

Lot Line Project Final Report

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1. Data and Resources

1.1. Data Collection Methodology

At our current stage, we have been collecting financial data from the Bloomberg terminal. We have obtained access to Bloomberg legally through authorized student accounts under Columbia University. In the Bloomberg terminal, we searched for our target companies' financial profiles, gathering critical financial information about 17 major public companies in the U.S. homebuilding industry up until the latest fiscal quarter (2023 Q4). Following the format guidance and previous principles established by our client, we have limited the scope of our data to a few significant statements and metrics of interest and exported the data as .xlsx files. Apart from collecting concrete numbers, we also investigated earnings conference call transcripts of selected firms and gained managerial insights from their CEO, CFO, and COO's reports.

1.2. Quantitative Data

Our quantitative data analysis mainly revolves around the financial information about 17 major public companies in the U.S. homebuilding industry including LEN, DHI, & PHM, etc. These are the main players who dominate the U.S. homebuilding industry. A closer look at their data would be sufficiently reflective of the market landscape of private home builder companies' operating status quo in the U.S.. More specifically, we focused on several key statements and metrics such as the classic balance sheet, income statement, and cash flow statement. We also extracted from Bloomberg other statistics of interest including profitability (margins, returns, etc.), by-segment stats (financial services, construction, etc.), and home builder stats (pricing, dollar value of housing, etc.) according to our client's requirement. Here is a partial snapshot of the data outlook of one company's data.

KB Home (KBH US) - Home Builders																						
In Millions of USD except 3 Months Ending		Q3 2015	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016	Q1 2017	Q2 2017	Q3 2017	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Q1 2019	Q2 2019	Q3 2019	Q4 2019	Q1 2020	Q2 2020	Q3 2020
08/31/2015		11/30/2015	02/29/2016	05/31/2016	08/31/2016	11/30/2016	02/28/2017	05/31/2017	08/31/2017	11/30/2017	02/28/2018	05/31/2018	08/31/2018	11/30/2018	02/29/2019	05/31/2019	08/31/2019	11/30/2019	02/29/2020	05/31/2020	08/31/2020	
Housing Statistics																						
Orders CANCELLED																						
Orders CANCELLED	2,167.00	1,882.00	2,272.00	3,249.00	2,508.00	2,254.00	2,580.00	3,416.00	2,608.00	2,296.00	2,784.00	3,532.00	2,685.00	2,013.00	2,675.00	4,064.00	3,325.00	2,777.00	3,495.00	1,758.00	4,214.00	
Cancellations	30.00	32.00	27.00	21.00	29.00	25.00	23.00	21.00	25.00	24.00	20.00	18.00	26.00	28.00	20.00	15.00	20.00	14.00	22.00	14.00	43.00	17.00
Backlog NUMBER_C	4,664.00	3,966.00	4,285.00	5,205.00	5,226.00	4,420.00	4,776.00	5,612.00	5,455.00	4,411.00	4,972.00	5,787.00	5,844.00	4,108.00	4,631.00	5,927.00	6,230.00	5,078.00	5,821.00	5,080.00	6,749.00	
Closings NUMBER_C	2,236.00	2,580.00	1,953.00	2,329.00	2,487.00	3,060.00	2,224.00	2,580.00	2,765.00	3,340.00	2,223.00	2,717.00	2,988.00	3,389.00	2,152.00	2,768.00	3,022.00	3,929.00	2,752.00	2,499.00	2,545.00	
Backlog Cor BACKLOG	47.24	55.32	49.24	54.35	47.78	58.55	50.32	54.02	49.27	61.23	50.40	54.65	51.63	61.80	52.39	59.77	50.99	63.07	54.19	42.93	50.10	
Dollar Value of Housing																						
Value of Ord VALUE_OF	773.3	675.8	824.7	1,203.0	929.6	855.9	1,085.4	1,383.5	1,071.9	935.4	1,173.1	1,362.0	1,018.1	738.3	1,022.1	1,532.7	1,276.2	1,059.1	1,382.7	688.4	1,643.8	
Value of Bad VALUE_OF	1,585.5	1,281.5	1,433.5	1,820.1	1,848.6	1,519.1	1,793.6	2,181.4	2,115.9	1,660.1	1,966.7	2,236.9	2,035.3	1,434.4	1,658.3	2,173.2	2,296.8	1,813.7	2,124.6	1,903.0	2,567.7	
Value of Hor VALUE_OF	798.6	979.8	672.6	807.4	910.1	1,185.4	810.9	995.7	1,137.4	1,391.2	866.5	1,091.8	1,219.6	1,339.3	798.2	1,017.8	1,152.6	1,542.2	1,071.8	910.0	979.1	
Pricing (000s)																						
Average Ord AVG_ORDER	356,847.25	359,107.33	362,972.71	370,268.39	370,649.52	379,720.50	420,706.20	405,009.37	411,016.87	407,395.91	421,369.25	385,608.72	379,172.44	366,786.39	382,088.60	377,137.80	383,832.18	381,395.75	395,609.16	391,606.37	390,071.19	
Average Bad AVG_BACKLOG	339,930.54	323,115.99	334,540.72	351,412.49	353,727.52	343,685.29	375,538.85	388,705.63	387,890.38	376,361.60	395,551.69	386,536.20	371,142.05	349,164.56	358,083.35	366,656.49	368,667.26	357,169.55	364,980.42	374,609.65	380,451.03	
Average Clo AVERAGE_CLO	357,200.00	379,800.00	344,400.00	346,700.00	365,900.00	387,400.00	364,600.00	385,900.00	411,400.00	416,500.00	389,800.00	408,200.00	395,200.00	370,900.00	367,700.00	381,400.00	392,500.00	389,500.00	364,100.00	384,700.00		
Land																						
# of Selling NUMBER_C	252.00	247.00	241.00	242.00	227.00	235.00	240.00	236.00	231.00	224.00	219.00	210.00	224.00	240.00	248.00	255.00	254.00	251.00	250.00	244.00	223.	
# of Lots Co NUMBER_C	47,344.00	47,390.00	48,211.00	47,283.00	46,636.00	44,825.00	44,471.00	45,085.00	45,624.00	46,371.00	49,551.00	53,390.00	53,627.00	54,744.00	54,752.00	58,379.00	64,910.00	63,234.00	60,490.00	60,378.00		
Lots Owned LOTS OWN	38,822.00	37,919.00	39,051.00	38,772.00	37,775.00	35,412.00	35,577.00	36,086.00	35,587.00	46,371.00	36,513.00	37,163.00	40,049.00	39,684.00	40,511.00	40,116.00	39,198.00	38,039.00	39,033.00	37,589.00		
Lots Options LOTS_OPT	8,522.00	9,480.00	9,160.00	8,511.00	8,861.00	9,413.00	8,894.00	9,017.00	21,531.00	9,706.00	12,388.00	28,793.00	25,330.00	14,233.00	14,636.00	17,183.00	26,871.00	24,201.00	22,891.00	22,168.00		
Year's Supp YEARS_SU	6.03	5.78	5.63	5.20	4.99	4.56	4.40	4.36	4.29	4.25	4.24	4.49	4.74	4.87	4.85	4.98	5.47	5.07	4.96	5.14		
Year's Supp YEARS_SU	4.95	4.63	4.56	4.26	4.04	3.80	3.52	3.48	3.35	4.25	3.35	3.36	3.51	3.60	3.55	3.46	3.20	3.13	3.08	3.25		
Other																						
Interest: Inc INTEREST_	46.6	46.1	46.3	46.3	46.5	46.5	50.1	43.3	43.4	40.3	39.9	39.9	35.2	34.6	34.8	36.5	36.0	36.1	31.0	31.1	31.1	
Interest: Exp INTEREST_	56.1	47.8	34.4	37.5	40.4	54.9	45.7	50.5	55.2	70.3	42.4	52.4	53.3	54.7	30.5	37.8	38.6	49.9	34.6	28.7	30.6	
Interest Acc INTEREST_	290.1	288.4	300.3	309.0	315.1	306.7	311.1	304.0	292.2	40.3	259.8	247.3	229.2	34.6	213.4	212.2	36.0	36.1	192.1	194.4	31.1	
Trailing 12M TRAIL_12M	7,845.00	8,196.00	8,556.00	9,098.00	9,349.00	9,829.00	10,100.00	10,351.00	10,629.00	10,909.00	11,268.00	11,317.00	11,246.00	11,297.00	11,040.00	11,220.00	11,297.00	11,040.00	11,437.00	12,077.00	12,841.00	
Trailing 12M TRAIL_12M	9,077.00	9,253.00	9,336.00	9,570.00	9,911.00	10,283.00	10,591.00	10,758.00	10,858.00	10,900.00	11,104.00	11,220.00	11,297.00	11,040.00	11,437.00	12,077.00	12,841.00	13,661.00	11,355.00	12,244.00		

