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Nonperforming Loans: Asset Pricing and Determinants of Profitability

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Claremont McKenna College

Non-Performing Loans: Asset Pricing and
Determinants of Profitability

Submitted to
Professor Batta

By
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For
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I. Introduction

The decline in the quality of bank loan portfolios was a core problem within the U.S. banking system during the recent financial crises (Kauko, 2011). Mortgage delinquencies spiked, and the large amount of bad debt led to stagnation in the economy (Sanders, 2008). Non-performing loans (NPLs) have similarly been linked to other financial crises around the world, including the crisis in the Eurozone (Maki, Tsagkanos, & Bellas, 2014) and the Asian financial crisis (Yang, 2003). Researchers have investigated the negative correlation between the number of non-performing loans (NPLs) in the economy and economic conditions; finding that NPLs are generally more prevalent during times of recession (Makri, Tsagkanos & Bellas, 2014). There are a variety of studies focused on NPLs on a macroeconomic scale, as noted above. To the best of my knowledge, however, there exists very little information on privately held NPLs outside the banking industry.

The purpose of my paper is to add to the existing literature by examining whether certain NPL loan characteristics (such as, the current interest rate, delinquent taxes, current interest and principle payment, current taxes and insurance payment, days in foreclosure, reason for default, occupancy status, property condition, neighborhood condition, liquidation type, days held, UPB, Acquisition BPO and state) lead to more profitable outcomes when being purchased by non-banking firms. I am interested in assessing the accuracy of the current asset pricing model for NPLs, specifically from the buy side. In particular, I am testing whether certain NPL loan characteristics, some of which are not directly controlled for in the current NPL pricing model, play a significant role in predicting profitability. The loan characteristics used in the current asset pricing model (such as, sponsor value, UPB, current interest rate and occupancy status) are not expected to be significant in determining profit

outcomes as they have already been accounted for in determining the purchase price of the asset (See Table 5 for current asset pricing model inputs).

Using private company data, I use a standard linear regression model to examine the role of loan characteristics on NPL profitability. Intuitively, I find that properties in good and fair condition positively affect NPL profitability, relative to properties in poor or unknown condition. Surprisingly, I find that interest rates are negatively correlated with NPL profitability. This was unexpected because interest rates are a factor used to determine the purchase price in the current asset pricing model. I believe this outcome is due to interest rates being correlated with the probability of reperformance. Due to the particular strategy of the firm used in this study, NPLs which reperform are less profitable. I find a negative correlation with NPL profitability and properties located in New York. This is likely because New York is relatively more expensive than other states. I also find a very slight correlation with Delinquent Taxes and profitability. This outcome can be explained by the amount of property taxes being connected to property value, where assets with a larger amount of delinquent taxes may be more likely to have a higher property value.

The remainder of this paper is organized as follows. Section 2 presents a background of the existing literature relating to NPLs on the macroeconomic level. Section 3 presents the existing literature relating to housing prices and variation of state foreclosure and liquidation laws. The data are described in Section 4. Section 5 discusses the methodology and presents the results. The final section concludes.

II. Background

The existing research on non-performing loans (NPLs) focuses mainly on their relationship with banking practices and/or macroeconomic correlations.

Some commonly used macroeconomic indicators include, GDP and unemployment. Curak, Pepur and Poposki (2013) look at determinants of NPLs, focusing on Southeastern Europe and find that both macroeconomic conditions and banking practices influence the number of non-performing loans in an economy. For NPLs, they find a negative relationship with GDP and bank size. They also find a positive relationship with inflation, real interest rates, and the solvency ratio. Macroeconomically, this suggests that NPLs become less prevalent as GDP increases and become more prevalent as inflation and interest rates increase. This also suggests that an individual bank will hold fewer NPLs in their portfolio as they grow larger and will hold a greater number of NPLs as their solvency ratio increases. Klein (2013), with the IMF, finds similar results when looking at Central, Eastern and Southeastern Europe (CESEE). He discovers a feedback loop between NPLs and economic conditions, where the number of NPLs in an economy will affect the state of the economy while economic conditions will also affect the amount of NPLs. In general, research relating to macroeconomic conditions finds that NPLs have a negative relationship with preferable economic conditions, where the number of NPLs will increase during times of recession.

Some banking practices have also been linked to the existence of NPLs. Gosh (2015) evaluates banking practices and finds that bank profitability reduces the number of NPLs a bank will hold. He also finds that liquidity risks and poor credit quality increase NPL prevalence. This suggests that as banks take on greater risks, such as those associated with credit and liquidity, they will hold a larger number of NPLs in their portfolio. Looking at credit more specifically, Ranjan and Chandra Dhal (2003) find that variables of credit strongly affect bank-level NPAs (Non-performing assets) in India. Relating to terms of credit variables, they find that expectations of increasing interest rates will increase NPAs, while scope of credit maturity, healthier credit

culture, and better macroeconomic conditions reduce NPAs. This suggests that credit related risks will increase as credit maturity is lengthened and as credit culture diminishes. Intuitively, this also suggest that interest rates and macroeconomic conditions affect not only the number of NPLs in an economy but also the number of NPLs held by individual banks. In general, research relating to banking practices mainly finds that NPLs have a positive relationship with bank risk-taking behavior and a negative relationship with bank size and profitability.

Only one paper I found looks at NPLs using non-bank data. Mahmood Rifat (2016) focuses on the determinants of NPLs in the Non-Bank Financial Institutions (NBFI) in Bangladesh. He finds that ROA differed significantly between organizations. Similarly, the data I use also focuses on NPLs in the private non-banking sector. However, I look more specifically at NPLs sold to a private investment firm due to continued nonperformance. This firm targets NPLs with a small probability of reperformance. There exits little to no research in this area, especially given the specific strategy of this firm. I intend to add to the literature by focusing on NPLs from the buy side and looking at determinants of NPLs profitability compared to the current NPL model, while focusing mainly on Midwestern and Southern U.S. states. This differs from the current research because I look at privately held non-bank owned NPLs to evaluate the financial processes involved from acquisition to liquidation. Based on the structure and strategy of this firm I will not look at the average NPL but instead those in significant distress and with little chance of re-performance.

