collateral value if it is more general, less geographically specific and if there exists a wide array of potential purchasers for the asset in liquidation. For each of these three dimensions of asset redeployability there exists a spectrum: for example, an asset may be more general but also very geographically specific limiting the number of buyers for the asset in liquidation. Therefore, these dimensions of the collateral value of the asset are not merely additive factors but rather that they interact in interesting ways to give more texture to the underlying collateral value of the asset in liquidation. Hence, any study that analyzes asset specificity is not complete without accounting for how geographically specific the asset is. To this end the Longitudinal Research database (LRD) maintained by the Center for Economic Studies at the Bureau of the Census contains some detailed plant level data. Although this data may be insightful, it is at the plant and industry level and thus it is considerably challenging to map this information to the firm level asset data. The data is detailed in so much as it tracks approximately 50,000 manufacturing plants (by means of the Annual Survey of Manufacturers) even as they change owners, yet the challenge remains in mapping these plants to the firms in the COMPUSTAT universe. One potential use of this publicly available data may be to aggregate the current analysis at the industry level. The concern with doing this is that it will take away from the firm's capital structure choice and change the focus to average industry leverage. Capital structure decisions are firm specific as is evident by the fact that two firms in the same industry may have vastly different capital structures while two firms in different industries may have very similar capital structures. Thus, by aggregating at the industry level we lose granularity around the relation between asset specificity – general vs. firm specific assets, geographic specificity as well as availability of potential purchasers (as captured by competition in this study) – and leverage at the firm level. Thus, this is something that needs careful consideration and is something that is left for further research.

Although the U.S. Census reports data from the Annual survey of manufacturers this data pertains mainly to the value of manufacturers' shipments, employment, cost of materials etc. Data pertaining to the location of manufacturing assets is not publicly available. Blouin, Krull and Robinson (2014) obtain data on assets held in specific foreign affiliates as well as the domestic operations of U.S. multinationals from the BEA's Annual Survey of U.S. Direct Investment Abroad. This data is confidential. Obtaining this data to gain further clarity on

domestic versus foreign ownership of assets by industry will serve as a useful additional control. Doing this will also provide additional clarity on the issue of permanently reinvested earnings and whether this and not asset specificity drives higher leverage for firms that are operating more heavily in foreign markets.

Another area that calls for careful analysis is this question around whether firms grow in the face of competition. To this end studying corporate action in the face of increased competition by focusing on mergers and acquisitions will contribute added texture to the idea of being a small firm in a big industry being the "best strategy" in the face of increased competition.

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APPENDICES

Appendix A.1: Variable Definitions

Market Leverage = (data 9 + data 34)/(data 9 + data 34 + data25 × data 199)

Firm Size = ln(data 6)

Profitability = (data 18 + data 15 + data 16)/data 6_{t-1}

Tangibility = data 8/data 6

Market to Book ratio = (data 6 − Book Equity + (data 199 × data 25))/data 6

Book Equity = data 6 − data 181 − data 10 (or data 56 if data 10 is missing) + data 35 + data 79

Debt Issuance Dummy = 1 if $\frac{data\ 111 - data\ 114}{data\ 6} > 0.05$

Debt Retirement Dummy = 1 if $\frac{data\ 111 - data\ 114}{data\ 6} < 0$ and $\left|\frac{data\ 111 - data\ 114}{data\ 6}\right| > 0.05$

Stock Issuance Dummy = 1 if $\frac{data\ 108 - data\ 115}{data\ 6} > 0.10$

Stock Repurchase Dummy = 1 if $\frac{data\ 108 - data\ 115}{data\ 6} < 0$ and $\left|\frac{data\ 108 - data\ 115}{data\ 6}\right| > 0.0125$

Market Value of Equity = data 25 × data 199

International Competition = $\frac{CIF\ value\ of\ imports + Customs\ value\ of\ imports}{CIF\ value\ of\ imports + Customs\ value\ of\ imports + DOmestic\ production\ in\ USD - Exports}$

Imports: Measures the total physical arrivals of merchandise from foreign countries, whether such merchandise enters consumption channels immediately or is entered into bonded warehouses or Foreign Trade Zones under CBP custody.

CIF value of imports: Represents the landed value of the merchandise at the first port of arrival in the United States. It is computed by adding import charges to the Customs value and therefore excludes U.S. import duties.

Import charges: The import charges represent the aggregate cost of all freight, insurance, and other charges (excluding U.S. import duties) incurred in bringing the merchandise from alongside the carrier at the port of exportation in the country of exportation and placing it alongside the carrier at the first port of entry in the United States.