1.3. Qualitative Data

Our qualitative analysis mainly emphasizes on studying earnings conference call transcripts of 5 representative homebuilding companies. Each of us is assigned to research one company's operating and financial status in depth and report back to our client. Here is an example of one company's earnings call log:

<https://www.fool.com/earnings/call-transcripts/2023/12/15/lennar-len-q4-2023-earnings-call-transcript/>

These reports typically entail authentic information about companies' overall performance and senior executives' opinions on their future development strategies. After comprehending the operating context and financial state of each company, we summarized the information in either written reports, bar graphs, or mind maps and made lively presentations to our client with solid statistics and comparative managerial insights.

Initially, endeavors were made to automate the amalgamation of these metrics for 17 companies into a consolidated sheet employing Python. However, an impediment arose due to the absence of data pertaining to Dream Finders Homes (DFH) for certain metrics, thus necessitating its exclusion from our analytical framework.

Subsequently, attention was directed towards addressing missing values within the dataset. Rigorous cross-referencing with the Bloomberg Terminal was conducted to ensure data accuracy, following which efforts were made to supplement missing values with information sourced from the U.S. Securities and Exchange Commission (SEC). For cells persisting with missing data, we employed a methodological approach by calculating the average values of the specific metrics for the corresponding year.

Lastly, additional analyses were conducted, including the computation of ratios such as the Value of Backlog to Value of Homes Closed and the ratio of Year's Supply Owned to Year's Supply Total and the industry average, which were weighted by revenue.

