MOODY'S ANALYTICS

U.S. MIDDLE MARKET RISK REPORT

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Private Firm Summary

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This semiannual report examines credit risk in the otherwise opaque U.S. private firm credit market. We report trends in four different areas of risk measurement: realized defaults, internal bank ratings, financial statement-based information, and model-based risk estimates. We derive the statistics in this report from Moody's Analytics Credit Research Database (CRD®).

This report contains EDF™ (Expected Default Frequency) values calculated using the RiskCalc™ U.S. 4.0 Corporate model. The stressed EDF is calculated using the RiskCalc Plus Stress Testing Model, ratio-based approach. The model adjusts a company's financial statements depending on how various statement inputs behave under different stress scenarios to calculate pro forma FSO EDF values. The model also estimates stressed credit cycle signals under different scenarios. Combining the pro forma FSO EDF with the stressed credit cycle factors leads to a meaningful quarterly stressed EDF.

Highlights

- Private firm default rates have declined steadily during the past five years. At 1.5%, the rolling 12-month default rate is down 73% from its September 2009 peak of 5.3% (Fig.1). This trend has been driven primarily by a decline in the charge-off rate, now at its lowest level in the past ten years. In addition, the rate of borrowers in non-accrual status has decreased 53% since September 2009. The number of borrowers rated "Substandard" has seen a steady increase since the first quarter of 2015, rising above pre-crisis levels, reflecting banks' cautious lending practices (Fig.2).

- 15% of borrowers were downgraded in bank internal ratings during the past year, comparable to that of a year ago (Fig.6). This finding suggests caution among banks.

- *Mining, Oil & Gas* bears the highest percentage of balances adversely rated in 2015, at 62%. *Construction* ranks next in order (Fig.5). Across all industries except *Mining, Oil & Gas*, the percentage of balances adversely rated remained relatively unchanged during the past year. This figure remains slightly lower than pre-crisis levels.

- The median RiskCalc 4.0 CCA EDF value for the U.S. rose from 0.5% in June 2015 to 0.6% in June 2016. In March 2016, it reached its highest point in the past four years, at 0.7% (Fig.8). The median CCA EDF increased significantly for Non-Pass borrowers over the past year, from 1.6% in June 2015 to 2.5% in June 2016 (Fig.9).

- Financial statement ratios generally improved in 2015, showcasing banks' decisions in extending credit to stronger borrowers. *Debt Coverage* reached the highest level in the past ten years. *Leverage*, measured by retained earnings over current liabilities, has continued to improve over the past decade. *Sales Growth* and *Change in ROA*, despite slowing in 2015, have both remained positive after the crisis, indicating steady growth for borrowers. *Size* continued rising in 2015, indicating that banks increasingly prefer to lend to larger borrowers. We also observe

decreasing *Liquidity*, measured by cash over assets, as well as rising *Inventory to Sales* and *Current Liabilities to Sales* ratios, signaling potential deterioration (Fig.13).

» The median FSO EDF credit measures of different vintage loans all fell in 2015. This convergence tendency indicates an improving overall credit risk profile for middle market portfolios and tighter lending standards (Fig.12).

» *Mining, Oil & Gas* and *Information & Culture* displayed the highest EDF levels as of June 2016 (Fig.14). All industries experienced increased EDF levels during the past year, but *Mining, Oil & Gas* showed the largest EDF level increase, rising 212% since June 2015 (Fig.15).

» Among the ten states showcasing the largest change in EDF levels during the past ten years, Oklahoma, North Dakota, and Texas experienced significant increases (Fig.18). All states' median CCA EDF measures have fallen since June 2009, except Oklahoma (Fig.19). On the other hand, we observe EDF measure elevation in most states during the past year, led by Oklahoma, Illinois, and North Dakota (Fig.20).

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Overview

Introduction

This report uses realized default information, bank risk ratings, financial statement data, and RiskCalc Credit Cycle Adjusted (CCA) private firm EDF credit measures to provide insights into a market where data is otherwise unavailable. Data comes from the Moody's Analytics Credit Research Database (CRD). The CRD collects quarterly data from 19 U.S. lending organizations, including large institutions as well as smaller regional banks. The breadth and depth of the CRD make the data highly representative of the U.S. credit market. The CRD actively works with each institution to ensure a complete and thorough understanding of loan accounting and financial statement data. The CRD captures defaults in a consistent and accurate manner using information from each institution's loan accounting data.

TABLE 1

CRD Data Characteristics[1]

	COUNTS
Statements	1,912,117
Loan Accounting System Defaults	203,715
Statements with CCA EDF in June 2016	38,946
Defaults with Statements	59,032

TABLE 2

Distribution of Defaults by Type

	PERCENTAGE OF TOTAL DEFAULTS
90 Days Past Due (Non-Pass)	8%
Loss Provision	44%
Non-Accrual	25%
Charge-Off	13%
Loss	8%
Trouble Debt Restructuring	1 %
Bankruptcy	0.2%
Unknown	1%

Definition of Default

We define "default" in accordance with our interpretation of the Basel II directive. Our methodology detects default and near-default events over time for all banks. Borrowers are flagged as defaulters if they are 90 days past due with a non-pass rating, are in non-accrual status, have an internal bank rating corresponding to the regulatory ratings "Doubtful" or "Loss," or have an obligation partially or entirely charged-off. "Substandard" ratings are also flagged, but we consider these indicative of near-defaults and exclude them from our definition of default.

After detecting all defaults, we aggregate the data into a single default event for each defaulted borrower. For the date of default, we use the date of the borrower's earliest default event; for the severity of default, we use the borrower's most severe default type. Table 2 shows the distribution of defaults in the CRD by default type.

Lending Performance Measures

Lending performance measures utilize loan accounting data provided by participating U.S. institutions. This data provides quarterly snapshots of loan level information, such as internal bank ratings, coupon rates, balances, and commitments for each institution's middle market commercial portfolio. We use this data to detect default events, to map internal bank ratings to a standard regulatory rating, and to track balance and commitment information over time. The CRD began collecting this data in 1999.

Private Firm Default Rates

We present the default rate in two forms. Figure 1 provides a rolling 12-month default rate for U.S. private firms by default type. As noted above, a borrower is considered to be in default if they are 90 days past due with a non-pass rating, in non-accrual status, rated Doubtful or Loss, or partially or entirely charged-off. This default rate does not include borrowers rated as Substandard. Figure 2 presents the rolling 12-month default rate including borrowers rated as Substandard. While Figure 1 shows the actual default occurrences over time, Figure 2 illustrates how banks perceive potential, future default risk. We calculate the default rate using all loan accounting records, regardless of whether or not there is a corresponding financial statement.

Charts also include a projection value. We include this value because a significant reporting lag exists between default occurrence and the time when the default information is actually received. For example, as of June 2016, we observe borrowers that are 90

[1] CRD Data characteristics exclude companies in industries such as Finance, Public Administration, Management, and Education.

days past due, but have a pass rating. A certain proportion of these borrowers will become non-pass rated in the future. In such cases, we record each default as occurring on the date the borrower first became 90 days past due. An analysis using eight years of data shows that, on any given quarter end date, banks report approximately 88% of defaults occurring one year prior, 87% of those occurring nine months prior, 63% of those occurring six months prior, and only 50% of those occurring three months prior. The projection provides an estimate of what the actual default rate likely will be once we receive all the default information.

As of June 2016, private firm default rates have declined steadily over the past five years. At 1.5%, the rolling 12-month default rate is down 73% from its September 2009 peak of 5.3% (Fig.1). The trend has been driven primarily by a decline in the charge-off rate, now at 0.4%, its lowest level in the last ten years. In addition, the proportion of borrowers in non-accrual status has decreased by 53% since September 2009. The number of borrowers rated "Substandard" has seen a steady increase since the first quarter of 2015 and remains slightly above pre-crisis levels, reflecting banks' cautious lending practices (Fig.2).