Customs value of imports: This value is generally defined as the total payment (whether direct or indirect, and exclusive of any costs, charges, or expenses incurred for transportation, insurance, and related services incident to the international shipment of the merchandise from the country of exportation to the place of importation in the United States) made, or to be made, for imported merchandise by the buyer to, or for the benefit, of the seller. This excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the merchandise to the United States. In the case of transactions between related parties, the relationship between buyer and seller should not influence the Customs value.

Exports: Exports measure the total physical movement of merchandise out of the United States to foreign countries whether such merchandise is exported from within the U.S. Customs territory or from a CBP bonded warehouse or a U.S. Foreign Trade Zone.

$HHI_j = \sum_{i=1}^{n} \left(\frac{Sales_{i,j}}{Sales_j}\right)^2$, $Sales_{i,j}$ is the sales for firm *i* in industry *j* and $Sales_j$ is the total sales of industry *j*.

Domestic Competition = $1 - \frac{HHI}{10000}$

Industry- level exchange rate: This variable is constructed from foreign exchange rates, expressed as the amount of foreign currency per U.S. dollar. To convert the raw exchange rates to real exchange rates I multiply the raw exchange rates by the exporting countries' CPI. Then, for each four-digit SIC industry, I compute the source-weighted average of exchange rates across all countries exporting to the U.S. that take up at least 2\% of U.S. total imports in each year. The weights are each exporting country's share in total U.S. imports in each year. Finally, I divide the resulting exchange rates by one thousand to obtain the industry exchange rate index variable expressed in thousands.

Appendix A.2: Correlation Matrix for Firm and Industry Variables

	Domestic Competition	International Competition	Market Leverage	Firm Size	Tangibility	Profitability	Market-to-Book	Exchange Rate	Asset Redeployability
Domestic Competition	1								
International Competition	-0.2096	1							
Market Leverage	0.0203	-0.1380	1						
Firm Size	0.2134	-0.1273	0.1727	1					
Tangibility	0.2327	-0.3690	0.3044	0.3171	1				
Profitability	0.1712	-0.0669	0.1189	0.5147	0.2288	1			
Market-to-Book	-0.1793	0.0588	-0.4005	-0.3251	-0.2231	-0.4869	1		
Exchange Rate	-0.1220	0.1728	-0.0096	-0.0143	-0.0493	0.0645	-0.0606	1	
Asset Redeployability	0.0942	-0.2378	0.0139	-0.0644	-0.0613	-0.0113	0.0176	-0.0773	1

The above table provides the correlations for the variables used in the analyses. Calculations of firm level controls are standard with the literature and are summarized in *Appendix A*.1. For ease of interpretation, Domestic Competition is calculated as one minus HHI. HHI is the Herfindahl-Hirschman Index for each four-digit SIC industry. The asset redeployability measure is from Kim and Kung (2014). For each asset category, redeployability is computed as the ratio of the number of industries in which the asset is used to the number of total industries.

Appendix A.3: Baseline OLS regressions for firms that operate in a single segment

Dependent Variable:	Market Leverage
Domestic Competition	1.738***
	(2.77)
International Competition	–1.370***
	(-7.27)
Firm Size	0.008***
	(5.87)
Tangibility	0.274***
	(13.23)
Profitability	-0.134***
	(-11.37)
Market-to-Book	-0.027***
	(-7.57)
Exchange Rate	0.003
	(0.10)
Asset Redeployability	2.196**
	(2.52)
Domestic Competition × Asset Redeployability	1.661**
	(2.09)
International Competition × Asset Redeployability	2.879***
	(6.83)
Year FE	Yes
Standard Errors Clustered by	Year
N	10,423
R^2	0.2096

The table provides the baseline regression estimates for the sample of firms operating in a single segment (as a robustness check). Calculations of firm level controls are standard with the literature and are summarized in *Appendix A*.1. For ease of interpretation, Domestic Competition is calculated as one minus HHI. HHI is the Herfindahl-Hirschman Index for each four-digit SIC industry. The asset redeployability measure is from Kim and Kung (2014). For each asset category, redeployability is computed as the ratio of the number of industries in which the asset is used to the number of total industries. For details on the Fama-Macbeth estimation procedure refer to Fama and Macbeth (1973).
$t-statistics$ associated with standard errors clustered by year are reported in parentheses and ***,** and * indicate significance at the 1%, 5% and 10% levels respectively.

