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Master Degree Project in Accounting

Recognition of Supplier and Customer Relationships in Business Combination

A quantitative study of American acquisitions

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ABSTRACT

While insights from business relationship literature indicate that relationships with suppliers and customers are key value drivers in many companies, there is little insight as to how their value is reflected in firms' financial statements. Relationships can only be recognized as intangible assets when they are acquired, which is usually done through a business combination. To provide a better understanding of business relationships and how they are accounted for, we investigate possible determinants that could affect the probability of relationships being recognized in business combinations. Through logistic regression, we examine a sample of 516 business combinations by publicly traded American companies during the period 2001-2011. We find that the probability of allocation to these relationships is higher when the target firm operates in a high-tech industry, and that its pre-acquisition profit margin has a positive impact on the probability. Additionally, it is found that the likelihood of allocation to business relationships is greater after the implementation of a revised version of SFAS 141, and when the acquirer and target firm operates in different industries. We further find an interchange between allocation to supplier and customer relationships, and allocation to other identifiable intangible assets. However, no indication is found that the post, through its interchange with goodwill is associated with accounting for certain incentives. The findings are of relevance to both relationship literature, financial accounting literature and standard setters as they are some of the first quantitative evidence of when customer and supplier relationships are recognized in business combinations.

Keywords: Supplier and customer relationships, intangible assets, business combinations, purchase price allocation, SFAS 141

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Abbreviations

FASB	Financial Accounting Standards Board
IOS	Investment Opportunity Set
OIIA	Other Identifiable Intangible Assets
SCRs	Supplier and Customer Relationships
SFAS	Statement of Financial Accounting Standards
US GAAP	Generally Accepted Accounting Principles in the United States

1 Introduction

A firm does not exist in isolation, but its success is dependent on interactions with its suppliers and customers. The value of a firm's relationships has been argued to be the key predictor of its future performance (Castedello and Klingbeil, 2010). First of all, customer relationships ultimately bring earnings and revenue growth, while interactions with suppliers enable the firm to deliver to its customers more efficiently. The firm's supply chain is a competitive differentiator, along with the product or service, which emphasizes the importance of supplier relationships (Galbreath, 2002). Gaining control over supplier and customer relationships (SCRs) can be one way to gain market shares, reduce competition and to cut costs. Insights from case studies within the management accounting discipline (e.g. Cooper and Slagmulder 2004; Agndal and Nilsson, 2007, 2010) and the marketing discipline (e.g. Cannon and Perreault Jr, 1999; Dwyer et al., 1987) illustrated how relationships between organizations are built. Moreover, quantitative studies have clarified the benefits that they bring (Carr and Pearson, 1999; Primo and Amundson, 2002; Ragatz and Handfield, 2002). While it is easy to argue that these SCRs have a value and should therefore be considered as assets on a conceptual level, knowledge about recognition and valuation of them in firms' financial statements is limited. The inherent conservatism in accounting regulations such as US GAAP prohibits the recognition of intangible assets when internally generated and recognition is only allowed when they are acquired. This is mainly done through business combinations.

In a business combination, all identifiable intangible assets are to be recognized separately from goodwill. The purpose of financial reporting is to provide financial information about the entity which is useful for users of financial statements in their decision making (FASB, 2010). As literature has shown, SCRs are key value drivers, therefore it is important to provide information regarding these assets to increase usefulness and faithful representation. However, there are few insights as to how it actually is reflected in firms' financial statements. There is a gap in the literature concerning what kind of business combinations lead to the recognition of SCRs intangible assets and what firm characteristics or incentives that determine the probability of recognition.

The purpose of this study is to provide a better understanding of what characterizes firms with valuable SCRs, and when SCRs are recognized as intangible assets in business combinations. We investigate the research question of what factors determine whether or not SCRs are recognized in business combinations. By using insights from both the management accounting, marketing and financial accounting disciplines, we develop hypotheses. The hypotheses concern three perspectives that could affect the probability of allocation. First of all, we investigate characteristics of the target firm that could be indications of the existence of valuable SCRs. Secondly, we look at factors relating to the acquiring firm's ability to identify SCRs. Thirdly, we look at factors within the acquiring firm that could indicate incentives to, or not to, recognize

SCRs. A sample of US business combinations performed during 2001-2011 is studied. Data concerning the acquisitions, as well as company-specific data, is gathered from the acquirers' 10-K files and the databases *Zephyr* and *Compustat*.

We find that the probability of allocation to SCRs is positively related to the profit margin of the target firm prior to the acquisition. The likelihood of allocation to SCRs is also higher when the target firm operates in a high-technology industry. Additionally, we find that the probability of recognition was higher during the period 2009-2011 when a revised and more detailed version of SFAS 141 Business Combinations was in effect and that allocation is more likely when the acquiring firm and the target firm operate in different industries. Limited evidence is found in terms of SCR (non-)allocation being used for accounting incentives, through its interchange with goodwill allocation. However, there appears to be an interchange between the allocation of purchase price to SCRs and the allocation to other identifiable intangible assets.

This study has three main contributions. Firstly, while the majority of prior research on business relationships consists of case studies, our study provides quantitative insights in terms of characteristics of firms that are more likely to carry SCRs. These insights can also be used for hypothesis development in future studies. Secondly, the findings are of relevance to financial accounting literature by providing a better understanding of the interchange between different intangible assets in the purchase price allocation process. Lastly, standard setters can benefit from this study in two ways: the result indicates that the revised standard might have clarified the accounting for SCRs. Further, the low extent of recognized supplier related intangibles, combined with the prior literature's emphasis of its importance, indicates that further clarification is needed as to how such assets should be identified and valued.

The remainder of this paper is structured as follows; chapter 2 describes the empirical context of the study, covering the characteristics and importance of SCRs, the relevant FASB standards and accounting choice literature. Based on this, the hypotheses of the study are developed in Chapter 3. Chapter 4 describes the methodology and presents the main model for testing the hypotheses. The results are presented in Chapter 5 and discussed in Chapter 6. Lastly, the conclusions and contributions of the findings are argued for in Chapter 7, along with suggestions for further research.

2 Empirical context

2.1 Supplier and Customer Relationships

First of all, it is important to clarify what a relationship constitutes and when it has a value. Firms do not exist in isolation but depend on networks of relationships. Firms' success is ultimately derived from how well these relationships are managed, as relationships are key value drivers and predictors of firms' future performance (Castedello and Klingbeil, 2010; Galbreath, 2002). Interactions between a buyer and seller can contain far more than only price discussions and transfers of products and money (Håkansson and Snehota, 1995, p. 2.). A business relationship can be defined as a "mutually oriented interaction between two reciprocally committed parties" (Håkansson and Snehota, 1995, p. 25). Close relationships enable firms to access economies of scale and scope more efficiently than they could through arm's-length transactions. Through the relationship, the buyer and seller can create and achieve something they could not on their own, which creates a mutual commitment and interdependence. In the interaction process activities are linked, resources are tied together and the individual actors develop bonds to each other (Håkansson and Snehota, 1995, p. 385). Valuable relationships are often continuous and built up over time, by short term exchanges and interactions between the actors. For example, through collaboration in daily operations, joint product developments and other projects (Agndal and Nilsson, 2007). Trust and commitment are argued to be key characteristics of successful relationships (Morgan and Hunt, 1994). Relationships can be viewed as a processes, which require trust and commitment built up over time and in this process the relationship can grow into a deeper and more dependent relationship with increasing importance for the overall success of the firm (Cojohari, 2014).

SCRs can take various forms depending on the business context, the technology used, the nature of the business (Gadde and Snehota, 2000), as well as the importance of the product or service or existing procurement obstacles (Cannon and Perreault, 1999). Further, different purchasing strategies of the buying firm will affect the relationship. Researchers have studied the extent of different inter-organizational cost management practices within relationships. Cooper and Slagmulder (2004) studied Japanese manufacturing firms and argue that more of such practices were used in the closer and deeper relationships, and greater benefits of the relationship could be gained through more information sharing. Similarly, Agndal and Nilsson (2010) studied inter-organizational cost management techniques, under different settings and indicate that such techniques might be used for different reasons depending on the nature of the relationships. In relational purchasing strategies, more cost information was disclosed by the supplying firm, whereas less information was shared and in a one-directional manner when applying a more transactional purchasing strategy. An example of the benefits of close relationships in terms of efficiency is direct material cost. Direct material, which often is purchased goods, may constitute

a major part of firms' total cost today. One way to decrease direct material cost is to use inter-organizational cost management techniques with suppliers (Nilsson, 2003), which are more commonly used in closer relationships (e.g. Agndal and Nilsson, 2010).

In the long run there is no reason for the business to exist without its customers, as no value is created if there are no customers to purchase the products or services offered. Forbes (2007) and Gupta and Lehmann (2003) argue that customers are valuable assets in the firm and Galbreath (2002) mean they should be purposefully managed as assets to increase their value. Customer retention and loyalty leads to repeated business, which enables lower marketing costs and improved profitability over time. For example, Steenkamp and Kashyap (2010) found that managers in New Zealand ranked customer satisfaction and customer loyalty as the most important value drivers for business success.

Suppliers play a crucial role, as they enable firms to deliver their products and services to customers efficiently. Relationships with suppliers are important in order to stay competitive and to reduce cost associated with changing suppliers (Agndal and Nilsson, 2007; Carr and Pearson, 1999). Further, they can lead to competitive advantage in new markets, cost reductions, improved speed of delivery, knowledge and technology-sharing (Cojohari, 2014). Arguably, firms of today compete just as much on their supply chains as their product or service offerings. The supply chain needs to be managed wisely, not only to reduce cost but also to enable growth and maximization of the market value (Galbreath, 2002). One example the author gives is how close collaborations with suppliers can improve forecasting ability, which lowers required inventory levels. Furthermore, close supplier relationships can be means to create differentiated products and strengthen the firm's financial performance. Carr and Pearson (1999) found that strategically managed long-term buyer-supplier relationships have a positive effect on the firm's financial performance, as competitive advantages are gained and costs are reduced. High involvement with suppliers has been found to lead to higher product quality in new product development, as well as reduced costs (Primo and Amundson, 2002; Ragatz and Handfield, 2002). If a firm applies a relational purchasing strategy, the value of the relationship is likely to be of greater significance. Compared to when a more transactional strategy is applied, changing suppliers is then likely to be more difficult and costly (Agndal and Nilsson, 2010). In more transactional situations, supplier relationships are less likely to constitute assets with any significant values.

2.2 Relationships Across Industries

The importance of SCRs arguably varies across industries. Industries are differentiated by industry specific characteristics which drive the importance of SCRs and networks. For example, the complexity of products, purchasing strategies and business models could lead to varying frequency levels and importance of relationships. Specifically looking at customer and supplier related intangible assets, variations have been found across industries as well. Castedello and Klingbeil's (2010) industry study provides an idea of what key intangible assets that underpin the value of acquired firms in a European setting. The authors list which categories of intangible assets that are the main and supportive value drivers in various industries and find that SCRs are key value drivers in many of them. Their findings indicate that while SCRs are likely to be found to some degree within all industries, the extent is likely to vary. As this study does not apply the same industry aggregation level, the findings of Castedello and Klingbeil's (2010) are not described in greater detail here.

Agndal and Nilsson (2010) conducted a case study on buyer-supplier relationships in three buying firms across three industries; one in manufacturing, one in retailing and one in the telecom industry. The manufacturer's supplier relationships were characterized as the closets with highest level of commitment. This was because high switching costs due to few available alternative suppliers. The telecom case was more standardized with low commitment, normally several alternative suppliers available, and a low degree of benefit-sharing. The retail case was considered a mix between the two, as some of the suppliers of more standardized products were favored with higher commitment. The rest were considered alternative suppliers, as they provided less complex products which reduces the switching cost. Even if this study only describes the situation in single cases of three different industries, the findings are still of relevance to illustrate that industry-dependent differences are likely to exist.

