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The Dark-Side of Banks' Nonbank Business: Internal Dividends in Bank Holding Companies

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The Dark Side of Banks' Nonbank Business: Internal Dividends in Bank Holding Companies *

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Abstract

We show a dark-side view of internal capital markets in which one segment exploits the funding advantage of another profitable segment to relax its financial constraints. Results demonstrate that bank holding companies (BHCs) shield their nonbank segments, and not their bank segments, from inflexible external dividend policies. Further, bank internal dividends are used to support nonbank segment expansion. We show that BHCs whose nonbank activity had been constrained prior to the passage of the Gramm-Leach-Bliley Act increased their bank segments' payout ratios by 12 percentage points relative to those that had not been constrained.

JEL Codes: D29, G21, G23, G28, G34, G35, L25

Keywords: internal capital markets, dividends, bank, nonbank, financial constraints

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I. Introduction

The extent to which banking organizations are allowed to comingle with nonbanks has been a point of continued historical policy contention and academic debate. The Glass-Stegall Act of 1933 established boundaries between banks and certain nonbanks, and the Gramm-Leach-Bliley Act of 1999 (GLB) removed those restrictions. The 2008 financial crisis and the Dodd-Frank Act of 2010 rekindled the debate on the scope of activities that banking organizations should perform. Combining traditional banking activities with a broader range of activities has the capacity to increase efficiency through economies of scope. At the same time, banking organizations could exploit bank access to the safety net to subsidize their nonbank units. In this paper, we contribute to this debate by analyzing the internal capital markets of banking organizations that combine banks with nonbanks, showing the factors that determine how the parent pulls capital from its banks and nonbanks through internal dividends and how those factors affect banks' abilities to retain capital.

Internal capital markets can mitigate informational asymmetries between subsidiaries and investors as the parent can borrow directly from external markets and reallocate funds internally among subsidiaries (Gertner, Scharfstein, and Stein (1994), Stein (1997), Stein (2003)). The capacity to externally raise funds through the parent encourages conglomerates to acquire financially constrained targets and relieve those constraints. Similarly, bank holding companies (BHCs) can acquire nonbank firms that are financially constrained. However, BHCs differ from nonfinancial conglomerates in at least one important way: bank subsidiaries (which we collectively call the bank segment) have access to external capital that can be used as an internal source of funds for the rest of the bank holding company.

The funding advantage of banks within the BHC forms the basis of our analysis. The fundamental hypothesis of this paper is that the bank segment provides support to the nonbank subsidiaries (nonbank segment) within a BHC because it has access to its own cheap external funding. The nonbank segment benefits because internal dividends from the bank segment can allow the BHC shield the nonbank from the pressures of its external dividend policy. We

term this the *nonbank dividend-support hypothesis*. The parent can also use bank internal dividends for nonbank acquisitions or new debt and equity investments in its existing nonbank subsidiaries. We term this the *nonbank expansion-support hypothesis*. These hypotheses imply that the federally insured banks are weakened at the expense of the nonbank segment of the BHC, creating a dark-side channel of the BHC internal capital market.

To examine how the bank segment behaves in the presence of nonbank business affiliates, we use data from Y-9LP filings[1] on the internal dividends of BHCs. The baseline sample comprises 1,820 observations over 480 distinct BHCs with nonbank subsidiaries for the period from 2001 to 2007. We find support for the nonbank dividend-support hypothesis. BHCs use internal dividends from the insured bank segment, but not its nonbank segment, to fund the parent's external dividends. We demonstrate the disparate drivers of dividend policies between the bank and nonbank segments within these BHCs. The parent pulls capital from the bank segment whenever the segment's income increases, but does not decrease its capital demands when the segment's income decreases. In contrast, the nonbank segment's internal dividends rise and fall with its income. Thus, nonbanks appear to transfer resources to the BHC more on the basis of their abilities, while banks transfer cash to the parent more on the basis of the parent's needs.

Results are robust to sample period selection (the crisis period 2008 to 2010 and the post-crisis period 2011 to 2015) with the exception that bank segment dividends decrease with income declines during the crisis period. Results hold when we use Y-11 filings[2] and restrict the sample to BHCs with large nonbank subsidiaries. We also show a direct link with deposit funding and the dividend-support hypothesis. Nonbank income declines are associated with increases in bank segment internal dividends when deposit funding is high.

In addition, we find evidence consistent with the nonbank expansion-support hypothesis. We first show that bank internal dividends vary with parent debt and equity investments

[1]The parent and all intermediate BHCs file a Y-9LP, reporting assets and cash flows of subsidiaries at the segment level. For more information, see Section III and Appendix A

[2]Y-11 are filed by some individual material nonbanks within a BHC. For more information, see Section IV.C.2 and Appendix A.

in its nonbank segment. Next, we use GLB to help identify a causal relationship between nonbank activity and bank segment internal-dividend behavior. Under GLB, BHCs could undertake previously prohibited affiliations with certain nonbanks as early as March 2000 by becoming financial holding companies (FHCs). We argue that those BHCs that opted to become FHCs soon after the passage of the law had been constrained by the restrictions, while those BHCs that did not opt to become FHCs had not been constrained. Our premise is that by eliminating the constraints, GLB generated exogenous variation in the expansion of nonbank activities between immediate adopters and other BHCs. Using a difference-in-differences analysis, we show that following GLB, the group of BHCs that had been constrained in their nonbank activities (the treated group) increased their bank segment payout ratios by twelve percentage points relative to the BHCs that had not been constrained.

We show that our results are not driven by BHCs redirecting funds from the low-performing bank segment into the higher-performing nonbank segment. Instead, we find that on both a raw return-on-equity basis and a risk-adjusted basis, the bank segment tends to outperform the nonbank segment. Further, BHCs that divert more funding from the bank segment to the nonbank segment tend to have worse nonbank segment performance relative to the bank segment. These findings are consistent with theories of agency conflicts within the firm (e.g., Scharfstein and Stein (2000) and Rajan, Servaes, and Zingales (2000)) as well as empirical papers on inefficient empire building (e.g., Morck, Shleifer, and Vishny (1990)) and those showing that conglomerates channel resources from large productive segments to smaller segments (Shin and Stulz (1998) and Maksimovic and Phillips (2002)). These results are also consistent with literature that shows decreased performance when firms expand scope (e.g., Stiroh (2004), Stiroh and Rumble (2006), DeYoung and Torna (2013)).

Our findings have policy implications, especially in light of the revived debate on bank scope. While broad-scope banking potentially helps customers by giving them single-window access to a broad menu of services, these effects are not without costs. Regulatory concerns focus on the systemic risk that banks create because of their nonbank segments within the

same BHC.[3] We highlight a different and somewhat subtle channel in which liquidity and capital pressures on the bank segment from its parent are a function of the holding company structure. The funding and capital of banks residing in BHCs are subject to diversion, which reflects the pressures that the nonbank segment creates.

Our paper relates to several strands of literature. The literature on conglomerates advances arguments for both the bright and the dark side of internal capital markets. On the bright side, internal capital markets create value by mitigating the asymmetries of information between subsidiaries and investors. On the dark side, Scharfstein and Stein (2000) and Rajan, Servaes, and Zingales (2000) argue there could be inefficient cross-subsidization where strong segments subsidize weak ones. This inefficiency arises because of agency problems between rent-seeking division managers and the headquarters. Similarly, Ferreira, Matos, and Pires (2018) find that conflicts of interest in banking organizations lead to an underperformance of subsidiary asset management divisions relative to unaffiliated funds. Our findings are more consistent with the dark side of internal capital markets. In our case, inefficiency can arise not only through the allocation of capital to bribe the weak subsidiary managers but also through the exploitation of the bank segment, which has access to the government safety net.

Second, the results presented in the paper fit into a large literature on the internal capital markets at BHCs. This literature focuses on the management of loans using internal capital markets between banks within a BHC. Houston, James, and Marcus (1997), Houston and James (1998), and Holod and Peek (2010) find that multibank holding companies establish internal markets to smooth loan growth. The literature also shows that internal capital markets lessen the impact of monetary policy on bank lending and reallocate resources to those banks with the greatest need for capital and that this reallocation occurs through loan sales and purchases (Campello (2002)). Further, banks raise deposit rates at branches in one state to help fund loan growth in other states (Ben-David, Palvia, and Spatt (2015)). Another branch of this literature focuses on lending by multi-market and multinational banks. Cortés

[3] Laeven, Ratnovski, and Tong (2014) find that systemic risk increases with the complexity of a bank. Meanwhile, De Jonghe (2010) finds that heterogeneity in banks' tail risk is attributable to differences in the scope of nontraditional banking activities.

and Strahan (2017) show that multi-market banks reallocate funds toward markets with high credit demand and away from their traditional markets. De Haas and Van Lelyveld (2010) find that the parent's financial strength is an important determinant of credit supply for foreign subsidiaries in times of crisis. Cetorelli and Goldberg (2012) show that liquidity is reallocated using internal capital markets such that those affiliates deemed most important for revenue generation are protected, while traditional funding locations are used as a buffer against shocks to the parent's balance sheet. In contrast to these studies, we study the internal capital markets at work between bank and nonbank segments within the holding company, and we examine the internal dividends rather than focusing on loans sales and purchases.

Third, our paper is related to the literature on economies of scope in general and banking in particular. Cetorelli, Jacobides, and Stern (2017) demonstrate the expansion of nonbank activities over time and report a negative relationship between scope expansion and BHC performance. Their results are consistent with both a narrower literature in banking that finds a similar result (e.g., Stiroh (2004), Stiroh and Rumble (2006), DeYoung and Torna (2013)) as well as a broader literature on scope-economies (e.g., Comment and Jarrell (1995), Morck, Shleifer, and Vishny (1990), Matvos, Seru, and Silva (2018), Villalonga (2004), Schoar (2002)). In contrast, our paper focuses on the internal dividends through which BHCs achieve economies of scope. We find that scope expansion via internal dividends is generally associated with a diversion of funds from a higher-performing bank segment to a lesser-performing nonbank segment.

Fourth, we add to the literature on mergers and acquisitions by proposing a new channel through which the acquirer can relax a target's financial constraints. Namely, the target nonbanks in our case do not share the burden of dividends with the existing bank segment and are shielded from the pressures of dividend payments. This strategy clearly can give nonbanks flexibility in terms of financing needs. In this regard, our paper complements Erel, Jang, and Weisbach (2015), who focus on the targets after acquisition by nonfinancial firms.

The paper is organized as follows. Section II describes the regulatory oversight of dividend payments at BHCs. Section III describes the data and provides our empirical specifications.

Section IV presents results and the robustness tests for the nonbank dividend support hypothesis. Section V presents findings on the nonbank expansion-support hypothesis, including results of the difference-in-differences analysis. Section VI argues that the results are not supported by superior returns on equity of the nonbank segment. Section VII concludes.

II. Regulatory Oversight of Transactions Across Affiliates in a BHC

Regulatory concerns relating to a BHC's incentive to use the bank segment as support for other parts of the BHC are addressed by Sections 23A and 23B of the Federal Reserve Act. These regulations require that transactions across affiliates within the BHC, including credit decisions, asset sales, and leases, be conducted at arms length. In addition, these regulations restrict advertising that suggests that the bank shall in any way be responsible for obligations of its affiliates. Thus, regulation recognizes the incentive to use the bank to support a nonbank affiliate and restricts doing so through these limitations.

Yet, Board of Governors of the Federal Reserve System (2016), the Bank Holding Company Supervisory Manual (BHCSM) also explicitly argues in favor of using bank internal dividends to support a struggling nonbank affiliate. The guidance argues that a failing nonbank subsidiary within the BHC structure can undermine confidence and that it might be prudent for the BHC to support the problem nonbank, despite the bankruptcy remoteness of the subsidiary. Further, "because the bank is usually the largest subsidiary, the holding company may attempt to draw upon the resources of the bank to aid the nonbank subsidiary. The bank can transfer a substantial portion of its capital through dividends to the parent company, which may pass these funds on to the troubled nonbank subsidiary" (BHCSM, 2016 Section 4030.0). In other words, internal dividends remain a mechanism through which the BHC can use the bank to support the rest of the organization.

Notwithstanding the guidance suggesting that BHCs can rely on banks for internal divi-

dends to support the nonbank, the prevailing view in the banking literature is that the BHC serves as a "source of strength" for the subsidiary banks (Ashcraft (2008)). The underlying principle of this view is the expectation that BHCs should serve as a source of managerial and financial strength for their subsidiary banks (BHCSM, 2016, Section 2020.5). In addition, guidelines recognize that "a bank holding company should not maintain a level of cash dividends to its shareholders that places undue pressure on the capital of bank subsidiaries, or that can be funded only through additional borrowings or other arrangements that may undermine the bank holding company's ability to serve as a source of strength" (BHCSM, Section 2020).

Another important distinction between the regulatory treatment of banks and nonbanks in a BHC arises in the context of failure. The Financial Institutions Reform and Recovery Act of 1989 allows the Federal Deposit Insurance Corporation (FDIC) to assess the cost of resolving a failed depository institution within a BHC against other depository institutions controlled by the same BHC. However, this cross-guarantee provision does not apply to nonbanks. Nevertheless, Ashcraft (2008) argues that the Federal Reserve has the authority to force a parent's divestiture of a nonbank subsidiary to support a struggling depository institution. Yet, Clause (ii) of 12 USC 1831 o(f) (2)(I) specifically notes that the regulating authorities can force divestiture of a nonbank affiliate under the condition "that the affiliate is in danger of becoming insolvent and poses a significant risk to the institution, or is likely to cause a significant dissipation of the [insured depository institution's] assets or earnings." In addition, no precedent interprets this statute. Therefore, capital held in a healthy bank subsidiary is at risk when an affiliate bank subsidiary fails, but capital held in a healthy nonbank remains bankruptcy remote in the presence of a failing bank affiliate. This may then affect where in the BHC the parent chooses to locate any excess capital.

