Using ROIC To Measure Shareholder Value in Community Banks

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The purpose of this paper is to demonstrate the use of the return on invested capital (ROIC) metric to assess whether community banks are creating value for their shareholders. Using data for a sample of community banks in Pennsylvania, this study applies a ROIC methodology to evaluate community banks' performance in terms of value creation. The study finds that community banks in Pennsylvania report good profitability levels over the 2010–2015 period. Their performance and risk characteristics are in line with their peers in the nation and, in fact, display more favorable credit risk. The study finds that based on the ROIC, top performers generate significant shareholder value. This study highlights shortcomings of traditional bank performance measures, particularly their failure to fully account for risk that may have contributed to the excessive risk-taking prior to the recent financial crisis. ROIC is used by large corporations and was recently tested on a small number of global financial institutions. To our knowledge, this is the first study to apply the ROIC to community banks. The paper contributes to research concerned with developing more informative performance metrics. It should be of interest to academics, consultants, and practitioners when evaluating the performance of community banks.

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1. Introduction

Two of the most widely used metrics of bank performance used by academics and practitioners are return on assets (ROA) and return on equity (ROE). These metrics are used as absolute and comparative measures to assess bank performance across time and to compare to peer group averages that are typically based on asset size. The metrics measure the return on each dollar of assets (ROA) or stockholders' equity (ROE), respectively. Higher returns for a bank can result from higher pricing of assets and/or lower pricing of liabilities, cost advantages compared to the peers, or a higher degree of financial leverage. ROA and ROE are often used for aggregate time-series industry analysis to discern historical patterns and to forecast future performance.

In addition to ROA and ROE, banks also analyze market-based return measures, such as price-to-earnings (P/E) and price-to-book-value (P/BV) ratios, to compare their performance to market benchmarks, peers, and broad-based indices such as the S&P 500. Lately, Wall Street analysts began to pay more attention to the return on invested capital (ROIC). A *Wall Street Journal* article touted ROIC as the "hottest

metric in finance" (Benoit, 2016). The article reports that large nonfinancial companies, such as GM, now choose to rely on ROIC as a measure of performance and even tie it to management compensation. Although ROA, ROE, and ROIC may appear very similar, Wall Street analysts point out that accounting-based ROA and ROE metrics include some items in net income that are not necessarily meaningful to the company's operating activities or indicative of its success (for example, minority interests, discontinued operations, and other "below the line" items). Furthermore, in the case of ROE, the measure does not include debt in the definition of capital and thus lacks important information about the firm's financial leverage and risk (Collins, 2006). Studies have shown that focusing on ROE as a central measure of performance in banking may have contributed to the excessive risk-taking prior to the recent global financial crisis (Admati and Hellwig, 2013).

Unlike the traditional measures, ROIC examines returns on total invested capital and clearly shows whether a company is creating value for its shareholders. A ROIC-based methodology was recently outlined by Chen (2014) in his analysis of multinational financial institutions. However, to our knowledge, this is the first study to apply the ROIC methodology to community banks. Using data for a sample of community banks in Pennsylvania, the study identifies top and bottom performers based on the ROIC methodology and examines the results in terms of shareholder value creation. We believe that a formalized ROIC-based methodology may be of interest to researchers, consultants, and practitioners when evaluating the performance of community banks, particularly at this time when bank consolidation is occurring so rapidly.

The paper is organized as follows. First, we will review the literature that addresses the shortcomings of the traditional ROA and ROE metrics and discuss what makes ROIC a superior measure of performance. Second, we will develop the ROIC methodology for assessing the performance of community banks. Finally, we will apply the ROIC methodology to a sample of Pennsylvania community banks and examine whether they are creating shareholder value.

2. Literature Review

The most important drawback of purely accounting-based measures, such as ROA and ROE, arises from the shortcomings inherent in the measurement of accounting profit. The limitations arise because most of the items on financial statements are recorded at historical values and do not reflect the *true* rate of return on investment. Accounting treatment of historical costs and the choice of depreciation methods can also distort the rate of return on investment (Stern, Stewart, and Chew, 1999; Young, 1999).

Another limitation of using accounting-based measures of performance is that they ignore the implicit cost of equity and only consider explicit borrowing costs reflected in the operating profit. As a result, they do not fully capture the risk inherent in a bank's business model nor do they address whether the returns are

commensurate with the risk of the underlying assets on the balance sheet. Traditional accounting-based measures can lead bank managers to invest in loans and securities that produce an appealing return, but fail to produce value for shareholders. The opponents of accounting-based measures note that value creation and profitability may be quite different when managers pursue ROA and ROE gains because short-term profitability can be improved at the expense of long-term value creation at a bank (Ehrbar, 1998; Stern et al., 1999; Stern and Shiely, 2001).

