



IN BRIEF

APPLYING TECHNOLOGY ADVANCES TO IMPROVE PUBLIC ACCESS TO MORTGAGE DATA

Ren Essene and Michael Byrne

Consumer Financial Protection Bureau

“Sunlight is said to be the best of disinfectants”

—Justice Louis D. Brandeis

Recent open government initiatives view data as a “valuable national resource.” Project Open Data and others are providing data sets to the general public and private-sector innovators “to promote efficiency and effectiveness in government, but also...to create economic opportunity and improve citizens’ quality of life.”¹

Data can help community leaders understand how well current policies are working and advance evidence-based policymaking. The community development sector has a long history of using data and metrics alongside community members’ stories to inform policymaking. Two civil rights era statutes from the 1970s, the Community Reinvestment Act (CRA) and the Home Mortgage Disclosure Act (HMDA), implicitly encourage citizen groups working to improve their communities to use data to augment the more formal regulatory and enforcement establishment.²

Although there continues to be a push to release more data sets, many open data advocates are also focused on the quality and value of the

1 Project Open Data [website]: <http://project-open-data.github.io/>.

2 A. Fishbein, “The Ongoing Experiment with ‘Regulation from Below’: Expanded Reporting Requirements for HMDA and CRA,” *Housing Policy Debate*, 3 (2) (1992): 601–636.

data. The idea that public disclosure can improve market functioning, engendering both greater fairness and efficiency, depends critically on the quality and value of the public information available. As the community development sector has long understood, data need to be relevant, easily accessible, and easy to use.

In keeping with these objectives, the Consumer Financial Protection Bureau (CFPB) has developed new mortgage data tools to provide public HMDA data in more user-friendly forms to improve transparency in the mortgage market. These tools make it easier for the public to analyze market trends and emerging risks. Public officials also gain improved access to the public data to conduct analyses that may inform future policymaking and research.

HMDA BACKGROUND

In response to community development issues in the 1960s and 1970s, including urban blight caused by mortgage redlining by thrift institutions and banks, Congress passed a series of federal laws to prevent discrimination, discourage redlining, and encourage reinvestment in the nation's cities.³ Enacted in 1975, HMDA provides communities with greater transparency about local lending activities as a way to encourage a fair and functioning mortgage market, particularly for low-income and minority neighborhoods. At its core, HMDA is a simple statute: it ensures transparency by requiring many mortgage lenders to collect, report, and publicly disclose data about their home lending activities. HMDA data currently capture the majority of mortgage loans made, loans sold, and applications received for home purchase, refinance, and home improvement in metropolitan areas.⁴

Initially, Congress was focused on discrimination at the neighborhood (census tract) level. The two original purposes of HMDA include: 1) to help determine whether financial institutions were serving the housing needs of

3 P. McCoy, "The Home Mortgage Disclosure Act: A Synopsis and Recent Legislative History," *Journal of Real Estate Research* 29 (2007): 381–397. These laws include Title VIII of the Civil Rights Act (1968), the Equal Credit Opportunity Act (1974), the CRA (1977), and HMDA (1975).

4 Financial institutions that meet the metropolitan statistical area (MSA) asset and loan threshold tests report their lending activities in non-MSA areas, while financial institutions that do not have a home or branch office in an MSA generally do not report their lending activity. See FFIEC, "A Guide to HMDA Reporting: Getting it Right!" (Washington, DC: FFIEC, December 30, 2013), available at www.ffiec.gov/hmda/guide.htm.

their communities; and 2) to help public officials distribute public-sector investment to attract private investment to needed areas. In the late 1980s, studies highlighted potential race-based lending discrimination, and Congress responded with broad changes to HMDA. In particular, Congress amended HMDA to require itemization by “racial characteristics,” which assists in identifying possible discriminatory lending patterns and enforcing antidiscrimination statutes.

HMDA’s statutory text and legislative history show that the law was designed to put data in the hands of the public as well as government officials. Spurred by community advocates and in response to changing market products and practices during the past 39 years, Congress and the Federal Reserve Board have updated, respectively, HMDA and its implementing Regulation C significantly to improve the volume and types of information publicly available. For example, in 1980, the Federal Financial Institutions Examination Council (FFIEC) was directed to compile data for metropolitan areas and produce aggregate tables for institutions by categories such as census tracts, age of housing, income, and race.⁵ Following additional statutory changes in 1989, Regulation C was revised to require financial institutions to record loan-level information on the “Loan/Application Register” (LAR), including information about race, ethnicity, sex, income, and application disposition.