III. Data

A. *Sources*

A critical aspect of our analysis is the classification of bank and nonbank subsidiaries into two identifiable segments of a BHC. Over time, the organizational structures of BHCs have become extremely complex, and data sources for various segments and the holding company itself are dispersed across a number of regulatory filings (Avraham, Selvaggi, and Vickrey (2012)). In Appendix A, we explain this complex structure and various regulatory filings that we use to construct the data and the sample. Typically, a BHC can have three types of subsidiaries: an insured bank, a nonbank, and a subsidiary BHC. The subsidiary BHC can have a similar structure, expanding the parent BHC downward and resulting in a complex vertical organizational structure.[4]

Classifying bank subsidiaries in one segment is reasonably straightforward. All bank subsidiaries file quarterly Call Reports that contain detailed financial information. To construct the bank segment data, we add bank variables across all Call Report filers held within a parent BHC.

Unfortunately, not all nonbank subsidiaries report financial data at the legal entity level. As a result, we use the Y-9LP filings to construct the nonbank segment variables. These filings contain information on cash flows and parent investments in nonbank and BHC subsidiaries. A subsidiary BHC can also have nonbank subsidiaries. Therefore, to obtain the nonbank segment for the conglomerate, we aggregate income and investments across all BHCs within the structure.[5] Because nonbanks include thrifts in the Y-9LP definition, we subtract any thrift data (available from Call Reports) from the nonbank segment where appropriate. A fuller description of the data sources is provided in Appendix A, Table A.1.

In robustness analysis, we also use the regulatory filings of major nonbank subsidiaries

[4] A BHC can also have financial arrangements, such as special purpose vehicles, as subsidiaries. Such subsidiaries are not included in our analysis.

[5] Consequently, each nonbank dollar of income or assets is counted only once, corresponding to the lowest level of BHC owner.

(Y-11 filings) of a BHC to measure nonbanks. Using this measure, we similarly aggregate nonbanks across the BHC into a single "nonbank segment," using only the highest filing Y-11 nonbanks within a branch of the organization to ensure that we do not double count income, dividends, or assets.

Our sample period for the regressions starts in 2001 because of the expansion of BHC nonbank activity after the passage of Gramm-Leach-Bliley Act in November 1999 (discussed further below). We end in 2007 so as to not confound our analysis with the 2008 financial crisis. We also follow Benartzi, Michaely, and Thaler (1997) and use annual rather than quarterly data. This is necessary as BHCs pay dividends with differing frequency throughout the year. In addition, dividend changes are often coincidental with annual shareholder meetings that induce institution-specific seasonality.

To remain consistent across changes to reporting requirements, we require that consolidated BHC assets are greater than $500 million through the sample period. In addition, because we rely on the Y-9C data as a measure for conglomerate assets, we exclude foreign banking organizations, as the top Y-9C filer does not correspond to the ultimate parent within the conglomerate. Our baseline sample using Y-9LPs has 1,820 BHC-year observations, representing 480 unique BHCs. In extensions of the analysis, we include data from 2001 through 2015.

B. Summary Statistics

Table 1 provides statistics for the BHC and the bank and nonbank segments analyzed in our baseline regressions. The flow variables are winsorized at the 1st and 99th percentiles. All level variables are in 2010 dollars.

Panel A presents distribution values of assets, income, payout, and capital variables. We observe that the average BHC asset size in our sample is quite large at $23.1 billion, with significant positive skewness during the pre-crisis period 2001 to 2007. The vast majority of the assets are held in the bank segment, with aggregated average assets of $20.0 billion in

the pre-crisis sample. The aggregated nonbanks account for $5.6 billion in assets on average. The size of the nonbank segment relative to the bank segment increases gradually from 27 percent to 33 percent between the pre- and post-crisis samples.[6]

As a fraction of BHC consolidated assets, the bank segment income (1.36 percent) is notably larger than the nonbank segment income (0.15 percent) in the pre-crisis period. During the crisis, both bank segment and nonbank segment incomes were depressed, to 0.07 percent and 0.04 percent of consolidated assets, respectively. Although the fraction of income from the nonbank segment is relatively small, its contribution to BHC income variation is a similar order of magnitude to the bank segment. The standard deviation of nonbank income to BHC consolidated assets is larger than that of the bank segment in the pre-crisis period (1.36 percent to 0.87 percent, respectively). This pattern reversed during the crisis period, when bank segment incomes varied more than nonbank segments (standard deviation of 1.81 percent versus 0.97 percent). In the post-crisis sample, nonbank and bank segments incomes contributed similarly to BHC income variation (0.94 percent to 0.99 percent, respectively).

The bank and nonbank segments distribute their income to the parent via internal dividends. In the pre-crisis period, bank segment internal dividends to the parent made up a large portion of parent income, at 0.79 percent of consolidated assets, relative to nonbank segment internal dividends at 0.11 percent. The income from its subsidiaries helps the BHC to fund its external distributions. Pre-crisis, the parent distributed 0.78 percent of its consolidated assets to external shareholders, with 0.51 percent in the form of dividends and 0.27 percent in the form of share repurchases. Both dividends and share repurchases declined in the crisis period and recovered somewhat in the post-crisis period, though repurchases recovered to a lesser extent.

In terms of capital ratios, we observe that the bank-segment capital ratio is lower than that of the BHC and nonbank segment in all three periods. In addition, the bank segment and BHC capital ratios remained relatively constant over time. In contrast, capital ratios for

[6]The consolidated balance sheet is smaller than the aggregated segments because intrafirm exposures are netted in the consolidated balance sheet.

the nonbank segment increased notably during the post-crisis period.

Panel B of Table 1 presents aggregate data relating to dividend and income changes. We observe that the frequency of increases exceed decreases during the pre-crisis period and reverses during the crisis period.

The nonbank segments in our sample data include many different kinds of subsidiaries. Figure 1 shows, for various nonbank types, the number of sample BHCs with at least one nonbank subsidiary in a given year. The subsidiary types are not mutually exclusive, and the figure is not exhaustive of all nonbank types. Among the most prominent subsidiary types within the nonbank segment are those that have an insurance charter, which may include insurance brokerage and underwriting services. Nondepository credit intermediation is another major subsidiary type within the nonbank segment. The number of these subsidiaries is fairly stable in our sample until the financial crisis, when it declines. Securities and commodities contracts and holders of a broker-dealer charter are two other major subsidiary types represented in the nonbank segment. Along with insurance subsidiaries, broker-dealers could exist in the BHC before GLB either as Section 20 subsidiaries or if they engaged in non-prohibited activities within the sector (e.g., insurance underwriting was prohibited before GLB, while insurance brokers were not prohibited). Nevertheless, broker-dealer chartered and insurance chartered nonbanks began rising soon before GLB and accelerated thereafter. Real estate, professional and technical services, social services, and activities related to credit intermediation are also major nonbank types, though they are flat throughout the sample period. Information subsidiaries began the sample period as one of the most represented nonbank types, though they declined considerably beginning in the early 2000s.

IV. Nonbank Dividend-Support

Our analysis examines the internal capital markets in BHCs where insured banks operate alongside nonbanks. We argue that the presence of a bank segment with access to its own cheap external funding can provide support to the nonbank segment by shielding it from the

pressures of internal dividends. The parent BHC can allow the nonbank segment to reduce its internal dividends when faced with declining income. In contrast, the bank segment's internal dividends might be insensitive to negative changes in its own income. That is, when bank income is down its internal dividends might not go down. Such asymmetric sensitivity to negative changes in own income is consistent with the nonbank dividend-support hypothesis and the view that the bank segment is a source of strength to the BHC. In addition, if only the bank segment is sensitive to changes in external dividends, this sensitivity provides further support for this argument.

To compare bank and nonbank segments' internal dividend behaviors, we estimate the following baseline ordinary least squares (OLS) specification:

$$\Delta D_{ijt} = \beta_1 \Delta I_{ijt} + \beta_2 \Delta I_{kjt} + \beta_3 \Delta XD_{jt} + \beta_4 EQ_{ij,t-1} + \beta_5 ln(CA_{jt}) + \beta_6 ROE\_Spread_{j,t-1}, \quad (1)$$

where ΔD_{ijt} is the change in the internal dividends of the ith segment of BHC j between period $t-1$ and t. The ΔI_{ijt} and ΔI_{kjt} are the changes in net income between period $t-1$ and t for segment i and k, respectively, of BHC j at time t. The ΔXD_{jt} is the change in external dividends between period $t-1$ and t for BHC j. We also control for book equity (EQ) of segment i at time $t-1$. We deflate all flow variables by consolidated assets (CA) and measure capital ratios (EQ_{ij}) as the asset-weighted average ratios among subsidiaries in the segment. The CA_{jt} is the average consolidated assets of BHC j from time $t-1$ to t.

An important control variable is the expected profitability at the segment level because internal dividends can be a function of segment-level opportunities. We use lagged values of the return on equity (ROE) as a proxy for the expected ROE.[7] In particular, we construct ROE spread as the difference between nonbank and bank segments' ROE and interpret it as the nonbank segment investment opportunity relative to the bank segment. If BHCs are efficiently allocating resources to the highest return segment, then we expect the nonbank

[7]Both bank and nonbank segments' ROEs have a statistically and economically significant level of persistence. For banks, the autoregressive coefficient is about 0.65, while for nonbanks it is about 0.40. This result holds true both with and without time fixed effects.

(bank) segment to pay less (more) internal dividends when the nonbank segment's relative investment opportunity is higher.

This regression equation models the year-to-year change in internal dividends of a segment as a function of three primary factors: sensitivity to change in external dividends, sensitivity to its own income, and sensitivity to other segments' income. However, the sensitivity of a segment's internal dividends to cash flows across the BHC can be misleading in the face of asymmetries. For example, a segment can pay a dividend on its excess cash flow to its parent in good times without the benefit of relaxing dividend payments when earnings decline. Similarly, segments can upstream capital in the case of cash flow shortages elsewhere, without the benefit of a decreased pull from the parent in the face of BHC-wide excess cash flow. Therefore, we test for asymmetric responses to changing cash flows as follows:

$$\begin{aligned}\Delta D_{ijt} &= \beta_1^+ \Delta I_{ijt}^+ + \beta_1^- \Delta I_{ijt}^- + \beta_2^+ \Delta I_{kjt}^+ + \beta_2^- \Delta I_{kjt}^- \\ &\quad + \beta_3^+ \Delta XD_{jt}^+ + \beta_3^- \Delta XD_{jt}^- + \beta_4 EQ_{ij,t-1} + \beta_5 ln(CA_{jt}) + \beta_6 ROE\_Spread_{j,t-1} \quad (2)\end{aligned}$$

Equation 2 assesses whether a segment faces an implicit tax or subsidy from the parent. We allow for asymmetric responses of the dependent variable to positive and negative values of the segment's own income, the other segment's income, and external dividends. That is, we split each of the flow variables X in Equation 1 into two: $X^+ = \max(X, 0)$ and $X^- = \min(X, 0)$:

A. Results

In Table 2, we report the results from our baseline OLS specification on the changes in internal dividends as a function of external payouts and income. In Column 1 of Panel A we show that the bank segment's dividend distributions are strongly sensitive to changes in external dividends and show no sensitivity to bank or nonbank segment incomes. A $1 change in BHC external dividends is associated with a $0.68 change in bank internal dividends, significant

at the 1 percent level, after controlling for other variables. In contrast, Column 3 of Panel A shows that nonbank internal dividends exhibit no sensitivity to external dividend distributions or bank segment income but are sensitive to changes in own income. A $1 change in nonbank segment income is associated with a $0.18 change in internal dividends paid to the parent. Thus, these results show that nonbanks appear to transfer resources to the BHC more based on their abilities, while banks transfer cash to the parent more on the basis of the parent's external distribution needs.

In Column 2 of Panel A, we show the estimates for Equation 2 where we measure sensitivities to income increase and decrease. We observe that the bank segment internal dividends have a one-sided sensitivity to own income and a strong sensitivity in both directions to external dividends. When bank income increases, the increase is passed to the parent ($0.09 increase in dividends on a $1 increase in income). However, the sensitivity to income decreases is insignificant, indicating that the parent does not decrease the bank dividend burden when bank income decreases. In contrast, in Column 4 we show that the nonbank segment responds symmetrically to own income increases and decreases. A $1 increase (decrease) in own income is associated with a $0.17 increase ($0.20 decrease) in nonbank internal dividends to the parent. Nonbank internal dividends are not sensitive to bank segment income or external distributions.

In Panels C and D, we use two alternative definitions of external payouts. In Panel C, we define external payouts inclusive of both dividends and common stock repurchases. The results are qualitatively similar to Columns 2 and 4, with Column 5 showing that banks absorb the burden of external payouts. Column 6 shows that the nonbanks continue to pay dividends on the basis of own income, with nonbank segment dividends marginally related to increases in distributions inclusive of share repurchases.

