

2013 HMDA Survey and Case Study

Volume II: 2013 HMDA Data Insights

May 16, 2014

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Foreword

The purpose of this Case Study, the second and final report arising from our 2013 HMDA survey, is to demonstrate that cost-efficient advanced analytical tools provide mortgage bankers with critical company and peer-to-peer financial, operational, and risk management insights.

In addition, this Case Study confirms that viewing HMDA reporting as “just a compliance task” is at odds with “data driven” regulators that have aggressively deployed business intelligence solutions in response to the financial crisis of 2007 – 2008. These regulators, especially the Consumer Financial Protection Bureau, are incorporating advanced analytics into their regulatory protocols and, equally important, as the means to inform the public.

Mortgage TrueView provides mortgage bankers with an advanced analytical platform that changes regulatory reporting activities from a “check the box” exercise to a value-added activity that simultaneously manages fair lending risk while driving revenues, controlling costs, and enhancing accountability.

* * * * *

We hope the mortgage banking industry finds our reports helpful and the basis for constructive discussions on taking proactive steps to more effectively use company and industry data to manage risk and drive enterprise value. We welcome the opportunity to be part of these discussions.

To those firms that have not yet provided us with a Public LAR, we invite you to submit your data. Please visit www.mortgagetrueview.com for submission instructions.

Author's Note: The issues described in Section II resulted in a two week delay in the issuance of this report. Based on these issues, the analytics incorporated herein are based on Public LARS received in electronic format. All other Public LAR information will be loaded into Mortgage TrueView as our data management and quality assurance protocols are completed to our satisfaction.

I. Executive Summary¹

1. Key 2013 HMDA business indicators show an 8% year-over-year decline in mortgage loan applications

- Origination rates dropped from 52% to 44% (15% change) while the percentage of loans purchased increased from 17% to 27% (59% change).
- Refinancing applications dropped from 66% to 59% (11% change) while home purchase applications increased from 30% to 35% (17% change).
- Gender and race composition rates experienced moderate changes.

2. Key 2013 HMDA regulatory risk indicators show a 13% year-over-year increase in loan denial rates

- Denials based on applicant credit history increased from 25% to 29% (16% change) while denials based on collateral declined from 21% to 17% (19% change).
- Denial rates for white applicants increased from 17% to 21% (24% change) while denial rates for non-white applicants increased from 23% to 28% (22% change).
- Denial rates for Hispanics increased from 25% to 30% (20% change) while denial rates for non-Hispanics increased from 18% to 21% (17% change).
- Denial rates for female applicants increased from 21% to 26% (24% change) while denial rates for males increased from 17% to 21% (24% change).

3. Unexpected Public LAR data issues noted in Section II of this report indicate an opportunity to for HMDA Respondents to enhance compliance protocols

- The scope of data issues include missing and incomplete fields, understated application counts, and fields to be omitted pursuant to Regulation C §1003.5 (c).
- Our limited analysis of the data issues indicates that the noted data issues could be attributable to either user error in generating the Public LAR and/or issues with one or more HMDA reporting platforms.

4. The combination of HMDA regulatory risk indicators and identified data issues highlight the need for enhanced executive oversight of HMDA reporting activities

- Regulators have indicated, and demonstrated, that the consequences of non-compliance include significant fines and penalties driving the need for greater executive engagement in monitoring and managing regulatory reporting risks.

5. Integrating additional public data elements into HMDA-related lending analyses generates substantial enterprise value

- In addition to reduced fines and penalties, advanced analytics provide a more meaningful view of lending activities which, in turn, mitigates potential financial exposure.
- Advanced analytics also provide the type of insights that drive revenue and profitability, especially in challenging markets.

¹ Analytics are as of May 13, 2014. Actual results will change as additional Public LARs are loaded into Mortgage TrueView.

II. Incorporating 2013 Public LARs into Mortgage TrueView

As part of our 2013 HMDA Survey, each 2013 Public LAR provided was reviewed to identify the submission format. A 2013 Public LAR provided in an electronic format such as .dat, .txt, .csv or .xl* was classified as a machine readable format. All other response formats (e.g., .pdf or hardcopy) were classified as non-machine readable format.

