Report on SBLF Program Impact Evaluation

January 2015

SBLF PROGRAM IMPACT EVALUATION

The SBLF program impact evaluation performed for the quarter ending September 30, 2013 was published as an appendix to the April, July, and October 2014 Reports of SBLF Participants' Small Business Lending Growth ("SBLF Lending Growth Reports"). It is being reproduced here as a standalone report.

The Small Business Jobs Act of 2010 directs the Secretary of the Treasury to provide a quarterly report on how institutions participating in the SBLF program have used the funds they received under the program. Each quarter SBLF publishes a report providing information on changes in small business lending by participants relative to baseline levels[1]. The results suggest that the SBLF program is supporting significantly increased business lending by participants, consistent with the program's objectives.

Quarterly SBLF Lending Growth Reports have compared SBLF participant lending growth to that of a broad comparison group as well as a representative peer group.[2] These comparisons show that SBLF banks have generally increased business loans outstanding, both over baseline levels and since investment, by significantly more than either a representative peer group or a broader comparison group of non-SBLF banks.

The selection of representative peer institutions used in the quarterly SBLF Lending Growth Reports employs variables that reflect common conventions of market structure, including institution geography, size, and financial condition. Any such selection of peer institutions, however, may be subject to the effect of unobserved variables that could also have influenced an institution's decision to participate in SBLF, increase business lending, or take other actions (i.e., "selection bias").

This report describes SBLF program results using a statistical methodology called propensity score analysis which attempts to limit the potential reported effect of such selection bias. This analysis of participant lending growth was performed for the quarter ending September 30, 2013. Consistent with the previously reported findings from the peer and comparison group analysis in the quarterly SBLF Lending Growth Reports, the results of this additional analysis suggest that the SBLF program is supporting substantially increased business lending among program participants.

[1] As established in the Act, the baseline for measuring the change in small business lending is the average of the amounts that were reported for each of the four calendar quarters ended June 30, 2010.

[2] For additional information regarding the composition of the peer and broader comparison groups, please see Appendix A of the January 2015 edition of the *Report of SBLF Participants' Small Business Lending Growth.*

Program Impact Analysis Using Propensity Score Methods

Propensity score methods seek to account for observable characteristics that may be predictive of a bank's likelihood of participating in the SBLF, extending beyond the conventional measures of market analysis used in the peer group analysis.

Treasury implemented two separate propensity score methods to analyze the impact of SBLF. In general, propensity score methods use balancing factors ("propensity scores") to offset an unequal distribution of observable characteristics between comparison groups. In this way, they help mitigate selection bias by controlling indirectly for a bank's motivation to participate in the SBLF program.

The first approach Treasury implemented is called "propensity score matching." This analysis calculates the predicted probability that a given institution would have received SBLF funding given the many variables that may have influenced the institution's ability or decision to participate in the SBLF program. This predicted probability of participation is codified as a "propensity score" for each SBLF bank participant as well as each non-participant (6,028[3] banks). To assess the effect of SBLF participation, the analysis matches each SBLF bank with a non-SBLF bank that has the closest propensity score. This process has the effect of creating a propensity score-matched "control group" of non-SBLF banks that is balanced with SBLF banks across all relevant variables. Assembling the two groups in this manner controls for the influence of these characteristic variables by largely eliminating any imbalances across the distribution of these variables among the two groups of banks. This approach explores whether, when controlling for propensity to participate in SBLF, banks that received SBLF capital increased their business lending balances more than other banks.

Treasury also implemented a second propensity score method called "multiple propensity score regression adjustment." The structure of the SBLF program couples capital investments (which are intended to augment the lending capacity of an institution) with targeted incentives to increase small business lending (through the dividend and interest rate adjustment mechanism). Because some SBLF participants may have had the ability to raise capital from sources other than SBLF, and vice versa, this second method provides a mechanism for distinguishing the impact of the SBLF program specifically from the effect of capital increases generally. The second approach evaluates program impact by seeking to calculate and control for each institution's propensity to raise capital from either SBLF or a separate source. This approach explores whether, when controlling for propensity to receive SBLF and Other Capital, the SBLF program was effective in driving higher levels of business lending at SBLF participants versus that of institutions which received no new capital.