In Panel D, Columns 7 and 8, we run similar regressions, scaling external dividends by the lagged proportion of parent equity held in the segment. This specification is designed to account for the differences in expected contribution from segments based upon available capital in the segment. The results from Columns 2 and 4 hold, demonstrating that protection

of the nonbank segment from supporting external dividends is not driven by the relative segment sizes.

These findings provide strong support for the nonbank dividend-support hypothesis. The nonbank segment is shielded from the pressures of external dividends and does not have to pay a steady stream of internal dividends to the parent. In contrast, the bank segment does not get a break. They provide a steady stream of internal dividends to the parent even if their incomes decline.

The results are also economically significant. Table 1 shows that the bank segment increased its net income by $31.8 billion in the pre-crisis period ($69.4 billion income increase plus -$37.6 income decrease). Moreover, these BHCs collectively increased their net dividends by $33.2 billion ($35 billion dividend increases plus -$1.8 dividend decreases). Multiplying these values by the coefficients from Column 2 in Table 2, we find that the sensitivity of the bank segment dividends to own income and external dividends is associated with an aggregate increased payout of $30.8 billion. This amount is 97 percent of the aggregate $31.8 billion in increased income in the bank segment during this time. Conversely, nonbank segment dividends are sensitive only to own income. Using the coefficients from Column 4 in Table 2 and multiplying by the nonbank income aggregates from Table 1, we find that the nonbank segment paid out $1.5 billion of its $13.7 billion of increased income through these channels, retaining 89 percent. Hence, while the bank segment paid out almost all of its income increases, the nonbank segment retained the majority of its income increases. This finding clearly shows that the nonbank segment receives funding support in the form of reduced internal dividends, further reinforcing the nonbank dividend-support hypothesis.

In our framework, we assume decisions on external dividends are exogenous to the parent's decisions on internal dividends. However, external dividends might be endogenous if there is an outstanding regulatory enforcement action against a subsidiary bank that restricts its internal dividend payments. In this case, external dividends might be driven by the dividend restriction, which violates our assumption. Yet, if external dividends are reduced in response to the dividend restriction, then our estimates would be biased downward; the relationship

between external dividends and bank internal dividends for the unrestricted BHC would be even stronger. We examine public enforcement actions and find that eight BHCs in our baseline are subject to dividend restrictions during the estimation period, representing 18 of the 1,820 (less than 1 percent) sample BHC-years. In unreported analysis, we find that the baseline results hold or are stronger when removing those BHCs with regulatory dividend restrictions.

B. Deposit Sources of Internal Capital Markets

The premise of the nonbank dividend-support hypothesis is that bank subsidiaries have access to external funding, particularly through insured deposits, and use this advantage to ease the pressure that the parent places on the nonbank segment to support its external dividend policy. Toward that end, in this section, we examine whether bank segments with more deposit funding allow BHCs to rely more on bank internal dividends to meet cash flow demands emanating from outside the bank segment.

We use the baseline specification and add interactions between deposit funding and the different variables of interest and report the results in Table 3. In Column 1, we interact changes in external dividends with the lagged proportion of BHC funding from deposits. The coefficient of the interaction term $\Delta ExtDiv * Dep/Assets$ shows that more deposit funding is significantly associated with higher sensitivity between bank internal dividends and external dividend increases. In other words, increases in external dividend demands are met with greater increases of internal bank dividends when the BHC relies more on deposits.

In Column 2, we allow for interactions between deposit funding and the bank segment income. We find that the sensitivity of bank internal dividends to bank income does not depend on BHC deposit funding. This is plausible, given that changes to bank income do not represent a change to cash flow demands from outside the bank segment.

Last, we allow for interactions between changes in nonbank income and deposit funding. Column 3 shows that the deposit funding has a statistically significant effect on the sensitivity

of bank segment internal dividends to nonbank income. Consistent with our hypothesis, the interaction term between nonbank income declines and deposit funding is negative. Nonbank income declines are associated with bank segment increases in internal dividends when deposit funding is high.

C. Robustness

C.1. Sample Period

Our baseline analysis focuses on the time period after the passage of the Gramm Leach Bliley Act and before the onset of the 2008 financial crisis. In Table 4, we examine bank and nonbank segment internal dividends during the crisis (2008 to 2010) and post-crisis (2011 to 2015) periods. We end our sample at 2015 because Federal Reserve reporting thresholds for BHCs changed that year.

In Columns 1 and 2, we report regression estimations from Equation 2 during the crisis period. As is the case in the pre-crisis period, bank segment internal dividends are sensitive to external dividend distributions of the parent, with similar magnitudes. However, the sensitivity of the bank segment's internal dividends to own income reverses during the crisis period. Internal dividends become sensitive to declining bank income. This is expected since the banking industry and bank capital levels in particular were closely scrutinized during the crisis.

Nonbank segment internal dividends continue to be insensitive to external dividend payments showing that the burden of external dividends is still on the bank segment. Similar to the pre-crisis period, nonbank segment internal dividends are sensitive to decreases in own income. However, unlike the pre-crisis period, nonbank segment dividends are not statistically sensitive to increases in own income during the crisis. These findings show that even during the crisis when banks were getting direct government support, banks' nonbank support not only continued but increased. They are even exempted from increasing dividends when their income increased. One additional finding, albeit marginally significant, for the crisis

and the post-crisis periods is that nonbank segment internal dividends are also associated with increases in bank segment income. Specifically, when bank segment income increases, the nonbank segment reduces its own internal dividends, implying that the nonbank segment receives implicit funding support when the bank segment is performing well. Regression estimates using the post-crisis sample period (Columns 3 and 4) largely resemble those in the baseline for the bank segment. Columns 5 and 6 report pooled regressions across the 2001 to 2015 period and similarly reflect the baseline sample period, while also reflecting the sensitivity of bank segment internal dividends to declines in bank segment income from the crisis period.

C.2. Large Nonbank Sample

To keep a sufficiently large sample, our baseline analysis includes all BHCs with any reported nonbank segment assets, according to the Y-9LP. Given that the role of nonbanks within BHCs differs, in this subsection we investigate the baseline results and restrict attention to only those BHCs with a relatively large nonbank presence.

Table 5 reports two sets of regressions. In the first set (Columns 1 and 2) we continue to use the Y-9LP filings data, but we restrict attention to those BHCs in which nonbank segment consolidated assets represent at least 3 percent of total BHC assets.[8] This restriction reduces the sample to approximately the top fifth of those BHCs with a nonbank presence, as measured by assets. In the second set of regressions, we use Y-11 filings of nonbank subsidiaries to restrict the sample to BHCs with a large nonbank presence as determined by regulatory filings. Relative to using nonbank assets measured from the Y-9LP filings, the Y-11 filings have the advantage of measuring the materiality of nonbanks not only by assets, but also by off-balance sheet exposures and operating income. However, Y-11 filings do not capture the entirety of nonbank activity within a BHC.[9]

[8] Our results are not sensitive to this particular threshold, subject to the sample remaining sufficiently large.

[9] In addition, the Y-11 filings directly measure nonbank financial activity relative to the Y-9LP which measures nonbank activity through the parent BHCs. Y-11 filings are filed only by a subset of nonbank subsidiaries within a BHC: smaller nonbank subsidiaries or those that are already required to submit regulatory filings to another agency (e.g., a broker-dealer to FINRA) do not file Y-11s, though an intermediate nonbank parent may file.

Table 5 results show that our findings are robust to both definitions of large nonbank presence. The only material difference shows up in the nonbank dividend sensitivity in Column 4 where we use the Y-11 filings data to construct the sample. Here, we observe that the nonbank dividends show sensitivity to external dividends, but only when they decrease. In other words, nonbank dividends decline with declines in external dividends.

In addition, we observe that nonbank dividends and bank income increases are negatively correlated. Albeit marginally significant, this finding shows that nonbanks get further support as their size increases within the BHC, as bank income becomes one of the determinants of the nonbank internal dividends.

C.3. Nonbank Activities within the Bank Segment

Our baseline analysis focuses on nonbank subsidiaries of the parent-BHC and their transactions with the parent. However, a bank segment may engage in many of the same activities as the parent's nonbank subsidiary, either within the banking operations or through ownership of its own nonbank subsidiary (see DeYoung and Torna (2013)). The main concern that arises from the bank segment directly performing nonbank activities is whether income from nonbank activities is offsetting between the bank and nonbank segments. In that case, the bank segment may simply be the conduit through which funding of nonbank activities occurs. For example, increased internal dividends from the bank segment might reflect an increase in nonbank activities within the bank segment following a reallocation of activities between the segments.[10]

The Call Reports and Y-9C forms provide data that allow us to address this concern. In particular, we consider components of noninterest income common to both reports as a proxy for nonbank activity (Demsetz and Strahan (1997)). We aggregate Call Report components across the bank segment to establish bank segment income derived from two nonbank activities: investment banking and insurance. We proxy the nonbank incomes from investment banking and insurance as the difference between the respective components of

[10]We thank Mitchell Berlin for bringing this concern to our attention.

investment banking and insurance incomes from the Y-9C and their corresponding bank segment values from the Call Reports.

We test for correlations between changes in bank segment nonbank incomes and changes to nonbank segment incomes for these activities (investment banking and insurance). Table 6 shows that there is no statistically significant relationship between bank segment nonbank income and income from corresponding activities in the nonbank segment. This result holds for both investment banking income and insurance income and for specifications with and without year fixed effects. Consequently, there is no evidence that our baseline results are driven by a reallocation of nonbank activities between segments.

C.4. Capital Inflows from Parent

Our analysis of internal capital markets between the bank and nonbank segments has thus far focused on capital outflows from the segments to the parents in the form of internal dividends. However, internal capital markets also manifest through parent injections of capital into subsidiary segments.

The examination of segment inflows requires a different approach than the baseline specification. In particular, capital inflows from the parent tend to be lumpy and infrequent. Whereas 87 percent of bank-segment years in our sample pay dividends to the parent, only 14 percent have a capital inflow from the parent. Thus, the first-differencing approach used to estimate relationships between internal dividends, segment income, and external payouts is not appropriate for capital inflows. The persistence of internal dividends and lumpiness of capital injections also imply that combining the two variables to obtain net flow would also not be appropriate.

Instead, we estimate tobit specifications of capital inflows for bank and nonbank segments similar to our baseline specification [11] The goal of this exercise is to establish that the baseline

[11] In this subsection, we report results using equity capital inflows. The results are comparable if we include debt investments from the parent. For both bank and nonbank segments, the 75th percentile BHC has no debt investments in its subsidiaries. For the bank segment, the 95th percentile BHC has debt investments equal to 1.1 percent of bank segment assets. For the nonbank segment, the 95th percentile BHC has debt investments equal to 33 percent of nonbank segment assets.

results are not undermined by offsetting capital inflows. We report results in Table 7.

Column 1 shows no relationship between capital inflows to the bank segment and the right hand side variables of interest in our baseline specification—namely, changes to bank segment income, nonbank segment income, and external dividends. One interesting finding is that while BHC size does not have any impact on internal dividends, it is a significant determinant of inflows to segments. Larger BHCs are more likely to inject capital to segments.

In Column 2, we report similar tobit regressions for the nonbank segment. We find evidence that parent capital injections to the nonbank segment are correlated with increases in nonbank income and increases in external dividends. This finding is consistent with the parent expanding its nonbank operations during good times.

V. Nonbank Expansion-Support

A. Uses of Internal Dividends

In this section, we test the *nonbank expansion-support hypothesis*, which states that BHCs use bank resources for expansion into nonbank activities. We take two approaches. First we examine whether bank segment internal dividends are related to investments in the nonbank segment. Second, we examine whether the bank segment increases its internal dividends to allow the parent to accumulate funds for its nonbank acquisition needs. We use the passage of GLB in 1999 as the identifying event for the causality of nonbank expansion on bank segment internal dividends.

Figure 2 presents the BHC uses of bank segment internal dividends. On the horizontal axis, we plot changes to bank segment dividends divided by BHC consolidated assets. On the vertical axis, we plot parent uses of funds consistent with our hypotheses: external dividends, repurchases and nonbank investments, and nonbank investments.[12] We observe that increases

[12]In unreported analysis, we also consider other BHC uses of bank segment dividends, including cash held at the parent, securities held at the parent, parent employee expenses, parent debt servicing, and long-term debt repayments. In general, these other uses do not exhibit a strong relationship with bank segment internal dividends. Unreported analysis also shows that changes in external dividends, repurchases, and nonbank investment exhibit

in bank segment dividends are used to fund external payouts as well as nonbank investments.

We formally test the relationship between nonbank investment and bank internal dividends by expanding Equation 2 to include changes in nonbank investments ($\Delta Nonbank\ Inv$). We estimate the relationship separately for debt investments, equity investments, and total investments. Recall that Sections 23A and 23B of the Federal Reserve Act require that the bank segment must transact with the parent and affiliates at arm's length. However, these regulations do not restrict the ability of the parent to lend to nonbank affiliates. Thus, the BHC can upstream funds from the bank to the parent, which can then lend or inject capital to nonbanks. Although we cannot directly measure investment into new and existing nonbank subsidiaries, equity investment is more likely to capture the new nonbank subsidiaries and debt investment is more likely to capture existing nonbank subsidiaries. To become a subsidiary, a parent must make an equity investment; to make a debt investment in a subsidiary, the parent must already have equity ownership.

