



Technical Report Series

National Mortgage Database

Technical Report 1.2

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1. Introduction

The National Mortgage Database project is a multi-year project being jointly undertaken by the Federal Housing Finance Agency (FHFA) and the Consumer Financial Protection Bureau (CFPB). The project is designed to provide a rich source of information about the U.S. mortgage market based on a five percent sample of residential mortgages. The project has three primary components: (1) the National Mortgage Database (NMDB®); (2) the quarterly National Survey of Mortgage Originations (NSMO); and (3) the annual American Survey of Mortgage Borrowers (ASMB).

The NMDB® enables FHFA to meet the statutory requirements of section 1324(c) of the Federal Housing Enterprises Financial Safety and Soundness Act of 1992, as amended by the Housing and Economic Recovery Act of 2008, to conduct a monthly mortgage market survey.

Specifically, FHFA must, through a survey of the mortgage market, collect data on the characteristics of individual mortgages, including those eligible for purchase by Fannie Mae and Freddie Mac and those that are not, and including subprime and nontraditional mortgages. In addition, FHFA must collect information on the creditworthiness of borrowers, including a determination of whether subprime and nontraditional borrowers would have qualified for prime lending.¹

For CFPB, the NMDB® project supports policymaking and research efforts and help identify and understand emerging mortgage and housing market trends. The CFPB uses the NMDB®, among other purposes, in support of the market monitoring called for by the Dodd-Frank Wall Street Reform and Consumer Protection Act, including understanding how mortgage debt affects consumers and for retrospective rule review required by the statute.

FHFA and CFPB considered existing databases but determined that none sufficiently support the above objectives.² The NMDB®, as it nears completion, is a de-identified loan-level database of closed-end first-lien residential mortgages. It: (1) is representative of the market as a whole; (2) contains detailed, loan-level information on the terms and performance of mortgages, as well as characteristics of the associated borrowers and properties; (3) is continually updated; (4) has an historical component dating back before the financial crisis of 2008; and (5) provides a sampling frame for the NSMO (see NMDB® Technical Report 2.1) and ASMB.

The core data in the NMDB® are drawn from a random 1-in-20 sample of all closed-end first-lien mortgage files outstanding at any time between January 1998 and the present in the files of Experian, one of the three national credit repositories.³ The use of a sampling frame substantially reduces the privacy risk associated with any data collection. By contrast, a universal registry can present challenges for privacy since it is known that a particular loan must be in the dataset. However, for a 1-in-20 sample, the odds are 95 out of 100 that a particular loan is not in the database. In addition, the sample used is large enough to support almost all types

¹ FHFA interprets the NMDB® project as a whole, including the NSMO, as the “survey” required by the Safety and Soundness Act. The statutory requirement is for a monthly survey. Core inputs to the NMDB®, such as a regular refresh of credit-repository data, occur monthly, though the NSMO does not.

² Please see the Appendix A for a discussion of existing sources and their limitations.

³ Experian was chosen through a competitive procurement process to assist in creating the NMDB®.

of statistically valid analyses but small enough to manage logically, thus dramatically reducing both contract and personnel costs.

A random 1-in-20 sample of mortgages newly reported to Experian is added each quarter. Mortgages are followed in the NMDB® database until they terminate through prepayment (including refinancing), foreclosure, or maturity. Information from credit repository files on each borrower associated with the mortgages in the NMDB® sample is collected from at least one year prior to origination to one year after termination of the mortgage. The information on borrowers and loans available to the FHFA, CFPB, or any other authorized user of the NMDB® data is de-identified and does not include any directly identifying information such as borrower name, address, or Social Security number.

This technical report is designed to provide users of the NMDB® data with background on the development of the database, as well as an assessment of the quality of its data. The remaining sections of this report discuss the development of the contract with Experian, outline the process of selecting the initial historical sample, describe how the initial sample data were processed, discuss how the data are being updated, how administrative data are being merged into the NMDB®, and the details of the initial production version of the database, NMDB® 1.0. The final section then evaluates the NMDB® sample frame.

2. The Experian Contract

By interagency agreement between FHFA and CFPB, FHFA leads the production of the NMDB®. Following a competitive procurement process, a five-year contract for the core data of the NMDB® was signed between FHFA and Experian in September 2012.⁴ Simultaneously, FHFA and CFPB signed an interagency agreement that codified the cost-sharing (shared equally) and administrative arrangement.

The Experian contract has several key elements designed to ensure compliance with the Fair Credit Reporting Act (FCRA) and to protect the privacy of both borrowers and lenders.⁵ First, while Experian will be using name, address and Social Security number for matching purposes only, this information will not be transmitted to FHFA or CFPB when constructing the NMDB®. Second, any user of the database must sign a “terms of use agreement” that states that they will not attempt to learn the identity of any borrower.⁶ Third, all access to the NMDB® must be through a server at FHFA or CFPB and strictly controlled. Fourth, the NMDB® – which is a

⁴ A 10-year extension of this contract was signed in September 2017.

⁵ The Fair Credit Reporting Act (FCRA), Public Law No. 91-508, was enacted in 1970, and substantially amended since, to promote accuracy, fairness, and the privacy of personal information assembled by credit reporting agencies (CRAs). The Act's primary protection requires that CRAs follow “reasonable procedures” to protect the confidentiality, accuracy, and relevance of credit information. To do so, the FCRA establishes a framework of requirements for credit report information that include rights of data quality (right to access and correct), data security, use limitations, requirements for data destruction, notice, user participation (consent), and accountability.

⁶ Though FHFA and CFPB have not yet finalized policies of access or determined who may attempt to obtain access, the contract allows access to the NMDB® to be extended to employees of other federal agencies, the Federal Reserve System, Fannie Mae, Freddie Mac, and Federal Home Loan Banks, provided the employee has signed the terms of use agreement.

sample and designed to describe the market as a whole – cannot be used for enforcement against any specific servicer or lender.

3. Selecting the Initial Sample

The credit repository core of the NMDB® was developed in two phases: (1) an initial 1-in-20 random sample of closed-end first-lien mortgages active at any time from January 1998 to June 2012 (January 1998 was the earliest available date given Experian's archive policies); and (2) quarterly updates that add a 1-in-20 random sample of mortgages newly reported to Experian and updated information on existing loans still active in the database.

One of the virtues of the credit repository sampling frame is that the repositories maintain records in a credit report not only of mortgages (and other credit obligations) that are currently active, but also of those that are closed. However, because of FCRA, records with derogatory information are purged from the current credit report after seven years from their point of first continual delinquency, and Experian's policies dictate a purge of all closed accounts 10 years after their closing.

However, since Experian retains archives of their data for 10 years or longer, data on mortgages that have been purged from Experian's current files can be recovered. These archives, which are not used for credit granting decisions, contain snapshots of each credit record as it existed at the close of business on a given day of each month, except that personal information (such as name, address, and Social Security number) is suppressed.