The 2013 Public LAR response format determined our Extract, Transform, and Load (“ETL”) protocols for staging the 2013 Public LAR data into Mortgage TrueView. The following table summarizes our ETL data management and quality assurance protocols for each data format:

Data Format	Key Data Management Protocol(s)	Key Quality Assurance Protocol(s)
Electronic (.dat, etc.)	1. Map source file to MTV data file using our file conversion utility and load.	<ul style="list-style-type: none"> • Hash total check (record count, etc.)
Electronic (.xl*)	<ol style="list-style-type: none"> 1. Remove column headers; 2. Incorporate additional columns as needed²; 3. Execute electronic (.dat) format protocols as set forth above. 	<ul style="list-style-type: none"> • Hash total check (record count, etc.) • Visual inspection of rows and fields.
PDF (System generated or Photocopied)	<ol style="list-style-type: none"> 1. Convert to Excel format using commercial OCR software; 2. Execute electronic (.xl*) protocols as set forth above. 	<ul style="list-style-type: none"> • Hash total check (record count, etc.) • Visual inspection of rows and fields.
Hard Copy	<ol style="list-style-type: none"> 1. Scan into .pdf format; 2. Execute PDF protocols as set forth above. 	<ul style="list-style-type: none"> • Hash total check (page count, record count, etc.) • Compare hardcopy page count to the number of pages in the .pdf

Our data management and quality assurance protocols were based on Regulation C §1003.5 (c) which provides “a financial institution shall make its loan/application register available to the public after removing the following information regarding each entry: the application or loan number, the date that the application was received, and the date action was taken.”

² The addition of columns was necessary in connection with the disposition of certain data issues noted herein.

Based on this regulatory guidance, we anticipated that all submissions, regardless of the form or format, would include the elements released by the Federal Financial Institutions Examination Council (FFIEC) annually in September with the exception of census fields added by the FFIEC³.

In the course of executing our data management and quality assurance protocols we noted instances where files did not contain expected data elements⁴. The following table summarizes the key exceptions:

Exception Description	Example	Disposition
Missing Fields	<ul style="list-style-type: none"> Property Type Census Tract 	Data loaded with notice to submitter.
Incomplete Fields	<ul style="list-style-type: none"> One applicant and/or co-applicant race field 	Data loaded with additional columns added to conform to database structure.
Incomplete Records	<ul style="list-style-type: none"> Source Excel row count equaled maximum row count. 	Data loaded with notice to submitter that reported applications totaled 65,535 which is a fraction of prior year indicating incomplete records based on row limitations of Excel 2003.
Incorrect Data Format	<ul style="list-style-type: none"> Census tract field not delimited with a "." Improper data field formatting removed leading zeroes from selected fields. 	Manual repair of State, County, Census Tract, MSA Code, loan amount, income amount fields.

The indicated disposition was based on our consideration on the analytical impact associated with the omitted and/or incomplete data element. Consideration of the analytical impact, and disposition of the above noted data variances, resulted in a delay in issuing this report.

Our consideration of the issues noted above was limited as we did not have the information needed to perform a comprehensive root-cause analysis. However, there are indications that the noted issues are attributable, at least in part, to the following reasons:

³ Fields added by the FFIEC are identified in Section III of this Report.

⁴ Our data management and quality assurance protocols also noted instances where Survey Respondents provided additional data elements such as Loan Application Numbers, Loan Application Dates, Decision Dates, etc.

1. Possible user error(s) in preparing and submitting the Public LAR, particularly in the use of Microsoft Excel to provide the Public LAR in electronic format.
2. Possible issues with the Public LAR rendering system and/or user error in identifying the reporting option that generates the Public LAR.

III. Data Enrichment

The FFIEC incorporates the following census data elements into the HMDA data it releases annually in September:

1. Population: total population in tract.
2. Minority Population %: percentage of minority population to total population for tract. (Carried to two decimal places).
3. HUD Median Family Income: HUD Median family income in dollars for the MSA/MD in which the tract is located (adjusted annually by HUD).
4. Tract to MSA/MD Median Family Income Percentage: % of tract median family income compared to MSA/MD median family income. (Carried to two decimal places).
5. Number of Owner Occupied Units: Number of dwellings, including individual condominiums, (which) are lived in by the owner.
6. Number of 1- to 4-Family units: Dwellings that are built to house fewer than 5 families.

The FFIEC adds these census data elements to provide additional dimensions in evaluating and analyzing the basic HMDA data set. The FFIEC also makes approximately 1,200 other census-related data elements available through their website.

We sourced the six census data elements listed above from the FFIEC website, loaded them into Mortgage TrueView and associated them with the 2013 applications. We also added 970 additional census data elements to enhance Case Study results⁵. These additional 970 census data elements provide the HMDA respondent with many more analytical dimensions.

⁵ A list of the additional census data elements available in Mortgage TrueView can be found at www.mortgagetrueview.com.