III. Literature Review

To my knowledge, there exists no literature on NPLs purchased by private for-profit firms relating to NPL asset pricing or profit outcomes. Because the literature in this area is scarce, I use exiting literature relating to

home valuation and state foreclosure, eviction and tax laws. Property valuation and state law variation are two important factors in which I was able to relate existing literature to NPL pricing and profitability.

As noted above, two significant NPL characteristics used in the current NPL model of the firm are the sponsor value (similar to the acquisition BPO) and the state in which the property is located. The sponsor value is an estimate of the property value provided by the seller and the acquisition BPO is an estimate of the property value provided by a broker around the time of acquisition. The sponsor value is used as a preliminary value until the firm can acquire its own value estimates from an outside appraiser. Property value plays an inherently significant role in pricing an NPL and due to the unique strategy of the firm whose data is used in my research, it is especially significant. The firm targets NPLs with little change of reperformance which typically results in foreclosure and REO sale. Thus, the underlying home value is crucial in determining the purchase price. However, the purchase price, or NPL Value, is capped by the unpaid principal balance (UPB) because the UPB value is the maximum amount collectible in the case of reperformance. The state in which the property is located also plays an especially important role as it determines many associated timelines and costs affecting the NPL purchase price value.

Many pieces come into play when valuing a residential property. Home prices are affected by both internal and external characteristics. Obviously, home values are affected by their inherent characteristics, such as property size, the number of bedrooms and bathrooms, the year it was built and quality of upkeep, and additional home amenities. Location is another a key consideration in real estate valuation. Specifically, Bitter and Krause (2017) discuss the impact of neighborhoods on home values finding that certain neighborhood "packages" have a significant impact on home values.

There are a variety of neighborhood attributes which can contribute to home value. Kane, Riegg and Staiger (2006) focus on school quality in neighborhoods, finding that home prices vary significantly by school assignment zone boundaries. Housing prices also vary significantly by state and region. For example, Quigley (2005) found that housing costs in California are relatively high compared to other states. Similarly, home values are affected by geographical conditions associated with the locational variation mentioned above. Benson (1998) focuses on the impact of ocean views on home values. They find that the best ocean views increased home value by nearly 60% while even low-quality ocean views could increase home value by about 8%. Weather is another locational and geographical contributor to property values. Harrison, Smersh & Schwartz (2001) find that homes located within specific flood zones in Florida are on average worth less than comparable homes outside the flood zones.

Other external conditions also affect home prices. Intuitively, the state of the housing market will affect home prices (Quigley, 1999). According to Davis and Nieuwerburgh (2014), housing also has a "lead-lag" relationship with the business cycle. Thus, home prices will be lower directly preceding and during times of recession. Borio and McGuire (2004) note that traditional macroeconomic determinants of housing prices include interest rates, output growth and unemployment. They also find that housing prices often trend with equity prices and note that real home prices are affected by inflation.

State laws are another important factor in determining the costs of foreclosure, eviction and liquidation. These factors are included in the current pricing model for NPLs (See table 6 for current NPL model state assumptions). The variation in these laws is therefore also significant in determining the value of an NPL. Terrence and Herzog (1990), note that these

costs can be categorized into three areas: transaction costs, property costs, and opportunity costs. They define transaction costs as costs associated with foreclose and liquidation, such as attorneys' fees, brokers' commissions and title charges. Property taxes, insurance, utilities, repairs and property maintenance are provided as examples of property costs. Foregone interest is given as an example of an opportunity cost. Terrence and Herzog (1990) also state three additional major differences in foreclosure laws between states: 1) Judicial vs nonjudicial procedure 2) the provision for a statutory right of redemption and 3) deficiency judgements. They note that states in which the lender must use a judicial procedure to foreclose are costlier to firms because the process tends to take longer. Conversely, states allowing nonjudicial foreclosure, in which the lender can foreclose without going through the court system, tend to be quicker, and thus less costly. Statutory redemption relates to a borrower's right to recover their ownership of a property which has been foreclosed (Terrence and Herzog, 1990). States which give borrowers this right can be costlier to the firm by delaying eviction and extending asset holding times. Extending holding timelines increases costs because the firm must pay certain property expenses periodically, such as utilities and maintenance. A deficiency judgment is a ruling made by a court in favor of the lender if a borrower's mortgage foreclosure sale does not produce sufficient funds to pay the loan in full (Terrence and Herzog, 1990). Because the firm caps their bid price by the UPB, deficiency judgements are less important in this case. These state-specific foreclosure laws are significant in calculating time and transaction related costs associated with a given NPL.

IV. Data

The dataset used in the analysis is from a private asset management firm, Neighborhood Stabilization Capital Management (NSCM). This dataset was

chosen because it provides loan level details for all assets purchased by the firm (for example, loan ID, occupancy status, property condition, bankruptcy status, liquidation amount, liquidation date, reason for default, current interest rate, workout option, days in foreclosure, liquidation type, property address, investor pool, entity, deal name, funding date, unpaid principle balance (UPB), acquisition broker price opinion (BPO), purchase price, and sum of total remittance). This data was retrieved from the firm's online database and remittance report. The workout option data has been excluded because it is collinear with liquidation type. The sum of total remittance was used as a reference but was excluded from the model because remittance data was captured through the IRR calculation. Assets currently under management have been excluded due to the limited information available for non-liquidated assets and to maintain a complete dataset. Besides the remittance data used in the IRR calculations, any data obtained after the time of acquisition was excluded for the purpose of evaluating the current NPL pricing model.