The bulk of the initial sample for the NMDB® was drawn from the June 2012 archive. This was supplemented by samples from the December 2005 and July 2001 archives that captured loans that may have been purged from the current files by June 2012.

Trade lines, which are records that contain information about specific loans or debt obligations that are reported by loan servicers, account for most of the information contained in credit records. Loan servicers typically update trade line information on a monthly basis using a standardized format agreed upon by the servicers and the credit repositories (the Metro 2® format, introduced in 1997 and mandatory in 2018). The updates include information on the opening date of the loan, the current and original loan balance, the type of servicer, loan term and type, payment amount, and loan repayment performance.

However, the format agreed upon by loan servicers and the credit repositories does not perfectly identify closed-end first-lien mortgages. Recognizing that some second liens would be sampled and have to be removed later, trade lines falling under the following categories were deemed eligible for the NMDB®:

any trade line with a Metro 2 “Enhanced Account Type Code” of: 08 (Real estate loan, specific type unknown), 19 (FHA real estate mortgage), 2C (FMHA real estate mortgage), 25 (VA real estate mortgage), 26 (Conventional real estate mortgage), 27 (Real estate mortgage, with or without collateral, usually second mortgage), 85 (Bi-monthly mortgage payment), 87 (Semi-

monthly mortgage payment), 5A (Real estate – junior liens and non-purchase money first), 17 (Manufactured home loan) , and 05 (FHA home-improvement loan); or trade lines reported by servicers with “Kind of Business Codes” of: FB (Mortgage Brokers), FM (Mortgage Companies), FR (Mortgage Reporters), RE (Real Estate Sales and Rentals), BM (Bank-mortgage only), FL (Savings and loan – mortgage department) and Metro 2 “Enhanced Account Type Codes” of: 02 (Secured loan), 04 (Home improvement loan), 66 (Government- secured guaranteed loan), 7B (Agriculture), 9A (Secured home improvement) or a “Secondary Agency Code” of: 01 (Fannie Mae) or 02 (Freddie Mac).

Trade lines in the June 2012 archive that met either of the above criteria were included in the population from which the initial NMDB® 1-in-20 random sample of mortgages was drawn. Any open-ended or revolving loans otherwise meeting one of the criteria were excluded from the sampling universe. No other restrictions were imposed.

The first supplemental sample was a 1-in-20 random sample of trade lines drawn from the December 2005 archive that met the criteria for the June 2012 archive, had information reported for some period in the past 7 years (indicated by an “Account Balance Date” of January 1998 or later), and were opened in September 2005 or earlier. In order to exclude loans from the 2005 sample that should be present in the June 2012 archive, loans were excluded if they were last reported after July 2002 with a reported account status of “current.”

The second supplemental sample, drawn from the July 2001 archive, was a random 1-in-20 sample of trade lines that met the criteria used for the June 2012 archive and that had “Account Balance Dates” of January 1998 or later and “Account Open Dates” of April 1999 or earlier. Any trade line with an “Enhanced Status Code” of “current” was excluded from the sample. Again, these additional conditions were designed to exclude from the 2001 sample all trade lines that should be present in the 2005 archives.

4. Processing the Initial Sample

For each archival pull, all available individual depersonalized credit records, including trade lines, inquiries, and public records (collectively, TIPs) associated with all borrowers accompanying any initial sample trade line were provided regardless of the archive from which it was sampled. The data provided by Experian are de-identified and contain no directly identifying personal information such as name, address, or Social Security number. The credit records were tagged with de-identified borrower numbers (DINs) and servicer and loan numbers (both in encrypted form).⁷ These could be used (imperfectly) to link TIP files to other account-level files both within an archive and over time.

⁷ The encrypted servicer identification and loan numbers are used only by the NMDB® development team primarily to update the database each quarter. They are not available to dataset users even in encrypted form. This is done to ensure compliance with the contract restriction that the database not be used for enforcement against servicers. The borrower DINs are unique to the NMDB® and are randomized. Experian, however, maintains the mapping between the borrower identification numbers used in their system and the DINs supplied to the NMDB® team so that records in the NMDB® associated with the same DIN will be associated with the same borrower ID in the Experian records.

One major problem encountered with the NMDB® sample frame is that a single mortgage can be associated with multiple trade lines. This can arise when the servicing of the loan is sold or transferred, and the trade line reported by the original servicer is not properly linked to the trade line reported by the new servicer. In such cases, borrowers may appear to have multiple mortgages, when, in fact, they have only one. Because of these duplicates, randomly sampling trade lines will result in mortgages with multiple records being over represented in the data. To correct for this, a processing methodology was developed to identify and combine multiple records that contain information about the same mortgage into one record.

The first step in the process of eliminating duplicate mortgage records (“de-duping”) was to find multiple trade lines for the same mortgage in the same archive. From these duplicates, sample loans were removed when the selected trade line was not the one with the latest “Account Balance Date” (this corrects for the problem of having mortgages associated with multiple trade lines over-represented in the sample). The second step was de-duping across archives. The June 2012, December 2005, and July 2001 samples were treated as sequential NMDB® sample frames (in that order) whereby mortgages selected from a NMDB® sample frame later in the order (e.g., July 2001) that can be found in a NMDB® sample frame earlier in the order (June 2012 or December 2005) would be removed from the sample (again, this corrects for the fact that such mortgages are over-sampled in the raw frame).

The de-duping process also dealt with the problem of ambiguous lien status for the “Enhanced Account Type Codes” of 08 (Real estate, specific type unknown), 27 (Real estate mortgage, with or without collateral, usually second mortgage), and 5A (real estate – junior liens and non-purchase money first). Sample trade lines associated with these codes were removed from the sample when they subsequently could be linked with trade lines that were unambiguously second liens.

Once the initial samples were de-duped, it was necessary to link archival records over time to create a composite picture of each sample loan (this is particularly important for loan performance as described in Section 7 and Appendix B). Semi-annual archives were drawn for the period December 2001 to December 2011 for borrowers associated with the initial sample loans. Data from these archives were patched together to create a temporal picture of each loan. One issue that needed to be dealt with is that DINs for a given borrower can change over time. There are times when a loan is first reported to the credit repositories and cannot be connected with existing credit records for the borrower(s). This can happen because lenders make errors in reporting names and addresses or because of changes to a borrower’s addresses or names. In this instance Experian treats the loan as associated with a new borrower. In most of these instances the records are ultimately reconciled with the correct existing borrower and a “DIN-merge” occurs. However, historical archives are stored with the DINs at the time of the archive. Thus, to properly connect borrowers (and mortgages) over time, it was necessary for Experian to provide a DIN-merge transformation table to map historical to current DINs.

