

Article

Relationship between Home Depot and Lowe's Under Impact of Major Events

Jia-Yi Chen¹ and Grant G. L. Yang^{2,*}

¹ School of Accounting and Finance, Xiamen University Tan Kah Kee College, Fujian, China; 1662737641@qq.com;

² Department of Agricultural Economics, The Pennsylvania State University, Pennsylvania, USA

* Correspondence: grant@g2.usc.edu.tw

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Abstract: Home Depot and Lowe's are two of the world's largest home building materials retailers. We analyze whether the two are in a competitive relationship or the same dilemma under the impact of major events by using the obvious structural breakpoints and combining them with the event research method. An empirical study of the major events is conducted corresponding to the major events at the time node where the obvious structural breakpoints are located. Based on the revenue and profit data from 1996 to 2021, the two companies are compared for the changes in revenue and profits under the impact of the same major event. The results show that the major events affect the development of the entire home building materials retail industry and the company's operation. The internal impact prompts both parties to actively adjust their internal business to be competitive, and several events affect only individual companies. However, certain significant events have little impact on the company's revenue.

Keywords: Unit Root Test, Structural Breakpoint, Event Study Method

1. Introduction

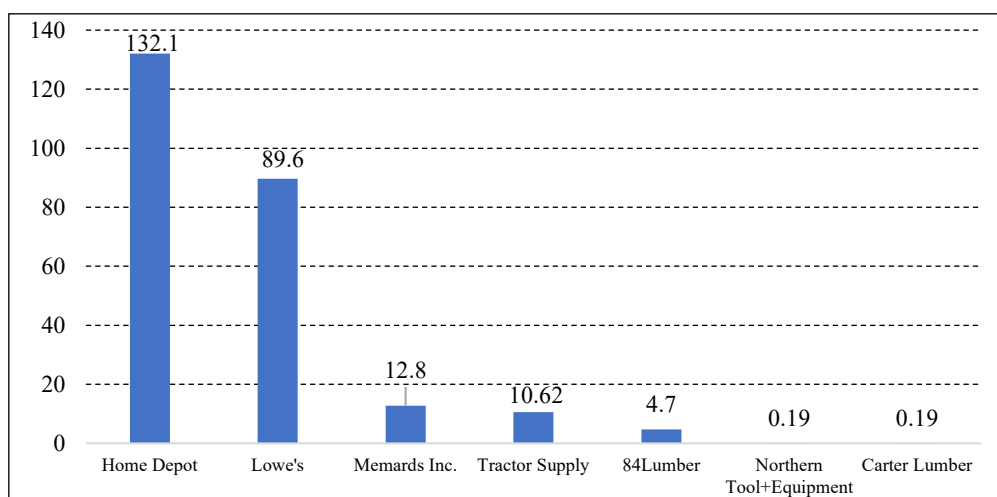
Home building materials retail business, compared with traditional retail ones, is characterized by one-store sales in a relatively large area. Building materials and home products are highly personalized products, and a large operating area provides various products to meet customer needs at different levels at the same time. As the volume of goods of the building materials is large, land and rent cost are essential to be considered. For more consumer demand, it is necessary to increase the shop and make a rational distribution network, so most companies have more than a single-store operation. Multi-use chain operation is used to expand market share, while the chain stores often have the same layout and management.

Home Depot, founded in 1978 and headquartered in Atlanta, is a warehouse-based home building materials retailer that started the DIY concept. After nearly 40 years of development, Home Depot has become the world's largest retailer of home building materials and supplies, and the second largest retailer after Walmart. At present, Home Depot owns more than 500,000 employees, operates more than 2,000 large shopping malls, and has set up stores in the U.S., Canada, Mexico, and China. The number of stores maintains and the overall number is more than Lowell's. Home Depot also has several private brands covering furniture, lamps, power tools, home textiles, kitchen, bathroom, and coatings, and has formed a relatively complete product line. Home Depot is famous as a home improvement retailer with stores characterized as full-service warehouse stores. The company currently serves three types of customers, characterized as do-it-for-me customers, do-it-yourself customers, and professional customers. To address this, the retailer stocks a wide selection of products for all needs. The home improvement retailer currently offers a wide variety of products, including a wide assortment of building materials, home improvement products, landscaping products (lawn and garden), and various services geared toward home improvement and repairs. Over 600,000 different products are offered through Home Depot, and most products are available for purchase through their official website. Like many larger retailers, this retailer also allows customers to pick up their products in-store after purchasing them through the website.

Lowe's is the world's second-largest manufacturer of building materials for home improvement, the fifteenth largest retailer in the U.S., and the thirty-fourth largest retailer in the world. Lowe's was founded in 1946 as a small hardware store in North Carolina and successfully went public in 1961. Lowe's has opened a total of 1,845 direct stores in the U.S., Canada, and Mexico, and more than 1,800 stores in the Americas. As of January 28, 2022, Lowe's operates 1,971 home décor and hardware stores in the U.S. and Canada with a retail space of 208 million ft² and serves approximately 230 dealer-owned stores. Lowe's provides furniture, home decoration products, and services required for home decoration, maintenance, repair, renovation, and property repair. Lowe's provides well-known brands to the market as well as creates its brands (mostly home accessories and home appliances).

The Lowe's strategy is rooted in serving the customers, and the mission is guarded by delivering the right home improvement products with the best service and value across every channel and community served. Lowe's total home strategy provides a full complement of products and services for consumers, enabling a total home solution for every need at home. This strategy allows providing customers with one of the world's most customer-centric and omnichannel retail experiences. In 2021, the market share across DIY and Pro grew, which is focused on providing the customers with the products and services they need for every project at home. This is an important step in the ongoing evolution toward becoming a world-class, customer-centric, and omnichannel retailer.

