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## **BONUS STOCK ANNOUNCEMENTS IN INDIA: COMPARING MARKET REACTIONS DURING THE GLOBAL FINANCIAL CRISIS AND THE COVID-19 PANDEMIC**

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### ***ABSTRACT***

This study examines investor responses to bonus share announcements in India during two structurally different crises: the credit-induced Global Financial Crisis (2008–2009) and the pandemic-induced COVID-19 crisis (2020–2021). Using an event study methodology, we assess abnormal returns over multiple event windows. The analysis reveals strong positive market reactions during the COVID-19 period—comparable to responses observed in non-crisis times—while reactions during the Global Financial Crisis were largely muted or statistically insignificant. Notably, abnormal returns during COVID-19 remained elevated post-announcement, deviating from the extended drift reported in prior studies. These findings highlight the importance of crisis context in shaping investor behavior toward corporate actions.

Keywords: Bonus shares, abnormal returns, financial crises, investor sentiment, Indian stock market

### **INTRODUCTION**

Bonus share announcements are widely regarded as significant corporate events, often triggering notable market reactions. While theory suggests such announcements are fundamentally neutral regarding firm valuation (Miller & Modigliani, 1961), empirical evidence frequently demonstrates substantial stock price responses, particularly in markets characterized by higher informational asymmetry and greater retail investor participation, such as India (Dhar & Chhaochharia, 2008; Raja & Sudhakar, 2010). However, the magnitude and persistence of these market reactions can vary significantly depending on the broader macroeconomic context in which they occur.

Financial crises offer uniquely insightful settings to examine such variability, given their pronounced impacts on investor behavior and market sentiment. The Global Financial Crisis (GFC, 2008–2009), marked by systemic financial stress and heightened investor risk aversion, contrasts sharply with the COVID-19 pandemic (2020–2021), characterized by unprecedented policy support, abundant liquidity, and a surge in retail investor activity (Rajan, 2010; RBI, 2021).

While both the Global Financial Crisis (2008–2009) and the COVID-19 pandemic (2020–2021) triggered major disruptions in Indian financial markets, they differed significantly in origin, transmission mechanisms, and investor environment. The GFC was a credit-driven crisis rooted in systemic failures within global financial institutions, ultimately leading to a collapse in liquidity and capital flows. India's real GDP growth slowed from 9.8% in FY2007 to 3.1% by the first quarter of FY2009, reflecting the drag from external financial contagion and dampened investment activity (RBI, 2009). By contrast, the COVID-19 crisis was an exogenous health shock that rapidly evolved into a full-blown economic crisis through nationwide lockdowns, labor dislocation, and global supply chain breakdowns. India's economy contracted by –7.3% in FY2020–21—the sharpest decline since the country gained independence in 1947 (Government of India, 2021; RBI, 2021; NITI Aayog, 2022).

The policy responses of the government to the two crises also diverged meaningfully. During the GFC, the Indian government deployed a relatively modest fiscal stimulus of about 3.5% of GDP, focused primarily on indirect tax cuts, public infrastructure spending, and export incentives (RBI, 2009). The Reserve Bank of India also cut the repo rate from 9% to 4.75% and reduced the cash reserve ratio to 5% to ease liquidity. In contrast, the COVID-19 crisis prompted a swift and expansive response. The government announced a headline stimulus package amounting to nearly 10% of GDP, although only a portion reflected direct fiscal outlays; the package largely comprised credit support to Micro, Small, and Medium Enterprises (MSMEs), food security programs, and liquidity schemes (Government of India, 2021; NITI Aayog, 2022), as further analyzed by Sengupta & Vardhan, (2023). The RBI also slashed the repo rate to 4% and introduced long-term repo operations and government bond purchases to stabilize financial markets.

Market behavior and investor participation further underscore the contrast between the two crises. During the GFC, Indian equity markets remained volatile and rangebound, with the NIFTY 50 hovering between 2,800 and 4,800 throughout 2009 despite eventual macroeconomic stabilization (SEBI, 2021). Institutional investors dominated market activity, and retail participation remained muted. In stark contrast, the COVID-19 period witnessed a sharp and sustained market rebound. The NIFTY 50 rose nearly 70%, from approximately 7,500 in March 2020 to over 14,500 by March 2021, buoyed by strong liquidity and optimistic recovery expectations. Retail investor participation surged during this time, likely driven by digital trading platforms, low interest rates, and increased household savings (Sengupta & Vardhan, 2023). In addition, the introduction of the COVID-19 vaccine in December 2020 increased abnormal returns and reduced the volatility of global stock markets due to investors' increased confidence that the economically crippling global health crisis would soon end (Chan, et al., 2022; Rouatbi, et al., 2021). In contrast, there was no “vaccine” to bring about a quick resolution to the economic damage of the GFC. These differences—systemic versus exogenous crisis, cautious versus expansive policy response, and institutional versus retail-driven markets—create a

compelling backdrop to examine how investors in India responded to firm-level announcements such as bonus share issuances.

This study empirically examines market reactions to bonus share announcements in India during these two distinct crises with the use of an event study methodology. By comparing abnormal returns (AR) and cumulative abnormal returns (CAR) across several event windows, we directly assess how market reactions vary in response to differing macroeconomic environments and investor sentiments. Specifically, we analyze whether anticipatory, immediate, and sustained market reactions differ markedly between the GFC and COVID-19 periods.

Our analysis contributes to existing literature in two important ways. First, it provides clear empirical evidence that the effectiveness and interpretation of bonus share announcements depend heavily on macroeconomic conditions and the prevailing market sentiment. Second, by directly comparing two fundamentally different crisis periods, this study enhances our understanding of how investor psychology and market liquidity influence price reactions in emerging markets, the market classification into which MSCI Inc. (2025) places India. To our knowledge, this study is the first empirical analysis directly comparing market responses to bonus announcements across the distinctly different macroeconomic environments of the GFC and COVID-19 crises in India.