The ability to incorporate these additional data elements provides mortgage industry executives with the ability to more fully leverage their experience and insight on a real-time basis rather than rely exclusively on third-party consultative advice. These additional data elements as part of the user-directed “hands on” access of Mortgage TrueView described in Exhibit B

IV. Case Study Analytics

Mortgage TrueView is a powerful – and disruptively constructive – combination of big data, business intelligence-enabled advanced analytics, collaborative risk management, and user empowerment. For example:

- The database at the heart of this case study is comprised of more than 55 million records each with approximately 50 fields. While most fields have no more than four or five possible values, the number of valid census tracts exceeds 75,000 resulting in billions of metadata permutations.
- The calculation and visualization of hundreds of contextualized metrics, including those designed to highlight business process risks, brings unmatched visibility and a greater opportunity for proactive engagement.
- Enterprise risk management activities are enhanced when results can be appropriately evaluated in an industry context. Such industry context indicates absolute and relative risk and advantage which aligns regulatory and enterprise interests.
- Experience matters. Providing executives, managers, and operating staff with solutions that allow them to leverage their experience and insights is likely to be much more effective than the advice and insights of third-party advisors.

The value of business intelligence-enabled advanced analytics is demonstrated in the 2013 HMDA Case Study Analytics which is comprised of the following:

1. Exhibit A provides a “first look” at absolute and relative key indicators through a series of annotated images taken from Mortgage TrueView. Specifically:
 - Exhibit A provides dashboards supporting the business and risk indicators summarized in Section I.
 - Exhibit A provides dashboards presenting indicative advanced analytical views including (i) fair lending analytics in scatter chart format and (ii) FFEIC Quality Edit Check tables.

2. Exhibit B is a Case Study User Guide prepared to provide interested parties with “hands on” access to the 2013 HMDA data. Please request access credential as set forth in Section VI prior to beginning the Case Study.

v. Case Study Conclusions

This Case Study identified a number of areas for possible improvement including the following:

1. Providing Public LARs in machine readable form, particularly .dat format, lowers compliance costs and minimizes analytical risks.
2. The issues noted in Section II confirm the need to be more diligent in overseeing regulatory reporting activities including periodic testing of rendering platforms. In addition, incorporating regulatory compliance business process intelligence would improve the quality of regulatory reporting.
3. Industry-wide collaboration in the form of concurrent submission of standardized LARS will provide contributors with more timely and substantive absolute and relative insights that will significantly reduce regulatory compliance risk.
4. Business Intelligence-enabled advanced analytics, including standardized lending analyses, will also significantly reduce regulatory risk and direct financial exposures.
5. While the data issues noted herein may be attributable to the lack of requests pursuant to Regulation C §1003.5 (c), infrequency is not a prudent justification.

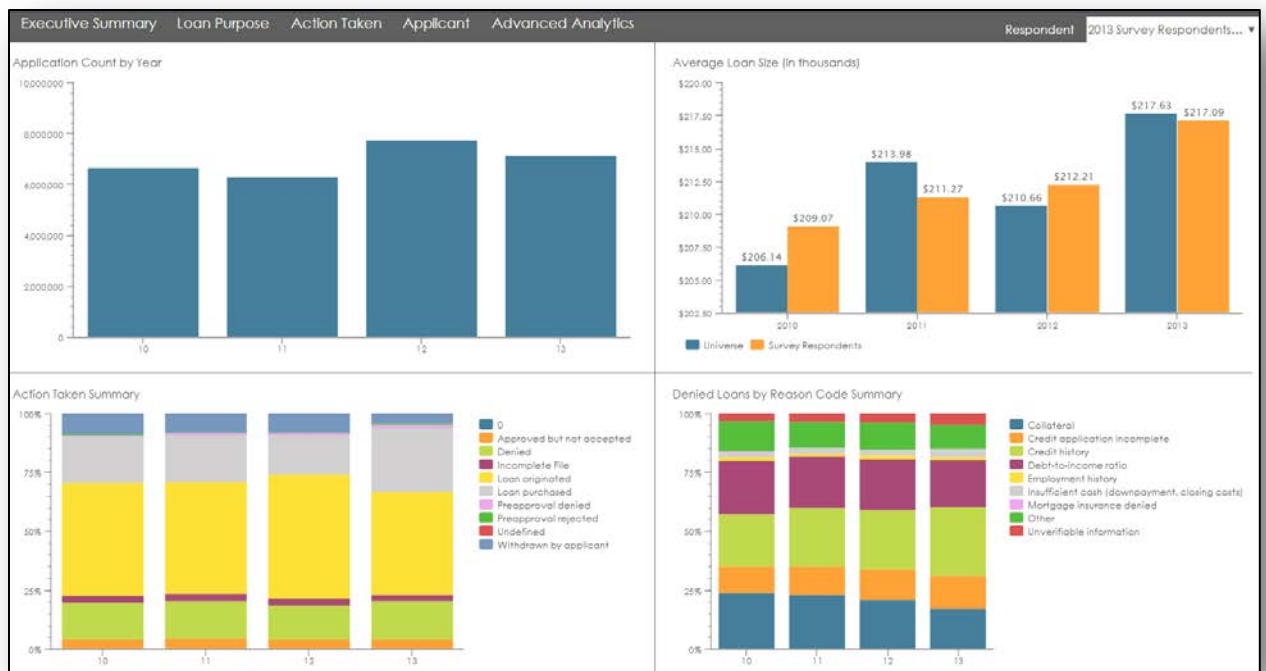
vi. Contact Information

Access Credentials: To secure access credentials to our survey results and case study on our website, please contact Tom Engebretsen at tom@mortgagetrueview.com.