Home Depot and Lowe's are the first and second largest offline home improvement retailers in the U.S., accounting for 30 and 19% of the domestic market share, respectively. In 2020, Home Depot's revenue was US\$132.1 billion, and Lowe's revenue was US\$89.6 billion, which was largely ahead of the home improvement retail channels that ranked behind them (Fig. 1).

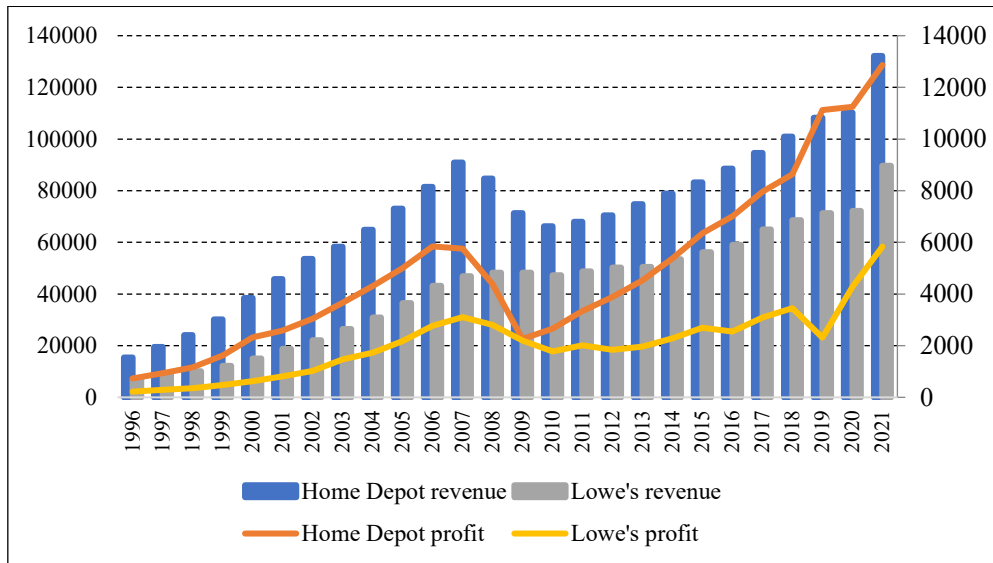


Data Sources: Future Think Tank

Figure 1. Competitive landscape of home improvement retail channels in the United States in 2020 (in billion US\$).

Globalization leads to supply chains that sprawl across space and time. Where and how products are produced and consumed shape the environmental and social conditions of regions, far and wide. Knowledge of these upstream effects in the manufacturing process influences the behavior of branding, selling, buying, and regulating products. Due to the influence of numerous internal and external factors, it is difficult to determine whether Home Depot and Lowe's are in a competitive relationship or the same dilemma under the influence of the same major event. Corporations with branded products and retailers are sensitive to financial losses due to unflattering portrayals of their suppliers. For example, Russian wood supply and U.S. retailers, namely Walmart, Lowe's, and Home Depot have uncovered the connections between consumers who shop at these stores to forests in the Russian far east through the Tracking Corporations Across Space and Time (TRACAST) methodological framework to investigate the detailed inner workings and impacts on entire supply chains without corporations (Goldstein and Newell, 2020). However, without further restrictions, serious challenges would be posed due to multiple equilibria and the potential complexity. For example, the number of stores has been modeled to measure the competition between Lowe's and Home Depot, and the strategic interaction between these firms (Aradillas-Lopez and Rosen, 2022). Therefore, based on the revenue and profit data of Home Depot and Lowe's from 1996 to 2021 (Fig 2), this study introduces structural breakpoints and analyzes the detected structural breakpoints through the event research method to understand the relationship between the two companies under the impact of major events and to provide a basis for the decision-making of home building materials retail enterprises.

The paper is organized as follows. Section 2 illustrates major events for potential structural breakpoints for Home Depot and Lowe's. Section 3 proposes unit root tests applied in the study in presence of a structural break. Section 4 briefly summarizes findings from structural breakpoints unit root tests with full detailed events of Home Depot and Lowe's. Section 5 concludes.



Source: Fortune Global 500

Figure 2. Home Depot and Lowe's revenue and profit trends Chart (in million US\$).

2. Potential Structural Breakpoints

Structural breakpoints refer to those time nodes that have undergone structural changes in time series due to sudden and random events. They change a long-term trend and the stability of related models in a time series. Within a certain interval, there may be one or more such time nodes (Han and Department, 2019). Event research methods have been researched in the late 1960s and used to determine the information content of accounting surplus reports to confirm the usefulness of accounting information (Ball and Brown, 1968). Fama et al. (1969) also introduced event research methods to explore the speed at which markets react to information such as corporate stocks and dividend policies. Since then, the event research method has been widely used in the field of corporate finance, economic law, and macroeconomic regulation and control (Konovalenko and Ludwig, 2019). To better correspond to the structural breakpoints and events in the future, we comb through the timeline of Home Depot and Lowe's as described in Table 1.

Table 1. History of Home Depot and Lowe's

Year	Home Depot	Lowe's
1921		Founded in North Carolina, U.S.
1961		Listed on the New York Stock Exchange
1978	Founded in Georgia, U.S.	
1981	Listed on the New York Stock Exchange	
1989		Accepted the big store model
1994	Acquired Aikenhead's Hardware, a Canadian hardware chain	
1995		Launched own company, official website
1997	Expanded business to Chile and Argentina	
1989	Surpassed Lowe's to become the largest retail store in the U.S.	
1999	Acquired pipeline and fittings supplier Apex Supply	
	Launched own official website;	
2000	Launched a new era combination of DIY+DIFM+PRO; added the pre-sales and after-sales service business of stores;	
	Acquired Maintenance Warehouse in San Diego	
	Introduced at home service (later DIFM);	
2001	Start developing HD supply's MRO and supply chain business;	
	Marched into Mexico	
2004	HD Supply was born	
2006	Entered the Chinese market;	
	Acquired Hughes Supply and Home Decorators Collection	
2007	Sold HD supply;	Moved the business into the Canadian market
	Proposed RDC (rapid deployment centers)	
2010		Entered Australia to develop chain stores
2012	Ended the large-scale home building materials retail supermarket business and withdraw from the Chinese market	Acquired Rona, Inc, a hardware chain in Quebec, failed