The remainder of this paper proceeds as follows. Section 2 presents a literature review, synthesizing theoretical perspectives and empirical findings on bonus issues, market efficiency, and crisis-specific investor behavior. Section 3 details our methodology, highlighting the event study approach and significance testing methods. Section 4 describes our data sources, sample selection, and the rationale for choosing the crisis periods. Section 5 presents our empirical results, clearly illustrating the differences in market reactions across event windows, supported by detailed statistical analysis in Tables 1 through 6 and Figure 1. Section 6 discusses our findings, situating them within broader financial market implications and policy contexts. Finally, Section 7 concludes by summarizing key insights, acknowledging limitations, and proposing directions for future research.

## **LITERATURE REVIEW**

According to classical financial theory, as proposed by Miller and Modigliani (1961), dividend policy—including bonus share issuances—is irrelevant to firm valuation in efficient markets without taxes or informational asymmetries. Yet, empirical evidence consistently indicates that bonus share announcements provoke measurable market reactions, particularly in emerging markets characterized by information opacity and significant retail investor participation. This divergence from theoretical neutrality is often explained through signaling theory, where bonus issues serve as credible indicators of managerial optimism and future firm performance (Bhattacharya, 1979; McNichols & Dravid, 1990). Empirical studies from developed markets,

such as those by Grinblatt, Masulis, and Titman (1984) and Lakonishok and Lev (1987), consistently report positive abnormal returns following stock dividend announcements, suggesting effective signaling even in relatively efficient markets.

Indian market evidence further substantiates the signaling effect of bonus issues. Raja and Sudhahar (2010) and Rao (2016) document significant positive cumulative abnormal returns around bonus announcements, affirming investor interpretation of bonus issues as signals of firm strength and future profitability. Moreover, Dhar and Chhaochharia (2008) highlight increased trading volumes post-announcement, attributing such responses to improved liquidity and enhanced marketability arising from bonus share issuance. Conversely, more recent studies, including Kumari and Pushpender (2019) and Mehta, Jain, and Yadav (2014), report more modest or statistically insignificant abnormal returns, indicating that signaling effectiveness might depend significantly on investor expectations and market maturity.

The impact of macroeconomic crises on investor response to corporate actions represents a critical but relatively understudied dimension within financial market literature. The Global Financial Crisis (GFC) of 2008–2009 and the COVID-19 pandemic (2020–2021) provide contrasting contexts to explore this issue. During the GFC, characterized by severe global financial distress and investor risk aversion, market reactions to firm-specific announcements were subdued (IMF, 2010; Rajan, 2010). Khanal and Mishra (2017), examining the post-GFC U.S. market, confirmed dampened investor responses to bonus announcements amid systemic uncertainty. In contrast, the COVID-19 pandemic was marked by significant policy interventions, ample liquidity, and increased retail investor activity, potentially enhancing the market's responsiveness to corporate signals (RBI, 2021; Government of India, 2021). Indeed, Pandey, Kumari, and Tiwari (2022) document significant event-day returns for bonus announcements during the first half of the COVID-19 period in India. These studies show that investor sentiment and the macroeconomic environment profoundly influence market reactions to these announcements.

Despite these valuable insights, a direct comparative analysis of investor reactions to bonus share announcements across distinctly different crises remains conspicuously absent. This gap underscores the importance of our study, which empirically compares the market response to bonus announcements during the GFC and COVID-19 crises, providing novel insights into how macroeconomic context shapes investor behavior and market efficiency in emerging markets.

## **METHODOLOGY AND HYPOTHESIS DEVELOPMENT**

We employ an event study methodology (detailed fully in Appendix A) to analyze market reactions to bonus share announcements during two significant financial crises: the Global Financial Crisis (GFC) and the COVID-19 pandemic. Following Brown and Warner (1985), we adopt the market-adjusted return model, particularly suitable during crisis periods as it avoids

estimation biases that arise from structural shifts or abnormal volatility. We use the WRDS World Market Index for India as our market benchmark to calculate abnormal returns (ARs). We assess investor behavior across multiple event windows, including anticipation (−20 to −2 days), immediate reaction (−1 to +1 days), event-day reaction (0 to +1 days), and post-announcement drift (+2 to +20 days). Additionally, we evaluate broader windows to capture overall market reactions (−20 to +20 days) and shorter-term symmetric responses (−5 to +5 days). Statistical significance is evaluated using parametric t-tests and non-parametric tests (Sign Test and Wilcoxon Signed-Rank Test). Detailed methodological explanations are available in Appendix A.

Previous studies have established that bonus share announcements typically signal managerial confidence, positively influencing stock prices in emerging markets (Raja & Sudhakar, 2010; Dhar & Chhaochharia, 2008). However, the signaling effectiveness of these announcements during crisis periods remains less clear, given differing macroeconomic conditions. Specifically, during the GFC, global deleveraging, reduced liquidity, and heightened risk aversion limited investors' attention to firm-level signals (Rajan, 2010; IMF, 2010). Conversely, the COVID-19 pandemic was characterized by significant monetary and fiscal stimulus, increased market liquidity, and heightened retail investor activity (RBI, 2021; Government of India, 2021; NITI Aayog, 2022). These contrasting environments motivate our study's hypotheses:

**H1:** Bonus share announcements will generate significantly stronger abnormal returns during the COVID-19 crisis compared to the GFC period.

*Explanation:* Investor optimism, ample liquidity, and supportive market conditions during COVID-19 likely resulted in more favorable market reactions compared to the cautious investor sentiment and tighter liquidity conditions during the GFC.

**H2:** Pre-announcement abnormal returns will be significantly higher during the COVID-19 crisis compared to the GFC period.

*Explanation:* Greater speculative activity, increased retail investor engagement, and positive market sentiment during COVID-19 may have led investors to anticipate bonus announcements more actively than during the cautious, risk-averse environment of the GFC.