Table 8 presents the results. In Column 1, we observe that the nonbank debt investments are positively related to the bank segment internal dividends. This is consistent with the parent using bank dividends to support the expansion of existing nonbanks within the BHC. A similarly positive but marginally significant relationship exists between parent equity investment in nonbanks and the bank segment internal dividends (Column 2), consistent with the parent using bank internal dividends to finance the acquisition of new nonbank subsidiaries or capital injections into existing nonbank subsidiaries. Combining equity and debt investments in Column 3, we show that a positive relationship remains between parent total nonbank investments and bank internal dividends. These findings provide evidence to support the *nonbank expansion-support hypothesis*, as the parent-BHC uses bank internal dividends to support nonbank investment in the form of both equity and debt.

no relationship with changes to bank segment income.

B. Bank Payout Policy and Nonbank Acquisition: Difference-in-Differences

In this section, we exploit the passage of the Gramm Leach Bliley Act (GLB) in 1999 to provide another test for the *nonbank expansion support hypothesis*. Given the cost of acquisition of nonbanks, integration of these new entities into the organization, and funding needed to relieve the target nonbank financial constraints, the parent BHC required resources at its disposal when GLB was passed. The BHC could have met this need by pulling extra dividends from the bank segment to fund its expansion policy. Thus, evidence of a jump in the bank internal dividends following the passage of GLB can provide support for the nonbank expansion-support hypothesis.

The fundamental rationale for GLB, also known as the Financial Services Modernization Act of 1999, was to "modernize" the industry by taking advantage of economies of scope. As the President of the Federal Reserve Bank of Richmond, J. Alfred Broaddus remarked, "There are substantial economies to be gained, for example, from combining credit evaluation for the banking and securities businesses in a single company... I think these [GLB created] combinations—precisely because they are being driven by basic potential economies of scale and scope—will increase efficiency in financial services markets..."[13]

GLB was the culmination of the removal of barriers between banks and other sectors within the financial services industry that had been erected following the Great Depression. Barriers between banks and certain financial sectors (for example, investment banking and insurance underwriting) were originally established under the Glass Steagall Act in 1933 under the view that banks had taken risks with depositor funds.[14] The Bank Holding Company Act of 1956 further codified limits on banks' abilities to engage in nonbanking activities not deemed by regulators to be related to banking. Nevertheless, Section 20 of Glass-Steagall allowed for some affiliation between banks and otherwise restricted nonbanking activities as long as the nonbank was not "engaged principally" in the restricted activity. Over time, the Board of Governors of the Federal System (Federal Reserve), which was responsible for

[13] Broaddus (2000).

[14] Kroszner and Rajan (1994) suggest that such a view was unfounded.

interpreting the provision of the act, relaxed its interpretation of "engaged principally." In 1987, the Federal Reserve allowed for the creation of Section 20 subsidiaries that engaged in some restricted activity below a specified amount of its overall business.

Passed on November 12, 1999, GLB enabled BHCs to operate as financial holding companies (FHCs) and engage in any activity deemed to be financial in nature or incidental to a financial activity. This provision included previously prohibited activities such as securities underwriting and dealing, insurance underwriting, insurance agency activities, and merchant banking. GLB also authorized the Federal Reserve, working with the Secretary of the Treasury, to determine other permissible financial activities or activities that are incidental to financial activities. Federal Reserve Board of Governors (2003) notes that on March 13, 2000, the first day that BHCs were eligible to become FHCs, the Federal Reserve approved 117 applications (including both domestic BHCs and foreign banking organizations).

We argue that by eliminating nonbank activity restrictions on BHCs, GLB generated exogenous variation among BHCs in the likelihood of expansion in nonbank areas. This variation lets us estimate the causal effect of increased nonbank opportunities on bank segment internal dividends. We use a difference-in-differences analysis to exploit the immediacy with which some firms applied to become FHCs relative to others. In particular, the desire of some BHCs, but not others, to become FHCs suggests that firms were differentially positioned to take advantage of scope-economies provided by nonbanks. In other words, those firms that elected to become FHCs had been previously constrained in their ability to expand their nonbank activities by Glass Steagall. Meanwhile, we infer that those firms that did not elect to become FHCs had not been previously constrained. Consequently, we can view GLB as having removed obstacles on nonbank activity for the FHCs (the "treated" group), but as having no direct effect on those firms that did not opt to become FHCs (the "control" group).

We define our "treated" group as those that were FHCs according to the National Information Center (NIC) in 2000. The "control" group is defined as those BHCs that did not elect to become FHCs at any point through the end of 2003. For consistency with earlier analysis, we also restrict attention to domestically owned BHCs. Together, we have 207 treated BHCs

and 621 control BHCs. The difference-in differences specification is as follows:

$$Payout_{jt} = \gamma_1 Treated_j + \gamma_2 Post_t + \gamma_3 Post_t * Treated_j + \Gamma Controls_{jt} + Year_t + \epsilon_{jt}, \quad (3)$$

where j and t denote banking organization and the time, respectively. $Payout$ is the bank segment of the banking organization's dividends to earnings ratio. Note that in the baseline regressions we use the dividends to consolidated assets ratio, and our dependent variable is the payout ratio. In the baseline analysis, the objective is to determine uses and needs for cash among BHCs with nonbank business. However, in the case of Equation 3, we compare the bank segment of BHCs that are expanding their nonbank business with those that are not. Consequently, using consolidated assets in the denominator will bias our results downward as the treated sample is, by definition, expanding its consolidated assets away from the bank segment relative to the control sample.

The variable $Treated$ equals one for the treated sample (FHCs in 2000) and zero otherwise. $Post$ is equal to one for the years after FHCs could be established (2000 and after) and zero for the years before FHCs (1999 and earlier). The difference-in-differences estimator, γ_3, is the coefficient on the product of the $Treated$ and $Post$ variables. We consider the three-year period surrounding the creation of FHCs, 1997 to 2002, as the analysis period.

The vector $Controls$ contains variables that are correlated with the internal dividend decisions. These are logarithm of the bank segment asset size, profitability measured by the bank segment's return on assets (ROA), and external dividend payouts. Dividend studies generally find size to be a determinant of payout policy (e.g., Brown, Liang, and Weisbenner (2007)). Higher profitability makes it easier for the banking organization to pay higher dividends without attracting regulatory scrutiny. Finally, the external dividend decision affects how much cash the holding company extracts from the segments. Hence, the external dividends can influence segment-level dividends.

To be included in either the control or treated group, BHCs must be in existence through the end of 2003. We exclude BHC-year observations for which information is not available

and winsorize all variables at the 1 percent level in each tail. We exclude observations with negative income because calculation of payout ratio becomes problematic.[15]

The main coefficient γ_3, measures how the bank segment of the treated BHC changes its dividend payments to the parent following the passage of GLB. For γ_3 to have a causal interpretation passage of GLB should satisfy two conditions. First, the passage of GLB should be unrelated to individual BHCs investment opportunities. Second, the passage of GLB should eliminate relevant constraints on BHCs. In Appendix B, we present evidence supporting both conditions. We also show that our results are unlikely to be driven by pre-GLB industry trend differences between the treated and control groups (parallel trend tests).

Table 9 presents the regression results for the difference-in-differences analysis. Column 1 reports estimates from the pooled regression approach, treating each BHC-year as a separate observation. The coefficient of interest on the interaction term shows that the bank segment payout ratios for the treated BHCs rose by 9.1 percentage points in the post GLB period relative to the control BHCs, significant at the 5 percent threshold. Column 2 shows the magnitude and statistical significance of the result holds after including various controls.

Bertrand, Duflo, and Mullainathan (2003) argue that the standard errors of a pooled difference-in-differences estimator are generally understated. To address this concern, they recommend aggregating each firm's pre- and post-treatment data into a single pre- and single post-observation. Using this approach, we construct the three-year payout ratio for each BHC in the pre- and post-GLB periods. We show in Column 3 that the payout ratios for treated BHCs rose by 12.1 percentage points relative to the control group, significant at the 1 percent level. In Column 4, we relax the requirement that FHCs remain in the sample through 2003, allowing all BHCs with at least one year in the post-GLB period to remain in the sample. The results remain quantitatively similar. Column 5 reports results from the specification of Column 3 with control variables. The results are again statistically and in magnitude similar. In Column 6, we rerun the specification of Column 5, but use a two-year window to

[15]This is consistent with Floyd, Li, and Skinner (2015).

construct the pre- and post-GLB observations. Estimates are similar in magnitude, though the statistical significance drops to the 5 percent level.

We also perform a difference-in-differences analysis using a matched sample for robustness. Table 10 Panel A shows that in 1999, before the creation of FHCs, the control group tended to be smaller than the treated group (significant at the 1 percent level) and less profitable (significant at the 10 percent level). Moreover, none of the control firms had a Section 20 subsidiary before GLB.

To account for the pre-GLB differences between the treated and control groups, we use a nearest-neighbor propensity score matching with replacement (with a 0.03 caliper match). The pre-GLB matching variables that we use are log assets, bank capitalization, bank holding company dividends to assets, and bank holding company income. We exclude BHCs with Section 20 subsidiaries before the crisis, as this variable creates quasi-complete separation of the data. Table 10 Panel B reports the pre-GLB differences in the treated and control groups for the matched samples. Unlike Panel A, the matched sample shows no statistical differences for any of the matched variables. Notably, the differences in size are eliminated through the matching procedure.

In the last row of Table 10 Panel B we report the difference-in-differences estimator for the matched samples. For the treated group, the bank segment payout ratio rose by 13.4 percentage points following GLB. For the control group, the bank segment payout ratio was virtually unchanged following GLB, falling by 0.3 percentage points. The difference between the differences of the treated and control groups, 13.7, is statistically significant at the 5 percent level and is quantitatively similar to the results presented in Table 9. Therefore, it does not appear that our results are influenced by the measurable pre-GLB differences of the BHCs that elected to become FHCs versus those that did not. Also, it is important to note that GLB did not affect external dividends but affected the composition of internal dividends at the segment level.

These results collectively show strong support for the nonbank expansion-support hypothesis. The parent taxes the bank segment significantly upon the passage of the GLB, which

provides the opportunity for increased nonbank acquisitions. Consistent with the hypothesis, we observe that the bank segment capital is diverted to nonbanks, increasing the fragility of the insured banking industry.

VI. Segment Profitability and Internal Cash Flows

A natural question emerges as to whether the parent assesses segment level dividends based on segment profitability and investment opportunity. For example, the bank segment might pay more internal dividends than the nonbank segment because the bank segment may have fewer profitable investment opportunities. Investment opportunities could differ as a result of business operations, geographical presence, or regulation.

Although our baseline regressions control for the differences in profitability between bank and nonbank segments, in this section, we explore how the net cash flows between the parent and its subsidiary segments relate to the performance of the segment investments. In particular, we contrast ex-post ROE across the bank and nonbank segments.[16] In Table 11, we show the raw differences in bank and nonbank segment ROE. The bank segment ROE is 6.9 percentage points higher than the nonbank segment. The risk-adjusted returns for the bank and nonbank segments, using the volatility of the previous eight quarters of segment ROE, also show that the bank segment outperformed the nonbank segment. Together, the findings do not support the view that the reallocation of bank segment capital to the nonbank segment through internal dividends management is due to better investment opportunities at the nonbank segment.

To further test whether internal dividends are assessed on the basis of segment profitability, we evaluate a series of regressions of the form:

$$r_{it}^{b} - r_{it}^{nb} = \alpha NetCF_{i,t-1} + \epsilon_{it} \tag{4}$$

[16]Ideally, we would want to use ex-ante measures of investment opportunity using Tobin-Q measures that also incorporate industry risk premiums, as in Shin and Stulz (1998). However, while we have information on nonbank subsidiary industries, we do not have any measures of their respective sizes within a BHC, as the Y-9LP reports only aggregated nonbank measures.

where the left hand side represents difference in returns on equity (raw or risk-adjusted) between banks and nonbanks as a function of the capital reallocation between the segments through the parent. To measure the capital reallocation to banks relative to nonbanks ($NetCF$), we first construct net cash flows from the parent to each segment as the difference between parent capital injections to the segment and segment dividends to the parent. We define $NetCF$ as the difference in the bank and nonbank segment net cash flows with the parent. The $NetCF > 0$ implies that the parent injected funds into the bank relative to the nonbank and vice versa when $NetCF < 0$. Under the hypothesis that the BHC pulls bank segment funds and reallocates them to the nonbank segment with better investment opportunity, we would expect $\alpha > 0$.

In Table 12 we report results for all BHCs and those with the largest nonbank presences. In each specification, we do not find evidence that the internal cash flows support higher return nonbank investments. Columns 1 and 2 show that relative cash flows to the bank segment are associated with lower ex-post relative bank segment performance. This result holds for raw ROE (Column 1), risk-adjusted ROE (Column 2), and for the subsample of BHCs with large nonbank presence (Columns 3 and 4). Our finding that the nonbank segment underperforms the bank segment is generally consistent with the extant literature. For example, Demsetz and Strahan (1997), DeYoung and Torna (2013), Stiroh (2004), and Stiroh and Rumble (2006) all find that non-traditional banking activities are (weakly) less profitable and riskier than traditional banking activities.

The reallocation of capital from the higher return bank segment to the lower return nonbank segment is also consistent with the existing theories of agency frictions arising in complex institutions. For example, Aron (1988) and Rotemberg and Saloner (1994) show how frictions between managerial and shareholder incentives make optimal incentive contracts more costly in broad conglomerates relative to narrower firms. Intrafirm agency frictions (Harris, Kriebel, and Raviv (1982)) between headquarters and division managers may also arise as financial institutions expand their scope. Alternatively, broader scope firms may suffer agency costs in the form of rent-seeking of managers within the firm (Scharfstein and

Stein (2000)) as well as free cash flow incentive problems (Jensen (1986)). Laeven and Levine (2007) empirically weigh potential costs of diversification in financial firms against possible benefits.[17] They find that the market values of financial conglomerates involved in a broader array of financial activities are lower than if those firms existed as specialized standalone entities, consistent with theories on agency problems.