As shown in Table 1, the de-duping process substantially reduced the size of the original NMDB® sample. About 15 percent of the mortgage trade lines originally sampled from the June 2012 archive, more than a quarter of the selections from the 2005 archive, and almost three-quarters of the selections from the 2001 archive were dropped. The percentages were higher for

the older archives since many of the loans selected from them were selected because they were not current at the date of the archive and thus subject to FCRA purge rules. However, many of these loans subsequently became current and could be found in later archives.

Table 1				
Archive Date	Sample Trade Lines	Final Loans	Final Borrowers	Percentage of Trade Lines Dropped
Jul 2001	302,398	85,331	130,405	71.8
Dec 2005	2,955,675	2,117,188	3,449,758	28.4
Jun 2012	9,225,304	7,765,473	12,124,033	15.8

5. Updating the Sample

Under the NMDB® sample design going forward, credit records for borrowers associated with sampled mortgages are to be collected quarterly until one year after the mortgage is reported as closed.⁸ As of June 2012, approximately 3 million loans from the initial sample were still active or had been closed less than a year. In addition, to keep the NMDB® up-to-date, it is necessary to add a representative sample of the new mortgages reported to Experian each quarter to the database.

The initial update of the NMDB® from the June 2013 archive covered a full year of newly-reported mortgages since June of 2012. Since that date, updates have taken place quarterly drawing from the last archive of the quarter (March, June, September or December). Each quarterly update follows the same pattern. A 1-in-20 random sample of closed-end first-lien mortgage trade lines is drawn. These loans, which are identified using the same criteria as was used for the June 2012 archive, are selected from among the loans that were newly reported to Experian since the date of the previous quarterly update archive. The new sample is de-duped using the same methodology as used for the initial sample. If multiple trade lines are identified for the mortgage and the selected mortgage is not the one with the latest “Account Balance Date” or the mortgage is deemed to be a second lien, then it is dropped. In addition, checks are run to determine if the mortgage was already reported in an earlier archive period (perhaps as a different trade line). If so, the loan is dropped.

Existing sample loans are also updated each quarter. Prior to the update, the DIN-merge transformation table is updated to account for “newly merged” DINs. To ensure that lagged information for all DINs newly added to the dataset is collected, the year-old archive is drawn each quarter for all active DINs for which this archive had not previously been collected.

⁸ A partial update is done monthly collecting only limited performance data for active sample mortgages. This allows the database to provide high-frequency information on mortgage delinquency rates.

At present, an average of 85,000 new loans are added to the NMDB® each quarter (see Table 2). The number of mortgages added to the database is only about two-thirds of the raw trade lines originally selected for the update sample.

Table 2				
Archive Date	Sample Trade Lines	Final Loans	Final Borrowers	Percentage of Trade Lines Dropped
Jun 2013	648,224	498,743	774,782	23.1
Sep 2013	240,001	131,970	201,142	45.0
Dec 2013	174,404	110,141	163,650	36.8
Mar 2014	111,928	54,284	80,570	51.5
Jun 2014	146,406	79,289	117,296	45.8
Sep 2014	124,389	76,440	113,612	38.5
Dec 2014	124,323	77,099	114,114	38.0
Mar 2015	104,613	72,162	107,262	31.0
Jun 2015	129,737	93,152	138,879	28.2
Sep 2015	150,399	99,668	148,266	33.7
Dec 2015	124,413	90,765	133,769	27.0
Mar 2016	123,438	76,032	111,942	38.4
Jun 2016	111,797	84,572	124,942	24.4
Sep 2016	135,699	107,428	157,720	20.8
Dec 2016	177,386	110,734	163,905	37.6
Mar 2017	137,917	98,548	145,749	28.5
Jun 2017	129,953	83,742	122,443	35.6

6. Merging with other Data Sources

Although extensive, Experian's archive files do not contain information on a number of key mortgage features, such as the loan's purpose (home purchase or refinance), whether it had an adjustable or fixed rate, its securitization status, its origination channel (broker or retail lender), or whether it was for an owner-occupied property, vacation home, or investor property.

Moreover, Experian's archives contain no information on the property backing the mortgage, such as its location, purchase price, characteristics, or current value. Finally, key information on borrowers associated with the loan including income is also missing. Consequently, values of these key variables need to be inferred indirectly or acquired from other data sources if they are to be included in the NMDB®.

The NMDB® obtains much of the missing information from matches to administrative file records. The core administrative files come from Fannie Mae and Freddie Mac (the Enterprises), the Federal Housing Administration (FHA), the U.S. Department of Veterans Affairs (VA), and the Rural Housing Authority (RHS). Collectively, loans associated with these programs comprise about three-quarters of the loans in the NMDB®.

The most accurate means of merging information from outside sources into the NMDB® is to use information about the borrowers, such as their names, Social Security numbers, addresses, and dates of birth. Using such directly identifying information (DII), however, heightens concerns about data security and borrower privacy. Consequently, FHFA contracted with an outside consultant to conduct a study of how such concerns might be mitigated. The third-party-blind matching process that FHFA used is consistent with the “best practices” and recommendations from that study.

The third-party-blind matching process adheres to three guiding principles. First, neither FHFA, FHA, VA, RHS, nor the Enterprises can receive DII from Experian. Second, Experian cannot access FHA, VA, RHS or Enterprise administrative data and borrower DII in the same place. Third, FHFA must not be able to match loans in the NMDB® records to the specific administrative records from FHA, VA, RHS, or the Enterprises.

In December 2014, a process was initiated to supplement the NMDB® data with administrative data from Fannie Mae and Freddie Mac. The process for matching the data from the Enterprises followed seven steps:

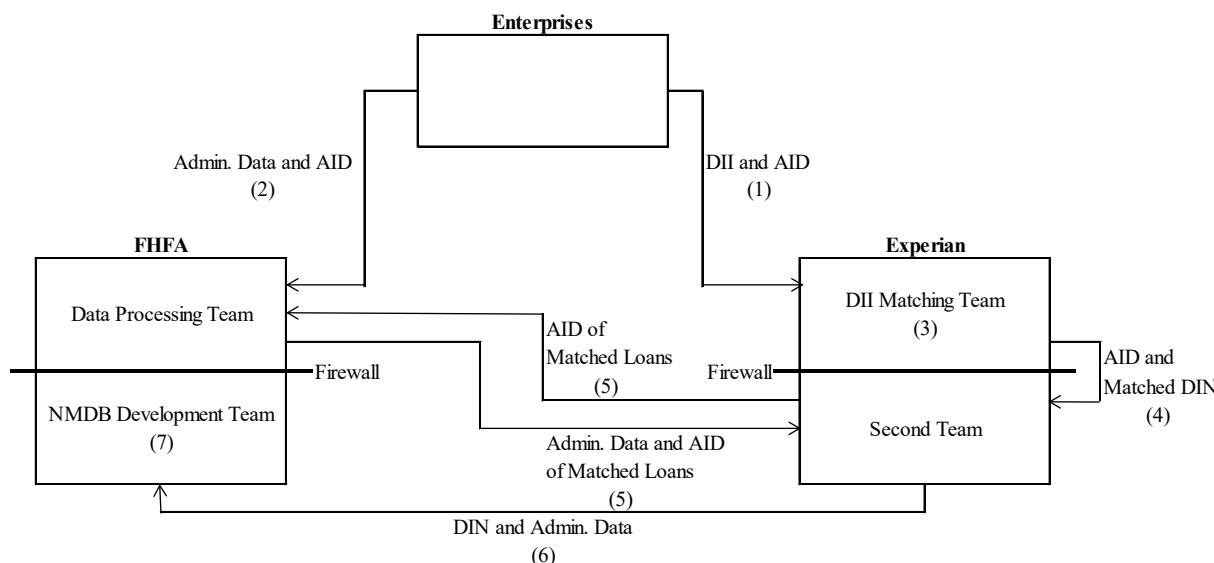
- (1) The Enterprises created a unique anonymized identifier (AID) for each loan. This identifier, along with the borrower-level DII associated with each loan (including name, address, Social Security number, and date of birth), was transmitted directly to Experian using a secure portal. FHFA did not receive this information. Other administrative data on these loans were not sent to Experian.
- (2) The Enterprises sent the AID, along with administrative data for each loan, to an FHFA data processing unit that is separate from the NMDB® development team. No borrower-level DII was included in the information sent to the FHFA data processing unit.
- (3) Behind a secure firewall to protect FCRA-regulated data, Experian matched the DII it received from the Enterprises to the DII maintained in its own files on the borrowers in the NMDB® to determine potential matches. When a potential match was identified, Experian compiled the DIN for each matched borrower.
- (4) For all potential matches, Experian transferred the Enterprise-supplied AID and the matched NMDB® borrower DINs to a separate unit within Experian that had no access to the credit repository data or any DII.
- (5) The second Experian unit sent the list of matched AIDs to the data processing unit in FHFA that received the administrative data from the Enterprises in step (2). For each AID it received, this data processing unit sent back the associated administrative data that it received from the Enterprises.
- (6) After receiving this information, the second Experian unit forwarded the administrative data they received from the data processing unit at FHFA, plus the matched borrower DIN that they received from the first Experian unit, to the NMDB® development team at

FHFA. The information sent to the NMDB® development team included neither the Enterprise-created AID nor any DII.

- (7) The NMDB® team compared the characteristics of the loans associated with the DINs received from the second Experian unit to the administrative information on the loans. If the information from both sources was consistent, the match was confirmed. A list of confirmed matches was sent to Experian. Upon confirmation, Experian stored the property address supplied as part of the DII file from the Enterprises but otherwise permanently destroyed all DII used in the match.

The figure below illustrates the third-party-blind matching process.

NMDB Administrative Data Merging Process



As of this writing, results of the Enterprise administrative file matching have been processed and quarterly updates, reflecting loans acquired by the Enterprises through March 2017 have been conducted. Similar methods have been used to match FHA, VA, and RHS loans with the NMDB®. At present, loans with insurance or guarantees backed by these three programs through June 2017 have been matched to the NMDB®.

Efforts are currently underway to merge property record information into the NMDB®, using similar third-party blind matching techniques. At present, approximately two-thirds of the loans in the NMDB® database have been matched to property records with plans to match the remaining one-third in the fall of 2017.⁹ When the property matching is complete, data from

⁹ To facilitate the property matching, the entire property database of one of the two largest U.S. property data vendors has been placed behind the secure firewall at Experian. This allows information on borrower name and address to be used in the matching process. Again, any DII used in the match will be discarded once the matching process is completed.

servicing and private-label databases will also be matched which should provide missing data elements for most of the non-government-affiliated loans in the NMDB®.

It is anticipated that additional matching will be conducted to enhance the NMDB® with information reported under the Home Mortgage Disclosure Act (HMDA), by private mortgage insurance companies, and available from the Federal Home Loan Banks.¹⁰ These matches will likely not involve DII and those will have to rely on less accurate techniques.

Ultimately, the NMDB® will combine data from all of these sources into a common file with one record per sampled loan. The record will contain variables reflecting all the static characteristics of the loan, culled from multiple sources, as well as vectors of dynamic data, such as the monthly performance of the loan from origination to termination, changes to its interest rate in each month (if a variable rate loan), and the associated loan balances. It should be noted that information from external databases is only used to supplement information about sample loans, not to add new loans to the sample. The NMDB® sample frame will continue to be that established in the Experian data files. All information on mortgage performance will likewise come from Experian.

7. NMDB® 1.0

On October 30, 2017, NMDB® 1.0 was certified and released for internal production use at FHFA and CFPB. The NMDB® 1.0 dataset features payment performance data for the 11.9 million NMDB® sample mortgage loans and 18.6 million borrowers associated with those mortgages as of June 2017. Each borrower for each sample mortgage has a single record in the database identified by unique mortgage and borrower identifiers, with monthly mortgage loan payment information reported (at the borrower level) from January 1998 to June 2017 (or the months in which the loan was active).¹¹ Monthly loan payment information can vary from borrower to borrower. No data have been imputed and variables reflect the unedited values of the most up-to-date information the NMDB has on each performance month. The data is quite clean and only missing for a relatively small number of cases. Because credit-repository-based mortgage performance data have systematic differences from performance information taken from other sources, more detailed background information is provided on this component of NMDB® 1.0 in Appendix B.

¹⁰ Such merges will use information common to both datasets to perform a match but not DII. Most of the matches contemplated for the NMDB® will rely on the original loan balance, the opening date of the mortgage and the general location of the property (census tract, ZIP Code or state/county). Unfortunately, mortgage servicers report the billing address of the mortgage borrowers to Experian, but this is not necessarily the property address, particularly for mortgages on non-owner-occupied properties. Additional address information maintained within Experian's databases may prove useful in supplementing the repository addresses, as might historical information on borrower location. Nevertheless, it is expected that such merges will be less accurate than those employing DII because the later are less reliant on address.

¹¹ The production database excludes a small number of loan/borrower records because the borrower was not originally associated with the loan when it was sampled but added by Experian (or the servicer) later. This can only be picked up if the borrower happened to be in the NMDB® because of another loan and thus will not be representative of all new borrowers added to loans. Consequently, they are excluded, and the production database should be considered a dataset of all loan/borrower combinations where the borrower was associated with the loan from the beginning.

NMDB® 1.0 is a SAS dataset that consists the following mortgage payment data elements: (1) the last report date records the month and year the mortgage was last reported to Experian; and (2) monthly (a) payment performance codes, (b) account condition codes, (c) account status codes, and (d) special comment codes. Variables are created monthly for all series, however, the condition, status, and special comment variables are only available from archives on a quarterly (or semi-annual prior to June 2012) basis and thus have missing values for many months.