**H3:** Announcement-day abnormal returns will be significantly greater during the COVID-19 crisis compared to the GFC period.

*Explanation:* Enhanced macroeconomic support, sectoral resilience (especially in technology and healthcare), and higher investor participation during the COVID-19 crisis likely contributed to stronger market responses at announcement relative to the muted investor reactions amid GFC-related uncertainty.

**H4:** Post-announcement abnormal returns during the COVID-19 crisis will exhibit sustained positive drift or stabilization at elevated levels compared to the GFC period.

*Explanation:* Prior research (Pandey et al., 2022) found modest positive drift in abnormal returns following corporate announcements during COVID-19, suggesting that investors continued to process announcement-related information positively. Given the heightened investor optimism, liquidity support, and favorable market conditions during COVID-19, we anticipate that bonus share announcements will not only trigger immediate positive reactions but will sustain or stabilize these elevated returns post-announcement. In contrast, the pervasive uncertainty and risk aversion characterizing the GFC period should result in minimal or no sustained positive market response post-announcement.

## DATA AND SAMPLE SELECTION

Bonus share announcements, including announcement dates, bonus ratios, and International Securities Identification Numbers (ISIN), were primarily obtained from official stock exchange portals: the Bombay Stock Exchange (BSE) (bseindia.com) and the National Stock Exchange of India (NSE) (nseindia.com). Data was further cross-verified using Moneycontrol.com, a widely recognized financial portal providing comprehensive corporate action data.

Initially, we identified 146 bonus announcements during the COVID-19 pandemic period (February 2020 to December 2021) and 77 announcements during the Global Financial Crisis (GFC) period (January 2008 to December 2009). After applying rigorous criteria—requiring complete availability of fundamental financial data and continuous daily stock price coverage for the entire event window (–20 days to +20 days around the announcement date)—our final sample consisted of 100 firms for the COVID-19 sample and 39 firms for the GFC sample.

Firm-level fundamental data, including total assets, return on assets (ROA), return on equity (ROE), working capital, and related financial metrics, were sourced from Compustat Global via Wharton Research Data Services (WRDS). Daily stock price data, adjusted for dividends and splits, were also retrieved through Compustat Global, with event-study calculations executed using the Event Study Suite available through the WRDS platform.

While the selection criteria required comprehensive availability of fundamental data, it is common practice in event-study methodologies to accept minor variations in availability of daily returns due to non-trading days, trading halts, or data gaps (Brown & Warner, 1985; MacKinlay, 1997). Thus, our final sample includes only firms with sufficient price coverage around the announcement dates to reliably compute abnormal returns. This variation is transparently documented in Tables 2 through 5, ensuring robustness without compromising analytical rigor or representativeness.

Table 1 and Table 2 provide descriptive statistics that highlight notable differences between the two samples. Firms announcing bonus issues during COVID-19 were characterized by larger asset sizes, higher profitability (ROA and ROE), higher liquidity, and greater bonus ratios than those announcing during the GFC period. This divergence likely reflects differing investor expectations, macroeconomic conditions, and market sentiment across these distinct crisis contexts, explored further in our empirical analysis.

**Table 1: Descriptive Statistics – Covid Sample**

Variable	Mean	Std. Dev.	Min	25%	Median	75%	Max	N
Total Assets (₹ millions)	37263.59	256307.5	91.52	336.77	661.5	4945.55	2557491	100
Return on Assets	0.05638	0.08339	-0.41	0.0223	0.0464	0.0901	0.2703	100
Return on Equity	0.09378	0.17286	-1.2369	0.0407	0.1087	0.1698	0.3808	100
Working Capital	1385.92	8175.13	-51702.9	84.51	273.25	640.09	47129.4	100
Debt-to-Equity	2.14213	9.9922	0.0423	0.401	0.7527	1.3973	99.5594	100
Bonus Ratio	1.16889	1.3101	0.0333	0.3333	1	1.05	10	100

Notes: All monetary values are in Indian Rupees (INR), millions.

**Table 2: Descriptive Statistics – GFC Sample**

Variable	Mean	Std. Dev.	Min	25%	Median	75%	Max	N
Total Assets (₹ millions)	36578.72	80461.56	186.72	1037.3	2130.93	32866.85	399979.5	39
Return on Assets	0.15206	0.1081	0.0008	0.0726	0.1107	0.2272	0.4517	39
Return on Equity	0.33159	0.24972	0.0009	0.1728	0.2664	0.4183	0.9261	39
Working Capital	8745.99	19764.58	-1735.69	84.55	486.78	3075.25	80696.4	39
Debt-to-Equity	1.36916	1.21416	0.0273	0.409	0.9774	1.8992	4.982	39
Bonus Ratio	1.08831	1.00125	0.1	0.5	1	1	4	39

Notes: All monetary values are in Indian Rupees (INR), millions.

## RESULTS AND DISCUSSION

This section presents the empirical results of our event-study analysis, examining abnormal returns (ARs) and cumulative abnormal returns (CARs) around bonus share announcements during the Global Financial Crisis (GFC) and the COVID-19 pandemic. Tables 2 through 5 summarize the average abnormal returns (AARs) and CARs across various event windows, providing insights into market reaction patterns and their significance.

Table 3 and Table 4 report the average abnormal returns for the COVID-19 and GFC samples, respectively, covering event days from -20 to +20. During COVID-19, significant positive abnormal returns emerged notably around days -15 (AAR = 1.55%,  $t = 3.15$ ,  $p < 0.01$ ), days -9 through -2, and on the announcement day itself (AAR = 1.35%,  $t = 2.78$ ,  $p < 0.01$ ), clearly

signaling robust anticipatory investor behavior and enthusiasm. In contrast, during the GFC period, abnormal returns were generally insignificant and lacked both magnitude and persistence, as demonstrated by statistically insignificant values (e.g., day 0, AAR = 0.05%,  $t = 0.21$ ,  $p > 0.10$ ). These initial findings strongly suggest that investor sentiment and anticipatory effects during COVID-19 contrasted sharply with investor caution and subdued market reaction during the GFC period.