VII. Conclusion

We advance two hypotheses in this paper: the nonbank dividend-support hypothesis and the nonbank expansion-support hypothesis. To test these hypotheses, we evaluate internal capital markets through the lens of capital extraction from segments, rather than through an examination of capital reallocation. Our empirical findings support both hypotheses. Results show that BHCs use their bank segments to support the capital needs elsewhere within the company, specifically to relieve the nonbank segment from the pressures of external dividend payments. We find that these effects are strongest when the BHC relies more heavily on deposit funding. The parent pulls capital through internal dividends from the bank segment during good times, but does not relieve its demands on the bank during bad times. In contrast, the nonbank segment appears to be insulated from the parent's capital needs, paying internal dividends based only on its own performance. In addition, we show that the passage of GLB triggers a significant increase in bank-segment dividends, which the parent BHC can use to support nonbank expansion. We also provide evidence that the expansion of nonbanks through internal dividend policy is not associated with better nonbank performance. Instead, BHCs that transfer capital from the bank to the nonbank tend to have worse ex-post performance. We conclude that these results provide evidence that banks are a source of strength for the BHC.

[17] Possible benefits include information sharing of clients across segments (Saunders and Walter (1994), Stein (2002)), facilitating delegated monitoring (Diamond (1984)), and easing information asymmetries with external suppliers of capital (Gertner, Scharfstein, and Stein (1994)).

Appendix A. Bank and nonbank classification, sample construction, and data sources

Bank and nonbank classification

Figure A.1 displays a stylized structure of a bank holding company (BHC). Four major types of subsidiaries exist in this BHC: bank (and/or savings and loan), intermediate BHC, intermediate nonbank holding company, and nonbank. Segments in each of these categories can further expand vertically by owning other subsidiaries. These major categories can be divided into domestic and foreign segments, creating an extremely complex structure for a BHC, although our analysis focuses only on domestic subsidiaries. In this structure the parent is often referred to as the top-tier holder or high-holder. All top-tier holding companies must file annual reports (FR Y-6, FR Y-7) that explain their organizational structure. In addition, top-tier holding companies must also file a report (FR Y-10) on any changes in their organizational structures within 30 days of a reportable event.

We use these structure data to separate banks from nonbanks within the organization. In particular, we define banks to be the legal entity filing a Call Report, which may include nonbank subsidiaries held within the bank. Each bank within a BHC is necessarily owned by a holding company (which may be intermediate or top-tier).

We define "nonbanks" as those that have a BHC parent and are not thrifts (entities "F" and "H" in Figure A.1). We use this definition because nonbank activity is measureable from the Y-9LP parents and because we wanted to avoid double counting income and dividends in the BHC. For example, suppose subsidiary "I" in Figure A.1 made $1 of income and up-streamed it to its parent "F," who then up-streamed it to the top-tier ("A"). Both the dollar of income and the dividend would be recorded on the filings of both "I" and "F." Counting only the income and dividends from "F" avoids this problem.

We use this classification to form bank and nonbank segments. We aggregate income and dividend variables of bank and nonbank subsidiaries within each BHC to establish these flow variables for the two segments. We also sum assets across subsidiaries and calculate asset-

weighted capital ratios by segment. In the context of Figure A.1, the bank segment variables are created by combining data from entities "C" and "G," and the nonbank segment variables are created by combining data from entities "F" and "H."

Data Sources

Our study requires financial statement data for banks, nonbanks, and the higher-holder operations on a stand-alone basis. We use a number of regulatory filings to compile our data. Looking at Figure A.1, the set of filings in the analysis are those filed by the entities with the thick outlines. This set includes banks (entities "C" and "G"), Y-9LP filings of intermediate BHCs ("D"), and the high-holder ("A").

For the higher-holder operations, we use the Parent Company Only Financial Statement (FR Y-9LP) that large parents ($500 million or more) must file with the Federal Reserve System (Fed).[18] In addition, we use the Consolidated Financial Statement for Holding Companies (FR Y-9C) that the holding companies with total consolidated assets of $500 million or more have to file with the Fed.[19] This consolidated report represents on- and off-balance sheet activities of all subsidiaries in the BHC.

For banks, we use the Consolidated Reports of Condition and Income (FFIEC 031/041 or simply Call Report) that each federally insured depository institution (denoted as bank) with branches and subsidiaries in the United States must file with the FDIC or the Fed. This is a detailed report of on- and off-balance sheet items as well as income statements of the consolidated bank operations. Because a depository institution can have its own subsidiaries, the reporting is done on a consolidated basis.

In robustness analysis, we use material domestic nonbank subsidiaries of U.S. holding companies that are Y-9C filers who must file financial statements (FR Y-11) with the Fed. However, the Y-11 forms are not required of subsidiaries that have separate reporting requirements (e.g., insurance companies or broker dealers). Therefore, this sample misses these non Y-11 filers but includes them implicitly if they are owned by another Y-11 filer. The Y-11

[18] In 2015 this size limit increased to $1 billion.

[19] In 2015 this size limit increased to $1 billion. Before 2006, the reporting threshold was $150 million. For consistency, we include only bank holding companies above the $500 million threshold throughout.

forms are filed on a legal entity (not consolidated) basis.[20]

Appendix B. Validity of Difference-in-Differences Estimator

To examine the validity of the difference-in-differences estimator, we provide evidence in favor of the parallel trends assumption necessary for identification. In the case of our sample firms, Figure A.2 shows the level and trends of bank segment payout ratios for treated and control BHCs. For every year before 2000, when BHCs could first become FHCs, the payout ratios between the treated and control BHCs remained within five percentage points of one another and tended to rise and fall similarly. It is only following the election to become FHCs that the treated firms payout ratios deviate in level and trend from the control group. These trends are further borne out in Figure A.3, which plots the differences between treated and control group payout ratios. Statistically, there are no level differences between treated and control group bank segment payout ratios before GLB.

We formally test pre-GLB trend differences in variables. Table A.2 reports the differences in annual variable trends for the three years before GLB on the *treated* variable, regressing variable trends against the *treated* variable and clustering standard errors at the BHC. In the first row, we confirm statistically the conclusion from Figure A.3 in that there is no pre-trend differences in the variable of interest, bank-segment payout ratio. We run similar specifications for other bank and BHC variables—namely, bank dividend growth, BHC dividend growth, bank asset growth, BHC asset growth, changes to bank ROA,[21] changes to BHC ROA, bank capital growth, and BHC capital growth. For most variables, there is no statistical association between the treated and control groups' pre-GLB trends. We find a slight difference (10 percent threshold) in pre-GLB BHC asset growth rates and BHC capital growth variables.

[20] This distinction does not matter for our income or dividend measures but does matter for stock variables such as assets. As such, we rely minimally on stock variables.

[21] Note that growth rates for an income variable are not practical given the possibility of negative values.

In our difference-in-difference analysis surrounding GLB, we also rely on an assumption that bank holding companies that quickly applied to become a financial holding company had been previously constrained by legislation. Though we cannot directly test the extent to which companies had been previously constrained, this appendix examines the validity of our assumption through textual analysis of public filings before GLB legislation.

Similar to Hoberg and Maksimovic (2014) and Fresard and Valta (2016), we use textual analysis of 10-K filings of reporting BHCs in our matched sample and look for discussion of regulation associated with limitations of nonbank activity. Under our assumption, we expect the treated BHCs in our sample to discuss limitations on nonbank activity to a greater extent than control BHCs before the passage of GLB.

For our analysis, we begin by searching SEC public 10-K filings for the BHCs in our matched sample for fiscal year end 1998, which are predominantly filed in the first quarter of 1999. We then label as *constrained* firms that discuss limitations on nonbanks in the following way:

1. If there is mention of the Bank Holding Company Act (or any associated acronym contained within the filing, e.g., BHCA) AND
    (a) Within the section/paragraph containing the discussion of BHCA any of the following root words appear {*limit, prohibit, restrict, may not engage*} AND
    (b) The object of the verb is one of the following root words $\{acquire, activity, business, own\}$ AND
    (c) The object is referring to anything other than banks,
    (d) Then $constrained = 1$,
2. Else if there is mention of Glass Stegall, then $constrained = 1$,
3. Else $constrained = 0$.

We compare *constrained* for treated and control banks within our matched sample, pre-

serving 39 matched pairs. We find that 85 percent of treated BHCs are constrained under this measure, while only 54 percent of control banks are constrained, statistically different at the 1 percent threshold. In some cases, the language in the 10-K filings is quite explicit in the role of BHCA on the BHC's business. For example, "Because of limitations arising under the BHC Act, [the BHC's] only line of business is that of providing commercial banking and other bank-related services and products to its customers." However, for the vast majority of banks, discussion of BHCA follows boilerplate language that is lifted directly from the regulation itself. For example, most BHC filings that are identified as constrained contain language similar to the direct language of BHCA: "no bank holding company shall acquire direct or indirect ownership or control of any voting shares of any company which is not a bank." Therefore, the signal appears to be more about the active decision by banks regarding which parts of BHCA to include in their 10-Ks rather than the specific language used therein.

In addition, our difference-in-differences specification assumes that growth prospects did not differ between treated and control BHCs before GLB. To test the validity of this assumption, we compare financial analyst expectations across our sample BHCs. Following Derrien and Kecskes (2013) and Fresard and Valta (2016) we use three measures of expectations: (1) EPS/Stock Price: earnings estimates as a percent of stock price for fiscal years 1999 and 2000 as of December 1998 and 1999, respectively; (2) Recommendation: investment recommendations measured on a five-point scale; and (3) Long-term Growth: long-term earnings growth rate estimates for the next five years as of 1997 and 1998. We obtain these variables from the I/B/E/S database and CRSP. Table A.3 shows that analyst expectations in terms of earnings before the passage of GLB are similar across treated and matched BHCs. There is no statistical difference between analyst recommendations and long-term growth estimates. These findings suggest that analysts viewed prospects of both groups to be similar before the passage of GLB.

Table A.1: Data Definitions and Sources

Variable	Source	Item	Notes
Holding Company Assets	Y-9C	BHCK2170	Average between reports, denominator for all income and dividend variables
Bank Subsidiary Income	FFIEC031/041	RIAD4340	Sum over all banks and thrifts
Nonbank Subsidiary Income	Y-9LP	BHCP1275+BHCP3147	Sum over parent and all intermediate BHCs. Subtract any thrift income. from Call Reports.
	Y-11	BHCS4340	Sum over all "High" Nonbank filers. Subtract any thrift income from Call Reports held within Y-11 filer.
Bank Dividends	FFIEC031/041	RIAD4475	Sum over all banks and thrifts.
Nonbank Subsidiary Income	Y-9LP	BHCP1275+BHCP3147	Sum over parent and all intermediate BHCs. Subtract any thrift income from Call Reports.
	Y-11	BHCS4598	Sum over all "High" Nonbank filers. Subtract any thrift dividends from Call Reports held within Y-11 filer.
External Dividends	Y-9LP	BHCP6742	Cash payouts on common stock
External Payouts	Y-9LP	BHCP6742 + BHCP6741 + BHCP8518	Includes preferred and common dividends and repurchased
BHC Book Equity	Y-9C	BHCK8274	Expressed relative to Holding Company Assets.
Bank Book Equity	FFIEC031/041	RCFA8274	Sum of Tier 1 Capital over all banks and thrifts, relative to total bank assets (sum over bank subsidiary assets on FFIEC031/041).
Nonbank Book Equity	Y-9LP	BHCP1273/BHCP2792	Sum numerator and denominator across parent and intermediate BHCs. Subtract from numerator and denominator any thrift equity and assets.
	Y-11	BHCS3210	Sum of Capital over all "High" Nonbank Y-11 filers, Expressed relative to total nonbank assets (sum over all "High" Nonbank subsidiary filer assets on Y-11). Expressed in bps for more easily readable coefficients.

Table A.2: Parallel Trends: This table reports the annual differences between pre-GLB variable trends for treated and control groups. Standard errors of pre-GLB variables are reported in parentheses for Control and Treated Group. T-stats reported for difference, clustered at BHC.

	Control	Treated	Difference	t-stat
Δ(Dividend/Income)*100	0.135	0.381	0.246	0.11
	(2.12)	(2.73)		
Δ(Dividend/Asset)*100	0.002	0.022	0.020	0.02
	(0.023)	(0.034)		
Bank Dividend Growth	0.136	0.254	0.118	1.07
	(0.076)	(0.115)		
BHC Dividend Growth	0.284	0.323	0.039	0.41
	(0.055)	(0.105)		
Bank Asset Growth	0.143	0.156	0.012	0.91
	(0.006)	(0.010)		
BHC Asset Growth	0.138	0.161	0.023*	1.77
	(0.005)	(0.010)		
Δ(Bank ROA)*100	0.009	0.013	0.003	0.13
	(0.012)	(0.024)		
Δ(BHC ROA)*100	0.013	0.008	-0.004	0.21
	(0.012)	(0.023)		
Bank Capital Growth	0.132	0.152	0.020	1.31
	(0.007)	(0.012)		
BHC Capital Growth	0.111	0.138	0.028*	1.95
	(0.006)	(0.012)		

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

Table A.3: This Table reports descriptive statistics of analysists forecasts. The baseline sample consists of 82 matched pairs. The last column presents two-sample Kolmogorov-Smirnov test (K-S Test) for equality of distribution functions of treated and matched BHCs.