Appendix A.4: Fama-MacBeth Regressions for market leverage on control variables

Dependent Variable:	Market Leverage (1)	Market Leverage (2)
Domestic Competition	0.166***	-0.441**
	(2.79)	(-2.01)
International Competition	-0.039*	-0.635
	(-1.70)	(-4.93)
Firm Size	0.003***	0.003***
	(3.19)	(3.28)
Tangibility	0.291***	0.285***
	(16.95)	(17.32)
Profitability	-0.075***	-0.075***
	(-9.65)	(-9.68)
Market-to-Book	-0.020***	-0.020***
	(-8.62)	(-8.55)
Exchange Rate	0.125***	0.088***
	(5.94)	(3.73)
Asset Redeployability	0.039**	2.412**
	(2.51)	(2.25)
Domestic Competition × Asset Redeployability		2.991**
		(2.57)
International Competition × Asset Redeployability		-1.514***
		(-5.25)
N	34,681	34,681
R^2	0.1437	0.1461

The tale provides the estimates for Fama-Macbeth regressions for the full sample. Calculations of firm level controls are standard with the literature and are summarized in *Appendix A.1*. For ease of interpretation, Domestic Competition is calculated as one minus HHI. HHI is the Herfindahl-Hirschman Index for each four-digit SIC industry. The asset redeployability measure is from Kim and Kung (2014). For each asset category, redeployability is computed as the ratio of the number of industries in which the asset is used to the number of total industries.

For details on the Fama-Macbeth estimation procedure refer to Fama and Macbeth (1973).

$t-statistics$ associated with Fama-Macbeth standard errors are reported in parentheses and ***,** and * indicate significance at the 1%, 5% and 10% levels respectively.

Appendix A.5: Capital Structure Adjustment Regressions – Debt Retirement and Stock Repurchase

Dependent Variable:	Debt Retirement (Probit Marginal Effects) (1)	Stock Repurchase (Probit Marginal Effects) (2)
ΔDomestic Competition	0.027 (1.05)	-0.039 (-1.22)
ΔInternational Competition	0.052 (0.37)	-0.132* (-1.88)
ΔFirm Size	-0.015*** (-8.93)	0.023*** (12.41)
ΔTangibility	0.104*** (4.95)	-0.064*** (-3.19)
ΔProfitability	0.125*** (9.80)	0.319*** (11.15)
ΔMarket-to-Book	0.043*** (9.61)	-0.090*** (-5.42)
ΔExchange Rate	0.091 (0.58)	0.124** (2.13)
ΔMarket Value of Equity	-0.051*** (-11.55)	0.088*** (5.48)
ΔAsset Redeployability	0.107** (2.47)	0.101** (2.15)
N	29,385	29,385
R^2	0.0482	0.1363

The table presents the probit marginal effects for the regression of debt retirement (specification (1)) and stock repurchase (specification (2)) on firm and industry control variables. The debt retirement dummy takes on a value of 1 if the difference in long-term debt issuance and long term debt reduction is negative and its absolute value is in excess of 5% of assets. The stock repurchase dummy takes on a value of 1 if the difference between the sale of common and preferred stock and the purchase of common and preferred stock is negative and its absolute value is in excess of 1.25% of assets.

All regressions include time and industry fixed effects to control for common time trends and cross-industry differences in both measures of competition. Calculations of firm level controls are standard with the literature and are summarized in *Appendix A*.1. For ease of interpretation, Domestic Competition is calculated as one minus HHI. HHI is the Herfindahl-Hirschman Index for each four-digit SIC industry. The asset redeployability measure is from Kim and Kung (2014). For each asset category, redeployability is computed as the ratio of the number of industries in which the asset is used to the number of total industries.

All control variables are the annual changes of the corresponding variable and all regressions control for year and industry fixed effects. $t-statistics$ associated with robust standard errors clustered by industry are reported in parentheses and ***,** and * indicate significance at the 1%, 5% and 10% levels respectively.