**Table 3: Average Abnormal Returns (AAR) Around Event Day – Covid Sample**

EVT-TIME	AAR (%)	STD. DEV.	N	T-STAT	P-VALUE	
-20	-0.2	0.0263	87	-0.71	0.4818	
-19	-0.27	0.0291	85	-0.86	0.3899	
-18	0.31	0.0260	85	1.1	0.2752	
-17	0.02	0.0260	83	0.08	0.9326	
-16	0.24	0.0312	85	0.7	0.4831	
-15	1.55	0.0322	86	4.47	<b>&lt;0.0001</b>	***
-14	0.51	0.0358	86	1.32	0.1917	
-13	0.43	0.0400	88	1	0.3192	
-12	0.25	0.0366	83	0.61	0.5422	
-11	-0.47	0.0356	85	-1.22	0.2263	
-10	0.75	0.0447	84	1.53	0.1293	
-9	1.26	0.0443	86	2.64	<b>0.0099</b>	***
-8	1.12	0.0423	88	2.48	<b>0.0150</b>	**
-7	1.19	0.0471	88	2.38	<b>0.0196</b>	**
-6	1.33	0.0427	84	2.84	<b>0.0056</b>	***
-5	1.63	0.0460	84	3.24	<b>0.0017</b>	***
-4	1.95	0.0505	89	3.64	<b>0.0005</b>	***
-3	1.46	0.0428	87	3.19	<b>0.0020</b>	***
-2	1.49	0.0498	86	2.77	<b>0.0068</b>	***
-1	0.76	0.0414	83	1.66	<b>0.1000</b>	*
0	1.35	0.0489	87	2.57	<b>0.0119</b>	**
1	0.43	0.0489	86	0.82	0.4128	
2	0.23	0.0447	87	0.47	0.6396	
3	-0.1	0.0451	88	-0.22	0.8291	
4	0.27	0.0428	85	0.59	0.5565	
5	-0.55	0.0334	84	-1.51	0.1344	
6	0.08	0.0369	85	0.2	0.8406	
7	-0.25	0.0274	87	-0.86	0.3919	
8	-0.25	0.0452	86	-0.51	0.6120	
9	0.17	0.0404	82	0.38	0.7053	
10	-0.36	0.0325	86	-1.02	0.3083	
11	0.01	0.0361	86	0.03	0.9780	
12	-0.66	0.0288	87	-2.14	<b>0.0355</b>	**
13	-0.21	0.0304	88	-0.64	0.5256	
14	-0.06	0.0304	86	-0.19	0.8534	
15	-0.3	0.0247	85	-1.12	0.2640	
16	0.44	0.0352	84	1.13	0.2603	
17	0.58	0.0378	88	1.44	0.1533	
18	0.68	0.0339	86	1.85	<b>0.0673</b>	*
19	0.39	0.0315	79	1.09	0.2773	
20	0.21	0.0356	82	0.54	0.5925	

Notes: AAR expressed in %. T-stats are based on cross-sectional tests. Significance stars:  
\* p < 0.10; \*\* p < 0.05; \*\*\* p < 0.01

**Table 4: Average Abnormal Returns (AAR) Around Event Day – GFC Sample**

EVT-TIME	AAR (%)	STD. DEV.	N	T-STAT	P-VALUE	
-20	2.84	0.0492	37	3.52	<b>0.0012</b>	***
-19	0.57	0.0540	37	0.64	0.5233	
-18	-0.74	0.0306	37	-1.47	0.1497	
-17	0.3	0.0313	35	0.56	0.5778	
-16	-1.01	0.0269	37	-2.29	<b>0.0279</b>	**
-15	-0.81	0.0283	36	-1.71	<b>0.0963</b>	*
-14	-0.13	0.0267	35	-0.3	0.7687	
-13	-0.01	0.0344	35	-0.02	0.9843	
-12	0.37	0.0311	35	0.69	0.4918	
-11	1.09	0.0376	35	1.71	<b>0.0966</b>	*
-10	0.67	0.0270	37	1.51	0.1399	
-9	-0.39	0.0309	36	-0.76	0.4541	
-8	-0.19	0.0254	36	-0.45	0.6539	
-7	-0.03	0.0286	36	-0.07	0.9452	
-6	-0.04	0.0277	36	-0.1	0.9242	
-5	0.53	0.0300	36	1.07	0.2926	
-4	0.75	0.0350	36	1.28	0.2082	
-3	-0.94	0.0316	37	-1.82	<b>0.0777</b>	*
-2	0.59	0.0255	34	1.34	0.1888	
-1	0.15	0.0316	34	0.27	0.7868	
0	0.21	0.0264	37	0.48	0.6358	
1	-0.68	0.0448	36	-0.91	0.3688	
2	-0.15	0.0313	37	-0.3	0.7669	
3	0.65	0.0301	37	1.31	0.1998	
4	-0.12	0.0296	36	-0.25	0.8023	
5	-0.47	0.0308	36	-0.91	0.3668	
6	-0.62	0.0417	34	-0.87	0.3926	
7	-0.33	0.0339	35	-0.58	0.5638	
8	-0.71	0.0408	36	-1.05	0.3021	
9	0.54	0.0316	36	1.03	0.3113	
10	0.27	0.0319	37	0.52	0.6080	
11	-0.41	0.0937	37	-0.26	0.7939	
12	0.25	0.0329	37	0.45	0.6530	
13	0.89	0.0278	36	1.93	<b>0.0619</b>	*
14	-0.76	0.0398	33	-1.1	0.2808	
15	0.79	0.0469	36	1.01	0.3213	
16	-0.06	0.0339	35	-0.1	0.9186	
17	0.25	0.0450	35	0.33	0.7444	
18	-0.64	0.0333	35	-1.13	0.2654	
19	0.36	0.0492	33	0.42	0.6779	
20	-2.37	0.1139	37	-1.27	0.2129	