Expectation	Time Period	Treated	N	Mean	p25	p50	p75	K-S P-Value
EPS / Stock Price	FY Ending in 1999 as of Dec 1998	0	11	0.07	0.06	0.07	0.08	0.9
EPS / Stock Price	FY Ending in 1999 as of Dec 1998	1	31	0.07	0.06	0.07	0.08	
EPS / Stock Price	FY Ending in 2000 as of Dec 1999	0	13	0.09	0.08	0.09	0.11	0.48
EPS / Stock Price	FY Ending in 2000 as of Dec 1999	1	34	0.1	0.08	0.09	0.11	
Recommendation	As of Dec 1997	0	10	2.22	2	2.25	2.56	0.72
Recommendation	As of Dec 1997	1	25	2.1	1.67	2	2.75	
Recommendation	As of December 1998	0	11	2.09	1.89	2	2.5	0.98
Recommendation	As of December 1998	1	31	2.12	1.59	2	2.5	
Long-Term Growth	1998-2002 as of Dec 1997	0	10	10.53	9.5	10.17	12	0.7
Long-Term Growth	1998-2002 as of Dec 1997	1	18	12.22	10	11.13	14.75	
Long-Term Growth	1999-2003 as of Dec 1998	0	10	10.9	9.13	10.6	12	0.97
Long-Term Growth	1999-2003 as of Dec 1998	1	21	12.25	10	11.67	13.32	

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

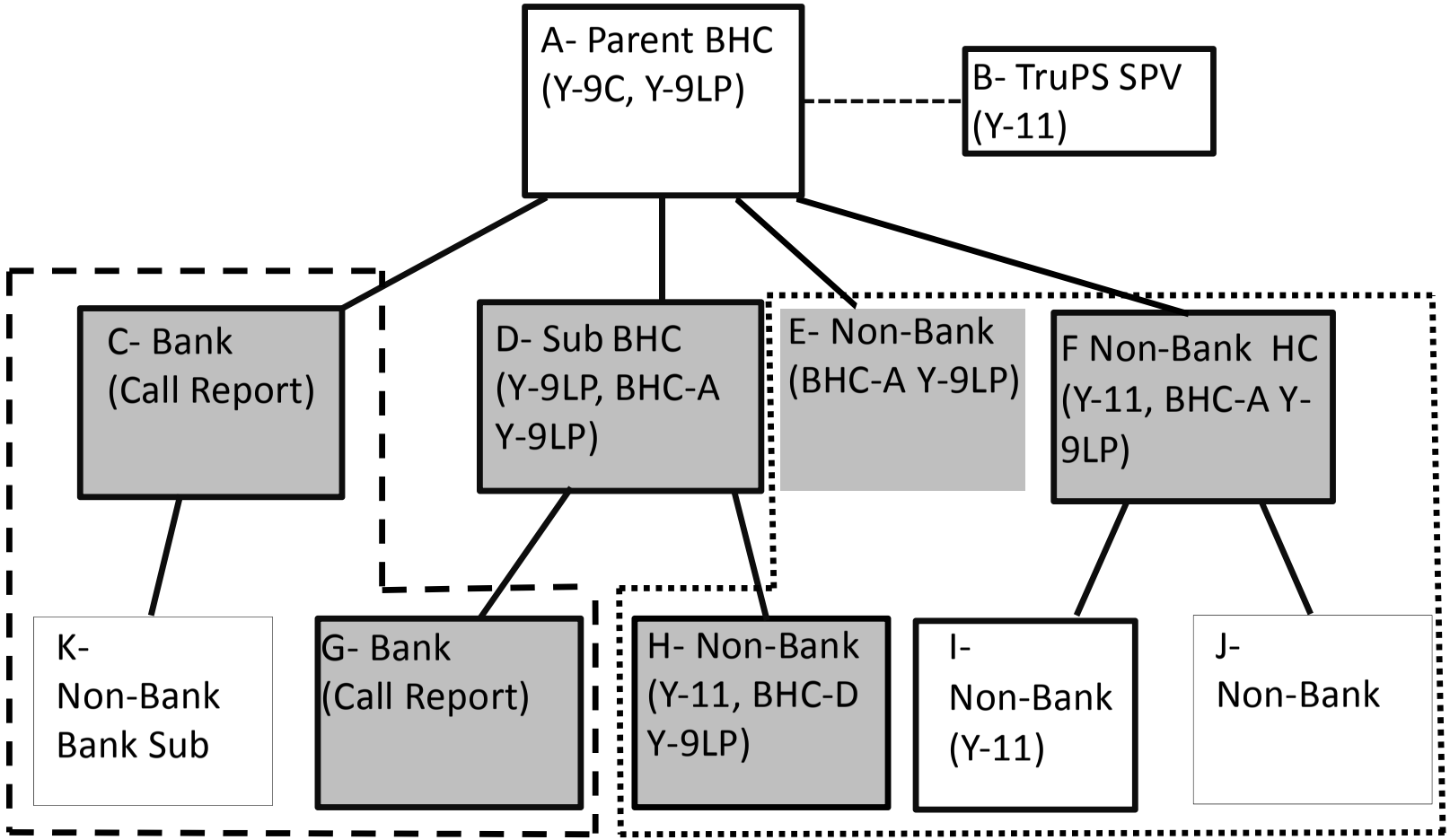

Figure A.1: Stylized Structure of a Bank Holding Company. The bank segment in the paper combines data from Banks C and G. The nonbank segment combines data from Nonbanks E, F, and H, measured indirectly from Y-9LP data. Subsidiaries that can be measured directly have a thick outline. Subsidiaries that can be measured indirectly through their direct parent are shaded. The top Parent is A. Segment income and dividend variables are obtained by summing over all BHCs within the organization.

Figure A.2: Bank Payout Policy Surrounding GLB Average bank segment payout ratios for the treated and control groups surrounding the passage of GLB and the election to become FHCs. BHCs could first elect to become FHCs in March 2000. Treated BHCs are those that elected to become FHCs during that first year. Control BHCs are those that did not elect to become FHCs at any time through the end of 2003.

Figure A.3: Differences in average bank segment payout ratios for the treated and control groups surrounding the passage of GLB and the election to become FHCs with 90 percent confidence intervals. BHCs could first elect to become FHCs in March 2000. Treated BHCs are those that elected to become FHCs during that first year. Control BHCs are those that did not elect to become FHCs at any time through the end of 2003.

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Table 1: Descriptive Statistics. This table presents descriptive statistics fro the BHC and the bank and nonbank segments analyzed in the baseline regressions. All level variables are in constant 2010 dollars.

Panel A	2001–2007				2008–2010				2011–2015			
	mean	p50	sd	count	mean	p50	sd	count	mean	p50	sd	count
Asset												
Consolidated Asset ($B)	23.1	1.5	125.0	1,820	35.4	1.6	213.0	916	54.3	1.9	272.0	1,381
Bank Assets ($B)	20.5	1.6	108.0	1,820	30.1	1.6	178.0	916	42.1	1.9	217.0	1,381
Nonbank Assets ($B)	5.6	0.02	47.8	1,820	8.6	0.01	70.5	916	14.2	0.01	93.1	1,381
Ln(Cons Asset)	14.8	14.2	1.5	1,820	14.8	14.3	1.5	916	15.0	14.3	1.7	1,381
Income												
Bank Inc/Consolidated Asset (%)	1.362	1.333	0.874	1,820	0.072	0.585	1.805	916	0.990	0.987	0.995	1,381
Nonbank Inc/Consolidated Asset (%)	0.146	0.006	1.365	1,820	0.037	0.002	0.968	916	0.107	0.006	0.940	1,381
ΔBank Inc/Consolidated Asset (%)	0.081	0.099	0.503	1,820	-0.315	-0.108	1.242	916	0.164	0.093	0.679	1,381
Δ Nonbank Inc/Consolidated Asset (%)	0.008	0.000	0.097	1,820	-0.009	0.000	0.117	916	0.009	0.000	0.098	1,381
Payout												
Bank Div/Consolidated Asset (%)	0.791	0.671	0.706	1,820	0.425	0.281	0.594	916	0.576	0.436	0.681	1,381
Nonbank Div/Consolidated Asset (%)	0.107	0.000	1.036	1,820	0.057	0.002	0.430	916	0.079	0.001	0.451	1,381
BHC Div/Consolidated Asset (%)	0.513	0.418	0.971	1,820	0.380	0.242	1.051	916	0.361	0.238	0.732	1,381
BHC Repurch/Consolidated Asset (%)	0.288	0.056	0.767	1,820	0.083	0.000	0.468	916	0.137	0.000	0.547	1,381
Δ Bank Div/Consolidated Asset (%)	0.064	0.021	0.499	1,820	-0.124	-0.047	0.439	916	0.072	0.000	0.443	1,381
Δ Nonbank Div/Consolidated Asset (%)	0.003	0.000	0.076	1,820	-0.004	0.000	0.066	916	0.002	0.000	0.072	1,381
Δ BHC Div/Consolidated Asset (%)	0.047	0.028	0.157	1,820	-0.052	0.000	0.186	916	0.027	0.009	0.167	1,381
Capital												
BHC Capital/Consolidated Asset (%)	12.51	8.71	48.55	1,820	11.89	8.95	38.88	916	13.14	10.13	39.16	1,381
Bank Capital/Bank Asset (%)	9.51	9.09	3.26	1,820	9.48	9.50	2.41	916	10.72	10.46	2.27	1,381
Nonbank Capital/Nonbank Asset (%)	44.72	29.26	40.32	1,820	52.27	54.63	41.69	916	57.54	69.30	39.95	1,381

Panel B	Sum ($B)	Proportion	Sum ($B)	Proportion	Sum ($B)	Proportion
Δ BHC Div^{+}	35,004	0.87	12,709	0.53	43,830	0.76
Δ BHC Div^{-}	(1,832)	0.13	(40,112)	0.47	(8,531)	0.24
Δ Bank Inc^{+}	69,378	0.70	111,531	0.42	52,966	0.72
Δ Bank Inc^{-}	(37,553)	0.30	(118,206)	0.58	(14,967)	0.28
Δ Nonbank Inc^{+}	38,350	0.64	87,893	0.47	44,407	0.60
Δ Nonbank Inc^{-}	(24,664)	0.36	(92,395)	0.53	(26,124)	0.40

Table 2: Baseline Regression Results. This table presents regressions estimates of changes in segment dividends to parents on segment variables, other segment variables, and BHC variables over the period 2002 to 2007. This sample includes all bank holding companies with (BHC Assets) > $500 million reporting nonzero nonbank nonthrift assets on the Y-9LP. Panel A has the results for the bank segment and Panel B shows the results for the nonbank segment. Panels C and D show similar calculations using alternative definitions of external payouts. Panel C includes external dividends and repurchases. Panel D scales external dividends by the lagged proportion of segment capital relative to total capital across both segments. All income and dividend variables are measured as a fraction of the BHC assets, while equity variables are measured as a ratio of segment equity to segment assets. Segment income is measured as the changes in total income for the segments measured indirectly from the Y-9LP for nonbanks and the Call Reports for banks. For any variable "X", the notation is as follows: X(+)=max(X,0) and X(-)=min(X,0). The standard errors are clustered at the BHC level. The t-statistics are in parentheses.

	External Dividends Only				Alternative Ext Div Measure			
	Panel A: Bank Segment		Panel B: Nonbank Segment		Panel C:Div+Repur		Panel D: Scaled to Seg	
	Δ Internal Dividends		Δ Internal Dividends		Δ Internal Dividends		Δ Internal Dividends	
					Bank	Nonbank	Bank	Nonbank
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ΔExt Div	0.675***		-0.017					
	(6.77)		(1.15)					
ΔExt Div (+)		0.747***		-0.004	0.339***	0.015*	0.871***	-0.089
		(6.79)		(0.32)	(6.30)	(1.95)	(7.34)	(1.54)
ΔExt Div (-)		0.509***		-0.044	0.311***	0.009	0.505**	-0.228*
		(2.59)		(1.30)	(4.78)	(0.79)	(2.08)	(1.81)
ΔBank Inc	0.052		-0.004					
	(1.57)		(0.61)					
ΔBank Inc (+)		0.090**		-0.003	0.099**	-0.005	0.088**	-0.003
		(1.99)		(0.37)	(2.25)	(0.56)	(1.99)	(0.38)
ΔBank Inc (-)		0.018		-0.005	0.019	-0.006	0.029	-0.003
		(0.48)		(0.48)	(0.55)	(0.53)	(0.77)	(0.27)
ΔNonBank Inc	-0.105		0.182***					
	(0.75)		(4.13)					
ΔNonBank Inc (+)		-0.249		0.167***	-0.235	0.166***	-0.217	0.167***
		(1.35)		(3.87)	(1.21)	(3.81)	(1.22)	(3.56)
ΔNonBank Inc (-)		0.095		0.200***	0.113	0.188***	0.078	0.201***
		(0.44)		(3.08)	(0.57)	(2.86)	(0.35)	(3.24)
L.Own Eq/Asset	0.011*	0.009	0.00	0.00	0.006	0.000	0.011*	0.00
	(1.69)	(1.45)	(0.07)	(0.14)	(0.85)	(0.25)	(1.93)	(0.18)
log(BHC Asset)	0.038	0.069*	-0.001	0.002	0.027	-0.004	0.082*	0.00
	(0.97)	(1.66)	(0.16)	(0.20)	(0.63)	(0.40)	(1.95)	(0.22)
ΔROE Spread	-0.053	-0.037	0.106**	0.108**	0.022	0.103**	-0.04	0.097**
	(0.20)	(0.14)	(2.25)	(2.20)	(0.09)	(2.05)	(0.15)	(1.98)
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
R^2	0.059	0.06	0.055	0.054	0.086	0.057	0.063	0.06
N	1820	1820	1820	1820	1820	1820	1820	1820

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

Table 3: Baseline Regressions with Deposit Funding Interactions. This table presents regression estimates for interactions between deposit funding and external dividends, bank segment income, and nonbank segment income. The sample includes all bank holding companies (BHC Assets) > $500 million reporting nonzero nonbank nonthrift assets on the Y-9LP. Column 1 examines changes to bank segment dividends, allowing for interactions between external dividends (=Var) and deposit funding. Column 2 examines changes to bank segment dividends, allowing for interactions between bank income (=Var) and deposit funding. Column 3 examines changes to bank segment dividends, allowing for interactions between nonbank income (=Var) and deposit funding. We measure income and inflow variables as a fraction of the BHC assets, while equity variables are measured as a ratio of segment equity to segment assets. We measure segment income as changes in total income for the segments measured indirectly from the Y-9LP for nonbanks and the Call Reports for banks. For any variable "X", the notation is as follows: X(+)=max(X,0) and X(-)=min(X,0). The standard errors are clustered at the BHC level. The t-statistics are in parentheses.