Questions and Comments: Please address any questions or comments about this survey to David K. Moffat at david@mortgagetrueview.com.

Exhibit A – Key HMDA Indicators⁶.

- a. The *Executive Summary* dashboard presents (clockwise beginning with the upper left quadrant) the following:
- Application Count by Year
 - Average Loan Size Summary (in thousands)
 - Action Taken Summary
 - Denied Loan by Reason Code Summary



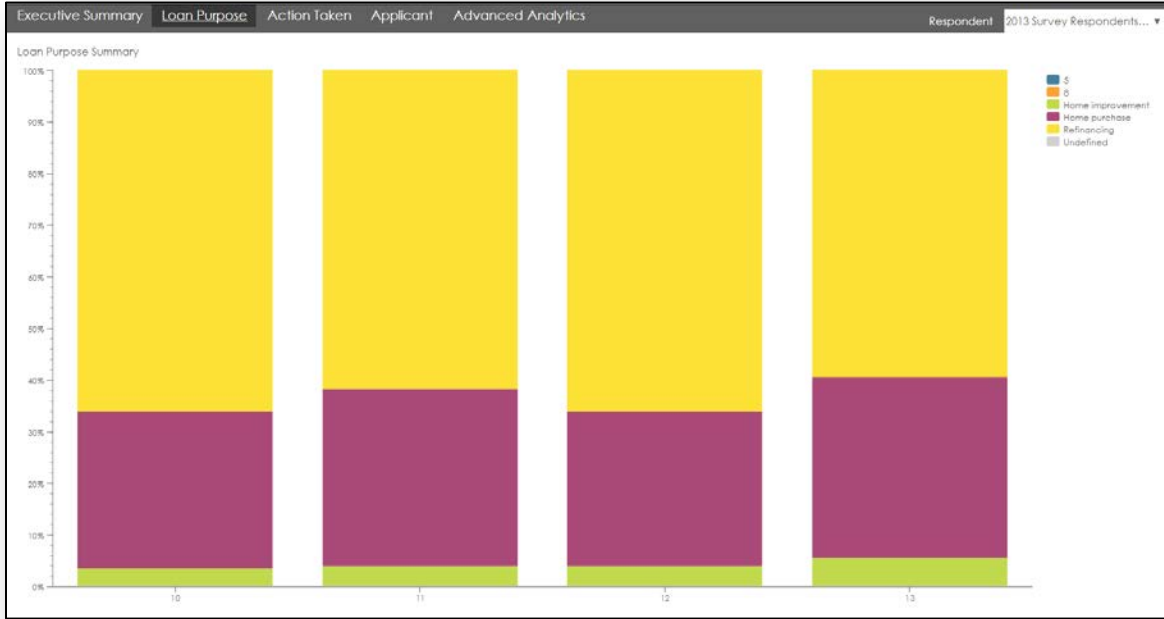
Key highlights⁷ include:

- Application volumes decreased approximately 8% from 2012 to 2013.
- Origination rates dropped from 52% in 2012 to 44% in 2013 (15% change) while loan purchased percentages increased from 17% in 2012 to 27% in 2013, (59% change).
- Average loan size is virtually unchanged.
- The denial rate increased from 16% in 2012 to 18% in 2013 (13% change)
- Denials based on applicant credit history increased from 25% in 2012 to 29% in 2013 (16% change) while denials based on collateral declined from 21% in 2012 to 17% in 2013 (19% change).

⁶ Filtered on “2013 Survey Respondents (Electronic) Group”