Figure 1 Rolling 12-Month Private Firm Default Rate by Default Type

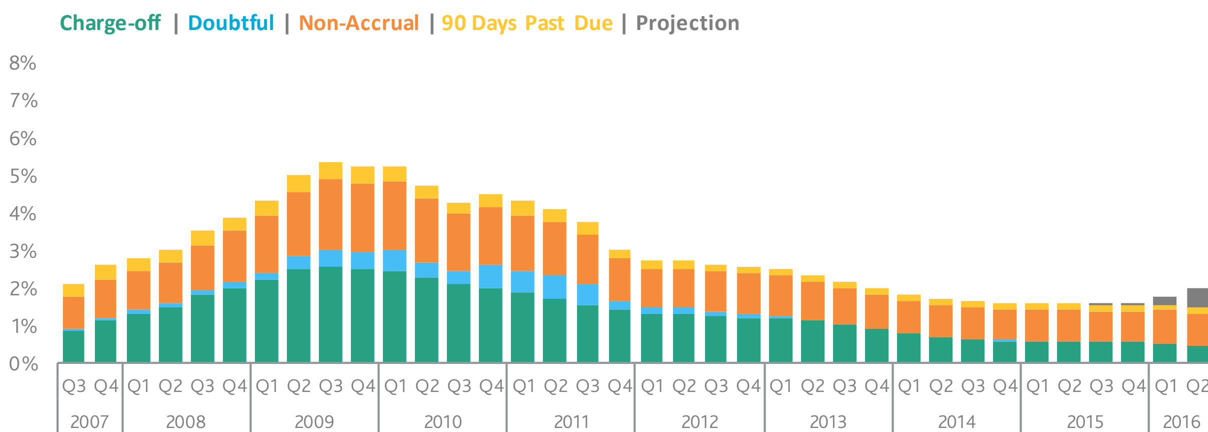
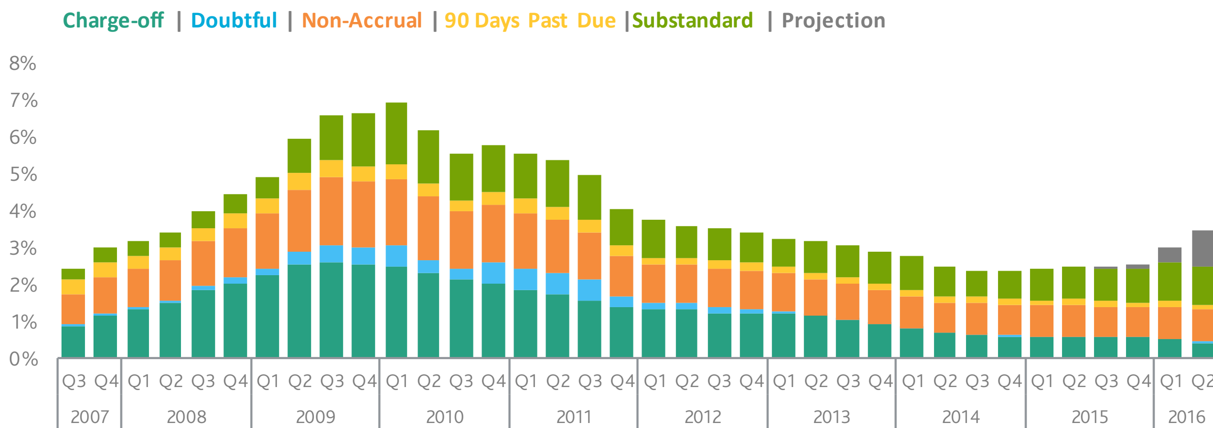
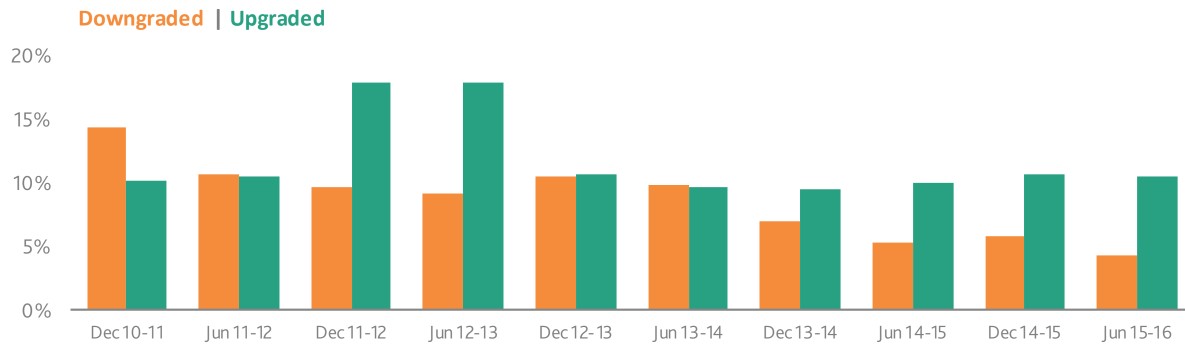


Figure 2 Rolling 12-Month Private Firm Default Rate by Default Type, Including Near-Defaults[2]



[2] We calculate the rolling 12-month default rate as the total number of defaulted and near-defaulted (i.e., Substandard) borrowers during the past four quarters, divided by the average number of borrowers across the same four quarters.

Figure 3 Migration from Substandard to Other Classifications



Adversely Rated Credits

This analysis examines the actual and perceived future risk of the portfolios contained in the Credit Research Database. Figure 3 shows the rates at which borrowers classified as Substandard migrated to more or less severe classifications during the past five years. Figure 4 presents adversely rated credits as a percentage of all loan balances over time. Table 3 shows adversely rated credits as a percentage of total loan balances by year and industry. Figure 5 presents adversely rated credits as a percentage of loan balances as of June 2016 by regulatory rating and industry. Because many banks cease tracking loan information once a loss occurs, loss percentages are most likely higher than presented.

The number of Substandard borrowers upgraded has been comparable or greater than that of those downgraded for the past four years (Fig.3). Additionally, the percentage of balances rated Substandard has come down from the 10% high mark posted in December 2009, now at 3% (Fig.4).

The percentage of balances adversely rated continues to decrease from the 24% high mark posted in June 2010, now at 8% (Fig.4). *Mining, Oil & Gas* bears the greatest percentage of adversely rated balances as of June 2016 (Fig. 5), increasing to 62% from 27% in one year (Table 3). The stark increase may be attributed to the commodity price slump since late 2014. *Construction* continues to carry a high percentage of adversely rated balances (Fig. 5), but has seen a 0.3% improvement since June 2015 (Table 3). Adverse ratings are much less prevalent in *Finance* and in sectors with significant government interest or oversight, such as *Public Administration* (Fig.4).

Figure 4 Percentage of Balances with Adverse Bank-Assigned Regulatory Ratings, as of the end of Q2

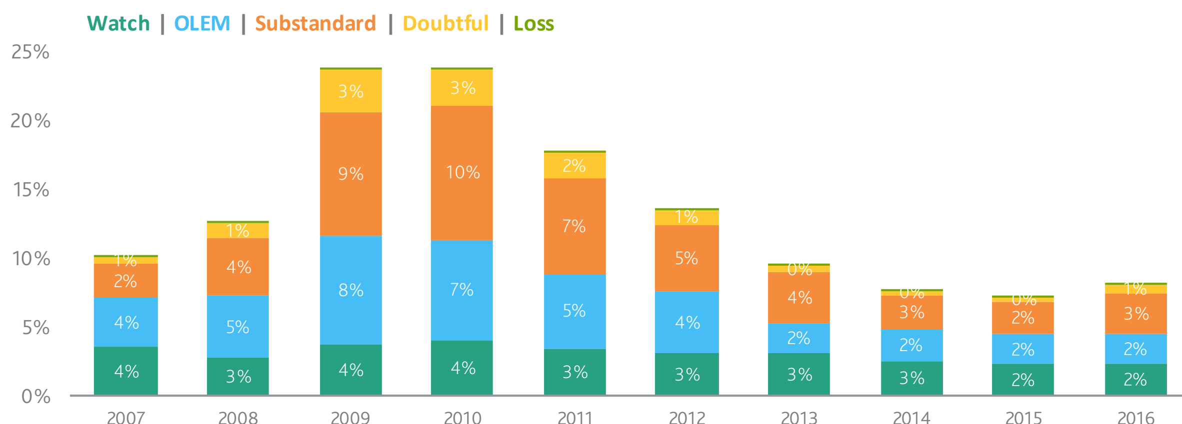
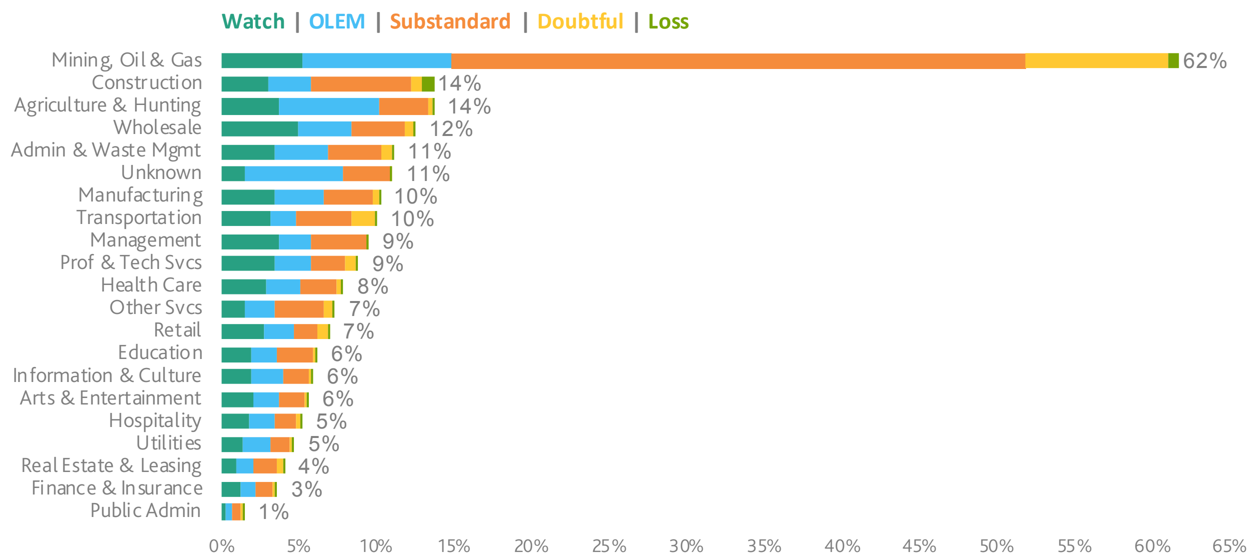