Moreover, traditional performance measures, such as ROE, were shown to be flawed because improvements in these metrics may not necessarily be a measure of increased value, but rather the result of risk implementing strategies by banks (Haldane, Brennan, and Madouros, 2010; Admati, DeMarzo, Hellwig, and Pfleiderer, 2011; Admati and Hellwig, 2013; Klaassen and van Eeghen, 2015). Since the denominator of ROE contains stockholders' equity, more equity and less debt can lower ROE, assuming that the change in equity has a greater impact than the change in the after-tax interest expense. Conversely, to increase ROE, managers can change the funding mix and leverage a bank through borrowing. Motivated by empire-building or compensation considerations, managers may choose to target higher ROEs, but this behavior involves increased borrowing and higher risks that ultimately can harm creditors and taxpayers (Admati and Hellwig, 2013). These distrorted incentives inherent in traditional performance metrics contributed to risk-taking behavior prior to the recent financial crisis.

In contrast to traditional performance measures of ROA and ROE, a ROIC-based approach to measuring performance examines returns on *total* invested capital, which consists of debt and equity:

$$ROIC = \frac{Operating\ Income \times (1 - Tax\ Rate)}{Invested\ Capital} \quad (1)$$

According to Equation 1, there are several ways to improve a firm's ROIC: increase operating income for a given capital base, reduce the capital base while holding the overall return steady, or increase operating income incrementally faster than the capital base. Determining what should be included in "operating income" and "invested capital" is a subject debated by academics and practitioners (Chen, 2014; Collins, 2006; Damodaran, 2009). The lack of consensus on the ROIC components is likely the reason why the measure is not widely reported by financial data providers, such as Capital IQ, SNL, and Compustat.[1] This issue is discussed in more detail in the methodology section. This study contributes to the existing research concerned with developing more informative and accurate performance measures for the banking industry, specifically for smaller community banks.

[1] Indeed, Collins (2006) makes the observation "that [the fact] an investor needs to make some judgment calls in calculating ROIC is probably what's keeping the metric out of stock screeners."

3. The ROIC methodology and data

3.1 ROIC applied to banking

Banks are different from nonfinancial firms primarily because banks must pursue the growth of shareholder value under the constraint of stringent regulatory requirements. Regulations can affect the perceived risk of investing in banks as well as their financing mix, growth, and value. Our research uncovered a recently published monograph titled *Integrated Bank Analysis and Valuation: A Practical Guide to the ROIC Methodology* written by Sandy Chen (2014). Chen does not suggest that the ROIC methodology should replace other tools that are used by analysts. Instead, he states, "We think [the ROIC methodology] complements those tools by highlighting key value levers that affect a bank's performance, and [shows] how operating performance can link directly with a bottom-up, fundamental valuation" (Chen, p. 25). In his "value-added" approach, Chen describes various adjustments that need to be made to net profit attributable to equity shareholders to obtain net returns to invested capital (Chen, Table 2.26). Other researchers have suggested numerous adjustments (more than 160, according to Fiordelisi and Monferra (2009)) that may be required to implement a value-added approach. Obviously, making all these adjustments is not possible for any single company or study; Chen (2014) made adjustments that, in his view, were the most relevant to large global financial institutions, such as HSBC, Barclays, Credit Suisse, and Citigroup. He does not test his ROIC methodology on community banks, but presumably applying this methodology to small banks would be easier given that financial statements for these banks tend to be less complex than for a multinational bank.

3.2 NOPAT and Invested Capital

As presented in Equation 1, the net operating profit after taxes (NOPAT) is defined as earnings before interest and taxes adjusted for taxes, or EBIT×(1–T). Characteristic of depository institutions' income statements, interest income on loans and investments represents the bulk of revenue.[2] Compared to Chen's model, the resulting "adjusted operating profit" that he derives (p. 51) closely matches what the typical bank reports as "earnings before taxes (EBT) excluding unusual items," such as merger and restructuring charges, impairment of goodwill, and other unusual items.

Financial institutions are exposed to credit risk that is associated with the quality of assets and the probability of default (Koch and MacDonald, 2015). The risk arises from the potential variation in net income and market value of equity resulting from nonpayments or delayed payments on loans. Nonperforming loans are designated as such when they are placed on nonaccrual basis and when a bank can deduct all interest on the loans that was recorded but not collected. Typically, this should be

[2] For a brief of review of Call Reports and banks' financial statements, see Federal Financial Institutions Examination Council (FFIEC) reporting forms and https://www.ffiec.gov/pdf/FFIEC_forms/FFIEC031_201706_f.pdf.

done after a loan is 90 days past due, but in the past, some banks would not move their loans to nonaccrual status quickly enough, thus misstating loan figures on the balance sheet, as well as inflating their interest income, net interest margin, ROA, and ROE. Federal regulators keep an eye on these practices and enforce the 90-day requirement.