The need of inter-organizational adaptation could be dependent on the technological complexity of the product or service offered. Hallén et al. (1991) argue that technology affects SCRs and that continuous production processes lead to lower adaptation to partners. De Ruyter et al. (2001) indicate that commitment and trust is of high importance in SCRs in high-technology markets. Primo and Amundson (2002) finds that the involvement with suppliers in new product development tends to be greater when the product is technically complex. This is in line with Agndal and Nilsson's (2010) discussions about higher switching costs when few alternative suppliers exist.

2.3 Accounting for Business Combinations under US GAAP

2.3.1 SFAS 141 Business Combinations

FASB issued a new standard, SFAS 141: Business Combinations, in 2001 (hereafter SFAS 141). The key consequence of SFAS 141 is the requirement to apart from goodwill identify, value and disclose qualifying intangible assets in every business combination. Under the former standard, Opinion 16, acquisitions could be accounted for using two methods while SFAS 141 only allows the purchase method. Further, under Opinion 16 intangible assets were to be recognized if they could be identified and named, whereas they now are to be recognized if they meet the contractual-legal or separability criterion (SFAS 141, 2001). In 2007, FASB issued a revised standard which became effective at the end of 2008 (SFAS 141.74, 2007). The revised standard (hereafter SFAS 141r) is meant to be more clear, it reduced some of its differences with IFRS and increased the disclosure requirements. For example, information on intangible assets subject to amortization and those which are not amortized, the total amount assigned to intangible assets and the major intangible asset classes should now be separately disclosed (SFAS 141.52, 2001; SFAS 141.68f, 2007).

2.3.2 Purchase Price Allocation

Following a business combination, the purchase price is allocated to the assets acquired and the liabilities assumed. This includes both tangible and identifiable intangible assets and any residual is allocated to goodwill (SFAS 141.34, 2007). Under the original version of SFAS 141, the cost of the acquisition was to be allocated to the assets acquired and liabilities assumed in the business combination based on their estimated fair value at the acquisition date. In the revised standard, assets acquired and liabilities assumed are valued at their fair value on the acquisition date and any acquisition related cost has to be recognized separately from the acquisition (SFAS 141.12+20, 2007).

Intangible assets which have risen from either contractual or legal rights, or are otherwise separable, should be recognized (SFAS 141.39, 2001; SFAS 141, 2007). The standard gives examples of intangible assets which meet the recognition criterion divided into five categories: marketing related, customer related, artistic-related, contract-based and technology-based intangible assets. As this study focuses on SCRs as intangible assets, the customer related and contract-based intangible assets are of interest. Examples of customer-related intangible assets are customer list, customer relationships (contractual or non-contractual) (SFAS 141.A14b, 2001; SFAS 141.A36, 2007), key accounts, open orders and production back logs (Grant Thornton, 2008; Castedello and Klingbeil, 2010). Customer lists are frequently leased and therefore meet the separability criterion (SFAS 141.A11, 2001; SFAS 141.A37, 2007) and non-contractual customer relationships are considered separable (SFAS 141.A14b, 2001; SFAS 141.A42, 2007). In

a business combination, an analysis of the target's customer base might be carried out to determine whether identifiable customer relationships exist (Grant Thornton, 2008). If the target firm holds a customer contract, both the actual contract and the related customer relationship (if separable) can be recognized as two distinct intangible assets as their useful lives and pattern of economic benefits might differ (SFAS 141.A40, 2007). Intangible assets related to supplier relationships are exemplified under the contract-based category (SFAS 141.A14d, 2001; SFAS 141.A46b, 2007). There might exist supplier-related contractual intangible assets when a business depends on specific rights of use, for example rare supplies of raw material or other favorable contracts with suppliers (Grant Thornton, 2008; Castedello and Klingbeil, 2010).

Intangible assets lack physical substance and can thus be difficult to identify and value. Valuation is based on the fair value and as there is often no active market for SCRs intangibles, the income approach is most commonly used. To evaluate customer relationships, forecast revenues, expected contract extensions and future churn rates might have to be estimated (Castedello and Klingbeil, 2010). Gadde and Snehota (2000) illustrates the complicity of valuation by discussing different costs and benefits of SCRs. Costs are direct procurement costs, direct transaction costs, relationship handling costs and supply handling costs, while benefits include cost benefits and revenue benefits. However, revenue benefits are not easily measured as they are mostly indirect and relate to improvement of product quality or performance which increased the customer's competitiveness. Such benefits might appear later in time and may not easily be directly connected to the relationship which contributes to the difficulty to value a relationship. The authors argue that the value is not only derived from the relationship in itself or the product content but more so from how the relationships fits into the operations of its customers, which shows the difficulty of valuation. Additionally, it has been noted that customer relationships at times can be close in nature to brands and that these two assets might therefore be difficult to separate (Forbes 2007).

2.3.3 Effect on Reported Earnings

Whether intangible assets are separately identified or not affect the subsequent earnings, as their accounting treatment differ from goodwill in subsequent periods. Finite lived identifiable intangible assets are amortized over their useful life, leading to an even decrease in reported earnings each year (SFAS 142.11-14, 2001). Goodwill and intangible assets with indefinite useful life, are tested for impairment at least annually (SFAS 142.16-22, 2001). Thus, these assets do not affect the reported earnings when no impairment is done but can have a major negative effect on the reported earnings when an impairment is done. Therefore, the subsequent effect on reported earnings will not only depend on whether or not identifiable intangible assets are separated from goodwill. More discretion is available if an intangible asset with an indefinite lifetime is recognized.

2.4 Accounting Choice Theory

In general, the field of accounting choice theory investigates the underlying reasons as to why companies choose to account in one way or another. The three common perspectives on accounting choices are the efficient contracting perspective, the opportunism perspective and the information signaling perspective (Holthausen, 1990; Ball and Smith, 1992). This study is limited to only focus on the efficient contracting and information signaling perspectives. As discussed more thoroughly in Chapter 3, applying the accounting choice literature to this study is not entirely straightforward. The discretion involved in the process of purchase price allocation is not as binary as many of the accounting choices that have been investigated in earlier studies. Due to this and the lack of prior studies on this particular accounting issue, this part of the literature review is partially based on more general research within the field, rather than only specific studies on purchase price allocation. The central issue is choices between income-increasing and non-income increasing accounting methods.

2.4.1 Efficient Contracting

Under the efficient contracting perspective, the firm chooses accounting methods that minimize agency costs incurred towards its stakeholders. Multiple external stakeholders can be identified in a firm, for example shareholders, debt holders and institutions. The efficient contracting perspective is largely built on agency theory. As stakeholders have their self-interest at stake with the company, they are likely to incur monitoring costs in order to ensure the agent (management) acts in their best interests. The financial statements are arguably the main outlets of company-specific financial information. Watts (1977) points out that the financial statement has a pivotal role in the agency relationships between the firm and its stakeholders and that accounting choices could thus be explained by these relationships. This study will focus on two of the most common efficient contracting hypotheses within the accounting choice literature, namely leverage (sometimes referred to as the debt-equity hypothesis) and political costs (or political visibility).

The rationale behind the leverage hypothesis is that firms with high leverage are on average closer to violating debt covenants in contracts with debt holders, thus have greater incentives to make income-increasing accounting choices. Dichev and Skinner (2002) studied a large sample of firms and their leverage ratios in relation to terms stated in their debt contracts. They found a suspicious distribution where relatively few firms reported ratios just below the stated terms and relatively many just above the requirements, indicating that managers are likely to use accounting discretion to avoid violating covenants. Several studies have found indications of such behavior concerning different accounting choices (Whittred, 1987; Mian and Smith, 1990; Hand and Skantz, 1998) Additionally, Godfrey and Koh (2009) found a negative association between

goodwill impairments and leverage in American companies during the first years after the implementation of SFAS 142. This means that firms with higher leverage were less likely to make goodwill impairments and the impairments they made were smaller in size.

The extent to which choices between different accounting methods impacts monitoring costs related to debt holders has been noted as restricted at times. For example, the occurrence of specific terms written in contracts that clearly define how covenants and interest coverage ratios should be measured are common (Leftwich, 1983; Whittred and Zimmer, 1986), which indicates that the importance of the financial statement for this particular purpose can be questioned. Especially relevant to this study is that goodwill is often ignored when leverage is calculated in debt contracts (Bugeja and Loyeung, 2015; Leftwich 1983; Rehnberg, 2012). Still, James et al. (2011) studied the allocation process in Australian business combinations in regards to goodwill and identifiable intangible assets and found that firms with more debt allocated more to goodwill. However, in the context of that study the subsequent accounting treatment for goodwill was yearly amortization, while the treatment of intangibles was unregulated. This means that allocation to intangible assets was potentially a more earnings-increasing alternative. Bugeja and Loyeung (2015) found the same relationship when studying Australian acquisitions subject to the same regulations. In the later study, the proportion allocated to identifiable intangible assets was also studied, but its relationship with leverage was insignificant.

The argument for the political cost hypothesis is that firms with high political visibility are more prone to be under scrutiny from consumers, employees, unions and politicians. If the firm upsets these groups, wealth can be taxed away from the firm (Holthausen and Leftwich, 1983). Thus, these firms are predicted to have greater incentives to avoid income increasing accounting choices as their political costs associated with such reporting is likely to be higher. Political cost (or political visibility) is usually proxied as a measure of the reporting firm's size. Skinner (1993) found that larger firms were more likely to make income-decreasing accounting choices relating to depreciations and inventory valuation. Additionally, goodwill impairments in American companies was found to be more likely in larger companies during the first years after the implementation of SFAS 142 (Godfrey and Koh, 2009). Further, large firms within the oil industry have been found to choose a more conservative method when they capitalized exploration costs (Malmquist, 1990). Relating more specifically to accounting choices in business combinations, Bugeja and Loyeung (2015) argue that large acquisitions will lead to greater media attention, thus the acquiring firm is likely to put greater effort into the allocation process in order to correctly identify the assets of the target firm. James et al. (2011) looked at purchase price allocation to goodwill and intangibles when goodwill was amortized and accounting for intangibles was unregulated. They found no association between firm size and the allocation to identifiable intangible assets, but a positive relationship with goodwill allocation. All these

findings indicate that firms proxied with higher political visibility are less likely to choose the most earnings-increasing alternative.

2.4.2 Information Signaling

Under the information signaling perspective, the assumption is that investors only respond to reported accounting numbers since this is the only costless financial information that can be obtained (Holthausen and Leftwich, 1983). Financial information is thus provided to illustrate management's expectations about future performance. Managers have the opportunity to utilize the flexibility in US GAAP to improve faithful representation and predictive usefulness of the reported numbers (Badertscher et al., 2012). Under this view, reported numbers have no effect on firms' cash flows but are instead provided in order to signal less informed stakeholders (Holthausen, 1990).

Hand and Skantz (1998) found a positive relationship between choosing to book equity carve-outs to income and unexpected future earnings, as opposed to reporting the gain directly in equity. This is argued to be in line with the information signaling perspective as it could be seen as a way for managers to indicate their expectation of positive future cash flows through the current earnings number, rather than "hiding" it directly in equity. Within the information signaling perspective, it is common to measure investment opportunity sets (IOSs). They are measures of the expected growth opportunities of the firm, that can be seen as a proxy for management's expectations of future cash flows. Skinner (1993) uses a number of different measures of the IOSs, for example, assets-in-place (PP&E divided by market value), where a higher ratio indicates a lower IOS. Further, he measures R&D expenses divided by net sales as an additional proxy. Using these proxies, he finds IOSs to be positively associated with three different income-increasing accounting choices.