Similar to other retrospective statistical techniques, propensity score methodologies carry inherent limitations. For example, propensity score matching techniques presume that all relevant characteristic variables are subject to measurement and inclusion when calculating an institution's propensity to participate in one or more groups. Consequently, it remains possible that unmeasured factors may influence differences in outcomes in a comparison of SBLF banks and non-participants.[4] The use, however, of a large set of observable variables – a total of 71 in the context of this analysis – helps mitigate this risk.

[3] Of the 6,035 non-SBLF banks, seven institutions were excluded from the matching analysis due to missing values associated with the data used to calculate propensity scores.

[4] Randomized experiments are best suited to assessing program effectiveness where it is possible to maintain random assignment to minimize the influence of external factors on program outcomes. The structure of the SBLF program, however, did not permit random assignment, as Treasury considered all applicants for funding and sought to provide consistent decisioning among applicants.

In addition, the scope of this analysis is limited to an assessment of whether SBLF participants have increased business lending in comparison to similarly situated institutions. This analysis does not seek to evaluate, for example, whether increases in business lending by program participants have been offset by decreases by non-participants or slower growth in non-business lending by participants than may otherwise have occurred. Likewise, this analysis does not seek to capture or calculate potential second-order benefits to a community from increased business lending, such as increased job creation, capital investment, tax revenues, or other effects. As well, this analysis is not intended to address questions of capital access or availability, such as whether banks that participated in SBLF could have raised capital from alternative sources, nor does it seek to address potential limitations on the aggregate amount of capital available to community banks.

Selection of Characteristic Variables

Treasury incorporated a broad set of 71 observable financial and market variables that could potentially affect a bank's likelihood of participating in the SBLF program. These variables include balance sheet measures, financial performance measures, capitalization, loan composition, deposit composition, asset quality, liquidity, yield to cost ratios, corporate organization, and participation in the Capital Purchase Program, as well as characteristics of the institution's lending markets. These variables were measured as of March 31, 2011, which was the quarter before the first SBLF investment.

To obtain financial information on each bank, Treasury accessed information from SNL Financial (SNL), a private database that contains publicly-filed regulatory and financial reports. To obtain market population, unemployment, and income information on the bank's lending markets, Treasury accessed U.S. Census information using SNL. For banks located within a Metropolitan Statistical Area (MSA), MSA-level information was used, while county-level data was used for banks outside of an MSA.

The following is a list of the 71 characteristic variables selected, grouped by category. These variables are based on SNL's array of summary financials for each institution.

- ***Balance sheet measures (6 continuous variables*)**: total assets, asset growth rate, loan growth rate, deposit growth rate, gross loans to assets, and loans to deposits.

- ***Performance measures (5 continuous variables):*** return on average assets (ROAA), return on average equity (ROAE), net interest margin, yield to cost spread, and efficiency ratio.

- ***Capitalization (8 continuous variables and 1 categorical variable):*** equity to assets, tangible equity to tangible assets, tangible common equity to tangible assets, risk based capital ratio, tier 1 risk based ratio, tier 1 common risk based ratio, leverage ratio, change in common and preferred stock and capital surplus as a percentage of total equity between Q1 2010 and Q1 2011 (0% or less, 0 to 5%, 5 to 10%, over 10%) and common dividends declared to net income.

- ***Loan composition (6 continuous variables):*** construction land development loans to total loans, total 1-4 family loans to total loans, multifamily loans to total loans, total real estate loans to total loans, commercial and industrial loans to total loans, and consumer loans to total loans.

- ***Deposit composition (5 continuous variables):*** non-interest bearing deposits to total deposits, transaction accounts to total deposits, money market deposit account (MMDA) savings to total deposits, retail time deposits to deposits, and jumbo time deposits to total deposits.