Similarly, financial statements can be distorted by the bank's provisions for loan losses (an income statement item) and the allowances for loan losses or reserves (a contra-asset item on the balance sheet). Management uses discretion in determining how much it should report as provisions for loan losses in financial statements. During some periods, managers have minimized the provisions, which leads to understated reserve for losses and overstated earnings (Koch and MacDonald, 2015). In theory, provisions for loan losses (PLL) represent management's estimate of the potential incremental lost revenue from nonperfoming loans and is a deduction from net interest income (NII), representing a bank's periodic allocation to its allowances for loan losses (ALL) on the balance sheet. For tax purposes, the IRS specifies the maximum allowable for losses and corresponding tax deductions. Since PLL is at the discretion of the bank management and is a noncash expense, we make an adjustment to NOPAT by adding PLL back and deducting the net charge-offs (the difference between gross charge-offs and recoveries).

The provision for loan losses helps banks regulate invested capital, particularly during difficult financial situations. If a bank takes a big impairment charge during a crisis, it will recognize a big loss and its shareholders' equity will take a hit. However, if the actual charge-offs have not picked up, the additional impairment allowances will be added back to invested capital. According to Chen (2014), adding back provisions to EBT and adding allowances to invested capital in the denominator of ROIC "gives us a fairer, less volatile invested capital number" (Chen, p. 38).

Chen makes other adjustments to NOPAT to account for items such as exceptional items, goodwill impairment, and unrealized fair value gains or losses, but community banks rarely have anything to report on these items. Another step he takes to estimate the true returns on total invested capital is to include debt in the bank's invested capital base. When we include debt as a component of invested capital, we correspondingly add back the after-tax interest expense associated with the bank's debt capital funding to calculate NOPAT. This is designated as interest on borrowings on the bank's income statement. Note, however, we do not add back the interest expense on deposits because deposits are not included in invested capital (we also do not include them in the calculations for weighted average cost of capital (WACC)). In addition to total equity, which includes total preferred equity, total common equity, and allowances for loan losses, invested capital also includes long-term debt. The above-described modifications lead to these two key equations for estimating a community bank's ROIC:

$$Adjusted\ NOPAT = EBT(1-T) + Provisions\ for\ Loan\ Losses - Net\ Charge\text{-}Offs + After\text{-}Tax\ Interest\ on\ Borrowings \quad (2)$$

$$Invested\ Capital = Total\ Equity + Loan\ Loss\ Reserves + Long\text{-}Term\ Debt \quad (3)$$

As discussed earlier, ROIC is the ratio of the adjusted NOPAT divided by invested capital.

3.3 Cost of capital

An estimate of the bank's WACC is necessary to assess whether the company is creating shareholder value. Also, WACC is used in capital budgeting to make incremental funding decisions to accept or reject a proposed project. Chen (2014) compares ROIC and WACC to see whether a bank's returns are exceeding its cost of capital. However, he does not derive these measures for community banks, which we attempt to do in this study. To estimate WACC we use the following equation:

$$WACC = w_d r_d(1-T) + w_p r_p + w_e r_e \quad (4)$$

where w_d, w_p, and w_e are the weights of debt, preferred stock, and common equity; r_d, r_p, and r_e are the costs of debt, preferred stock, and common equity; and T is the firm's marginal tax rate. In order to estimate WACC for a bank, the analyst has to make some important decisions, particularly related to the cost of equity (Walker and Geyfman, 2016). We carefully reviewed the existing literature on the cost of capital and chose to use the capital asset pricing model (CAPM) to estimate the cost of equity for our banks:

$$r_e = r_{RF} + (RP_M) \times b_i \quad (5)$$

where r_{RF} is the risk-free rate, RP_M is the risk premium on the market (often referred to as the market risk premium), and b_i is the beta coefficient of the ith stock. There are several alternatives for estimating each of these parameters, and the task for the chief financial officer (CFO) of a community bank is to obtain suitable estimates for them. Analysts use a variety of sources for CAPM variables, the most notable of these are from academician Damodaran (2015), practitioners Pratt and Grabowski (2008), and Grabowski, Harrington, and Nunes in the Duff & Phelps *2016 Valuation Handbook – Guide to Cost of Capital* (D&P). For the risk-free rate, Damodaran (2015) recommends that practitioners use the yield on the 10-year Treasury note for a mature firm or the yield on the 30-year Treasury bond for a growth firm. Pratt and Grabowski (2008) and D&P (2016) recommend the use of the 20-year yield as a middle point between the 10-year yield and the 30-year yield.[3]