1.5. Data Visualization

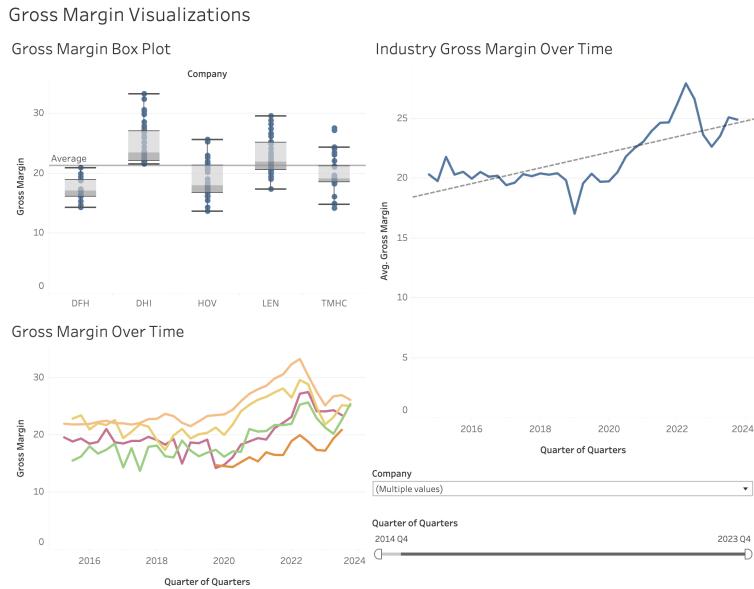
Our project aims to develop an interactive dashboard tailored for our sponsor, enabling them and other stakeholders to delve into and understand market dynamics thoroughly. We experimented with a range of tools, including Looker Studio, PowerBI, and several Python libraries like Bokeh, Plotly, and Altair. After careful consideration, we decided to proceed with Tableau owing to its user-friendly interface and the extensive set of functionalities it offers, perfectly aligning with our project requirements.

Before we could start crafting the visualizations, we encountered a challenge with the format of the data. The financial reports we had access to were structured in a manner where metrics were listed as row names and quarters as column names. This format was quite the opposite of what we usually work with. To tackle this, we initially 'transposed' the financial report data for a single company to evaluate its compatibility with Tableau. This experiment proved successful, leading us to developing a Python script that automated the process of converting financial reports into a Tableau-friendly format for all the companies in our dataset.

With the data preparation phase behind us, we embarked on creating a wide array of visualizations. Our strategy was multi-pronged: starting with line graphs to depict the trajectory of various metrics over time, integrating an average line to offer a benchmark for comparison. Next, we constructed box plots to visualize the distribution of values across each metric, offering insights into the variability and central tendency of the data. We didn't stop there; bar charts were also introduced to facilitate comparisons between companies based on specific aggregated metrics. Recognizing the importance of interactivity, we incorporated dynamic filters alongside the graphs, enabling users to tailor the visual display to show information for selected companies only. Additionally, we implemented time-based filters allowing for the examination of data over specific years or to observe broader trends across an extended timeframe. Given the potential impact of seasonal variations, particularly in sectors like construction where quarter-to-quarter performance can differ significantly, we added a quarter-based filter to aid users in conducting a granular analysis of metric performances. Moreover, recognizing that some metrics might be correlated, like average backlog price and average closing price, we crafted side-by-side plots for these metrics to facilitate direct comparison and deeper insight into their relationship.

Upon assembling the initial versions of our dashboards, we engaged with our sponsor to gather feedback and received a design template specific to LotLine. Moving forward, our focus will shift towards integrating these design elements into our dashboards, aligning the visual aesthetic with LotLine's brand identity. Another critical aspect of our ongoing work involves optimizing the dashboard layout to accommodate the visualization of approximately 15 metrics without overwhelming users. Our approach includes devising dashboards that concentrate on a subset of four metrics each, incorporating hyperlinks to facilitate navigation to more detailed visualizations centered on company performance. Alternatively,

we are exploring layouts that feature eight company-based plots per dashboard, with hyperlinks enabling users to toggle between metric-focused and company-focused views. This dual strategy aims to enhance user engagement by offering multiple perspectives and deeper insights into the data.



2. Modeling (Tableau Operations)

2.1. Model Selection

In our case of this visualization task, “model” refers to the type of graph and the visual elements we pick and use to present and deliver the financial status of a certain company. After pulling out a broad range of financial data from 17 major companies in the U.S. homebuilding industry such as balance, sheet, income statement, and cash flow, etc., we have discussed in further detail with our client to underpin 8 financial metrics of paramount interest, including net debt to equity, cancellation rate, year’s supply total, etc. These 8 metrics will be the main targets we aim to visualize and display to our potential users and investors. For the other financial data, we will embed them as secondary detailed information behind the visualization dashboard, which requires the user’ further actions (zoom in and click on) to access.

Following this goal, we have devised a visualization prototype system along with a set of visual design elements that work best to deliver the 8 metrics as our main dashboard the most effectively and aesthetically. We have achieved this in Tableau by importing data in the right format, converting date data type to corresponding financial quarters data type, and plotting appropriate graphs to display development trends and allow users to check exact numbers on a specific company within a specific period. We extensively used line graphs and added trend lines to visualize past direction and project future development. We also adopted stacked bar charts for comparison purposes between companies and between segments within a single metric. As for metrics which we might care about their

distribution, we adopted box plots, offering a holistic view of the data capturing its range, maximum, minimum, and percentiles.

2.2. Modeling Methodology

Along with the aforementioned fundamental graph choices we implemented in our dashboard, we also took the initiative of incorporating a spectrum of UI elements based on design methodologies that serve to enhance user experience and encourage engaging user interactions. First, we unified the standard colors, fonts, and other formats used in our visualizations to (1) ensure our design align with our client's original website's design principles, as outlined in their Figma style guide, and (2) guarantee strong and visually pleasing contrast ratios which make our visualizations intuitive to understand, especially when it comes to comparing different companies, represented by different lines with different colors.