Table 1. *cont.*

2013	Returned to the Chinese market in the form of paint stores; Set up two large distribution centers in Atlanta and Los Angeles	Acquired Orchard Supply Hardware to expand west coast stores in the U.S.
2014	Data leakage occurs; Craig Menear took over as CEO	Faced with class action lawsuits from former and current HR managers
2015	Acquisition of Interline Brands and Re-focus on MRO Business	Lowe's Canada announced that it will acquire 13 former target Canada stores and the lease of distribution center in Ontario for US\$ 151 million
2016		Acquired Rona Canada to expand Canadian stores
2017	Acquired the online business of The Company Store	Acquired Maintenance Supply Headquarters into MRO business The new CEO Marvin Ellison took office;
2018	Introduced Home Depot Pro	Closed all 99 existing Orchard Supply stores; Announced its withdrawal from the Mexican market and closed all Mexican stores
2020	Bought HD supply	

Source: Future Think Tank, Wikipedia, Home of American Stocks

3. Research Method

In the traditional econometric model, the unit root test is processed to assess the stability in time series regression. If the test results reject the unit root process, the sequence is concluded to be stationary. However, the conclusion cannot be drawn as non-stationary because the test research assumes that there is no structural change in data generation (Lee et al., 2022). Perron (1989) and Phillip-Perron (1988) argued that in presence of a structural break, the conventional unit root tests such as ADF (1979) are biased towards non-rejection of the null hypothesis. Subsequently, Zivot and Andrews (1992), Perron and Vogelsang (1992), Perron (1997), and Lee and Strazicich (2003) suggested test statistics allow an endogenous single structural break in the series while testing for unit roots. It has been further argued that a single endogenous break in a series is insufficient and leads to loss of information when more than one break exists. Studies by Lumsdaine and Papell (1997), Clemente et al. (1998), and Lee and Strazicich (2003) also proposed unit root tests based on multiple structural breaks.

Zivot and Andrew (1992) pointed out that traditional ADF testing is not suitable for situations where a variable has a structural breakpoint. When a structural breakpoint occurs, the ADF root test may not reject the null hypothesis that the sequence is non-stationary because financial crises, political unrest, wars, and natural disasters can all lead to structural breakpoints in time series. A structural breakpoint test in 1992, for example, in which structural breakpoints were endogenous to data and did not need to be pointed out in advance (Belhassine and Karamti, 2021). Thus, we use the three methods of intercept, trend, and both to respectively conduct the Zivot-Andrews unit root test. The P-value is compared to the significance level of 5%, and when the P-value is less than 5% of the significance level, the presence of a structural breakpoint is accepted.

At the same time, the structural change means that the parameters of the generation process have been adjusted, and the analysis of the time series in which the structural change has occurred using the general method is likely to cause serious deviations. The evolution of the test method for structural mutation points has mainly undergone a process from exogenous to endogenous and from single mutation to multi-mutation (Quan et al., 2014). Combining existing research, we refer to Lee and Strazicich (2003; 2004)'s results for the Lagrange multiplier test method (two break number methods) to examine the structural mutation points of the two companies separately and compare the t-value at their significance levels for the significance of unit root.

Perron (1989) derived the progressive distribution of the unit root statistic under the assumption that the structural mutation point is known (exogenous), pointing out that most U.S. macroeconomic sequences were trend stabilization processes with structural mutations, rather than the unit root processes determined by the standard ADF test. It is an important improvement of the traditional unit root test method (Hu et al., 2019; Caglar et al., 2021). On the premise that the sequence is stable, the unit root tests of the Zivot and Andrews (ZA), Lee and Strazicich (LS), and Perron (Perron) with structural breakpoints of two financial variables of Home Depot and Lowe's are found. The empirical analysis is carried out by combining the event research method, and the results of the relationship between Home Depot and Lowe's under the impact of major events are obtained.

3.1. Data Sources and Processing

Taking 1996–2021 as a time series, four variables are investigated: total revenue of Home Depot (HTR), profit of Home Depot (HPI), total revenue of Lowe's (LTR), and profit of Lowe's (LPI). Then, the unit root test of these four variables is carried out. The data are collected from Fortune Global 500. Due to the lack of the revenue and profit data of Lowe's in 1996, 1997, 2000, and 2004, the data of the first 11 issues (including missing data) is used to estimate the missing data using exponential trends. Statistics of the four variables are described in Table 2.

Table 2. Revenue and profit data of Home Depot and Lowe's from 1996 to 2021 (millions of dollars).

	HTR	HPI	LTR	LPI
Mean	70,288.64	4,945.51	42,577.25	2,082.60
Standard Deviation	29,085.19	3,256.10	22,340.53	1,301.10
Kurtosis	-0.1914	0.3754	-0.7077	1.4723
Skewness	-0.1624	0.9595	-0.0054	0.8071
Minimum	15,470.40	731.50	7,265.17	222.77
Maximum	132,110.00	12,866.00	89,597.00	5,835.00
Number of Observations	26	26	26	26

Source: Fortune Global 500

3.2. Stationarity Test

The stationarity test is first conducted using the Augmented Dickey-Fuller test to evaluate the degree of stationarity and to check whether a unit root appears in a sequence. Table 3 shows the absolute value of the P-value of HTR, HPI, LTR, and LPI is greater than the critical value at the significance level of 5%. Therefore, the null hypothesis that the original sequence has a unit root cannot be rejected, *i.e.*, none of these variables is stable. The first-order difference inspections show the null hypothesis of the unit root of HTR and LTR cannot be rejected. The second-order difference inspections of each variable reject the null hypothesis of a unit root.