The second parameter to consider is the market risk premium (MRP). There are several ways to estimate the MRP, including (1) conducting a survey of investors and financial managers; (2) using the historical risk premium as a forecast for the future; and (3) using current market data to generate an implied premium. Given the practical difficulties in conducting surveys and choosing the correct time period on

[3] Pratt and Grabowski observe that neither the 10-year nor 30-year Treasury rates differs much from the 20-year yield. As of this writing, the yields for the 10-year, 20-year, and 30-year Treasury are 1.87%, 2.27%, and 2.67%, respectively (based on closing yields for 5/25/16).

which to base a historical risk premium, Damodaran (2015) recommends the third approach for estimating the MRP – the implied market risk premium. To estimate a forward-looking MRP, an analyst can use (1) discounted cash flow (DCF) Model-Based MRPs; (2) Default Spread-Based MRPs; and (3) Option Pricing Model-Based MRPs. Damodaran provides all three estimates on his website, and we propose using an average of the two trailing 12-month MRP estimates as long as they are internally consistent, i.e., if a T-bill is used, the MRP needs to be based on this benchmark. Using the same source for the risk-free rate and the MRP, such as Damodaran's website or D&P (2016), helps ensure consistency between the estimates.

The third component of the CAPM is the bank's beta. A CFO can obtain an estimate of a bank's beta that would operationally be fairly straightforward from one of these three options: (1) from Bloomberg; (2) by running a regression between the bank's return versus a proxy for the market's return; or (3) by using a proxy for the bank's market risk, such as an industry index, and running a regression between the proxy for the bank's return versus a proxy for the market's return. While most bank CFOs have access to Bloomberg, we chose to use data from SNL Financial to run a regression of banks' stock returns against the S&P 500 based on the asset size of our institutions (around $1 billion). One has to be aware of the challenge that arises from the fact that many community banks are thinly traded. The lack of trading can distort the stock's responsiveness to market moves and lead to an underestimation of the beta coefficient (Torchio and Surana, 2014).

In sum, we found that deriving the cost of equity for a community bank can be part art and part science, as there is no consensus as to the estimation process. Specifically, the CFO will need to use some judgment as to what numbers to utilize for the risk-free rate, the MRP, and beta. Arguably, the key is to make educated decisions as to the sources for these numbers and then be consistent. Thus, we chose to use the Duff & Phelps *2016 Valuation Handbook*, with the risk-fee rate based on the long-term U.S. Treasury coupon bond yield on the 20-year instrument and an MRP based on what they term "long-horizon expected equity risk premium." For the beta estimate, we ran a five-year regression between each bank's monthly returns versus the S&P 500, or in the case of banks with low trading volumes, the SNL Bank Index versus the S&P 500.

In addition, we need to address the issue of the size premium (or liquidity premium). According to Brotherson, Eades, Harris, and Higgins (2013), about a third of the textbooks/trade books discuss further adjustments for small cap and industry. Obviously, adding a premium can have a substantial impact on the magnitude of the community bank's cost of capital. The D&P *2016 Valuation Handbook* lists a size premium of 8.76% for the group 10b in the 10th decile. Based on Morningstar's "size-decile portfolios of the NYSE/AMEX/NASDAQ," most community banks would fall in either the ninth or the tenth decile with $596.4 million and $265.0 million as the largest companies, respectively, based on market capitalization.

Unlike the cost of equity estimations, the costs of other sources of capital are much more straightforward because these costs are explicit. Community banks derive significantly more capital from retained earnings compared to non-community banks (FDIC, 2012). Nevertheless, a community bank can have other important sources of capital, such as long-term debt, borrowings from the Federal Home Loan Bank (FHLB) system, subordinated debt, and preferred stock. Another decision that a CFO needs to make is whether to include the cost of deposits in the WACC calculation. When bank analysts describe the community bank business model, they view deposits as the firm's "raw materials" and loans as the "products produced." Consistent with that view, the cost of deposits can be thought of as the "cost of goods sold" while the yield on loans are the "sales generated" from writing the loans. Since we view WACC to be based on the costs paid to providers of capital to the bank, we do not include the cost of deposits, and this is consistent with Chen (2014) and Damodaran (2009). The revenue is equal to net interest income (interest income minus interest expense) plus noninterest income. For debt financing, the bank makes interest payments, while for preferred stock, it pays a fixed dividend. To obtain an estimate of the costs of FHLB borrowings for a forward-looking WACC estimate, a CFO could simply average the costs of fixed and variable FHLB advances, and it would be up to the CFO to decide on the weights of each source of funding to use for future growth in the balance sheet.