The final sample includes 179 assets (that is, mortgage-backed notes and REO properties) both purchased and liquidated between 2014 and 2018. The majority of the sample includes properties from Midwestern, Southeastern and Northeastern states. The sample is comprised of 48 properties located in Illinois, 36 properties in Georgia, 26 properties in New Jersey and 16 properties in Florida, 9 properties in Maryland, 7 properties in Pennsylvania, 6 properties in Ohio, 6 properties in New York, 6 properties in New England states, and 19 properties in other states. All states included in the other category contain fewer than 5 assets. As such, these remaining states are aggregated into a single category (See Table 4, Panel A for asset breakdown by state).

The internal rate of return (IRR) of each loan is used as a measure of profitability and is calculated using the total loan remittance over time. Days held is calculated as the difference between the Funding Date and the Liquidation Date. Sum of total remittance is calculated as the net remittance amount, excluding time. The liquidation amount provided is net of expenses and is used in the IRR calculation through the remittance report. Property condition and Neighborhood condition data was acquired from the servicers at the time of acquisition. Explanations for individual dummy variables are provided below. All other variables were exported directly from the database and are unadjusted (See Table 1 for variable definitions).

Each asset in the sample is categorized as belonging to one of two mutually exclusive default reasons: Default reason and other. Default reason is used when no reason is give and is aggregated with assets in which the reasons given include: Other/No Applicable Code and Unable to Contact Borrower. Other default reasons include, temporary Loss or Reduction of income, unemployment, death or illness of Primary Borrower, excessive obligations, servicing problems, and marital difficulties. I define these variables using information provided by the servicers at the time of acquisition. For each category, I assign a value of one if the asset falls within the category, and zero otherwise. Majority of borrowers did not give a reason for default. 152 of the 179 assets fall within the Default/Other category meaning this category is limited in the information is can provide. Only 27 of the 179 borrowers provided a reason for default. (See Table 4, Panel B for asset breakdown by default reason).

Assets are categorized as belonging to one of three mutually exclusive Occupancy Statuses: Vacant, Owner Occupied, and Other/Unknown. These variables are defined by who was living in the home at the time of acquisition. For each category, I assign a value of one if the asset falls

within the category, and zero otherwise. Non-owner-occupied assets are aggregated with other/unknown. 89 of the 179 assets fall under vacant, 74 of the assets fall under owner occupied and 16 of the assets fall under Other/Unknown. (See Table 4, Panel C for asset breakdown by occupancy status)

Assets are categorized as belonging to one of two mutually exclusive bankruptcy statuses: BK and None. I define these variables by if the borrower declared bankruptcy while the firm held the loan. For each category, I assign a value of one if the asset falls within the category, and zero otherwise. Majority of the assets fall within the None category in which case the borrower did not declare bankruptcy. 43 of the 179 assets went into bankruptcy. The BK status includes chapters 11, 7 and 13. (See Table 4, Panel D for asset breakdown by bankruptcy status)

Assets are categorized as belonging to one of three mutually exclusive Property Conditions: Good, Fair, and Poor/Unknown. I define these variables using information provided by the servicers at the time of acquisition. For each category, I assign a value of one if the asset falls within the category, and zero otherwise. 93 of the 179 assets were in good condition at the time of acquisition, 51 were in fair condition and 16 were either in poor condition or the condition was unknown (see Table 4, Panel E for asset breakdown by property condition). Poor and unknown were aggregated because they are the smallest categories, however, this category may provide limited information due to assets with unknown property conditions diluting the results of the assets in poor condition. Assets are similarly categorized as belonging to one of two mutually exclusive Neighborhood Conditions: Stable and Declining/Unknown. For each category, I assign a value of one if the asset falls within the category, and zero otherwise. These variables are also defined using information provided by the servicers at the time of acquisition. 139 of the 179 properties were located in stable neighborhoods

at the time of acquisition and 40 of the 179 were in either declining neighborhoods or the neighborhood condition was unknown (See Table 4, Panel F for asset breakdown by neighborhood condition). Declining and unknown were also aggregated because they are the smallest categories. Similarly, this category may also provide limited information due to assets with unknown neighborhood conditions being included with the assets in poor condition.

Each asset in the sample is categorized as belonging to one of two mutually exclusive liquidation types: REO sale and other liquidation type. I define these variables by how the asset was sold. For REO, I assign a value of one if the asset was sold as an REO, and zero otherwise. Similarly, for other liquidation type, I assign a value of one if the asset was not sold as an REO, and zero otherwise. Other liquidation types include, note sales, third party sales, short sales, foreclosure sales, not listed, and one which was put back to the seller. 81 of the 179 assets were liquidated through REO sales and 71 of the 179 assets were liquidated in another form (See Table 4, Panel G for asset breakdown by state).

Assets are categorized as belonging to one of three mutually exclusive entities: Southside NSP Trust 2016-1, Southside NSP Trust 2015-1, and Private Trust 2014-1. I define these variables by how and when the assets were funded. For each category, I assign a value of one if the asset falls within the category, and zero otherwise. 27 of the 179 assets fall under Southside NS Trust 2016-1, 79 fall under Southside NSP Trust 2015-1 and 73 fall under Private Trust 2014-1. (See Table 4, Panel H for asset breakdown by entity)

Assets were categorized as belonging to one of five mutually exclusive Workout Options: Short Sale, Repayment Plan, Short Repay Plan, Modification, None/Other. I had defined these variables by whether and how a borrower became current on their mortgage. For each category, I assigned a value of one if the asset fell within the category, and zero otherwise. Majority of

the assets fell within the none/Other category in which case an alternative work out option was used or, pertaining to majority of the assets within this category, there was no workout option and the home was foreclosed. This category was omitted because it is perfectly collinear with the liquidations types category. This is intuitive because certain workout options correlate with specific liquidation types. For example, if there was a loan modification, then the asset will be liquidated as a note sale. Similarly, if the asset had no workout option then it would be liquidated through an REO sale. Thus, this information is captured by the Liquidation Types category.