James et al. (2011) studied the identification of intangible assets during business combinations in Australian companies. Again, this was under the context when subsequent treatment of identifiable intangible assets was unregulated and goodwill was subject to yearly amortizations. Thus, if management would want to signal better future cash flows they could identify more intangible assets as there were no requirement to amortize such assets. The information signaling hypothesis was investigated using both the acquiring and the target firms' IOSs. The recognition of identifiable intangible assets was positively related with the IOSs of the target firms, indicating that managers might use the allocation of purchase price in business combinations to signal expectations of future cash flows (James et al., 2011).

For the purpose of this study, the information signaling hypothesis has to be put into the context of the regulations in place for US companies. Contrary to the context in which James et al.'s (2011) study, US GAAP requires systematic amortization of finite lived intangible assets and yearly impairment tests of goodwill and indefinite lived intangible assets. From this perspective, allocation to goodwill and intangibles that are not amortized gives management more discretion to signal future expectations, rather than allocation to intangible assets subject to amortization. This notion is strengthened by Godfrey and Koh (2009), as they found that goodwill impairments in American companies were negatively associated with IOSs, indicating that firms with expectations of greater future cash flows make goodwill impairments to a lesser extent.

3 Hypothesis Development

In this chapter, a number of hypotheses related to the likelihood of purchase price allocation to SCRs in business combinations are presented. The underlying issue is that SCRs are key value drivers of firms today and should be accounted for in business combinations in accordance with SFAS 141. To study the probability of recognition, we have identified three perspectives. First of all, the existence of SCRs varies among firms. All firms may not have valuable SCRs depending on aspects discussed in Chapter 2. Secondly, firms may fail to identify the SCRs, even if they are present in the target firm. This could either be due to the complexity involved in the valuation process as discussed in section 2.3.2, or the asset being too similar to another intangible asset. Thirdly, if close SCRs exist in the firm, management can use its discretion in recognition and valuation to affect subsequent earnings.

3.1 Target Firm Characteristics

Close relationships enable firms to access economies of scale and scope more efficiently than they could through arm's-length transactions (Håkansson and Snehota, 1995, p. 385). Galbreath (2002) argues that automated and efficiently managed supplier relationships leads to better forecasting and lower required inventory levels. Cojohari (2014) states that strategic alliances lead to improved speed of delivery, which in theory also should lead to lower required inventory levels. If close supplier relationships exist, this could also mean that the incentive for the firm to internalize operations is smaller. In this way, the balance sheet of the firm will be smaller compared to a more integrated firm, as the relationships are likely to be internally generated and not recognized. These notions lead to the conclusion that firms with valuable SCRs are likely to be more efficient than firms without valuable SCRs. As a firm's asset turnover ratio is an

indicator of asset efficiency, firms with close SCRs are likely to have higher asset turnover ratios, holding everything else constant. Therefore, we hypothesize that:

H1: When the target firm has a higher asset turnover ratio prior to the acquisition, the probability of purchase price allocation to SCRs is higher.

Deep involvement with suppliers has been found to bring multiple benefits for the buying firm. Carr and Pearson (1999) establish the link between strategically managed long-term supplier relationships and the financial performance of the buying firm. Nilsson (2003) argues that direct material costs are usually substantial in producing firms and that working closely with suppliers can help bringing such costs down. Agndal and Nilsson (2010) indicate that different levels of information sharing in supplier-buyer interactions might vary with different kinds of relationships, but in either case such inter-organizational information sharing should lead to either cost reductions or improved product quality. Similar results are found by Primo and Amundson (2002) and Ragatz et al. (2002) when it comes to supplier involvement in new product development. In terms of customer relationships, Forbes (2007) states that existing customer relationships enables significantly lower marketing costs without decreasing revenues. All in all, these notions lead to the reasoning that higher profit margin in the target firm could be a sign of more valuable SCRs. Firms could either work with suppliers to decrease costs in the supply chain or to improve product or service quality to be able to increase sales prices. Additionally, in terms of customer relationships, lower spending on marketing would naturally lead to lower costs. Thus, we hypothesize:

H2: When the target firm has a higher profit margin prior to the acquisition, the probability of purchase price allocation to SCRs is higher.

Previous literature has highlighted the increased need of buyer-supplier cooperation in high-technology industries (De Ruyter et al., 2001; Hallén et al., 1991; Primo and Amundsen, 2002). This is motivated by the large costs expected to be associated with switching suppliers, when products or services are specific and advanced. Additionally, the importance of various intangible assets has been found to vary across different industries (Castedello and Klingbeil, 2010). Due to the nature of the business environment and business models across industries, varying amounts of intangible assets are likely to exist. In industries as, for example, manufacturing, services and transportation SCRs are likely to be of higher importance (Castedello and Klingbeil, 2010). However, it is important to note that a different industry level aggregation is used in this study compared to Castedello and Klingbeil's (2010) study. Therefore, speculating in detail about in which industries firms are more or less likely to carry SCRs is difficult. Still, it is of interest to investigate possible differences within these broadly defined industries. Thus, we hypothesize:

H3: The probability of purchase price allocation to SCRs is (a) higher when the target firm operates in a high-technology industry and (b) varies with the main industry group of the target firm.

3.2 Acquiring firm's ability to identify SCRs

Identifying intangible assets in business combinations has been argued to be a challenging process due to the lack of tangibility and quoted prices (Castedello and Klingbeil, 2010; Grant Thornton, 2008). To comply with the accounting requirements of fair value estimates, the acquirer has to undertake valuation exercises that are often difficult and costly. Failure to identify intangible assets leads to a higher proportion of the purchase price allocated to goodwill and if goodwill is too large there might be reason to criticize the allocation process (Grant Thornton, 2008). Bugeja and Loyeung (2015) argue that when the acquisition is relatively large, the firm will put more effort into accurately identifying intangible assets. While the regulations under their study made the authors reason that this should lead to a higher goodwill allocation, it would in the context of this study mean a greater likelihood of SCR allocation. The reasoning is that allocation to identifiable intangible assets should present a more accurate picture of the acquisition, than large goodwill allocations. Considering costs versus benefits, we argue that efforts to accurately identify acquired assets might be more focused to larger acquisitions than smaller and therefore more intangible assets relating to SCRs are likely to be identified. Thus, we hypothesize:

H4: When the acquisition is large in relation to the size of the acquiring firm, the probability of purchase price allocation to SCRs is higher.

It is of interest to investigate whether the accounting regulations influence the likelihood of SCR allocation. SFAS 141, which was implemented in July 2001, changed the accounting for business combinations quite significantly from the former Opinion 16. As with any major change, it could take time for practitioners to fully understand and properly apply the standard. Thereby, there could be a learning curve for practitioners, meaning that they should get better at application over time. Further, a revised version of the standard was implemented in December 2008, which is argued to provide more direct guidelines on how to identify and value intangible assets (SFAS 141, 2007). Therefore, we predict that firms are better at identifying intangible assets relating to SCRs in the years following the implementation of the revised standard (2009-2011), compared to the years before (2001-2008). We hypothesize:

H5: The probability of purchase price allocation to SCRs is higher after the implementation of SFAS 141r.

To correctly identify and recognize the intangible assets within a business combination, it is argued that good industry knowledge is required (Castedello and Klingbeil, 2010). When the acquirer operates in the same industry as the target firm, the firm is likely to have better knowledge of what creates value in the specific industry. Thereby, the firm would be likely to be better at accurately identifying and valuing relationships. Bugeja and Loyeung (2015) found a negative relationship between goodwill allocation and target firms operating in the same industry as the acquirer, although the variable was used as a proxy for synergistic acquisitions. Still, this indicates that there could be more identified intangible assets when the target firm operates in the same industry. However, it could also be argued that a possible aim of business combinations is to reach new markets. If so, it is likely that the very purpose of the acquisition is to attain the supply channels and customer relationships on the new market. Thus, SCRs are more likely to be identified in business combinations of target firms operating in different industries than the acquirer. The same reasoning could also be applied to target firms having their main operations in another country than the acquiring firm. Therefore, a non directional relationship is hypothesized;

H6: The probability of purchase price allocation to SCRs varies depending on whether or not the target firm has its main operations in (a) a different industry and (b) a different country than the acquirer.

3.3 Association with Other Identifiable Intangible Assets

SFAS 141r aims to facilitate the allocation process in business combinations and should result in more accurate recognition of intangible assets, closer to the financial reality. We reason that companies that recognize a large proportion of the purchase price to intangible assets are likely to be relatively better at identifying intangible assets in general, including SCRs. Thus, the probability of them recognizing SCRs might increase if other intangible assets are recognized. There is also the possibility of a crowding-out effect. If that is the case, the part of the amount that could have been allocated to SCRs is instead allocated to another intangible asset similar in nature to SCRs. For example, Forbes (2007) discusses the common features of brand values and customer relationships and that separating them is might be difficult. This would, contradictory to the first reasoning, indicate a negative relationship between the recognition of SCRs and recognition of other identifiable intangible assets (OIIA). Therefore, we hypothesize:

H7: The probability of purchase price allocation to SCRs varies with the allocation to other identifiable intangible assets.

3.4 Accounting Choice Hypotheses

While previous studies often focus on the choice between one income-increasing and one non-income increasing alternative, it is more problematic to make such straightforward categorizations on the accounting choices of purchase price allocation. Given the direction of fair value measurements, the choices in purchase price allocation are not as binary since the allocation items and the sizes of the allocations can be numerous. For example, if a company fails to identify SCRs, it can be questioned whether the amount that should have been allocated is instead allocated to another identifiable assets or goodwill. If the amount is included in goodwill (or an intangible asset with indefinite lifetime), the subsequent accounting treatment will differ compared to if the SCR had been identified correctly. However, if it instead is allocated to another intangible asset with a finite lifetime the subsequent accounting treatment could be similar, depending on the assigned useful life. Thus, it would be problematic to, for example, conclude that the political costs hypothesis can be confirmed by merely identifying a positive relationship between the allocation to SCRs and firm size without controlling for the allocation to OIIA. The rejection criterion for the null-hypotheses based on the accounting choice literature (H8-H11) is therefore that the relationship holds when the size of the allocation to OIIA is controlled for. The underlying assumption applied for the accounting choice hypotheses in the interchange between the allocation of purchase price to SCRs and allocation to goodwill.

3.4.1 Efficient Contracting Hypotheses

One commonly studied ratio within the efficient contracting perspective of accounting choice is leverage. Dichev and Skinner (2002) illustrated a suspicious distribution of firms reporting leverage rates just below contra just above required leverage ratios in debt holder contracts, indicating that managers use their discretion in accounting choices to avoid violations of the required ratios. Additionally, studies have found positive relationships between firm leverage and specific earnings-increasing accounting choices (e.g. Mian and Smith, 1990; Hand and Skantz, 1998; Godfrey and Koh, 2009). In terms of the specific accounting choice in allocation of purchase price to SCRs, it is difficult to predict a sign of the relationship. Even if allocation to goodwill rather than identifiable intangible assets is the potentially most income increasing alternative, due to subsequent accounting treatment, the goodwill post is often ignored in calculations of debt covenants (Bugeja and Loyeung, 2015; Leftwich 1983; Rehnberg, 2012). Still, both Bugeja and Loyeung (2015) and James et al. (2011) found that leverage was positively related to goodwill allocation. If goodwill indeed is ignored in these calculations, it could mean that firms with high leverage would rather allocate the identified amount to SCRs. However, if it is not, they would prefer goodwill allocation. Due to these conflicting theories, we hypothesize:

H8: The probability of purchase price allocation to SCRs varies with the leverage of the acquiring firm.

The relationship between political costs and accounting choices is commonly studied as well. Political costs represent the hypothetical costs that could be taxed away from the company by stakeholders, for example legal institutions, if they account wrongfully. Watts (1977) argues that large firms have higher political costs than smaller firms, as they are more closely monitored by different institutions. For example, Skinner (1993) finds a negative relationship between firm size and income increasing accounting choices relating to depreciation and inventory valuation. Godfrey and Koh (2009) found that large firms were more prone to make goodwill impairments than smaller firms, presumably in order to avoid political pressure. Additionally, James et al. (2011) find a positive relationship between firm size and purchase price allocation to goodwill in an environment where the subsequent accounting for goodwill offers less discretion than subsequent accounting for identifiable intangible assets. We consider allocation to goodwill rather than SCRs to be the income maximizing accounting choice in this context and since the political cost hypothesis indicates that larger firms avoid the most income-increasing choice, we hypothesize:

H9: Larger acquiring firms are more likely to allocate a proportion of the purchase price to SCRs.