Notes: AAR expressed in %. T-stats are based on cross-sectional tests. Significance stars:  
\* p < 0.10; \*\* p < 0.05; \*\*\* p < 0.01

Tables 5 and 6 display CAR results for key event windows. For COVID-19, CARs across anticipatory (−20 to −2 days; CAR = 4.32%,  $t = 2.95$ ,  $p < 0.01$ ), immediate (−1 to +1 days; CAR = 2.47%,  $t = 2.87$ ,  $p < 0.01$ ), and post-announcement (+2 to +20 days; CAR = 3.81%,  $t = 2.41$ ,  $p < 0.05$ ) windows were statistically significant and positive. Conversely, CARs during the GFC across these windows were minimal and statistically insignificant (e.g., immediate window CAR = 0.16%,  $t = 0.13$ ,  $p > 0.10$ ).

**Table 5: Event Study Results Using Market-Adjusted Return Model with WRDS World Index for India (Covid Sample)**

Event Window	N	Mean CAR (%)	t-stat (CAR)	p-value (t-test)	Pos:Neg	p-value (Sign Test)	Wilcoxon S	p-value (Rank Test)
-20 to +20	89	16.79	4.04	<0.0001***	63:26	<0.0001***	630	<0.0001***
-5 to +5	82	1.53	3.01	0.0035***	45:37	0.2199	450	0.0140**
0 to +1	80	1.62	1.84	0.0693*	47:33	0.0728*	470	0.0291**
-1 to 0	79	2.23	2.8	0.0065***	52:27	0.0033***	520	0.0033***
-1 to +1	76	2.54	2.28	0.0255**	46:30	0.0423**	460	0.0201**
-20 to -2	89	14.1	5.76	<0.0001***	67:22	<0.0001***	670	<0.0001***
+2 to +20	88	0.27	0.11	0.9120	44:44	0.5424	440	0.9900

Notes: Significance stars indicate two-tailed p-values: \*  $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$

**Table 6: Event Study Results Using Market-Adjusted Return Model with WRDS World Index for India (GFC Sample)**

Event Window	N	Mean CAR (%)	t-stat (CAR)	p-value (t-test)	Pos:Neg	p-value (Sign Test)	Wilcoxon S	p-value (Rank Test)
-20 to +20	37	0.41	0.11	0.9154	20:17	0.3714	200	0.8815
-5 to +5	37	0.54	0.32	0.7491	19:18	0.5000	190	0.7884
0 to +1	35	-0.56	-0.60	0.5498	17:18	0.6321	170	0.4708
-1 to 0	34	0.41	0.60	0.5502	22:12	0.0607*	220	0.3011
-1 to +1	33	-0.57	-0.50	0.6213	12:21	0.9599	120	0.4798
-20 to -2	37	3.27	1.13	0.2670	21:16	0.2557	210	0.7429
+2 to +20	38	-2.8	-0.84	0.4067	21:17	0.3136	210	0.8634

Notes: Significance stars indicate two-tailed p-values: \*  $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$

Based on the CAR analysis, we evaluate our hypotheses as follows:

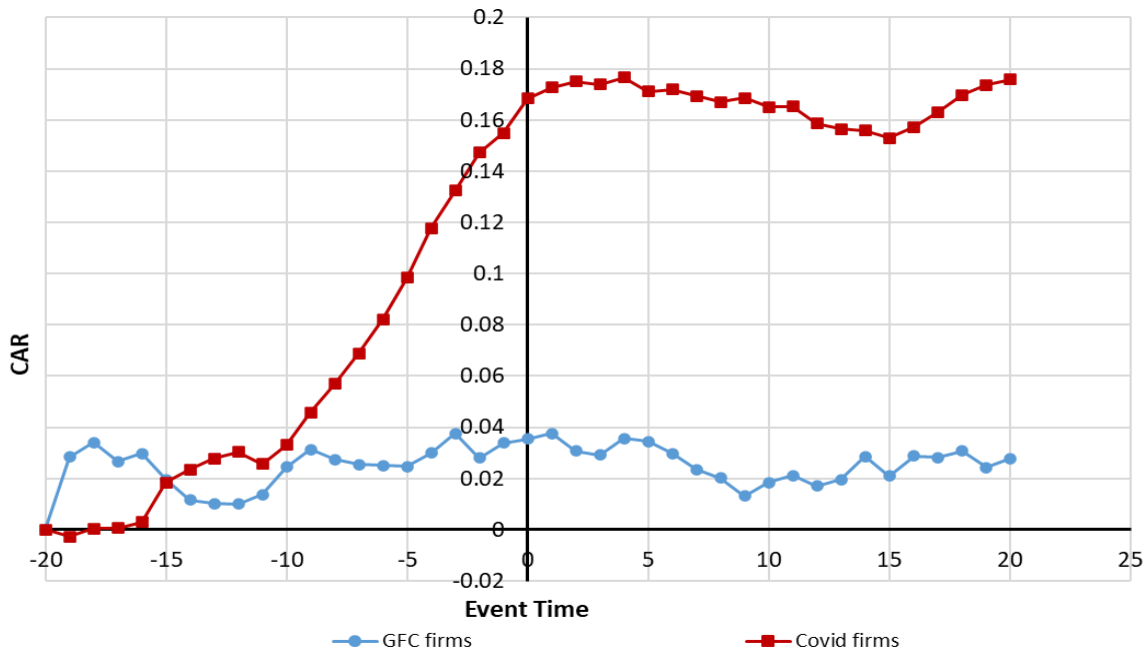
**H1** (Overall reaction): Strongly supported. COVID-19 CARs significantly exceed those during the GFC, confirming that bonus announcements elicited stronger investor responses during COVID-19.