V. Determinants of NPL Profitability and Purchase Price

To formally identify the underlying causes of differences in NPL profitability, I perform a standard linear regression of the determinants of NPL pricing characteristics. Specifically, I estimate a model of NPL profitability of the following form:

$$(1) \quad Y_i = X_{i1}\beta_1 + \varepsilon_i$$

where Y_i is the internal rate of return (IRR) which captures NPL profitability and i represents individual NPLs. X is a vector of observable characteristics, and ε is an error term with the usual properties. To provide a base comparison of what has already been captured in the asset pricing model, I re-estimate equation (1) by replacing the NPL measure of profitability with the NPL purchase price. This provides an understanding of the extent that each loan characteristic contributed to the initial price, under the current asset pricing model.

Unsurprisingly, the majority of the loan characteristics are statistically insignificant. This suggests that either the variation in those loan characteristics have been adequately accounted for in the current asset

pricing model or the characteristics do not consistently contribute to specific profit outcomes. This is particularly unsurprising for the state, occupancy status, and Acquisition BPO variables because those are the primary characteristics used in the asset pricing model to determine the purchase price of the assets (See tables 2 and 3 for summary statistics and results).

Interestingly, the current interest rate is statistically significant and negatively correlated with IRR, with a coefficient of -45.48. Interest rates are considered in the current asset pricing model and they also have a negative correlation with the purchase price. However, this implies that an increase in the interest rate will reduce the firms calculated purchase price but will still result in a lower profit outcome. Thus, the variation in the interest rate may not be adequately considered in the current NPL pricing model. This suggests that interest rates should be given greater consideration in the determination of the purchase price. According to the results, the firm should reduce its purchase price by a greater amount than it currently does with an increase in the interest rate to counterbalance the lower profit outcome.

Delinquent taxes is statistically significant in contributing to profitability but has only a slightly positive correlation with IRR, with a coefficient of .00018. It is not statistically relevant to the Purchase Price as they are deducted directly from the purchase price. This suggests that delinquent taxes signify something slightly greater than their numerical amount. It is possible that this is a result of higher valued properties having a larger amount of property taxes. The acquisition BPO should capture the variation in property value, however, BPOs can vary significantly and it difficult to pinpoint the exact value of a given property.

New York is statistically significant and negatively correlated with IRR with a coefficient of -11.546. This is likely because New York is relatively

more expensive than other states. This suggests that the firm's model does not accurately account for the additional costs associated with properties in New York. According to the results, the firm should assign a lower purchase price than it currently does to properties in New York. However, only 6 of the 179 assets are located in New York, making this a very small sample size. Additional data on properties in New York should be included to better assess this variable.

Intuitively, properties in good and fair condition are both positively correlated with IRR, relative to properties in poor or unknown condition. They have coefficients of 3.13 and 2.53, respectively. Although intuitive, these results are still somewhat surprising as the variation in property condition should be captured through the acquisition BPO. However, BPO accuracy is limited by the significant room for error in property valuation.

Unsurprisingly, the R^2 is significantly smaller for IRR than for Purchase Price; 0.372 and 0.965, respectively. This was expected because the asset characteristics used in the model directly reflect the characteristics used in the asset pricing model to determine the purchase price. Intuitively, the loan characteristics considered in the model more adequately reflect the current pricing model than the true profit outcomes. Thus, additional variables would need to be included to more accurately predict profit levels. However, limiting the model to information available at the time of acquisition was expected to reduce the R^2 .

Including additional NPL characteristics could create a more comprehensive model which would better predict profitability. For example, the variation in the BPOs of a given asset over time would likely be an important predictor of profit outcomes because the variation reflects the accuracy of those value estimates. If a property has BPOs that vary significantly, it is more likely that the value attributed to that asset

could be inaccurate. A property with a small variation in BPO values is more likely to have an accurate value attributed to it. Although significant, this information is unimportant in relation to the asset pricing model because an asset must be priced at the time it is acquired. BPOs are ordered periodically during the time an asset is held, making this information inaccessible at the time of acquisition. Thus, for the purpose of evaluating the current pricing model, information acquired after the time of acquisition was excluded from my model.

VI. Conclusion

I formally analyze the role of NPL loan characteristics in explaining NPL profit outcomes compared to the current pricing model for NPLs. To the best of my knowledge, this topic has not been examined in any previous studies. Existing literature looks largely at determinants of NPL prevalence in the economy and their relationship with banking practices. I am contributing the literature by evaluating determinants of NPL profitability within a private asset management firm. I use the internal rate of return (IRR) of each loan as a measure of profitability. I expected that factors included in the current NPL model would not be statistically significant in determining profit outcomes as those factors were considered in determining the purchase price of the asset.

Surprisingly, I find that interest rates are statistically significant and negatively correlated with IRR. This is surprising because interest rates are considered in the current asset pricing model. The results suggest that greater weight should be given to interest rates in determining the purchase price of an NPL. Also surprising, I find that properties located in New York are negatively correlated with profitability. State assumption relating to costs and holding timelines are included in the current NPL model. However, the results suggest that additional consideration should be given to

properties in New York when determining a purchase price. I also find that delinquent taxes have a slightly positive correlation with NPL Profitability. This was unexpected as delinquent taxes are deducted directly from the purchase price, suggesting a slightly greater significant than their dollar amount.

The NPL loan characteristics used in the model explain less than half the variation in IRR, suggesting that additional factors should be considered to better represent the total variation in profit outcomes. However, for the purpose of evaluating the current pricing model, I excluded any data acquired after the time of acquisition. Including additional NPL information attained after acquisition may be useful in creating a more comprehensive model of the determinants of NPL profitability, however, this would be unhelpful in contributing to predictors of the asset pricing model. When using only information available at the time of acquisition, that information is limited. Even if it were possible for the firm to retrieve additional information on each asset prior to acquisition, retrieving additional information may be costly. Asset information may have marginal benefits and the costs of retrieving additional data may outweigh those benefits.