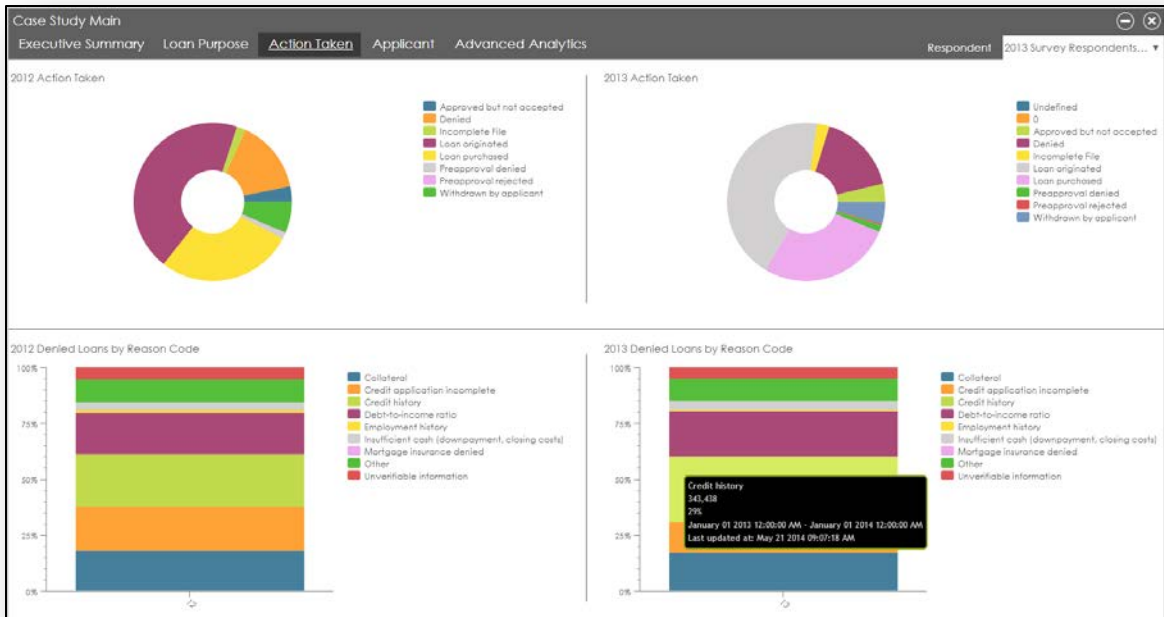
⁷ Components “legended” with numerical values or “Undefined” are indicative of the issues noted in Section II.

b. The *Loan Purpose* dashboard indicates refinancing applications dropped from 66% in 2012 to 59% in 2013 (11% change) while home purchase applications increased from 30% in 2012 to 35% in 2013 (17% change).



c. The *Action Taken* dashboard presents comparative benchmarking . Specifically:

- 2012 Action taken vs. 2013 Action Taken
- 2012 Denied Loans by Reason Code vs. 2013 Denied Loans by Reason Code



This dashboard allows for respondent-specific analytics of the dimensions presented on the Executive Summary dashboard.

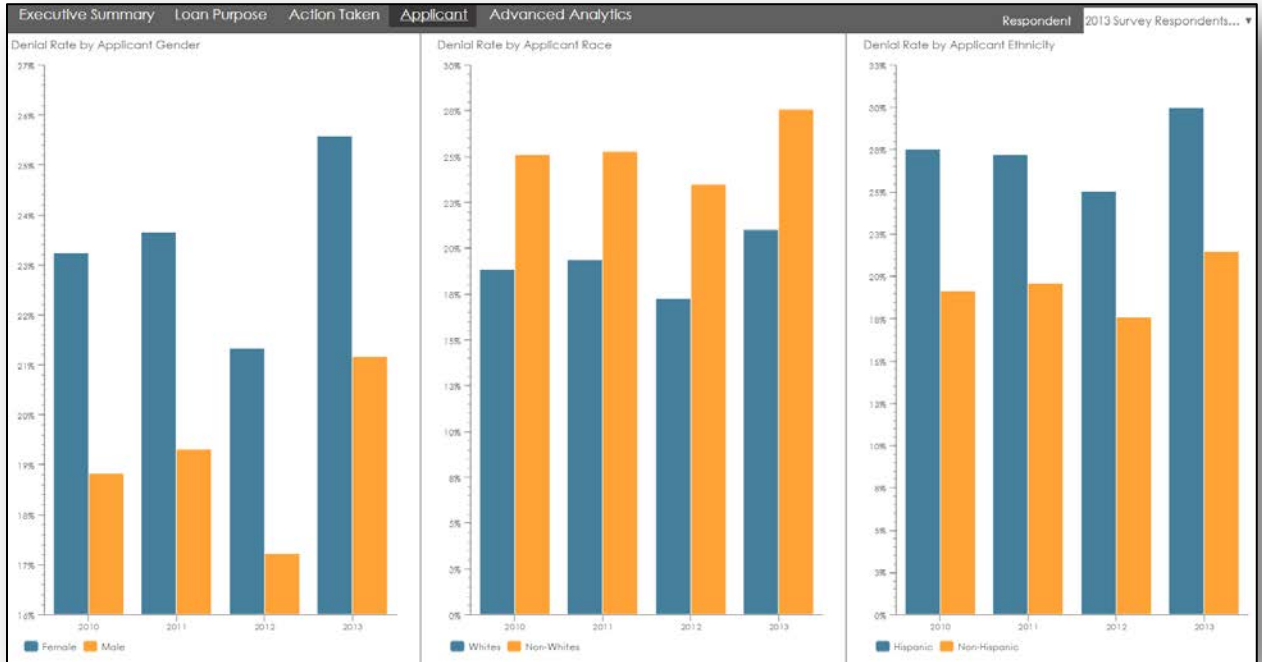
- d. The *Applicant Applications* dashboard presents four-year comparative results for applicant and co-applicant gender, applicant race, and applicant ethnicity.