Other than style design, we also incorporated several label features in Tableau to offer clear notations for some key figures in our dashboard. Users will be able to easily and quickly grasp not only the general trend but also where the numbers reside in the graph through just a quick glance; if they wish to inquire about more specific numbers during a specific financial quarter of a company, the user may zoom in and hover their mouse above a certain sector of the graph, where more detailed numbers and information may show up, allowing the user to explore in depth.

Lastly, we have created filter functions with Tableau for our visualization, particularly in two dimensions: time and company. Users will be able to select a specific time period (fiscal quarter) or a time range if they are specifically interested in how the rate changes within a certain period of time, and they will be able to toggle between different times by zooming in and out. They will also have the freedom to view one or multiple specific companies for purposes such as specific inspection for a single company, drawing comparisons between companies, or observing industry trends through studying a multitude of companies altogether.

2.3. Results and Insights

Here are the links of a demo version of some of our visualization work:

Recent Analysis (starting from January 2015 to the present)

https://public.tableau.com/views/FinancialMetricsforCompanyWithMovingAverage/Dashboard2?:language=en-US&publish=yes&:sid=&:display_count=n&:origin=viz_share_link

https://public.tableau.com/views/CompanyComparisonRecent/Dashboard1?:language=en-US&:sid=&:display_count=n&:origin=viz_share_link

Earlier Analysis

https://public.tableau.com/views/metrics_dashboard_17141407317740/Dashboard1?:language=en-US&:sid=&:display_count=n&:origin=viz_share_link

Profitability Analysis for a single company:

https://public.tableau.com/views/ProfitabilityAnalysisforHomeBuildingCompanies/Dashboard1?:language=en-US&:sid=&:display_count=n&:origin=viz_share_link

Gross margin comparison for multiple companies:

https://public.tableau.com/views/GrossMarginVisualizations/Dashboard1?:language=en-US&:sid=&:display_count=n&:origin=viz_share_link

Profitability analysis for BZH:

https://public.tableau.com/views/BZHProfitabilityAnalysis/Dashboard?:language=en-US&:sid=&:display_count=n&:origin=viz_share_link

Balance Sheet Analysis for BZH:

https://public.tableau.com/views/BalanceSheetAnalysis_BZH/TotalAssetsoverTime?:language=en-US&publish=yes&:sid=&:display_count=n&:origin=viz_share_link

Cash Flow Analysis for BZH:

https://public.tableau.com/views/BZH_CashFlowVisualization/Dashboard1?:language=zh-CN&:sid=&:display_count=n&:origin=viz_share_link

Early Analysis for NVR:

https://public.tableau.com/app/profile/xingchen.li6514/viz/NVR_EarlyAnalysis/BacklogClosed

Early Analysis on some Cash Flow Metrics:

<https://public.tableau.com/app/profile/xingchen.li6514/viz/CashAnalysis/CashFromFinancingActivities>

Home Builder Section:

https://public.tableau.com/views/HomeBuilderDashboardBZH/BuildingSection?:language=en-US&publish=yes&:sid=&:display_count=n&:origin=viz_share_link

Income Statement (Adjusted and GAAP):

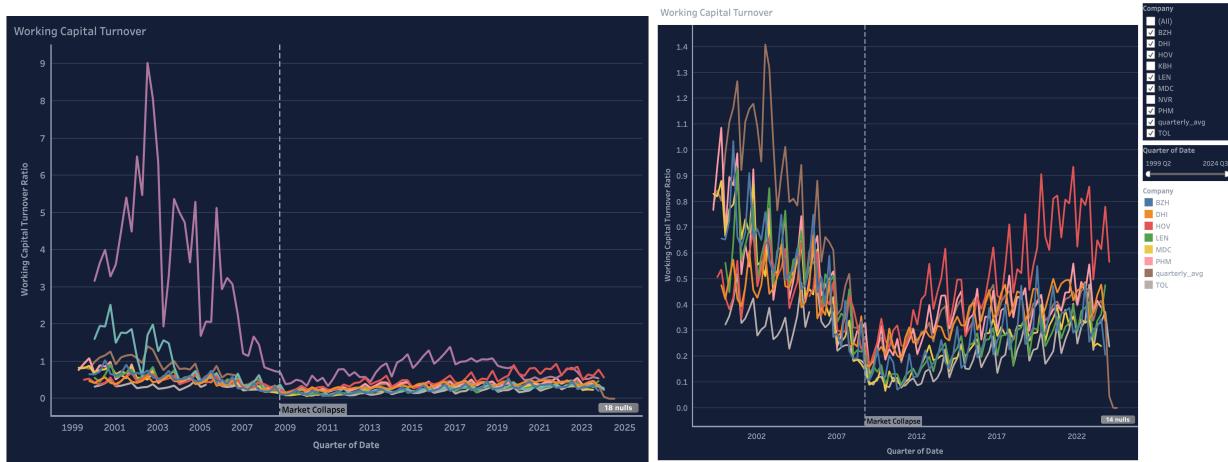
https://public.tableau.com/views/IncomeStatement_17093085172540/ProfitMargin?:language=zh-CN&:sid=&:display_count=n&:origin=viz_share_link

