

Unpacking the Dynamics of Scope Transformation in US Banks, 1992-2006¹

Working paper – v39 – October 25, 2017

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Abstract

Using a novel database containing the time series details of the organizational structure of individual bank holding companies, this paper presents the first population-wide study of the transformation in business scope of US banks. Expanding scope has a negative impact on performance on average. However, we find that firms whose expansion keeps them closer to the prevailing “modal bank” are better off compared to those pursuing generic scope expansion. Moreover, we find that early expanders into particular activities benefit more, whereas late adopters, rather than benefitting by “fitting the norm,” lose out.

JEL Codes: G21, L22, L25

¹ The views expressed in this document are those of the authors and do not necessarily represent those of the Federal Reserve Bank of New York or the Federal Reserve System. We would want to thank seminar participants at the London Business School, the Wharton School’s Management Department, Cambridge University’s Judge School, Hitotsubashi U. (Tokyo), EPFL, ETHZ, University of Rome III, BI Norwegian Business School, EBRD, the Bank of England, Banque de France, the Fed Board, the New York, Boston, and Cleveland Fed. Henri Servaes, Elias Papaioannou, Andrew Scott, Connie Helfat and Emily Feldman provided useful feedback. Jacobides acknowledges financial support from the Institute of Innovation and Entrepreneurship and RAMD at the London Business School. All remaining errors are our own.

Branch Banking and Trust (BB&T) is a 221 billion dollar banking organization (at June 2017 total assets). Started by Alpheus Branch in 1872, in the aftermath of the Civil War, as a traditional deposit institution focusing on agricultural and small business loans, it survived the Great Depression and the banking crisis of the 1980s/early 1990s with a fairly unchanged organizational structure, and a business model focused on commercial banking. Through the 1990s and the first half of the 2000s, however, BB&T experienced a significant transformation in its business scope, adding subsidiaries in areas such as securities brokerage, underwriting, insurance, asset management and much more. By the time the 2007 financial crisis hits, BB&T's subsidiaries spanned over 30 unique 5-digit NAICS activities (see Figure 1).

These dynamics of scope transformation (with new activities being added, but also dropped) are not unique to BB&T. They reflect sweeping changes in the overall composition and business model of banking firms, which have evolved from narrow to broad, as a result of regulatory changes, financial and technological innovation, and the resulting shift in the competitive landscape. Over the last 30 years, approximately 2,200 US Bank Holding Companies (BHCs), or roughly 55% of the total, have engaged in some form of scope expansion. Along the way, they have attained control of, or created, around 62,000 subsidiaries, with business activities spanning 362 unique five-digit NAICS segments. This is arguably one of the key structural changes in the banking sector. It has been the cause and the manifestation of BHCs change of “business model”, affecting the very definition of what banks are, and what they do (Cetorelli et al, 2012; Jacobides et al, 2014).

Such transformations are not unique to banking. From telecommunications to software to healthcare, new technological opportunities combine with regulatory changes to re-shape “industry architectures” and the firms within them. Yet population-wide studies of sectors have by and large taken business scope for granted (Jacobides et al, 2006). While such sector-wide processes have long been of interest to business historians (Chandler, 1977; 1990), institutional theorists and strategy scholars (Teece et al, 1994; Noda and Collis, 2001; Langlois, 2003) we do not have much by way of a systematic understanding of the nature or the implications of this process at the sectoral level.

This paper aspires to cover this gap. We use a newly created dataset detailing the organizational structure for the entire population of US BHCs, allowing us to track each entity's subsidiaries, and as such the different, and new business activities they are involved in over time

(Cetorelli and Stern, 2015). We map entry and exit across segments, and explore how different strategies of business scope transformation have performance implications that differ between firms and over time.

Our setting has a number of particularities that we exploit. Our data focuses on a fairly homogeneous group of firms, US BHCs, which start quite narrow, and which face a similar technological and regulatory environment. These firms take different paths- some, deciding to grow in their original segment, some others only expanding in a few activities (but potentially shifting significant resources in their new areas of business) and some experimenting much more broadly with scope expansion. Our empirical strategy is thus to compare not only the BHCs that expand with those which do not, but also to consider what are the *types* of activities firms choose to expand in.

This exercise has parallels, but also significant differences with research on diversification. Diversification research compares the costs and benefits of corporate units which operate as a stand-alone businesses, vs businesses which belong to the same corporate parent. It does not focus on the particularities of diversifying into a *new* activity, or the specific reason for which such novel diversification may occur – a function, we posit, of industry-wide conditions. Our interest is narrower, and different. We focus on *change of scope through entering (or exiting) new activities*, which we contrast with BHC’s diversification in general- that is, the addition of new subsidiaries in activities that already exist in a BHC’s portfolio, or the change in the ratio between banking and non-banking assets (diversification which can happen without subsidiary changes). We also explicitly consider the way the entire BHC *industry* evolves in terms of business scope, as such evolution reflects a shifting menu of options for different activities to be combined together, brought about by new technology and regulation.² Our focus is firmly on the comparative

²There is abundant anecdotal evidence about the importance of this synergy-driven motive for scope expansion in banking (irrespective of whether or not *ex post* synergies are realized). For instance, the press release for the Citi-Travelers merger in 1998 said: “Mr. Reed and Mr. Weill [CEOs] also said that the companies expect to generate substantial incremental earnings from the significant *cross-selling opportunities* that will be created as well as cost savings that will be realized.” Similar considerations are made in middle-tier markets as well. For example, in the acquisition of Sterling Bancorp by Provident New York, the CEO, Jack J. Kopnisky commented on the deal, “This merger is a tremendous opportunity [and it] provides greater *diversity of product sets, clients and revenues streams* while presenting considerable potential to build our small-to-middle market and consumer client bases.” The acquisition was met by a 3% increase in shares value in market trading. Likewise, the importance of the potential synergies was also recognized on the regulatory side: Synergies were mentioned as a key justification to relax the restrictions for BHCs to establish Section 20 subsidiaries, as noted in 1997 by Governor Phillips, a member of the Board of Governors in a testimony before a U.S. Congress Subcommittee on Banking, Housing and Urban Affairs.

implications of BHC *scope innovation*. We therefore isolate the question of banks' breaking "new ground" (or changing their "business model") from the separate, and broader question of diversification, and show that the former is empirically much more important (in terms of performance) than the latter.

That said, our starting point to explain scope change is to draw on what we have learned from diversification research. The extant literature generally finds that diversification of scope (new or otherwise), on average is associated with worse performance.³ The main explanations relate to agency frictions within the conglomerate and managerial empire building, which are seen to overshadow any potential benefits of, e.g., vertical integration, of overcoming capital market inefficiencies, or of leveraging synergies across businesses.⁴ We control for these factors, and focus on the dynamics of scope expansion. To do so, we look in greater detail at the role of *relatedness* in new expansion, as the closer the connection, the more likely it is that the effort to integrate a new business activity with the old will not go awry, and the greater the likelihood that synergies may materialize.

The degree of relatedness in business scope has been explored in the literature, primarily in the field of strategic management (see Palich et al, 2000), even if not in the context of *novel* expansion. Previous research has considered relatedness as a firm-level construct (e.g., Caves, Porter, Spence, and Scott 1980; Montgomery and Hariharan, 1991; but also Robins and Wiersema, 2003, for some criticisms). However, this approach neglects the fact that *industries themselves* evolve, as changing technologies of production and organization—as well as regulatory evolution—can shift the comparative advantage from narrower to broader firms (Chandler, 1990), while at the same time throwing up new opportunities for activities to be reconfigured (Teece et al, 1994). The benefits available from integration and diversification should therefore evolve as industry conditions change—a thesis supported by historical research (Chandler, 1977, Langlois, 2003) and further explored by institutional and evolutionary research (e.g. Jacobides and Winter, 2005, 2012).

³ See, e.g., Laeven and Levine (2007) in banking, consistent with the canonical findings in the corporate space (e.g. Lang and Stulz, 1994, Berger and Ofek, 1995).

⁴ See, e.g., Perry (1989), Williamson (1989) for the potential benefits from vertical integration; Matvos, Seru and Silva (2016), Khanna and Palepu (2000), Kuppaswamy and Vilallonga (2015), Almeida, Kim, and Kim (2015) for potential benefits from broader scope during times of high external capital market frictions. And finally, Zhou (2011), Penrose (1959), Rumelt (1982), Helfat and Eisenhardt (2004), Folta, Helfat, and Karim (2016) Nelson & Winter (1982) and Capron and Mitchell (2013) for work recognizing the importance and articulating the nature of synergies.

This insight rings particularly true for US banking, where the mode of financial intermediation has shifted so dramatically over the last few decades. The sector has traveled from a model where commercial banks brokered supply and demand of intermediated funds to a decentralized system where the matching has increasingly occurred through much longer *credit intermediation* chains, with non-bank entities emerging as providers of specialized inputs along the way (Cetorelli, Mandel, and Mollineux, 2012).⁵ This, along with regulatory changes, has created many new opportunities over time for potential synergies to be developed across a variety of business types.⁶

Hence, we argue that as the prevailing mode of intermediation evolves over time, banks that diversify into new areas to match such evolution will benefit more—in contrast to indiscriminate diversifiers, who will incur the cost of agency for little benefit. Testing such conjectures requires a level of data detail that has simply not been historically available. First, it requires us to know which activities are “new” (to a banking organization) and which are not. Second, it requires a comprehensive coverage, as opposed to a representative sample, to gauge overall banking industry dynamics and how “related” various segments become over time. The Cetorelli and Stern (2015) database on BHCs’ organizational structure is ideal, allowing us to track the evolving “*modal*” bank, as specific activities become more or less popular in the population of BHCs.

The results are consistent with our priors. First, and consistent with diversification research, we see that indiscriminate scope expansion can be detrimental, presumably because frictions associated with a more complex structure and the related costs dominate. Second, and more to the point, we find significant heterogeneity in how firms change their scope, and whether or when they benefit. In particular, we find that expanding in industry-modal activities – those that are more commonly found in the BHC population *at the time of expansion*, is beneficial, and that as the relative modality of specific sectors changes over time, so does the relative impact of expanding into them.

⁵ This process is often described as the emergence of shadow banking (Poszar et al, 2013).

⁶ For example, the prospect of combining commercial banking with securities dealing and underwriting, following the institution of Section 20 subsidiaries in the late 1980s/early 1990s (see, e.g. Cornett, Ors and Tehranian, 2002), may well have pumped up value-add in the run-up to the 90s technology boom. Likewise, the development of products that allow for better indemnification of credit or liquidity risk has likely enhanced the synergies between banks and insurance subsidiaries. Similarly, the proliferation in asset securitization throughout the 1990s and up to the financial crisis may have created the conditions for banking institutions to add specialty lenders, special purpose vehicles, and servicers, among others.

We then ask *why* expansion into such modal activities is more valuable. This could indeed be driven by the fact that the benefits of scope evolve as the technological, regulatory, and competitive landscape changes. On the other hand, the shifting value of modality may simply reflect firms' desire to look similar to one another. In this scenario, firms benefit by becoming "isomorphic," as economic sociologists suggest— because stakeholders expect it (DiMaggio & Powell, 1991). Since trust is paramount in banking, it may be that depositors, lenders, and corporates prefer to do business with a firm that "looks like a bank," as opposed to an unusually narrow or broad BHC that engages in eccentric segments. As the "modal" scope changes, and as fashions flare up, banks that follow the trend benefit.

Our setup allows us to distinguish between the two alternative arguments by "slicing" the data across a different dimension. Instead of comparing the relative impact *across* activities (modal vs. non-modal), we look at early and late expanders into the *same* activity. If the sociological explanation is correct, we should expect that early adopters will be penalized for their "innovation," or deviation from the norm, whereas latecomers will enjoy a performance boost as the activity becomes more mainstream. Conversely, if the relative modality of activities reflects shifts in the "technology" of intermediation, and thus the benefits that can be reaped from combining such activities, early expanders should do better. We find the latter, and also find that early expansion is particularly beneficial when the new NAICS will ultimately become modal, reinforcing the thesis of the importance of synergistic expansions.

These results, put together, help unpack the dynamics of industry change. We find that some pioneers help change the scope in the sector. Those, and the firms that follow in their footsteps shortly thereafter, presumably drawing on the new opportunities technological and regulatory change offers them, benefit in terms of ROE and Tobin's Q. This might entice late followers who, while lured by the promise of success, might not have the skills or the positioning to benefit in a similar way. Their expansion makes them significantly worse off compared to non-expanders, so much so that scope expansion appears to be a *net negative* overall.

More broadly, our paper provides the first comprehensive analysis of how firms break new ground in a sector, shifting from fairly limited, homogeneous and narrow scope, to broader scope. We separate out new scope expansion from diversification more broadly, and explore the dynamics of scope transformation more narrowly. By leveraging our comprehensive data, and by shifting our empirical strategy from diversification overall to *which particular NAICS* firms enter

(or exit) we provide some fresh insights on the dynamics of transformation in the banking industry. These insights should apply more generally, and help us understand the complex dynamics of scope (and business model) change we observe in many sectors beyond banking (eg, Noda and Collis, 2001).

I. Data description

I.1 Introducing a new database

The Federal Reserve is the principal regulator of US BHCs. By virtue of that authority, all registered BHCs are required to report *any* change to their structure, including subsidiaries entering or exiting the organization due to acquisitions of going concerns, de novo formations, sales, changes in ownership status, liquidation, or becoming inactive. For the first time, all this information has been assembled in a consistent panel covering the entire population. In section A1 of the Appendix we argue that the population of BHCs is exactly what one should look at to understand the process of scope transformation in the US banking industry.

Given our objective, we analyze the period 1992–2006. It ends before the financial crisis of 2007–09, during which we would expect very different behavior and overall performance drivers.⁷ Likewise, the beginning of the period coincides with the end of a severe, decade-long banking crisis “...of a magnitude not seen since the Great Depression...” (FDIC, 1997). The crisis culminated with the passage of the FDICIA Act in 1991, marking the start of modern banking regulation (Spong, 1994). Another important point is that US banking exited the 1980s ready to undertake, *for the first time*, a relatively unencumbered process of organizational transformation: US banks had been effectively restricted for decades in their business activities by the Glass-Steagall Act of 1933. Interestingly, though, the laws left regulators significant interpretative leeway to define “permissible banking activities.” This discretionary power itself evolved over time, and by the second half of the 1980s the perimeter of permissible activities was at its largest (Omarova, 2009). Hence, it is really from this point on that BHCs – as the experience of BB&T

⁷ Moreover, the years *after* the crisis belong to a different “regime” as far as business scope goes, due to the significant changes in regulation and the imposition of new forms of restrictions on bank activities. We consider the role of scale, scope, M&A in relation to the crisis in a follow-on paper. Results for the period 2007-2016 are available upon request.

shows - could operate in an unrestricted environment for the first time.⁸

Because we intended to focus on firms' performance, we merged the database with information on BHCs' own consolidated financials (both balance-sheet and income-statement items), as contained in the FR Y-9C Reporting Form, *Consolidated Financial Statements for Holding Companies*. The matched sample consists of a panel of 3,206 unique BHCs for which we have financial data. This set of firms consistently accounts for the virtual totality of total BHC assets over the sample period.⁹

I.2 Defining business scope, expansion, and exit

For each subsidiary of a BHC, the database reports its primary and, where applicable, secondary business activity¹⁰, both classified according to the finest (six-digit) North American Industry Classification System (NAICS) code. Since full six-digit codes are not available for all activities, we aggregated codes at the five-digit level and defined business *scope* as the number of different five-digit codes that were under a BHC's organizational umbrella.¹¹ For example, a BHC that controls a commercial bank (NAICS 52211), a securities brokerage firm (NAICS 52312), and a life insurance carrier (NAICS 52411) would have a scope defined by these three business activities. By extension, we define the *expansion* (or *adoption*) of scope as the addition of one or more subsidiaries in a *five-digit NAICS that was not part of the organization before*. We identify an expansion of scope whether it originates from a subsidiary's primary or secondary activity.¹²

⁸ A clear indication of conditions already being ripe for industry transformation at the end of the 1980s is the perhaps less well-known Proxmire Financial Modernization Act of 1988, a piece of legislation that would have repealed Glass-Steagall 11 years earlier. The Act actually passed in the Senate with 94 votes to 2, but then died in the House (US Congress 1987–1988). Our evidence confirms that the experimentation of BHCs with different subsidiaries exploded in the 1990s, and the maximum number of NAICS owned by banks can be found *before* the Financial Modernization Act of 1999, which sanctioned the end of Glass-Steagall (also, see Cetorelli, 2017a, b).

⁹ A question might be raised about the extent to which the database captures *nonbank* entities (e.g. insurance companies, specialty lenders, or investment banks) buying bank subsidiaries. However, by law any entity that acquires a bank charter has to turn itself into a bank holding company. Hence the database has full coverage on such instances.

¹⁰ Approximately 3 per cent of all subsidiaries in the database ever report a secondary business activity, suggesting that for the vast majority of cases, the subsidiaries are narrow in scope and the industry classification accurately reflects the activity subsidiaries engage in. This also marks our database out from others where scope has been analyzed (e.g. Compustat), where NAICS information is collected at the level of the corporation, leading to not only vast understatement of the actual scope, but also to potential inconsistencies.