3.4.2 Information signaling hypotheses

The information signaling perspective is highlighted in the literature as relevant if managers use reported accounting numbers as a way to disclose their expectations of future cash flows (Holthausen and Leftwich, 1983; Holthausen, 1990; Badertscher et al., 2012). James et al. (2011) indicated that in a context where goodwill was amortized and subsequent accounting for identifiable intangible assets was unregulated, the higher the IOS of the target firm, the more was allocated to identifiable intangible assets and less to goodwill. The rationale is that firms that expect higher future cash flows can avoid future charges by allocating a higher proportion of the purchase price to a balance sheet item that enables more accounting discretion. Skinner (1993) uses a number of proxies to measure the IOS of firms, for example the ratio of assets-in-place to market value and finds that high IOSs are associated with income increasing accounting choices. Godfrey and Koh (2009) found that impairments of goodwill were negatively related to the firm's IOS, offering further support to the notion that the accounting discretion can be used to signal management's expectations. Under the regulations in place in the context of this study, these findings would indicate that allocating a relatively larger proportion of the purchasing price to goodwill rather than to identifiable intangible assets allows managers to better signal their cash flow expectations in future periods.

We argue that the strength of the acquiring firm's belief in the future financial performance can be proxied as the purchase price divided by the total assets in the target firm prior to the acquisition. With the information signaling way of reasoning, the higher this ratio is, the more of the purchase price should be allocated to goodwill in order to enable the acquiring company to avoid future charges. Furthermore, this measure could be high if the value of the target firm mainly consists of internally generated intangible assets which are unrecognized prior to the acquisition. In such a case, the acquirer might allocate a larger proportion of the purchase price to both goodwill and intangible assets, including SCRs. With these differing ways of reasoning, a directional hypothesis is not suitable and we hypothesize;

H10: The probability of purchase price allocation to SCRs differs with the ratio of purchase price to target firm's total assets prior to the acquisition.

Hand and Skantz (1998) found a positive relationship between unexpected future earnings and choosing a more income-increasing accounting method. Thus, reasoning from the accounting choice literature suggests that firms could allocate a relatively larger proportion of the purchase price to goodwill rather than to identifiable intangible assets in order to signal expectation of favorable future performance. In this way, they can use the future discretion to reflect the actual performance of the firm. At the same time, literature from the marketing field has stressed the importance of valuing SCRs in order to manage them better (Gupta and Lehmann, 2003; Forbes, 2007; Galbreath, 2002). Additionally, SCRs are key value drivers (Castedello and Klingbeil, 2010) why it is important to provide information regarding these assets to increase the usefulness and faithful representation of the financial information provided to the users. Thus, recognizing SCRs would in itself be a way to signal future performance in a more transparent way than a relatively larger allocation of purchase price to goodwill. Although it is difficult to measure management's expectations about future cash flows, how the cash flows actually turned out could be another proxy for this. Therefore, the association between allocation to SCRs and the future cash flows of the acquiring firm is tested and we hypothesize:

H11: The probability of purchase price allocation to SCRs varies with the future operating cash flows of the acquiring firm.

3.5 Summary of Hypotheses

All hypotheses, their expected sign and the name of the variable related to it, are summarized in Table 1.

Table 1 - Summary of hypotheses

	Key word	Hypothesis	Exp Sign	Var. name
Target Firm Characteristics	Asset turnover ratio	H1	+	LN_ATR_T
	Profit margin	H2	+	$Margin_T$
	High or low tech	H3a	+	$HighTech_T$
	Industry group	H3b	?	$Industry_T$
Acquirer's ability to identify SCRs	Relative size of acquisition	H4	+	$LN_RelSize_A$
	After revised standard	H5	+	$SFAS141r$
	Different industry groups	H6a	?	$DiffIndustry$
	Different countries	H6b	?	$DiffCountry$
Relationship with OIIA	OIIA	H7	?	$OIIA$
Efficient Contracting	Leverage	H8	?	LEV_A
	Acquirer size	H9	+	LN_REV_A
Information Signaling	Relative size of acquisition to target firm total assets	H10	?	LN_PP/TA_A
	Future cash flow	H11	?	$FutureCF_A$

See Appendix A for variable definitions

4 Research Methodology

The purpose of this study is to provide a better understanding of what characterizes firms with valuable SCRs and when SCRs are recognized as intangible assets in business combinations. Due to the lack of previous empirical research concerning how firms account for SCRs under business combinations, we take an exploratory approach and investigate a wide set of hypotheses. The hypotheses are tested through logistic regression, based on a sample of 516 acquisitions by publicly traded American companies. This chapter describes and discusses the data sample, data collection, statistical tests and the research quality of the study.

4.1 Data Sample

All business combinations were identified through the M&A database *Zephyr*. From the same database, further details about the acquisitions such as acquisition date, purchase price, country code, industry code and financial information of the target firms were obtained. Financial information regarding the acquirer was obtained from the financial database *Compustat*. Lastly, additional details about the purchase price allocation was manually collected from the 10-K files of the acquiring firms, available through SEC's database *Edgar*.

Table 2 - Sample selection

The acquirer was listed at the time of the business combination	269947
The deal type was "Acquisition"	147096
The acquiring company's initial stake in the target firm prior to the acquisition was maximum 49.99% and final stake after the acquisition was minimum 50%	102155
The deal is completed and confirmed	67837
The deal was completed sometime between the 1st of July 2001 and the 31 st of December 2011	42581
The primary country of the acquiring firm was the US	14552
The minimum deal value was \$50 million	3661
<hr/>	
Acquisitions identified in <i>Zephyr</i>	3661
<hr/>	
<i>Less:</i> Acquirer or Target operates in Finance industry	(775)
<i>Less:</i> Observations with missing data in <i>Zephyr</i> and <i>Compustat</i>	(2093)
<i>Less:</i> Observations with missing data for dependent variable	(274)
<i>Less:</i> Target firm in Agricultural industry, too few observations	(3)
<hr/>	
Final sample	516

The sample selection was made with the constraints described in Table 2. We look at publicly traded American companies for two main reasons. First of all, they report under US GAAP which is one of the two most globally influential sets of accounting standards of today. Secondly, 10-K documents are readily available through *Edgar*, which made the manual data collection feasible. Another prerequisite was that the acquisition was completed and confirmed between the 1st of July 2001, the effective date for mandatory application of SFAS 141, and 31st of December 2011. As data from three subsequent years after the acquisition date was needed to compute some of the independent variables, 2011 was the last possible year. From the 3,661 acquisitions identified in *Zephyr*, 775 observations where either the acquirer or target firm were banks and financial institutions were excluded due to their significant difference in financial structure. 793 acquisitions remained after removing observations where all the necessary data could not be obtained. In the manual data collection of purchase price allocation, further observations were dropped in cases where sufficient data was not disclosed. Some acquisitions were not mentioned while others were mentioned but described as insignificant, or only mentioned in terms of target firm name and purchase price. After reviewing the data of the 519 remaining acquisitions, only three acquisitions from the agriculture industry remained, thus these were removed. The final sample consisted of 516 acquisitions. Out of these observations, 366 allocated a proportion of the purchase price to SCRs, while 150 did not. Customer related intangible assets were identified in 345 acquisitions, while supplier related intangible assets were identified in 65 acquisitions.

The industries of this study have been classified by the Standard Industrial Classification (SIC) codes. The SIC codes are four-digit numbers, where the first two numbers identify the major industry group, the third indicates the industry group and the last identifies the industry. The acquisitions of this study are categorized into industries by the major industry group (first two digits). Given the sample size, this is the most detailed level at which it is feasible to categorize the observations in order to obtain any valid statistical results. See Appendix B for details of the different industry groups. Additionally, the firms have been categorized as high-technology or low-technology based on 3-digit SIC codes, in accordance with the recommendations given by Kile & Phillips (2009). This classification of high-technology industry groups is illustrated in Appendix B.

4.2 Manual Data Collection

The dependent variable in the study is a dummy variable indicating whether any allocation was made to SCRs in the business combination. There are no requirements in SFAS 141 regarding how identified intangibles should be named. Therefore, a wide range of different intangible-names had to be considered. Continuously, we have used insights from previous literature and our judgment to determine which identified intangible assets to include as SCRs intangibles.

SFAS 141 discusses how intangible assets regarding both a specific contract, as well as the related relationship, can be recognized. However, it can be difficult to make the distinction between the two. We have taken a broad view and include assets related to SCRs but not explicitly named relationships. As discussed in 2.1, relationships are built over time by short-term exchanges. Therefore, contracts can be seen as proxies of these exchanges and even if they might not measure the complete value of the relationship in the long term, such contracts are still signs that the relationship exists. Supply contracts are explicitly exemplified under the contract related category in SFAS 141, but there are also other items given as suggestions under the contract category that relate to supplier relationships. Examples of contracts that were found in the data collection and subsequently included are supply agreements, contracts, contractual relationships, product distribution networks, transportation agreements, raw material supply contracts and service agreements. The majority relate to some form of contract with suppliers which we reason should lower the firm's costs or improve the product or service offering. Further, assets which represented the exclusive right for a firm to operate on a certain market were excluded. The reason is that such assets have been assessed to be closer to brands in nature. Therefore, assets such as favorable leaseholds were included as supplier relationships, while licenses and franchise rights were excluded.

As discussed in section 2.3, there are more detailed guidelines on identification of customer related intangible assets. The standard has a separate category for them and most of the identified assets had similar names to the suggestions in the standard. Examples are customer relationships, customer contracts, order backlogs and customer lists. Customer lists constitute information about customers which can be used in the future business, regardless of the nature of the customer. Therefore, these are likely to contain information about both buying firms and individual consumers. Relationships with individual consumers are not commonly discussed in relationship literature. However, we argue that customer lists are still a representation of customer relationships, regardless if they constitute more detailed information about fewer customers or less detailed information about more transactional customers. A list of intangible assets categorized as SCRs in our sample is provided in Appendix C.

4.3 Research Design

The hypotheses are based on the research question concerning what factors that affect the probability of purchase price allocation to SCRs during business combinations. To test the hypotheses, a logistic regression model is used where the dependent variable indicator variable denoting whether any allocation has been made to intangible assets related to SCRs. The model is appropriate to test the stated hypotheses since they relate to the probability of allocation.