- ***Asset quality (11 continuous variables):*** non-current loans to loans, nonperforming loans to loans, non-performing assets to total assets, non-performing assets excluding restructured loans to total assets, non-performing assets to loans plus foreclosed real estate, loan loss reserves to gross loans, net charge-offs to average loans, non-performing assets plus loans 90 days past due to tangible equity plus loan loss reserves, adjusted non-performing assets plus adjusted loans 90 days past due divided by tangible equity plus loan loss reserves, adjusted non-performing assets to total assets, and adjusted non-performing loans to total loans.

- ***Liquidity (4 continuous variables):*** liquidity ratio, interest earning assets to interest bearing liabilities, brokered deposits to deposits, and jumbo deposits to total domestic deposits.

- ***Yield to cost ratios (4 continuous variables):*** yield to loans and leases, cost of interest bearing deposits, cost of interest bearing liabilities, and cost of funds.

- ***Government program participation (3 categorical variables):*** current or former participation in CPP (participant; non-participant), former participation in Transaction Account Guarantee Program (TAGP) (participant; non-participant), former participation in Debt Guarantee Program (TDGP) (participant; non-participant).

- ***Corporate organization (6 categorical variables and 1 continuous variable):*** de novo status (de novo; non-de novo), ownership (private; public), ownership structure (mutual; stock corporation), institution type (savings bank; commercial bank), primary regulator (Federal Reserve Board (FRB); Office of the Comptroller of the Currency (OCC); Federal Deposit Insurance Corporation (FDIC)), Community Reinvestment Act rating (outstanding, needs to improve, satisfactory), and bank age in years.

- ***Local market indicators (1 categorical variable and10 continuous variables):*** region (Mid-Atlantic, Midwest, Northeast, Southeast, Southwest, West), unemployment rate, change in unemployment rate from prior year, 2011 compound annual growth rate (CAGR) of households, 2011 CAGR of population, 2010 CAGR of median household income, 2010 CAGR of per capita income), projected 2017 CAGR of households, projected 2017 CAGR of median household income, projected 2017 CAGR of per capita income, and projected 2017 CAGR of population.

Propensity Score Matching Analysis Methodology

Propensity score matching, the first of the two methodologies employed, follows five primary steps: (1) evaluation of the balance of characteristic variables between SBLF participants and non-participants, (2) calculation of a propensity score for each institution, (3) selection of a control group of banks using propensity scores, and (4) testing of the control group to assess its effectiveness in mitigating selection bias, and (5) estimation of net effect of SBLF participation.

Step 1: Evaluation of the Balance of Characteristic Variables Between SBLF Participants and Non-Participants

Treasury measured the statistical differences between the SBLF banks and the broader market of community banks across each of the 71 characteristic variables listed above to identify which characteristics were equally distributed (i.e., balanced) among SBLF participants and non-participants. To evaluate balance, the statistical differences in each variable between the two groups of banks were calculated using chi-squared tests for categorical variables and Kolmogorov–Smirnov tests (K-S tests) for continuous variables. The analysis found statistically significant imbalances

(p-values < 0.05) between SBLF and non-SBLF banks for 63 of the 71 characteristic variables. This result suggests that SBLF banks have observable characteristics that differ significantly from the broader market of community banks.

Step 2: Calculation of a Propensity Score for Each SBLF Participant and Non-Participant

Treasury calculated a "propensity score" ranging between 0 and 1 for each SBLF bank participant and each non-participant based on the 71 characteristic variables described above. The calculation of the propensity score for each bank follows a standard logistic regression. The dependent variable is defined as program status (non-participant = 0, SBLF participant = 1) and the independent variables are the 71 characteristic variables. A backward selection process was used to iteratively eliminate highly insignificant variables (i.e., p-values > 0.60).[5] Through the backward variable selection process, 17 variables were eliminated. The initial test of propensity score's ability to balance across SBLF and the control group (see Step 5) indicated remaining imbalances for the asset growth rate and ROAA variables, suggesting a non-linear relationship for these variables not captured in the initial model. To correct for this imbalance, Treasury added squared terms for each of these factors (a common approach in propensity score modeling) which yielded two additional variables for the logistic regression.