Today, HMDA is the preeminent source of data about the US mortgage market and is used by community advocates, economists, social scientists, the news media, government agencies, and financial institutions. HMDA data have been used to understand community lending patterns across different characteristics, such as income, race, and ethnicity. This understanding has driven policy related to community investment strategies, helped bank regulators and other agencies supervise financial institutions, ensured greater compliance with the CRA, and aided in the enforcement of fair lending laws. In response to the Great Recession, Congress passed

5 The FFIEC is a formal interagency body empowered to prescribe uniform principles, standards, and report forms for the federal examination of financial institutions by the Board of Governors of the Federal Reserve System (FRB), the Federal Deposit Insurance Corporation (FDIC), the National Credit Union Administration (NCUA), the Office of the Comptroller of the Currency (OCC), and the CFPB, and to make recommendations to promote uniformity in the supervision of financial institutions. In 2006, the State Liaison Committee (SLC) was added to the Council as a voting member. The SLC includes representatives from the Conference of State Bank Supervisors (CSBS), the American Council of State Savings Supervisors (ACSSS), and the National Association of State Credit Union Supervisors (NASCUS). See <http://www.ffiec.gov/>.

the Dodd-Frank Act, which transferred HMDA rulemaking authority to the newly established CFPB and added new reporting requirements.

MODERNIZING HMDA

The CFPB's modernization efforts address the three stages of HMDA data: collection, reporting and processing, and publication. In implementing the Dodd-Frank Act changes to HMDA, the CFPB has proposed to reform the HMDA data collection.⁶ Alongside this rulemaking, the CFPB is working to modernize and improve the reporting and processing of the future HMDA data set to mitigate burden and increase efficiency for industry. The CFPB has also worked to improve data publication, as robust public access allows for greater public transparency and utility, ultimately better serving the purposes of HMDA.

HMDA has an established history as a high-quality public data source for technically sophisticated users analyzing mortgage market applications, originations, and loan purchase activity. These users are generally academic, industry, or government researchers with statistical analysis and statistical software skills. Although full data files are available to the public on the interagency FFIEC website, the size and complexity of the data can be hard for the public to digest and understand. Beyond the data files, the FFIEC also releases aggregate and disclosure reports that aggregate and display the data by different geographies and financial institutions.⁷ However, some of the primary audiences have found the information difficult to use. Although the data have become more accessible as technology has advanced, community advocates continue to call for the information to be more user-friendly.⁸

The CFPB employs a user-centric design approach to technology development. Therefore, to understand better the challenges that HMDA data

6 On July 24, 2014, the CFPB issued on its website a proposed rule to implement the Dodd-Frank Act changes to HMDA and make other improvements in Regulation C. See: <http://www.consumerfinance.gov/newsroom/cfpb-proposes-rule-to-improve-information-about-access-to-credit-in-the-mortgage-market/>. The proposed rule was published in the Federal Register on August 29, 2014. See 79 Fed. Reg. 51732 (August 29, 2014).

7 For a listing of reports see FFIEC, "HMDA Aggregate and Disclosure Reports" [website] (Washington, DC: FFIEC), available at <https://www.ffiec.gov/hmdaadwebreport/abouthmda.htm>.

8 The Federal Reserve Board conducted hearings on HMDA reform in 2010 to gather suggestions for improvements. Many panelists called for improved public access to the data. For more detail on the hearings, see www.federalreserve.gov/communitydev/hmda_hearings.htm.

users face, the CFPB reached out to community groups, think tanks, academia, and other regulatory agencies asking how they currently use HMDA data and what barriers exist to greater use. These initial user interviews suggested that local government, community groups, and students, in particular, would benefit from more accessible HMDA data. Users expressed interest in a web layout, default data, download options, custom geographies, save search function, user forums, mapping capabilities, and panel data that are more intuitive and easier to use. Users also wanted improved data documentation.