The results are also limited by the relatively small sample size of the data and the significant variation in IRR. Additional research should be performed with a larger sample size to more accurately analyze the impact of loan attributes on profitability, particularly on properties in New York. The variation in outcomes may be a result of both the size and youth of the firm. In particular, two pools of assets retrieved inaccurate BPOs resulting in very negative profit outcomes for those assets. This occurred during the early years of the firm's life and operations have since been improved to prevent future BPO inaccuracy. It is possible that assets with bad BPOs could have skewed some results. Using data from a larger more mature company may

provide more precision in the results. With the small sample size of the data I was not able to exclude the assets with bad BPOs or some other potential outliers. Obtaining a larger sample size would likely be the best possible improvement to this study.

Table 1: Variable Definitions

Variable	Definition
IRR	The rate of return that sets the NPV of all cash flows (both positive and negative) from the investment to ZERO. Individual asset IRRs are calculated from their total remittance.
Current Interest Rate	The proportion of the loan charged as interest to the borrow, expressed as an annual percentage of the loan outstanding.
Delinquent Taxes	The amount of property taxes unpaid after the payment due date.
Current Principle and Interest Payment	The current payment amount towards the principle owed and the amount determined by the interest rate.
Current Taxes and Insurance Payment	The payment toward the amount of principle owed and the amount determined by the interest rate
Days in FC	The number of days the asset was in foreclosure.
Default Reason	A dummy variable equal to one if no default reason was given by the borrower or the reason is otherwise unknown.
Other (<i>omitted</i>)	A dummy variable equal to one if a default reason was provided by the borrower.
Owner Occupied	A dummy variable equal to one if the property owner lived in the home at the time of acquisition.
Other/Unknown	A dummy variable equal to one if someone other than the property owner lived in the home at the time of acquisition or if the occupancy status was unknown.
Vacant (<i>omitted</i>)	A dummy variable equal to one if the property was vacant at the time of acquisition.
Good	A dummy variable equal to one if the property was in good condition at the time of acquisition.
Fair	A dummy variable equal to one if the property was in fair condition at the time of acquisition.
Poor/Unknown (<i>omitted</i>)	A dummy variable equal to one if the property was in good condition at the time of acquisition.
Bankruptcy (BK)	A dummy variable equal to one if the borrower declared bankruptcy.
None (<i>omitted</i>)	A dummy variable equal to one if the borrower did not declare bankruptcy.
Stable	A dummy variable equal to one if the neighborhood was stable at the time of acquisition.
Declining/Unknown (<i>omitted</i>)	A dummy variable equal to one if the neighborhood was declining at the time of acquisition or if the neighborhood condition was unknown.
REO Sale	A dummy variable equal to one if the asset was liquidated through and REO sale.
Other Liquidation Type (<i>omitted</i>)	A dummy variable equal to one if the asset was not liquidated through and REO sale.
SouthsideNSP Trust 2016	A dummy variable equal to one if the asset were funded by the Southside NSP Trust 2016.
SouthsideNSP Trust 2015	A dummy variable equal to one if the asset were funded by the Southside NSP Trust 2015.
Private Trust 2014 (<i>omitted</i>)	A dummy variable equal to one if the asset were funded by the Private Trust 2014.

Investor Pool	Indicator of the investor pool in which the asset falls under.
Deal Name	Indicator of the deal name in which the asset falls under.
Days Held	The number of days the asset was held, calculated as the difference between the funding date and liquidation date.
UPB	The principle amount still owed on the loan.
AcqBPO	The broker price opinion obtained at the time of acquisition.
Zip	Address zip code.
GA (<i>omitted</i>)	A dummy variable equal to one if the property is located in Georgia.
NJ	A dummy variable equal to one if the property is located in New Jersey.
FL	A dummy variable equal to one if the property is located in Florida.
IL	A dummy variable equal to one if the property is located in Illinois.
NY	A dummy variable equal to one if the property is located in New York.
MD	A dummy variable equal to one if the property is located in Maryland.
OH	A dummy variable equal to one if the property is located in Ohio.
PA	A dummy variable equal to one if the property is located in Pennsylvania.
New England	A dummy variable equal to one if the property is located in a New England state.
Other States	A dummy variable equal to one if the property was not located in Georgia, New Jersey, Florida, Illinois, New York, Maryland, Ohio, Pennsylvania, or any New England States.

Table 2: Summary Statistics

This table presents the summary statistics for the variables used in our study.

The sample period is from 2015 to 2018. The definitions of the variables are provided in Table 1.

	mean	sd	p25	p50	p75
IRR	0.672	4.450	-0.015	0.014	0.039
Purchase Price	67658.490	57129.970	31436.220	57271.990	80644.560
Current Interest Rate	0.058	0.020	0.050	0.058	0.065
Delinquent Taxes	1387.342	6455.685	0.000	0.000	1046.000
Current Principle and Interest Payment	3556.867	36975.460	465.560	679.250	932.920
Current Taxes and Insurance Payment	291.016	245.785	120.590	249.920	440.240
Days in Foreclosure (FC)	278.760	442.935	0.000	43.000	441.000
Default Reason	1.611	10.754	1.000	1.000	1.000
Other (omitted)					
Owner Occupied	0.822	5.507	0.000	0.000	1.000
Other/Unknown	0.178	1.220	0.000	0.000	0.000
Vacant (omitted)					
Good	1.033	6.911	0.000	1.000	1.000
Fair	0.567	3.807	0.000	0.000	1.000
Poor/Unknown (omitted)					
Bankruptcy (BK)	0.478	3.216	0.000	0.000	0.000
None (omitted)					
Stable	1.544	10.311	1.000	1.000	1.000
Declining/Unknown (omitted)					
REO Sale	1.200	8.020	0.000	1.000	1.000
Other Liquidation Type (omitted)					
SouthsideNSP Trust 2016	0.300	2.033	0.000	0.000	0.000
Southside NSP Trust 2015	0.878	5.876	0.000	0.000	1.000
Private Trust 2014 (omitted)					
Investor Pool	7.615	4.364	3.000	8.000	10.000
Deal Name	15.061	20.672	3.000	8.000	19.000
Days Held	431.374	237.703	233.000	357.000	583.000
Unpaid Principle Balance (UPB)	128795.400	109628.600	59859.470	105775.800	153863.600
Acquisition BPO (AcqBPO)	117589.900	91123.110	63500.000	97500.000	142000.000
GA (omitted)					
NJ	0.289	1.959	0.000	0.000	0.000
FL	0.178	1.220	0.000	0.000	0.000
IL	0.533	3.585	0.000	0.000	1.000
NY	0.067	0.480	0.000	0.000	0.000