Step 3: Selection of a Control Group of Non-Participants Using Propensity Scores

Treasury selected a control group of non-participants for comparison to SBLF institutions by matching each SBLF participant with the non-participant that had the next closest propensity score (propensity score-matched "control group"). For example, if an SBLF participant had a propensity score of 0.30, the institution selected for inclusion in the control group was the non-participant that received a propensity score closest to 0.30.

Step 4: Evaluation of the Balance of Characteristic Variables Between SBLF Participants and the Control Group

Treasury performed statistical tests to assess whether the control group and the SBLF participants had comparable distributions with respect to each of the 71 characteristic variables. The statistical differences in each variable between the two groups of banks were calculated using chi-squared tests for categorical variables and Kolmogorov-Smirnov tests (K-S tests) for continuous variables (see Table A for detailed test results). These tests found no statistically significant imbalances (p-values < 0.05) between the group of SBLF banks and the control group across any of the 71 characteristic variables (see Table A for additional detail). This suggests that the propensity score matching analysis reduced the possibility of selection bias by selecting a statistically balanced control group.

Step 5: Estimation of Net Effect of SBLF Participation

To estimate the net effect of the SBLF participation using this methodology, Treasury compared the median increases in lending growth at SBLF banks to the median increases in lending growth and the control group over baseline and since investment. Consistent with the findings from the peer and comparison group analysis published in the quarterly SBLF Lending Growth Reports, the results of the propensity score matching analysis suggest that the SBLF program is supporting increased business lending among program participants. By convention, the output of these

[5] The variables eliminated were found to be insignificant in the presence of other correlated variables; individually, however, they may be correlated with lending growth. The eliminated variables included: deposit growth rate, ownership = private, regulator = OCC or FRB, ROAE, projected CAGR households, tier 1 common risk based capital ratio, NPAs to total assets, cost of interest bearing deposits, yield on loans and leases, jumbo time deposits to total deposits, CAGR per capita income, MMDA savings to total deposits, leverage ratio, projected CAGR per capita income, institution type = savings bank, and ownership structure = mutual.

methodologies reflects differentials between groups and are not directly comparable with the results of the peer and comparison group analyses presented in the quarterly SBLF Lending Growth Reports.

As of September 30, 2013, SBLF banks have increased business loans outstanding by a median 52.1 percent over baseline levels, versus a 29.0 percent median increase for the propensity score-matched control group, for an estimated net effect associated with SBLF participation of 23.1 percent. The following table shows changes in business lending and other lending by SBLF banks and the propensity score matched control group.

Results of Propensity Score Matching Analysis

	Average Lending of SBLF Participants	Average Lending of Control Group	Estimated Net Effect of SBLF Participation
Number of institutions	257	257	
Median Change in Lending Over Baseline			
Business lending	52.1%	29.0%	**23.1%**
Other lending	31.6%	17.8%	**13.8%**
Median Change in Lending Since Investment			
Business lending	29.8%	14.9%	**14.9%**
Other lending	20.6%	11.4%	**9.2%**

Impact of SBLF and Non-SBLF Capital Investments on Business Lending

The preceding analysis examines the performance of SBLF participants against non-participants based on their characteristics in the period prior to investment, irrespective of subsequent activities that may have augmented their lending capacity. The SBLF program structure coupled capital investments with targeted incentives to increase small business lending. Some non-participants, however, raised capital from sources other than SBLF.