Appendix A.6: Who is ready to buy assets in the case of default: Is being a small firm in a large industry the "best strategy"? - OLS Regression Estimates using Dummy Variables

Dependent Variable:	Market Leverage (1)	Market Leverage (2)	Market Leverage (3)	Market Leverage (4)
Domestic Competition	0.082*** (4.09)	0.082*** (4.05)	0.082*** (4.10)	0.082*** (4.11)
International Competition	-0.054** (-2.57)	-0.051*** (-2.54)	-0.051** (-2.54)	-0.056** (-2.61)
Firm Size	0.001** (2.50)	0.003*** (2.39)	0.001** (2.39)	0.001** (2.36)
Tangibility	0.218*** (10.71)	0.218*** (10.73)	0.218*** (10.71)	0.218*** (10.70)
Profitability	-0.082*** (-5.90)	-0.082*** (-5.89)	-0.081*** (-5.74)	-0.081*** (-5.74)
Market-to-Book	-0.014*** (-7.14)	-0.014*** (-7.12)	-0.014*** (-7.19)	-0.014*** (-7.17)
Exchange Rate	0.072 (0.79)	0.071 (0.79)	0.073 (0.80)	0.073 (0.81)
Asset Redeployability	0.063** (2.03)	0.062** (2.02)	0.062** (2.02)	0.062** (2.01)
Large Industry Dummy	0.002 (0.21)		0.009 (0.62)	0.009 (0.55)
Small Firm Dummy	-0.003 (-0.52)		-0.013 (-1.50)	-0.013 (-1.53)
Small Firm in a Big Industry Dummy		-0.016** (-2.13)	-0.025** (-2.31)	-0.422 -(0.48)
Small Firm in a Big Industry × Domestic Competition				0.466** (2.50)
Small Firm in a Big Industry × International Competition				-0.019** (-2.30)
Year FE	Yes	Yes	Yes	Yes
Standard Errors Clustered by:	Year	Year	Year	Year
N	34,681	34,681	34,681	34,681
R^2	0.2425	0.2422	0.2428	0.2429

In the regression estimates above, I include additional controls to identify small firms, large industries, small firms in large industries as well as an interaction of the competition measures and the indicator for small firm in a large industry. To construct the additional controls to identify small firms, large industries as well as small firms in large industries. I take the average of the firm size variable across 4-digit industry-years. The small firm identifier variable takes on a value of one if the firm size is smaller than the average firm size by industry-year. To identify large industries, I first calculate the size of each industry for a given year by summing firm size by industry-year for the COMPUSTAT Universe. I then compare this to the average industry size for each year i.e., the average of all industries for a given year. If the size of an industry in a given year is greater than the average size of industries in that year, the large industry identifier takes on a value of one. Finally, if the small firm identifier as well as the large industry identifier takes on a value of one then the identifier for a small firm in a large industry takes on a value of one. Calculations of firm level controls are standard with the literature and are summarized in *Appendix A.1*. $t-statistics$ associated with robust standard errors clustered by industry are reported in parentheses and ***,** and * indicate significance at the 1%, 5% and 10% levels respectively.

Appendix A.7: Four-digit manufacturing industries represented in the sample

2011 MEAT PACKING PLANTS
2013 SAUSAGES AND OTHER PREPARED MEATS
2015 POULTRY SLAUGHTERING AND PROCESSING
2020 DAIRY PRODUCTS
2024 ICE CREAM AND FROZEN DESERTS
2030 CANNED AND PRESERVED FRUITS AND VEGETABLES
2033 CANNED FRUITS AND SPECIALTIES
2040 FLOUR AND OTHER GRAIN MILL PRODUCTS
2050 BAKERY PRODUCTS
2052 COOKIES AND CRACKERS
2060 SUGAR AND CONFECTIONERY PRODUCTS
2070 FATS AND OILS
2080 BEVERAGES
2082 MALT BEVERAGES
2084 WINES, BRANDY, AND BRANDY SPIRITS
2085 DISTILLED AND BLENDED LIQUORS
2086 BOTTLED AND CANNED SOFT DRINKS
2090 MISC. FOOD PREPS
2092 FRESH OR FROZEN PACKAGED FISH
2111 CIGARETTES
2211 BROAD WOVEN FABRIC MILLS, COTTON
2273 CARPETS AND RUGS
2320 APPAREL AND OTHER FINISHED PRODUCTS
2330 APPAREL AND OTHER FINISHED PRODUCTS
%2340 APPAREL AND OTHER FINISHED PRODUCTS
2421 SAWMILLS AND PLANING MILLS, GENERA
2430 LUMBER AND WOOD PRODUCTS
2451 MOBILE HOMES
2452 PREFABRICATED WOOD BUILDINGS
2510 HOUSEHOLD FURNITURE
2511 WOOD HOUSEHOLD FURNITURE
2520 OFFICE FURNITURE AND FIXTURES
2522 OFFICE FURNITURE, EXCEPT WOOD
2531 PUBLIC BUILDING AND RELATED FURNITURE
2540 OFFICE FURNITURE AND FIXTURES\\
2611 PULP MILLS
2621 PAPER MILLS
2631 PAPERBOARD MILLS
2650 PAPER AND ALLIED PRODUCTS
2670 PAPER AND ALLIED PRODUCTS
2673 BAGS: PLASTIC, LAMINATED, AND COATED
2732 BOOK PRINTING
2750 COMMERCIAL PRINTING
2761 MANIFOLD BUSINESS FORMS
2780 BOOK BINDING
2810 INDUSTRIAL INORGANIC CHEMICALS
2820 PLASTIC MATERIAL AND SYNTHETIC RESIN
2821 PLASTICS MATERIALS AND RESINS
2833 MEDICINALS AND BOTANICALS
2834 PHARMACEUTICAL PREPARATIONS
2835 DIAGNOSTIC SUBSTANCES
2836 BIOLOGICAL PRODUCTS, EXCEPT DIAGNOSTIC
2840 SOAP AND OTHER DETERGENTS
2842 POLISHES AND SANITATION GOODS