Key Highlights include:

- o Applicant gender metrics shows a decrease from 62% in 2012 to 58% in 2013 (6% change) for male applicants. This variance was offset by change in "Not applicable" (which increased from 8% in 2012 to 10% in 2013, or a 20% change) and female applicants (which increased from 24% in 2012 to 25% in 2013, a 4% change).
- o Co-applicant gender metrics indicates a decrease in female applications from 37% in 2012 to 33% in 2013 (11% change) offset by an increase in "Not applicable" which increased from 7% in 2012 to 10% in 2013 (42% change).
- o With regards to Applicant race metrics, White applicant applications decreased from 71% in 2012 to 67% in 2013 (6% change) while African Americans applications increased from 5% in 2012 to 6% 2013 (20% change). In addition, applications where raced was reported as "Not applicable" increased from 8% in 2012 to 10% in 2013 (25% change).
- o With regards to Applicant ethnicity metrics, the rate of Hispanic applications was unchanged while there was a 20% increase in "Not applicable".

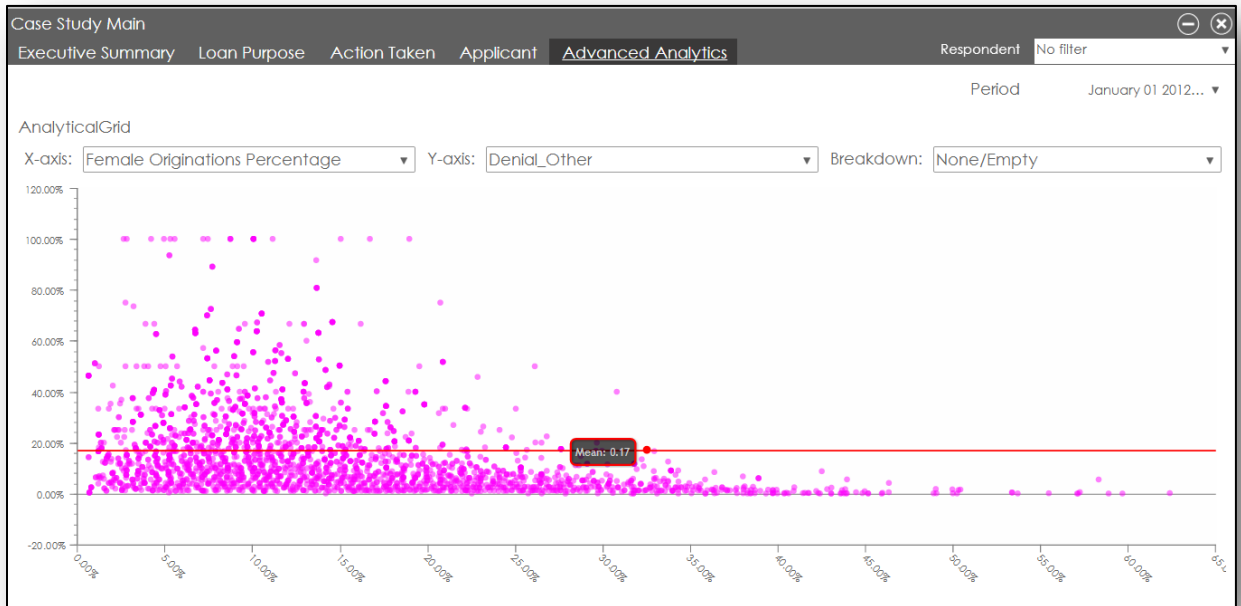
e. The *Applicant Denial Rate* dashboard presents four-year comparative denial compositions based on applicant gender, race, and ethnicity.



Key Highlights include:

- o Denial rates increased across all demographic dimensions.
- o The rate of relative increase in denial rates was most significant for Hispanics as compared to non-Hispanics with a year-over-year change of 20% and 17%, respectively.
- o The rate of relative change in denial rates for all other demographic measures was essentially comparable.

- f. Advanced Analytics – Scatter Chart. This Case Study dashboard provides a dynamic, user-driven analysis of a broad range of dimensions. As indicated in the following view, a scatter chart easily identifies respondent-specific concentrations and outliers and, therefore, efficiently identifies risks and opportunities.