Once the problem was clear, the initial solution prioritized broadening the user base and helping less technically sophisticated users to download smaller slices of HMDA data. The CFPB then put its technology experts to the task of designing a web-based solution. The initial result is a new public data platform that enables queries to the data to be processed almost instantly, providing data users with both a simple summary statistic and the complete underlying data used to develop that summary. This technology approach is a great step forward for large data delivery to less sophisticated users.

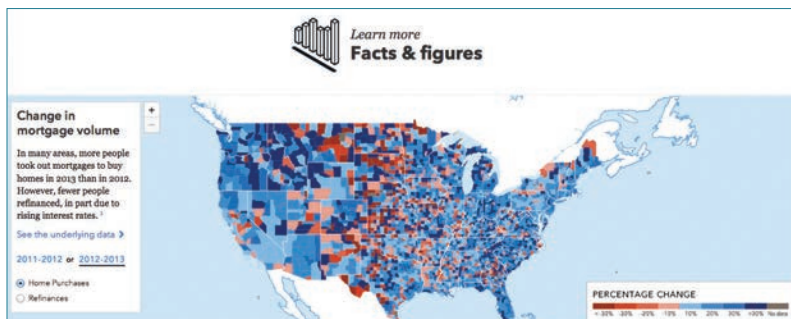
NEW MORTGAGE DATA TOOLS



The CFPB's open source HMDA public data platform (available at www.consumerfinance.gov/hmda) provides information for a variety of users. Basic *facts and figures* provide a snapshot of annual mortgage data; *get the data* allows users to filter and download just the data they need; and *developers* offers access to the underlying application programming interface (API) to allow developers to build their own tools and contribute to the open source tools.

Facts & Figures

Homepage: The homepage shows some basic trends and infographics to orient the user, along with linking to a video that describes what is in the data.



Get the Data

Users can either extract a bulk download or download filtered data since 2007, allowing users to better understand the mortgage market trends in their communities. For less sophisticated users, the tools allow users to construct custom filters and queries and download the data in multiple formats, depending on the users' software options. Users can also share filtered data through the new platform's "share" function to encourage a robust civic debate.

Explore the data CUSTOM DATASETS SUMMARY TABLES

Get the data Find what you want

Filters

Interested in learning about specific mortgage trends in a location, among a community, or with a certain type of loan? Filter your search results to get just the data you need. You can also download the filtered HMDA data in different formats.

[Filter data >](#)

Summary tables

Need more insight? Use your specific search filter to create unique aggregate views called summary tables. These allow you to gain statistical insight into concepts such as applicant race, average income, and more.

You can create a summary table based on your custom data set once you've filtered to the results you want.

Custom Filters: Through links from the homepage, users can choose to see only the data that interest them. The data can be filtered by geography (state, metropolitan area, county, and census tract), loan characteristics, property type, and more. The website provides some suggested filters to help users get started.

Filter the data

Select year(s) of data: 2013 X

Select suggested filters: Mortgages for first-lien, owner-occupied, 1-... X

Want something more specific? Modify your filters below or [download now](#). [Or [start over](#).]

- +** LOCATION State, metro area, county, and census tract of the property
- +** PROPERTY Property type and occupancy
- +** LOAN Loan action, purpose, type, and more
- +** LENDER Lender ID and federal agency
- +** APPLICANT Demographic information for applicants and co-applicants

NEED MORE INSIGHT?
Compare your filtered data across state, loan type, applicant race, and more with a custom summary table. [Create a summary table >](#)

Custom Summary Tables: Similarly, users can create summary tables of information. For example, users can compare refinances and home purchases over the past few years, or see county-level trends in federally related mortgages.

Create a summary table

There are 17,016,159 HMDA records from 2013 with the previously selected filters.
Not quite what you're looking for? You can also go back and [modify your filters](#).

CHOOSE VARIABLES
Compare your filtered data by choosing up to three variables below. [Submit](#)

Select the first variable Select the second variable Select the third variable Number of records

Data Downloads: Once users select the data they want, they can download that data in a variety of formats, including CSV, which is compatible with most spreadsheet programs, and JSON, JSONP, and XML, which are standards commonly used by software developers. Users can also preview the first 100 records returned before downloading the data.

Save and Share Results: With a click on the “share” button, the user is provided a link to a unique web address for the query to share. This link can be pasted into a document, an email, or into social media, such as a Facebook post.