¹¹ For robustness, we also ran all our analyses on 4-digit NAICS. This analysis (available upon request) produced consistent results, if somewhat less significant results, as expected from an (artificially) coarser measure.

¹² Restricting the identification to consider only subsidiaries' primary business activity would be a more conservative approach, under the presumption that if a NAICS is observed as a secondary activity, it might not be considered economically important enough to qualify as an expansion of scope. At the same time, including secondary NAICS improves the overall information set on BHCs' activity. We have run the entire analysis excluding secondary NAICS' information, and the results were extremely robust throughout.

Conversely, we define *exit* as the complete elimination of a previously held NAICS.

Financial data for individual subsidiaries is not available, so we cannot measure the *intensity* of engagement by a BHC in a new activity.¹³ However our focus is on banks that add activities that are *new to the banks* themselves (i.e. an *extensive* margin of business-scope expansion), and our data are uniquely positioned to inform us about this.¹⁴ We also examine how this compares to the addition of subsidiaries in *existing* NAICS.¹⁵ We also consider alternate measures of scope, such as changes in the ratio of Core Banking Assets / Total BHC Assets, as detailed in section V below.

I.3 Evolution of scope

Figure 2 shows that most BHCs are “simple” organizations at entry, with most entities starting as commercial banks (NAICS 52211) or having subsidiaries in just one or two additional NAICS. This is a compelling feature of the population, since in most cases we see a process of business scope transformation driven by a relatively homogeneous base of similar firms—rather than by “legacy” firms that already had a more complex scope before becoming BHCs.

As noted previously, the process of expansion is broadly diffused—not just the practice of a select few. Figure 3a reports, in its upper part, the number of BHCs that pursued some degree of scope expansion in every year. We see a consistent number—about 200 institutions per year in the early 1990s—adding new NAICS, and then a ramping-up over time, reaching a peak of over 400 in the early 2000s. The trend then reverts—but, remarkably, there is still a relatively consistent cross-section of institutions entering new activities, even during the crisis. Overall, more than half of the observed population engages in at least some degree of scope expansion. Figure 3b provides a complementary illustration, focusing on the *total number* of NAICS exits and entries per year (as each bank can have multiple entries and exits), but also illustrates the number of new subsidiaries which deepen activities in *existing* sectors. Unsurprisingly, we see that these dominate the sample both in terms of entry, and of exit.

¹³ Note that for many activities it is actually not obvious that total asset size, or even total income, would reflect the impact of the new activity. Some have a small footprint and significant impact (e.g. asset management services, data management, financial technology). Heterogeneous or limited impact would, if anything, introduce a conservative bias.

¹⁴ While overall firms may expand their scope without creating new subsidiaries, the regulatory framework of banking makes it *more* likely that scope expansion will be associated with the creation of a separate subsidiary than we might expect in other sectors, making this a convenient setting for our purposes.

¹⁵ Our sample contains 11,376 expansion events into subsidiaries in existing NAICS codes and 5,810 into new NAICS

One might object that much of what we see as strategic may simply reflect the passive incorporation of businesses resulting from acquisition dynamics. But this is not borne out by the data. As the data reveals, only 10% of scope expansions were ever the result of M&A activity between BHCs. Nevertheless, in the analysis of performance, we explicitly take into account the M&A dynamics within each BHC. We also acknowledge that M&A plays an important role in adding new subsidiaries in existing BHCs, and that post-merger integration may be a driver of shedding subsidiaries without inducing a NAICS exit, via organizational simplification. We leave the analysis of these organizational changes that do not relate to changes in scope for future research.

II. Background: From Scope and Diversification in our sample

II.1 Basic relationship between scope and performance: Approach

In order to establish common ground with the diversification literature, we first take a basic cross-sectional approach, testing whether firms with a broader scope overall exhibit higher or lower performance. This first pass through the data is more for illustrative purposes. We leave possible issues of endogeneity and selection aside and discuss that later. This is estimated through:

$$Performance_{i,t} = \alpha + \beta \cdot Scope_{i,t-1} + Controls_{i,t-1} + \varepsilon_{i,t} \quad (1)$$

A concern might be that both expansion decisions and performance are driven by common unobservable factors changing over time. For example, banks may consider expanding during the upswings of macroeconomic cycles, when their performance may also be relatively better. We acknowledge this issue by adding time fixed effects to the same model specification. Hence,

$$Performance_{i,t} = \alpha + \beta \cdot Scope_{i,t-1} + Controls_{i,t-1} + \gamma_i + \delta_t + \varepsilon_{i,t} \quad (2)$$

Where γ_i and δ_t are vectors of BHC and year-specific indicator variables. The reason for including BHC fixed effects is to account for unobserved heterogeneity at the level of the BHC, and provide results which help us see how *changes* in scope changes a BHC's performance.

In terms of performance, our baseline metric is the BHC's accounting ROE. Standard objections to using accounting metrics of performance is that they may not properly reflect the overall level of risk taking. Further, the quality of accounting standards may not be homogeneous in the cross section of firms under study. For these reasons, market-based metrics of performance,

such as a firm's Tobin's Q, are typically used instead. However, there are good reasons why concerns over the use of accounting metrics are less acute for this particular study. First, net returns reported in BHCs' income statements include a component of "provisioning" for expected losses, which will be naturally correlated with the level of risk each firm is taking, thus automatically reducing reported returns as risk increases.¹⁶ Moreover, as an industry subject to supervisory monitoring, accounting standards are by definition homogeneous and reporting less exposed to systematic *discretion* across firms. Also, the data strongly indicates that the process of scope transformation in the US banking industry occur broadly across the *entire* population of BHCs, and not just among listed companies (upward of 2,600 scope expansion events, or more than 45% of the total, are incurred by private BHCs). For this reason we run our benchmark analysis on the entire population of BHCs, thus privileging the use of *ROE* as the default metric of performance. In section V, however, we provide a full replica of the analysis using alternative metrics of performance, including Tobin's Q, a direct metric of risk (which is BHC's Z-score). We also consider the full results around leverage, to examine whether higher ROE comes at the expense of requiring higher leverage.

Starting with the regressors, as defined earlier, *Scope* is the count of five-digit NAICS present in the BHC's organizational structure. We also include basic firm-specific controls that should have a direct and independent impact on the performance of a bank—and for which, at the same time, one could argue that the metric of scope could serve as a proxy. For example, scope *per se* may not have any particular impact on performance, but could simply be a reflection of the size of the bank, with larger banks exhibiting higher returns on average, possibly indicating market power, or easier access to cheaper funding (e.g., Lang and Stulz, 1994). Likewise, as noted earlier, regulation constrains scope expansion for banking firms with declining performance. Capital adequacy is one of the main factors capturing a bank's quality standing. Hence we include the BHC's capital-to-asset ratio as a basic control of overall firm quality.

II.2 Basic relationship between scope and performance: Results

Table 1 shows the results of specification (1), displaying the relationship between the breadth of scope of a BHC and its performance. The comparison of results in columns 1 and 2 suggests that

¹⁶ In fact, one could argue that for this particular industry there may be a possible *upward* bias in the use of market-based metrics: If scope expansion leads to circumstances where a BHC is "too complex to let fail," markets may incorporate a valuation premium associated to this potential regulatory subsidy.

Scope may indeed capture the role of size, but also that once we control for *Size*, it exhibits a significant effect of its own, suggesting the existence of a negative relationship, consistent with the extant literature. The *Size* control enters with a positive and significant sign, also consistent with previous findings. In column 3 we report the result of the same regression, but including BHCs' capital-to-asset ratio. That ratio displays a positive association with BHCs' ROE, but the coefficient of *Scope* remains unchanged. This first set of results is consistent with the many contributions in the literature documenting a negative association between firm scope and performance.

The effect is economically significant. For example, the value of business scope in the first quartile of the population is 1, while it is 4 at the third quartile. Hence, an inter-quartile increase in scope would generate, according to the estimate in column 3, a decrease in ROE of about 0.36 percentage points. This figure corresponds to about 5% of the standard deviation of the ROE distribution. To put things in perspective, from the same regression, a hypothetical doubling of the asset size of a BHC would generate an impact on ROE equal to about 10% of its standard deviation.

The question of course would emerge, why, in the face of such risks in terms of broader scope, would BHCs persist? One answer could be that *some* of this expansion is beneficial, and is a response to adverse capital market conditions which makes broader scope and the reliance on capital (re-)allocation within large corporates more beneficial as capital markets get distorted. To test for this, Table 2 augments specifications (1) and (2) with the TED spread observed at a given point in time and its interaction with BHCs' scope. Following Matvos, Seru, and Silva (2016), we use the TED spread as indicator of tight capital markets. Broad scope may yield lower performance results overall, but the implicit internal capital reallocation effect in bad times can help. The data supports this conjecture. Having broader scope in times of tighter capital markets is associated with a positive, countervailing effect on ROE, as indicated by the coefficient of the term of interaction. This is found both in the pure cross section (the OLS regression in column 1) and from within-firm variation (the FE regression in column 2).

The table also shows the differential impact on ROE from being engaged in activities that are more or less connected with one another within vertical chains of production. Drawing on the data of the Bureau of Economic Analysis' Input-Output tables, we constructed a NAICS-specific

metric of vertical integration relatedness.¹⁷ Columns 3 and 4 of Table 2 report the results. The variable *average VI* captures the extent to which the NAICS that constitute the scope of a BHC are more or less vertically integrated. Conditional on a given level of scope, a higher degree of vertical integration yields a negative impact on ROE in the cross section. The relationship, though, becomes positive and significant in the FE specification, consistent with the argument that unconditionally worse performers confine their expansion to NAICS that enable VI, and that once we take this selection issue into account, there can be a benefit to VI as a strategy. We also find that the interaction between scope and VI is negative: The broader the scope, the more VI becomes a *drag* on performance (consistent with Rawley and Simcoe, 2010), suggesting that overly broad *and* integrated firms can suffer as a result of excessive complexity.

III. Dynamics of Entry and Exit in Existing vs New Segments

III.1 Dynamic analysis of entry and exit: Approach

The “static” relationship between scope and performance, of course, is not our objective; it only provides an overview of the underlying patterns in the data, which may also suffer from selection effect and endogeneity (discussed at length, along with research design, in the next section). Our interest is in the dynamic analysis, where we analyzed the specific impact of *expanding into new segments* (or exiting some segments altogether), thus allowing us to consider the impact of *different firm strategies*. It also allowed us to run two separate analyses, one for *new* scope expansion, and one for scope expansion (in the sense of a new subsidiary) which happens in a NAICS segment where the BHC already had activities. By comparing these two sets of results, we can ascertain if changing a BHCs scope is empirically different from diversifying in general.

Specifically, our first analysis focused on new segment entry (scope expansion), exit, and overall churn (i.e. the combination of entry and exit). We asked whether firms that build broader scope and keep it are better or worse off than firms that enter new segments that they subsequently exit, consistent with the idea of strategic renewal (Capron, Mitchell, and Swaminathan, 2001). We also considered whether scope expansions that have happened incidentally—i.e. resulting from M&A between two high-holding BHCs—have different impacts

¹⁷Details on the construction of this metric and the TED spread are contained in section A2 of the Appendix.

from de novo or acquisitive expansions. To capture these dynamics, we adopt the following specification:

$$Performance_{i,t} = \alpha + \beta \cdot Cum\ Adoption_{i,t-j} + \gamma \cdot Cum\ Exit_{i,t-j} + \delta \cdot Churning_{i,t-j} + \theta \cdot Scope_{i,t-j-1} + Controls_{i,t-j-1} + \varepsilon_{i,t} \quad (3a)$$

where *Cum Adoption* is the total number of new NAICS that a BHC has added in the recent past. As we look into dynamic effects, it is plausible that expanding into new activity may require an adjustment time before any beneficial effect might pan out. For example, one might expect that a commercial bank expanding into, say, investment banking needs to build a track record before generating returns on its investment banking unit. Alternatively, it might need to hire or train staff, reorder its operations, and develop new customer relationships. Thus value-enhancing scope expansions might initially lower ROE and only gradually lead to increasing ROEs.¹⁸ To allow for this likely time lag in the scope expansion-performance relationship, we look at the scope expansion activity over the previous n years, and measured the impact on performance at time t . In our baseline specification, we use the sum of scope adoptions over the previous *three* years.¹⁹ Conversely, the variable *Cum Exit* measures the total number of NAICS that the BHC completely dropped over the same three-year period, while *Churning* is the interaction between the first two variables, thus capturing the extent to which a BHC is *transforming* its business scope. Controls also included the level of *scope* before the three years of expansions captured by *Cum Adoption*. Moreover, we controlled for any M&A activity over the previous three years, as a way to condition on possible scope expansions that might be just the indirect consequence of such activity. In addition, we included the interaction of *Cum Adoption* with *Scope*, to allow for non-linear effects of expanding scope depending on the extent to which scope is broad to begin with.

Next, we looked at the equivalent specification for expansion into *existing areas only*, i.e. the addition of subsidiaries in NAICS that were already part of the BHC's organizational structure.

¹⁸ A similar story can be told for M&A given the well-known concerns that mergers are costly in the short-term because they require integrating corporate cultures, staff, systems, etc.

¹⁹ We ran alternative specifications from 1 to 5 years, and the effects were most visible with the 3 year lag- which is also managerially a sensible period for the fruits of expansion to affect ROE. Tobin Q impact was, unsurprisingly, on the same period, as the capital markets incorporated these inter-temporal tradeoffs. The consistency between our ROE, cumulative lag results and the Tobin Q impact, discussed in Section V, increase our confidence in this specification.

This was the same specification with (3) but focusing instead on the diversification of banks onto *existing NAICS only*, so as to see how this shapes performance, with the same setup. Specifically:

$$Performance_{i,t} = \alpha + \beta \cdot Cum\ Exist\ Adoption_{i,t-j} + \gamma \cdot Cum\ Exist\ Exit_{i,t-j} + \delta \cdot Exist\ Churning_{i,t-j} + \theta \cdot Scope_{i,t-j-1} + Controls_{i,t-j-1} + \varepsilon_{i,t} \quad (3b)$$

where *Cum Exist Adoption* is the total number of new subsidiaries that a BHC has added in the recent past in *existing NAICS*. In our baseline specification we summed over the previous three years and measured the impact on performance at time t . Similarly, the variable *Cum Subs Exit* measures the total number of Subsidiaries (as opposed to NAICS) that the BHC dropped over the same three-year period, while *Churning* is the interaction between the first two variables. The same controls as above were also included. For completeness sake, we also estimated another specification, (3c), which included *both new and existing section adoptions* (ie, total adoption of subs) during the period.

We then ran one more analysis to see the joint effect of these two expansionary moves- into existing and new areas. Also, acknowledging that firms may change their diversification through other means – ie, without adding new subsidiaries, but by changing the mix between different activities, we added the lagged change in the ratio between banking and non-banking assets, which we calculated by identifying the narrow banking subsidiary Assets and comparing them to BHC’s total Assets. This led us to the final specification, which considers the joint effects expansion into new vs established areas, done incidentally as our focus remains expansion into new areas:

$$Performance_{i,t} = \alpha + \beta \cdot Cum\ Adoption_{i,t-j} + \gamma \cdot Cum\ Exit_{i,t-j} + \delta \cdot Churning_{i,t-j} + \zeta \cdot Cum\ Exist\ Adoption_{i,t-j} + \eta \cdot Cum\ Exist\ Exit_{i,t-j} + \theta \cdot NonBankAssets_{i,t-j} + \iota \cdot Scope_{i,t-j-1} + Controls_{i,t-j-1} + \varepsilon_{i,t} \quad (3c)$$

III.2 Dynamics of entry and exit: Results

Table 3a reports the results of regressions based on specification (3a). A few results are worthy of note. First, controlling for the extent of business scope, the act of expanding into new NAICS is associated, unconditionally, with a negative impact on performance. However, the impact seems to have a non-linear component, with further expansions gradually becoming associated with a positive impact. Engaging in M&A activity has a negative impact on performance. However, even

after this is properly accounted for, the expansion in and of itself retains its negative coefficient.²⁰ Exiting does not have a significant relationship with ROE, at least in the basic OLS regressions. This may indicate an underlying latent heterogeneity in the population—after all, a firm must expand its scope before one can observe instances of refocusing. Hence, the cross-sectional regressions in columns 3–5 compare BHCs exiting activities they have added, BHCs that expanded and then chose to stay, *and* BHCs that never expanded in the first place.