In terms of the independent variables, the distribution of all continuous variables have been examined and windzORIZED when needed, in order to mitigate the problem of outliers. The variables representing LN_REV_A , LN_PP/TA_T , LN_ATR_T and $LN_RelSize_A$ are all expressed as their natural logarithms due to positively skewed distributions. Model 1 (i.e. before stepwise variable selection is applied) is expressed:

$$\ln \left(\frac{p_{SCR}}{1 - p_{SCR}} \right) = \quad (1)$$

$$\begin{aligned} & \beta_0 + \beta_1 LN_ATR_T + \beta_2 Margin_T + \beta_3 Hightech_T + \beta_4 Industry_T + \beta_5 LN_RelSize_A \\ & + \beta_6 SFAS141r + \beta_7 DiffIndustry + \beta_8 DiffCountry + \beta_9 OIIA + \beta_{10} LEV_A \\ & + \beta_{11} LN_REV_A + \beta_{12} LN_PP/TA_T + \beta_{13} FutureCF_A \end{aligned}$$

Where,

p_{SCR}	=	the probability of purchase price allocation to SCR
SCR	=	an indicator variable denoting acquisitions in which purchase price allocation to SCRs was made
A	=	acquiring firm
T	=	target firm
LN_ATR_T	=	the asset turnover ratio of the target firm during the last financial year prior to the acquisition
$Margin_T$	=	the post-tax profit margin of the target firm in the last financial year prior to the acquisition
$Hightech_T$	=	an indicator variable denoting if the target firm operates in a high-technology industry
$Industry_T$	=	a set of indicator variables denoting which main industry group the target firm operates in
$LN_RelSize_A$	=	the natural logarithm of the purchase price divided by the market value of the acquiring firm at the end of the last financial year prior to the acquisition
$SFAS141r$	=	an indicator variable denoting if the acquisition was finalized during 2008-2011

<i>DiffIndustry</i>	=	an indicator variable denoting if the target firm operates in a different industry than the acquiring firm
<i>DiffCountry</i>	=	an indicator variable denoting if the target firm has its main operations in a different country than the acquiring firm
<i>OIIA</i>	=	the proportion of purchase price allocation to other identifiable intangible assets (excluding SCRs) to the total assets
<i>LEV_A</i>	=	the debt-to-equity ratio of the acquiring firm at the end of the last financial year prior to the acquisition
<i>LN_REV_A</i>	=	the natural logarithm of the acquiring firm's revenue, in thousands of dollars, at the end of the last financial year prior to the acquisition
<i>LN_PP/TA_T</i>	=	the natural logarithm of the purchase price divided by total assets of the target firm at the end of the last financial year prior to the acquisition
<i>FutureCF_A</i>	=	the average of operating cash flows divided by total assets of the acquiring firm during the three financial years following the acquisition

A wide range of variables are tested in relation to the probability of allocation of purchase price to SCRs. Thus, there could be a risk of model overfitting. In order to strengthen the robustness of the findings, we test a second model obtained through stepwise variable selection. While stepwise variable selection methods have been criticized by researchers for being flawed (e.g. Thompson, 1995; Leigh, 1988), it is used in this study as a complement to the full model in order to see if the significance or direction of any variables materially change when only variables with lower p-values are included in the model. Both forward and backwards stepwise variable selection methods were used, with a significance level for both removal and addition to the model of $p = 0.15$. Both methods yield the same variable selection, meaning that Model 2 excludes the insignificant variables LN_ATR_T , $LN_RelSize_A$, $DiffCountry$, LEV_A and LN_REV_A . Worth noting is that even if some of the industry dummies would have been excluded solely based on the inclusion criteria, removing them would cause observations from those industries to be considered part of the control group (manufacturing firms). As this would have made the model faulty, all industry dummies are included. Model 2¹ is expressed:

$$\ln \left(\frac{p_{SCR}}{1 - p_{SCR}} \right) = \quad (2)$$

$$\beta_0 + \beta_1 MARGIN_T + \beta_2 Hightech_T + \beta_3 Industry_T + \beta_4 SFAS141r + \beta_5 DiffIndustry + \beta_6 OIIA + \beta_7 LN_PP/TA_T + \beta_8 FutureCF_A$$

¹ The variable definitions are the same as Model 1

4.4 Research Quality and Limitations

The relevance of this study is motivated by the lack of quantitative research concerning SCRs recognition. However, the lack of literature also means that it is difficult to develop appropriate hypotheses and to predict the signs of the relationships. Rather than financial accounting studies on SCRs, the reasoning is largely based on marketing and management accounting literature about the value of these relationships and accounting choice literature investigating other accounting choices. This means that some of the hypotheses that have been developed stem from literature that relates more generally to purchase price allocation to identifiable intangible assets and goodwill.

As discussed above, in terms of accounting choices, the process of purchase price allocation is not a simple binary choice as the case is in many other studies (e.g. Whittred, 1987; Mian and Smith, 1990; Malmquist, 1990; Hand and Skantz, 1998). Non-allocation to SCRs could either mean that no valuable SCRs exist in the target firm, the firm has failed to identify existing SCRs, or that managers use their discretion to allocate the amount that should have been allocated to SCRs to some other item instead. In this study, the allocation to identified intangible assets other than SCRs is controlled for. Further, the assumption concerning the accounting choice hypotheses is that significant variables are indications of managers using their discretion to allocate (or not to allocate) to either goodwill or SCRs. We do not investigate whether managers use accounting incentives in connection to allocation to OIIAs. An example of this is if an amount that in theory should have been allocated to SCRs is instead allocated to brands or trademarks, which are assets that may be considered to have indefinite useful lives. In that case, the subsequent accounting treatment is largely the same as the subsequent treatment of goodwill. The reason why this is not controlled for in this study is that while gathering the data, we discovered that detailed information regarding amortization periods for the various posts of intangibles was not always given. Thus, including such data would have severely limited the sample size. This means that conclusions regarding choices made due to accounting incentives only apply to the interchange between SCR allocation and goodwill allocation.

The hypotheses that relate to the characteristics of the target firm have partially been limited by the availability of data. If the criterion had been that the target firm had to be publicly traded prior to the acquisition, more financial data would have been available. However, as this would severely limit the sample size, the choice was made to include non-public targets as well. The proxies used for measuring the likelihood of SCR allocation have to our knowledge not been used prior in the literature for this purpose. Therefore, the findings from an exploratory study as this one could be useful for hypothesis development in future studies.

Drawing strict conclusions about the *SFAS141r* variable could be problematic, since the implementation of the revised standard partially coincided with the global financial crisis. When examining the collected data on purchase price allocation, it was found that the average percentual allocation to goodwill was lower during the period 2009-2011, compared to 2001-2008². This means that a positive coefficient on the *SFAS141r* variable could be a reflection of companies allocating less to goodwill and more to identifiable intangible assets after the crisis and not only a sign that the revised standard has fulfilled its purpose. The effect of the financial crisis is difficult to control for as the *SFAS141r* variable could be seen as a near proxy of the financial crisis as well. Controlling for time-fixed effects is not possible due to multicollinearity issues. What can be measured with the variable is thus mainly if firms were more or less likely to make an SCRs allocation during the period 2009-2011, while strict conclusions as to causes of this are more problematic to draw. An attempt is made to control for the effect of the size of the goodwill allocation in section 5.5.3 where additional analysis is conducted.

It is important to note that when a continuous variable is coded to be dichotomous, a lot of information is lost in terms of the size. In this case, our dependent variable only measures whether or not an SCR allocation was made, but ignores the size of the allocation. Conducting tests on a dependent variable measuring the size of the allocation is problematic, since the distribution of the variable in relative terms to the total assets acquired is highly skewed with 29% of the observations taking on the value of 0. We also conducted other tests where the size of the allocation is measured in the dependent variable and the outcomes of these tests are discussed in section 5.3.

For statistical robustness purposes, a larger sample of business combinations would have been of interest to investigate. As detailed data about purchase price allocation is not readily available through financial databases, the data had to be collected manually from 10-K files. Thus, a larger sample than the one used was considered unfeasible within the scope of this study. Still, a sample of several hundred observations has the potential to offer valid outcomes. Peng et al. (2002) argues that the literature does not prescribe any specific rule for the observations-to-predictors ratio in order to avoid overfitting. In any case, both of our models fulfill the commonly recommended 10-to-1 ratio by some margin.

² The average ratio of allocated goodwill to total assets acquired for the period 2001-2008 was 0.412, while the average in 2009-2011 was 0.387. However, a Mann-Whitney U-test indicates that the difference is not statistically significant.

5 Results

5.1 Descriptive Statistics

Table 3 illustrates descriptive statistics for the variables used in the study. The mean of the *SCR* variable shows the percentage of the observations which allocated to SCRs was 29%, as mentioned in the methodology section. Out of interest is that the mean of the *Margin_T* variable is negative, indicating that target firms on average had a negative profit margin during the last financial year prior to the business combination. The validity of this is strengthened that we collected a couple of different margin measures from *Zephyr* and all of them yield similar averages. There are a number of possible explanations for, one of which could be that the investigated time period covers the financial crisis. The mean of 0.461 on the *HighTech_T* variable shows that 46% if the observations are classified as high-technology. The means of *DiffIndustry* and *DiffCountry* illustrate that 23.1% percent of acquisitions were made of target firms in different main industries, and 51.7% percent of target firms in different main countries.

Table 3 - Descriptive Statistics

VARIABLES	N	mean	sd	min	max
SCR	516	0.709	0.455	0	1
LN_ATR _T	516	-0.386	1.056	-4.715	1.907
Margin _T	516	-0.0104	0.449	-1.747	0.755
HighTech _T	516	0.461	0.499	0	1
Mining	516	0.0736	0.261	0	1
Construction	516	0.0194	0.138	0	1
Transportation	516	0.107	0.309	0	1
Wholesale	516	0.0252	0.157	0	1
Retail	516	0.0426	0.202	0	1
Services	516	0.302	0.460	0	1
LN_RelSize _A	516	-1.865	1.469	-7.774	1.329
SFAS141r	516	0.324	0.468	0	1
DiffIndustry	516	0.231	0.422	0	1
DiffCountry	516	0.517	0.500	0	1
OIIA	516	0.118	0.132	0	0.891
LEV _A	516	1.346	1.375	0	7.142
LN_REV _A	516	7.834	1.780	2.470	12.53
LN_PPTA _T	516	0.736	0.949	-2.374	3.194
FutureCF _A	516	0.0338	0.0825	-0.370	0.277

Variable definitions are given in Appendix A

Table 4 shows the distribution of observations over the years studied. The year with most observations is 2011, during which 75 of the included business combinations were finished. The year with the fewest observations is 2001, with 17. Additionally, the data also shows that 2001 was the year in which the smallest proportion of acquisitions lead to SCR recognition, while 2008 and 2011 were the years with the highest proportion of allocation.

Table 4 - Distribution of observations by year

Year	Observations	SCR allocation	No SCR allocation	SCR allocation %
2001	17	4	13	23,5%
2002	37	16	21	43,2%
2003	33	20	13	60,6%
2004	44	31	13	70,5%
2005	49	38	11	77,6%
2006	66	52	14	78,8%
2007	58	45	13	77,6%
2008	45	36	9	80,0%
2009	29	21	8	72,4%
2010	63	43	20	68,3%
2011	75	60	15	80,0%
Total	516	366	150	70,9%

Table 5 illustrates the distribution of observations by the studied main industry groups of the target firms. The lowest number of observations come from the construction industry, while the industry groups with the most observations is manufacturing. In terms of frequency, the industry where the greatest proportion of business combinations which led to SCR allocation is the service industry, while the lowest proportion is found in the mining industry.

Table 5 - Distribution of observations by main industry group

Industry	N	Customer Relationship	Supplier Relationship	SCR allocation	No SCR allocation	SCR allocation %
Mining	38	7	2	8	30	21,10%
Construction	10	7	0	7	3	70,00%
Manufacturing	222	158	15	162	60	73,00%
Transportation	55	38	13	43	12	78,20%
Wholesale	13	8	1	8	5	61,50%
Retail	22	12	9	16	6	72,70%
Services	156	115	25	122	34	78,20%
Total	516	345	65	366	150	70,90%

5.2 Logistic Regression

The main tests of this study are the logistic regression models run in Table 6. The dependent variable *SCR* is a dummy variable taking on the value of 1 for all business combinations where some proportion of the purchase price was allocated to SCRs and 0 for non-allocating observations. In the sample, there are 150 observations taking on the value of 0 and 366 taking on the value of 1. As discussed in section 4.3, we run two logistic regression models. In Model 1, all independent variables in the study are included. In Model 2, the variables LN_ATR_T , $LN_RelSize_A$, $DiffCountry$, LEV_A and LN_REV_A are dropped after stepwise variable selection.

Appendix D includes a Spearman correlation matrix of the independent variables. The strongest significant correlation between any of the independent variables is -0.4025, which is not considered to cause any collinearity issues. Included in Appendix D is the VIFs of the independent variables in Model 1. The variable with the highest VIF is $LN_RelSize_A$, with a value of 1.41, which indicates low multicollinearity among the used independent variables.