Each dot in the above scatter chart represents a HMDA and/or Survey respondent⁸. The X-axis is the composite female origination percentage (“Female Origination Rate”) and the Y-axis is the composite denial rate based on the denial reason code “Other” (“Denial_Other”). This view does not include a further breakdown “band” – application counts, loan count, etc. – that would allow further context but such a breakdown could be selected by the user.

A review of the above scatter chart indicates a mean Denial_Other rate of 17% and, when the axis are switched, a Female Origination Percentage of 14%. These results draw attention to originators with Female Origination Rates below 14% and/or Denial_Other rates greater than 17%. Such results suggest the need to integrate these results with other metrics (i.e., income benchmarks, MSA benchmarks, etc.)

Of particular note is the fact that the above scatter chart shows that eight originators have Female Origination Percentages below the mean and all denied loans were given a denial reason code of “Other”. These results will undoubtedly draw the attention of regulators.

⁸ The scatter chart can be presented so that each dot represents a loan within a book of business.

Another Mortgage TrueView feature include the ability to both “filter” and “drill down” on metrics and scatter chart results to put results into a rational context.

- g. **Advanced Analytics – Quality Edit Checks.** The Case Study includes a series of dashboards that indicate, at a summary level, the results of FFIEC Quality Edit Checks. The scope of the edit checks is too extensive to summarize in this report so we invite you to review the data on-line.

Executive Summary							Loan Purpose	Action Taken	Applicant	Advanced Analytics	Resp
Property Panel							Loan Panel	Applicant Panel	Purchaser and Denial Panel	Other Panel	Census Panel
Property Location Panel											
Yearname	Applications	Multifamily Loan Applications as a percentage of all applications (Q.015 Count)	Multifamily Loan Applications Amount as a percentage of all application amounts (Q.015 Amount)	Multifamily Applications >= 200 (Q031)	VA or FSA/RHS Loan Type and Multifamily Property Type (Q059)	Property Type is missing or not in Specified Range (V400)	Respondent(s) No #				
Total	6,125,441	0.31%	3.40%	18,792	19	99.84%					
2013	6,125,441	0.31%	3.40%	18,792	19	99.84%					

Exhibit B – 2013 HMDA Case Study User Guide

After obtaining user credentials, complete the following steps:

1. **Access Mortgage TrueView.** Enter *mortgagetrueview.net* into your web browser and enter your assigned user name and password when prompted.



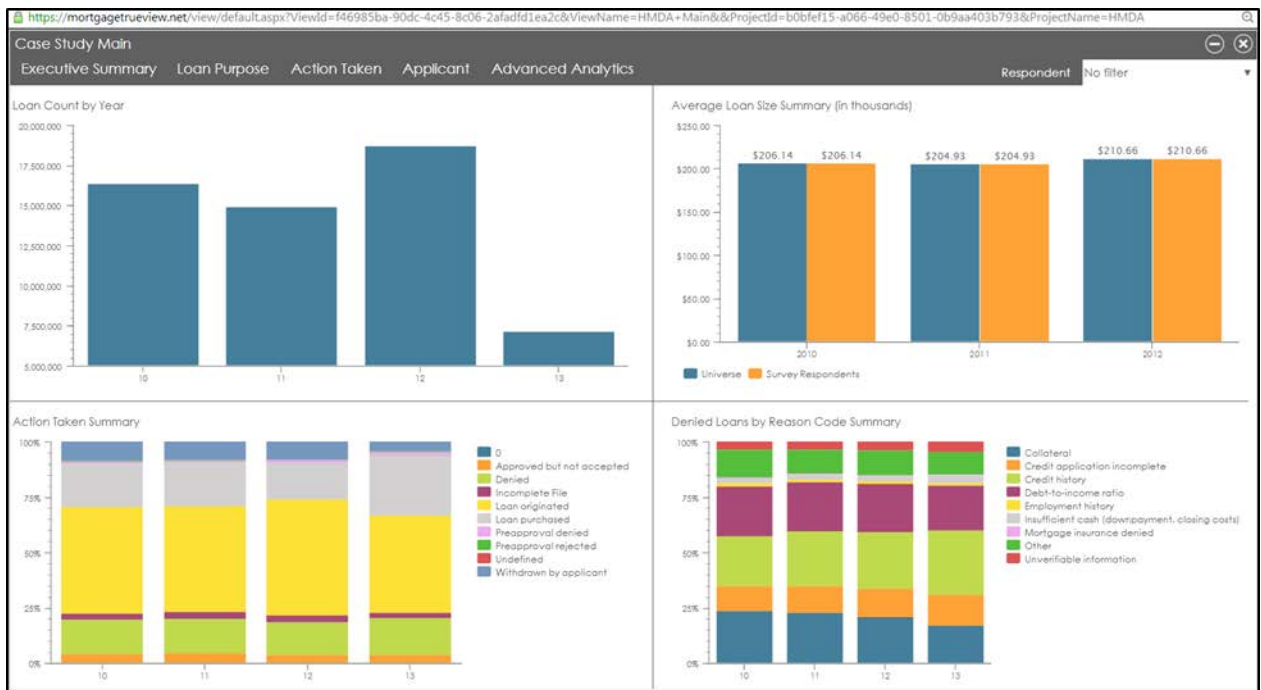
2. **Access 2013 HMDA Data.** Click on "2013 HMDA Survey and Case Study" on the HMDA Analytics landing page.