To better understand the *marginal effect* of expansion, it might be more helpful to regard it as a “treatment” and consider its impact, in the spirit of Schoar (2002). We can do this by shifting to a fixed effects model, which looks at how dynamics of scope *transformation* affect firms, accounting for their heterogeneity. The results in column 6 show, as we would expect, a significant difference from those in columns 3–5. Moreover, exiting displays a positive and significant coefficient. This suggests that firms that engage more broadly in scope expansion, but also retrench when (presumably) its results are poor, on net display relatively better performance. At the same time, the results in column 6 indicate that overall churning of activities does not improve performance—if anything, it worsens it slightly.²¹

A possible issue is that the full population includes a relatively small but still potentially important subset of BHCs that begin the study period with an already-broad scope footprint (e.g. financial conglomerates such as insurance companies that at some point acquire a bank charter and therefore become BHCs). We cannot observe the dynamics that brought them to that point—and if they exit certain NAICS, we do not know how long they have been pursuing those activities. Our attempted workaround was to run a separate regression excluding BHCs that were already “complex” in scope (i.e. three or more separate NAICS) at the outset. The results are in column 7. Interestingly, all the action actually comes from churning, while exit *per se* is not significant. Moreover, with already-complex BHCs excluded, exiting is more likely to be from recently added

²⁰ While the baseline control for M&A activity is represented by the cumulative number of subsidiaries acquired through M&A over the previous three years, we tried three alternative specifications, for which we ran the full set of analyses reported in the paper (results available upon request.) First, we used an indicator variable that switches on if M&A activity occurred; second, we considered all adoptions which were the result of M&A separately; and third, we excluded from the computation of the cumulative adoptions those that were the result of an M&A event at the top-holder level. None of these affected our results. The robustness is also due to the fact that –as remarked earlier – only a small fraction of all scope adoption events come from M&A activity.

²¹ Interestingly, expanding scope when credit conditions are tight is *negatively* correlated with performance in the cross section, although significance disappears when we introduce FEs (results not reported here, available upon request.)

activities. Hence, it is not pure refocusing that is associated with a positive impact on performance, but rather the combined act of entering and exiting.

Finally, it is worth noting that scope has a negative direct coefficient. However, scope (which is also the result of previous expansion into new areas, since BHCs started narrow) has a *positive* interaction term with adoption, suggesting that broader scope (which is linked to the previous experience in expanding) makes expansion into new areas more effective. This confirms Zollo and Singh (2004), who study the impact of experience and learning, albeit in the context of acquisitions in banking. Overall, these results thus indicate that different strategies combining scope expansion with activity exiting have a heterogeneous impact on performance—a finding consistent with theories of resource renewal.

The *expansion* of scope comes in sharp relief when we consider the difference between the results above and the correlations with the expansion into *existing* NAICS of (3b), which are provided in Table 3b. While the results are in a similar direction, the economic significance of the expansion coefficients is from one to three orders of magnitude smaller. Also, there is no significance when we consider Exit or Churn for existing subsidiaries; organizational simplification through purging of subsidiaries without existing businesses does not seem to help ROE, neither is administrative churn important. The only other significant finding is in the fixed effects (with year effects) specification, where the number of subsidiaries has a very small but quite significant positive effect- suggesting that for all the (small) negative effect of increasing complexity, there is some learning, which allows to compensate the negative effect as firm complexity and subsidiary number grows. Presumably, bigger firms are better able to digest growing complexity.

Together, these findings provide significant support to the hypothesis that the expansion into *new* segments is quite distinct from diversification overall. We also put this hypothesis to the test through our analysis of the joint impact of new expansion (into new areas and through new subsidiaries), existing subsidiaries, and the shift of activities that can be inferred from a firms' shift in terms of core banking vs other assets. Note that this is a particularly stringent test, since the shift of assets into non-core may be the result of the shift into new areas of activity, so that this variable might inadvertently absorb some of the variance due to new subsidiary addition (or new NAICS expansion). What we see is that, first, this variable does not dominate the results; it is significant, but loses its significance in our penultimate specification, and in our final, fixed effects

specification. We also see that the number of subsidiaries (which duplicate existing NAICS) also are not consistently connected to ROE. They only become significant in the FE specification, and even then their economic significance is an order of magnitude smaller compared to a subsidiary addition which *expands* the existing NAICS (-0.011 vs -0.122). Conversely, coefficients for *new* expansion are still significant (and negative), with little change from the analysis presented in Table 3a.

In all, this suggests that understanding the dynamics of how firms expand into new areas are particularly interesting. But before moving to our analysis, a methodological note is called for.

IV. Understanding the dynamics of scope expansion

IV.1 Identification, Endogeneity and Research Design on Scope Expansion

As noted earlier, the literature on diversification has focused on the comparison between narrow vs broad firms, or on the impact on valuation (eg, Tobin's Q), profitability (including ROE) or productivity, of diversifying, finding a negative empirical relationship between business scope diversification and performance in the cross section, a finding we replicate in our analysis, and which does not go away with the inclusion of TED spreads or VI measures. However, many contributions—e.g., Chevalier (2000); Campa and Kedia (2002); Maksimovic and Phillips (2002); and Villalonga (2004a, 2004b)—have suggested that such findings may be the result of selection: Underperformers seek to diversify to ensure their survival, thus leading to a negative but non-causal link between diversification and performance. This is a valid concern, even if fortuitously limited by the institutional specificities of our sample: BHCs are subject to intensive supervisory monitoring and regulation that might discourage expansion plans in the case of poor performance. In fact, bank regulation explicitly codified this during the period of our study: in 1991, the Federal Deposit Insurance Corporation Improvement Act (FDICIA), imposed restrictions on BHCs' expansion plans if they exhibited low or falling performance. The problem is also mitigated by the inclusion of BHC fixed effects so to extract identification from changes in scope occurring within the same organizations.

As noted earlier, our focus and the potential contribution (theoretically and empirically) is on the analysis of the different expansion paths, and not of the aggregate benefits of diversification. This shift of emphasis also helps address the research design issues and the concern with endogeneity and reverse causality. Diversification research generally compares the

performance of separate entities to those who are part of a broader entity, and its thorny econometric problems are the result of the need to separate out the impact of diversification *per se*, from the selection effects of why firms would expand. In our setting, we have a different setup, which may help us address these issues. We start with a narrow set of BHCs, dominated by their core (commercial banking) subsidiaries, which are increasingly given the option to expand. The comparison group is not (as in the “chop-shop” analyses, e.g.) the “narrow” vs the “broad” firms in the cross-section. It is firms which remain narrow, and firms that from narrow choose to expand, presumably because they believe (rightly or wrongly) that there are benefits to be had, or because their managers are ambitiously growing and expanding into new areas. The qualitative evidence also confirms that the core interest of top-holders is the BHC profitability; our analysis considers whether BHCs are able to achieve that goal or not, as opposed to produce a scale-weighted or target-ROE-weighted assessment. The research design here, in a uni-sectoral study, is simpler. Identification comes from the comparison of different expansion paths into (new) segments, compared with the null of no expansion.

Separating out expansion into existing segments vs expansion into new segments, which lies at the core of our paper, allows us to revisit endogeneity and selection. If there was a concern that banks would diversify away from their core because of the reduction in profitability (thus leading to a negative relationship between performance and scope), then we would not expect to find this relationship to differ between diversification into activities that are within the BHC portfolio rather than outside it. If anything one might expect that it would be easier to diversify away from the core moving into areas that are already known to a BHC, whereas we find strong evidence for the opposite. More to the point, if the empirical focus becomes *where firms enter into*, i.e., what are the exact segments where scope expansion takes place, then by (research) design, it is hard to raise endogeneity concerns. The critical difference here is that we do not derive identification from the correlates of the difference between diversified and un-diversified banks; but rather, by the structure of the *particular sectoral choices made* by banks who expand. While a firm which diversifies might have done so to escape a dire core segment, *where* it expands (to either make sales or derive upstream or downstream synergies) is a strategic choice where reverse causality is hard to construe.

A final potential concern with our overall research design is that the addition of subsidiaries in new NAICS may be just incidental, or it may not be reflective of significant

economic activity – “small fry” in the context of BHCs, especially on the larger end. However, if that were the case, we would be bound to pick up just noisy signals from the data and we should not expect to find any material impact on aggregate performance. The fact that we do, and systematically so, seems reassuring of the fact that the observation of scope change is economically meaningful, and captures the elusive “business model transformation” dimension which likely accompanies and defines new segment entry. The robustness analysis presented in section V, where we use Tobin Q as alternative metric of performance supports this argument, as it indicates an impact on long-run performance that is picked up by markets, above and beyond the reflection on balance sheet accounting.²²

IV.2 Synergies from related activities: Approach

Our analysis of expansion into new segments starts with examining performance effects across activities that are more or less related, drawing on the literature on relatedness in diversification (Rumelt, 1974; Teece et al, 1994; Palich et al, 2000; Villalonga, 2004a), hypothesizing that expansion into related activities will be more beneficial than distant expansion.²³

We implemented this idea by refining specification (3), allowing for a separate effect of adoption activity as a whole and that of specific kinds of adoptions, using alternative metrics that should capture relatedness across activities. One traditional measure is the “distance” of a given NAICS code from core commercial banking (NAICS 52221): looking “upwards” from 52221 in the NAICS tree, activities that shared the same first four digits were assigned a distance of 1; those that shared only the first three digits were assigned 2, etc. The prediction would be that entering more distant activities should have a relatively worse impact on performance. A second, similar metric of distance differentiates between scope expansions within the financial industry proper (NAICS 52) and all others.

These approaches have two key shortcomings. First, as Bryce & Winter (2009) note, NAICS-distance is a problematic measure of true relatedness. There may very well be activities further “away” from NAICS 52211, and/or outside of NAICS 52, that are nevertheless closely related to financial intermediation (e.g., real estate, which is seen to offer direct synergies, but also other

²² See also the additional robustness results presented in Appendix, in section A1

²³ Note that by testing for the validity of these alternative theories we are also implicitly examining the depth of the basic story of agency-driven motives and imperium building: If diversification is not in the interests of shareholders, but managers pursue it for their own benefits, then it should be the case that any instance of diversification would do it. In other words, the agency argument cannot predict any heterogeneous effects on performance across alternative expansion paths.

non-financial sectors that may be seen as natural hedges in credit intermediation, such as oil and gas extraction, construction, etc.). Second, and more important, these metrics are time-invariant, while combining certain activities may have a very different implication at different times. And so, to go back to the division between NAICS 52 and non-52, it may be that adding a securities broker or an insurance underwriter is beneficial early in the sample period, but less so later on, when there are no more externalities to be had as the market matures. Conversely, changes in financial intermediation might make functions such as warehousing and title insurance more attractive later on, as the underlying technologies develop and mature.

More broadly, we want to introduce a measure that captures the changing set of opportunities that drives all firms in the sector, and that may explain their quest for greater scale and scope (as Chandler, 1990, remarked for a different set of industries and time periods). We can only do this if we know what the average or *modal* firm looks like, and consider how far the diversification of a particular BHC is geared towards it. We operationalized these considerations with two alternative specifications. First, we classified individual NAICS on the basis of how many BHCs expanded in them over the previous year. This yielded a natural ranking, with “hot” NAICS at the top. The fact that many BHCs choose to enter the same activities at the same time may indicate bigger rewards.

A possible concern with ranking NAICS this way is that a very popular NAICS may *fall* in the ranking because it has attained saturation within the population. We therefore complement this flow metric with one that ranks NAICS based on how many BHCs *hold* them at any point in time, irrespective of when they added them. This classification of modality is just as dynamic, but captures more of the organizational structure that is currently most prevalent. Note that these metrics are fully derived from the data itself, thus leaving us agnostic about which specific combinations should better reflect the prevalent technology. In this sense, the approach is consistent with the basic *survivor principle* originally proposed in Alchian (1950), reiterated by Stigler (1968), and adapted to organizational studies by Teece et al (1994), Bryce and Winter (2009), and others.

To provide a visual intuition of the concept of NAICS modality, Figure 4 shows the corresponding time series for a representative subset of five-digit NAICS. For instance, NAICS 52599, Other Financial Vehicles, which includes closed-end investment funds, special purpose vehicles, mortgage real estate investment trusts (REITs), and real estate mortgage investment conduits (REMICs), was hardly present within the population in the early 1990s, but became

overwhelmingly prevalent in later years. This seems to match the prior that this type of subsidiary became increasingly related to the mode of intermediation during the asset securitization boom. Conversely, NAICS 53111, which includes entities managing residential dwellings, was relatively very popular in the early 1990s—presumably a time when balance sheet assets such as mortgages and their collateral defined the predominant scope of a commercial bank—but later declined into obscurity, probably mirroring the subsequent evolution toward the originate-and-distribute model of intermediation. And NAICS 52312, Securities Brokerage, and 52421, Insurance Brokerage, start at similar levels of popularity but diverge later. Table A3 in the Appendix presents the ranking of modality for the top 50 NAICS in the population.

IV.3 Synergies from related activities: Results

We began with the two NAICS-distance metrics of relatedness described above, in the spirit of existing work. Table 4, column 1 shows the results of a regression based on the same specification as in Table 3a, where, however, we included a term (*adoption type*) that captures the average distance from NAICS 52211 of adoptions over the previous three years. The estimated coefficient of the baseline cumulative adoption regressor remains negative and significant, while the distance-related term is not significant. We then used the alternative metric that simply separates expansion in NAICS 52 sectors from any other. Column 2 shows the results. In this case the baseline effect of expansion remains negative and significant, while the term capturing expansions in NAICS 52 sectors is positive and significant—a first indication that expansions in possibly more closely related activities should be associated with relatively better performance outcomes.

We then introduced metrics to reflect activities becoming more or less related over time, depending on industry-wide evolution. We started using the metric of “hot” activities described in section 3.4. The results, in column 3, show that hot expansions do seem to have a more positive effect on performance. Columns 4 and 5, meanwhile, display the results for the stock-based “modal” metrics. The results are consistent with previous ones, and they are significant whether we use a coarse binary metric or the more accurate, continuous measure. Expanding into modal activities is associated with better performance.²⁴

²⁴ Including both the term for NAICS 52 sector (static measure) and our dynamic measures of modality shows that modality is more important: The static coefficient that was significant at the 1% level, when tested separately, becomes significant at the 10% level when tested jointly, and its point estimate is reduced by 39%. The point estimate of the dynamic measure remains significant at the 1% level, when jointly considered, and its point estimate decreases

We can gauge the economic magnitude of expanding into modal NAICS. We ran the exercise focusing on one activity, and reporting the hypothetical impact of its addition to the organizational structure of a BHC for different degrees of modality of this activity. Take, for instance, NAICS 52421, Insurance Agencies and Brokerage. Over the sample period, it had a minimum modality of 12.2%, and a maximum of 37.5%, with fluctuations over time. If a BHC were to expand into this activity at the nadir of its modality, it would yield a net *ROE* impact of approximately -0.15% ($-0.39 + 0.02 \times 12.2$). Expanding instead when the NAICS had its maximum modality would generate a net *ROE* boost of around +0.36%; hence the differential is approximately +0.51%.

Next, we wanted to consider together the role of vertical integration and the importance of expanding toward the modal BHC structure, to make sure that they captured independent strategies of scope expansion. To that end, column 5 includes the average VI metric. It also considers the interaction of VI with the modality metric. This allows us to assess the extent to which a firm enters into a *commonly held* VI sector in our BHC population.²⁵ We find, first that VI is negative, and second, the *interaction* between modal and VI is significant and positive: If firms move to a VI segment that is becoming modal, VI can add value.²⁶

Note that while our research design avoids the standard selection and endogeneity issues of the typical diversification setup, one may wonder whether BHCs that have been doing better and/or foresee better future prospects, would *systematically* expand in exactly those NAICS that are hot or modal in the population. To test for this, we ran logit regressions of the likelihood of expanding in a hot or modal NAICS as a function of BHC characteristics capturing past performance, and we did not find any systematic empirical relationship in the data, as noted in Table A4 in the Appendix. More to the point, it is hard to construe an argument on the selection process through which firms which are inherently better and as such expect higher ROE would

by 12% when compared to its separate test. This suggests that the dynamic measure is a more reliable indicator, which also has greater economic impact when considered jointly with the static measure.

²⁵ Some vertically related sectors become *more* modal over time, and others less. This reflects BHCs choosing *which* of their related sectors to hold. NAICS 541 (Professional, Scientific, and Technical Services), which includes NAICS 54199 (mostly, specialized B2B service providers) and NAICS 54119 (Legal Services) gains popularity, while NAICS 561 (Administrative and Support Services) loses popularity over our sample period, even though both maintain similar vertical linkages.

²⁶ The inclusion of TED as a control variable does not change our base results, nor does it reduce the impact of modality, being early, or engaging in VI as a type of expansion.

move to the segments which will become hot or modal vs other segments. As our identification comes from the *type* of expansion, there is no evident reverse causality.²⁷

IV.4 What lies behind Modality: Survival or conformity?

Finding a positive association between these measures and performance from diversification, however, does not necessarily mean that firms that “go modal” are better at responding to economic needs. Rather, it may simply be the result of institutional and social pressures to conform. As economic sociologists have long argued, the consistency of business activities (the “iron cage” that makes businesses remarkably similar to each other) might be caused by social pressures that punish deviants while rewarding conformers (Meyer and Rowan, 1977; DiMaggio and Powell, 1983; Zuckerman, 1999). Thus, banks might all change their scope not to take real opportunities, but to follow a trend. Their customers prefer them to look a certain way; potential employees are seeking the reassurance of a “familiar scope”; and capital providers like to fund what they know (Zuckerman, 1999).

How can we distinguish between these two alternative explanations? As described in the introduction, we compare BHCs that adopt the *same* NAICS at different points in time, and define a BHC as a “lead adopter” if it fell within the first quartile of all BHCs that ever expanded in that same NAICS.²⁸ If it is underlying technology change that drives possible benefits in transforming scope, “early” adopters should benefit more than latecomers, while the opposite prediction should hold under the alternative, sociological explanation.