For someone outside the bank, such as a stock analyst, who wants to calculate ROIC and WACC, all the components of ROIC are publicly available and the WACC measure can be calculated using the approach discussed above. In the case of Chen (2014), he puts a premium on an approach that provides him the ability to revise valuation estimates within hours. In our proposed approach, all components for both ROIC and WACC calculations can be easily accessed through FFIEC, FDIC, banks' investor relation sites, or data services, such as SNL or Capital IQ.

4. Data and sample description

Our research specifically focuses on community banks, yet an exact definition for a community bank is elusive. According to FDIC (2012), community banks are known for their focus on traditional banking activities within their local communities where they obtain core deposits and make loans. This specialization in local community banking is what makes them "relationship" bankers rather than "transactional" bankers (FDIC, 2012). Typically, community banks are identified by asset size, such as less than $1 billion, but according to the FDIC study, some researchers have used $3 billion or even $10 billion. Using the detailed financial statements data of these banks and their geographic scope and list of activities, FDIC proposed to define community banks as those banks that concentrate on traditional banking activities (thus, excluding specialty institutions, such as credit card companies and consumer nonbank companies) within their local communities. Based on this definition, about 95% of all U.S. banks were considered community banks in 2010.

Table 1. Sample Justification and Filter Procedures

Bank Sample Justification:

- Pennsylvania banks are representative of community banks nationwide in terms of size, activities, and performance trends.
- The authors have strong professional connections to Pennsylvania banks.

Our Results Compared to the Nation:

Deposits-to-assets ratio

- Average for the nation: 62%
- Average for our banks: 61%

Loans-to-assets ratio

- Average for the nation: 67%
- Average for our banks: 66%

Bank composition

- Nationally, community banks as defined by FDIC account for 95% of banks in terms of the number of institutions and for 14% of all bank assets.
- Our sample accounts for roughly a third of all banks in Pennsylvania and for 39% of the state's banking assets.

Include:

Community banks located in Pennsylvania

- Total assets between $500 million and $5 billion as of December 2015.

Guided by FDIC methodology

- Banks primarily concentrated on traditional activities: accepting deposits and making loans

Exclude:

Financial institutions that concentrate on non-traditional banking activities

- Specialty Institutions
  - Credit Card Companies
  - Consumer Nonbank Companies
  - Industrial Loan Companies
  - Trust Companies
  - Bankers' Banks

Geographic restrictions

- Exclude banks that are located outside of Pennsylvania

In this study, we examine a sample of community banks in Pennsylvania. These banks are representative of community banks nationwide in terms of size, activities, and performance trends. Specifically, our sample consists of Pennsylvania commercial banks with asset sizes between $500 million and $5 billion as of December 2015. Guided by the FDIC definition, we limited the banks that primarily concentrated on traditional activities of accepting deposits and making loans (those with the deposits-to-assets ratio of 50% or more and the loans-to-assets ratio greater than 33%). According to the FDIC statistics, community banks account for approximately 14% of total banking assets in the United States. Our sample accounts

for approximately a third of all banks in Pennsylvania in terms of the number of institutions, and these banks account for about 39% of total bank assets in the state. Table 1 describes the filtering procedure and justification used to generate our sample. In sum, banks in our sample are similar to community banks in the nation as they focus on providing traditional banking activities and are comparable in size to their national peers. The loan composition for this sample is also similar to their national peers with an emphasis on residential loans, which account for more than 60% of all bank loans at Pennsylvania community banks. To calculate adjusted NOPAT and invested capital, we obtain all components for Equations 1–3 from banks' regulatory Call Reports, SNL Financial, and Capital IQ.

5. Results

Table 2 reports descriptive statistics for our sample of 37 community banks in the state over the period of 2010–2015. The average total assets for the banks in our sample is approximately $1.1 billion, and these banks display good profitability levels based on traditional performance measures, with an average ROA of 0.71% and ROE of 7.11% during the sample period. To make appropriate comparisons to national data, we gathered information about banks of similar characteristics in terms of size and activities from the FDIC Statistics on Depository Institutions (SDI). According to SDI, the average bank size for this group of about 3,500 banks between 2010 and 2015 is $1.02 billion, with an average ROA of 0.79% and ROE of 7.36%, confirming that the Pennsylvania community banks are comparable to their national peer group.