TOOLS FOR DEVELOPERS

Software developers can use and contribute to the API. Developers who want to build their own tools using the API can browse the documentation, and if there are technical questions, they can engage with CFPB developers using GitHub issue tracking.⁹

The new HMDA platform was built entirely on GitHub, an open source collaborative tool for developing software. Software engineers and developers interested in improving the underlying public data platform can also get involved on GitHub.¹⁰

POTENTIAL ENHANCEMENTS

Launching a new platform for data publication is only the first step. The work to date addresses today’s primary consumers of public HMDA data: community-based researchers. Although this is an important constituency, the same public data could be used by a broader audience, such as financial institutions, vendors, software developers, and industry researchers. For example, some data users may want to generate interactive data products, such as community-level maps and dynamic data visualizations. To support these applications, the CFPB could invest in the development of APIs to deliver data more efficiently and effectively than a point-and-click user interface.

9 The API is available at: <https://api.consumerfinance.gov/data>. The HMDA API Documentation is available on GitHub at: <http://cfpb.github.io/api/hmda/>. GitHub issue tracking for HMDA or “project qu” is available at: <https://github.com/cfpb/qu/issues?q=is%3Aopen>.

10 Project qu, or HMDA, can be found on the collaborative GitHub tool, available at: <https://github.com/CFPB/qu>.

Moving forward, the CFPB aspires to continue to implement best-in-breed technology that serves the public good and furthers the goals of HMDA and Regulation C. The CFPB remains committed to open source platforms and to designing technology with smaller, decoupled components as discussed above. Open source platforms enable collaboration and transparency between the CFPB and regulated institutions, helping to reduce regulatory burden by providing opportunities for program enhancements and efficiencies. These strategies also hold the potential to reduce the long-term cost of maintaining out-of-date disparate technology and reduce the large, ongoing costs of proprietary software contracts, allowing for more efficient use of government resources. Although technology gains have improved access to data, these gains may also help to ensure greater consumer protections as well. Meanwhile, future data publications will need to balance concerns for consumers' privacy with the benefits of broad public access.

CONCLUSION

Ultimately, public data and the related open-source software are a public good. With the continuing drive toward data-driven policymaking, public data may become a vital part of the next generation of civic infrastructure.¹¹ Government has an important role to play in ensuring that the data are relevant, accessible, and easy to use by a broad set of stakeholders, including the public, community groups, government agencies, regulated entities, and researchers more generally. This continued modernization is responsive to user needs and provides for greater use and transparency, allowing for greater democratic participation in housing and mortgage policies.

Specifically, technology advances help to improve the methods of data publication. Data consumers, whether they are community leaders, researchers, financial institutions, or the general public, typically have at least a basic ability to manipulate digital data and an expectation that data will be delivered via interactive web-based tools. The CFPB has released new HMDA data tools as a first step to meeting these open data and new technology demands. Ultimately, increased access to public data can help community leaders foster a healthy conversation about community issues and further the purposes of HMDA.

11 A. Howard, "The Art and Science of Data-driven Journalism." (New York: Tow Center for Digital Journalism, Columbia Journalism School, May 2014), p. 15.



REN ESSENE currently serves as the program manager of mortgage data assets in the Division of Research, Markets and Regulations at the CFPB and is the HMDA Team Lead. Previously she served as a supervisory policy analyst for the Board of Governors of the Federal Reserve System and co-authored a book chapter with Allen Fishbein entitled “The Home Mortgage Disclosure Act at Thirty-Five: Past History, Current Issues” in *Moving Forward: The Future of Consumer Credit and Mortgage Finance* (Brookings Press). Prior, Ren conducted research and engaged in policy efforts at the Federal Reserve Bank of Boston and the Joint Center for Housing Studies at Harvard.



MICHAEL BYRNE is currently a project director in the Technology and Innovation Division at the Consumer Financial Protection Bureau. He is the lead for implementing the technology supporting Home Mortgage Disclosure Act activities for CFPB. Prior to joining CFPB, he was the geographic information officer at the Federal Communications Commission. Prior to that, he was the geographic information officer for the State of California.

The views expressed are those of the authors and do not necessarily reflect those of the Consumer Financial Protection Bureau or the United States.