IV.5 What lies behind Modality: Results

The results in column 1 of Table 5 summarize the findings, indicating that lead adopters achieve a better performance. The estimated effect is economically strong: The estimated net impact on a lead adopter’s *ROE* would be equal to about +0.62%. Adding the same activity in any of the following three quartiles, meanwhile, would yield an estimated net impact of -0.20%. Results are robust to using different definition of lead adopters. We ran separate regressions, with the

²⁷ The only other potential concern might be a “mechanical association”, whereby firms that stand to succeed enter particular NAICS making them more “hot”. Note that our definition of “hot” (or indeed modal) has to do with count, and not with success of those that enter. So there does not appear to be any means for a particular BHC’s success to drive a NAICS “hotness” or modality. Moreover, the modal metric is a stock measure driven not only by the *focal* BHC, but by *the average* BHC in the past few years, which can’t plausibly be connected to performance status or expectations.

²⁸ It is perhaps worth repeating that this classification allows particular banks to be lead adopters in some NAICS, but mass adopters or laggards in others, thus yielding identification from the treatment effect of different types of adoption through the use of our fixed effects specification.

definition altered to encompass the first 5%, 10%, etc., up to 40%, in addition to the baseline 25%. The rest of the table shows the results, and indicates that whatever specification we use, being a lead adopter is associated with better performance at the 1% level. More to the point, the lower the cutoff point (i.e., the earlier the adoption), the greater the benefit in terms of performance, suggesting that the very first adopters benefit the most: The estimated *ROE* impact on a very early entrant (first 5%) would be +2.11%, compared to the estimated effects mentioned above, of about +0.643% for a BHC in the first quartile and -0.20% for a later adopter.²⁹

Finally, we provide a comparative analysis of leader/laggard and modal expansion analysis, so as to consider their interaction. We split the sample and ran separate regressions for (a) all “lead” adoptions (which is what we report in Table 6, Column 1); (b) lead adoptions that *are* modal at the time of their adoption; (c) lead adoptions that are *not* modal at the time of their adoption but *ultimately become* modal; and (d) lead adoptions in segments that never become modal. Comparing the coefficients, we see that our baseline is 0.817 ($p < 0.01$), whereas (b), as expected, is higher at 0.951 ($p < 0.01$)—as this also includes the benefit of being modal. More importantly, the coefficient value in (c) is also higher than (a) at 0.849 ($p < 0.01$), suggesting that *future* modal segments yield more benefit, whereas leading in segments that will never catch on does *not* help ROE, with the coefficient 0.291 being not significant.

A fuller exploration of leader/laggard dynamics goes beyond the scope of this paper, but our results offer some basis for educated conjecture. Our evidence is consistent with the hypothesis that lead adopters are intrinsically better at identifying the opportunities offered by changes in intermediation. Alternatively, early expansion might offer preemptive “first mover” type benefits—although this is made less likely by the fact that we are not looking at entry into new markets, but rather expansion of existing firms into existing markets in the quest for synergies. Moreover, we measure ROE, and as such do not look at whether, e.g., laggards overpay for their acquisitions in popular areas. If popularity is associated with increased cost for expansion, then the negative impact of late adoption would be even higher. Furthermore, it may be that there is heterogeneity in *why* firms expand: Lead adopters might go after the opportunities, as they obtain

²⁹ We also analyzed “laggards” (bottom quartile adopters) separately to see whether they would be more harshly “penalized” for adopting late (something which, again, would be inconsistent with the basic isomorphism hypothesis, but consistent with a “peer pressure” and vicarious learning hypothesis). We found that being a laggard does indeed have a net negative impact on performance (-.28, significant at the 5% level). (Full results for the laggard group are available on request.)

higher ROE. As the sector sees the benefit of these moves, other firms, perhaps less well poised to benefit from scope expansion, also expand, but fail to benefit, as we can see from the decisively negative impact of being a laggard.

These results, taken together, also suggest that there could be a subtler but important set of social pressures that shapes scope expansion mechanisms, with a predictable sequence of first functional, then dysfunctional expansion. This hypothesis, consistent with our data but not tested through it, is corroborated by anecdotal evidence from the financial crisis (see Tett, 2009), and will be the object of future research.

V. Alternate Measures of Performance

As said earlier, while our analysis above provides a comprehensive set of robust results, covering the entire industry rather than a representative sample, a question might emerge on our dependent variable, which is an accounting profitability measure. In section III we provided justifications to the use of such metric. Nevertheless, we provide here some additional comprehensive results using other measures of performance. We focus in particular on Tobin's Q (available for the publically listed firms) and, to gauge risk, the BHC's Z-score, computed routinely in banking as an estimate of the number of standard deviations below the mean that consolidated profits would have to fall to make consolidated equity negative, and as such a plausible metric of distance from default (Boyd and Graham, 1986). We also briefly report on our analysis on Leverage.

The analysis of Tobin's Q does not present major differences in terms of the static analysis.³⁰ More relevant, the analysis in terms of Table 3a shows remarkable consistency. All the "new cumulative adoption" variables are negative and significant, with a similar range of coefficients (albeit some with lower significance, but only one coefficient in specification (3) not being significant). Scope remains negative and very significant. The only difference is that the Exit

³⁰ For the basic static analysis, reported for ROE in Table 1, coefficients are similar, with similar significance, the only difference being that in the FE specification of equation (2) Capital Ratio isn't important whereas (change in) log assets enters with significance and a negative sign, meaning that growth dents Tobin's Q whereas it doesn't affect ROE. For the Table 2 results, the TED spread in specification 1 is negative and significant (understandably, since valuation may be affected by volatility more than ROE), and Scope x TED spread is slightly more significant and economically somewhat more important, in line with the results and interpretation offered. In specification (3) the VI measures are not significant (they were at the 10% level for ROE), although the coefficients are still negative, with similar magnitude. In the FE specification (4), the interaction term of VI and scope is analogous (negative, significant at the 5% level) and the only change is that the main VI term becomes significant (0.183, p<0.01).

variables, and the interaction between Exit and Entry are not significant, suggesting that while experimentation may yield fruits in terms of ROE, it does not get picked up (favourably or otherwise) by the stock-market. The only other noticeable difference is that M&A does not appear to be negatively correlated to Tobin's Q. It is insignificant (and broadly positive) and becomes significant in specification (6) (0.282, $p < 0.05$), suggesting that capital markets have a much kinder view on M&A, or perhaps that M&A produce a reduction in ROE within three years, possibly due to Post-Merger Integration challenges that stock markets brush aside.³¹

We also see a similar pattern when we compare the Tobin'Q results for 3a with the results of 3b. The coefficient for *new* subsidiaries is on average 20 times bigger than the same coefficient for subsidiaries in existing NAICS. Likewise, in the Table 3c equivalent, we observe that the change in Core/Total Bank Assets is not significant (neither is the lagged coefficient), and that in specifications (4)-(6) new subsidiaries in existing NAICS are not significant whereas those in new NAICS are. (In specifications 1-3, they are significant). Also, the coefficients in the joint analysis are even more different, with new subsidiaries in existing segments having a two to three order of magnitude lower coefficient, whether significant or not.

Moving to our analysis in Table 4, to facilitate the line-by-line comparison, we provide in the Appendix the same table in A6. As we can see, results are also analogous. There is a base negative impact on new subsidiary addition, but Financial, Hot, Modal, and Modal with VI are all positive and significant, and, interestingly, with similar coefficients. Again, other results remain (e.g. Lagged scope, other controls) are equivalent, including the interaction of scope with adoption, suggesting a learning effect. The differences are also consistent with the previous ones: Exit and interactions with Exit are not picked up (favorably) by market, and that M&A turns from being a negative, to becoming significantly positive in terms of valuation.

The analysis of Table 5 was also replicated and the results also broadly held. The main difference is that the 5% cutoff isn't significant (perhaps suggesting that truly innovative moves do not get rewarded from the stock-market, but once the pattern becomes established, there is a significant net benefit. Otherwise, both the coefficients in "adoption type" are all significant, and the magnitude is comparable. It is also the case that (after the 10% cutoff level) the coefficient

³¹ Note that R-squared jumps by an order of magnitude to around 35% for RE and 25% for FE. This is understandable, as the sub-sample of publically listed firms has a much greater incidence of new NAICS entries and exits, and as such there is more variance on the independent variable side, which translates to more explanatory power.

monotonically decreases, much like in our ROE analysis, and in line with expectation. As above, the main difference is that M&A shifts from a negative into a positive, and that Exits and interactions are not significant. Finally, the analysis of Table 6, replicated as well, is also consistent. (Results for this additional analysis available upon request)

In all, then, Tobin Q's results, for the sub-sample of listed firms, strongly confirms our analysis, suggesting that our results are not picking up a particularity of accounting measures. We also find some interesting differences, in particular in terms of the role of M&A's, which appears to be a negative from an ROE perspective but a positive from a Tobin Q perspective, and Exits and their interaction which do not seem to move the capital markets, though they provide some meaningful impact at the ROE level. Whether this is because they free up equity (thus leading to a mechanical ROE improvement), or because the idea of "churn" or "renewal" is not seen with much interest in the market remains an interesting question for future research. It is also worth noting that market-based valuations do not recognize the initial trailblazers (which have the highest ROE impact), but does reward those who follow (early enough) the new path in terms of expansion.

Finally, we considered the risk implications of scope expansion. Is it the fact that new subsidiaries, especially in hot or modal sectors increase ROE and Tobin Q, but that they also increase risks? Using the Z-score, calculated as the sum of ROA and the capital ratio (equity over assets) divided by the standard deviation of ROA across the previous four years, we considered if there were any adverse risk implications of changing a banks' scope. Our analysis (available upon request), which follows the same template, yields some interesting results. First, in terms of the static analysis, scope *and* VI is *positively* correlated with default risk (leading to a low Z-score). Second, comparing *all* subsidiary to *new* subsidiary entry, we find that non-new subsidiaries do not matter, contrasted to entry into new NAICS that do. More specifically, for the Table 3 analyses, new subsidiaries are positively associated with risk, and so are exits (perhaps unsurprisingly, as exits may also be prompted by banks that are failing at their core). Interestingly, when they are significant (in three instances at the 1% level and one at the 10% level), both exit x entry and scope x entry are positive, suggesting that both churn and learning not only can help boost ROE but also potentially reduce risks. In terms of Table 4 analyses, new industry entry remains risky but there is no additional risk from entering into hot or modal segments, while churn and learning reduce risks. In terms of Table 5 analyses, being in the very initial batch of entrants

(top 5%), while not picked up by the stock market, as we saw earlier, does significantly decrease risk; otherwise, none of the other groups of early movers faces additional risks, something that Table 6 also confirms.

We also ran our full set of analyses on Leverage, to consider whether any beneficial effects (especially in terms of ROE) came at the expense of needing to increase leverage and as such risk for banks. We found that there was no consistent evidence that expansion into new subsidiaries and especially in hot, modal or lead subsidiaries increases leverage (thus making profits riskier). Unlike on ROE or Tobin's Q, Leverage impact is inconsistent and varies between specifications, with signs changing and limited significance. (Results available upon request).

In all, our analyses of alternative performance measures, both in terms of Tobin's Q and Z scores maintains and reinforces the thrust of our analysis, alleviating any concern that ROE construction may be driving our results. The comparison between the three also provides some intuitive, and interesting differences and subtleties – in terms of the role of exit (and how capital markets vs ROE picks it up, and on how it relates to risk), and of the role of M&A.

VI. Conclusions

We aimed to illuminate the dynamics of business scope transformation, drawing on the unique opportunities offered by our comprehensive data on BHCs. We demonstrated the importance of *new* sector entry, and showed its implications for performance, over the sectors' life cycle, contrasting this with expansion in *existing* subsidiaries or increase in diversification measured by core banking / total asset changes. Our objective was to provide a systematic analysis of *changes* in business scope, and unpack its dynamic process in the context of a changing sector.

We explicitly focused on a period of increasingly permissive policy, regulatory change, and significant technological change that transformed both the process of financial intermediation and the boundaries of the majority of firms well before the formal repeal of the Glass-Steagall Act through Graham-Leach-Bliley in 1999. We show that M&A at BHC level does not drive our results, suggesting that this expansion is the result of a desire to broaden the boundaries of the banking firm. Our analysis addresses the puzzle of why this sector-wide transformation happened, even though expansion does not yield positive results—given that, in our sample, it is not the poor performers who expand into *new* segments.

Our results suggest that broader scope is beneficial during periods of turbulence (Matvos et al, 2016), although *expanding* into new areas when credit conditions are tight is not. We also find that vertical integration is (weakly) positively associated with ROE in some specifications, but that *expansion* into new vertically related segments is *negatively* related to ROE, which confirms the conjecture that it is more beneficial to dis-integrate in mature markets, as transaction costs diminish and capable suppliers emerge (Jacobides and Winter, 2005). We also illustrate the role of churning and portfolio renewal, whose beneficial impact is demonstrated for the first time, to our knowledge, in such a systematic fashion (see Capron & Mitchell, 2013): We show that imperium builders suffer, while those experimenting with both entry *and* exit benefit. We show that churn appears to be a firm-level attribute—which is why it is important in our panel, while fixed-effects regressions are not. We also find evidence for learning through the positive correlation between scope (and as such experience with expanding) and the ability to benefit from scope expansion. We further find that Tobin Q is affected by expansion in similar fashion- even though market valuations seem not to reward exits from segments and churn, and are more positive on M&A.

More important, we provide fresh insights on the nature of synergistic benefits, which cannot be explained away by considering the variation in capital market conditions (Matvos et al, 2016; Kuppaswamy and Villalonga, 2015) or any control variables, even with the most comprehensive FE specifications. Confirming and qualifying existing theory, we find that relatedness matters for the success of scope expansion, and find strong support for our hypothesis that the evolution of the modal bank, reflecting the changing technology of intermediation, affects success in expansion. BHCs that move into modal or “hot” segments tend to benefit. This is a significant advance over the prevailing mode of analysis of scope expansion, and draws on our dynamic analysis of a shifting set of “coherent” segments (see Teece et al, 1994). Our findings show that this dynamic feature matters, and we further advance research by finding that this is not due to banks benefitting from becoming more isomorphic over time, but rather to trailblazers who shape the frontiers of the sector and benefit. This finding leaves an interesting question for future research in terms of the underlying causes of the qualitative differences between early and late innovators (or non-expanders). While our findings allow some conjectures on this, it merits dedicated follow-on research.

Theoretically, our analysis is the first, to our knowledge, to separate the narrower question of how organizations expand their scope breaking new ground, from the broader question of

diversification. We argue that a better understanding of the drivers and implications of firms *changing* their scope, which, as we show, needs to happen with an understanding of the changing context, is an important step in mapping and decoding changes in shifting “business models” (Cetorelli et al, 2012; Jacobides et al, 2014). In a time of boundary changes in sectors from media and telecommunications to healthcare and IT, this mode of analysis may help us decode what drives organizational and sectoral dynamics and what are their results, extending existing research.

Empirically, our results are a significant departure from the received wisdom that scope expansion and diversification are detrimental just because of managerial agency, and also move beyond the (debatable) merits of VI and the (more robust) benefits of scope in dealing with capital market volatility. The role of *specific strategies*, in terms of corporate renewal, and the (early) identification of where the sector “mode” is heading, provide a fresh agenda for strategy as well as policy. In terms of the policy, which is currently debated, our findings suggest that it is hard to justify a blanket negative bias against broadening bank boundaries. The robust regularities we have brought to light suggest that policy, as well as our understanding of scope expansion and diversifications’ merit, may require a better understanding of the role of the shifting sectoral context and of firms’ strategies.

That said, while our research provides a systematic exploration of a sector whose business model is transforming, we do not consider welfare and broader stakeholder impact. The fact that we find evidence of net benefits for the banking organizations that implement scope transformation (especially early on), does not imply a translation of such benefits for society as a whole, nor does it rule out the possibility of associated negative systemic externalities. In particular, the change in the business model of BHCs was an important driver of the 2007-2009 financial crisis (Tett, 2009; Rajan, 2011; Jacobides et al, 2014). This is an important issue, which we hope to consider in related future research.

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Table 1: Return on equity and scope

	(1)	(2)	(3)	(4)
	ROE	ROE	ROE	ROE
Scope	0.0785*** (0.0184)	-0.0576* (0.0305)	-0.113*** (0.0384)	-0.178*** (0.0543)
Log Assets		0.684*** (0.120)	0.763*** (0.136)	-0.0478 (0.428)
Capital Ratio			-0.425*** (0.0457)	-0.413*** (0.0535)
Constant	12.85*** (0.120)	4.350*** (1.493)	7.501*** (1.810)	18.53*** (5.447)
Bank fixed effects	No	No	No	Yes
Year fixed effects	No	No	No	Yes
Observations	21031	21031	16742	16742
Adjusted R ²	0.003	0.008	0.037	0.026

The dependent variable is the BHC's return on equity. The variable Scope is defined as the count of unique 5-digit NAICS identified by either the primary or secondary business activity reported by a BHC's subsidiaries. Log Assets is the natural logarithm of the total asset size of the consolidated BHC, while Capital Ratio is the ratio between regulatory capital and total asset. The regression frequency is annual, with the right hand side variables measured at year t-1. The sample consists of all FR Y-9C-filing BHCs between 1992 and 2006. Column 4 includes both BHC and year indicator variables. Standard errors are in parentheses and are clustered at the BHC level. *** indicates statistical significance at the 1% level, ** at 5% and * at 10%.