NMDB® 1.0 also includes the state and county that the property associated with the loan is estimated to be in. Experian maintains addresses for each borrower compiled from the billing addresses supplied by loan servicers augmented by addresses from marketing sources. From these data and the dates they were first reported to Experian, the address for each mortgage is inferred. For example, for all active mortgages the most recently reported address is used. For older loans, addresses are given preference when the borrower moves around the time the loan is originated.

8. Evaluating the NMDB® Sample Frame

A complete evaluation of the NMDB® sampling frame may not be possible until the database is fully developed. However, at this stage of development the NMDB® can be compared with HMDA data as alternative estimates of the U.S. mortgage origination market. Table 3 compares estimates of national quarterly origination totals from HMDA data and the NMDB® from 1998 to 2016. Loans are divided into two groups, based on whether they exceeded \$75,000 in real 2016 dollars. Smaller loans are separated out because HMDA did not differentiate between first and second liens (which are generally smaller balance loans) prior to 2004.

The two databases track each other remarkably well, with HMDA loan totals slightly below those of the NMDB®. This may stem from known gaps in HMDA's coverage. Loan originators that are very small or that operate exclusively in rural areas are exempt from HMDA reporting requirements, so their lending activity is not included in the HMDA data. Additionally, HMDA data excludes commercial loans and (non-purchase) loans backed by properties that were previously mortgage-free. Many of these loans, however, may not be reported to the credit repositories either. For example, loans to corporations, loans made as part of a seller-financed property sale, and loans made by non-traditional lenders are unlikely to be in either database. Moreover, some types of loans may be missed by the NMDB® though they are captured in the HMDA data. Lenders that retain all of their loans in portfolio, particularly credit unions, are known not to report their loans to the credit repositories, but are nevertheless still subject to HMDA reporting requirements.

Table 3						
Quarterly Loan Originations (in Thousand Loans)						
	\$75,000 and under		Over \$75,000		NMDB/HMDA (Percent Ratio)	
Quarter	NMDB®	HMDA	NMDB®	HMDA	<=\$75,000	>\$75,000
1998-1	593	667	1,960	1,978	88.9	99.1
1998-2	724	860	2,276	2,280	84.2	99.8
1998-3	682	818	2,223	2,196	83.3	101.2
1998-4	672	797	2,796	2,695	84.3	103.7
1999-1	575	719	2,238	2,139	80.0	104.6
1999-2	631	829	2,122	2,078	76.1	102.1
1999-3	599	764	1,726	1,681	78.5	102.7
1999-4	523	647	1,407	1,370	80.9	102.7
2000-1	471	607	1,195	1,175	77.7	101.8
2000-2	546	752	1,475	1,492	72.6	98.8
2000-3	503	683	1,469	1,441	73.6	101.9
2000-4	446	584	1,449	1,408	76.3	102.9
2001-1	437	588	1,989	1,941	74.3	102.4
2001-2	579	843	2,799	2,819	68.7	99.3
2001-3	529	742	2,597	2,568	71.3	101.1
2001-4	543	725	3,542	3,467	74.9	102.2
2002-1	479	637	2,873	2,819	75.2	101.9
2002-2	484	691	2,513	2,532	70.1	99.2
2002-3	483	672	3,572	3,512	71.8	101.7
2002-4	510	683	4,807	4,643	74.6	103.5
2003-1	488	655	4,456	4,349	74.5	102.5
2003-2	593	846	5,615	5,487	70.1	102.3
2003-3	616	866	5,657	5,622	71.1	100.6
2003-4	411	608	2,976	3,015	67.6	98.7
2004-1	348	301	2,887	2,815	115.7	102.6
2004-2	415	358	3,551	3,558	115.7	99.8
2004-3	361	295	2,769	2,746	122.6	100.8
2004-4	303	270	2,841	2,817	112.3	100.9
2005-1	281	248	2,622	2,545	113.1	103.0
2005-2	365	292	3,153	3,064	125.1	102.9
2005-3	372	301	3,460	3,351	123.7	103.3
2005-4	294	260	2,842	2,764	113.2	102.8
2006-1	265	238	2,380	2,282	111.1	104.3
2006-2	344	269	2,748	2,611	128.2	105.2
2006-3	333	254	2,599	2,461	131.2	105.6
2006-4	261	224	2,545	2,396	116.5	106.2
2007-1	231	198	2,249	2,000	116.8	112.4
2007-2	305	235	2,415	2,220	129.6	108.8

Table 3 (Continued)						
Quarterly Loan Originations (in Thousand Loans)						
	\$75,000 and under		Over \$75,000		NMDB/HMDA (Percent Ratio)	
Quarter	NMDB®	HMDA	NMDB®	HMDA	<=\$75,000	>\$75,000
2007-3	278	217	1,935	1,844	128.2	104.9
2007-4	216	189	1,701	1,643	114.7	103.5
2008-1	203	184	1,884	1,762	109.9	106.9
2008-2	239	210	1,772	1,696	113.8	104.5
2008-3	204	179	1,296	1,259	113.8	102.9
2008-4	146	134	1,158	1,100	108.5	105.3
2009-1	152	147	2,137	2,023	103.8	105.6
2009-2	206	187	2,557	2,450	110.5	104.4
2009-3	190	172	1,796	1,757	110.3	102.2
2009-4	163	157	1,772	1,701	104.1	104.2
2010-1	131	129	1,320	1,293	101.7	102.1
2010-2	177	163	1,565	1,532	108.2	102.2
2010-3	169	163	1,937	1,880	103.5	103.0
2010-4	181	180	2,252	2,202	100.6	102.3
2011-1	148	153	1,394	1,384	97.2	100.8
2011-2	180	176	1,265	1,253	102.0	100.9
2011-3	192	192	1,556	1,538	100.1	101.2
2011-4	193	204	1,916	1,890	94.4	101.4
2012-1	189	193	1,864	1,832	97.9	101.8
2012-2	218	222	2,050	2,035	98.3	100.7
2012-3	229	233	2,332	2,287	98.3	102.0
2012-4	231	239	2,455	2,402	96.5	102.2
2013-1	226	237	2,207	2,188	95.2	100.9
2013-2	253	259	2,294	2,277	97.6	100.7
2013-3	227	230	1,769	1,764	98.5	100.3
2013-4	168	171	1,212	1,229	98.2	98.7
2014-1	127	138	929	972	92.1	95.5
2014-2	176	171	1,280	1,300	102.8	98.5
2014-3	171	167	1,342	1,401	102.4	95.8
2014-4	161	152	1,293	1,361	106.2	95.0
2015-1	146	132	1,415	1,464	110.9	96.6
2015-2	193	164	1,754	1,817	118.0	96.5
2015-3	192	164	1,592	1,674	117.2	95.1
2015-4	173	142	1,369	1,442	121.9	95.0
2016-1	151	130	1,326	1,390	116.6	95.4
2016-2	195	157	1,792	1,889	123.8	94.9
2016-3	197	157	2,004	2,099	124.8	95.5
2016-4	199	151	1,890	1,977	131.8	95.6