**H2** (Pre-announcement window): Supported. CARs for the anticipatory window were significantly greater during COVID-19, indicating higher investor anticipation and speculative positioning compared to the GFC.

**H3** (Announcement-day reaction): Supported. COVID-19 announcement-day returns were markedly higher and statistically significant, demonstrating a stronger immediate market reaction compared to the muted GFC response.

**H4** (Post-announcement stabilization or drift): Partially supported. Contrary to Pandey et al. (2022), who documented modest positive drift post-announcement during COVID-19, our findings clearly demonstrate no further drift. Instead, abnormal returns stabilized at the elevated levels reached immediately following the announcement. While this stabilization differs from previous research indicating modest drift, it strongly contrasts with the GFC period, which showed no significant stabilization or positive momentum post-announcement.

**Figure 1.** Plot of cumulative abnormal returns for bonus stock announcements (from event day -20 to event day 20). The abnormal return is calculated using the market adjusted return model. COVID-19 firms exhibit significantly stronger cumulative abnormal returns compared to GFC firms, reflecting differential investor responses across the two crises.



## SUMMARY AND CONCLUSION

This study investigates market responses to bonus share announcements in the Indian equity market during two distinct types of financial crises: the Global Financial Crisis (GFC), a systemic credit crisis, and the COVID-19 pandemic, an exogenous health crisis. Employing an event study methodology, we analyze abnormal returns (ARs) and cumulative abnormal returns (CARs) around bonus announcements, examining how investor reactions varied under these fundamentally different macroeconomic disruptions.

Our findings reveal stark contrasts between investor responses during these crises. During the COVID-19 pandemic, bonus announcements elicited significant anticipatory reactions, robust announcement-day responses, and stabilized abnormal returns post-announcement—mirroring the optimism and speculative investor behavior typical of periods with strong liquidity support and proactive policy intervention. In contrast, investor reactions during the credit-driven GFC were muted and largely insignificant, underscoring heightened investor caution and diminished responsiveness amid widespread financial uncertainty and liquidity constraints. These differences highlight that investor responses to corporate announcements depend critically not only on market sentiment and liquidity but also fundamentally on the nature and source of the economic disruption.

From an academic standpoint, our results underscore the importance of contextualizing market signaling and investor reaction theories within crisis-specific environments. Practically, our findings inform corporate managers about conditions under which bonus shares might effectively convey financial strength, emphasizing the need to tailor corporate communication strategies to the underlying characteristics of a crisis—whether it arises from systemic financial vulnerabilities or external health-related shocks.

Despite robust findings, our study has limitations. Our analysis primarily focuses on short-term market reactions using a market-adjusted returns model; therefore, potential long-term valuation effects remain unexplored. Future research could extend this analysis by examining sector-specific impacts, conducting cross-country comparisons, or investigating long-term firm performance post-announcement.

In summary, this paper contributes to a nuanced understanding of investor reactions within emerging markets during different types of financial crises. By demonstrating that superficially similar periods of financial distress—a systemic credit crisis versus an exogenous health crisis—can trigger fundamentally different market dynamics, our study highlights broader implications for corporate financial strategies and investor behavior, particularly in markets where investor sentiment, liquidity conditions, and macroeconomic policy responses significantly influence corporate signaling efficacy.

## REFERENCES

- Bhattacharya, S. (1979). Imperfect information, dividend policy, and the "bird in the hand" fallacy. *Bell Journal of Economics*, 10(1), 259–270. <https://doi.org/10.2307/3003330>
- Brown, S. J., & Warner, J. B. (1985). Using daily stock returns: The case of event studies. *Journal of Financial Economics*, 14(1), 3–31. [https://doi.org/10.1016/0304-405X\(85\)90042-X](https://doi.org/10.1016/0304-405X(85)90042-X)
- Chan, K. F., Chen, Z., Wen, Y., & Zu, T. (2022). COVID-19 vaccines and global stock markets. *Finance Research Letters*, 47(Part B). Retrieved from <https://doi.org/10.1016/j.frl.2022.102774>
- Dhar, S., & Chhaochharia, S. (2008). Market reaction around the stock splits and bonus issues: Some Indian evidence. *SSRN Working Paper Series*. <https://ssrn.com/abstract=1087200>
- Government of India, Ministry of Finance. (2021). *Economic survey 2021–22: COVID-19 and the Indian economy*. Retrieved from <https://www.indiabudget.gov.in>
- Grinblatt, M. S., Masulis, R. W., & Titman, S. (1984). The valuation effects of stock splits and stock dividends. *Journal of Financial Economics*, 13(4), 461–490. [https://doi.org/10.1016/0304-405X\(84\)90011-4](https://doi.org/10.1016/0304-405X(84)90011-4)
- International Monetary Fund (IMF). (2010). *Global financial stability report: Responding to the financial crisis and moving forward*. Retrieved from <https://www.imf.org>
- Khanal, A. R., & Mishra, A. K. (2017). Stock price reactions to stock dividend announcements: A case from a sluggish economic period. *The North American Journal of Economics and Finance*, 42, 338–345. <https://doi.org/10.1016/j.najef.2017.08.002>
- Kumari, P., & Pushpender, A. (2019). An empirical analysis of stock price behaviour around bonus issue announcement in India. *Journal of Management*, 6(1), 186–196. <https://ssrn.com/abstract=3526624>
- Lakonishok, J., & Lev, B. (1987). Stock splits and stock dividends: Why, who, and when. *Journal of Finance*, 42(4), 913–932. <https://doi.org/10.1111/j.1540-6261.1987.tb03920.x>
- MacKinlay, A. C. (1997). Event studies in economics and finance. *Journal of Economic Literature*, 35(1), 13–39. <https://www.jstor.org/stable/2729691>
- McNichols, M., & Dravid, A. (1990). Stock dividends, stock splits, and signaling. *Journal of Finance*, 45(3), 857–879. <https://doi.org/10.1111/j.1540-6261.1990.tb05103.x>
- Mehta, C., Jain, P. K., & Yadav, S. S. (2014). Market reaction to stock dividends: Evidence from India. *Vikalpa: The Journal for Decision Makers*, 39(4), 29–40. <https://doi.org/10.1177/0256090920140405>