The net charge-offs to loans and leases for the national peers was approximately 0.59%, while Pennsylvania banks report an average of 0.46%, and the ratio of nonperforming loans to total loans is 2.24% in the nation and 1.93% in the state during the sample period, which suggests lower credit losses possibly due to better loan screening and higher quality of loans. The average ROIC for the sample is 7.82% for the period examined, while the average WACC is 4.42% without a size premium and 7.91% with a size premium (as explained above, adding a size premium raises the WACC considerably). The WACC estimates are based on end-of-2015 figures from the banks' balance sheets and income statements, along with trading data over the last five years. Firms would likely make small adjustments to WACCs over time, but generally the estimates would be fairly static, unless there was a significant shift in capital structure or interest rates. For our analysis, we estimated individual WACCs for each bank, and then used them for the ROIC versus WACC comparisons over the 2010–2015 period.

In sum, we find that banks in our sample report good profitability levels based on traditional performance metrics of ROA and ROE. They report lower charge-offs and nonperforming loans compared to the banks in the nation, implying higher credit quality. About half of the banks in the sample have ROICs that exceed WACCs

(adjusted for size premium), suggesting that only half of these banks are generating shareholder value.

Table 2. Descriptive Statistics for Community Banks in Pennsylvania (2010–2015)

2010	Mean	Min	Max
Total Assets ($M)	1,012.30	267.70	4,929.80
EBT Excluding Unusual Items ($M)	4.90	–27.10	24.90
Market Capitalization ($M)	119.20	18.60	715.50
Basic EPS ($)	1.13	–1.97	3.64
ROA (%)	0.51	–2.50	1.60
ROE (%)	4.32	–66.70	17.70
Nonperforming Loans/Total Loans (%)	2.56	0.44	13.20
Net Charge-Offs/Total Avg. Loans (%)	0.77	0.04	4.73
ROIC (%)	5.76	–13.16	18.75
Percentage of Banks with ROIC > WACC*	54%		
2011	**Mean**	**Min**	**Max**
Total Assets ($M)	1,040.20	285.40	4,596.10
EBT Excluding Unusual Items ($M)	7.50	–23.40	32.10
Market Capitalization ($M)	103.00	16.60	672.10
Basic EPS ($)	1.25	–3.99	4.08
ROA (%)	0.58	–2.57	1.77
ROE (%)	5.95	–32.30	17.10
Nonperforming Loans/Total Loans (%)	2.62	0.48	12.40
Net Charge-Offs/Total Avg. Loans (%)	0.65	0.02	3.11
ROIC (%)	5.46	–34.17	12.68
Percentage of Banks with ROIC > WACC*	54%		
2012	**Mean**	**Min**	**Max**
Total Assets ($M)	1,071.20	275.10	5,000.00
EBT Excluding Unusual Items ($M)	8.60	–30.10	35.50
Market Capitalization ($M)	119.90	15.90	753.30
Basic EPS ($)	1.34	–4.77	4.56
ROA (%)	0.61	–2.87	1.74
ROE (%)	5.11	–35.70	16.60
Nonperforming Loans/Total Loans (%)	2.25	0.39	6.67
Net Charge-Offs/Total Avg. Loans (%)	0.64	–0.03	8.01
ROIC (%)	4.81	–56.64	14.94
Percentage of Banks with ROIC > WACC*	46%		
2013	**Mean**	**Min**	**Max**
Total Assets ($M)	1,117.20	446.10	4,583.40
EBT Excluding Unusual Items ($M)	10.70	–11.20	38.60
Market Capitalization ($M)	162.80	18.40	851.90
Basic EPS ($)	1.71	–2.96	8.25
ROA (%)	0.69	–2.86	1.49
ROE (%)	7.39	–27.20	18.10
Nonperforming Loans/Total Loans (%)	1.75	0.30	3.49
Net Charge-Offs/Total Avg. Loans (%)	0.39	–0.28	3.07
ROIC (%)	6.92	–13.77	24.56
Percentage of Banks with ROIC > WACC*	49%		

Continued: Table 2. Descriptive Statistics for Community Banks in Pennsylvania (2010–2015)