Appendix A. Origins of NMDB®

The primary sources explored were the Home Mortgage Disclosure Act (HMDA) data, the Federal Reserve Bank of New York's Equifax Consumer Credit Panel, the CoreLogic property database, the servicing databases owned by CoreLogic and Black Knight Financial Services, and data available from the three national credit repositories—Experian, Equifax, and TransUnion. Public survey databases, particularly the American Housing Survey (AHS), were also considered. All of these sources share several desirable features such as: (1) the databases are de-identified containing no direct-identifying information such as borrower name, address, or Social Security number; (2) they are collected for other purposes, thus their use entails no new data collection from lenders, servicers or borrowers; and (3) all of them have been collected for a period of time and are expected to continue into the future.

However, each was also found to be deficient in significant ways.

The HMDA data include loan applications and underwriting outcomes for most mortgages with selected information about the loan, property, and borrower. The data are arguably the most representative publicly available existing data source about the mortgage market. However, the HMDA data contain no information on loan performance, little information on borrower creditworthiness, and have up to a 21-month delay in release. The CoreLogic property database suffers from similar deficiencies. Although it has widespread coverage, the database contains very limited information on mortgage characteristics or performance and nothing on the borrower.

The Federal Reserve Bank of New York's Equifax Consumer Credit Panel provides a nationally representative 1-in-20 sample of individuals with credit records, observed quarterly from 1999 onward. However, mortgage loans are often represented by duplicate trade lines and important information is missing, such as loan purpose, owner-occupancy, pricing, loan-to-value ratio, income, and borrower demographics. Finally, these data are accessible at present only to the Federal Reserve System.

CoreLogic and Black Knight Financial Services produce loan-level databases with performance information collected from mortgage servicers. The servicing fields available from CoreLogic and Black Knight are relatively comprehensive in both variables and coverage: the CoreLogic database claims about 32 million active mortgage loans, while the Black Knight database claims about 31 million active mortgage loans. However, these data offer no assurance of being representative, as data are only collected from about 25 servicers each. Moreover, mortgages cannot be tracked if servicing is transferred. Other drawbacks include minimal borrower demographics and no information on other borrower's obligations.

The semi-annual AHS contains comprehensive information on a nationally representative 1-in-2,000 sample of mortgages of owner-occupied properties with very good information about the property and borrower demographic. However, the AHS has only limited information about the mortgage itself. As with the other nationally representative consumer survey data sources, the AHS contains no information on mortgage performance, provides only a small number of observations, and is released with a significant lag.

The credit repository data from Equifax, Experian, and TransUnion are rich in credit information. By construction they incorporate data on credit card debt, installment loans, credit inquiries, and public records for the consumers they have in their respective databases. Their data can be linked to marketing datasets that provide borrower characteristics including age, gender, and marital status which, if validated, could be of potential use in a dataset. The credit repositories also maintain data on borrowers' changes of address and broader geographic classifications, such as the census tract. However, there are important areas that are not covered. They lack some information on borrowers (*e.g.*, income), mortgages (*e.g.*, loan product and contract rate), and the underlying property (*e.g.*, location and value).

Given the foregoing, FHFA and CFPB, along with other organizations most notably HUD, the Federal Reserve Board and Freddie Mac, decided that a modified derivative of the credit repository data offered the best source from which to construct a nationally representative comprehensive mortgage database. The three credit repositories all actively pursue loan servicers as data providers. As a result, they obtain information on almost the entire population of non-private mortgage loans made in the United States. Furthermore, they archive their data, making it possible to “jump start” the data collection process by going back in time, collecting data in almost the same fashion as if it had taken place in real time.

As part of the exploratory process, using a competitive procurement process, Experian was engaged by Freddie Mac to construct a prototype to confirm the appropriateness of using credit repository data for the database. This effort confirmed the concept but suggested that a number of steps needed to be taken in order to meet the design objectives.

First, it was recommended that the database should be a sample rather than a universal registry of loans. Second, while these data contain detailed information on loan performance and other borrower credit obligations, they are missing critical data items needed for the database such as the location and features of the property, demographics, and loans characteristics such as whether the loan had an adjustable- or fixed-rate mortgage and whether the loan was a refinance or for a home purchase. Thus, it would be necessary to access other data sources and merge information gleaned from them with the repository data in order to make the database comprehensive. Pilot testing also confirmed that the best method of merging data would rely on third-party blind matching conducted behind a firewall at the credit repositories.

Appendix B. Background on Mortgage Delinquency Reporting

Almost all closed-end first-lien mortgages, such as those in the NMDB®, have a payment-in-arrears structure. That is, the mortgage payment for a month (*e.g.*, January) is generally due on the first day of the next month (*e.g.*, February 1). Moreover, the first “ever” payment on a mortgage is generally due on the first day of the second full month after the mortgage closing date. For example, borrowers who close on their mortgage on January 15 will have their first payment due on March 1. These borrowers would have prepaid the interest for the period covering January 15 through January 31 at their mortgage closing. One component of each monthly mortgage payment is the interest of the previous month based on the balance at the beginning of the month. While the monthly mortgage payment is generally due on the first of the month, most servicers allow a 15-day grace period for borrowers to pay. However, if the payment is not received by the 15th, the mortgage loan is considered past due 15 days. Thereafter, a loan not paid by the X-th date after the due date is considered X days past due.

Each month, mortgage servicers report the performance information to the credit repositories for each mortgage loan they service as of a snapshot date (balance date). Generally, the repositories will accept only one report per loan per month. Servicers report three measures of performance: (1) the account condition code which describes the condition of the mortgage, *e.g.*, whether it is open, paid in full, closed, transferred, or inactive; (2) a special comment code which provides special information on the mortgage such as a loan modification, location in a disaster area county, or dispute by the borrower; and (3) a loan status code which provides information on how many days “past due” a loan is as determined by the oldest non-paid payment (loan payments are generally applied against the oldest non-paid payment). Industry and Metro 2® credit repository reporting guidelines (available since 1997) differentiate between loans that are current or past due 29 or fewer days; 30 to 59 days past due; 60 to 89 days past due; 90 to 119 days past due; 120 to 149 days past due; and 150 to 179 days past due; and 180 or more days past due. This is the classification used for most loans. If a loan becomes 90 days past due under many mortgage contracts, the lender can declare the loan “in default.” The borrower then typically has 90 days to become current. If not, the lender can file a foreclosure action in which case the loan status is changed from “days past due” to some form of foreclosure or collection. If the borrower files for bankruptcy, the loan may be assigned a “bankruptcy” status even if the payments are current.