**Table 2: Return on equity and scope.
Capital market tightness and vertical integration**

	(1) TED	(2) TED	(3) VI	(4) VI
Scope	-0.217*** (0.0742)	-0.245*** (0.0667)	-0.0530 (0.0488)	-0.0629 (0.0683)
TED Spread (Avg.)	-0.353 (0.435)			
Scope X TED Spread	0.201** (0.0883)	0.138** (0.0701)		
Average VI			-0.0712* (0.0367)	0.0573 (0.0350)
Scope X Average VI			-0.0200* (0.0115)	-0.0284** (0.0114)
Log Assets	0.777*** (0.137)	0.00311 (0.430)	0.921*** (0.142)	0.0553 (0.431)
Capital Ratio	-0.425*** (0.0458)	-0.411*** (0.0534)	-0.425*** (0.0459)	-0.412*** (0.0536)
Constant	7.512*** (1.816)	17.83*** (5.478)	5.866*** (1.901)	17.04*** (5.506)
Bank fixed effects	No	Yes	No	Yes
Year fixed effects	No	Yes	No	Yes
Observations	16742	16742	16742	16742
Adjusted R ²	0.038	0.027	0.044	0.027

The dependent variable is the BHC's return on equity. The variable Scope is defined as the count of unique 5-digit NAICS identified by either the primary or secondary business activity reported by a BHC's subsidiaries. The variable TED Spread (Avg.) is the three-year moving average of the daily TED spread. The variable Average VI is the amount of normalized inputs (from the BEA's Inputs/Outputs table) that each of a BHC's NAICS provides to the BHC's other NAICS, averaged over all NAICS-pairs within the BHC. Log Assets is the natural logarithm of the total asset size of the consolidated BHC, while Capital Ratio is the ratio between regulatory capital and total asset. The regression frequency is annual, with the right hand side variables measured at year t-1. The sample consists of all FR Y-9C-filing BHCs between 1992 and 2006. Columns 2 and 4 includes both BHC and year indicator variables. Standard errors are in parentheses and are clustered at the BHC level. *** indicates statistical significance at the 1% level, ** at 5% and * at 10%.

Table 3a: Return on equity and unconditional adoption of new subsidiaries

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	ROE	ROE	ROE	ROE	ROE	ROE	Only simple
Cumulative Adoption	-0.123** (0.0580)	-0.112* (0.0589)	-0.111* (0.0612)	-0.176** (0.0731)	-0.271*** (0.0869)	-0.132* (0.0715)	-0.209* (0.126)
All Exit			-0.00369 (0.104)	-0.136 (0.123)	-0.00468 (0.137)	0.193* (0.104)	0.0793 (0.162)
Cum. Adoption X Exit				0.0189** (0.00912)	-0.0218 (0.0152)	-0.0198** (0.00970)	0.113** (0.0509)
Cum. Adoption X Scope					0.0169*** (0.00603)	0.00877* (0.00452)	0.00158 (0.0320)
Cumulative M&A		-0.147 (0.139)	-0.147 (0.139)	-0.128 (0.138)	-0.135 (0.134)	-0.336*** (0.101)	-0.644*** (0.226)
Scope (lagged)	-0.0960*** (0.0315)	-0.0948*** (0.0323)	-0.0941** (0.0397)	-0.103** (0.0413)	-0.183*** (0.0593)	-0.218*** (0.0619)	-0.151 (0.114)
Log Assets	0.910*** (0.146)	0.941*** (0.156)	0.940*** (0.157)	0.996*** (0.163)	1.094*** (0.174)	-1.205** (0.593)	-0.730 (0.738)
Capital Ratio	-0.365*** (0.0658)	-0.365*** (0.0657)	-0.365*** (0.0657)	-0.367*** (0.0659)	-0.367*** (0.0661)	-0.435*** (0.0735)	-0.458*** (0.0774)
Constant	4.962** (2.160)	4.556** (2.277)	4.568** (2.286)	3.942* (2.337)	2.875 (2.441)	34.11*** (7.854)	27.64*** (9.534)
Bank fixed effects	No	No	No	No	No	Yes	Yes
Year fixed effects	No	No	No	No	No	Yes	Yes
Observations	10226	10226	10226	10226	10226	10226	8005
Adjusted R ²	0.042	0.042	0.042	0.043	0.044	0.032	0.034

The dependent variable is a BHC's return on equity. An adoption is defined as the appearance of a new 5-digit NAICS within a BHC's organizational structure. Cumulative Adoption is the count of a BHC's adoptions over a consecutive three-year period. All Exit is the count of unique 5-digit NAICS that are observed leaving a BHC over a consecutive three-year period. Scope is defined as the count of unique 5-digit NAICS reported by a BHC's subsidiaries. Cumulative M&A is the number of subsidiaries acquired by a BHC from other BHCs over the previous three years. Log Assets is the natural logarithm of the total asset size of the consolidated BHC, while Capital Ratio is the ratio between regulatory capital and total asset. The regression frequency is annual. Cumulative Adoption, Exit and Cumulative M&A are calculated over t-1 and t-3, and Scope at t-4. Column 7 reports the results of a regression that excludes BHCs with a scope at entry in the database equal to or greater than 3. The sample consists of all FR Y-9C-filing BHCs between 1992 and 2006. Column 6 and 7 include both BHC and year indicator variables. Standard errors are in parentheses and are clustered at the BHC level. *** indicates statistical significance at the 1% level, ** at 5% and * at 10%.

Table 3b Return on equity and unconditional adoption of subsidiaries in existing NAICS only

	(1)	(2)	(3)	(4)	(5)	(6)
	ROE	ROE	ROE	ROE	ROE	ROE
Cumulative Sub. Entry	-0.00459*** (0.00121)	-0.00442*** (0.00126)	-0.00455*** (0.00129)	-0.00536* (0.00323)	-0.00536* (0.00323)	-0.0125*** (0.00320)
All Sub. Exit			0.00101 (0.00534)	0.000476 (0.00502)	0.00284 (0.00831)	0.0180 (0.0133)
Cum. Sub. Entry X Exit				0.00000277 (0.00000867)	-0.00000289 (0.0000136)	0.00000578 (0.0000125)
Cum. Sub. Entry X Sub. Count					0.00000212 (0.00000400)	0.00000616* (0.00000326)
Cumulative M&A		-0.211* (0.122)	-0.212* (0.123)	-0.207* (0.121)	-0.210* (0.121)	-0.318*** (0.0926)
Sub. Count (lagged)	0.0000907 (0.00161)	-0.0000722 (0.00166)	-0.000379 (0.00240)	-0.000350 (0.00236)	-0.00119 (0.00355)	-0.00461 (0.00301)
Log Assets	0.600*** (0.106)	0.662*** (0.121)	0.662*** (0.121)	0.667*** (0.127)	0.669*** (0.127)	-1.497** (0.586)
Capital Ratio	-0.363*** (0.0655)	-0.364*** (0.0653)	-0.364*** (0.0653)	-0.364*** (0.0653)	-0.364*** (0.0654)	-0.447*** (0.0738)
Constant	8.702*** (1.749)	7.908*** (1.905)	7.909*** (1.906)	7.841*** (1.977)	7.822*** (1.981)	37.48*** (7.803)
Bank Fixed Effects	No	No	No	No	No	Yes
Year fixed effects	No	No	No	No	No	Yes
Observations	10226	10226	10226	10226	10226	10226
Adjusted R ²	0.039	0.040	0.040	0.040	0.040	0.032

The dependent variable is a BHC's return on equity. A subsidiary entry occurs when a BHC adds a new subsidiary to its organization structure with a NAICS that it already held in a previous quarter. Cumulative Sub. Entry is the count of a BHC's subsidiary entries over a consecutive three-year period. All Sub. Exit is the number of subsidiaries that the BHC drops over a consecutive three-year period with NAICS that the BHC continues to hold during this period. Sub. Count is defined as the count of subsidiaries held by the BHC. Cumulative M&A is the number of subsidiaries acquired by a BHC from other BHCs over the previous three years. Log Assets is the natural logarithm of the total asset size of the consolidated BHC, while Capital Ratio is the ratio between regulatory capital and total asset. The regression frequency is annual. Cumulative Sub. Entry, All Sub. Exit, and Cumulative M&A are calculated over t-1 and t-3, and Sub. Count at t-4. The sample consists of all FR Y-9C-filing BHCs between 1992 and 2006. Column 6 includes both BHC and year indicator variables. Standard errors are in parentheses and are clustered at the BHC level. *** indicates statistical significance at the 1% level, ** at 5% and * at 10%.

Table 3c Return on equity and unconditional adoption of subsidiaries in existing and new NAICS, and Core Asset Changes

	(1)	(2)	(3)	(4)	(5)	(6)
	ROE	ROE	ROE	ROE	ROE	ROE
Cumulative Adoption	-0.110*	-0.103	-0.110	-0.177**	-0.253***	-0.122*
	(0.0657)	(0.0668)	(0.0675)	(0.0748)	(0.0846)	(0.0684)
Cumulative Sub. Entry	-0.00242	-0.00244	-0.00330	0.00235	0.000928	-0.0112***
	(0.00270)	(0.00269)	(0.00251)	(0.00383)	(0.00381)	(0.00337)
All Exit			-0.0298	-0.166	-0.0577	0.188*
			(0.103)	(0.125)	(0.137)	(0.107)
Cum. Adoption X Exit				0.0187*	-0.0135	-0.0187
				(0.00989)	(0.0166)	(0.0145)
Cum. Adoption X Scope					0.0141***	0.00901**
					(0.00528)	(0.00358)
All Sub. Exit			0.00849	0.00904	0.00110	0.0138
			(0.00634)	(0.00617)	(0.00778)	(0.0141)
Cum. Sub. Entry X Exit				-0.0000214**	-0.00000903	0.0000109
				(0.0000102)	(0.0000165)	(0.0000178)
Cum. Sub. Entry X Sub. Count					-0.00000303	0.00000293
					(0.00000502)	(0.00000556)
Change in Nonbank Assets Ratio	-0.00469**	-0.00461**	-0.00460**	-0.00441**	-0.00334	-0.00273
	(0.00197)	(0.00197)	(0.00197)	(0.00198)	(0.00387)	(0.00367)
Chg. in Nbank Assets Ratio X Lag					-0.00000502	-0.0000104
					(0.0000134)	(0.0000129)
Cumulative M&A		-0.0943	-0.0932	-0.101	-0.111	-0.289***
		(0.140)	(0.144)	(0.133)	(0.131)	(0.0984)
Scope (lagged)	-0.155***	-0.151***	-0.152***	-0.174***	-0.214***	-0.222***
	(0.0476)	(0.0479)	(0.0549)	(0.0585)	(0.0670)	(0.0617)
Sub. Count (lagged)	-0.00635***	0.00615***	0.00378	0.00588**	0.00643**	-0.00141
	(0.00196)	(0.00198)	(0.00230)	(0.00244)	(0.00289)	(0.00242)
Nonbank Assets Ratio (lagged)	-0.00242	-0.00232	-0.00227	-0.00221	-0.00230	-0.00722***
	(0.00166)	(0.00165)	(0.00166)	(0.00166)	(0.00168)	(0.00278)
Log Assets	0.998***	1.014***	1.023***	1.075***	1.128***	-1.136*
	(0.157)	(0.164)	(0.167)	(0.169)	(0.177)	(0.598)
Capital Ratio	-0.363***	-0.363***	-0.363***	-0.366***	-0.367***	-0.438***
	(0.0660)	(0.0659)	(0.0660)	(0.0664)	(0.0663)	(0.0740)
Constant	3.959*	3.746	3.647	3.112	2.526	33.53***
	(2.266)	(2.349)	(2.385)	(2.393)	(2.466)	(7.932)
Bank fixed effects	No	No	No	No	No	Yes
Year fixed effects	No	No	No	No	No	Yes
Observations	10225	10225	10225	10225	10225	10225
AdjustedR ²	0.044	0.044	0.044	0.045	0.045	0.035

The dependent variable is a BHC's return on equity. An adoption is defined as the appearance of a new 5-digit NAICS within a BHC's organizational structure. Cumulative Adoption is the count of a BHC's adoptions over a consecutive three-year period. All Exit is the count of unique 5-digit NAICS that are observed leaving a BHC over a consecutive three-year period. A subsidiary entry occurs when a BHC adds a new subsidiary to its organization structure with a NAICS that it already held in a previous quarter. Cumulative Sub. Entry is the count of a BHC's subsidiary entries over a consecutive three-year period. All Sub. Exit is the number of subsidiaries that the BHC drops over a consecutive three-year period with NAICS that the BHC continues to hold during this period. Change in Nonbank Assets Ratio is the ratio of nonbank-to-bank assets in t-1 minus this ratio in t-4. Scope is defined as the count of unique 5-digit NAICS reported by a BHC's subsidiaries. Sub. Count is defined as the count of subsidiaries held by the BHC. Nonbank Assets Ratio (or Lag) is the ratio of nonbank-to-bank assets. Cumulative M&A is the number of subsidiaries acquired by a BHC from other BHCs. Log Assets is the natural logarithm of the total asset size of the consolidated BHC, while Capital Ratio is the ratio between regulatory capital and total asset. The regression frequency is annual. Cumulative Adoption, All Exit, Cumulative Sub. Entry, All Sub. Exit, and Cumulative M&A are calculated over t-1 and t-3, and Scope, Sub. Count and Nonbank Assets Ratio (Lag) at t-4. The sample consists of all FR Y-9C-filing BHCs between 1992 and 2006. Column 6 includes both BHC and year indicator variables. Standard errors are in parentheses and are clustered at the BHC level. *** indicates statistical significance at the 1% level, ** at 5% and * at 10%.

Table 4: Return on equity and adoption for different adoption types

	(1) Distance	(2) Financial	(3) Hot	(4) Modal	(5) Modal with VI
Cumulative Adoption	-0.119 (0.0911)	-0.325*** (0.121)	-0.350*** (0.0919)	-0.386*** (0.117)	-0.193 (0.165)
Adoption Type	-0.0152 (0.0576)	0.298** (0.141)	0.134*** (0.0372)	0.0215*** (0.00781)	0.0162** (0.00812)
Cumulative VI					-0.0277*** (0.0106)
Modal X VI					0.000240* (0.000143)
All Exit	0.194* (0.104)	0.183* (0.105)	0.201* (0.104)	0.198* (0.104)	0.216** (0.104)
Cum. Adoption X Exit	-0.0200** (0.00976)	-0.0187** (0.00906)	-0.0196** (0.00974)	-0.0199** (0.00975)	-0.0224** (0.0103)
Cum. Adoption X Scope	0.00852* (0.00471)	0.0120** (0.00477)	0.0137*** (0.00421)	0.0146*** (0.00438)	0.0128*** (0.00493)
Cumulative M&A	-0.337*** (0.101)	-0.333*** (0.0993)	-0.345*** (0.101)	-0.331*** (0.0998)	-0.358*** (0.100)
Scope (lagged)	-0.217*** (0.0628)	-0.228*** (0.0613)	-0.241*** (0.0620)	-0.242*** (0.0612)	-0.228*** (0.0620)
Log Assets	-1.207** (0.595)	-1.222** (0.590)	-1.232** (0.591)	-1.186** (0.591)	-1.173** (0.592)
Capital Ratio	-0.435*** (0.0735)	-0.437*** (0.0733)	-0.441*** (0.0736)	-0.436*** (0.0736)	-0.439*** (0.0740)
Constant	34.15*** (7.885)	34.40*** (7.822)	34.62*** (7.826)	33.94*** (7.834)	33.81*** (7.852)
Bank fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	10226	10226	10226	10226	10226
Adjusted R ²	0.032	0.033	0.035	0.034	0.035

The dependent variable is a BHC's return on equity. Adoption Type is a sub-specification of the cumulative adoptions count based on the type specified in each column header. Distance defines the adoption type as the average distance (one, two, three or four digits) from NAICS 52211 of the NAICS adopted by the BHC. Financial is the subset of the cumulative adoption count of adoptions in NAICS 52. Hot defines the adoption type as the percentage of BHCs over the previous year that adopted the NAICS. Modal defines the adoption type as the sum of shares of BHCs that hold the NAICS a BHC adopts. Cumulative VI is the sum of the amount of normalized inputs (from the BEA Input/Output table) the adopted NAICS contributes to each of the BHC's NAICS, summed over each adoption in the past three years. The regression frequency is annual. Cumulative Adoption, All Exit, Adoption Type, Cumulative VI Added and Cumulative M&A are calculated over t-1 and t-3, and Scope at t-4. The sample consists of all FR Y-9C-filing BHCs between 1992 and 2006. Standard errors are in parentheses and are clustered at the BHC level. *** indicates statistical significance at the 1% level, ** at 5% and * at 10%.