TABLE 3

Percentage of Balances with Adverse Bank-Assigned Regulatory Ratings, by Industry and Year

	2012	2013	2014	2015	2016
Arts & Entertainment	14.2%	10.0%	7.5%	6.9%	5.5%
Admin & Waste Mgmt	15.6%	11.5%	13.4%	11.3%	11.0%
Agriculture & Hunting	15.5%	18.4%	14.9%	9.7%	13.6%
Construction	34.5%	25.4%	18.5%	14.1%	13.7%
Education	6.9%	6.6%	6.0%	7.0%	6.1%
Finance & Insurance	8.6%	4.4%	3.4%	3.0%	3.5%
Health Care	8.7%	7.0%	7.6%	5.8%	7.8%
Hospitality	16.7%	10.2%	7.7%	6.4%	5.1%
Information & Culture	11.9%	7.6%	6.1%	4.6%	5.8%
Management	13.4%	11.9%	9.8%	6.8%	9.5%
Manufacturing	16.4%	11.4%	10.3%	8.9%	10.3%
Mining, Oil & Gas	14.1%	7.7%	8.4%	27.0%	61.8%
Other Svcs	17.3%	11.8%	9.4%	8.5%	7.3%
Prof & Tech Svcs	13.9%	9.8%	10.8%	10.0%	8.8%
Public Admin	2.1%	2.2%	1.9%	1.7%	1.3%
Real Estate & Leasing	19.5%	11.7%	7.1%	4.7%	4.0%
Retail	16.1%	10.1%	8.5%	7.1%	6.9%
Transportation	11.4%	9.5%	6.9%	8.2%	9.9%
Unknown	29.9%	24.0%	17.0%	15.5%	11.0%
Utilities	5.0%	5.4%	3.8%	4.3%	4.6%
Wholesale	14.7%	11.0%	10.8%	11.0%	12.4%

Figure 5 Percentage of Balances with Adverse Bank-Assigned Regulatory Ratings in Current Period, by Industry

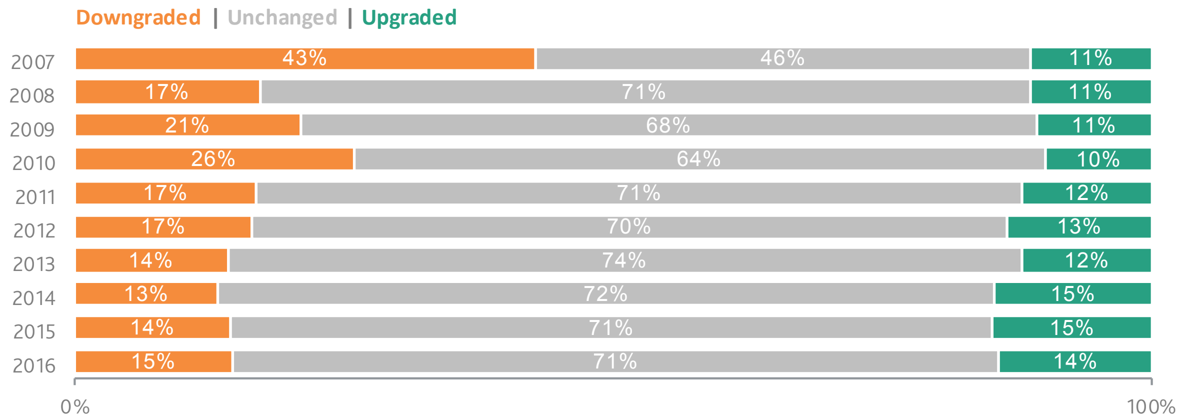


Internal Risk Rating Migration Summary

The rate at which banks change internal risk ratings reveals how they interpret changes in the credit risk of their portfolios. Figure 6 shows the migration of internal risk ratings assigned to borrowers by institutions annually since 2007. A borrower is considered "Upgraded" when an institution changes its risk rating to one that is less severe; a borrower is considered "Downgraded" when the rating increases in severity.

In 2016, 15% of borrowers were downgraded by banks, comparable to a year ago (Fig.6).

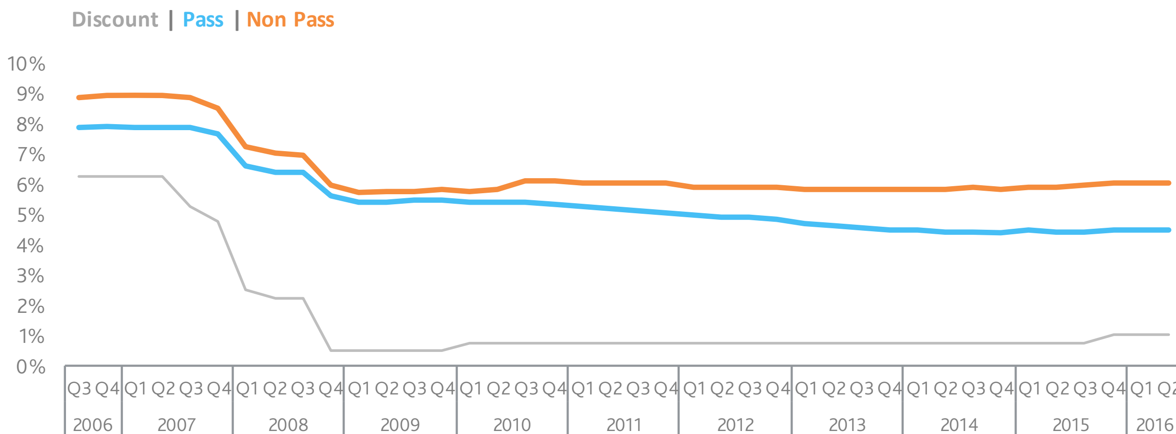
Figure 6 Yearly Migration Summary of Bank-Assigned Risk Ratings



Coupon Rates

Figure 7 presents the average coupon rate by bank-assigned regulatory rating over time. The figure also shows the primary credit discount rate offered by the Federal Reserve. Interest rates for non-pass borrowers in the middle market have seen a slow and steady increase since the first quarter of 2015. Meanwhile, the interest rate spread between the two widened marginally, from 150 basis points in June 2015 to 154 basis points in June 2016.

Figure 7 Mean Coupon Rates by Regulatory Rating Over Time



EDF Credit Measures

We generate the EDF credit measures presented throughout this report using RiskCalc 4.0 U.S. Corporate Financial Statement Only (FSO) mode and Credit Cycle Adjusted (CCA) mode. Unlike the Financial Statement Only (FSO) mode, which delivers EDF credit measures based primarily on financial and industry information, the CCA mode adjusts for the market's current credit cycle assessment. We measure this factor using the distance-to-default estimate from Moody's Analytics Public Firm Model. The CCA EDF credit measure is a forward-looking indicator of probability of default.

RiskCalc 4.0 CCA EDF Credit Measure Trends

Figures 8 and 9 present Credit Cycle Adjusted (CCA) One-Year EDF credit measures over time. Figure 9 segments by regulatory rating.

The median RiskCalc 4.0 CCA EDF value for the U.S. rose from 0.5% in June 2015 to 0.6% in June 2016. In March 2016, it reached its lowest point in ten years, at 0.7% (Fig.8). The median CCA EDF significantly increased for Non-Pass borrowers over the past year, from 1.6% in June 2015 to 2.5% in June 2016 (Fig.9).