3. Results and Insights

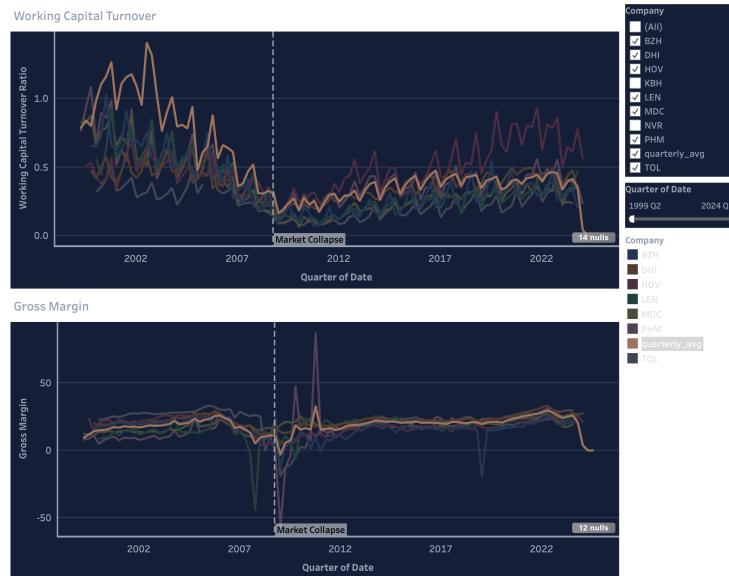
Working Capital Turnover Ratio

Working Capital Turnover Ratio reflects how much company value is freed up for operations, and having a higher ratio indicates how you're using capital to produce sales.

Too high of a ratio could signal that there isn't enough available working capital to support sales growth. A working capital turnover ratio exceeding 30.0 generally highlights needing more working capital in the future. Conversely, too low of a ratio could suggest ineffectively employed working capital. In general, if the working capital ratio falls below one, it suggests potential future liquidity issues, while a ratio between 1.5 and 2 signifies the company's solid financial footing regarding liquidity.



By ignoring the outlier lines of NVR and KBH as they didn't fit the overall market trend, we see a consistent decrease trend in working capital ratio. Besides the seasonality fluctuations, right before the downturn in 2008, there's a year-on-year decrease in working capital turnover ratio starting 2003 Q4. The quarterly average of this ratio drops from 1.410(2003 Q4) to 1.014(2004 Q4) by 28% percent, continues to decrease by 6%-30%, and drops to 0.31—a decrease of 33% from 2007 to 2008—to the market collapse.



When Working Capital Turnover Ratio indicates how effective a business is at generating sales for every dollar of working capital put to use, a decrease in this ratio will lead to a deceleration in sales, and also a decrease in sales will result in a decrease in gross profit. There's a sudden drop in gross margin from 25.6(2005 Q4) (in Millions of USD) to 16.51(2006 Q4) and even 5.09(2007 Q4). The decrease in working capital ratio starts from 2003 signals the decrease of sales, which can lead to a drop in gross margin starting 2005. We may say this is a good metric and predictor of the gross margin and market trend.

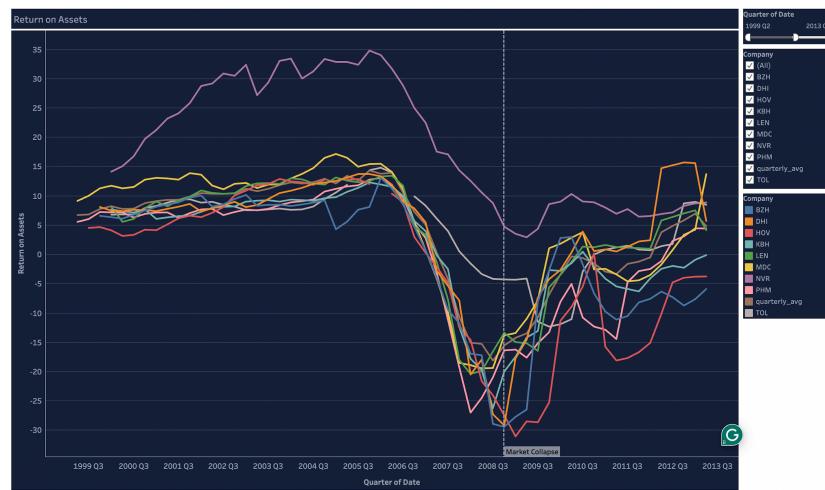
After the market collapse, it took years for companies to get back to normal with an increasing rate in working capital turnover.

Return on Assets (ROA):

Return on Assets (ROA) is a critical measure of a company's efficiency in utilizing its assets to generate profits. In the highly capital-intensive home building industry, ROA not only reflects operational efficiency but also serves as a predictor of potential financial distress, particularly in turbulent economic conditions.

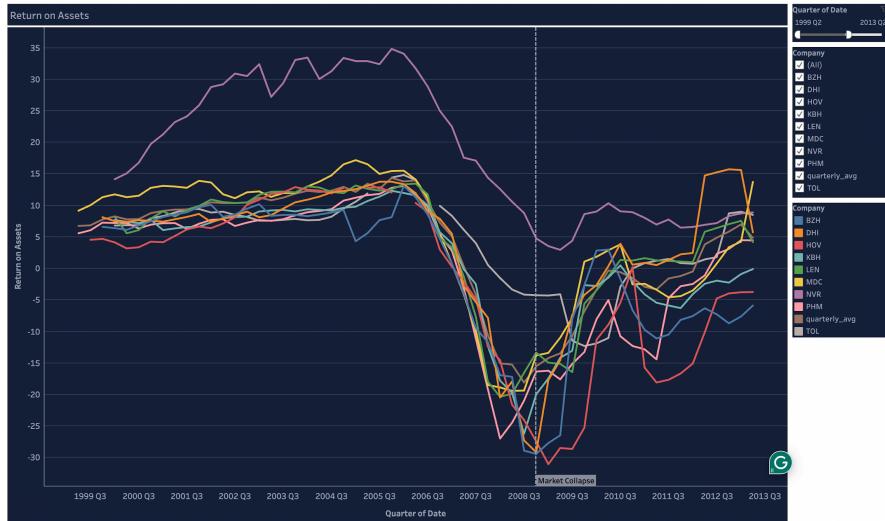
1. Trend Analysis

Observations indicate a gradual decline in ROA starting from the second and third quarters of 2006. This downward trend could serve as an early warning sign of an impending downturn in the industry, highlighting the importance of ROA as a predictive tool for financial performance.