To help distinguish the effect of SBLF program participation from capital increases generally, Treasury completed a second analysis called "multiple propensity score regression adjustment." The structure of the SBLF program couples capital investments (which are intended to augment the lending capacity of an institution) with targeted incentives to increase small business lending (through the dividend and interest rate adjustment mechanism). The second approach evaluates program impact by seeking to calculate and control for each institution's propensity to raise capital from either SBLF or a separate source. In particular, this approach explores whether, when controlling for propensity to receive SBLF and Other Capital, the SBLF program was effective in driving higher levels of business lending at SBLF participants versus that of institutions which received no new capital.

The multiple propensity score regression adjustment model estimates the average difference in lending growth between a control group of institutions which did not receive equity investments and those institutions that raised capital through SBLF or other sources, while controlling for the observable characteristics of these institutions. This approach uses a multinomial logistic regression to develop two propensity scores for each institution reflecting the conditional probability of receiving an SBLF capital investment (SBLF Investment) and an outside capital investment (Other Investment), or no new capital (No Investment) given the characteristic variables described above.

The methodology then uses a linear regression to estimate the relationship between lending growth as the dependent variable and indicators of sources of new capital and multiple propensity scores as independent variables. Once the effects of propensity scores are isolated, the remaining difference in average lending growth between the

"No Investment" group and each of the "SBLF Investment" and "Other Investment" groups is calculated, and is referred to below as the "estimated net treatment effect" for this approach.

Multiple Propensity Score Regression Adjustment Methodology

The multiple propensity score regression adjustment methodology follows five primary steps: (1) assignment of institutions into treatment groups, (2) evaluation of the balance of characteristic variables among the three treatment groups, (3) calculation of multiple propensity scores for each institution, (4) testing of the propensity scores to assess their effectiveness in mitigating selection bias, and (5) estimation of the net effects of receiving an SBLF Investment or Other Investment over No Investment.

Note that while many of these steps are similar to those used in the propensity score matching methodology above, an important difference in this approach is that no new comparison group is assembled. Rather, the calculated propensity scores are used as balancing variables in a linear regression to control for differences in the distributions of characteristic variables associated with all institutions in the SBLF Investment, Other Investment and No Investment groups.

Step 1: Assignment of Institutions into Treatment Groups

Treasury assigned institutions to one of three groups: SBLF Investment, Other Investment, and No Investment. To identify institutions that received capital investments, Treasury accessed call report data from SNL. Because banks do not report capital investments uniformly, Treasury used the sum of changes in the common stock, preferred stock and surplus capital call report line items as a percentage of the Q1 2011 total equity line item to identify outside capital investments. Institutions which did not receive a capital investment over the period were assigned to the "No Investment" control group.

Because both SBLF and non-SBLF institutions varied in the amount of capital they raised, Treasury sought to include in the "Other Investment" group a set of non-SBLF institutions that raised amounts of capital in a distribution comparable to that of the SBLF institutions. To establish an appropriate comparison group, the group of SBLF institutions was initially trimmed (excluding institutions above the 95th percentile and below the 5th percentile in capital increases) to minimize the influence outliers whose reported increases in capital generally reflected influences other than traditional capital investments, such as changes caused by mergers, acquisitions, or restructurings. Treasury then employed a stratified random sampling approach to identify a group of non-SBLF institutions with an equal distribution of net changes in their capital levels as that of SBLF institutions between Q1 2011 and Q3 2013. All institutions that reported changes in capital and were not assigned to the Other Investment group through this stratification process were eliminated.

Treasury validated the robustness of the stratification approach using multiple iterations and formal statistical tests to confirm that the results were not sensitive to the selection of a particular random sample. This approach resulted in an "Other Investment" group of 908 non-SBLF institutions, an SBLF Investment group of 254 program participants, and a No Investment control group of 3,654 non-participants.

Step 2: Evaluation of the Balance of Characteristic Variables Among Treatment Groups

To assess the distribution of each of the 71 characteristic variables across treatment groups, Treasury regressed each variable on the three comparison group indicators. For continuous variables, a form of linear regression was used. For categorical variables, a binomial or multinomial logistic regression was performed, depending on the number of

possible outcomes for that variable. The joint significance of comparison group indicators' coefficients was tested using F-tests. The analysis found statistically significant imbalances (p-values < 0.05) for 66 of the 71 characteristic variables measured. This result suggests that the SBLF Investment and Other Investment groups have observable characteristics that differ significantly from the No Investment group.