Table 5: Return on equity and adoption for lead adoption type

	(1)	(2)	(3)	(4)	(5)
	Lead	5%	10%	30%	40%
Cumulative Adoption	-0.204*** (0.0739)	-0.127* (0.0712)	-0.149** (0.0726)	-0.206*** (0.0749)	-0.204*** (0.0778)
Adoption Type	0.817*** (0.245)	2.237*** (0.836)	0.890** (0.427)	0.641*** (0.231)	0.416** (0.174)
All Exit	0.171 (0.104)	0.173* (0.103)	0.184* (0.104)	0.170 (0.105)	0.180* (0.104)
Cum. Adoption X Exit	-0.0149 (0.00971)	-0.0138 (0.00955)	-0.0167* (0.00979)	-0.0147 (0.0100)	-0.0162* (0.00961)
Cum. Adoption X Scope	0.00785* (0.00430)	0.00538 (0.00450)	0.00760* (0.00454)	0.00808* (0.00440)	0.00863** (0.00436)
Cumulative M&A	-0.362*** (0.0964)	-0.346*** (0.102)	-0.356*** (0.0984)	-0.362*** (0.0978)	-0.344*** (0.0982)
Scope (lagged)	-0.200*** (0.0600)	-0.183*** (0.0618)	-0.200*** (0.0619)	-0.201*** (0.0606)	-0.206*** (0.0604)
Log Assets	-1.219** (0.589)	-1.208** (0.592)	-1.187** (0.592)	-1.200** (0.589)	-1.205** (0.589)
Capital Ratio	-0.441*** (0.0732)	-0.437*** (0.0730)	-0.436*** (0.0733)	-0.439*** (0.0730)	-0.439*** (0.0733)
Constant	34.30*** (7.801)	34.11*** (7.842)	33.87*** (7.848)	34.03*** (7.808)	34.11*** (7.806)
Bank fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	10226	10226	10226	10226	10226
Adjusted R ²	0.035	0.034	0.033	0.034	0.033

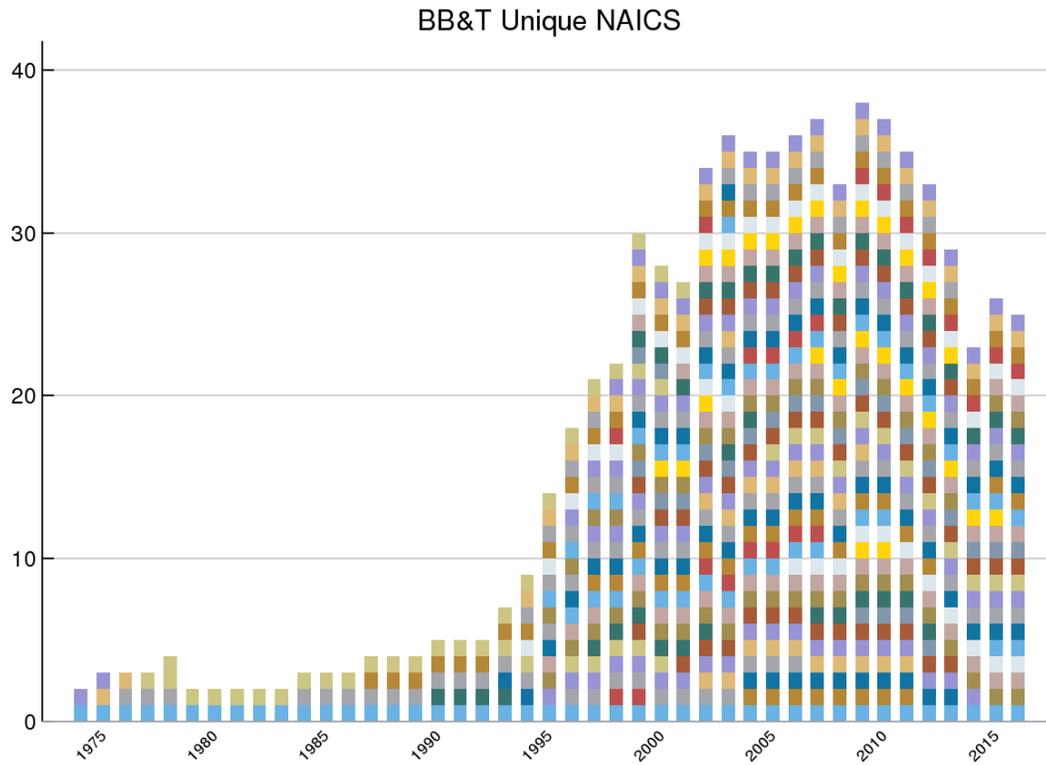
The dependent variable is a BHC's return on equity. Adoption Type is a sub-specification of the cumulative adoptions count and for each regression is a variant of the Lead adoption type. The main Lead adoption type (column 1) is defined as the subset of adoptions where the BHC was among the first 25% of BHCs to ever hold that NAICS. Columns 2 through 5 contain the same regression, except with the 25% cutoff changed to the indicated values. The regression frequency is annual. Cumulative Adoption, Adoption Type, Exit and Cumulative M&A are calculated over t-1 and t-3, and Scope at t-4. The sample consists of all FR Y-9C-filing BHCs between 1992 and 2006. Standard errors are in parentheses and are clustered at the BHC level. *** indicates statistical significance at the 1% level, ** at 5% and * at 10%.

Table 6: Return and adoption for lead adoption, by modality

	(1) Lead	(2) Lead (modal)	(3) Lead (future modal)	(4) Lead (not modal)
Cumulative Adoption	-0.204*** (0.0739)	-0.199*** (0.0746)	-0.157** (0.0728)	-0.137* (0.0712)
Adoption Type	0.817*** (0.245)	0.951*** (0.293)	0.849** (0.387)	0.291 (0.355)
All Exit	0.171 (0.104)	0.179* (0.104)	0.186* (0.104)	0.190* (0.104)
Cum. Adoption X Exit	-0.0149 (0.00971)	-0.0157 (0.00983)	-0.0165* (0.00989)	-0.0193** (0.00970)
Cum. Adoption X Scope	0.00785* (0.00430)	0.00869** (0.00433)	0.00798* (0.00444)	0.00847* (0.00451)
Cumulative M&A	-0.362*** (0.0964)	-0.353*** (0.0954)	-0.345*** (0.0983)	-0.340*** (0.102)
Scope (lagged)	-0.200*** (0.0600)	-0.205*** (0.0603)	-0.206*** (0.0609)	-0.216*** (0.0625)
Log Assets	-1.219** (0.589)	-1.188** (0.588)	-1.189** (0.592)	-1.215** (0.593)
Capital Ratio	-0.441*** (0.0732)	-0.440*** (0.0730)	-0.437*** (0.0734)	-0.436*** (0.0735)
Constant	34.30*** (7.801)	33.91*** (7.781)	33.89*** (7.842)	34.24*** (7.862)
Bank fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	10226	10226	10226	10226
Adjusted R ²	0.035	0.035	0.033	0.032

The dependent variable is a BHC's return on equity. Adoption Type is a sub-specification of the cumulative adoptions count and for each regression is a subset of the Lead adoption type. The Lead adoption type is the subset of adoptions where the BHC was among the first 25% of BHCs to ever hold that NAICS. In Column 1 the adoption type is the Lead adoption type. Column 2 defines the adoption type as the subset of Lead adoptions that are made on NAICS that are binary-modal (among the top ten most-held NAICS by BHCs as of the previous quarter) as of the time of the Lead adoption. Column 3 defines the adoption type as the subset of Lead adoptions that are not binary-modal at the time of adoption, but that become binary-modal for at least one future quarter. Column 4 defines the adoption type as the subset of Lead adoptions that are not binary-modal at the time of adoption and do not for any future quarter ever become binary-modal. The regression frequency is annual. Cumulative Adoption, Adoption Type, Exit and Cumulative M&A are calculated over t-1 and t-3, and Scope at t-4. The sample consists of all FR Y-9C-filing BHCs between 1992 and 2006. Standard errors are in parentheses and are clustered at the BHC level. *** indicates statistical significance at the 1% level, ** at 5% and * at 10%.

Figure 1: The evolution of scope of Branch Bank & Trust, 1972-2017



Each vertical rectangle depicts a unique 5-digit NAICS industry segment in which BB&T reported controlled subsidiaries at each point in time. The light blue rectangle at the bottom of each column represents the commercial banking core activity (NAICS 52211).

Figure 2: BHC scope upon entry

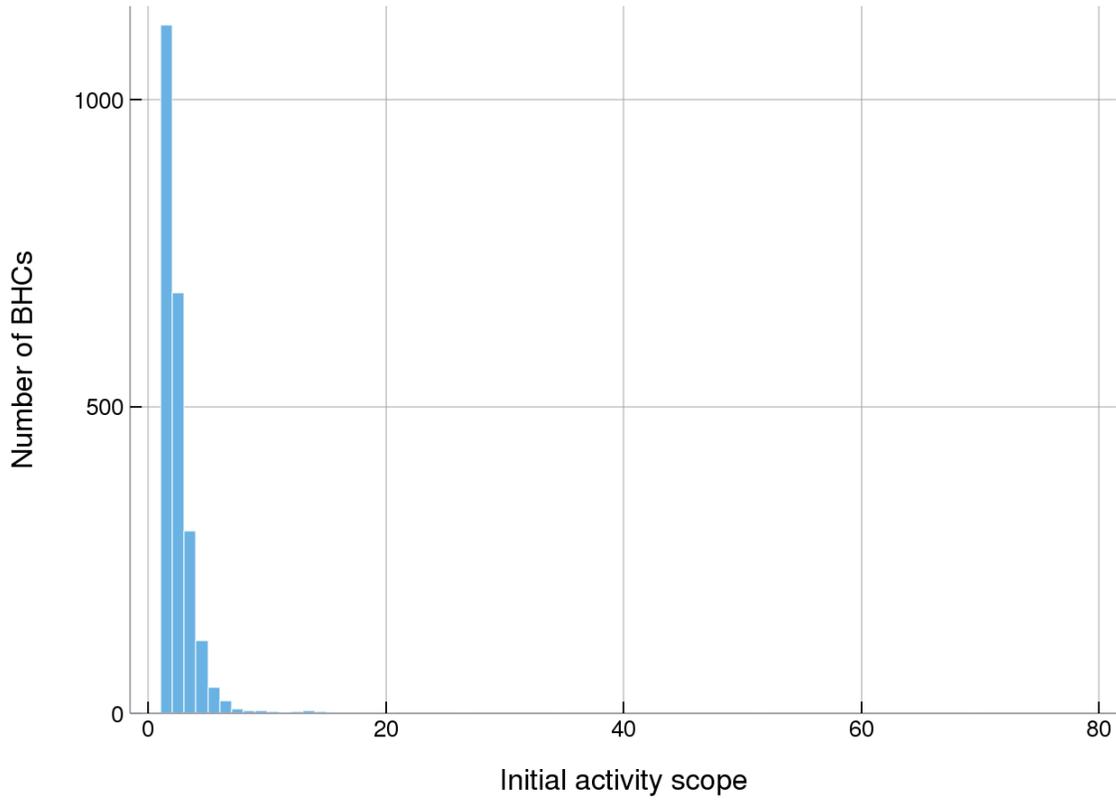


Figure 1 shows a histogram of initial activity scope for all BHCs that file the Y-9C and become BHCs during the sample period (1992-2006). Initial activity scope is the number of unique five-digit NAICS that a BHC holds during its first year as a top-tier BHC, based off the reported primary or secondary NAICS of its controlled subsidiaries. The data underlying the activity scope measure is from the Cetorelli and Stern (2015) database of organizational structure.

Figure 3a: Annual number of BHCs with adoptions or exits

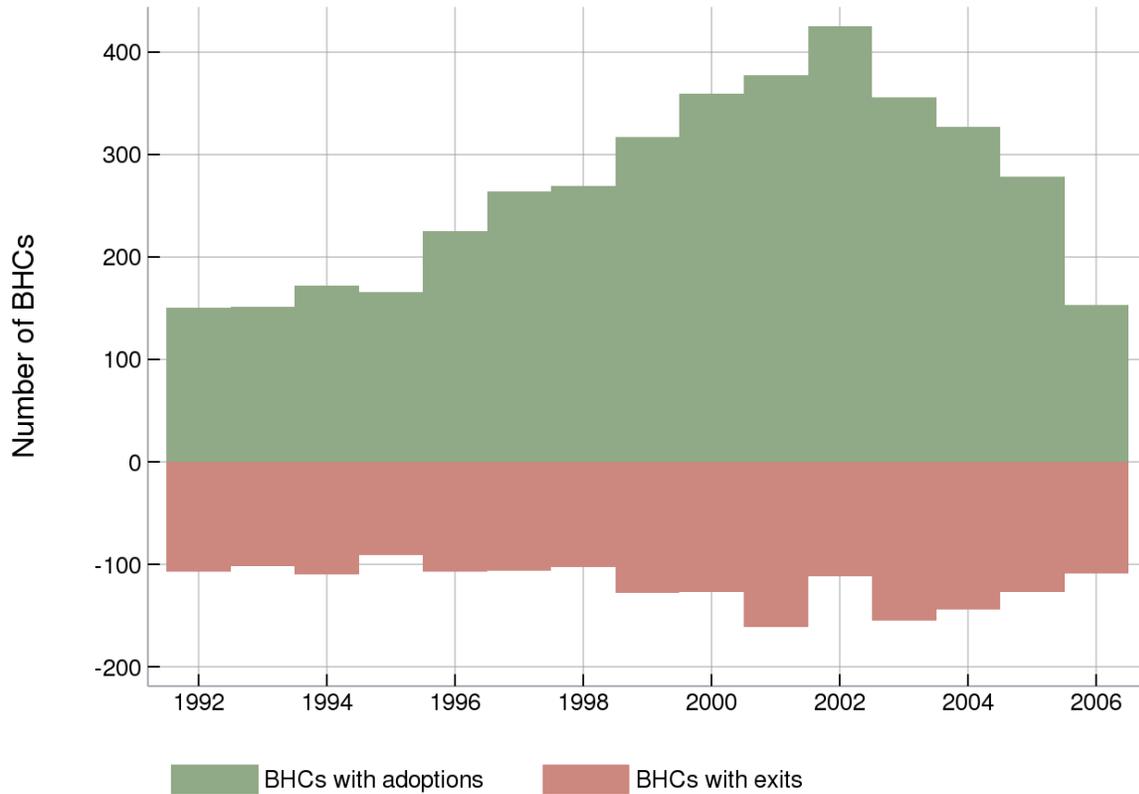


Figure 3a shows, among Y-9C-filing BHCs, how many BHCs make at least one adoption and/or at least one exit during each year over the sample period (1992-2006). An adoption occurs for a given year when a BHC controls a subsidiary with a five-digit primary or secondary NAICS code that prior to that year the BHC had never held within its organization. An exit occurs for a given year when it is the final year that a BHC holds a five-digit NAICS that it has held in prior years. The data underlying the adoption and exit statistics is from the Cetorelli and Stern (2015) database of organizational structure.

Figure 3b: Annual number of BHCs with adoptions or exits

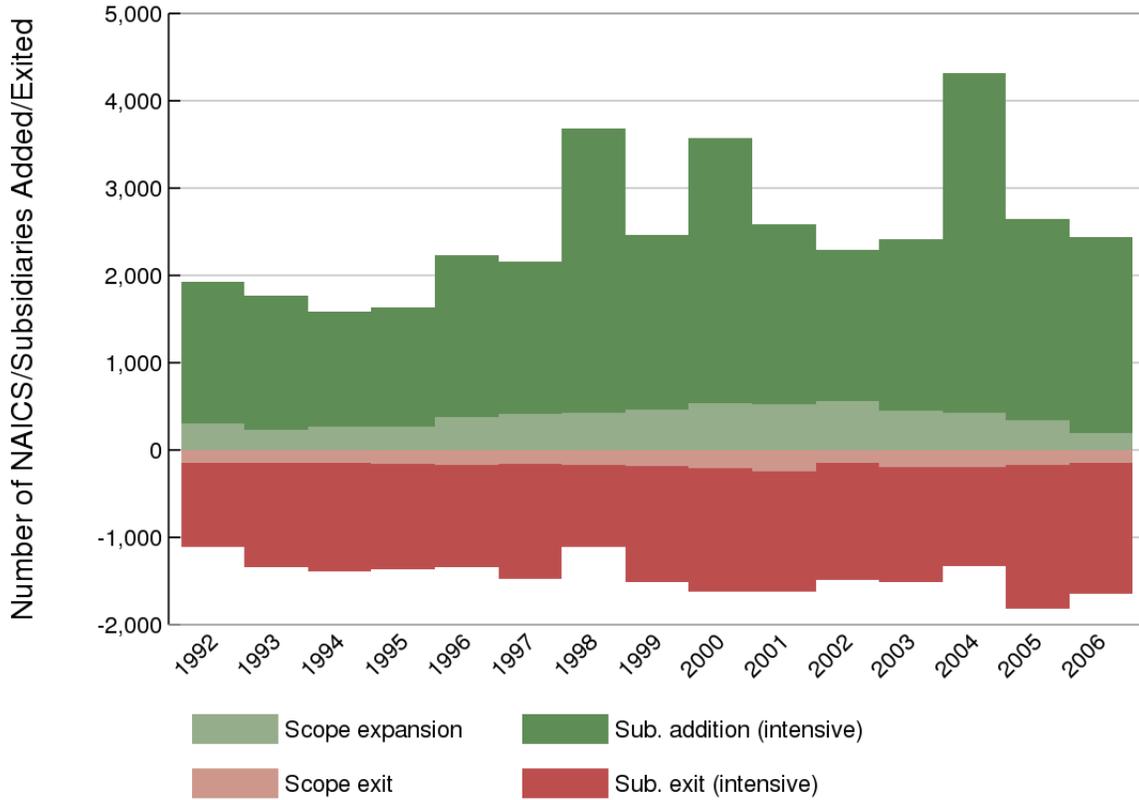


Figure 3b shows, among Y-9C-filing BHCs, the number of subsidiary adoptions which for the focal bank is a *new* adoption, and the number of *total* subsidiary adoptions for this year, summing up all the adoptions for each year done from all banks (1992-2006). Scope expansion occurs for a given year when a BHC controls a subsidiary with a five-digit primary or secondary NAICS code that prior to that year the BHC had never held within its organization. Scope exit occurs for a given year when it is the final year that a BHC holds a five-digit NAICS that it has held in prior years. A subsidiary addition (intensive) happens every time that a BHC adopts a new subsidiary which operates in a NAICS that was present in the BHC the previous year. A subsidiary exit (intensive) is an exit of a subsidiary from the BHC, whose five-digit NAICS level is still represented at the BHC level post-exit. The data underlying the adoption and exit statistics is from the Cetorelli and Stern (2015) database of organizational structure.