Table 3. Results of the stability test of Home Depot and Lowe's of America's revenue and profits.

Variables	Test type (C, T, K)*	ADF-statistic	Test critical value (5% level)	P-value	Conclusion
HTR	(0, 0, 1)	1.480303	-1.955681	0.9614	Not stable
HPI	(0, 0, 0)	3.175809	-1.955020	0.9991	Not stable
LTR	(0, 0, 0)	4.639825	-1.955020	1.0000	Not stable
LPI	(0, 0, 0)	1.784998	-1.955020	0.9789	Not stable
D(HTR) ¹	(0, 0, 0)	-1.050828	-1.955681	0.2562	Not stable
D(HPI)	(0, 0, 0)	-2.419729	-1.955681	0.0179	Stable
D(LTR)	(0, 0, 0)	-0.256020	-1.955681	0.5833	Not stable
D(LPI)	(0, 0, 0)	-3.308585	-1.955681	0.0020	Stable
DD(HTR) ²	(0, 0, 0)	-3.537175	-1.956406	0.0011	Stable
DD(LTR)	(0, 0, 0)	-3.048705	-1.956406	0.0039	Stable

* C denotes intercept; T denotes trend; K denotes lag length;

¹ D represents first difference; ² DD represents second difference

3.3. Unit Root Test with Structural Breakpoints

The Zivot-Andrews unit root test (ZA test), Lee Strazicich unit root test (LS test), and Perron unit root test (Perron test) with structural breakpoints are used to detect the HTR, HPI, LTR, and LPI for structural breakpoint and the time node. We investigate structural breakpoints into two categories. The first category is to judge the structural breakpoint based on the P-value as a reference, that is, the ZA test. The null hypothesis for the ZA test is tested with a unit root with a structural break which combines the unit root and the structural breakpoint and uses the P-value as a reference. When the P-value is less than the significance level at 5%, the unit root and the structural breakpoint exist at the same time. The second category is to test the null hypothesis, which presupposes the existence of structural breakpoints and records only structural breakpoints, namely LS tests and Perron tests. The null hypothesis for LS is tested with a unit root with a break, and Perron's null hypothesis is tested with a unit root with a structural break. The null hypothesis of both is created based on the existing structural breakpoint. Based on the t-value as a reference, it is investigated whether the unit root is stable. However, we investigate the existence and time node of structural breakpoints, so the t-value is not studied in detail. In summary, in this study, the significance level of the P-value is compared for the ZA test, while the LS test and the Perron test are performed for the time node of the structural breakpoint.

Under the three-unit root test methods with structural breakpoints, the time of structural breakpoints in revenue and profit is shown in Table 4. In addition, the ZA structure breakpoint diagram of HTR, HPI, LTR, and LPI is shown in Figs. 3 to 6, Perron structural breakpoint diagram is shown in Figures 7 to 10.

Table 4. Home Depot and Lowe's structural fracture unit root inspection.

	ZA		LS-crash		Perron			
	intercept	trend	intercept and trend	one break number	two break number	intercept	trend	intercept and trend
HTR	Accept** (2009)	Accept* (2017)	Accept** (2009)	Accept (2018)	Accept (2016, 2018)	Accept (2008)	Accept (2008)	Accept (2017)
HPI	Accept** (2008)	Accept* (2015)	Accept** (2008)	Accept (2013)	Accept (2011, 2018)	Accept (2007)	Accept (2008)	Accept (2015)
LTR	Not Accept (2015)			Accept (2012)	Accept (2012, 2018)	Accept (2015)	Accept (2003)	Accept (2014)
LPI	Accept* (2010)	Not Accept (2004)	Not Accept (2014)	Accept (2017)	Accept (2006, 2017)	Accept (2009)	Accept (2009)	Accept (2018)

Note: Accept means accepting the existence of a structure breakpoint, and Not Accept means not accepting the existence of a structure breakpoint

* indicates the P-value of the ZA test is less than 5% of the significance level

** indicates the P of the ZA test Values are less than 1% of the significance level

According to Table 4, the structural breakpoints of HTR are mainly observed in 2008–2009 and 2016–2018. The structural breakpoints of HPI mainly occur in 2007–2008, 2011, 2013, 2015, and 2018. Combined with the structural breakpoint analysis of HTR and HPI, the time interval of the two coincidences are obtained in 2007–2009 and 2015–2018, and the time node of the anastomosis appeared in 2008 and 2018. Home Depot's profits also had structural breakpoints in 2011 and 2013, but revenue was not affected.

The structural breakpoints of LTR mainly appear in 2003, 2012, 2014–2015, and 2018. The structural breakpoints of the LPI are only observed in 2004, 2006, 2009–2010, 2014, and 2017–2018. Combined with the structural breakpoint analysis of LTR and LPI, the time intervals that coincide with the two appeared in 2003–2004, 2014–2015, and 2017–2018. The time node of the anastomosis appeared in 2014 and 2018. In addition, the revenue of Lowe's also had a structural breakpoint in 2012, and its profits had a structural breakpoint between 2006, 2009, and 2010.