Step 3: Calculation of Three Propensity Scores for Each Institution

A multinomial logistic regression was performed to estimate three propensity scores, reflecting the probability of an institution's inclusion in the SBLF Investment, Other Investment, and No Investment treatment groups respectively. The regression incorporated and incorporated backward selection process to identify highly insignificant variables (p-values > 0.60).[6] Through the backward variable selection process, 14 variables were eliminated.

Propensity score models require that each institution maintain a non-zero probability of being selected into each group and that sufficient overlap between the propensity scores exists. To meet this criteria, Treasury trimmed all three groups to ensure that both propensity scores fall within a range common to all groups. Institutions with propensity scores below the lowest scores of any alternative group and above the maximum score of any alternative group were automatically discarded from further analysis. In total, 295 banks in the No Investment control group (8 percent of group), 115 banks in the Other Investment group (13 percent), and 31 banks in the SBLF Institutions group (12 percent) were eliminated through this process. This trimming requirement resulted, however, in only modest changes to the overall net impact results.

Step 4: Evaluation of the Ability of the Propensity Scores to Balance of Characteristic Variables

To validate the comparability of the three groups when using propensity scores to control for differences in characteristic variables, Treasury regressed each of the 71 characteristics variables on treatment (SBLF Investment, Other Investment, No Investment) incorporating the two separate propensity scores and their joint interaction as additional independent variables. For continuous variables, a form of regular linear regression was used to determine the appropriate coefficients for testing. For categorical variables, a binomial or multinomial logistic regression was performed, depending on the number of possible outcomes for that variable. Once the coefficients for each treatment group were determined with respect to each dependent variable, the joint significance of treatment group coefficients was tested using the F-test. These tests found no statistically significant imbalances (p-values < 0.05) between the groups across any of the 71 characteristic variables when propensity scores were included in the calculation. This suggests that the propensity scores reduced the possibility of selection bias by effectively balancing the characteristic variables (see Table B for additional detail).

Step 5: Estimated Net Effect of SBLF Investment and Other Investment over No Investment

Treasury regressed lending growth on treatment type, the two propensity scores and their joint interactions to determine the "estimated net treatment effects", or the average differences in lending growth associated with SBLF and Other Investment sources relative to No Investment.

[6] The variables eliminated were found to be insignificant in the presence of other correlated variables; individually, however, they may be correlated with lending growth. The eliminated variables included: retail time deposits to total deposits, non-performing assets plus loans 90 days past due over tangible equity and loan loss reserves, yield on loans and leases, tangible equity to tangible assets, return on average assets, non-performing assets excluding restructured loans to total assets, gross loans to total assets, risk-based capital ratio, projected CAGR [continued from previous page footnote] households, total equity to total assets, jumbo deposits to total deposits, common dividend declared to net income, multifamily loans to total loans and bank's age (in years).

After isolating the effect of propensity scores on lending growth, the difference in business lending associated with banks that received an SBLF investment (SBLF Investment) over banks that did not receive a capital investment (No Investment) is 31.2 percent. For banks that received an alternative investment (Other Investment), the difference in business lending over banks that did not receive a capital investment is 17.0 percent after controlling for propensity.

These results indicate that the business lending impact associated with SBLF investments has been highly significant. These findings also suggest that, when compared with alternative sources of capital, SBLF investments were more effective on a dollar-weighted basis in yielding increased business lending. In each case, these results are significant at a 95 percent confidence limit. As above, the output of this methodology reflects differentials between No Investment and SBLF Investment or Other Investment, respectively, and is not directly comparable with the results presented in the preceding peer and comparison group analyses.