2014	Mean	Min	Max
Total Assets ($M)	1,172.40	480.50	4,751.50
EBT Excluding Unusual Items ($M)	13.00	0.50	45.80
Market Capitalization ($M)	194.40	44.30	969.10
Basic EPS ($)	2.01	0.05	8.71
ROA (%)	0.93	0.06	2.46
ROE (%)	9.91	0.43	31.60
Nonperforming Loans/Total Loans (%)	1.39	0.29	3.11
Net Charge-Offs/Total Avg. Loans (%)	0.19	–0.51	0.82
ROIC (%)	8.27	0.92	36.22
Percentage of Banks with ROIC > WACC*	57%		
2015	**Mean**	**Min**	**Max**
Total Assets ($M)	1,291.10	546.50	4,826.70
EBT Excluding Unusual Items ($M)	13.80	–0.10	52.50
Market Capitalization ($M)	191.30	51.3	1,104.40
Basic EPS ($)	1.90	0.06	9.02
ROA (%)	0.90	0.18	3.48
ROE (%)	9.31	2.15	52.10
Nonperforming Loans/Total Loans (%)	1.01	0.15	2.13
Net Charge-Offs/Total Avg. Loans (%)	0.17	0.03	0.59
ROIC (%)	7.49	–1.44	39.60
Percentage of Banks with ROIC > WACC*	38%		

Source: Capital IQ, SNL, Call Reports, and authors' calculations. * The WACC estimates are based on end-of-2015 figures from the banks' balance sheets and income statements, along with trading data over the last five years. The average WACC is 4.42% without the size premium and 7.91% with the size premium.

In order to identify factors that contribute to banks' success as measured by ROIC, we compare the "top performers" to the "bottom performers" using key variables from their balance sheets and income statements (see Table 3) and relevant financial ratios (see Table 4).

The top performers (108 observations for 18 banks) are defined as those banks from the Pennsylvania sample that have estimated ROICs exceeding their WACCs when a size premium is included. In contrast, the bottom performers (114 observations for 19 banks) are defined as those banks that have estimated ROICs that fall short of their WACCs. The top performing banks outperform the bottom performers by a substantial margin, with an average ROIC of 10.21% versus 5.79% between 2010 and 2015. The difference is statistically significant.

In Panel A of Table 3, balance sheet statistics are presented for the two groups of banks. The samples of banks are comparable in size as measured by total assets, so it is not surprising to see other stock variables, such as gross loans and total investments, not statistically different between the two groups of banks. One stock variable that is significantly different between groups is cash and cash equivalents. This variable measures the level of liquidity at the bank. The top performers have considerably less liquidity than the bottom performers, suggesting that they are

assuming more liquidity risk. In Panel B of Table 3, income statement statistics are presented for the two groups of banks. Given that the top performers have a higher ROIC than the bottom performers, it is not surprising to see statistically higher EBT, tax expense, and net income for those banks.

There is a myriad of important financial variables and ratios that analysts use to tell a bank's investment "story" (Chen, 2014). In Table 4, we identify several important groups of financial indicators – liquidity, asset quality, capital adequacy, earnings, and profitability – to examine the main drivers of bank performance.

Table 3. Key Financial Variables for Top and Bottom Performers (2010–2015)

Panel A: Balance Sheet (selected items)	Top Performers (18 banks, 108 observations)	Bottom Performers (19 banks, 114 observations)	Significant Difference?
Total Assets ($M)	1,002.50	1,205.70	No
Cash and Cash Equivalents ($M)	29.98	55.91	Yes*
Total Investments ($M)	270.93	277.79	No
Gross Loans ($M)	646.71	798.65	No
Allowance for Loan Losses ($M)	8.90	11.98	No
Net Loans ($M)	636.80	785.61	No
Other Assets ($M)	664.94	798.14	No
Interest Bearing Deposits ($M)	603.21	761.68	No
FHLB ($M)	45.81	43.89	No
Total Debt ($M)	92.77	83.60	No
Total Preferred Equity ($M)	1.98	3.89	No
Total Common Equity ($M)	96.41	130.86	No
Total Equity ($M)	98.38	135.06	No
Panel B: Income Statement (selected items)	Top Performers	Bottom Performers	Significant difference?
Total Interest Income ($M)	38.91	44.22	No
Interest on Deposits ($M)	5.03	6.68	Yes*
Total Interest on Borrowings ($M)	2.17	2.34	No
Total Interest Expense ($M)	7.21	8.99	No
Net Interest Income ($M)	31.73	35.24	No
Service Charges on Deposit ($M)	2.43	1.95	No
Total Noninterest Income ($M)	9.79	9.47	No
Provisions for Loan Losses ($M)	2.82	4.34	No
Total Revenues ($M)	39.21	40.95	No
Total Noninterest Expense ($M)	26.67	33.39	No
EBT Excluding Unusual Items ($M)	12.52	7.22	Yes**
Income Tax Expense ($M)	2.82	1.50	Yes*
Net Income ($M)	9.04	5.92	Yes*

The superscripts ***, **, and * signify 1%, 5%, and 10% statistical significance based on *p*-values.
Source: Capital IQ, SNL, Call Reports, and authors' calculations.