3. **Access HMDA Case Study.** Click on “Case Study” on the Survey and Case Study Main dashboard...



...and you've arrived at the main Case Study Executive Summary dashboard:

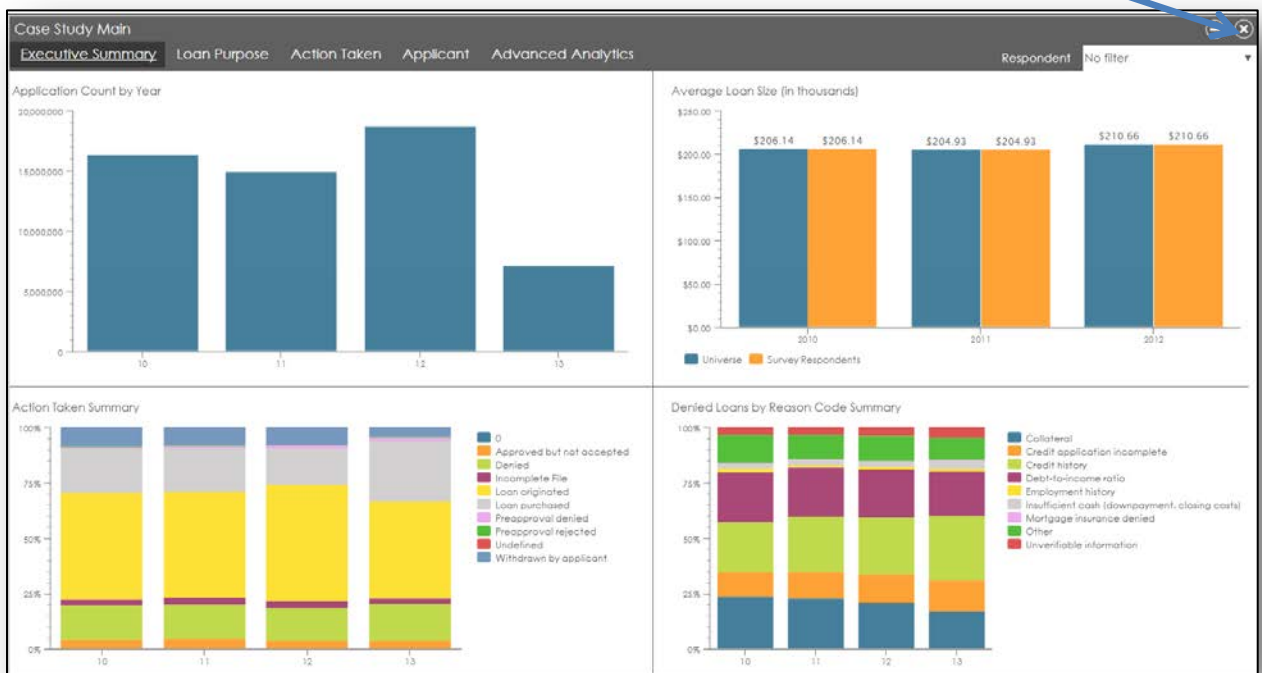


From this point:

- a. Set the Respondent Filter to "2013 Survey Respondents (Electronic)". This will present 2010 through 2012 data only for 2013 HMDA survey respondents that provided their 2013 HMDA Data. This filter provides a better indication of trends for this Filter Group.
- b. As you navigate the menu options, please note that *Applicant* and *Advanced Analytics* have sub-menu items which must be selected to present the dashboards.
- c. Select each of the dashboards described in Exhibit A and explore the data by
 - i. Placing cursor over charts to see amounts and percentage.
 - ii. On the Scatter Chart, explore the "drop down" menus and select x axis, y axis, and breakdown dimensions that are of interest to you.
- d. Be sure to explore the advanced analytical content.

* * * *

When you've completed this tutorial, close the case study by clicking the (X) twice...



...and explore the 2010 – 2012 HMDA data. Please note, however, that not all menu options are activated. If there is something that catches your eye that isn't available for review, give us a call!