Summary Results: Estimated Net Treatment Effects, Adjusted for Propensity			
	Estimated Net Treatment Effects	95% Confidence Limits	
Over Baseline			
Estimated Net Treatment Effect: SBLF Investment	31.2%	24.2%	38.2%
Estimated Net Treatment Effect: Other Investment	17.0%	13.3%	20.7%
Since Investment			
Estimated Net Treatment Effect: SBLF Investment	19.5%	15.4%	23.6%
Estimated Net Treatment Effect: Other Investment	10.5%	8.3%	12.6%

Table A: Summary Statistics of Characteristic Variables: Propensity Score Matching

The following tables includes additional detail of the chi-square test results for the 11 categorical variables and the K-S test results for the 60 continuous variables used in the propensity score matching analysis. All variables were measured at March 31, 2011, the quarter before the initial SBLF investment.

Summary of Chi-Square Test Results for Continuous Variables and KS-Test Results for Categorical Variables

	p-value After PS Correction		p-value After PS Correction
Corporate organization		**Asset quality**	
Banks Age in Yrs.	0.84	Noncurrent Loans to Loans	0.12
Balance sheet measures		NPLs to Loans	0.09
Total Assets	0.08	NPAs to Total Assets	0.21
Asset Growth Rate	0.25	NPA Excl. Restruct. Lns to Total Assets	0.42
Loan Growth Rate	0.25	NPAs to Loans+Frclsd RE	0.14
Deposit Growth Rate	0.36	Loan Loss Reserves to Gross Loans	0.30
Gross Loans to Assets	0.70	NCOs to Avg Loans	0.63
Loans to Deposits	0.90	NPA+ Loans 90PD to Tang Equity + LLR	0.21
Performance measures		Adj NPA + Adj Lns 90PD / Tang Equity + LLR	0.18
ROAA	0.18	Adjusted NPA to Total Assets	0.18
ROAE	0.18	Adjusted NPL to Total Loans	0.08
Net Interest Margin	0.18	**Local market indicators**	
Yield to Cost Spread	0.08	Unemployment Rate	0.90
Efficiency Ratio	0.42	Change in Unempl Rate from Prior Year	0.84
Capitalization		CAGR Population	0.63
Equity to Assets	0.63	CAGR Households	0.77
Tangible Equity to Tangible Assets	0.99	CAGR Per Capita Income	0.84
Tang Common Eqty to Tang Assts	0.84	CAGR Median Household Income	0.77
Risk Based Capital Ratio	0.90	Proj CAGR Population	0.77
Tier 1 Risk-based Ratio	0.70	Proj CAGR Households	0.55
Tier 1 Common Risk-Based Ratio	0.84	Proj CAGR Per Capita Income	0.77
Leverage Ratio	0.90	Proj CAGR Median Household Income	0.94
Com Div Decl to Net Income	0.36		
Loan composition		**Government Program Participation**	
Const Land Dev Lns to Loans	0.42	TARP	0.86
Tot 1-4 Fam Loans to Loans	0.84	TAGP Participant	0.26
Multifamily Loans to Loans	0.94	TDGP Participant	0.37
Total Real Est Lns to Tot Loans	1.00	**Ownership**	
CI Loans to Loans	0.84	Private	0.52
Consumer Loans to Loans	0.30	Ownership Structure	0.15
Deposit composition		Company Type	0.60
Non Int Bear Dep to Total Deposits	0.90	**Regulatory**	
Trans Accts to Total Deposits	0.63	Primary Regulator	0.38
MMDA Savings to Total Deposits	0.70	CRA Rating	0.99
Retail Time Deposits to Dep	0.30	**De Novo Status**	
Jumbo Time Deposit to Total Dep	0.77	De Novo Status	0.66
Liquidity		**Region**	
Liquidity Ratio	0.48	Region	0.81
Int Earn Assets to Int Bear Liab	0.25	**Capital Raising Activity**	
Brokered Deposits to Deposits	1.00	Capital Raise Observed	0.67
Jumbo Deposit to Total Dom Dep	0.77		
Yield to cost ratios			
Yield on Loans and Leases	0.42		
Cost of Int Bearing Deposits	0.58		
Cost of Interest Bearing Liab	0.84		
Cost of Funds	0.97		

Table B: Summary Statistics of Characteristic Variables: Multiple Propensity Score Regression Adjustment

The following tables include additional detail of the F-test results for the 11 categorical variables and for the 60 continuous variables used in the multiple propensity score regression adjustment.