Figure 8 CCA EDF Credit Measures Trends[3]

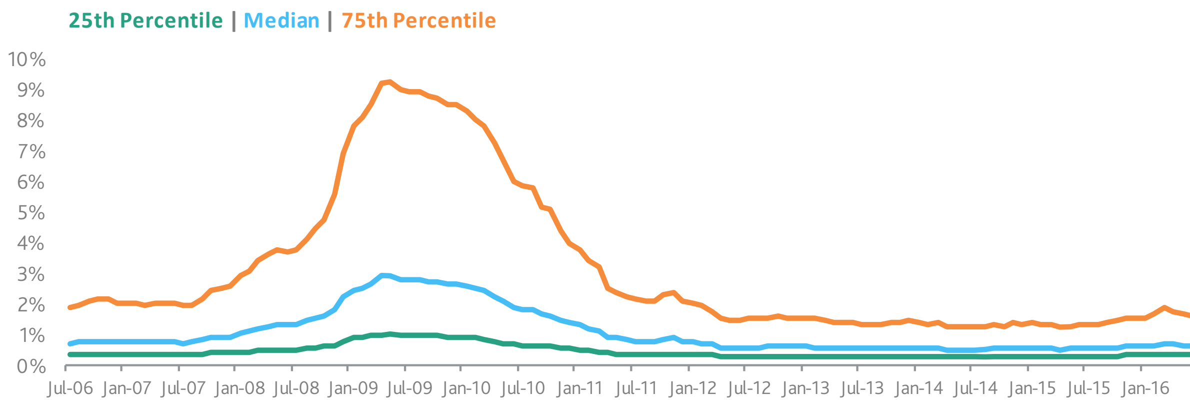
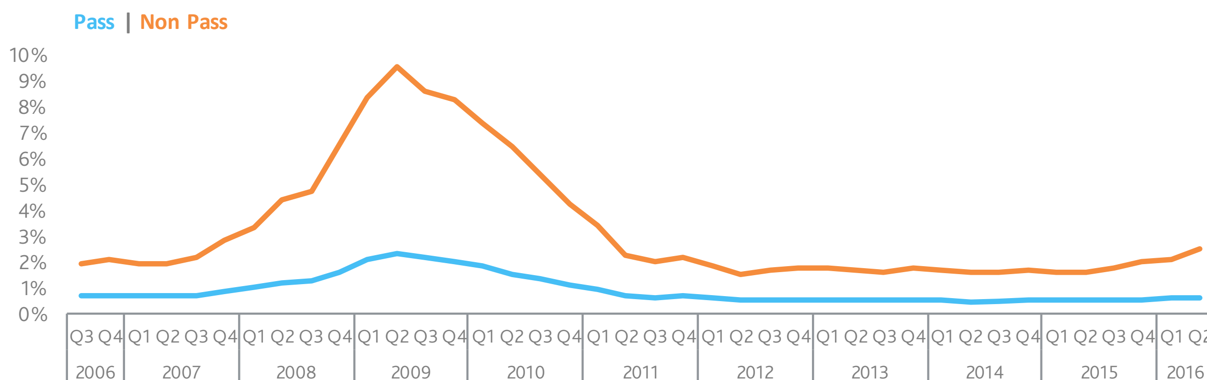


Figure 9 Median CCA EDF Credit Measures by Regulatory Rating[4]



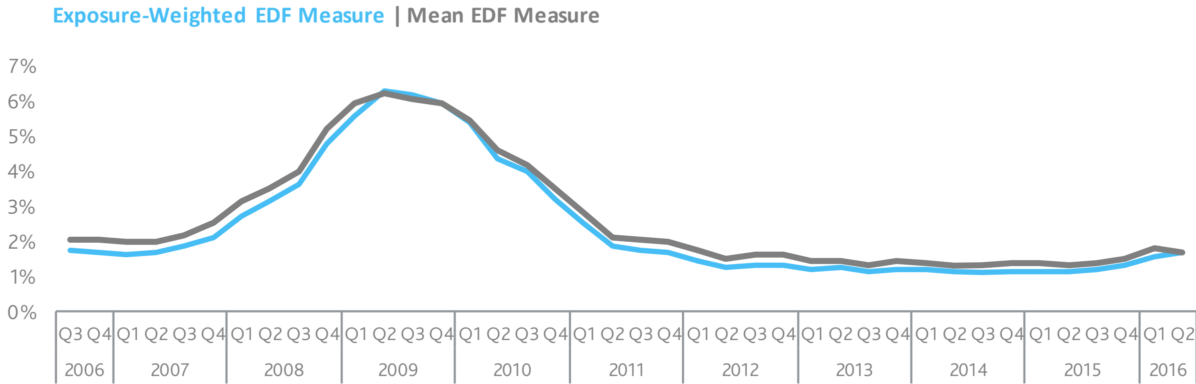
[3] This chart displays monthly CCA EDF observations. It does not include borrowers from industries for which RiskCalc is not designed, such as Vehicle Dealers, Financials, Insurance, Government Services, and Real Estate.

[4] This chart displays quarterly CCA EDF observations due to the reporting frequency of bank loan accounting data.

RiskCalc 4.0 Exposure-Weighted Average CCA EDF Credit Measure

Figure 10 depicts the exposure-weighted average EDF credit measure compared with the mean EDF credit measure for those borrowers that have both an EDF credit measure and an outstanding exposure as of the quarter-end for the past ten years.

Figure 10 Exposure-Weighted Average vs. Mean CCA EDF Credit Measure

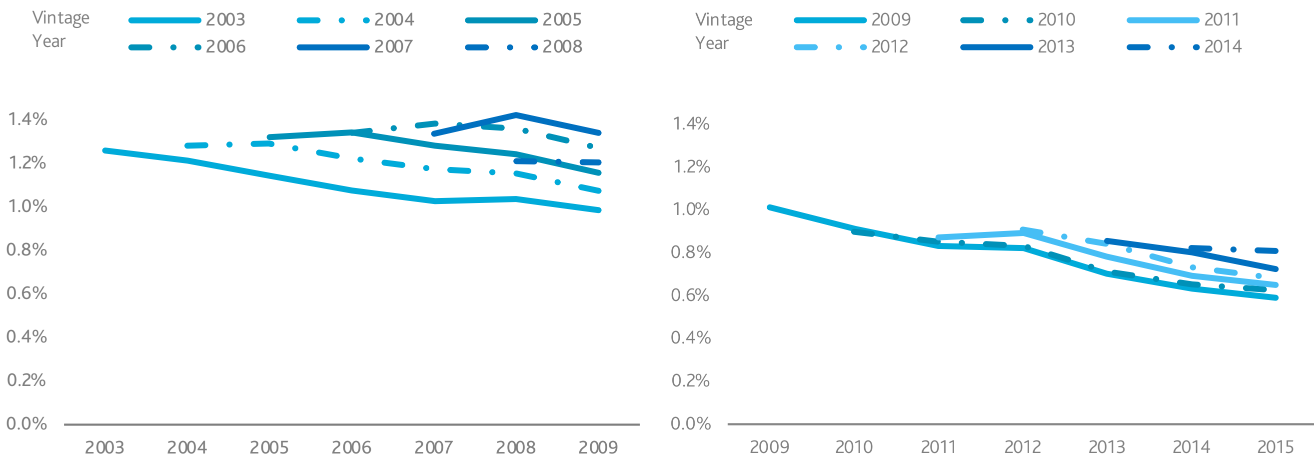


RiskCalc 4.0 FSO EDF Credit Measure Loan Vintage Analysis

Figure 11 and Figure 12 present risk level, measured by median Financial Statement Only (FSO) One-Year EDF of loans by year of origination. Figure 13 presents RiskCalc ratio percentiles over time and does not incorporate any credit cycle adjustment.

From 2003–2006, the period between the dot-com bubble in early 2000 and the financial crisis in 2009, we observe an increase in the level of risk tolerance for new loans (Fig.11). Similar to the trend displayed following the dot-com bubble, loans originated from 2009–2011 show a decreasing level of risk. The median FSO EDF credit measures of different vintage loans all fell in 2015. The convergence indicates the improving credit risk profile of middle market portfolios and tighter lending standards (Fig.12).