2. Lagged Effects on Gross Margins and Revenues

ROA has demonstrated a significant predictive relationship with gross margins and revenues, consistently preceding changes in these metrics by approximately one to two quarters. This relationship is vital for strategic planning, providing companies with a lead time to anticipate and adapt to changes in financial health.

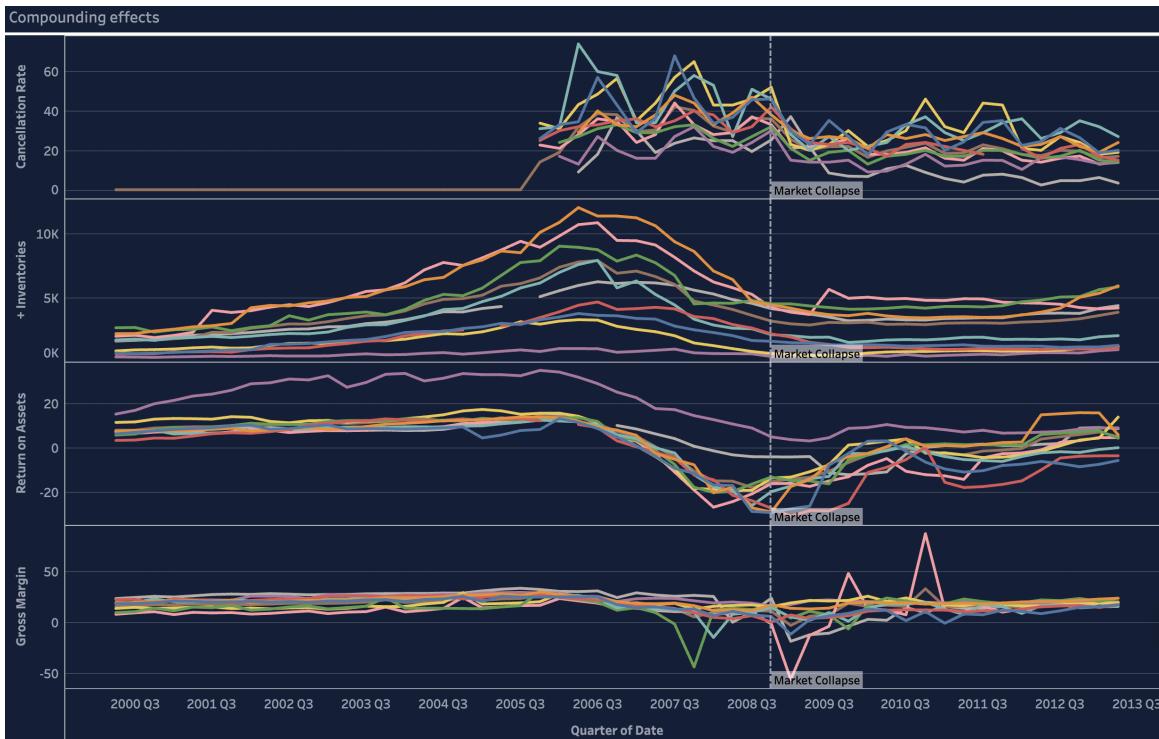


3. Compounding Effects with Cancellation Rate

During the second and third quarters of 2006, there was a notable increase in both cancellation rates and inventories, indicating rising holding costs, missed revenue opportunities, and reduced liquidity. These factors collectively lead to potential write-downs on unsellable inventory, adversely affecting the company's bottom line and decreasing ROA. This sequence of events underscores the predictive nature of these metrics in forecasting financial health.

Comparative Analysis: BZH vs. NVR

- BZH: high cancellation rates during the crisis, rising inventories during the crisis, and a significant decline in ROA.
- NVR: lower and more stable cancellation rates, consistently managed inventories prior to the crisis, a more stable ROA.
- Performance: BZH emerged weaker from the crisis, struggling with recovery due to high cancellation rates and inventory mismanagement. NVR emerged stronger, with shares trading at all-time highs, supported by effective management practices as evidenced by stable cancellation rates, well-controlled inventories, and resilient ROA.



Cancellation Rate

Cancellation rates generally exhibited a significant rise leading into the 2008 financial crisis, signaling a downturn in consumer confidence and presaging a wider market collapse. This uptick in cancellations, which indicates a higher number of customers withdrawing from home purchases, would naturally precede a contraction in revenue, leading to an immediate strain on gross margins.

The graphs indicate that as cancellation rates peaked and drastically oscillated, there was a corresponding sharp decline and heightened variability in gross margins. Specifically, the quarterly average cancellation rate (an industry aggregate measure weighted by company revenues) spiked from 29.50 in 2007 Q1 to 42.12 in 2007 Q3 and fluctuated drastically entering the 2008 financial crisis. Cancellation rate upsurged again from 29.23 in 2008 Q2 to 36.43 in 2008 Q3. Meanwhile, industry average gross margin plummeted from 17.62 in 2007 Q1 to 5.09 in 2007 Q4. After a slight period of struggle, average gross margin fell heavily again to history lows at -3.24 in 2009 Q1.