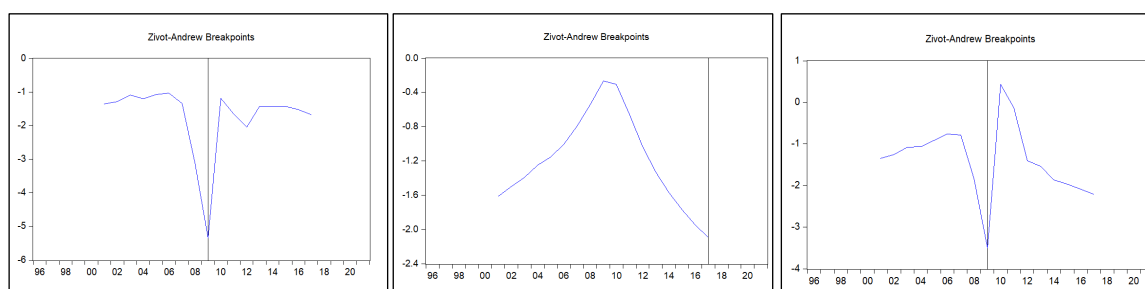
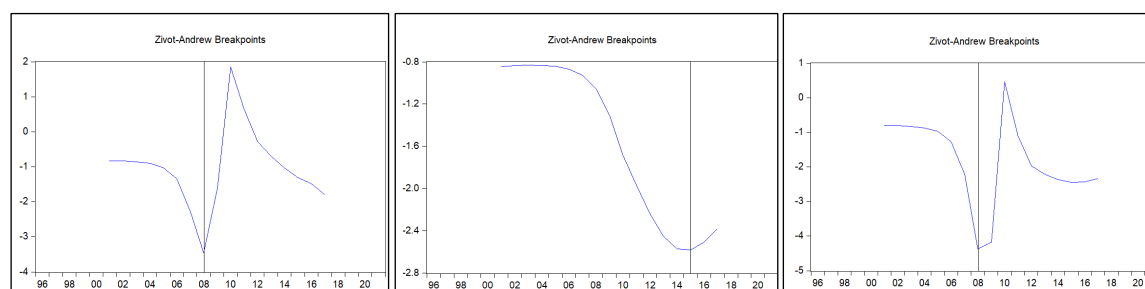
**Figure 3.** Structural breakpoints of the HTR-ZA.**Figure 4.** Structural breakpoints of the HPI-ZA.



Figure 5. Structural breakpoints of the LTR-ZA.

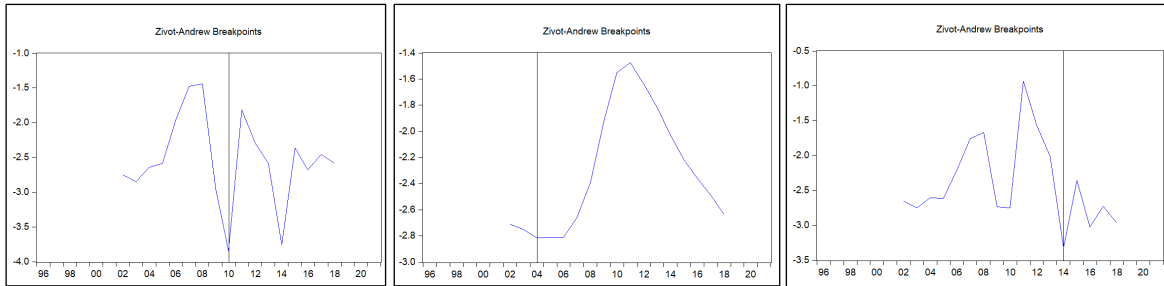


Figure 6. Structural breakpoints of the LPI-ZA.

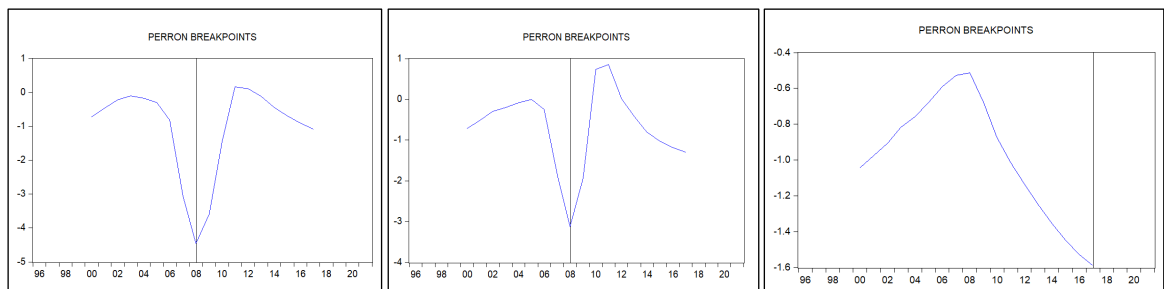


Figure 7. Structural breakpoints of the HTR-Perron.

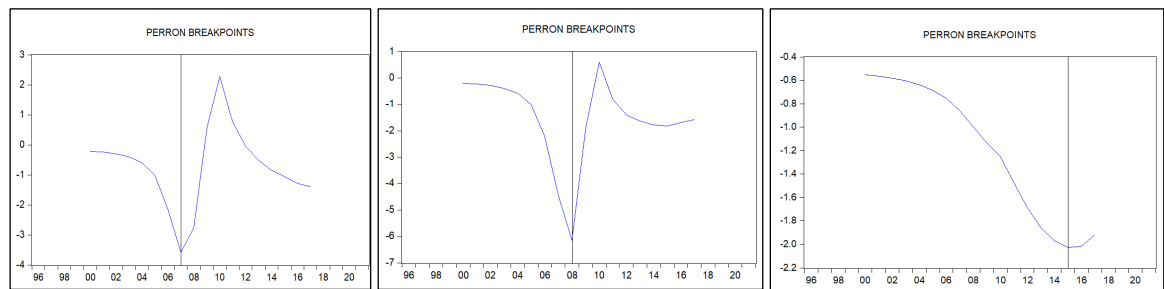


Figure 8. Structural breakpoints of the HPI-Perron.