A status code may be suppressed or not reported for some loans. This can occur for a variety of reasons—a borrower’s payments may have been suspended because of a natural disaster; reports may not be supplied for the period between a loan’s closing or the first due date; status is often not continually reported when loan servicing is sold from one servicer to another when it takes time for the acquiring servicer to set up reporting; status updates are often not reported for loans in foreclosure or other forms of serious delinquency; or servicers may have had problems with their servicing systems (as occurred, for example, in August 2015 and April 2016 for several large servicers). There are also loans which do not fit these circumstances—some loans do not have due dates of the first of the month; others have bi-weekly or quarterly payment requirements; some borrowers make partial payments (often to what is called a suspense account) which can leave them in a perpetually past-due status; others can make extra payments (curtailment) to reduce their loan balance more rapidly.

Servicers reporting to the credit repositories using Metro 2® guidelines are supposed to follow the guidelines described above. Thus, a loan with a due date of January 1 will be considered 30 days past due on January 31 if the payment has not been received by that date (the “days past due” standard). In the past, however, many servicers used a “billing cycle month” standard. Under the “billing cycle month” standard, a loan was not considered “30 days” past due until the due date of the next month (e.g. February 1 for a January 1 payment). The “billing cycle month” standard, associated with the older Metro™ reporting format, was phased out over the 2000s for reporters to the repositories. However, this has not necessarily happened for other regulatory reporting. Mortgage delinquency metrics reported to the Federal Financial Institutions Examination Council (FFIEC) for banking institutions can be based on either “days past due” or “billing cycle month” standards at the reporter’s discretion. Credit unions used the “billing cycle month” standard until 2013 when they were required to report using both methods. Fannie Mae and Freddie Mac report delinquency statistics for loans in their security pools using the “billing cycle month” standard.

Within the Metro 2® reporting guidelines and for other delinquency reporting, there is also variation based on precisely when a loan’s status is measured. Under the Mortgage Bankers Association’s “MBA” method, a loan is considered past due X days if a payment is not received by close of business (COB) on the X-th day following its due date. That is, a loan with a due date of March 1 is considered 30 days past due at COB on March 31. Under the Office of Thrift Supervision’s “OTS” method, a loan is considered past due X days if the payment has not been received by COB on the X+1-th day (e.g., April 1 for a March 1 due date).

The credit repositories allow loan servicers to choose whichever reporting day within the month that they wish to use, and either the MBA or OTS method. As of 2017, about 90 percent of reporters use the same day of the month every month and the same day for all of their loans. For NMDB® loans active in 2014 and later, the modal report day (31 percent) was the last day of the month; 16 percent were on the 5th; 12 percent on the 7th, and 8 percent on the 21st. For “prime” first lien closed-end mortgages, which dominate the NMDB®, servicers generally use the MBA method. Subprime servicers, however, who played a significant role in the 2003 to 2007 period, typically used the OTS method.

These differences in reporting day and method can lead to significant variation in the incidence of delinquency for loans with identical payment patterns when comparisons are made month-to-month or between servicers with different reporting patterns. This is shown in Table B-1. Servicers who report at the end of the month using the MBA method will maximize the 30-day delinquent count in the seven months with 31 days because the reporting day is the first day a loan can be 30 days delinquent. Servicers reporting in the latter half of the month—but not on the last day—will tend to systematically show lower delinquency rates.

These distinctions may matter when aggregated measures of delinquency are computed, particularly those for 30-days past due. For example, in 2016, servicers in the NMDB® reporting on the last day of the month showed an average 30-day delinquency rate 0.76 percentage points higher in the seven months with 31 days than they did for the five months with 30 days or less.

For servicers reporting between the 16th and the second-to-last day of the month, there is only a 0.03 percentage point difference.

These reporting differences can cause systematic differences across states as well. For example, 47 percent of the 2016 reporters in Mississippi were end-of-the-month reporters compared to 17 percent in Alaska, almost surely influencing the number of 30-day delinquencies. Because reporters can only report loan status once a month and it is impossible to know when a loan payment was received for many loans, this bias is difficult to correct for. Also, as just noted, numbers for the NMDB® are likely to show persistent monthly patterns if results are not seasonally-adjusted.

The mixture of reporting patterns in the credit repository data along with other differences in methodology and composition lead to systematic differences in aggregate delinquency metrics constructed from the NMDB® data when compared to other delinquency measures. For example, the MBA National Delinquency Survey asks respondents to classify loans by their status at COB on the last day of the quarter using the MBA method although it appears that the servicer can use either the “billing cycle month” or “days past due” standard. If the “days past due” standard is used, it means that reports for March and December (31 days) will show persistently higher 30-day delinquency rates than those of June and September. Similarly, 90-day delinquency rates will be lower in the first quarter except for leap years. The degree of seasonality will depend on what percentage of the reporters use the “billing cycle month” versus the “days past due” standard. FFIEC call report statistics, which are also reported COB on the last day of the quarter, will also exhibit seasonality depending on the mix of servicers using different methods. FFIEC statistics are further clouded by the fact that servicers can use either the MBA or OTS accounting method.

Delinquency statistics reported by Freddie Mac and Fannie Mae for loans in their security pools should show the least month-to-month distortions. Both companies use an end-of-month measure computed using the MBA method and “billing cycle month” standard which should lead to stable monthly patterns. Given that the standard mortgage contract is based on a monthly payment standard there is a compelling argument that the “billing cycle month” standard for measuring delinquency is the most appropriate. Nevertheless, that is not the standard used by most furnishers and thus is not the standard reflected in the NMDB® data.

The delinquency data in the NMDB® are built from the servicer reports supplied by Experian but with some additional processing. The performance information supplied by servicers for loan status, account condition, and special comments is static; that is, each month when the servicers update the performance data for a loan, the previous values for these variables are overwritten with new information. The values supplied in the previous months can only be recovered from archives. However, all the credit repositories maintain an abbreviated record of historical performance, known as a payment grid, which is not overwritten, but can be (and is) updated. Under FCRA rules the payment grid can only go back 84 months. When an initial report is supplied for a month (say June 2016) the “June 2016” element of the payment grid is initially populated. However, in subsequent filings the servicer can change the “June 2016” value. This can happen for a variety of reasons—the servicer can catch an error, they may have inadvertently failed to report performance in the first filing, the consumer could dispute the report and get the

record changed, or the report could subsequently be suppressed, for example, because the borrower was impacted by a natural disaster.