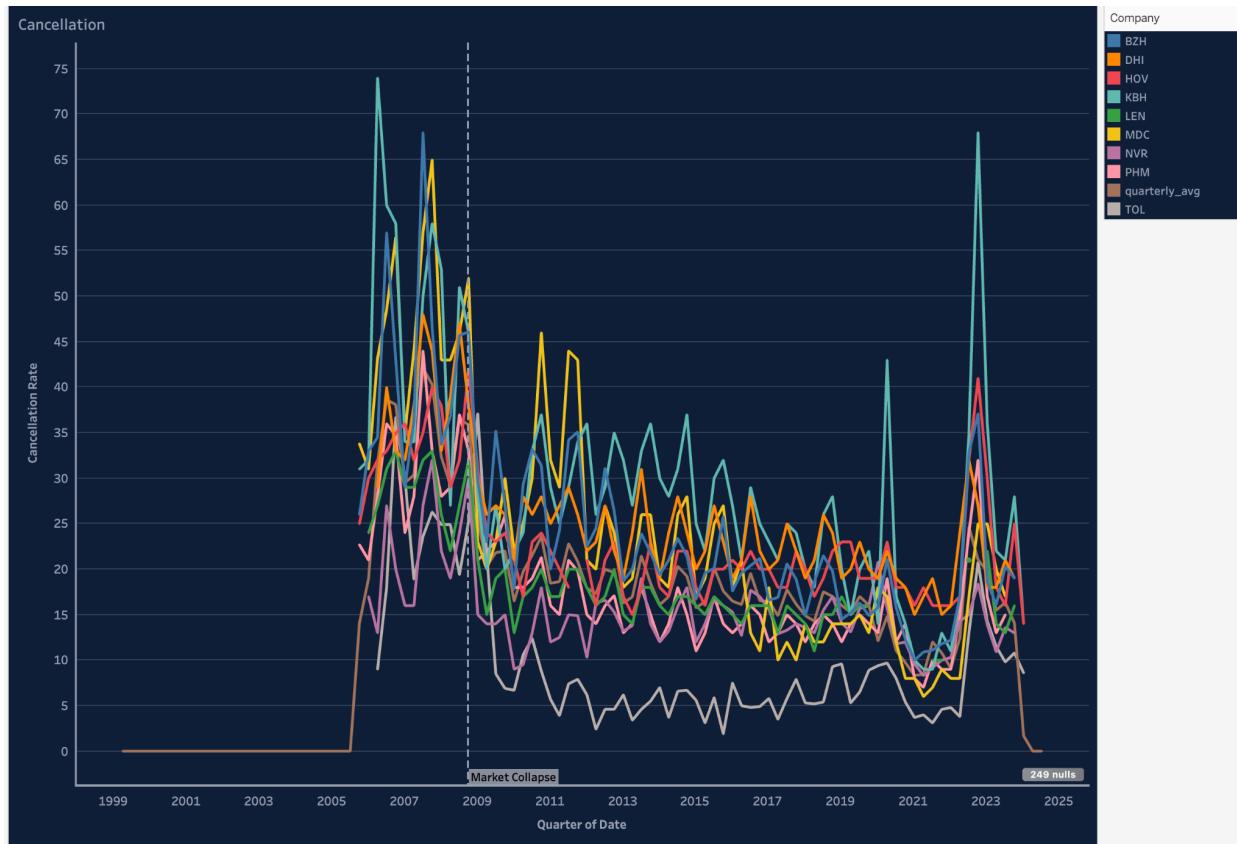
During the 2018 financial crisis, the interplay between cancellation rates and gross margin reflect intensively escalated holding costs, reduced pricing power, and a potential backlog of unsold inventory. The decline in gross margins underscores the high operational leverage in the homebuilding industry, where fixed costs remain constant despite fluctuations in sales volume.