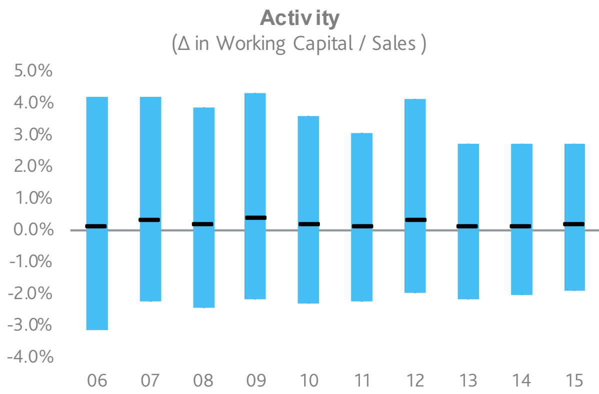
Figure 11 Median FSO EDF by Origination Year: 2002–2007 Figure 12 Median FSO EDF by Origination Year: 2008–2013

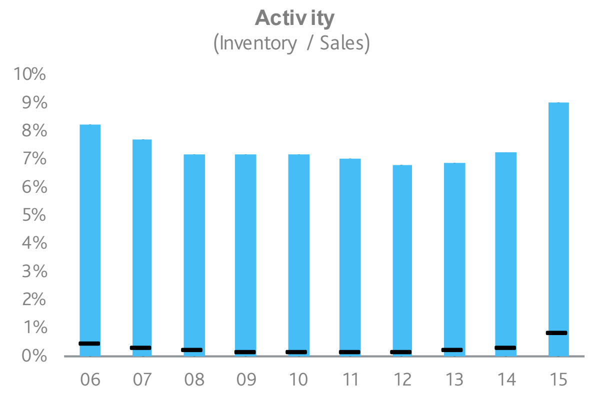


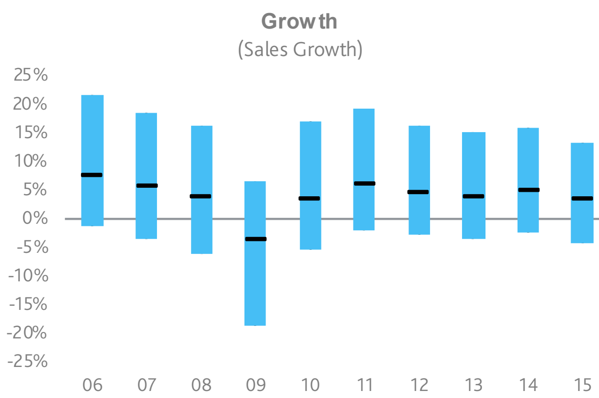
RiskCalc 4.0 Ratio Trends

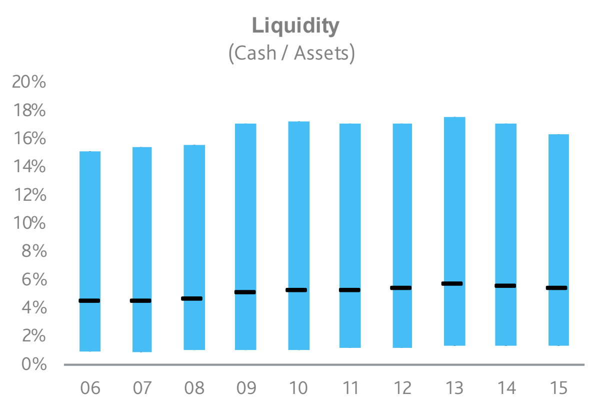
The median of borrowers' financial ratios generally improved in 2015. *Debt Coverage* is at its highest level in more than ten years. It has increased 11% from its 2014 level. *Leverage*, measured by retained earnings over current liabilities, has continued to improve over the past decade. *Sales Growth* and *Change in ROA*, despite slowing in 2015, have both remained positive after the crisis, indicating steady growth for borrowers. Borrower *Size* continued rising in 2015, indicating that banks increasingly prefer to lend to larger borrowers. We also observe decreasing *Liquidity*, measured by cash over assets, and rising *Inventory to Sales* and *Current Liabilities to Sales* ratios, signaling potential deterioration (Fig.13).

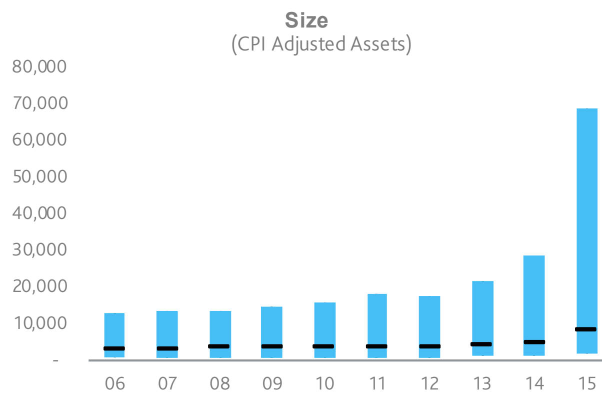
Figure 13 Financial Statement Ratios Used in RiskCalc 4.0 (25th, 50th, and 75th Percentiles)


Activity
(Δ in Working Capital / Sales)
5.0%
4.0%
3.0%
2.0%
1.0%
0.0%
-1.0%
-2.0%
-3.0%
-4.0%
06
07
08
09
10
11
12
13
14
15


Activity
(Inventory / Sales)
10%
9%
8%
7%
6%
5%
4%
3%
2%
1%
0%
06
07
08
09
10
11
12
13
14
15


Growth
(Sales Growth)
25%
20%
15%
10%
5%
0%
-5%
-10%
-15%
-20%
-25%
06
07
08
09
10
11
12
13
14
15


Liquidity
(Cash / Assets)
20%
18%
16%
14%
12%
10%
8%
6%
4%
2%
0%
06
07
08
09
10
11
12
13
14
15


Size
(CPI Adjusted Assets)
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
-
06
07
08
09
10
11
12
13
14
15

Industry Analysis

Table 4 presents median CCA EDF credit measures by NAICS industry, as of June, for each of the past 10 years. Figures 14 through 16 show CCA EDF credit measures by sector as of June 2015: Figure 14 presents median EDF values, Figure 15 shows percentage changes in median EDF over the past year, and Figure 16 presents the percentage of borrowers in each industry with an EDF above the 90th percentile for the entire population.

The industries with the greatest risk in June 2016, as measured by RiskCalc CCA EDF credit measures, were *Mining, Oil & Gas* and *Information & Culture* (Fig.14). All industries experienced an elevation in EDF levels during the past year. *Mining, Oil & Gas* showed the largest EDF level increase, climbing 212% since June 2015 (Fig.15).

Mining, Oil & Gas also showed the largest concentration of highly risky borrowers: 33% of firms in this sector had CCA EDF values higher than 90% of the overall population (Fig.16). *Information & Culture* and *Agriculture & Hunting* were the second and third riskiest sectors by this measure, both at around 14%. *Utilities*, at 3%, had the lowest proportion of highly risky borrowers.

TABLE 4

Median CCA EDF Values by NAICS Sector[5]

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Arts & Entertainment	0.74%	1.56%	3.33%	2.17%	1.00%	0.58%	0.60%	0.55%	0.53%	0.61%
Admin & Waste Mgmt	0.73%	1.17%	2.38%	1.65%	0.80%	0.59%	0.64%	0.60%	0.61%	0.70%
Agriculture & Hunting	0.77%	0.85%	2.59%	2.71%	1.14%	0.55%	0.62%	0.59%	0.56%	0.72%
Construction	1.33%	2.23%	3.83%	2.97%	1.46%	1.01%	0.84%	0.81%	0.72%	0.73%
Health Care	0.43%	0.65%	1.46%	0.98%	0.49%	0.42%	0.39%	0.36%	0.35%	0.41%
Hospitality	0.65%	1.52%	3.33%	1.93%	0.86%	0.51%	0.46%	0.48%	0.47%	0.54%
Information & Culture	0.87%	1.69%	3.90%	2.80%	1.01%	0.87%	0.88%	0.70%	0.79%	1.16%
Manufacturing	0.84%	1.50%	3.48%	2.44%	0.93%	0.65%	0.62%	0.53%	0.57%	0.71%
Mining, Oil & Gas	0.46%	0.63%	1.37%	1.41%	0.59%	0.42%	0.59%	0.49%	0.63%	1.95%
Other Svcs	0.45%	0.84%	2.09%	1.38%	0.60%	0.43%	0.42%	0.40%	0.39%	0.47%
Prof & Tech Svcs	0.68%	1.09%	2.18%	1.56%	0.75%	0.58%	0.57%	0.56%	0.56%	0.58%
Public Admin	1.17%	2.08%	4.79%	3.11%	1.37%	0.93%	0.90%	0.78%	0.81%	1.08%
Real Estate & Leasing	0.91%	1.95%	3.72%	2.23%	0.96%	0.62%	0.64%	0.58%	0.59%	0.69%
Retail	0.66%	1.36%	2.50%	2.17%	0.90%	0.57%	0.55%	0.51%	0.54%	0.69%
Transportation	0.71%	1.22%	3.02%	1.92%	0.98%	0.60%	0.62%	0.53%	0.56%	0.65%
Utilities	0.26%	0.37%	0.80%	0.61%	0.33%	0.23%	0.25%	0.27%	0.31%	0.36%
Wholesale	0.67%	1.41%	2.50%	1.67%	0.74%	0.55%	0.57%	0.51%	0.55%	0.69%

[5] This chart presents median EDF credit measures as of June of each year.