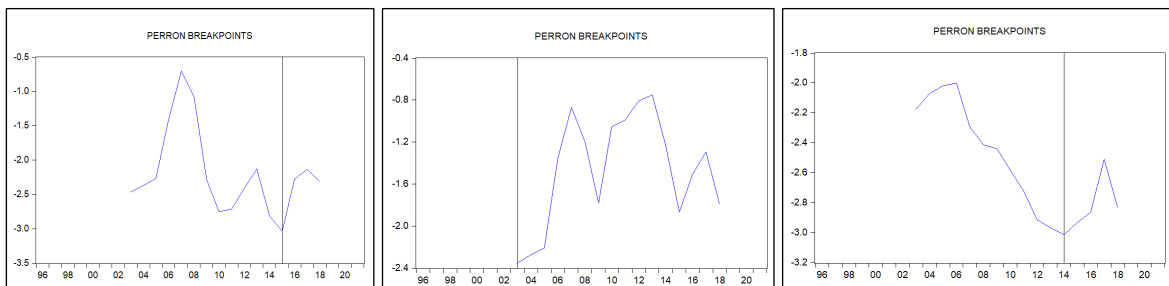


Figure 9. Structural breakpoints of the LTR-Perron.

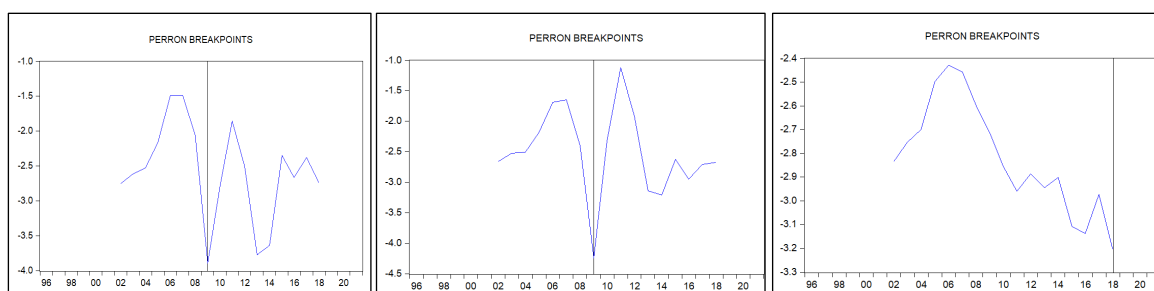


Figure 10. Structural breakpoints of the LPI-Perron.

4. Analysis of Empirical Results

4.1 Inference of Major Shock Events

The purpose of this paper is to investigate the relationship between Home Depot and Lowe's from 1996 to 2021 under the impact of major events. To achieve the research purpose, we examine the structural breakpoints of the two companies in the revenue data supplemented by the structural breakpoints in the profit data and analyze the relationship between the two companies in combination with the event research method. The structural breakpoints in revenue data are considered the main object of investigation because revenue can more fully represent a company's operating conditions, and it can also reflect the degree to which a company is affected by the outside world.

According to Table 4, the structural breakpoints of HTR appeared in 2008–2009 and 2016–2018, and the structural breakpoints of LTR appeared in 2003, 2012, 2014–2015, and 2018. A structural breakpoint in 2015 was not accepted by Lowe's. Combined with the event research method, it was inferred that two major events have a joint impact on Home Depot and Lowe's, namely the 2008 financial crisis and the 2018 business adjustment innovation of the two companies. The external shocks in the 2008 financial crisis directly affected the revenue of Home Depot from 2008 to 2009, although not directly reflected in the revenue data of Lowe's, but in the data of its profits from 2009 to 2010. In the time interval of another structural breakpoint of Home Depot, during the period from 2016 to 2018, combined with the structural breakpoint on the profit data, the revenue and profit data showed the structural breakpoint in 2018. In 2018, there was a greater impact on the operation of Home Depot, so 2018 was used as a time node and analyzed in conjunction with the event research method.

In 2018, Home Depot launched Home Depot Pro to strengthen the construction of Pro for professional contractors and services and attached great importance to the construction of online shopping channels during this period. In 2018, Marvin R. Ellison, the new president and CEO of Lowe's register took office and led Lowe's to make a series of changes in the construction of Pro users, channels, and so on. Both companies made business adjustments and innovations in 2018, focusing on and attaching importance to the construction of Pro customers while strengthening the construction of online shopping channels. In addition to the joint shock, there were also major events that only had an impact on Lowe's and had little impact on Home Depot. In 2012, Lowe's hostile acquisition of Quebec's hardware chain Rona Inc. failed, affecting Lowe's reputation and revenue. In 2014, Lowe's faced a class-action lawsuit from former and current human resources managers, and problems arose in the company's internal operations, which adversely affected Lowe's revenue and had an internal impact on Lowe's. In addition, in 2015, as an unacceptable structural breakpoint, Lowe's announced that it would acquire 13 former Target Canada stores and leases of an Ontario distribution center for US\$151 million. This incident had a favorable impact on Lowe's subsequent operations, but it did not have much impact on revenue in 2015. Although 2003 is the time node of the structural breakpoint of Lowe's income data, no data showed the major events experienced by Lowe's. Combined with the structural breakpoint on Lowe's profit data, there was no structural breakpoint in 2003. Due to the difference in the method of measuring the structural breakpoint, the measured time node was not consistent, so further analysis was not made.

In summary, there are five major events, but only two major events had a common impact on Home Depot and Lowe's, namely the financial crisis in 2008 and the business adjustment and innovation in 2018. To understand the relationship between Home Depot and Lowe's under the impact of major events, we analyze these two major events.

4.2. Common external impacts from shocks of 2008 financial crisis

The financial crisis is the core performance of the economic crisis, which mainly refers to the phenomenon of intensification or over-cyclical deterioration of financial indicators in most countries around the world in a short period with the characteristics of advanced, ultra-cyclical, global and centralized (Ren, 2021). The main market for Home Depot and Lowe's is in the U.S, while the outbreak of the financial crisis in 2008 had a negative impact on the economic development of the U.S. A total US GDP of US\$14,369.177 billion in 2008 decreased by 1.7% to US\$14,119.034 billion in 2009. At the same time, consumer spending also decreased due to the weak job market, housing market, and stock market, so the retail industry performance declined month by month. According to the news released by the US Department of Commerce in 2008, the U.S closed a total of 148,000 retail stores of various types, and layoffs of 530,000 employees. In 2009, retail sales totaled US\$966.1 billion in the first quarter of 2018, which decreased by 10.1% (Lan and Zhou, 2009).