Table 4. Key Performance Indicators for Top and Bottom Banks (2010–2015)

	Top Performers (n=108)	Bottom Performers (n=114)	Significant Difference?
Liquidity			
Deposits/Total Assets (%)	0.73	0.73	No
Gross Loans/Total Deposits (%)	80.34	84.51	No
Asset Quality			
Nonperforming Loans/Total Loans (%)	1.69	2.02	No
Allowances for Credit Losses/Nonperforming Loans (%)	110.28	132.90	No
Net Charge-Offs/Total Avg. Loans (%)	0.37	0.53	No
Coverage Ratio (Loan Loss Reserves/Nonaccrual Assets) (%)	90.24	126.79	No
Capital Ratios			
Avg. Common Equity/Avg. Assets (%)	9.35	9.55	No
Total Capital Ratio (%)	15.08	15.59	No
Leverage Ratio (Regulatory Capital Ratio) (%)	9.32	9.84	No
Earnings and Profitability			
Net Interest Margin (NIM) (%)	3.33	3.09	Yes**
Net Income Margin (NI/TR) (%)	19.78	8.15	Yes*
Efficiency Ratio (Noninterest Expense/Net Operating Revenue) (%)	0.65	0.78	Yes***
ROA (%)	0.93	0.53	Yes***
ROE (%)	9.68	4.92	Yes***
Basic EPS ($)	1.92	1.28	Yes*
P/E	12.24	18.01	No
Price/BV	1.17	0.84	Yes***
Price/Tangible BV	1.27	0.91	Yes***
ROIC	10.21	5.79	Yes***
WACC (without size premium)	4.18	4.65	No
WACC (with size premium)	7.12	8.66	Yes**

The superscripts ***, **, and * signify 1%, 5%, and 10% statistical significance based on *p*-values.
Source: Capital IQ, SNL, Call Reports, and authors' calculations.

The key performance indicators in Table 4 lead to several important conclusions. Most important, the average leverage ratio for the top performers is not lower than that for the bottom performers. This suggests that the top performers are not taking greater financial risk compared to the bottom performers. Likewise, there is no statistically significant difference between the two groups' common equity-to-assets ratio, which reinforces the notion that the top performing banks are not assuming greater financial risk to generate higher ROICs.

The significant differences between net interest margin, net income margin, and the efficiency ratio between two groups of banks are not surprising. The fact that top performing banks are showing evidence of a healthy balance between revenue generation and cost control is a positive development and it suggests that these banks should be resilient to potential interest spread squeezes. Banks that are overly

dependent on large margins and spreads are more vulnerable to erosion of their profitability during periods of yield curve flattening.

Finally, the P/BV and P/TBV for the top performers are statistically significantly greater than the bottom performers, which we anticipated given that these banks are generating higher returns on invested capital. However, P/E indicators do not seem to be pointing to better market valuations of top ROIC performers, which is puzzling and perhaps should be further explored by future research.

6. Conclusions

There are several bank performance measures that are widely used by academics and bank analysts, including ROA and ROE. However, the traditional performance metrics have serious drawbacks, including their reliance on accounting profits and a failure to fully account for risk. Research has shown that the latter may have contributed to the excessive risk-taking prior to the recent global financial crisis (Admati and Hellwig, 2013). The shortcomings of traditional performance measures led some large nonfinancial firms to use the ROIC, which is compared to the cost of capital to determine whether a company is creating shareholder value. The metric was recently outlined by Chen (2014) for analysis of a small number of multinational financial institutions. However, ROIC has never been applied to smaller community banks.

This study examined the performance of community banks in Pennsylvania during the 2010–2015 period and found that their return and risk characteristics based on traditional measures were in line with the national peers and, in fact, they displayed more favorable credit risk characteristics. However, when the ROIC methodology was applied, roughly half of the community banks in the sample had costs of capital that exceeded their ROICs, indicating they were destroying shareholder value. For the top performers, the differential between ROIC and WACC was on average about +6% without the size premium and about +3% with the premium. On the other hand, for the bottom performers, the differential between ROIC and WACC was on average about +1% without the size premium and almost -3% with the premium. This is an important result, as a firm that continues to generate positive excess returns on new investments in the future should see its value increase, while a firm that earns returns that do not match up to its cost of capital will likely destroy value as it grows. If our findings for Pennsylvania banks are an indicator of a national trend, then consolidation within the community bank industry makes sense and is likely to continue into the foreseeable future.

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