Figure 14 One-Year CCA EDF Measures by NAICS Sector

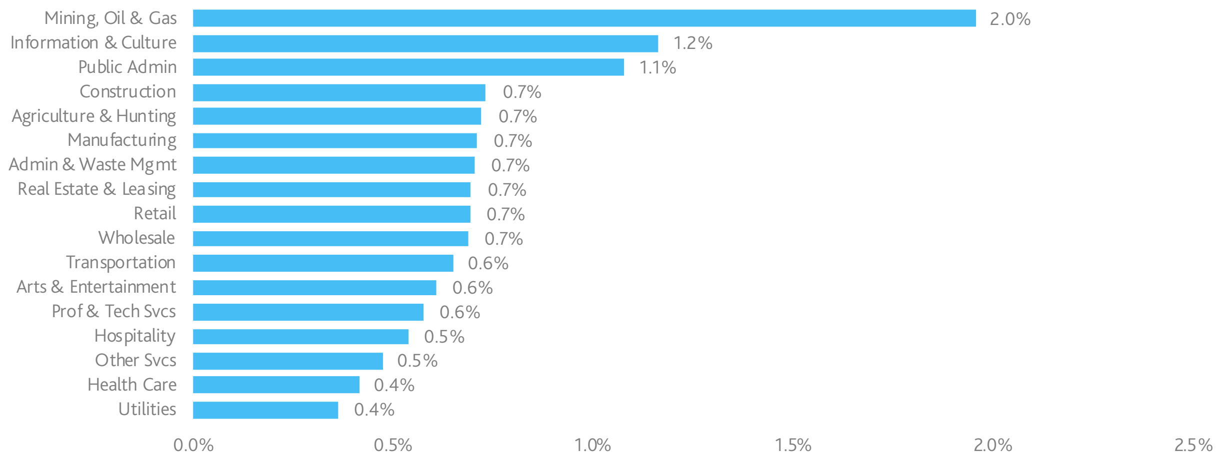


Figure 15 Percentage Change in CCA EDF Credit Measures During Past Year

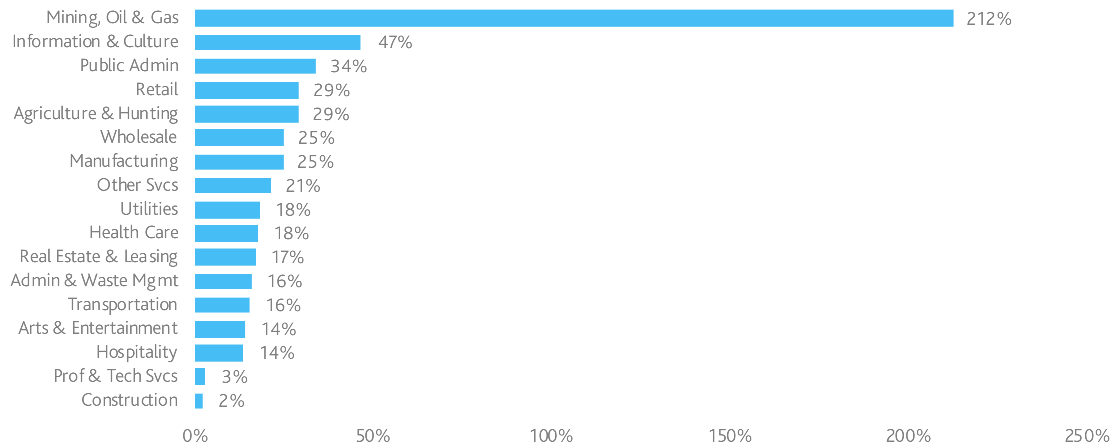
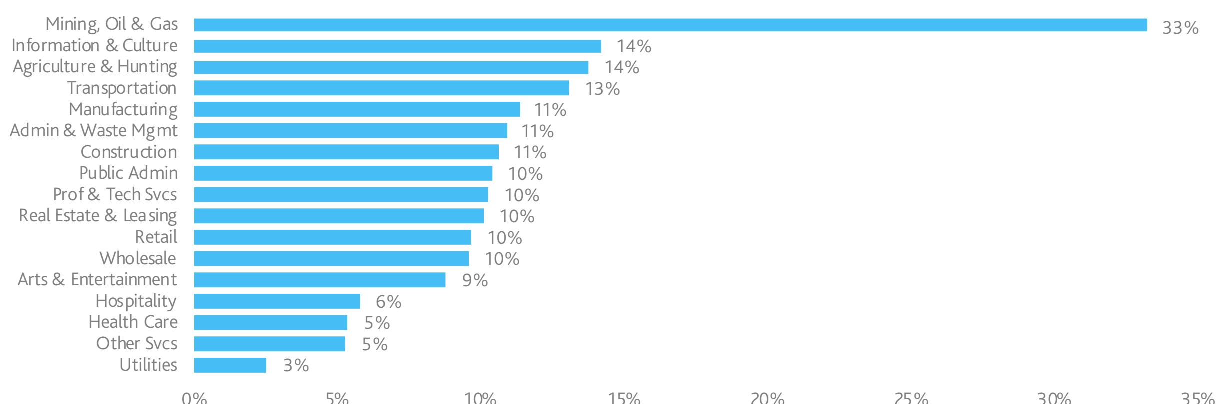


Figure 16 Percentage of Firms with CCA EDF Values Greater than 90th Percentile



Credit Migration

In this section, we report CCA EDF credit measure migrations during three different periods. To construct each migration matrix, we group firms into rating categories using their CCA EDF credit measures. Migrations below show annual transition rates averaged over the periods since 2005, 2010, and 2014, respectively.

TABLE 5

CCA EDF-Implied Rating Migration: Average One-Year Rating Migration Rates (%)

(2006-2016) TO													MIGRATION SUMMARY	
FROM	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa-C	%UP	%DOWN
A1	39.4	31.0	10.2	5.4	5.8	3.2	1.5	1.1	1.7	0.2	0.1	0.0	0.2		60.6
A2	13.6	33.2	20.1	10.8	10.8	4.9	2.9	1.4	0.9	0.6	0.4	0.2	0.3	13.6	53.2
A3	3.4	20.9	23.0	16.4	18.2	8.0	4.2	2.1	1.4	1.2	0.5	0.3	0.5	24.3	52.7
Baa1	1.1	10.8	17.9	18.2	26.1	11.6	5.8	3.0	2.0	1.4	0.8	0.6	0.7	29.8	52.0
Baa2	0.3	3.8	9.5	13.7	31.1	19.6	9.5	4.5	2.9	2.1	1.1	0.8	1.2	27.3	41.6
Baa3	0.1	1.0	3.2	6.5	23.7	27.3	17.3	8.1	4.6	3.1	1.8	1.3	2.0	34.4	38.3
Ba1	0.0	0.3	1.2	2.6	12.9	22.9	24.3	14.3	8.3	5.1	2.8	2.1	3.2	39.9	35.8
Ba2	0.0	0.1	0.5	1.2	6.5	15.0	22.7	19.8	13.5	8.6	4.2	2.9	4.9	46.1	34.1
Ba3	0.0	0.1	0.3	0.7	3.7	9.1	16.7	19.5	18.0	13.7	6.7	4.5	7.1	50.0	32.0
B1	0.0	0.0	0.1	0.4	2.2	5.6	11.5	15.5	18.3	18.2	10.3	7.4	10.4	53.7	28.1
B2	0.0	0.0	0.1	0.3	1.6	3.6	7.5	11.4	15.1	18.6	13.8	11.2	16.7	58.3	27.9
B3	0.0	0.0	0.1	0.2	1.0	2.7	5.5	8.8	12.0	16.3	14.5	14.1	24.8	61.1	24.8
Caa-C	0.0	0.0	0.0	0.1	0.6	1.5	2.9	4.8	7.0	11.0	11.3	14.0	46.8	53.2	

TABLE 6

CCA EDF-Implied Rating Migration: Average One-Year Rating Migration Rates (%)

(2011-2016) TO													MIGRATION SUMMARY	
FROM	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa-C	%UP	%DOWN
A1	46.0	31.4	9.2	4.5	4.2	2.4	1.3	0.5	0.2	0.2	0.1	0.0	0.0		54.0
A2	13.6	39.2	20.4	9.6	8.6	3.6	2.3	1.1	0.6	0.4	0.2	0.1	0.1	13.6	47.2
A3	3.2	23.3	26.9	17.3	15.8	6.1	3.2	1.6	1.1	0.7	0.4	0.2	0.2	26.5	46.5
Baa1	1.0	10.5	20.7	21.7	26.2	9.6	4.4	2.4	1.4	1.0	0.5	0.3	0.3	32.1	46.2
Baa2	0.3	3.7	9.8	15.4	36.1	18.7	7.3	3.3	2.1	1.6	0.7	0.5	0.5	29.3	34.6
Baa3	0.1	1.0	3.0	6.2	26.6	32.1	16.3	6.3	3.3	2.2	1.3	0.8	0.9	36.8	31.1
Ba1	0.0	0.4	1.3	2.6	12.5	26.4	28.3	13.6	6.4	3.6	2.0	1.4	1.7	43.1	28.6
Ba2	0.0	0.2	0.5	1.3	6.4	15.2	26.7	23.3	12.6	6.4	3.0	1.9	2.4	50.4	26.3
Ba3	0.0	0.1	0.3	0.8	3.7	9.0	17.6	23.2	20.9	12.7	4.9	3.0	3.7	54.8	24.3
B1	0.0	0.1	0.2	0.4	2.4	5.6	11.9	17.1	21.9	20.5	9.0	5.3	5.6	59.6	19.9
B2	0.0	0.0	0.1	0.4	2.0	3.8	7.8	11.9	16.6	21.6	15.3	10.3	10.1	64.3	20.4
B3	0.0	0.0	0.1	0.2	1.1	3.2	6.2	9.4	12.5	17.8	16.8	15.3	17.3	67.4	17.3
Caa-C	0.0	0.0	0.1	0.2	0.8	1.9	3.5	5.8	8.1	12.4	12.8	15.9	38.6	61.4	