Home Depot and Lowe's, as a member of the retail industry, have also been negatively affected. According to Fortune Global 500 data, compared with 2008, Home Depot's operating income decreased by 15.9% and profit decreased by 48.6% annually. In 2009, Lowe's operating income decreased by 0.1% and profit by 21.9%. When Home Depot and Lowe's were hit by the major external event of the 2008 world financial crisis, both companies had negative revenue and profit growth and were in the same predicament.

Table 5. Total U.S. GDP from 2008 to 2010

Year	U.S. GDP (in billion US\$)
2008	14,369.177
2009	14,119.034
2010	14,660.452

Source: National Statistical Office

4.3. Common internal impact of business adjustment and innovation in 2018

In 2018, both Home Depot and Lowe's made business adjustments and innovations. Both companies focused and attached importance to the construction of professionals as customers while strengthening the construction of online shopping channels. To match the needs of Pro's professional customers, Home Depot acquired Hughes Supply to strengthen the supply chain and combined the earliest acquired channel supply brand Maintenance Warehouse. However, in 2007, due to the impact of the US subprime mortgage and the full use of the value of HD Supply, Home Depot sold HD Supply in 2007 to a third party for US\$8.5 billion due to capital needs and pulled Home Depot's core business back into retail, focusing on the expansion of stores. For Home Depot, the sale of HD Supply did not mean the company pulled out of the engineering channel. Home Depot's acquisition of Interline Brands in July 2015 to refocus on the MRO (Maintenance, Repair, and Operations) business gave more opportunities. The expansion of maintenance and operations enabled Home Depot to expand into multifamily, hospitality, and industry. According to the Home Depot Internal Analyst Investment Conference, there announced two huge growth opportunities in the future: one was for Pro professional contractors, and the other was connected retail, an online digital business.

In 2018, after acquiring a home product supplier that integrated multiple major engineering channels, Home Depot launched Home Depot Pro, which was developed from Interline Brands. This division specialized in engineering channels, and a large portion of Home Depot Pro's business was related to MRO, which made Home Depot one of the largest wholesale distributors of MRO products in the United States. Home Depot distributed a wide range of products such as HVAC, cleaning supplies, plumbing supplies, and safety supplies. In the MRO business, MRO services provided Pro professional contractors with the equipment and tools needed for repair and maintenance and facilitated the construction of Pro customers. At this stage, Home Depot continuously improved the construction of online shopping channels, kept up with the development trend of online consumption, continuously improves related logistics facilities, and continued optimizing supply chain management.

Driven by internal and external pressures, Lowe's faced a difficult situation, including changes in consumer habits, intensified competition, and a shift in the retail landscape. In this dilemma, Lowe's new CEO in 2018, Marvin Ellison led Lowe's to carry out a series of transformations. In Marvin Ellison's view, what led to Lowe's dilemma was that the former leader "lost its way" and blindly expanded in pursuit of higher profits, hurting the core retail business. In addition, the company had many shortcomings in customer experience, e-commerce, IT, and supply chain management and was surpassed by competitors, especially since the supply chain was once one of the company's biggest strengths. To this end, Marvin Ellison made several adjustments.

The first is to increase the proportion of professional customers. Home Depot and Lowe's had similar customer segments: retail and professional. Retail customers were mainly ordinary families or individual consumers, who bought raw materials,

completed the project independently or paid a certain additional fee to complete the project. Professional clients mainly included contractors and home improvement professionals who required more complex services such as delivering orders directly to construction sites. Professional customers have higher unit prices, and the average expenditure was five times higher than that of ordinary retail shoppers. Lowe's, once dominated by professional clients, lost that advantage because it once stopped selling the tool brands favored by contractors and often ran out of stock in the supply of bulk goods that did not meet the needs of professionals. In this process, Home Depot had gradually taken the lead and secured more than 100,000 professional customers, whose sales far exceeded DIY retail sales, and became the main driver of its growth. To this end, Lowe's main measures included improving inventory management capabilities, providing professional customers with sufficient and selectable goods, and avoiding stock-outs. Loaders were specially designed for professional customers so that bulky products were loaded quickly and efficiently in the store. A competent department was set up to serve professional customers, track customer needs, improve service levels, and maintain customer relationships. Lowe's policy produced a good response with comparable sales from professional clients exceeding total comparable sales in January 2019.

The second was to increase investment in IT technology and improve digital capabilities. Lowe's investment in technology and software had historically been underinvested. In the past, it was mainly the practice of buying "off-the-shelf" software packages from IT companies and customizing them, which had obvious drawbacks. First, data was siloed, requiring companies to staff different departments, which resulted in high costs and inefficiencies. Second, it is not conducive to tracking business processes and creating real differentiation. To truly form the company's differentiated competitive advantage of inventory management or order management, an information platform was needed. With the appointment of the new CTO Seemantini Godbole, Lowe's increased its investment in technology and accelerated digital transformation. Lowe's hired about 2,000 software engineers intending to bring 80% of software engineering capabilities into the company to increase the company's flexibility, reduce maintenance costs, and improve its ability to monitor the business. The third is the ability for e-commerce. When it comes to home improvement, a definite trend was that customers searched for items online frequently, even though they eventually completed a purchase in the store. Thus, the importance of online shopping channels increased. In the fourth quarter of fiscal 2018, Lowe's online sales grew 11% year-over-year, which was significantly higher than the company's total sales growth but also well below the online sales of its main rival, Home Depot. Home Depot's online sales grew 22.7% in the fourth quarter and 24.1% overall in 2018, accounting for 7.9% of total sales. Home Depot's online customer unit price is 3 times higher than that of offline, and through the omnichannel strategy of connecting online and offline, it has greatly increased revenue per square foot. Lowe's management also focused on the transformation to have e-commerce capabilities, mainly with two main points of strength. The first was to improve the user-friendliness of the website by optimizing functions such as navigation, search, and checkout. The second was to establish closer cooperation with suppliers to help them optimize their online product selection. The fourth was to improve distribution and logistics infrastructure. In the era of brick-and-mortar retail, Lowe's had a traditional advantage in the supply chain. It established a vast warehousing and logistics system in the U.S., including regional distribution centers, truck distribution centers, coastal transportation centers, and third-party transshipment centers. These infrastructures ensured that goods were efficiently transported to stores. In the omnichannel era, to connect online and offline, Lowe's must improve its distribution and logistics infrastructure and its ability to deliver to customers. To this end, Lowe's strategy was to establish a direct sales center that connected directly the direct sales center to the customer. On the one hand, it improves the efficiency of transportation, and on the other hand, it freed up the store's storage space. The company invested US\$150 million in Tennessee to open its first direct sales center and plans to open a second on the West Coast. The first direct sales center took 75% of the country's commodity delivery business for less than two days, while the new distribution center in the west charged the remaining 25%. In addition, Lowe's logistics plan included the creation of 20 new bulk distribution centers and more than 90 "terminals" across the country, transferring the distribution of appliances, lawn mowers, grills, and other commodities to these centers and terminals, rather than store-based distribution.