MD	0.100	0.702	0.000	0.000	0.000
OH	0.067	0.480	0.000	0.000	0.000
PA	0.078	0.554	0.000	0.000	0.000
New England	0.067	0.480	0.000	0.000	0.000
Other States	0.211	1.442	0.000	0.000	0.000

Table 3: NPL Loan Characteristics: Linear Regression Estimations

This table presents the results of regressions of NPL Loan characteristics on IRR and Purchase Price. All variables are defined in Table 1. *t*-statistics are in parentheses. Significant at the 10%, 5%, and 1% levels is indicated by *, **, ***, respectively.

	IRR	Purchase Price
CurrentInterestRate	-45.47803** (-2.39)	-161316.6*** (-2.71)
DelinquentTaxes	0.0001859 (3.11)	-0.091278*** (-0.49)
PrincipleandInterestP	-5.71e-06*** (-0.62)	-0.0756715 (-2.63)
TaxesandInsurancePaym	0.0000852 (0.05)	-4.500637 (-0.90)
DaysinFC	-0.0002725 (-0.37)	-4.114386* (-1.80)
DefaultReason	-1.198282 (-1.39)	-2103.248 (0.78)
OwnerOccupied	-0.6255507 (-0.71)	-1310.846 (-0.48)
OtherUnkown	-0.3628081 (-0.28)	1380.225 (0.33)
Good	3.132552*** (2.69)	-30.01377 (-0.01)
Fair	2.526089** (2.13)	1249.455 (0.34)
BK	0.7198147 (0.95)	-2622.612 (-1.10)
Stable	-1.833429 (-1.43)	-3252.126 (-0.81)
REOSale	-1.395161* (-1.84)	-332.3978 (-0.14)
SouthsideNSPTrust20151	2.726646* (1.83)	-411.9387 (-0.09)
SOUTHSIDENSPTRUST20161	0.3819479 (0.13)	-2802.783 (-0.32)
InvestorPool	-0.4316824 (-1.41)	963.7667 (1.01)
DealName	0.076585 (1.06)	-237.4168 (-1.05)
DaysHeld	-0.0029275* (-1.78)	1.329684 (0.26)
UPB	1.09e-06	-0.0099328

	(0.21)	(-0.61)
AcqBPO	4.36e-06	.6352212***
	(0.70)	(32.51)
NJ	0.4943491	-4470.303
	(0.38)	(-1.11)
FL	0.4313081	3661.242
	(0.36)	(0.97)
IL	-0.9088358	-1373.376
	(-0.94)	(-0.45)
NY	-11.49263***	2513.056
	(-5.36)	(0.37)
MD	-2.134068	-226.9682
	(-1.34)	(-0.05)
OH	0.3481596	399.0185
	(0.19)	(0.07)
PA	2.097751	-6104.588
	(1.28)	(-1.19)
NewEngland	-0.0756457	-7063.842
	(-0.04)	(-1.05)
OtherStates	1.978419	2456.018
	(1.44)	(0.57)
Constant	4.629093	8754.932
	(1.76)	(1.06)
<hr/>		
Obs.	179	179
R ²	0.4147	0.9652
Adj. R ²	0.3008	0.9584
<hr/>		

Table 4: Asset Breakdowns

These tables present the breakdown of each dummy variable by possible aggregated subcategories and number of assets.

Table 4, Panel A:
Asset breakdown by State

1.FL	16
2.GA	36
3.IL	48
4.MD	9
5.NJ	26
6.NY	6
7.OH	6
8.PA	7
9.New England:	6
CT (3)	
MA (2)	
VT (1)	
10.Other States:	19
CO (2)	
CT (3)	
IA (2)	
IN (2)	
MN (2)	
NC (4)	
TX (5)	
Total	179