TABLE 7

CCA EDF-Implied Rating Migration: Average One-Year Rating Migration Rates (%)

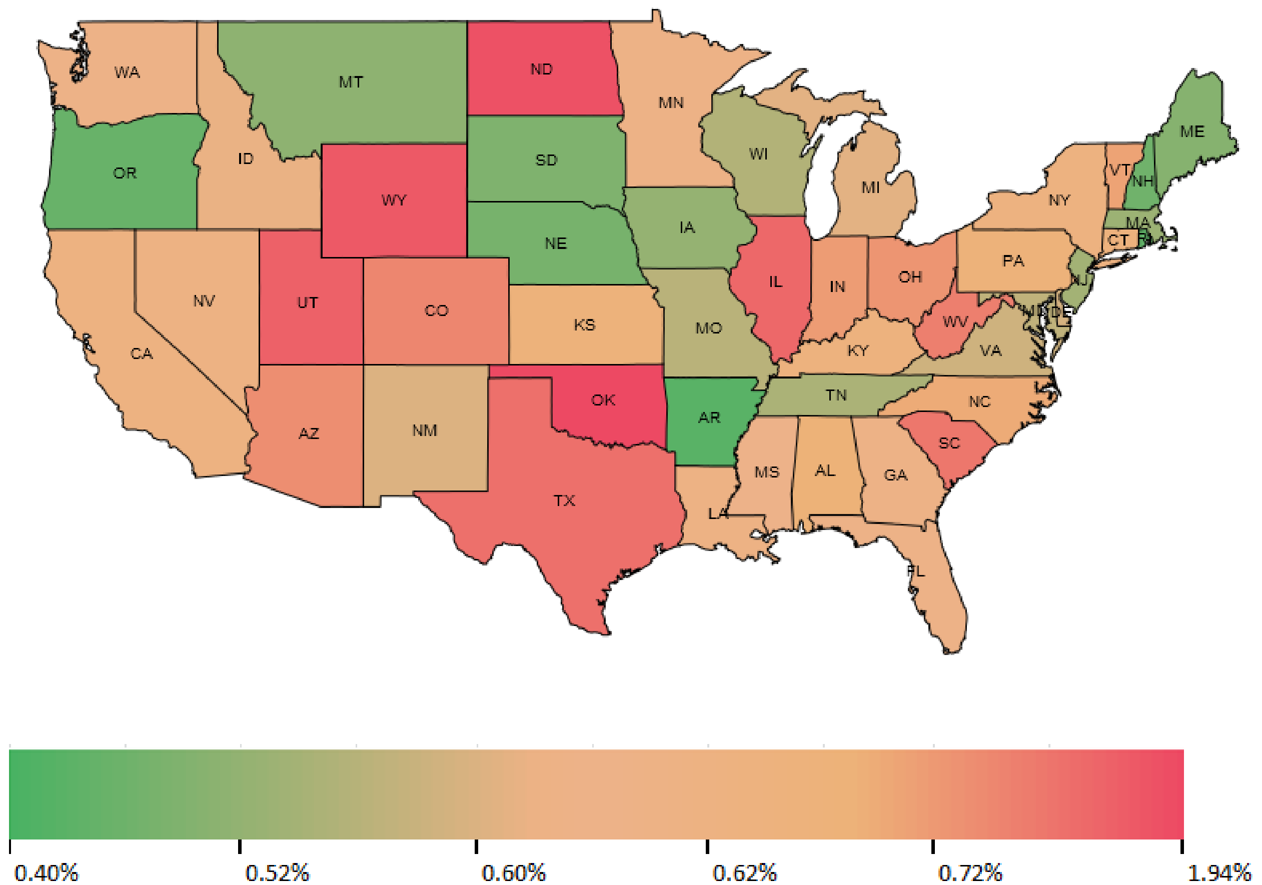
(2015-2016) TO													MIGRATION SUMMARY	
FROM	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa-C	%UP	%DOWN
A1	26.2	40.8	13.5	7.6	5.3	3.2	1.7	1.0	0.1	0.3	0.2	0.0	0.0		73.8
A2	3.2	31.9	28.9	14.4	11.5	4.0	2.9	1.0	1.1	0.4	0.1	0.1	0.2	3.2	64.9
A3	0.6	8.3	25.6	23.6	23.0	9.0	4.3	2.1	1.6	1.0	0.4	0.2	0.4	8.9	65.4
Baa1	0.1	3.0	11.7	20.9	36.8	14.7	5.6	2.8	1.6	1.2	0.7	0.5	0.5	14.8	64.2
Baa2	0.1	1.3	4.3	8.1	36.6	27.0	10.4	4.7	2.5	2.4	0.9	0.8	1.0	13.7	49.6
Baa3	0.0	0.2	1.1	2.7	15.9	33.3	25.3	9.9	4.2	2.8	1.9	1.2	1.5	20.0	46.7
Ba1	0.0	0.1	0.5	1.2	6.1	16.7	31.4	20.6	9.9	5.3	3.0	2.1	3.0	24.6	44.0
Ba2	0.0	0.0	0.3	0.6	3.8	7.7	19.4	25.8	21.0	10.5	4.6	2.4	3.9	31.8	42.4
Ba3	0.0	0.0	0.1	0.4	2.4	5.2	10.2	17.4	23.8	20.9	8.6	4.6	6.3	35.7	40.5
B1	0.0	0.0	0.1	0.2	1.8	3.2	7.9	10.6	18.5	25.2	15.0	8.8	8.9	42.2	32.6
B2	0.0	0.0	0.1	0.2	1.3	2.8	5.1	8.9	11.3	15.5	18.6	18.5	17.7	45.3	36.1
B3	0.0	0.0	0.0	0.0	0.0	2.3	4.8	7.7	8.3	12.9	14.6	19.6	29.9	50.6	29.9
Caa-C	0.0	0.0	0.0	0.2	0.7	1.0	1.4	4.5	6.1	9.5	10.0	12.8	53.8	46.2	

Regional Analysis[6]

The map below (Fig.17) reports EDF credit measures by state. To estimate each state's median credit risk score, we use the median one-year CCA EDF score assigned by the RiskCalc U.S. 4.0 Model as of June 2016. The spectrum legend below the U.S. heat map contains the range of observed median EDF values in June 2016. The states with the lowest median EDF were the District of Columbia and Alaska, both at 0.4%, while Oklahoma had the highest median EDF, 1.9%.

Figures 18 through 20 present the 10 largest changes in median EDF credit measures by state since June 2006, June 2009, and June 2015, respectively. Oklahoma and North Dakota saw the largest hike in median CCA EDF values compared to ten years ago. Both state economies took a hit from the recent oil price drop. Michigan and Arkansas showed the largest improvement, with a 48% and a 37% decline, respectively (Fig.18). All states' median CCA EDF measures have fallen since June 2009, except Oklahoma. Michigan led all states during this period with an improvement of 87% (Fig.19). On the other hand, we observe EDF measure elevation in most states in the past year, led by Oklahoma (217%), Illinois (61%), and North Dakota (60%) (Fig.20).

Figure 17 One-Year CCA Median EDF Values by State as of June 2016



[6] The data used in constructing this map contains a relatively small number of observations from Wyoming and Vermont. For each state, median EDF values may reflect different data population characteristics including lenders (CRD Participants) and distributions of borrowers across industries, asset sizes, and other characteristics that may materially impact EDF values for that state. EDF calculations using RiskCalc 4.0 do incorporate some state-level macroeconomic factors, such as unemployment.