2844 TOILET PREPARATIONS
2851 PAINTS AND ALLIED PRODUCTS
2860 INDUSTRIAL ORGANIC CHEMICALS
2870 AGRICULTURE CHEMICALS
2890 MISC. CHEMICAL PRODUCTS
2891 ADHESIVES AND SEALANTS
2911 PETROLEUM REFINING
2950 PAVING AND ROOFING MATERIALS
3011 TIRES AND INNER TUBES
3021 RUBBER AND PLASTICS FOOTWEAR
3050 GASKETS, HOSES ETC.
3060 FABRICATED RUBBER PRODUCTS
3080 MISC. PLASTIC PRODUCTS
3081 UNSUPPORTED PLASTICS FILM AND SHEET
3086 PLASTICS FOAM PRODUCTS
3089 PLASTICS PRODUCTS
3140 FOOTWEAR EXCEPT RUBBER
3220 GLASS CONTAINERS
3221 GLASS CONTAINERS
3241 CEMENT, HYDRAULIC
3250 STRUCTURAL CLAY PRODUCTS
3260 POTTERY AND RELATED PRODUCTS
3270 CONCRETE GYPSUM AND PLASTE
3272 CONCRETE PRODUCTS
3281 CUT STONE AND STONE PRODUCTS
3290 ABRASIVE AND ASBESTOS PRODUCTS
3310 BLAST FURNACES AND STEEL WORKS
3312 BLAST FURNACES AND STEEL MILLS
3317 STEEL PIPE AND TUBES
3320 IRON AND STEEL FOUNDRIES
3330 PRIMARY SMELTING AND REFINING OF NONFERROUS METALS
3334 PRIMARY ALUMINUM
3350 ROLLING AND DRAWING NONFERROUS METALS
3357 NONFERROUS WIRE DRAWING AND INSULATING
3360 NONFERROUS FOUNDRIES AND CASTING
3411 METAL CANS
3420 HAND TOOLS AND HARDWARE
3430 HEATING EQUIPMENT AND PLUMBING FIXTURES
3433 HEATING EQUIPMENT, EXCEPT ELECTRIC
3440 FABRICATED STRUCTURAL METAL PRODUCTS
3442 METAL DOORS, SASH, AND TRIM
3443 FABRICATED PLATE WORK (BOILER SHOP)
3444 SHEET METALWORK
3448 PREFABRICATED METAL BUILDINGS
3451 SCREW MACHINE PRODUCTS
3452 BOLTS, NUTS, RIVETS, AND WASHERS
3460 METAL FORGINGS AND STAMPINGS
3470 COATING AND ENGRAVING
3480 ORDNANCE AND ACCESSORIES
3510 ENGINES AND TURBINES
3523 FARM MACHINERY AND EQUIPMENT
3524 LAWN AND GARDEN EQUIPMENT
3530 CONSTRUCTION, MINING MATERIAL AND HANDLING MACHINERY
3531 CONSTRUCTION MACHINERY
3532 MINING MACHINERY