	$Var = ExtDividends$	$Var = BankIncome$	$Var = NonbankIncome$
	(1)	(2)	(3)
ΔVar (+)*Dep/Assets	1.525***	-0.007	2.232**
	(2.82)	(0.02)	(2.06)
ΔVar (-)*Dep/Assets	-0.821	-0.04	-1.429*
	(1.26)	(0.27)	(1.82)
ΔExt Div (+)	-0.353	0.751***	0.756***
	(0.88)	(6.85)	(6.80)
ΔExt Div (-)	1.098***	0.495**	0.492**
	(2.66)	(2.49)	(2.52)
ΔBank Inc (+)	0.098**	0.094	0.088*
	(2.16)	(0.45)	(1.88)
ΔBank Inc (-)	0.008	0.043	0.019
	(0.22)	(0.40)	(0.48)
ΔNonBank Inc (+)	-0.156	-0.207	-0.72
	(0.80)	(1.10)	(1.58)
ΔNonBank Inc (-)	0.002	0.064	0.970**
	(0.01)	(0.29)	(1.99)
Dep/Assets	0.00	0.00	0.00
	(0.68)	(1.46)	(0.09)
L.Own Eq/Asset	0.015***	0.010*	0.011**
	(2.90)	(1.68)	(2.29)
log(BHC Asset)	0.095*	0.116**	0.115**
	(1.92)	(2.27)	(2.29)
ΔROE Spread	-0.01	-0.03	-0.03
	(0.02)	(0.11)	(0.11)
Year FE	Y	Y	Y
R^2	0.064	0.059	0.061
N	1820	1820	1820

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

Table 4: Robustness: Sample Period. This table presents robustness of baseline results in Table 2 to sample period selection. We denote the 2008–2010 period as the crisis period and the 2011-2015 period as the post-crisis period. This sample includes all bank holding companies (BHC Assets) > $500 million reporting nonzero nonbank nonthrift assets on the Y-9LP. Panel A shows the results for 2008–2010, Panel B shows the results for 2011–2015. Panel C pools across all years 2001-2015. All income and dividend variables are measured as a fraction of the BHC assets, while equity variables are measured as a ratio of segment equity to segment assets. Segment income is measured as the changes in total income for the segments measured indirectly from the Y-9LP for nonbanks and the Call Reports for banks. For any variable "X", the notation is as follows: X(+)=max(X,0) and X(-)=min(X,0). The standard errors are clustered at the BHC level. The t-statistics are in parentheses.

	Panel A: 2008–2010		Panel B: 2011–2015		Panel C: Pooled	
	Bank	NonBank	Bank	NonBank	Bank	NonBank
	(1)	(2)	(3)	(4)	(5)	(6)
ΔExt Div (+)	0.622***	-0.021	0.561***	0.027	0.666***	0.008
	(3.29)	(0.39)	(4.14)	(1.26)	(8.13)	(0.64)
ΔExt Div (-)	0.726***	0.031	0.324	0.026	0.558***	0.012
	(6.37)	(1.38)	(1.60)	(1.11)	(5.26)	(0.83)
ΔBank Inc (+)	0.019	-0.009*	0.046**	-0.006*	0.041***	-0.007**
	(0.75)	(1.96)	(2.12)	(1.67)	(2.65)	(2.47)
ΔBank Inc (-)	0.072***	-0.004*	0.013	0.004	0.057***	-0.003
	(4.35)	(1.79)	(0.37)	(1.47)	(4.47)	(1.14)
ΔNonBank Inc (+)	0.368	0.073	-0.256	0.082*	-0.088	0.119***
	(1.43)	(1.06)	(1.40)	(1.87)	(0.70)	(4.41)
ΔNonBank Inc (-)	-0.203	0.128***	-0.271	-0.019	-0.119	0.112***
	(1.02)	(2.72)	(1.12)	(0.21)	(0.88)	(2.79)
L.Own Eq/Asset	0.007	0.00	0.018***	0.00	0.011***	0.00
	(1.42)	(0.44)	(3.89)	(0.07)	(2.87)	(0.18)
log(BHC Asset)	-0.101	0.01	-0.014	0.00	-0.003	0.00
	(1.33)	(0.51)	(0.28)	(0.27)	(0.11)	(0.60)
ΔROE Spread	-0.095	-0.03	-0.378	-0.02	-0.18	0.04
	(0.18)	(0.37)	(1.41)	(0.48)	(0.97)	(1.34)
Year FE	Y	Y	Y	Y	Y	Y
R^2	0.139	0.039	0.066	0.01	0.101	0.03
N	916	916	1381	1381	4117	4117

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

Table 5: Robustness: Nonbank Segment Size. This table presents robustness analysis of the baseline regressions to a sample of BHCs with large nonbank segments. The sample includes all bank holding companies (BHC Assets) > $500 million reporting significant nonbank nonthrift assets on the Y-9LP. Panel A reports results defining significant nonbank presence as at least 3% of consolidated assets held in non-banks. Panel B reports results defining significant nonbank presence as having a Y-11 nonbank filer. The regressions are changes in segment dividends to parents on segment variables, other segment variables, and BHC variables over the period 2002 to 2007. All income and dividend variables are measured as a fraction of the BHC assets, while equity variables are measured as a ratio of segment equity to segment assets. Segment income is measured as the changes in total income for the segments measured indirectly from the Y-9LP for nonbanks and the Call Reports for banks. For any variable "X", the notation is as follows: X(+)=max(X,0) and X(-)=min(X,0). The standard errors are clustered at the BHC level. The t-statistics are in parentheses.

	Panel A: Y-9LP Nonbank Assets $\geq$ 3%		Panel B: Y-11 Nonbanks	
	Bank	Nonbank	Bank	Nonbank
	(1)	(2)	(3)	(4)
ΔExt Div (+)	0.662***	-0.033	0.557**	-0.119
	(3.37)	(0.82)	(2.47)	(0.61)
ΔExt Div (-)	0.755***	-0.096	1.159***	0.772*
	(3.87)	(1.14)	(3.65)	(1.66)
ΔBank Inc (+)	0.132*	0.004	0.339**	-0.145*
	(1.87)	(0.30)	(2.22)	(-1.80)
ΔBank Inc (-)	-0.04	-0.031*	0.044	0.031
	(0.50)	(1.83)	(0.35)	(1.06)
ΔNonBank Inc (+)	-0.239	0.201***	-0.259	0.369***
	(0.96)	(3.38)	(1.07)	(3.65)
ΔNonBank Inc (-)	0.189	0.188**	-0.068	0.597***
	(0.55)	(1.98)	(0.22)	(2.78)
L.Own Eq/Asset	0.001	0.00	3.025*	-0.012
	(0.21)	(0.60)	(1.84)	(0.35)
log(BHC Asset)	0.114	-0.01	0.00	-0.01
	(1.56)	(0.79)	0.00	(0.31)
ΔROE Spread	0.73	-0.02	0.03	-0.02
	(1.18)	(0.15)	(0.57)	(0.96)
Year FE	Y	Y	Y	Y
R^2	0.072	0.113	0.195	0.195
N	370	370	299	299

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

Table 6: Comparable Nonbank Activity in the Bank and Nonbank Segments. This table reports regression results of changes to bank segment income for certain nonbank activities measurable from the Call Reports against changes in nonbank income for those same activities. Both variables are scaled by consolidated assets. Nonbank income for the activities are measured as the difference between income elements measured from the Y-9C and comparable income elements measured as the aggregate of Call Reports for the BHC. The sample period is 2002–2007 and includes all BHCs with measurable relevant nonbank activity. Standard errors are clustered at the BHC level.

	Insurance Income Δ Bank Income		Inv Bank Income Δ Bank Income	
	(1)	(2)	(3)	(4)
Δ NonBank Income	-0.088	-0.087	-0.018	-0.017
	(1.41)	(1.40)	(0.96)	(0.95)
Year FE	NO	YES	NO	YES
R-sq	0.03	0.03	0.02	0.02
N	967	967	1,052	1,052

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

Table 7: Capital Inflows from Parent: Tobit Regressions. This table analyzes the determinants of capital inflows to segments. The sample includes all bank holding companies (BHC Assets) > $500 million reporting nonzero nonbank nonthrift assets on the Y-9LP. Inflows are censored at zero. We measure all income and inflow variables as a fraction of the BHC assets, while equity variables are measured as a ratio of segment equity to segment assets. We measure segment income as the changes in total income for the segments measured indirectly from the Y-9LP for nonbanks and the Call Reports for banks. For any variable "X", the notation is as follows: X(+)=max(X,0) and X(-)=min(X,0). The standard errors are clustered at the BHC level. The t-statistics are in parentheses.

	Inflow Bank Segment (1)	Inflow Nonbank Segment (2)
ΔExt Div (+)	0.389	1.028**
	(0.85)	(1.97)
ΔExt Div (-)	0.984	-0.975
	(1.14)	(0.85)
ΔBank Inc (+)	0.239	0.221
	(1.25)	(1.11)
ΔBank Inc (-)	-0.015	-0.382
	(0.08)	(0.96)
ΔNonBank Inc (+)	-0.8	5.168***
	(0.86)	(2.90)
ΔNonBank Inc (-)	0.337	0.624
	(0.32)	(0.89)
L.Own Eq/Asset	0.025	0.002**
	(0.82)	(2.03)
log(BHC Asset)	0.973**	0.433***
	(2.17)	(2.90)
ΔROE Spread	-3.362*	3.344**
	(1.75)	(2.11)
Year FE	Y	Y
Pseudo-R^2	-0.031	-0.064
N	1820	1820

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

Table 8: Bank Segment Dividends and Nonbank Investments. This table presents analysis of the relationship between nonbank investment and bank segment internal dividends. The sample includes all bank holding companies (BHC Assets) > $500 million reporting nonzero nonbank nonthrift assets on the Y-9LP. All regression are for bank segment internal dividends. Column 1 defines nonbank investments as debt investments only. Column 2 defines nonbank investments as equity investments only. Column 3 defines nonbank investments as the sum of debt and equity investments. All income and dividend variables are measured as a fraction of the BHC assets, while equity variables are measured as a ratio of segment equity to segment assets. We measure segment as the changes in total income for the segments measured indirectly from the Y-9LP for nonbanks and the Call Reports for banks. For any variable "X", the notation is as follows: X(+)=max(X,0) and X(-)=min(X,0). The standard errors are clustered at the BHC level. The t-statistics are in parentheses.

	Debt Investment Only Bank (1)	Equity Investment Only Bank (2)	Equity and Debt Investments Bank (3)
ΔNonbank Inv	0.186**	0.092*	0.075**
	(2.00)	(1.87)	(2.35)
ΔExt Div (+)	0.738***	0.749***	0.746***
	(6.80)	(6.78)	(6.82)
ΔExt Div (-)	0.494**	0.476**	0.473**
	(2.52)	(2.44)	(2.41)
ΔBank Inc (+)	0.091**	0.094**	0.096**
	(2.02)	(2.03)	(2.11)
ΔBank Inc (-)	0.02	0.02	0.021
	(0.51)	(0.53)	(0.51)
ΔNonBank Inc (+)	-0.274	-0.21	-0.232
	(1.50)	(1.15)	(1.26)
ΔNonBank Inc (-)	0.103	0.076	0.082
	(0.48)	(0.36)	(0.39)
L.Own Eq/Asset	0.009	0.011*	0.01
	(1.31)	(1.73)	(1.59)
log(BHC Asset)	0.034	0.063	0.047
	(0.73)	(1.56)	(1.15)
ΔROE Spread	-0.038	0.021	0.004
	(0.14)	(0.08)	(0.02)
Year FE	Y	Y	Y
R^2	0.062	0.062	0.062
N	1820	1820	1820

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

Table 9: Difference-in-Differences around Gramm-Leach-Bliley (GLB). This table reports results from regressions using Equation 3. Treated holding companies are BHCs that become FHCs during the first year of eligibility (2000) under GLB. Control BHCs are those that do not become FHCs at any time through year end 2003. *Post* is an indicator variable equal to zero before 2000 and one after. Unless stated otherwise, all samples impose that BHCs are in existence at the end of 2003. Column 1 reports results from a pooled regression over the three-year period surrounding GLB, 1997-2002. Column 2 adds controls. Column 3 collapses each of pre- and post-periods into a single observation for each BHC, taking the cumulative three-year payout ratios for the pre- and post-periods. Column 4 reports results from a regression using the collapsed payout ratios, but relaxes the restriction that firms remain in the sample through the end of 2003. Column 5 adds controls to the specification of Column 3, using the collapsed three-year payout ratios and the restriction that BHCs survive through the end of 2003. Column 6 uses the collapsed two-year payout ratios.