Summary of F-Test Results

	p-value After PS Correction		p-value After PS Correction
Corporate organization		**Asset quality**	
Banks Age in Yrs.	0.85	Noncurrent Loans to Loans	0.67
Balance sheet measures		NPLs to Loans	0.89
Total Assets	0.78	NPAs to Total Assets	0.93
Asset Growth Rate	0.97	NPA Excl. Restruct. Lns to Total Assets	0.88
Loan Growth Rate	0.98	NPAs to Loans+Frclsd RE	0.91
Deposit Growth Rate	1.00	Loan Loss Reserves to Gross Loans	0.98
Gross Loans to Assets	0.84	NCOs to Avg Loans	0.92
Loans to Deposits	0.86	NPA+ Loans 90PD to Tang Equity + LLR	0.90
Performance measures		Adj NPA + Adj Lns 90PD / Tang Equity + LLR	0.85
ROAA	0.85	Adjusted NPA to Total Assets	0.89
ROAE	0.77	Adjusted NPL to Total Loans	0.86
Net Interest Margin	0.87	**Local market indicators**	
Yield to Cost Spread	0.87	Unemployment Rate	0.97
Efficiency Ratio	0.98	Change in Unempl Rate from Prior Year	0.99
Capitalization		CAGR Population	1.00
Equity to Assets	0.90	CAGR Households	0.95
Tangible Equity to Tangible Assets	0.77	CAGR Per Capita Income	0.94
Tang Common Eqty to Tang Assets	0.91	CAGR Median Household Income	1.00
Risk Based Capital Ratio	0.89	Proj CAGR Population	0.97
Tier 1 Risk-based Ratio	0.90	Proj CAGR Households	0.98
Tier 1 Common Risk-Based Ratio	0.88	Proj CAGR Per Capita Income	0.97
Leverage Ratio	0.83	Proj CAGR Median Household Income	0.99
Com Div Decl to Net Income	0.87		
Loan composition		**Government Program Participation**	
Const Land Dev Lns to Loans	0.89	TARP	0.37
Tot 1-4 Fam Loans to Loans	0.96	TAGP Participant	0.95
Multifamily Loans to Loans	0.63	TDGP Participant	0.91
Total Real Est Lns to Tot Loans	0.94	**Ownership**	
CI Loans to Loans	0.95	Private	0.92
Consumer Loans to Loans	0.99	Ownership Structure	0.91
Deposit composition		Company Type	1.00
Non Int Bear Dep to Total Deposits	0.89	**Regulatory**	
Trans Accts to Total Deposits	0.89	Primary Regulator	0.98
MMDA Savings to Total Deposits	1.00	CRA Rating	1.00
Retail Time Deposits to Dep	0.91	**De Novo Status**	
Jumbo Time Deposit to Total Dep	0.99	De Novo Status	0.98
Liquidity		**Region**	
Liquidity Ratio	0.88	Region	1.00
Int Earn Assets to Int Bear Liab	0.98	**Capital Raising Activity**	
Brokered Deposits to Deposits	0.61	Capital Raise Observed	0.92
Jumbo Deposit to Total Dom Dep	0.98		
Yield to cost ratios			
Yield on Loans and Leases	0.97		
Cost of Int Bearing Deposits	0.98		
Cost of Interest Bearing Liab	0.97		
Cost of Funds	0.96		

References

This program impact analysis follows a methodology drawn from prior research on program evaluation. To complete this analysis, Treasury worked with a third-party contractor with expertise in statistical methods. In addition, the following publications include information used in developing the methodological approach.

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