In 2018, the two companies made business adjustments and innovations to strengthen the construction of Pro customers and online shopping channels. Home Depot's revenue in 2018 was US\$1,00,904 million with an annual increase of 6.7%. Revenue in 2019 was US\$1,08,203 million with an annual increase of 7.2%. The annual growth rate in 2019 implied that the business adjustment and upgrading of Home Depot played a positive role. According to the financial report, the total revenue of Lowe's in fiscal 2018 was US\$71.31 billion, showing an increase of US\$2.69 billion from the previous year with an increase of 3.9%. The business adjustment and innovation carried out in 2018 made good progress. The two companies had a positive impact on the revenue after their respective business adjustments and innovations. However, the two companies were in a competitive relationship in the business adjustment and innovation event since the markets of the two companies were similar, and both companies carried out business adjustments in the same direction. Eventually, the two companies competed for customer resources. From another point of view, competitors' business adjustment and innovation also threatened themselves to a certain extent but their business adjustment and innovation help being pulled apart by competitors.

5. Conclusion

5.1. Exploratory Factor Analysis

After verifying the stability of the time series from 1996 to 2021 of the two companies, the structural breakpoints of the revenue data of the two companies were investigated with the analysis of profit data. Two main structural breakpoint intervals were found through the investigation of the breakpoint of Home Depot data, namely in 2008–2009 and 2016–2018. Combined with the analysis of the event research method, the events corresponding to the two structural breakpoints occurred with the 2008 financial crisis and the business adjustment and upgrading in 2018. Through the investigation of the structural breakpoints of Lowe's, multiple structural breakpoints were found, and their distribution was relatively scattered in 2003, 2012, 2014–2015, and 2018, of which 2015 was not accepted by Lowe's as a structural breakpoint. Combined with the event research method, it was found that the corresponding major event in 2012 was Lowe's acquisition of Rona, a hardware chain in Quebec, which failed. The corresponding major event in 2014 was that Lowe's faced a class-action lawsuit from former and current HR managers. 2015 was an unacceptable structural breakpoint, and the corresponding significant event was Lowe's announcement to acquire 13 former Target Canada stores and leases of distribution centers in Ontario for US\$151 million.

The structural breakpoints and event speculation results of the two companies showed that the major events that jointly affected the two companies were the occurrence of the financial crisis in 2008 and the business adjustments and innovations in 2018, and these two structural breakpoints had a significant impact on the operations of the two companies. At the time of the 2008 financial crisis, Home Depot and Lowe's were negatively impacted on revenues and profits and were in the same predicament. In 2018, both companies underwent business adjustments and upgrades, and to comply with the direction of the market, Home Depot Pro was launched by Home Depot. Lowe's had the leadership of a new CEO who reformed the company, and both companies increased Pro customer and online shopping channel construction. In 2018, there was an inflection point for the two companies. After the business adjustment and innovation, the revenue of both companies increased, but in the process of business adjustment, the two companies had a competitive relationship and competed for a common customer group. Among the above two major events, the former belonged to the common external impact brought about by major events, and the latter belonged to the common internal impact brought about by major events. In addition to the common internal and external shocks of major events, there were also internal and external shocks that occurred in one company. The analysis of the structural breakpoints showed that the corresponding major event in 2012 was Lowe's acquisition of the Hardware Chain Rona in Quebec, and the failure was an external impact of the major event only on Lowe's. The corresponding major event in 2014 was that Lowe's faced a class-action lawsuit from former and current human resources managers, which was an internal impact of major events only on Lowe's.

When the operation of the enterprise faces a major impact, it brings internal and external impacts. From the perspective of the scope of impact, it only affects itself or the entire industry. The financial crisis of 2008 was an irresistible external impact on Home Depot and Lowe's, leaving the two companies in a common predicament. In 2018, the internal business adjustment and innovations of the two companies was the result of fierce competition and conforming to the development of the market, and the two companies carried out business adjustment and innovation to meet the needs of customers to compete for common customer resources, thereby expanding market share and increasing revenue. The business adjustment and innovations were not only for the adjustment of themselves but also impacted the other party, prompting it to actively carry out reforms and adjustments and avoid being surpassed by the other party and abandoned in the market. Moreover, this situation becomes common, and there is a more competitive relationship between enterprises. Thus, enterprises need to have timely insight into changes in the market, and actively adjust and upgrade their business to avoid the loss of existing customers and potential customers. In addition to having a common impact, a major event may have an impact on its own business. Taking Lowe's as an example, the distribution of structural breakpoints in Lowe's was more scattered. Therefore, more problems arise within the enterprise, and problems in the operation of the enterprise must be solved promptly.

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