- Miller, M. H., & Modigliani, F. (1961). Dividend policy, growth, and the valuation of shares. *Journal of Business*, 34(4), 411–433. <https://doi.org/10.1086/294442>
- MSCI Inc. (2025). *Market classification*. <https://www.msci.com/indexes/index-resources/market-classification>
- NITI Aayog. (2022). *Indian economic recovery post-COVID-19: Policy interventions and market response*. Government of India. Retrieved from <https://www.niti.gov.in>
- Pandey, D. K., Kumari, V., & Tiwari, B. K. (2022). Impacts of corporate announcements on stock returns during the global pandemic: Evidence from the Indian stock market. *Asian Journal of Accounting Research*, 7(2), 208–226. <https://doi.org/10.1108/AJAR-06-2021-0097>
- Raja, M., & Sudhahar, J. C. (2010). An empirical test of Indian stock market efficiency in respect of bonus announcement. *Asia-Pacific Journal of Finance and Banking Research*, 4(4), 1–14. <https://www.proquest.com/scholarly-journals/empirical-test-indian-stock-market-efficiency/docview/1124453753/se-2>
- Rajan, R. G. (2010). *Fault lines: How hidden fractures still threaten the world economy*. Princeton University Press. <https://doi.org/10.1515/9781400839803>
- Rao, K. S. (2016). A study on the impact of bonus issue on stock price. *Adarsh Journal of Management Research*, 9(1), 1–10. <https://www.adarshjournals.in/index.php/ajmr/article/download/173243/117165/417365>
- Reserve Bank of India (RBI). (2009). *Annual report on financial stability 2008–09*. Retrieved from <https://www.rbi.org.in>
- Reserve Bank of India (RBI). (2021). *RBI bulletin: COVID-19 and India's financial markets*. Retrieved from <https://www.rbi.org.in>
- Rouatbi, W., Demir, E., Kizys, R., & Zaremba, A. (2021). Immunizing markets against the pandemic: COVID-19 vaccinations and stock volatility around the world, *International Review of Financial Analysis*, 77. Retrieved from <https://doi.org/10.1016/j.irfa.2021.101819>
- Securities and Exchange Board of India (SEBI). (2021). *Market performance and trading trends during the COVID-19 period*. Retrieved from <https://www.sebi.gov.in>
- Sengupta, R., & Vardhan, H. (2023). India's credit landscape in a post-pandemic world. In I. Gupta & M. Das (Eds.), *Contextualizing the COVID pandemic in India* (pp. 273–295). Springer. [https://doi.org/10.1007/978-981-99-4906-9\\_13](https://doi.org/10.1007/978-981-99-4906-9_13)

# **A FRAMEWORK FOR THE EFFECTIVE USE OF ARTIFICIAL INTELLIGENCE IN CORPORATE FRAUD DETECTION: THEORETICAL FOUNDATION AND EMPIRICAL PROPOSITIONS**

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## **ABSTRACT**

Corporate fraud remains a significant global challenge, eroding financial stability, corporate reputation, and stakeholder trust. The advent of Artificial Intelligence (AI) has revolutionized fraud detection, enabling more efficient, scalable, and adaptive solutions. Drawing upon the Technology Acceptance Model (TAM), the Resource-Based View (RBV), the Fraud Triangle Theory, Institutional Theory, and Signal Detection Theory (SDT), this paper develops a conceptual framework for the successful application of AI in corporate fraud detection and presents empirically testable propositions for future research. We present a theoretical model for achieving AI-powered Fraud Detection Effectiveness (AIFDE) in a corporate context and posit that AIFDE is contingent upon five key factors: data quality, AI model development and explainability, regulatory and ethical compliance, Human-AI collaboration, and behavioral and psychological factors. While prior studies explore AI applications in fraud detection, existing frameworks lack a comprehensive theoretical foundation linking technological, regulatory, and behavioral factors to fraud detection effectiveness. This study addresses this gap by developing an integrated framework grounded in multiple theoretical lenses. The paper concludes with research implications and directions for testing these propositions in empirical settings.

**Keywords:** Artificial Intelligence, Fraud Detection, Technology Acceptance Model, Machine Learning, Corporate Governance

## **INTRODUCTION**

Corporate fraud, including financial statement fraud, insider trading, and money laundering, presents significant risks to organizations and financial markets. Corporate financial fraud harms the interests of investors and affects the healthy development of the capital market (Sun et al., 2023). Traditional fraud detection methods rely on rule-based systems and expert-driven analysis, which often fail to detect novel fraud patterns. However, with the rise in Big Data and artificial intelligence (AI), new opportunities have arisen in using advanced machine learning (ML) models to detect fraud (Bao et al., 2022). Nweze et al. (2024) explore how AI/ML technologies are revolutionizing fraud prevention by leveraging real-time data analysis to detect suspicious activities, reducing the financial risk posed by fraud. The integration of AI, particularly machine learning and natural language processing, enables real-time fraud detection, anomaly detection, and risk prediction (Nweze et al., 2024). Recent advances in deep learning, such as spectrum-based neural networks and distributed deep forest models, have demonstrated improved fraud detection accuracy in large-scale datasets (Yuan et al., 2017; Zhang et al., 2019).

Konigstorfer and Thalmann (2020) conducted a structured literature review to identify applications of AI in commercial banks and the challenges of implementing AI. They found that by using AI, commercial

banks can reduce losses in lending, increase security in processing payments, automate compliance-related work, and improve customer targeting.