In general, the monthly performance measure in the NMDB® is constructed from the payment grid, using the most recently reported information for a given month. Payment grids retrieved from archival data—which were collected quarterly from June 2012 on and semi-annually before that—were used to piece together a full measure of performance and to get around the 84-month limitation on current data. An additional complication is created when loans are transferred from one servicer to another. Here, payment grids need to be combined for two different reporters to create a continuous measure of performance. Often when this happens, the transferring servicer will initially report the loan as delinquent but then correct it when they receive the transfer notice. Transfers may also create gaps in the payment grid when the new servicer is slow to report the loan. FCRA rules also place restrictions on how the new servicer reports performance under the assumption that some borrowers may have sent payments to the wrong place.

The effect of this process is that the initial performance report for a loan is often subsequently changed. On net, this tends to improve the overall measure of performance, but in recent years the change is small. For example, the initial NMDB® report for June 2016 differed from “final” report in June 2017 for 1.3 percent of the cases. The majority of these were blanks in the initial report but there were some real changes. Changes went both ways—2.3 percent of the loans originally reported as 30-days past due were corrected to current. But an almost equivalent number were changed from current to delinquent.

On balance, the updating process reflected in the NMDB® is likely to mean that in recent years delinquency measures in the NMDB® will be slightly more positive than other indices, such as the index reported by Equifax in their Quarterly U.S. Consumer Credit Trends publication, which are compiled only from the initial report. However, during the mid-2000s when the private label subprime market was a significant part of the mortgage market, sale of servicing was more prevalent and more likely to have led to initially inaccurate delinquency reports. Here, the NMDB® data show noticeable differences from indices based on initial reports.

Another difference arises when seriously delinquent loans are transferred within an organization (*e.g.*, from normal servicing to “work out” departments). It is not unusual for the loan to be reported as open and delinquent by both departments creating a double counting if not corrected. These reports are combined in constructing the NMDB®, but they may not be combined in other indices which are based on open accounts with positive balances. Consequently, indices of serious delinquency constructed from the NMDB® may differ from those constructed from other sources.

Finally, there is some ambiguity as to how to define an open account. It is not unusual for lenders to initiate foreclosure actions on small mortgage loans but never complete the process, perhaps because they decide the property isn’t worth acquiring. In other cases, state law allows lenders to maintain a claim on the borrower, termed a deficiency judgement, after a foreclosure. These loans can remain on the Experian files as open, with positive balances, for a long time until they are purged by FCRA rules. However, the borrower may well have lost title to the house or moved out much earlier in the process.

Table B-1																
Impact of Reporting Cycle Standard and Reporting Method on Delinquency Measurement																
Reporting of Days Past Due for a Mortgage where Payments were Stopped*																
	MBA Method**								OTS Method**							
Month Payments Stopped	Current Month	Month Plus 1	Month Plus 2	Month Plus 3	Month Plus 4	Month Plus 5	Month Plus 6	Current Month	Month Plus 1	Month Plus 2	Month Plus 3	Month Plus 4	Month Plus 5	Month Plus 6		
End of Month Reporters -Days Past Due Standard																
January	D30	D30	D60	D90	D150	D180	D180	C	D30	D60	D90	D120	D150	D180		
February	C	D30	D60	D90	<i>D120</i>	<i>D180</i>	D180	C	D30	D60	D90	D120	<i>D150</i>	<i>D180</i>		
March	D30	D60	D90	D120	D150	D180	D180	C	D30	<i>D90</i>	D120	D150	D180	D180		
April	C	<i>D60</i>	D90	D120	D150	D180	D180	C	D30	<i>D60</i>	<i>D120</i>	D150	D180	D180		
May	D30	D60	D90	D120	D150	D180	D180	C	D30	<i>D90</i>	D120	D150	D180	D180		
June	C	<i>D60</i>	D90	D120	D150	D180	D180	C	D30	<i>D90</i>	D120	D150	D180	D180		
July	D30	D60	D90	D120	D150	D180	D180	C	<i>D60</i>	<i>D90</i>	D120	D150	D180	D180		
August	D30	D60	D90	D120	D150	D180	D180	C	D30	<i>D90</i>	D120	D150	D180	D180		
September	C	<i>D60</i>	D90	D120	D150	D180	D180	C	D30	<i>D60</i>	<i>D120</i>	<i>D150</i>	<i>D150</i>	D180		
October	D30	D60	D90	D120	D150	D180	D180	C	D30	<i>D90</i>	D120	D120	D180	D180		
November	C	<i>D60</i>	D90	D150	D180	D180	C	D30	<i>D90</i>	D90	D120	D150	D180	D180		
December	D30	D60	D60	D120	D150	D180	D180	C	D60	D60	D90	D120	D180	D180		
Middle of Month Reporters - Days Past Due Standard																
All Months	C	D30	D60	D90	D120	D150	D180	C	D30	D60	D90	D120	D150	D180		
Billing Cycle Month Standard Reporters**																
All Months	D30	D60	D90	D120	D150	D180	D180	C	D30	D60	D90	D120	D150	D180		

Impact by Number of Days in the Month and Timing of Reporting Date															
Reporting of Missed Payments and Subsequent Cure Using the Days Past Due Standard and MBA Method															
March (31 Day Month)							April (30 Day Month)								
Performance Month							Performance Month								
Date Cured	March	April	May	June	July	August	Date Cured	April	May	June	July	August	Sept.		
End of Month Reporters															
15-Apr	D30	C	C	C	C	C	15-May	C	C	C	C	C	C		
15-May	D30	D60	C	C	C	C	15-Jun	C	D60	C	C	C	C		
15-Jun	D30	D60	D90	C	C	C	15-Jul	C	D60	D90	C	C	C		
15-Jul	D30	D60	D90	D120	C	C	15-Aug	C	D60	D90	D120	C	C		
Report on 22nd of Month															
15-Apr	C	C	C	C	C	C	15-May	C	C	C	C	C	C		
15-May	C	D30	C	C	C	C	15-Jun	C	D30	C	C	C	C		
15-Jun	C	D30	D60	C	C	C	15-Jul	C	D30	D60	C	C	C		
15-Jul	C	D30	D60	D90	C	C	15-Aug	C	D30	D60	D90	C	C		
Report on 7th of Month															
15-Apr	C	D30	C	C	C	C	15-May	C	D30	C	C	C	C		
15-May	C	D30	D60	C	C	C	15-Jun	C	D30	D60	C	C	C		
15-Jun	C	D30	D60	D90	C	C	15-Jul	C	D30	D60	D90	C	C		
15-Jul	C	D30	D60	D90	D120	C	15-Aug	C	D30	D60	D90	D120	C		

Note: This illustration is for loans where the payment due date is on the first of the month. C = Current. D30 = 30-59 days past due. D60 = 60-89 days past due. D90 = 90-119 days past due. D120 = 120-149 days past due. D150 = 150-179 days past due. D180 = 180 or more days past due.

*Bold indicates where performance reporting stays the same and *italics* indicates where reporting skips a reporting cycle.

**See text for explanation of "MBA" and "OTS" methods; and "Days Past Due" and "Billing Cycle Month" standards.



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