Table 6 - Logistic regression results

VARIABLES	Hypothesis	Exp sign ³	Model 1		Model 2	
			Odds ratio	p-value	Odds ratio	p-value
SCR (Dependent)						
LN_ATR_T	H1	+	1.077 (0.127)	0.529		
$Margin_T$	H2	+	2.695*** (0.712)	0.000	2.947*** (0.776)	0.000
$HighTech_T$	H3a	+	1.736** (0.420)	0.022	1.635** (0.384)	0.037
$Mining_T$	H3b	?	0.0590*** (0.0285)	0.000	0.0530*** (0.0250)	0.000
$Construction_T$	H3b	?	0.645 (0.488)	0.563	0.720 (0.534)	0.658
$Transportation_T$	H3b	?	1.002 (0.404)	0.996	0.987 (0.386)	0.973
$Wholesale_T$	H3b	?	0.306* (0.200)	0.070	0.332* (0.213)	0.086
$Retail_T$	H3b	?	1.483 (0.809)	0.471	1.419 (0.755)	0.511
$Services_T$	H3b	?	1.160 (0.323)	0.594	1.133 (0.311)	0.650

The table continues on the next page

³ In logistic regressions, an odds ratio >1 indicates a positive relationship and <1 indicates a negative relationship

LN_RelSize _A	H4	+	1.015 (0.0881)	0.864		
SFAS141r	H5	+	1.946*** (0.466)	0.005	2.011*** (0.474)	0.003
DiffIndustry	H6a	?	2.482*** (0.767)	0.003	2.488*** (0.762)	0.003
DiffCountry	H6b	?	1.316 (0.296)	0.223		
OIIA	H7	?	0.0381*** (0.0361)	0.001	0.0362*** (0.0332)	0.000
LEV _a	H8	?	1.132 (0.107)	0.190		
LN_REV _A	H9	+	0.924 (0.0624)	0.244		
LN_PP/TA _T	H10	?	1.216 (0.151)	0.115	1.204 (0.148)	0.132
FutureCF _A	H11	?	0.0796 (0.123)	0.103	0.0509** (0.0734)	0.039
Constant			3.307** (1.831)	0.031	2.417*** (0.582)	0.000
Observations			516		516	
LR chi2 (df)			103.49 (18)	0.000	98.81 (13)	0.0000
McFadden's R2			0.1664		0.1588	
H-L chi2 (8)			2.85	0.9436	10.32	0.2431

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

See Appendix A for variable definitions

In relation to the tests, we performed specification link tests, which did not detect any model specification errors. Additionally, Hosmer and Lemeshow's goodness-of-fit tests were performed, which are illustrated in Table 6 ("H-L test"). These tests indicate an adequate model fit, as the null-hypotheses are not rejected.

As seen in Table 6, no signs of significant relationships at the 5% level are found for the variables LN_ATR_T , $LN_RelSize_A$, $DiffCountry$, LEV_A , LN_REV_A and LN_PP/TA_T , in either of the setups. This means that neither of the null-hypotheses relating to these variables can be rejected and that this study does not support any relationships between the variables and the likelihood of SCR allocation. However, a number of the variables included are significant. Barring one independent variable, the same variables are significant and with the same signs in both of the tests, which strengthens the statistical conclusion validity of the findings.

The significance of $Margin_T$ with the odds ratios 2.695 and 2.947 respectively indicates a positive relationship between profit margin of the target in the final year prior to the acquisition and the probability of SCR allocation. The $HighTech_T$ variable is significant with odds ratios of 1.736 and 1.635 respectively, indicating a greater probability of SCR allocation when the target firm was categorized as high-tech. Out of the other target industry variables, the only one significantly differing from the control group of manufacturing firms is $Mining$. The odds ratios are 0.0590 and 0.0530 respectively, indicating that when the target firm operates in the mining industry, the acquiring firm is less likely to allocate a proportion of the purchase price to SCRs. The $Wholesale$ variable is significant at the 10% level in both of the tests, but this is not considered sufficient for rejection of the null-hypothesis.

The odds ratios of 1.946 and 2.011 on the $SFAS141r$ variable indicates that acquiring firms are more likely to make a purchase price allocation to SCRs after the revised standard became effective at the end of 2008. The variable $DiffIndustry$ is significant with odds ratios of 2.471 and 2.505 respectively, indicating a greater probability of SCR allocation when acquiring and target firms operate in different main industries. $OIIA$ is significant and with odds ratios lower than 1 in both tests, which means a negative relationship between the allocation to OIIA and likelihood of SCR allocation. These findings suggest that there is a crowding-out effect with other intangible assets. $FutureCF_A$ is the only variable that is insignificant in Model 1 while significant in Model 2. It is also the only accounting choice variable that is significant in either of the models.

5.3 Robustness Test and Additional Analysis

5.3.1 Alternative Proxies

In order to ensure the validity of the proxies, we use alternative measures for some independent variables. For example, we have tested different variables relating to the efficient contracting perspective. Leverage has been measured as both total debt divided by equity (in the tests above), as well as total debt divided by total assets. For the political cost proxy, we have used a number of different size measures to complement the revenue variable used in the tests. These measures include total assets, total market capitalization and number of employees, all measured at the end of the last year prior to the acquisition. The same goes for the variable $LN_RelSize_A$. None of these tests have rendered any different results in terms of changing the significance or signs of any of the variables in the models, thus they are left untabulated.

5.3.2 Control for Goodwill Allocation

As discussed in section 4.4, the tendency to allocate a lower proportion to goodwill after the financial crisis could be a threat to the statistical conclusion validity when it comes to the variable *SFAS141r*. Therefore, an additional logistic regression was run in which the accounting choice variables were replaced with a variable measuring the percentual allocation to goodwill out of the total assets acquired. The results, which are tabulated in Appendix E, show that even when controlling for this effect, *SFAS141r* is significant and positive at the 1% level and the odds ratio is similar. These findings indicate that the whole increase in the probability of SCR allocation during the period 2009-2011 was not caused by the lower goodwill allocations after the financial crisis.

5.3.3 Alternative Regression Models

Originally, the aim was to use regression models where the dependent variable represented the size of the allocations. Prior research has used tobit regression models to test allocation of purchase price in business combinations (e.g. Wong and Wong, 2001; Zang, 2008; Bugeja and Loyeung, 2015). A tobit model is a censored regression model, which was used in our study to censor the zero-allocation observations. The idea is that the coefficient produced from the model takes into account both the likelihood of the observation being in the non-allocation group, as well as the size of the observations. The dependent variable in the model was the SCR allocation divided by the total assets acquired, expressed in the form of its natural logarithm. Stepwise variable selection was used for the the tobit models as well and the outcomes of the regressions turned out to be highly similar to the logistic models in terms of significance and signs. However, examination of residuals indicated signs of both non-normality and heteroscedasticity, thus the regression output is not further analyzed or tabulated.

An OLS regression model was run on the subsample of companies that made an allocation of purchase price to SCRs. The results were unconvincing as the only significant variable was *SFAS141r* and moreover the error terms showed signs of heteroscedasticity. Therefore, the results of the OLS regressions are also left untabulated. All in all, this study offers no insights in regards to the size of the allocations to SCRs.

6 Discussion

First of all, we note that SCRs were recognized in 70,9% of the studied business combinations. Customer relationships were recognized to a larger extent than supplier relationships, with 66,9% and 12,6% respectively. Despite the quite broad categorization of supplier related intangible assets in the data collection process, the extent of supplier related intangible assets are low. Given the importance of supplier relationships emphasized by prior literature (e.g. Gadde and Snehota, 2000; Carr and Pearson, 1999; Primo and Amundson, 2002; Ragatz and Handfield, 2002) and by practitioners (Castedello and Klingbeil, 2010), these findings in themselves are noteworthy. The importance given to supplier relationships in the literature does not seem to be reflected in business combinations. This could in itself be a sign that SFAS 141 does not sufficiently help companies to properly reflect their underlying economics in the financial statements.

6.1 Target Firm Characteristics

We have investigated a number of variables relating to the target firm which serve as proxies for the existence of relationships. Firms with valuable SCRs should be more efficient (Håkansson and Snehota, 1995, p. 385) and have lower required inventory levels (Galbreath, 2002; Cojohari, 2014). Thus, it was hypothesized that SCR allocation should be more likely in business combinations where the target firms had higher assets turnover ratios prior to the acquisition. However, the findings on the variable were unconvincing. A possible explanation is that the relationship might differ in different industries as asset levels could vary depending on business model in different industries. We decided not to control for this with interaction variables, due to the risk of model overfitting.

Another hypothesis concerned the relationship between allocation to SCRs and the profit margin of the target firm prior to the acquisition. Close involvement with suppliers is likely to lead to cost savings or product quality improvement (Agndal and Nilsson, 2010; Primo and Amundson, 2002; Ragatz et al., 2002) and an existing customer base and its associated relationships enables lower marketing budgets without losing revenues (Forbes 2007). All in all, firms with SCRs (whether recognized or unrecognized) should thus have lower operating costs than other firms. This indicates that a higher profit margin in the target firm prior to the acquisition increases the likelihood of the target firm carrying SCRs, that are recognized in the purchase price allocation process. Support for this hypothesis was found in both of the logistic models.

As expected, the results from the regression models indicated that allocation to SCRs was more likely when the target firm was classified as high-technology industry. This is in line with prior research on buyer-supplier relationships that emphasizes their importance in such settings (De Ruyter et al., 2001; Hallén et al., 1991; Primo and Amundson, 2002). In terms of industry differences, target firms in the manufacturing industry were used as the base group. The only industry variable that significantly differed from the control group was the mining industry. Holding everything else constant, mining firms are less likely to allocate a proportion of the purchase price to SCRs. This is consistent with the industry study by Castedello and Klingbeil (2010), which indicated that intangible assets in general are of lower importance in the mining industry. In terms of differences between the manufacturing industry and the other studied industries, the results were insignificant. If it had been feasible to attain a larger sample size it would have been possible to categorize industries on a more detailed level than the main industry group (2-digit SIC codes). Using only two digits, there is a risk that dissimilar firms are included within the same group, which makes it more difficult to identify patterns in the data. Thus, the limited findings of this study (other than the mining variable) does not mean that industry differences in recognition of SCRs is irrelevant to study.

6.2 Acquiring firm's ability to identify SCRs

We have investigated variables relating to characteristics of the transaction and how this would affect the ability of the acquiring firm to accurately identify SCRs. Castedello and Klingbeil (2010) and Grant Thornton (2008) discuss the complexity of the allocation process when performing business combinations and especially the identification of intangible assets. We argued that when an acquisition is relatively large in proportion to the size of the acquiring firm, the firm is likely to devote more resources and effort to the allocation process. It was hypothesized that SCRs are more likely to be identified in relatively large acquisitions than in smaller ones. However, no support for this hypothesis was found in the tests. Explanations for this are difficult to speculate about, but it could be that relatively larger acquisitions are primarily done for other reasons than to acquire the SCRs of the target firm and that such relationships might also be more difficult for the acquirer to observe and properly value when the target firm is relatively larger.

FASB issued a revised version of the standard SFAS 141 which became effective for acquisitions that were finished from 15th of December 2008. The revised version gives more detailed guidance on the allocation process and was supposed to better enable firms achieving more proper valuation of the various posts. It could also be argued that there is a learning effect, meaning that acquiring firms should become better at conducting the valuation process over time. Thus, it was hypothesized that SCR allocation should be more likely in acquisitions accounted for after

December 2008 and support for this was indeed found. As discussed in section 4.4, our main models do not make it possible to distinguish the possible effects that the financial crisis could have had on the variable. The additional analysis showed that the relationship still holds when controlling for the allocation to goodwill. Thus, it appears as if the increased likelihood of allocation to SCRs is not entirely caused by the possible decrease in goodwill allocation that might have been caused by the financial crisis. Therefore, it is concluded that holding everything else constant, acquiring firms were more likely to make an SCR allocation during the period 2009-2011. While it is difficult to say anything with certainty, this increased probability is likely to have been at least partially caused by the learnings effect and the revised standard.