3533 OIL AND GAS FIELD MACHINERY
3537 INDUSTRIAL TRUCKS AND TRACTORS
3540 METALWORKING MACHINERY
3541 MACHINE TOOLS, METAL CUTTING TYPE
3550 SPECIAL INDUSTRY MACHINERY
3555 PRINTING TRADES MACHINERY
3559 SPECIAL INDUSTRY MACHINERY
3560 GENERAL INDUSTRIAL MACHINERY
3561 PUMPS AND PUMPING EQUIPMENT
3562 BALL AND ROLLER BEARINGS
3564 BLOWERS AND FANS
3567 INDUSTRIAL FURNACES AND OVENS
3569 GENERAL INDUSTRIAL MACHINERY
3570 OFFICE COMPUTERS
3571 ELECTRONIC COMPUTERS
3572 COMPUTER STORAGE DEVICES
3575 COMPUTER TERMINALS
3576 OFFICE COMPUTERS
3577 COMPUTER PERIPHERAL EQUIPMENT
3578 CALCULATING AND ACCOUNTING EQUIPMENT
3579 OFFICE MACHINES
3580 REFRIGERATION AND SERVICE INDUSTRY MACHINES
3585 REFRIGERATION AND HEATING EQUIPMENT
3612 POWER, DISTRIBUTION AND SPECIALTY TRANSFORMERS
3613 SWITCHGEAR AND SWITCHBOARD APPARATUS
3620 ELECTRICAL INDUSTRIAL APPARATUS
3621 MOTORS AND GENERATORS
3630 HOUSEHOLD APPLIANCES
3634 ELECTRIC HOUSEWARES AND FANS
3640 ELECTRIC LIGHTING AND WIRING
3651 HOUSEHOLD AUDIO AND VIDEO EQUIPMENT
3652 PRERECORDED RECORDS AND TAPES
3661 TELEPHONE AND TELEGRAPH APPARATUS
3663 RADIO AND T.V. COMMUNICATIONS EQUIPMENT
3669 COMMUNICATIONS EQUIPMENT
3670 ELECTRIC COMPONENTS AND ACCESSORIES
3672 PRINTED CIRCUIT BOARDS
3674 SEMICONDUCTORS AND RELATED DEVICES
3677 ELECTRONIC COILS AND TRANSFORMERS
3678 ELECTRONIC CONNECTORS
3679 ELECTRONIC COMPONENTS
3690 MISC. ELECTRICAL MACHINERY AND EQUIPMENT
3695 MAGNETIC AND OPTICAL RECORDING MEDIA
3711 MOTOR VEHICLES AND CAR BODIES
3713 TRUCK AND BUS BODIE
3714 MOTOR VEHICLE PARTS AND ACCESSORIES
3715 TRUCK TRAILERS
3716 MOTOR HOMES
3720 AIRCRAFT AND PARTS
3721 AIRCRAFT
3724 AIRCRAFT ENGINES AND ENGINE PARTS
3728 AIRCRAFT PARTS AND EQUIPMENT
3730 SHIP BUILDING AND REPAIR
3743 RAILROAD EQUIPMENT
3751 MOTORCYCLES, BICYCLES, AND PARTS

3760 GUIDED MISSILES AND SPACE VEHICLES
3812 SEARCH AND NAVIGATION EQUIPMENT
3821 LABORATORY APPARATUS AND FURNITURE
3822 ENVIRONMENTAL CONTROLS
3823 PROCESS CONTROL INSTRUMENTS
3824 FLUID METERS AND COUNTING DEVICES
3825 INSTRUMENTS TO MEASURE ELECTRICITY
3826 ANALYTICAL INSTRUMENTS
3827 OPTICAL INSTRUMENTS AND LENSES
3829 MEASURING AND CONTROLLING DEVICES
3841 SURGICAL AND MEDICAL INSTRUMENTS
3842 SURGICAL APPLIANCES AND SUPPLIES
3843 DENTAL EQUIPMENT AND SUPPLIES
3844 X-RAY APPARATUS AND TUBES
3845 ELECTROMEDICAL EQUIPMENT
3851 OPHTHALMIC GOODS
3861 PHOTOGRAPHIC EQUIPMENT AND SUPPLIES
3873 WATCHES, CLOCKS, WATCH CASES, AND PARTS
3910 JEWELRY - PRECIOUS METALS
3911 JEWELRY, PRECIOUS METAL
3931 MUSICAL INSTRUMENTS
3942 DOLLS AND STUFFED TOYS
3944 GAMES, TOYS, AND CHILDREN'S VEHICLES
3949 SPORTING AND ATHLETIC GOODS
3950 PENS, PENCILS AND OFFICE SUPPLIES
3960 COSTUME JEWELRY AND NOTIONS