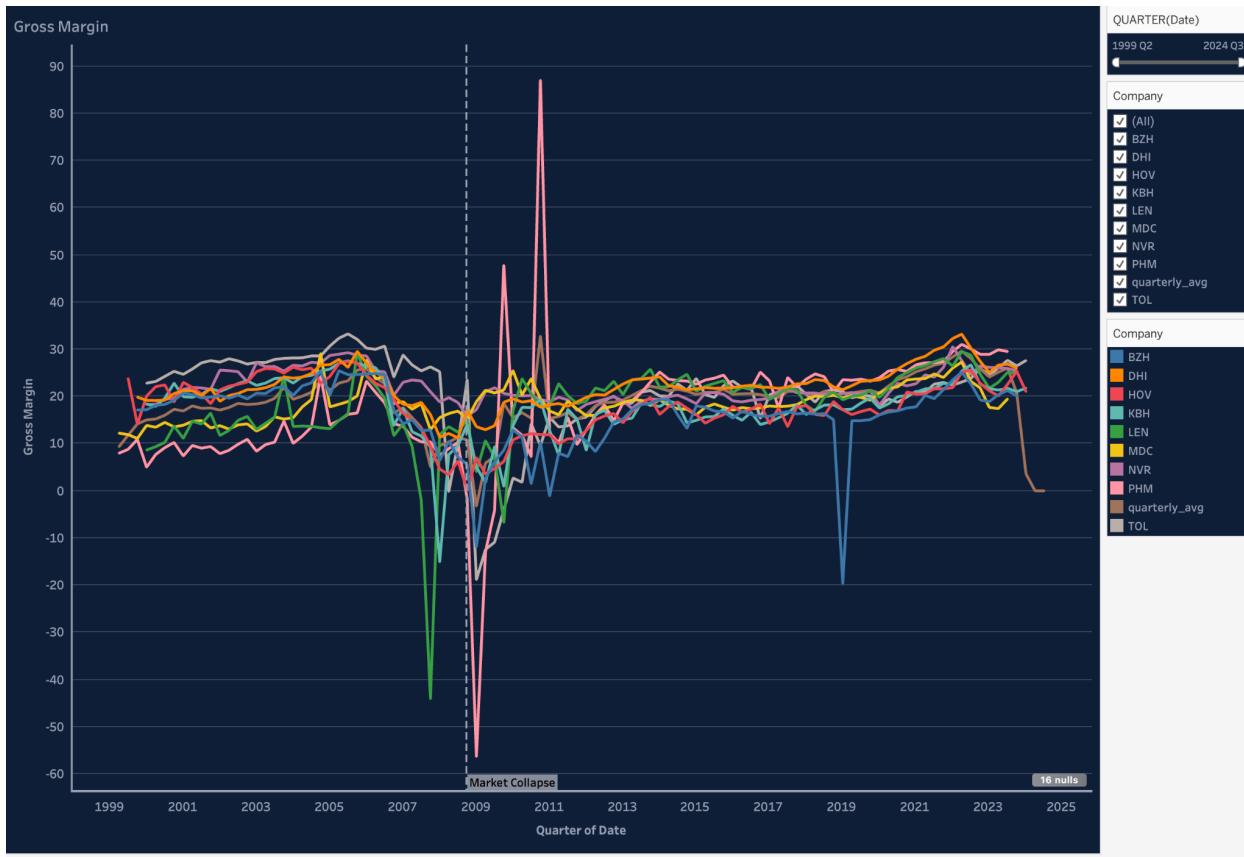
Apart from the close correlation between the two metrics, it's also notable that cancellation rate foreshadows changes in gross margin with a preceding time lag of one to several financial quarters (most companies exhibited a noticeable rise in cancellation rate as early as from 2007 Q1, while the dramatic decline of gross margin was concentrated from 2008 and some extended onwards to 2009), confirming the potential for cancellation rate to serve as an early warning system for impending financial stress within the homebuilding sector.

Before the crisis, the pattern of cancellation rates, where available (there are many null values of cancellation rate for several companies from 2000 to 2005), suggests a relatively stable market environment with normal fluctuations in consumer behavior. The sharp increase and unstable fluctuation just before the crisis could indeed be interpreted as a red flag.

Post-crisis, cancellation rates and gross margins appeared to normalize, with the former decreasing as consumer confidence returned, and the latter gradually increasing as companies scaled back operations or disposed of excess inventory and regained pricing power. Specifically, the industry average cancellation rate relaxed to 20.36 in 2009 Q2 and gradually stabilized around a lower interval, while average gross margin climbed back to 18.55 in 2009 Q4.

In conclusion, cancellation rates can reflect market sentiment and therefore serve as an indicator for gross margins, particularly in the homebuilding industry, where purchase commitments are significant, and customer confidence is closely tied to economic conditions.





Net Debt to Equity

For the following analysis, we will be viewing 2006 Q3 as the starting point of this crisis. We divided the companies into 3 groups based on gross margin decrease for the analysis below.

The first group are the companies whose gross margins suffered an amount of decrease (around 10) but still remained above 10 at the lowest. This group constrained DHI, MDC, and NVR

- We can see there is a **sharp decreasing change** in the slope of their net debt to equity trend line **before the market collapse in 2008**.
- MDC and NVR were able to achieve negative net debt to equity by **having negative net debt**, which is a strong indicator of a solid financial position.
- Another thing to notice is that for MDC and NVR, before the crisis in general, their **net debt to equity is kept below 50**.

The second group are companies whose gross margins suffered a relatively big amount of decrease around 40, but still remained above -20 at the lowest. Companies in this group include BZH, KBH, and TOL.

- We observe a **slight increasing trend from close to the market collapse in 2008**.
- For BZH and KBH, their net debt to equity was in general around **100 before the crisis**.

The last group would be companies whose gross margin suffered a huge decrease up to over 30 more decreases compared to the industry average. The companies in this group are LEN and PHM.

- We see no significant changes in net debt to equity trend before the market collapse in 2008.

Although not a predictor of a crisis, we suggest that the ability to rapidly reduce net debt to equity may reflect a company's capacity to adapt to sudden changes in the external environment. Both MDC and NVR, stronger survivors of the crisis, managed to significantly decrease their net debt to equity ratios in a timely manner. This ability to quickly adjust their financial strategies could be a critical indicator of a company's resilience in navigating through crises.



Overall, the dashboard suggests that after the 2008 financial collapse, the home-building companies improved their financial health, as indicated by the stabilization of most metrics. It appears that if the current metrics—especially gross margin, ROA, and net debt to equity—remain stable, the financial health of the industry is relatively solid. However, leading indicators such as an increasing cancellation rate, spikes in working capital turnover, or a decline in ROA could serve as early warnings of financial instability. Monitoring these metrics closely can help companies anticipate and mitigate risks of a financial downturn.