Figure 4: Annual popularity of select NAICS

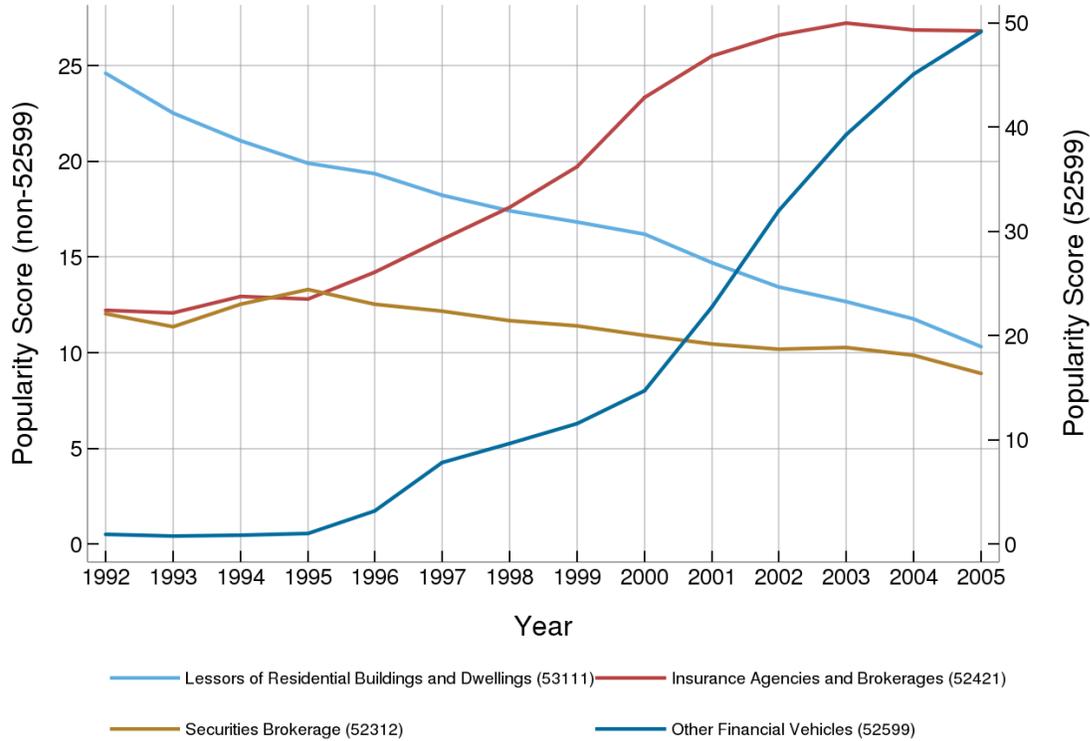


Figure 4 shows the popularity score of four different five-digit NAICS among Y-9C-filing BHCs for each year over the sample period (1992-2006). The right y-axis corresponds to the popularity score of NAICS 52599 (“Other Financial Vehicles”), while the left y-axis corresponds to the other three NAICS. The popularity score for a NAICS-year equals the number of BHCs that hold that NAICS during any quarter of the year divided by the total number of BHCs in the population (multiplied by 100). A BHC is considered to hold a NAICS if it controls at least one subsidiary whose reported primary or secondary activity is that NAICS. The underlying data is from the Cetorelli and Stern (2015) database of organizational structure.

Appendix for
Unpacking the Dynamics of Scope Transformation in US Banks, 1992-2006³²

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This appendix contains auxiliary material to the main analysis in the manuscript. The first section provides an in-depth discussion on the quality of the database, while the second presents more details on select items of both the methodology and the results of the analysis.

A1. Quality checks on the database

Is the data representative of the industry? The database is highly representative of the transformation in the US banking industry as a whole. However, while we focus on BHCs, it is certainly the case that commercial banks can operate as standalone organizations. Likewise, thrift (savings and loans) institutions can also engage in banking activities, but are not captured in our analysis. Hence, we might miss some transformation dynamics in the banking industry by focusing on BHCs. However, this is likely not the case, for two reasons. First, the extent to which an entity with a commercial bank or thrift charter could expand its business scope is constrained by regulation, with the holding company being exactly the legal vehicle reserved for this. Second, as Table A1 shows, BHCs have in fact been the largest component of the depository lending industry, accounting for a dominant share of total banking assets over time.

Properly capturing changes in business scope. While we believe that our database presents the most detailed and extensive analysis of banking scope (and, arguably, the most detailed database of scope transformation of any major industry), there is a risk of both Type I and Type II errors in our measure of changes in scope. First, there may be subsidiary additions that have little to do with actual economic activity, driven perhaps by tax or regulatory arbitrage (although creating a tax shield or circumventing regulatory restrictions could still be considered synergistic strategies). Second, one could argue that scope expansion could still take place within the boundaries of a commercial bank entity, even without a subsidiary addition. For instance, a

³² The views expressed in this document are those of the authors and do not necessarily represent those of the Federal Reserve Bank of New York or the Federal Reserve System.

commercial bank could obviously engage in mortgage lending without necessarily adding a specialist mortgage lender to its structure, so that the addition of such a lender may signal the “start” of a new activity that actually began earlier.

To check on the first type of concerns, we ran regressions with both interest income ratio (revenues from interest-earning assets over total revenues) and noninterest income ratio (revenues from fee-based activities over total revenues) as dependent variables, and our metrics of scope expansion as regressors. If the addition of subsidiaries in new NAICS were merely an artifact of the tax and regulatory landscape, or any other arbitrage opportunity, we should not find any systematic association with income generation. The results, reported in Table A2, show exactly the opposite: Scope expansion is consistently associated with a subsequent increase in income, especially in the noninterest component -- as one would expect, since most newly adopted activities are likely to generate fee-based rather than interest-based revenues. Interestingly, expansion of scope is also associated with an increase in income *expenses*, another indication that adding subsidiaries in new activities has direct economic consequences.

The second concern is also unlikely to apply in our setting. While it is certainly the case that certain activities, as in the case of specialty lending, could be pursued by a commercial bank entity, it is also true that significant restrictions are in place on the type of economic activities that can be conducted within its strict legal boundaries. Indeed, the BHC is exactly the legal vehicle that US law has designed for a bank to pursue broader activities. Having said that, in specific circumstances we could accurately map NAICS types to corresponding items on BHCs’ balance sheets (e.g. credit-card lending; rental and leasing). If those specific activities were already significantly pursued within the boundaries of an existing commercial bank subsidiary (and therefore showing up in the consolidated balance sheet of the commercial bank top holder), adding a specialist should not be associated with meaningful expansions in those activities; it would only be formalizing that activity, and just tracking the organization in a different way. Yet we found that this was not the case. Regression analysis confirms that adding subsidiaries in either credit-card lending or rental and leasing for the first time led to a significant rise in the respective balance-sheet line items (results available upon request).

We also looked into other potential data issues. For instance, we considered the possibility of false attribution of business scope and business expansion in the database: A particular concern is the possibility that a BHC might look like it had added subsidiaries in a given NAICS,

when such data might simply reflect the investments of private equity entities under its control, or the investments of its controlled asset management entities. If such instances were prevalent, we would be hard pressed to consider them as reflecting a BHC's own business scope. However, we show that this is a non-issue: Private equity and asset management entities account for virtually no instances of scope expansion in the population.

Further, we considered the fact that NAICS industry classifications are revised over time, a potential challenge in maintaining a consistent panel database. However, this is not an issue in our case, since the industry codes assigned to subsidiaries and reported to the regulatory authorities are either confirmed or updated in the event of changes in the classification system, and then the information is rendered backward-compatible in the database according to the most recent classification.

Comparison with alternative metrics of business scope. Knowledge of the business activity of controlled subsidiaries thus appears to be a direct and precise way to infer the business scope of an organization. The use of industry classification codes for this purpose is also far more accurate than popular alternatives—such as Compustat segments, which offer only a coarse classification. Moreover, and perhaps most important, Compustat segments are self-reported, leading to possible reporting biases and a lack of homogeneity in classification across firms (Villalonga, 2004a). Also, Compustat segment information is only available for listed companies by definition, whereas our database encompasses the entire population of BHCs. As we argued earlier, much scope transformation takes place among private BHCs.

The BHC database resembles census-based sources, such as the Longitudinal Business Database (Jarmin and Miranda, 2002), with detailed information on firms, subsidiaries, and business activity. However, in census records (as used by other detailed examinations, including Schoar, 2002 and Villalonga, 2004a), ownership is defined either by a majority equity stake, or, in the case of minority positions, by the firms' own declaration that they control the subsidiary (Nguyen, 1998). That raises the possibility of arbitrary classifications, as well as a lack of homogeneous standards. In our database, control is strictly defined according to a set of regulatory guidelines—conditions that guarantee objectivity and higher standards of homogeneity across firms and through time. Given that our interest is in *synergies* and the overall impact from diversification, the focus on high-holder overall performance (as opposed to productivity, as in Schoar, 2002) is appropriate, and the fact that we have a set of sectoral

comparisons further justifies the use of ROE, since firms are broadly comparable in our setting.

The data is also better suited to our purposes than income data, which has been used extensively in studies of corporate diversification in banking (see, e.g. the comprehensive literature review in Stiroh, 2015). Arguably, non-traditional banking activities are sources of fee-based, non-interest income, and so a higher reliance on such income can meaningfully be associated with greater business diversification. However, income data remains too coarse, and does not lend itself well to a precise mapping with specific business activities. Second, a hypothetical increase in non-interest income may simply reflect a *scaling up* of extant non-traditional activities, rather than an expansion into new ones. Of course, such an increase would still capture a change in business *emphasis* and overall diversification, but it could not be characterized as an instance of scope expansion as described in the manuscript. Finally, a focus on income cannot capture synergies across different business activities: A new activity may not necessarily generate an income contribution, and may even make a loss, but it may nevertheless have a positive impact on the profitability of other, already existing operations. For example, entering the underwriting business may not necessarily be profitable *per se*, but it may reduce information frictions on corporates, thus possibly boosting *interest* revenues. Hence, as a result of this scope expansion the overall income composition of the organization may remain stable, or even tilt back.

A2. Methodology and analysis

Index of NAICS modality. In order to capture the industry “modal” BHC, we identified the count of individual BHCs that at any point in time either *add* subsidiaries for the first time in a given five-digit NAICS (the flow measure of “hot” NAICS) or the count on the basis of subsidiaries *held* in a given five-digit NAICS, irrespective of when that NAICS was entered for the first time (the stock metric of “modal” NAICS). To give a sense of the broad span of NAICS held by BHCs and their changing modality, Table A3 reports the list of the 50 most widely held five-digit NAICS for three representative years, sorted on the 2005 ranking. For each NAICS/year, the table reports count of BHCs, the equivalent share of total BHCs in the population (the actual modality metric), and the total number of subsidiaries held (the BHC count and total number of subsidiaries are reported for reference). The first line reports the

figures for commercial bank subsidiaries, NAICS 52211. By dint of the legal definition of a BHC, the entire population necessarily holds at least one such subsidiary.³³ The other NAICS display a significant heterogeneity in both the cross section and the time series. As the table indicates, it is the case that many individual NAICS are held sparsely in the cross section, which may raise an issue about their relevance. If anything though, maintaining this high level of detail could simply be a source of noise and thus a bias toward non-findings. We also ran a full set of results using the 4-digit level of aggregation, which generated qualitatively similar results.

Construction of the vertical integration metric. We constructed a metric of how vertically related a BHC's scope expansions are by drawing on Input-Output Accounts Data (IO table) from the Bureau of Economic Analysis (BEA). These tables provide information on how industries in the US economy interact with each other. For a given three-digit NAICS industry i , the BEA constructs the input component of the IO table by calculating the annual US economy-wide dollar value of inputs provided by each three-digit NAICS industry (including industry i itself) for the production of output by industry i . If industry i takes a large proportion of its inputs from industry j , then we can reason that industry j is upstream in the production chain of industry i , and that the two industries are vertically related.

We can therefore use the input table to calculate how intensely a BHC's expansion into a new NAICS contributes to the vertical integration of the BHC's own "production process." This is done as follows. Let n be the five-digit NAICS adopted by the BHC at time t . From the input table at time $t-1$ we sum across the inputs that n gives to each of the NAICS the BHC already holds. A high value of the sum indicates that the addition of n significantly increases the upstream vertical integration of industries in which the BHC is active. The sum is dynamic in that as a BHC expands its scope, its opportunities for vertical integration also increase: in a BHC with a large scope, there are more NAICS with which the new NAICS n can be vertically related. We then normalize the inputs sum by dividing from it the total amount of inputs (across all industries, regardless of whether they are held by the BHC) used by the NAICS the BHC already held prior to its expansion. The resulting metric, which we call *average VI*, thus captures the extent to which a given scope expansion increases the proportion of upstream production that is housed within the BHC.

³³ And for the same reason, of course, there is never an instance of scope expansion *into* NAICS 52211.

Endogeneity concerns. As discussed in the manuscript, the negative relationship between scope and performance may in fact be the result of selection, with poorly performing BHCs more likely to expand into new activities. This problem, which is relevant for entry *into some* new NAICS, but *not* in terms of which sector BHCs choose to enter (as we explain in the paper), is mitigated in this setting. To see why, consider the logit regressions of the likelihood of expanding scope as a function of firm characteristics that should reflect relative performance. In the regressions, the dependent variable is switched on if a BHC expands scope at time t , and the regressors capture firm performance observed at time $t-1$. Table A4, column 1, reports the findings. In this table, each cell in a column shows the results of a separate logit regression, with the main covariate of interest listed in each row. We used a number of alternative measures that should correlate with inferior performance, especially in relation to traditional banking business. We used ROE itself, and then Tobin's Q for the subset of listed BHCs. We then used the capital-to-asset ratio and a measure of net loan charge-offs. We also used metrics of asset growth, a ratio of the assets of the commercial bank subsidiaries to the total assets of the BHCs and total BHC asset itself. The estimated coefficients are odd ratios, so they indicate significant relationships if they deviate significantly from a value of 1. None of these metrics seem to be fundamental drivers of scope expansions. The only variables that appear to have a strong association with the likelihood of expansion are, not surprisingly, asset size and the bank-to-total-asset ratio. Larger banks seem to be more likely to expand, and those that do so increasingly depart from core commercial banking activities. Overall, and as expected, there is no indication of a systematic relationship between previous performance and likelihood to expand scope in the BHC population.

We also addressed the *opposite* selection concern that might be raised in relation to our results on the impact of related scope expansions (hot and modal). There, one could argue that perhaps *better* performing BHCs somehow systematically would select into expansions that are closer to the modal firm. We thus ran logit regressions of engaging in a hot or modal expansion as a result of recent performance characteristics. The results are reported in columns 2 and 3 of Table A4. Again, we do not see any relationship in the data corroborating the selection concern. If anything, the evidence seems to go the other way, at least for hot expansions, and only in terms of the estimated coefficient on the capital ratio. We ran an equivalent logit regression also on lead-type expansions (results in column 4), there as well not finding any evidence that better performing firms should be more likely to go first in new activities.

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Table A1: Aggregate assets (\$ billion) of banking entities for select years

	1992		1996		2000		2004		2006	
	Assets	Percent								
BHCs	3,021	71%	4,176	76%	6,419	81%	9,734	83%	12,077	85%
Thrifts	1,030	24%	1,029	19%	1,217	15%	1,687	14%	1,764	12%
Standalone CBs	226	5%	259	5%	292	4%	252	2%	325	2%

Table A1 shows the total aggregate assets (in billions of dollars) of three types of banking industry entities at the end of select years within the 1992–2006 sample period. The entities included are bank holding companies (“BHCs”), thrifts, and commercial banks that are not controlled by a holding company (“Standalone CBs”). Data on BHC assets is from the *Consolidated Financial Statements for Holding Companies* (FR Y-9C). Data on thrift assets is from the Federal Deposit Insurance Corporation (FDIC), while data on Standalone CB assets is from the Reports of Condition and Income (Call Reports).