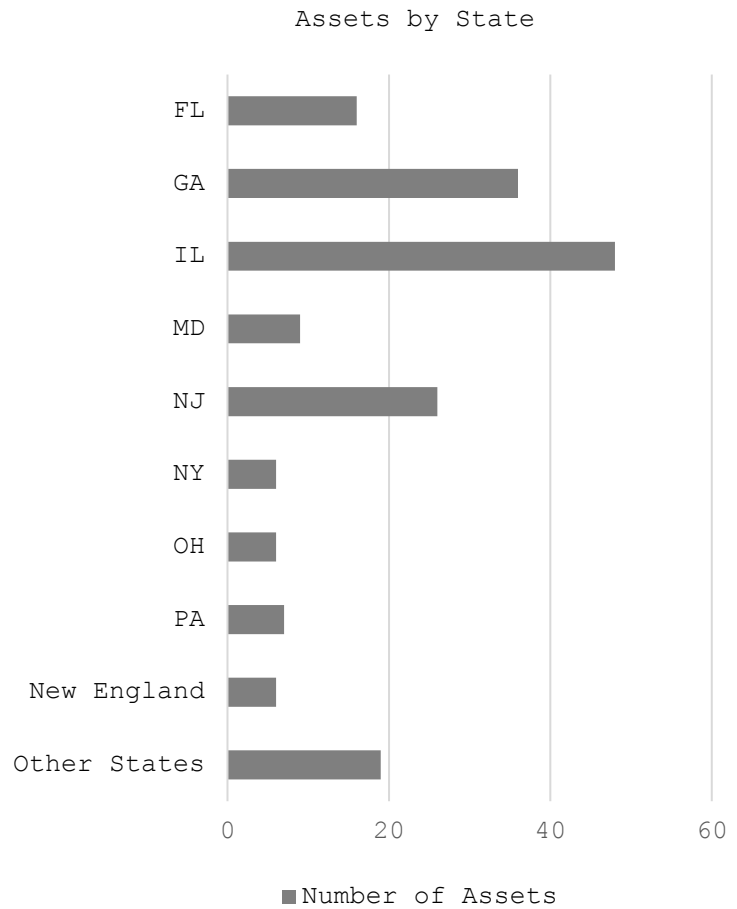


Table 4, Panel B: Asset breakdown by Default Reason

1. Default Reason	149
Default Reason (140)	
Unable to Contact Borrower	(7)
Other/NO Applicable Codes	(2)
2. Other	30
Temporary Loss/Reduction of Income	(7)
Death/Illness of Primary Borrower	(4)
Excessive Obligations	(11)
Unemployment	(3)
Servicing Problems	(2)
Payment Dispute/Due Date	(2)
Marital Difficulties	(1)
Total	(179)

Assets by Default Reason

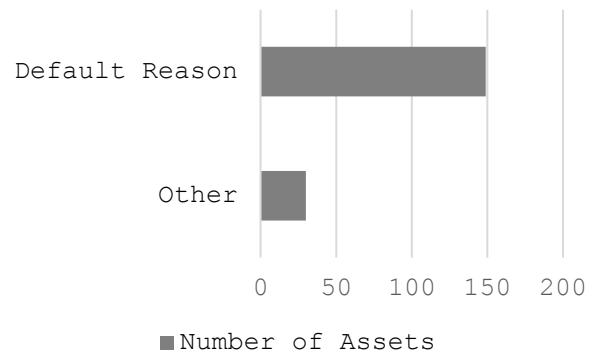


Table 4, Panel C: Asset Breakdown by Occupancy Status

1. Vacant	89
2. Owner Occupied	74
3. Other/Unknown	16
Non-Owner Occupied	(7)
Other/Unknown	(9)
Total	179

Assets by Occupancy Status

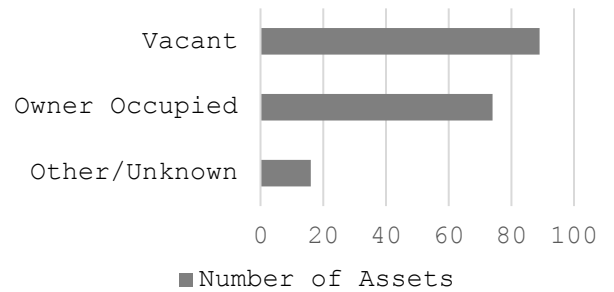


Table 4, Panel D: Asset Breakdown by Bankruptcy Status

1. None	136
2. BK Chapter	43
BK 7	(24)
BK 11	(1)
BK 13	(18)
Total	179

Assets by Occupancy Status

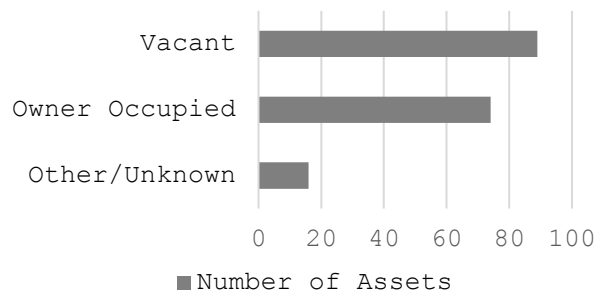


Table 4, Panel E: Asset Breakdown by Property Condition

1. Good	93
2. Fair	51
3. Poor/Unknown	35
	Poor (7)
	Unknown (28)
Total	179

Assets by Property Condition

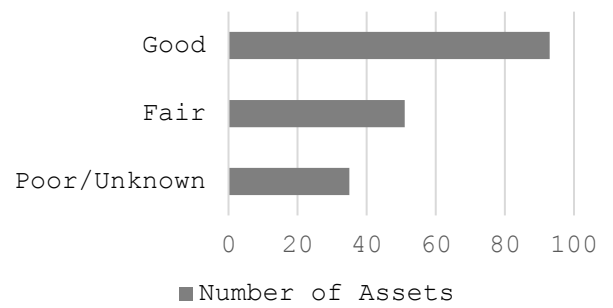


Table 4, Panel F: Asset Breakdown by Neighborhood Condition

1. Stable	139
2. Declining/Unknown	40
	Declining (7)
	Unknown (33)
Total	179

Assets by Neighborhood Condition

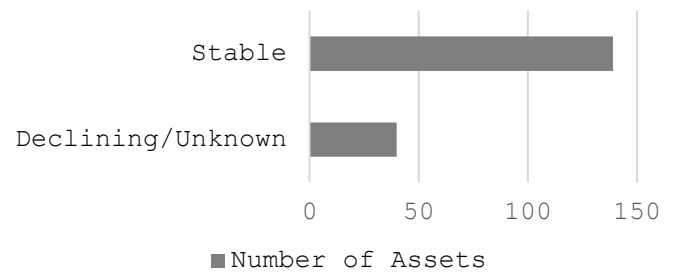


Table 4, Panel G: Asset Breakdown by Liquidation Type

1. REO Sale	108
2. Other Liquidation Type	71
	Note Sale (27)
	Third Party Sale (20)
	Short Sale/Short Payoff (3)
	Foreclosure Sale (1)
	Not Listed (19)
	Put Back to Seller (1)
Total	179