Further, we hypothesized that the probability of allocation would differ depending on whether the acquiring and target firm operated in different industries and in different countries, respectively. The hypotheses were non-directional due to rivaling explanations: On one hand, acquiring firms might have more knowledge about firms operating in the same industry or in the same country (as argued by Castedello and Klingbeil, 2010), why they might be better at identifying separate intangibles. However, it could also be that one goal with acquisitions on different markets is to gain access to new customer bases or supply chains. For the country variable, no significant relationship was found, but the variable representing different industries indicated a significant positive relationship. This would offer support to the notion that one of the reasons for acquiring a firm in a separate industry is to gain access to that firm's SCRs.

6.3 Relationship with Other Identifiable Intangible Assets

One of the main interest throughout this study has been the interchange between the allocation of purchase price to SCRs and the allocation to OIIA or goodwill. Therefore, we hypothesized a relationship between the probability of SCR allocation and the size of the allocation to OIIAs. With one way of reasoning, the relationship could be positive, as the ability to successfully identify many intangible assets could also mean that the acquiring firm is on average better at identifying SCRs. However, it could also be negative in case the firm struggles with separating SCRs from other intangibles, as other intangibles could be similar in characteristics (as argued by Forbes, 2007). Our regressions found the later relationship, as the variable was significant and negative in both regression models. Thus, the results indicate more of a crowding-out effect of other intangible assets in the allocation process. These findings are interesting as it indicates that allocation or zero-allocation to SCRs is related to the allocation of OIIAs, which in many cases have similar subsequent accounting treatment as SCRs. Still, the subsequent effect on earnings can differ, depending on the useful lifetime assigned to the identified intangible assets.

6.4 Accounting Choice

The allocation of purchase price is a complex accounting issue which cannot simply be categorized into one earnings-maximizing alternative and one non-earnings maximizing. If an intangible asset is disregarded in the allocation process, the amount of the purchase price that should have been allocated to that asset could, as mentioned above, either end up as another identifiable intangible asset or alternatively in goodwill. While controlling for the percentual allocation to other intangible assets, the allocation to SCRs has been put in relation to variables derived from the accounting choice literature. Thus, it is the interchange between allocation to SCRs and goodwill that is at the center of this part of the analysis.

6.4.1 Efficient Contracting

The debt-equity (leverage) hypothesis is widely studied within the field of accounting choice (e.g. Whittred, 1987; Mian and Smith 1990; Malmquist 1990; Hand and Skantz, 1998; Godfrey and Koh, 2009). In this study, the results on the variable representing leverage were insignificant. A reason for this could be the tendency of debt holders to ignore the goodwill post when calculating covenants and similar contracted lending requirements, as argued by Bugeja and Loyeung (2015) and Leftwich (1983). This means that even if allocation to goodwill could be a more income increasing choice in the longer perspective due to the discretion in subsequent accounting treatment, there is little incentive for the acquiring firm to allocate more to goodwill in order to limit the agency costs in relation to lenders. As no significant relationship was found, it could either be a sign that different debt-holders value goodwill differently, or simply that this allocation choice is not important to the acquiring firm in regards to its effect on leverage. No support for the debt-equity hypothesis in relation to the accounting issue of purchase price allocation to SCRs is offered through this study.

Furthermore, we also investigated the political cost hypothesis that is described in the accounting choice literature (Holthausen and Leftwich, 1983; Godfrey and Koh, 2009; Malmquist, 1990). The revenue of the acquiring firm was used as the proxy for political visibility and we argued that larger firms would allocate more to SCRs to avoid political cost associated with goodwill allocation. Additionally, larger acquiring firms were assumed to have more resources available in the allocation process and for that reason also be more likely to identify SCRs. However, the variable was insignificant in both model setups. Thus, no support is found for that more politically visible firms are more likely to make purchase price allocations to SCRs. One reason could be that larger firms do not perceive non-allocation to SCRs as something that will incur political cost.

6.4.2 Information Signaling

The variable representing the ratio of purchase price to total assets is a measure of the investment opportunity set of the target firm. Paying a larger overprice could be a sign of management's expectations of future cash flows from the target firm. From the information signaling perspective, goodwill allocation would be favored over SCR allocation if that ratio is high, as it gives more discretion in subsequent costing. In both logistic regressions, the variable was insignificant. This means that when the acquiring firm pays relatively more compared to the total assets of the target company, the likelihood of SCR allocation does not change. This study fails to indicate any relationship between IOS and income increasing accounting choices, unlike for example Skinner (1993) and Godfrey and Koh (2009).

The variable measuring the future performance of the acquiring firm in terms of cash flows was insignificant in Model 1, but significant and negative in the Model 2. Even if it has been argued that firms that are better at valuing SCRs also manage them better (Gupta and Lehman, 2003; Forbes 2007; Galbreath, 2002), the tests in this study do not indicate any association between identifying SCRs and better future performance. If the relationship instead is negative, it could offer some support to the information signaling hypothesis (as discussed in e.g. Hand and Skantz, 1998) as it could be a sign that managers with expectations of good future performance allocate more to goodwill instead. In that way, it is possible to avoid future amortizations which management do not expect to properly reflect future cash flows. As the findings were not consistent in both models it is not appropriate to draw any definite conclusions. It does however, indicate that future cash flows are a relevant variable to include in future studies.

7 Conclusions

7.1 Summary of Main Findings

This study has been conducted with the purpose to provide a better understanding of what characterizes firms with valuable SCRs and when SCRs are recognized as intangible assets in business combinations. To do this, we have developed hypotheses about determinants influencing the probability of SCR recognition in business combinations in publicly traded US firms. These determinants relate both to characteristics of target firms that could be signs of them carrying valuable SCRs, the acquiring firm's ability to identify SCRs and incentives for the acquiring firms to identify, or not to identify SCRs. After performing logistic regression on a sample of 516 business combinations during the time period 2001-2011, the following five point summarizes our main findings:

1. In terms of target firm characteristics, we find that allocation to SCRs is positively related to the profit margin. This indicates that firms with SCRs might have more beneficial cost structures than firms that do not, which is consistent with literature concerning the value of SCRs. Apart from a lower tendency to recognize SCRs when the target firm operates in the mining industry, no other major industry differences are found. However, we do provide quantitative support to the notion that SCRs are of higher importance in high-technology industries. The probability of allocation was insignificantly related to the asset turnover ratio in the target firm prior to the acquisition.
2. By controlling for the amount of purchase price allocated to other identifiable intangible assets (other than SCRs), the study offers insight into the interchange between various intangible assets in the allocation process. The results show a negative relationship between the allocation of purchase price to SCRs and allocation to other identifiable intangible assets, indicating that allocation to SCRs is crowded-out by the allocation to other identifiable intangible assets. Presumably, this can be explained by the similarity between SCRs and for example brands and trademarks, as they can be difficult to separate from each other. The negative relationship between SCR allocation and allocation to other identifiable intangible assets is tied together with our third main finding.
3. Throughout the study, the interchange between allocation to SCRs and goodwill has been a central topic. By testing various hypotheses stemming from the accounting choice literature, signs of allocation due to various accounting incentives were searched for. The outcome on these variables were unconvincing at best. Thus, the study does not indicate that the choice between allocating a proportion of the purchase price to SCRs or leaving it in the goodwill post is specifically used for accounting incentives.

4. The study indicates that acquiring firms were more likely to recognize SCRs in acquisitions accounted for after the implementation of SFAS 141r in December 2008. This could be an indication that FASB has fulfilled its goal to clarify the standard and facilitate the recognition of identifiable intangibles. Although, it could also reflect a learning effect among companies in terms of the ability to identify and value SCRs. Conclusions should be drawn carefully, as the implementation of the standard largely coincided with the global financial crisis and the data indicates that the average percentual allocation to goodwill was smaller during the later period. Even if the effects of goodwill allocation was controlled for in the additional analysis, it could be problematic to conclude with certainty that the higher probability of allocation in the later period was directly caused by the new standard and the learning effect. Additionally, the regressions show allocation to SCRs is more likely when the target firm operates in a different main industry compared to the acquiring firm. This indicates that such acquisitions are to a larger degree conducted to access new customer bases and supply chains in other markets.
5. Given the emphasize of supplier relationships as key value drivers, the extent to which US companies recognized recognized assets relating to them was low. Allocations to such assets were only made in 12.6% of the observed acquisitions. Given the importance of supplier relationships, there could be reason to question how well SFAS 141 enables firms to identify and recognize such assets. Customer relationships are more common, as they were identified in 66.9% of the business combinations.

7.2 Contribution

As one of the first studies of its kind, we argue that our findings contribute valuable insights in three main ways:

1. The findings offer quantitative insights in terms of characteristics of target firms that are more likely to carry SCRs. In literature that covers business relationships and strategic alliances, there are several studies that describe relationship characteristics, when relationships are of high importance and how they are built. Most of these studies are case studies that offer detailed qualitative description of relationships. Therefore, quantitative findings such as ours are important to the research discipline as they are arguably more generalizable than findings from qualitative studies. Additionally, they can be used for further hypothesis development.

2. Our findings contribute to the financial accounting literature, by providing a better understanding of the interchange between different intangible assets in the purchase price allocation process. While prior literature is mainly centered on the interchange between goodwill and identifiable intangible assets in general, this study focuses on the particular intangible assets representing SCRs. The interchange found between SCR intangibles and other intangibles indicates that there is need of more research of this kind. We illustrate that the purchase price allocation process is a non-binary accounting choice and that uncovering incentives for various choices is more complex than just looking at goodwill and identifiable intangible assets as a dichotomous choice.
3. Studies as these can help standard setters understand how the standard is applied in practice and whether it is implemented in the intended manner. In this case, it appears as if SFAS 141r has succeeded in clarifying the accounting for SCR intangible assets, even if rivalling explanations exist concerning why SCR allocation is more likely in the post-revised period. The low extent of recognition of supplier related intangibles, combined with the prior literature indicating the importance of these assets, could be a sign that further clarification is needed as to how such assets should be identified and valued.

7.3 Suggestions for Further Research

This study is a first step to understand how SCRs are accounted for. Thus, there are a number of different research paths that could be taken in order to bring further light on the topic. First of all, it would be of interest to study a wider range of hypotheses relating to the target firm and not least specific cost items. For example, it would be of interest to study the relationship between probability of allocation to supplier related assets and direct material costs or cost of sold goods. Testing the relationship between allocation to customer related intangibles and marketing costs would also be relevant. However, such studies would probably require the restriction to only include observations where the target firm is publicly traded, as such data is not otherwise likely to be available in financial databases. To only include publicly traded target firms would mean more difficulties in attaining a sufficient sample size, for validity reasons. Studies could be broadened to focus on acquisitions in more than one country. This would also allow for the investigation of country- and standard-related differences. Another route to take would be to conduct industry-specific studies, as the importance and effects of SCRs are likely to differ between industries. In general, we recommend using significant variables from this study for hypotheses building in future quantitative SCR studies.

Relating more generally to the financial accounting field, it would also be of interest to conduct further studies on the interchange between various types of intangible assets in the purchase price allocation process. Prior studies of business combinations mainly make the distinction between goodwill allocation and identifiable intangible assets and are based on the assumption that it is the goodwill post that is used for accounting incentives. This study has not found any major signs of interchange between SCR intangibles and goodwill, but rather that allocation to SCRs was more or less likely depending on the size of the allocations to identifiable intangible assets other than SCRs. While this study was delimited not to delve deeper into choices regarding useful (or indefinite) lifetimes, such choices are highly relevant to investigate within the framework of accounting choice theory, due to their impact on subsequent earnings. To the extent of our knowledge, such studies have not been conducted to any great extent in contexts where goodwill is only tested for impairment and especially not in relation to allocation or non-allocation to SCRs.