Table A2: Return on equity decomposition and adoption

	(1)	(2)	(3)	(4)	(5)	(6)
	Int. Inc.	Nonint. Rev.	Nonint. Exp.	Int. Inc.	Nonint. Rev.	Nonint. Exp.
Cumulative Adoption	0.676*** (0.186)	1.987*** (0.251)	2.887*** (0.318)	0.233* (0.130)	0.551*** (0.116)	0.978*** (0.167)
All Exit	0.0824 (0.311)	-1.316*** (0.422)	-1.145** (0.475)	-0.0845 (0.192)	-0.593** (0.256)	-0.838*** (0.325)
Cum. Adoption X Exit	-0.000284 (0.0254)	0.105** (0.0458)	0.124** (0.0501)	-0.0104 (0.0169)	0.0404* (0.0236)	0.0426* (0.0253)
Scope (lagged)	-0.276* (0.143)	1.416*** (0.207)	1.501*** (0.232)	-0.376*** (0.114)	0.262** (0.111)	0.177 (0.149)
Cum. Adoption X Scope	-0.0102 (0.0221)	-0.102*** (0.0207)	-0.136*** (0.0248)	0.00347 (0.00764)	-0.0190** (0.00905)	-0.0300*** (0.0109)
Cumulative M&A	0.244 (0.374)	-2.111*** (0.525)	-1.862*** (0.591)	-0.541*** (0.206)	-0.384** (0.157)	-0.255 (0.216)
Log Assets	-1.353*** (0.385)	0.390 (0.506)	-3.235*** (0.635)	-6.390*** (0.940)	-4.611*** (0.974)	-12.57*** (1.345)
Capital Ratio	-3.474*** (0.140)	-0.689*** (0.227)	-3.351*** (0.255)	-2.414*** (0.164)	-0.929*** (0.166)	-2.647*** (0.254)
Constant	96.04*** (5.203)	10.39 (7.313)	107.2*** (8.953)	155.8*** (12.97)	80.41*** (13.33)	226.8*** (18.72)
Bank fixed effects	No	No	No	Yes	Yes	Yes
Year fixed effects	No	No	No	Yes	Yes	Yes
Observations	10226	10226	10226	10226	10226	10226
Adjusted R ²	0.317	0.205	0.230	0.848	0.851	0.841

Table A2 reports regression results from specification (3). The sample consists of all FR Y-9C-filing BHCs, both listed and non-listed ones, between 1992 and 2006. The dependent variable is some component of net income, indicated by the column title, divided by equity. Int. Inc. is net interest income over equity, Nonint. Rev. is noninterest revenue over equity, and Nonint. Exp. is total noninterest expenses over equity. An adoption is defined as the appearance of a new 5-digit NAICS within a BHC's organizational structure. Cumulative Adoption is the count of a BHC's adoptions over a consecutive three-year period. All Exit is the count of unique 5-digit NAICS that are observed leaving a BHC over a consecutive three-year period. Cum. Adoption x Exit is the product of the previous two variables. Scope is defined as the count of unique 5-digit NAICS reported by a BHC's subsidiaries. Cum. Adoption x Scope is the product of a BHC Scope at time t-4 and the cumulative adoption count over t-1 and t-3. Cumulative M&A is the number of subsidiaries acquired by a BHC from other BHCs. Log Assets is the natural log of the total asset size of the consolidated BHC, while Capital Ratio is the ratio between regulatory capital and total asset. The regression frequency is annual. Cumulative Adoption, Exit and Cumulative M&A are calculated over t-1 and t-3, and Scope at t-4. Columns 4 through 6 include both BHC and year indicator variables. Standard errors are in parentheses and are clustered at the BHC level. *** indicates statistical significance at the 1% level, ** at 5% and * at 10%.

Table A3: Modality of NAICS for select years

NAICS	1995			2000			2005		
	BHC Count	BHC Share (%)	Sub Count	BHC Count	BHC Share (%)	Sub Count	BHC Count	BHC Share (%)	Sub Count
52211	1272	100.00	3418	1705	100.00	3348	2215	100.00	3428
52599	13	1.02	16	251	14.72	512	1088	49.12	2680
52421	163	12.81	284	398	23.34	896	594	26.82	1134
55111	292	22.96	1420	431	25.28	2111	497	22.44	2158
52229	219	17.22	602	291	17.07	893	333	15.03	1236
54199	118	9.28	309	209	12.26	493	277	12.51	814
53111	253	19.89	957	276	16.19	1327	229	10.34	1447
52393	105	8.25	312	169	9.91	695	211	9.53	847
52222	169	13.29	797	226	13.26	1193	203	9.16	1315
52312	169	13.29	272	186	10.91	321	198	8.94	326
52399	120	9.43	520	148	8.68	685	171	7.72	813
51821	153	12.03	278	175	10.26	358	146	6.59	299
62422	101	7.94	531	124	7.27	2779	142	6.41	5138
52239	126	9.91	1358	111	6.51	308	105	4.74	209
53119	16	1.26	18	107	6.28	207	101	4.56	176
52411	119	9.36	259	115	6.74	347	99	4.47	296
54119	13	1.02	21	57	3.34	82	94	4.24	137
52391	57	4.48	170	71	4.16	434	81	3.66	662
52413	33	2.59	43	57	3.34	65	64	2.89	87
53139	8	0.63	8	16	0.94	20	61	2.75	111
54161	43	3.38	111	53	3.11	134	60	2.71	127
52311	7	0.55	7	51	2.99	169	55	2.48	151
53112	61	4.80	186	44	2.58	113	54	2.44	131
52392	11	0.86	21	21	1.23	67	48	2.17	180
52231	27	2.12	76	29	1.70	39	48	2.17	108
52412	6	0.47	6	12	0.70	14	44	1.99	62
52429	2	0.16	2	11	0.65	13	38	1.72	49
52212	88	6.92	102	73	4.28	77	34	1.53	40
53132	19	1.49	19	27	1.58	29	32	1.44	37
52313	40	3.14	96	33	1.94	362	26	1.17	176
52591	4	0.31	4	15	0.88	30	25	1.13	164
52232	38	2.99	202	32	1.88	243	23	1.04	192
53131	4	0.31	4	6	0.35	9	22	0.99	38
53121	50	3.93	424	36	2.11	86	22	0.99	44
52590	14	1.10	65	21	1.23	187	22	0.99	81
52221	27	2.12	54	37	2.17	78	20	0.90	53
52220	25	1.97	348	28	1.64	342	18	0.81	94
56199	38	2.99	73	25	1.47	49	17	0.77	26
23721	42	3.30	100	28	1.64	152	15	0.68	149
52390	4	0.31	7	7	0.41	18	15	0.68	52
56144	10	0.79	14	8	0.47	9	14	0.63	16
54121	7	0.55	9	7	0.41	11	13	0.59	18
53242				3	0.18	4	13	0.59	16
81321	8	0.63	8	9	0.53	14	13	0.59	16
52314	16	1.26	24	12	0.70	28	12	0.54	20
48121	3	0.24	3	6	0.35	5	12	0.54	11
53249	5	0.39	5	8	0.47	11	11	0.50	14
54151	10	0.79	27	12	0.70	37	10	0.45	40
53241	4	0.31	5	5	0.29	8	9	0.41	14
53130	13	1.02	61	14	0.82	71	9	0.41	27

Table A3 shows the relative modality scores (BHC Share) for the top 50 five-digit NAICS sorted in descending order based on the 2005 count. The modality score for a NAICS-year equals the number of BHCs that hold that NAICS during any quarter of the year divided by the total number of existing BHCs (multiplied by 100). A BHC is defined to hold a NAICS if the NAICS is either the primary or secondary business activity reported by at least one of a BHC's subsidiaries. BHC Count is the number of BHCs that exist during the year and Sub Count is the number of subsidiaries with the NAICS. The underlying source is the database of Cetorelli and Stern (2015).

Table A4: Logits of any adoptions and adoption types (odds ratios)

	(1) Any Adp.	(2) Hot (Binary)	(3) Modal (Binary)	(4) Lead
ROE	1.014*** (0.00324)	0.992 (0.00583)	0.995 (0.00651)	1.007 (0.0103)
Tobin's Q	1.012** (0.00508)	0.992 (0.00747)	1.021*** (0.00784)	0.993 (0.00902)
Capital Ratio	0.925*** (0.0104)	0.906*** (0.0158)	0.964* (0.0184)	0.778*** (0.0295)
Log Net Charge-Offs	0.928 (0.0436)	0.945 (0.0659)	1.010 (0.0821)	1.074 (0.116)
4-Quarter Asset Growth	1.013*** (0.00145)	1.000 (0.00238)	1.003 (0.00251)	1.000 (0.00295)
Bank to Total Assets Ratio	0.678*** (0.0670)	0.815 (0.126)	0.735* (0.126)	0.941 (0.196)
Log Assets	1.615* (0.026)	0.702*** (0.0147)	0.600*** (0.0135)	1.147*** (0.0309)
Year fixed effects	Yes	Yes	Yes	Yes
Observations	17783	3484	3484	3333

Table A4 reports results of logit regression estimating the likelihood of NAICS adoptions. An adoption is defined as the appearance of a new 5-digit NAICS within a BHC's organizational structure. Each row corresponds to a distinct regression with that row's name as the RHS variable (as well as Log Assets, unreported, as a control). The LHS variable for Column 1 is an indicator for whether the BHC makes at least one adoption during the year. For Columns 2 through 4, BHCs are only included in the regression if they made at least one adoption during the year. The LHS of Column 2 is whether the BHC made a binary-hot adoption, defined as an adoption of a NAICS that was among the top three most adopted NAICS over the past year. The LHS of Column 3 is whether the BHC made a binary-modal adoption, defined as an adoption of a NAICS that was among the top ten most held NAICS as of the last quarter. The LHS of Column 4 is whether the BHC made a lead adoption, defined as an adoption where the BHC was among the first 25% of BHCs to ever hold that NAICS. ROE is the BHC's return on equity. Tobin's Q equals the BHC's market value (approximated by the sum of the market value of equity plus the book value of debt) over the BHC's book value (total assets), multiplied by 100. Log Net Charge Offs equals the log of the amount of net charge offs (the dollar difference between gross charge-offs and any recoveries on loans previously charged-off) divided by the total dollar amount of loans held. Capital Ratio is the ratio of regulatory capital and total BHC assets. 4-quarter Asset Growth is the average growth in total assets, calculated over the previous 4 quarters. Log Assets is the natural logarithm of a BHC's total assets. The regression frequency is annual, with the right hand side variables measured at year t-1. All regressions include year indicator variables. The coefficient estimates are expressed as odds ratios. Standard errors are in parentheses and are clustered at the BHC level. *** indicates statistical significance at the 1% level, ** at 5% and * at 10%.

Table A5: Tobin's Q and unconditional adoption of new subsidiaries

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Q	Q	Q	Q	Q	Q	Only Simple
Cumulative Adoption	-0.156*	-0.180**	-0.141	-0.190*	-0.253*	-0.251**	-0.334*
	(0.0875)	(0.0858)	(0.0880)	(0.113)	(0.138)	(0.104)	(0.186)
All Exit			-0.168	-0.257	-0.187	0.109	-0.304
			(0.144)	(0.170)	(0.198)	(0.131)	(0.196)
Cum. Adoption X Exit				0.0109	-0.00588	-0.0110	0.0243
				(0.0120)	(0.0179)	(0.0121)	(0.0509)
Cum. Adoption X Scope					0.00753	0.00967	0.0232
					(0.00793)	(0.00629)	(0.0373)
Cumulative M&A		0.304	0.305	0.319	0.318	0.282**	-0.0810
		(0.254)	(0.259)	(0.260)	(0.260)	(0.134)	(0.251)
Scope (lagged)	-0.212***	-0.210***	-0.175***	-0.178***	-0.222**	-0.465***	-0.631***
	(0.0531)	(0.0484)	(0.0603)	(0.0608)	(0.0889)	(0.0914)	(0.142)
Log Assets	2.459***	2.366***	2.300***	2.338***	2.411***	-4.869***	-3.385***
	(0.284)	(0.316)	(0.312)	(0.316)	(0.328)	(0.786)	(1.043)
Capital Ratio	0.714***	0.723***	0.721***	0.720***	0.719***	0.296**	0.422***
	(0.165)	(0.166)	(0.166)	(0.166)	(0.166)	(0.133)	(0.136)
Constant	70.47***	71.62***	72.45***	72.03***	71.21***	175.1***	150.1***
	(4.432)	(4.791)	(4.737)	(4.753)	(4.872)	(11.17)	(14.26)
Bank fixed effects	No	No	No	No	No	Yes	Yes
Year fixed effects	No	No	No	No	No	Yes	Yes
Observations	3542	3542	3542	3542	3542	3542	2450
Adjusted R ²	0.116	0.118	0.118	0.118	0.118	0.356	0.363

The dependent variable is Tobin's Q, calculated as the BHC's market value (approximated by the sum of the market value of equity plus the book value of debt) over the BHC's book value (total assets), multiplied by 100. An adoption is defined as the appearance of a new 5-digit NAICS within a BHC's organizational structure. Cumulative Adoption is the count of a BHC's adoptions over a consecutive three-year period. All Exit is the count of unique 5-digit NAICS that are observed leaving a BHC over a consecutive three-year period. Scope is defined as the count of unique 5-digit NAICS reported by a BHC's subsidiaries. Cumulative M&A is the number of subsidiaries acquired by a BHC from other BHCs. Log Assets is the natural logarithm of the total asset size of the consolidated BHC, while Capital Ratio is the ratio between regulatory capital and total asset. The regression frequency is annual. Cumulative Adoption, Exit and Cumulative M&A are calculated over t-1 and t-3, and Scope at t-4. Column 7 reports the results of a regression that excludes BHCs with a scope at entry in the database equal to or greater than 3. The sample consists of all listed FR Y-9C-filing BHCs between 1992 and 2006. Column 6 and 7 include both BHC and year indicator variables. Standard errors are in parentheses and are clustered at the BHC level. *** indicates statistical significance at the 1% level, ** at 5% and * at 10%.

Table A6: Tobin's Q and adoption for different adoption types

	(1)	(2)	(3)	(4)	(5)
	Distance	Financial	Hot (cont.)	Modal (cont.)	Modal with VI
Cumulative Adoption	-0.272** (0.120)	-0.529*** (0.161)	-0.485*** (0.131)	-0.566*** (0.150)	-0.406* (0.208)
Adoption Type	0.0350 (0.0972)	0.438** (0.192)	0.158*** (0.0494)	0.0288*** (0.0100)	0.0287*** (0.0111)
Cumulative VI Added					-0.0139 (0.0159)
Con. Modal X VI Added					-0.0000398 (0.000231)
All Exit	0.107 (0.131)	0.0936 (0.133)	0.114 (0.130)	0.108 (0.129)	0.108 (0.127)
Cum. Adoption X Exit	-0.0107 (0.0121)	-0.00947 (0.0116)	-0.0104 (0.0124)	-0.0106 (0.0125)	-0.0104 (0.0122)
Cum. Adoption X Scope	0.0100 (0.00645)	0.0144** (0.00661)	0.0146** (0.00711)	0.0166** (0.00754)	0.0138* (0.00750)
Cumulative M&A	0.283** (0.134)	0.286** (0.136)	0.266** (0.131)	0.282** (0.132)	0.275** (0.131)
Scope (lagged)	-0.467*** (0.0916)	-0.482*** (0.0906)	-0.487*** (0.0921)	-0.496*** (0.0922)	-0.475*** (0.0935)
Log Assets	-4.860*** (0.785)	-4.925*** (0.788)	-4.835*** (0.775)	-4.794*** (0.778)	-4.806*** (0.779)
Capital Ratio	0.296** (0.133)	0.295** (0.133)	0.298** (0.133)	0.296** (0.133)	0.297** (0.134)
Constant	174.9*** (11.17)	175.9*** (11.20)	174.7*** (11.03)	174.1*** (11.07)	174.2*** (11.09)
Bank fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	3542	3542	3542	3542	3542
Adjusted R ²	0.356	0.358	0.360	0.358	0.359

The dependent variable is Tobin's Q, calculated as the BHC's market value (approximated by the sum of the market value of equity plus the book value of debt) over the BHC's book value (total assets), multiplied by 100. Adoption Type is a sub-specification of the cumulative adoptions count based on the type specified in each column header. Distance defines the adoption type as the average distance (one, two, three or four digits) from NAICS 52211 of the NAICS adopted by the BHC. Financial is the subset of the cumulative adoption count of adoptions in NAICS 52. Hot defines the adoption type as the percentage of BHCs over the previous year that adopted the NAICS. Modal defines the adoption type as the sum of shares of BHCs that hold the NAICS a BHC adopts. Cumulative VI is the sum of the amount of normalized inputs (from the BEA Input/Output table) the adopted NAICS contributes to each of the BHC's NAICS, summed over each adoption in the past three years. The regression frequency is annual. Cumulative Adoption, All Exit, Adoption Type, Cumulative VI Added and Cumulative M&A are calculated over t-1 and t-3, and Scope at t-4. The sample consists of all listed FR Y-9C-filing BHCs between 1992 and 2006. Standard errors are in parentheses and are clustered at the BHC level. *** indicates statistical significance at the 1% level, ** at 5% and * at 10%.