Assets by Bankruptcy Status

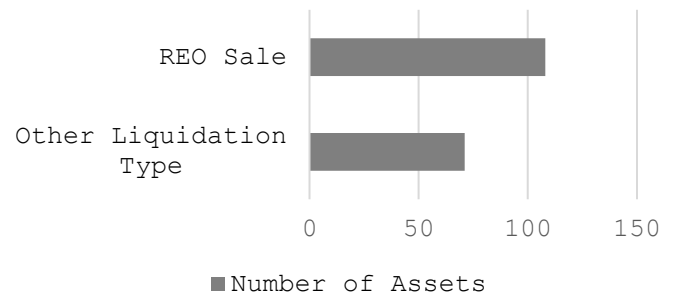


Table 4, Panel H: Asset

Breakdown by Entity

SOUTHSIDE NSP TRUST 2016-1	27
Southside NSP Trust 2015-1	79
Private Trust 2014-1	73
Total	179

Assets by Entity

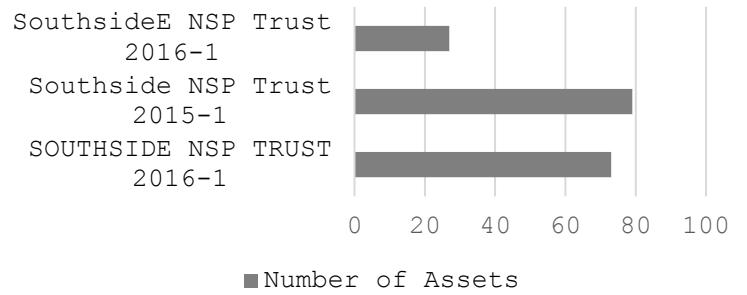


Table 5: Asset Pricing Model Inputs

This table presents the factors used in the current NPL asset pricing model for NS Capital. These loan characteristics are used to determine the purchase price.

Loan Characteristic	Definition
Current Status	<u>Status Options:</u> 30-59 Days (delinquent) 60- 89 Days (delinquent) 90 + Days (delinquent)
UPB	Unpaid Principle balance
Sponsor Value	Estimated property value provided by seller (used as preliminary estimate prior to acquisition BPO)
Next Payment Due Date	Date of next borrower payment
Interest Rate	Interest rate on mortgage
Occupancy Status	<u>Status Options:</u> Owner Occupied Vacant Other/Unknown

Table 6: Current NPL Asset Pricing Model State Assumptions

These tables present the state assumptions for all states included in the dataset. These assumptions are incorporated into the asset pricing model to determine the purchase price.

Table 6, Panel A: Eviction Assumptions					
State	Evic Timeline	Evict Costs	EvictConf-Redemp	Evict Most Frequent	EvictNotes
IA	45	850			None
IL	219.5	1200	Confirmation	30-45 days	Also, a 30 day right to possession once the sale confirms before you can start eviction
IN	40	850		-	Up to 1-year redemption if mortgagee pursues a deficiency judgment or lender forecloses with redemption
LA	120	750		-	None
MA	75	750		-	None
MD	195	1200	Ratification	45-60 days	Cannot begin marketing until judge has signed order of ratification
MN	57	950	Redemption	6 months. If vacant, can shorten	1 year if over 10 acres OR if debt is less than 2/3 original mortgage
NC	35	750	Confirmation	10 days	Additional 10 day upset bid period
NJ	140	1200	Redemption	10 days	None
NY	172.5	1200		-	None
OH	103.5	1000	Confirmation	45-60 days	None
PA	110	1000			None. Note: cannot begin eviction until deed has been recorded
TX	55	850		-	None
VT	40	850	Redemption	6 months	Can be shortened if there is no equity in the property

Table 6, Panel B: Foreclosure Assumptions

State	Fcl Judicial	Fcl Non- Judicial	Fcl Comment	Fcl Process Period	FCL Timeline	Fcl Redemption	FCL Costs
CO	•	•	Judicial rarely	145	191		800
CT	•		Judicial only	62	280		1500
FL	•		Judicial only	135	390		750
GA	•	•	Judicial rarely	37	180		2750
IA	•	•	Trustee Sale Voluntary	160	205	20	600
IL	•		Judicial only	300	472	90	5250
IN	•		Judicial only	261	296		1000
LA	•		Judicial only	180	540		1150
MA	•		Judicial only	75	338		1300
MD	•		Judicial only	46	215		5250
MN	•	•	Non- Judicial mostly	100	310	180	2000
NC	•	•	Non- Judicial mostly	110	150		1500
NJ	•		Judicial only	270	455	10	5250
NY	•		Judicial only	445	1050		5250
OH	•		Judicial only	217	203		2800
PA	•		Judicial only	270	630		4250
TX	•	•	Non- Judicial mostly	27	70		850
VT	•		Judicial only	95	390	240	1700

Table 6, Panel C: REO, Tax and HPI Assumptions

State	REO			Tax	HPI	
	REO Months	REO Days	REO State Speed	Tax Rate	HPI - 2015	HPI - 2016
CO	6	90	2	1.08%	360.5	392.8
CT	8	120	3	1.72%	100.0	102.5
FL	5	120	4	1.20%	100.0	102.5
GA	6	181.5	3	1.52%	100.0	102.5
IA	8	90	3	2.15%	252.7	258.6
IL	6	181.5	4	2.50%	100.0	102.5
IN	6	90	2	2.12%	244.8	251.1
LA	6	120	3	1.02%	100.0	102.5
MA	8	90	3	1.07%	621.7	652.4
MD	6	181.5	4	3.00%	100.0	102.5
MN	6	120	2	1.27%	309.2	325.0
NC	8	120	3	1.10%	302.5	311.8
NJ	6	181.5	2	3.76%	100.0	102.5
NY	6	181.5	4	3.76%	100.0	102.5
OH	8	242	3	1.81%	100.0	102.5
PA	6	181.5	3	1.70%	100.0	102.5
TX	6	120	1	2.57%	234.8	253.0
VT	9	90	4	2.06%	436.2	439.0

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