For the sake of standard setters, it is also of relevance that the allocation process following business combinations continues to be studied. With indications of the varying extent of allocation to SCRs, although prior literature emphasizes its existence and importance, it is an accounting area where there is likely to be room for improvement in terms of faithful representation. Similar studies can help standard setters to better understand how the standard is applied. For example, one suggestion is to study the possible interchange between customer relationships and brand values in more detail, as this is an accounting choice that could be associated with incentivized accounting. Lastly, we would recommend researchers to conduct studies similar to this one but in later time periods, in order to provide a better understanding of the effects of the financial crisis on purchase price allocation in practice.

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9 Appendices

9.1 Appendix A – Variable definitions

Table 7 - Variable definitions

Variable name	Variable definition
<i>SCR</i>	= an indicator variable denoting acquisitions in which purchase price allocation to SCRs was made
<i>LN_ATR_T</i>	= the asset turnover ratio of the target firm during the last financial year prior to the acquisition
<i>Margin_T</i>	= the post-tax profit margin of the target firm in the last financial year prior to the acquisition
<i>HighTech_T</i>	= an indicator variable denoting if the target firm operates in a high-technology industry
<i>Industry_T</i>	= a set of indicator variables denoting which main industry group the target firm operates in
<i>LN_RelSize_A</i>	= the natural logarithm of the purchase price divided by the market value of the acquiring firm at the end of the last financial year prior to the acquisition
<i>SFAS141r</i>	= an indicator variable denoting if the acquisition was finalized during 2008-2011
<i>DiffIndustry</i>	= an indicator variable denoting if the target firm operates in a different industry than the acquiring firm
<i>DiffCountry</i>	= an indicator variable denoting if the target firm has its main operations in a different country than the acquiring firm
<i>OIIA</i>	= the proportion of purchase price allocation to other identifiable intangible assets (excluding SCRs) to the total assets
<i>LEV_A</i>	= the debt-to-equity ratio of the acquiring firm at the end of the last financial year prior to the acquisition
<i>LN_REV_A</i>	= the natural logarithm of the acquiring firm's revenue, in thousands of dollars, at the end of the last financial year prior to the acquisition
<i>LN_PP/TA_T</i>	= the natural logarithm of the purchase price divided by total assets of the target firm at the end of the last financial year prior to the acquisition
<i>FutureCF_A</i>	= the average of operating cash flows divided by total assets of the acquiring firm during the three financial years following the acquisition

9.2 Appendix B – Industry classifications

Table 8 - Main industry group classifications

SIC Code	Industry	Description ⁴	Observations in sample
01-09	Agriculture	Establishments primarily engaged in agricultural production, forestry, commercial fishing, hunting and trapping, and related services.	3 (Excluded)
10-14	Mining	Establishments primarily engaged in mining, including the extraction of minerals occurring naturally: solids, such as coal and ores; liquids, such as crude petroleum; and gases such as natural gas. But also quarrying, well operations, milling and other preparation customarily done at the mine site.	38
15-17	Construction	Construction includes establishments doing new work, additions, alterations, reconstruction, installations, and repairs. 3 types; 1) building construction 2) heavy construction 3) Construction activity by special trade contractor	10
20-39	Manufacturing	Includes establishments engaged in the mechanical or chemical transformation of materials or substances into new products. Plants, factories, or mills which characteristically use power driven machines and materials handling equipment. Also assembly of component parts of manufactured products.	222
40-49	Transportation & Public Utilities	Establishments providing, to the general public or to other business enterprises, passenger and freight transportation, communications services, or electricity, gas, steam, water or sanitary services.	55
51-51	Wholesale Trade	Establishments primarily engaged in selling merchandise to retailers; to industrial, commercial, institutional, farm, construction contractors, or professional business users; or to other wholesalers.	13
52-59	Retail Trade	Establishments engaged in selling merchandise for personal or household consumption and rendering services incidental to the sale of the goods.	22
60-67	Finance, Insurance, Real Estate	Finance includes depository- and non-depository credit institutions, holding companies, brokers and dealers in securities and commodity contracts and exchanges. Insurance covers carriers/agents/brokers of all types of insurance. Real estate includes owners, lessors, lessees, buyers, sellers, agents, and developers of real estate.	Excluded
70-89	Services	Establishments primarily engaged in providing a wide variety of services for individuals, business and government establishments, and other organizations.	156

⁴ Description from <http://siccode.com/en/siccode/list/directory>

Table 9 - Categorization of high-technology industries

SIC Code	Industry Name
283	Drugs
357	Computer and Office Equipment
366	Communication Equipment
367	Electronic Components and Accessories
382	Laboratory, Optic, Measure, Control Instruments.
384	Surgical, Medical, Dental Instruments
481	Telephone Communications
482	Miscellaneous Communication Services
489	Communication Services, NEC
737	Computer Programming, Data Processing
873	Research, Development, Testing Services

9.3 Appendix C - Manual Data Collection

Table 10 - Identification of intangible assets related to SCRs

Customer relationship related	
Name	Description
Customer relationships	
Customer contracts	
Customer related intangible assets	Direct customer relationships/contracts
Order backlog	
Customer list	
Databases	List of customers connected with the target firm
Reseller relationships	
Distributor relationships/agreements	Other relationships related to customers
Supplier relationship related	
Supply contracts	
Supply agreement	
Contractual supplier relationship	
Contracts	
Contract based assets / contract rights	
Contractual relationships	
Agreements and relationships	Direct supplier relationships
Transportation agreements	
Foundry & Assembler relationships	
Affiliate and advertiser contracts and related relationships	
Vendor contract	
Products distribution network	
Collaborative research project with another company	
Gas, coal and power contracts	
Power, water and fuel contracts	
Net of Coal supply contract, NUG contracts, Energy contracts, transportation contracts	Raw material supply contracts/relationships
Coal supply agreements	
Favorable propane contract	
Maintenance and service agreements/contracts	
Software support agreements and related relationships	
Cable franchise rights / Cable network connections	
Right of way	Other supplier related relationships/contracts
Carrier contracts and related	
Studio relationships and content library	
Alliances (flight industry) and Airport slots	
Favorable leaseholds / lease agreements	
Below-market leases	
Favorable operating leases	Lease related
Favorable property lease	
Adjustment of acquired leases to market value	

9.4 Appendix D – Multicollinearity statistics

Table 11 - VIF statistics

Variable	VIF	1/VIF
LN_RelSize _A	1.41	0.709606
Services _T	1.34	0.747372
Transportation _T	1.25	0.801579
FutureCF _A	1.23	0.815429
OIIA	1.22	0.821716
HighTech _T	1.20	0.831504
Mining _T	1.20	0.833297
LN_REV _A	1.19	0.837181
DiffIndustry	1.14	0.875983
LN_PPTA _T	1.14	0.877530
LN_ATR _T	1.13	0.885770
Retail _T	1.12	0.896212
Wholesale _T	1.11	0.904443
LEV _A	1.11	0.904861
SFAS141r	1.09	0.919060
DiffCountry	1.08	0.922533
Margin _T	1.08	0.927008
Construction _T	1.06	0.940817
Mean VIF	1.17	

Table 12 - Spearman correlation matrix

	SCR	LN_ ATR _T	Margin _T	High Tech _T	Mining _T	Construc tion _T	Transport ation _T	Wholesale _T	Retail _T	Services _T	LN_ RelSize _A	After 2008	Diff Industry	Diff Country	OIIA	LEV _A	LN_ REV _A	LN_ PPTA _T	Futu
SCR	1.0000																		
LN_ATR_T	0.1000*	1.0000																	
Margin_T	0.0824	-0.1048*	1.0000																
HighTech_T	0.1386*	-0.1651*	-0.0076	1.0000															
Mining_T	-0.3097*	-0.2286*	0.0571	-0.0823	1.0000														
Construction_T	-0.0029	0.1215*	0.0420	-0.1301*	-0.0396	1.0000													
Transportation_T	0.0552	-0.1034*	-0.0424	0.0080	-0.0974*	-0.0486	1.0000												
Wholesale_T	-0.0333	0.1594*	0.0093	-0.0495	-0.0453	-0.0226	-0.0555	1.0000											
Retail_T	0.0084	0.1760*	-0.0588	-0.1183*	-0.0595	-0.0297	-0.0729	-0.0339	1.0000										
Services_T	0.1055*	-0.0665	-0.0601	0.2036*	-0.1856*	-0.0925*	-0.2274*	-0.1058*	-0.1389*	1.0000									
LN_RelSize_A	0.0046	0.0561	0.0368	-0.1615*	0.1030*	0.1256*	0.1848*	-0.0386	0.0858	-0.2337*	1.0000								
After2008	0.0835	-0.0432	-0.0231	0.0175	0.0209	0.0255	0.0179	-0.0588	-0.0592	-0.0265	-0.0186	1.0000							
DiffIndustry	0.0972*	0.0045	-0.1179*	0.0749	-0.0134	-0.0102	-0.0251	0.1468*	0.0211	0.1906*	-0.1393*	-0.0270	1.0000						
DiffCountry	0.0992*	0.0584	0.0769	-0.0012	-0.1138*	0.0232	-0.0435	0.0563	-0.0458	0.0192	-0.0639	0.1364*	0.0223	1.0000					
OIIA	0.0989*	0.0493	0.1069*	0.1351*	-0.2920*	-0.0580	-0.2477*	-0.0518	0.0578	0.0527	-0.2515*	0.1848*	0.0682	0.1532*	1.0000				
LEV_A	-0.0428	0.1317*	0.0796	-0.2406*	0.0203	0.0856	0.1123*	0.0252	0.0374	-0.1066*	0.0719	-0.0589	-0.0751	-0.0162	-0.1458*	1.0000			
LN_REV_A	-0.0630	0.0308	0.0510	-0.0345	-0.0520	-0.0470	0.0029	0.0435	0.0409	0.0096	-0.2417*	-0.0378	-0.0459	0.1467*	0.0778	0.2931*	1.0000		
LN_PPTA_T	0.0978*	0.0634	0.1999*	0.2921*	-0.0106	-0.0766	-0.1439*	-0.0128	-0.0531	0.1425*	-0.1015*	0.0140	0.0101	-0.0081	0.1935*	-0.1655*	-0.0027	1.0000	
FutureCF_A	-0.0865*	0.0269	0.1614*	-0.0039	-0.0312	-0.0473	-0.2039*	0.0062	0.0170	0.1261*	-0.4025*	0.0322	-0.0816	0.0228	0.1725*	-0.0404	0.2014*	0.0754	1.0000

*** p<0.01, ** p<0.05, * p<0.1

9.5 Appendix E - Additional logistic regression

Table 13 - Logistic regression controlling for goodwill allocation

VARIABLES	Odds ratio	p-value
SCR		
LN_ATR _T	1.111 (0.128)	0.361
Margin _T	2.617*** (0.674)	0.000
HighTech _T	1.926*** (0.449)	0.005
Mining _T	0.0610*** (0.0297)	0.000
Construction _T	0.714 (0.532)	0.652
Transportation _T	0.870 (0.346)	0.727
Wholesale _T	0.266* (0.173)	0.052
Retail _T	1.236 (0.678)	0.700
Services _T	1.179 (0.326)	0.552
LN_RelSize _A	1.129 (0.0921)	0.137
SFAS141r	1.936*** (0.463)	0.006
DiffIndustry	2.762*** (0.854)	0.001
DiffCountry	1.228 (0.274)	0.357
OIIA	0.0425*** (0.0410)	0.001
GW/TAA	3.292** (1.725)	0.023
Constant	1.637 (0.570)	0.157
Observations	516	
LR chi2	102.07	
Prob > chi2	0.0000	
Pseudo R2	0.1646	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1