Figure 18 Top-Ten Largest Changes in One-Year CCA Median EDF since June 2006

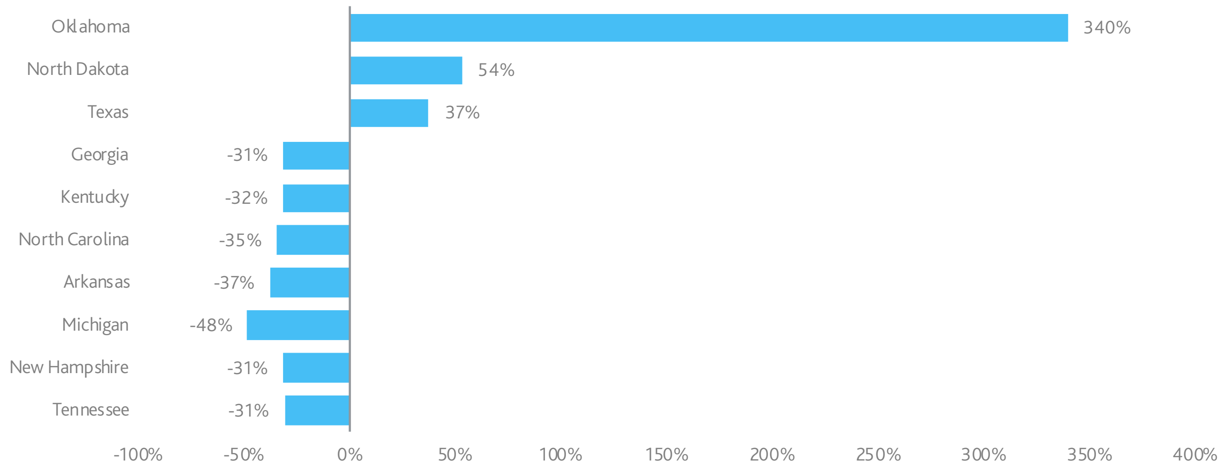


Figure 19 Top-Ten Largest Changes in One-Year CCA Median EDF Since June 2009

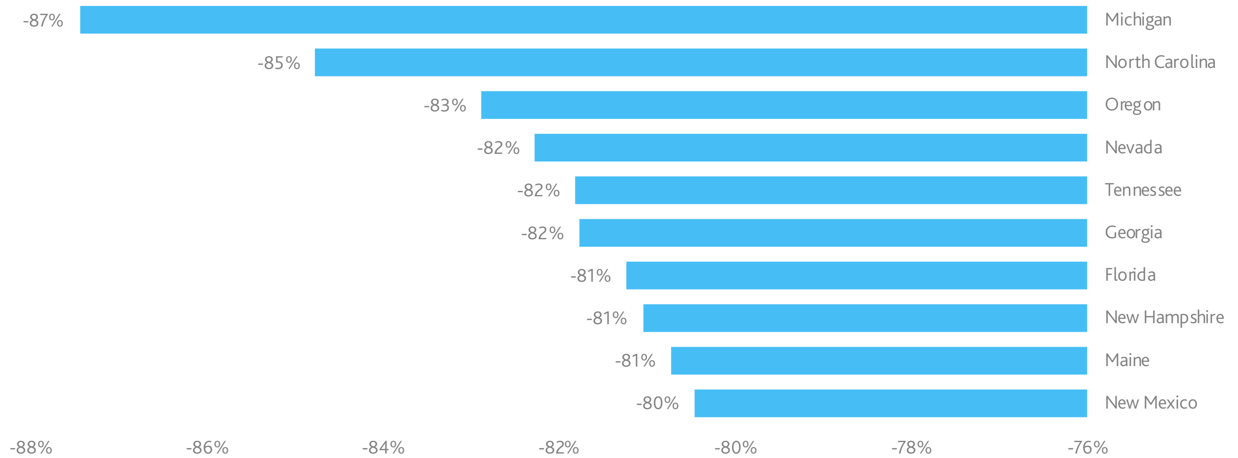
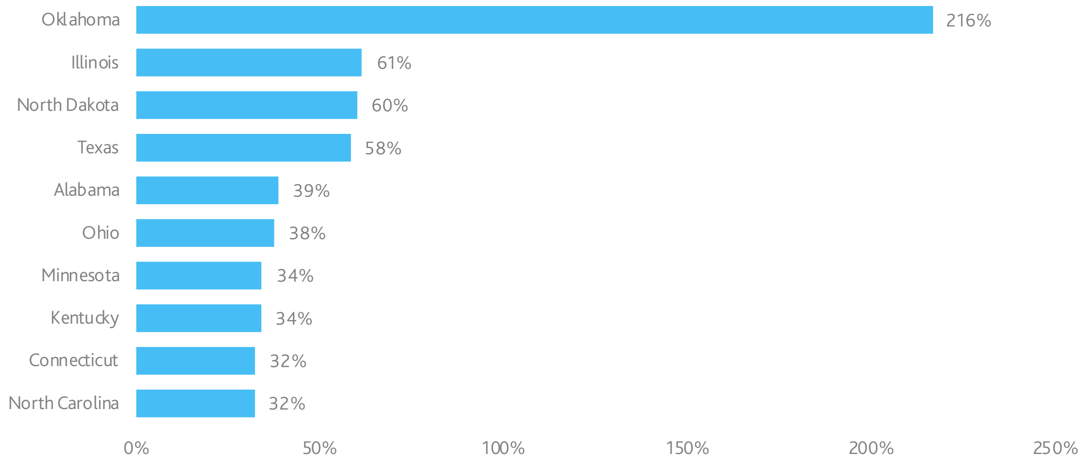


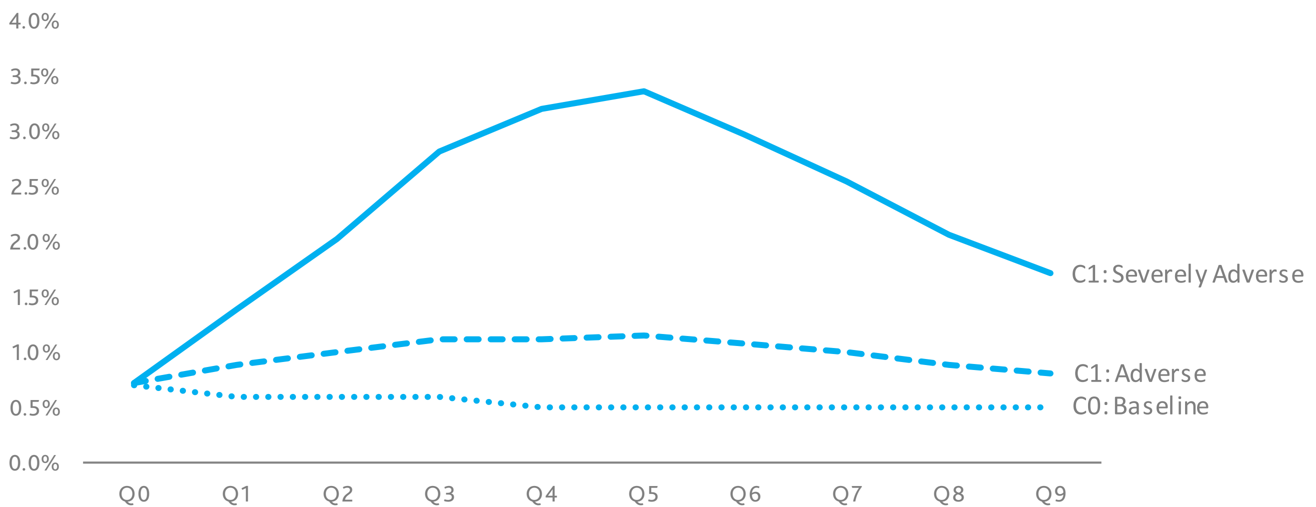
Figure 20 Top-Ten Largest Changes in One-Year CCA Median EDF Since June 2015



Stressed EDF Analysis[7]

Figure 21 presents the stressed EDF forecast based on the Federal Reserve's CCAR Scenarios. It is based on scores from the most recent statement for each company in CRD, no older than four years old. We calculate the annualized, nine-quarter EDF measure forecasts using a forecast date, Q1, of March 2016 on the February 2016 Federal Reserve's CCAR Scenarios.

Figure 21 Median, Ratio-Based Stressed EDF



[7] The stressed EDF analysis is updated annually.

Conclusion

The credit risk of private-firm borrowers in the U.S. middle market has improved since peaking in 2009. The market has shown credit soundness during the past year, as illustrated by the stable, rolling 12-month default rate and the median FSO EDF level. Changes in borrowers' financial positions during the past year have generally been positive, as seen in RiskCalc ratios (Fig.13). The actual default rate steadily decreased during the past five years (Fig.1), while the RiskCalc 4.0 One-Year CCA EDF credit measure continued to rise during the past 15 months (Fig.8), indicating potential deterioration.

Mining, Oil & Gas continued to display stress since the commodity price slump in late 2014.

Meanwhile, lenders have remained conservative. The overall number of bank-assigned risk rating downgrades outnumbered upgrades (Fig.6), although upgrades are more common than downgrades for Substandard borrowers (Fig.3).

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