	(1) Payout Ratio 1-Year, Pooled Control Not FHC 2003	(2) Payout Ratio 1-Year, Pooled Control Not FHC 2003	(3) Payout Ratio 3-Year, Pre/Post Control Not FHC 2003	(4) Payout Ratio 3-Year, Pre/Post Control Not FHC 2000	(5) Payout Ratio 3-Year, Pre/Post Control Not FHC 2000	(6) Payout Ratio 2-Year, Pre/Post Control Not FHC 2003
Post*Treated	0.091**	0.097**	0.121***	0.131***	0.119***	0.110**
	(1.97)	(2.07)	(2.62)	(2.9)	(2.63)	(2.08)
Post	-0.008	-0.011	-0.012	-0.023	-0.004	0.006
	(0.35)	(0.48)	(0.46)	(0.92)	(0.15)	0.21
Treated	0.024	-0.071*	0.005	-0.012	-0.085**	-0.086*
	(0.63)	(1.71)	(0.12)	(0.31)	(2.17)	(1.93)
Ln(Asset)		0.065***			0.062***	0.069***
		(5.75)			(5.61)	(5.23)
BHC Dividend		9.547			20.456**	20.743**
		(1.52)			(2.25)	(2.23)
Bank ROA		-0.712***			-0.490***	-0.756***
		(6.99)			(6.63)	(7.16)
Constant	0.544***	-0.392***	0.531***	0.547***	-0.399***	-0.494***
	(22.78)	(2.60)	(20.93)	(23.11)	(2.80)	(2.84)
R^2	0.01	0.06	0.01	0.01	0.13	0.11
N	2162	2150	828	970	822	823
Treated	586	584	207	207	207	208
Untreated	1576	1566	621	763	615	615

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

Table 10: Difference-in-Differences of Payout Ratios for Matched Sample. Treated holding companies are BHCs in 1999 that become FHCs during the first year of eligibility (2000) under GLB. Control BHCs are those that do not become FHCs at any time through year-end 2003. Treated and control firms are matched on size, ROA, bank capitalization, and parent payouts using 1998 data. All BHCs in the data with Section 20 subsidiaries as of 1998 become FHCs, and treated firms with such subsidiaries cannot be matched on this variable and are excluded. BHCs are matched using a nearest neighbor propensity score matching with replacement and a tolerance of 0.01.

	Treated			Control			Difference
Variable	Obs	Mean	Std Dev	Obs	Mean	Std Dev	
		Panel A: Unmatched					
Log Assets	94	15.35	1.902	235	14.03	0.891	1.317***
ROA	94	0.0133	0.009	235	0.0113	0.006	0.002*
Bank Capital	94	0.0882	0.059	235	0.0847	0.021	0.004
BHC Div to Asset	94	0.0042	0.003	235	0.0037	0.003	0.001
		Panel B: Matched					
Log Assets	82	14.884	1.558	82	14.79	1.333	0.089
ROA	82	0.0131	0.010	82	0.0136	0.009	-0.001
Bank Capital	82	0.0890	0.064	82	0.0836	0.022	0.005
BHC Div to Asset	82	0.0039	0.003	82	0.0045	0.003	-0.001
ΔPayout	82	0.1338	0.393	82	-0.0031	0.321	0.137**

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

Table 11: Segment ROEs. This table reports differences between bank segment and non-bank segment returns on equity (ROE) across different sample periods and non-bank presence. Panel A reports differences in bank and nonbank ROEs for the full sample of BHCs with Y-9LP non-bank assets as well as the subset of BHCs where nonbank assets are at least 3% of BHC consolidated assets. Panel B reports differences in bank segment and non-bank segment Sharpe Ratios using 8 quarter lagged ROE as the basis for the calculation of income volatility.

		Count	Mean Difference	StdErr	T-stat
Panel A: Bank Less Nonbank	Nonbank Assets > 0	1793	0.069***	0.006	11.88
Return on Equity	Nonbank Assets $> 3\%$ of Consolidated Assets	363	0.06***	0.012	4.89
Panel B: Bank Less Nonbank	Nonbank Assets > 0	1785	4.292***	0.197	21.75
Sharpe Ratio	Nonbank Assets $> 3\%$ of Consolidated Assets	363	1.976***	0.387	5.11

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

Table 12: Internal Segment Transfers and Ex-post Performance. This table reports regression results of ex-post bank segment performance relative to nonbank segment performance against lagged net segment cash flows ($NetCF$) with the parent. We define $NetCF$ as the net cash flows from the bank segment to the parent (capital injections less dividends) less the net cash flows from the nonbank segment to the parent (capital injections less dividends). The dependent variable is the differences in returns on equity (raw or risk adjusted) between the bank segment and nonbank segment. Columns 1 and 2 report results for 2001-2007 for all Y-9LP filers with nonbank assets. Columns 3 and 4 report results for the subset of BHCs with a large nonbank segment (at least 3% of consolidated assets in the nonbank segment). Standard errors are clustered at the BHC level.

	Nonbank Assets> 0%		Nonbank > 3%	
	ROE	Sharpe	ROE	Sharpe
	(1)	(2)	(3)	(4)
ΔBank Inc	-2.811**	-121.505***	-3.188	-122.393**
	(2.47)	(3.42)	(1.46)	(2.16)
Year FE	Y	Y	Y	Y
R^2	0.018	0.016	0.018	0.034
N	1,784	1,777	381	381

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

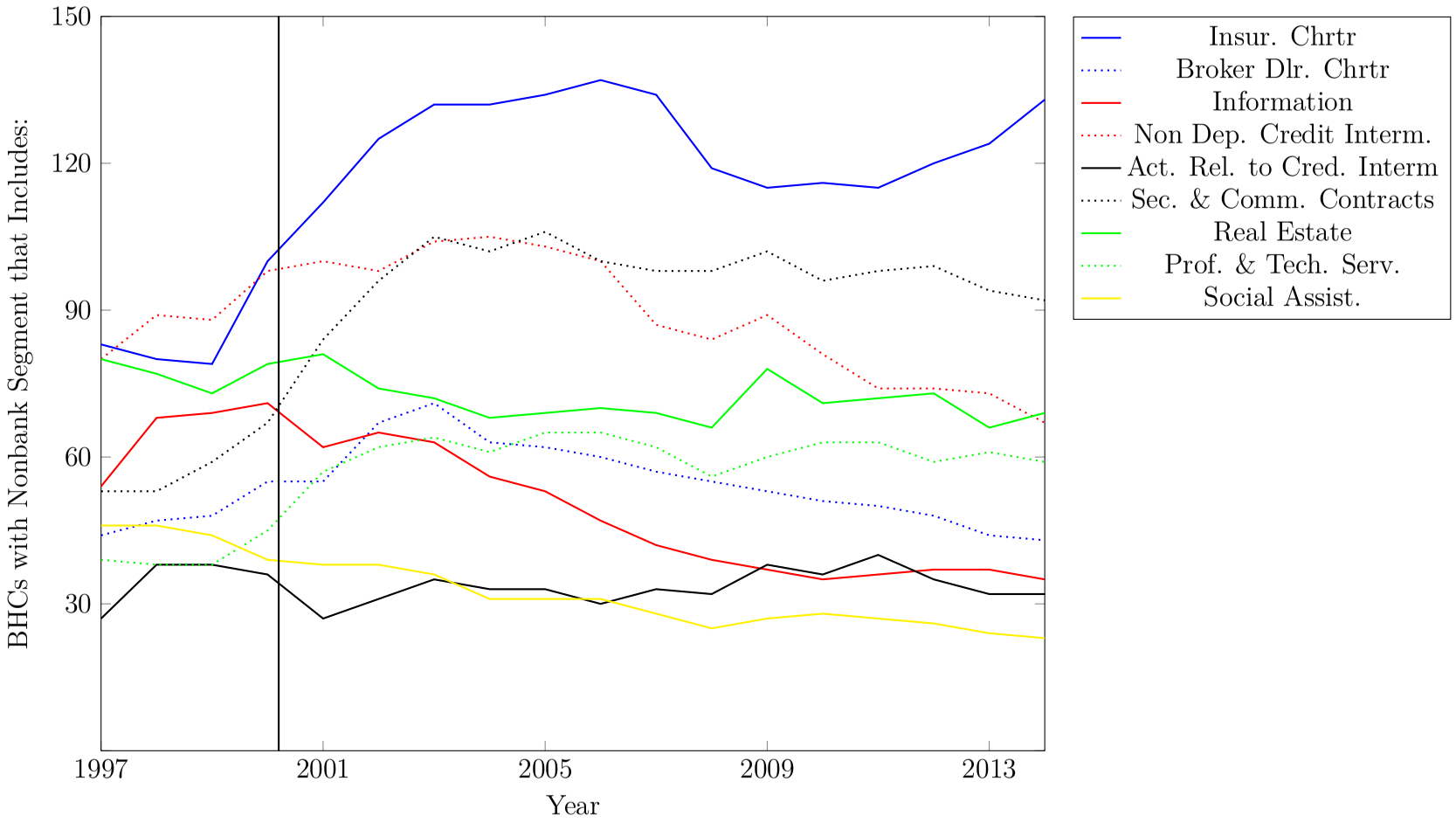

Figure 1: Nonbank Types in Sample. For various nonbank types, we plot the number of BHCs in the baseline Y-9LP data with at least one of each type represented in the nonbank segment. Nonbank subsidiaries that are part of the bank segment are not included. Nonbank types are defined by the charter type code for insurance and broker-dealers and by primary NAICS codes (at 2- to 4-digit levels for aggregation purposes) for all other subsidiaries. The black vertical line denotes the effective date for establishing financial holding companies under GLB.

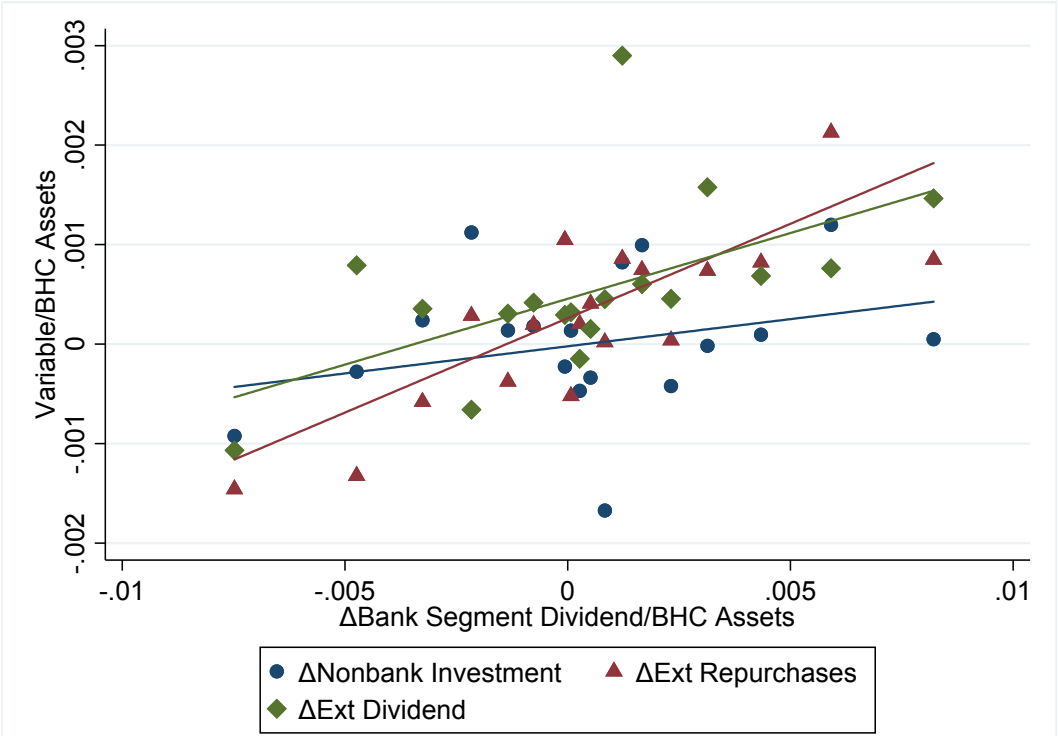

Figure 2: Parent Uses of Bank Segment Dividends: The horizontal axis plots changes to bank segment dividends to BHC consolidated assets, and the vertical axis plots changes to external dividends, external repurchases, and nonbank investments. Bin scatter is used to better visualize the data along with a line of best fit. Data are from 2002–2007 for all BHCs in the sample with non-zero nonbank assets according to the Y-9LP.