As the complexity and volume of financial transactions continue to grow, the role of AI in fraud detection will become increasingly vital (Adelakun et al., 2024). However, the successful implementation of AI in fraud detection requires a structured framework that considers technical, regulatory, and ethical dimensions (Königstorfer and Thalmann, 2020). This paper develops a conceptual framework and proposes empirically testable propositions to guide future research.

## LITERATURE REVIEW

AI has revolutionized fraud detection by integrating machine learning (ML), deep learning, and network analysis to enhance financial security. Recent studies demonstrate that AI models, trained on historical fraud data, can improve fraud detection rates while reducing false positives. For example, digital finance inhibits corporate financial fraud by alleviating financing constraints, reducing corporate leverage, and decreasing agency costs (Lin, 2024). Financial institutions have adopted AI-based models to combat money laundering, credit card fraud, and financial statement manipulation. Adelakun et al. (2024) found that the integration of artificial intelligence into accounting has significantly transformed the landscape of fraud detection. The case studies they examined indicate the practical benefits and successes achieved through AI-driven fraud detection, pointing to its potential to enhance the accuracy, efficiency, and effectiveness of fraud prevention efforts (Adelakun et al., 2024).

AI techniques for fraud detection in accounting primarily involve machine learning (ML), natural language processing (NLP), and data mining (Adelakun et al., 2024). AI/ML is integrated into accounting and financial systems with techniques that include supervised learning models, such as decision trees and neural networks. These models use labeled fraud data to classify transactions as fraudulent or non-fraudulent. Unsupervised models, on the other hand (including clustering and anomaly detection algorithms), identify suspicious transactions without predefined fraud labels (Nweze et al., 2024). Deep learning, a subset of machine learning, has shown exceptional promise in fraud detection due to its ability to process and analyze unstructured data such as images, text, and voice. (Bello and Olufemi, 2024). Combining these approaches enables a more robust fraud detection framework that adapts to evolving fraud schemes and mitigates emerging risks.

Natural Language Processing (NLP)-powered AI systems analyze textual data, such as financial reports, contracts, and emails, to detect inconsistencies and deceptive language indicative of fraud. Sentiment analysis and entity recognition tools help forensic accountants assess corporate disclosures for irregularities (Bello and Olufemi, 2024). Additionally, NLP can be integrated into regulatory reporting to identify discrepancies in financial disclosures, reducing the risk of financial misstatement and enhancing compliance monitoring (Bello and Olufemi, 2024).

AI can leverage pattern recognition to detect deviations from standard financial behaviors. AI systems analyze vast amounts of customer data, identifying fraudulent credit applications and transaction anomalies. The financial sector has also seen AI-based fraud detection systems integrated with blockchain technology, enhancing transaction traceability and security. Predictive analytics can flag transactions that resemble previously identified fraudulent activities, enabling proactive intervention (Adelakun et al., 2024). AI-based forecasting models predict future fraudulent trends, allowing organizations to take preemptive action against emerging risks. Moreover, anomaly detection methods enhance risk management by identifying abnormal transaction sequences in real-time.

AI has been used successfully in the banking sector to effect fraud prevention. Commercial banks have deployed AI in fraud detection and prevention by automating transaction monitoring and enhancing compliance measures (Sun et al., 2023). Machine learning models deployed by major banks have reduced false positives and improved fraud detection efficiency. Banks also employ AI-driven behavioral analytics to detect anomalies in customer transaction patterns, strengthening their ability to counter financial fraud. Sun et al. (2023) found that a combination of coverage and depth is needed to improve the success of digital finance on corporate financial fraud. Their results suggest that digital finance inhibits corporate financial fraud by alleviating financing constraints, reducing corporate leverage, and decreasing agency costs. They also found that digital finance has a greater inhibitory effect for large-scale corporates, state-owned corporates, and corporates in areas with a low degree of marketization (Sun et al., 2023).

Corporate tax fraud remains a significant issue globally. AI is being deployed to detect irregularities in tax filings by leveraging predictive analytics and historical tax data to identify anomalous patterns (Yalamati, 2023). AI-driven tax compliance systems enable authorities to identify fraudulent deductions, manipulated financial statements, and shell companies created for tax evasion purposes. Leveraging AI technologies such as machine learning and predictive analytics for employing advanced algorithms to discern subtle patterns indicative of fraudulent behavior could result in the development of a robust and adaptive system capable of detecting irregularities and anomalous patterns in corporate tax filings (Yalamati, 2023).

While AI enhances fraud detection, it also raises ethical concerns, including algorithmic bias and data privacy risks. Regulatory bodies, such as the Securities and Exchange Commission (SEC) and the Organization for Economic Cooperation and Development (OECD), stress the need for transparency and fairness in AI-driven compliance measures (Adelakun et al., 2024). Firms must implement robust governance frameworks to ensure AI models remain ethical and legally compliant. Additionally, AI ethics committees are being established within major financial institutions to oversee the deployment of AI, and ensure accountability in fraud detection practices. A balance is needed between efficient crime prevention and safeguarding individual privacy rights (Garcia-Segura, 2024). There is also a need for international cooperation and legal adaptation to uphold ethical standards in the application of AI, ensuring it promotes fairness and justice in combating corporate crime (Garcia-Segura, 2024).

Despite its advantages, AI in fraud detection faces many challenges. Implementing AI-driven fraud detection and prevention strategies raises concerns about protecting sensitive data and ensuring compliance with data privacy regulations (Adelakun et al., 2024). AI models must achieve high accuracy while minimizing false positives to maintain operational efficiency and avoid unnecessary disruptions (Faisal et al., 2024). Technical and organizational challenges may arise when integrating AI models with legacy fraud detection frameworks (Nweze et al., 2024). Governments must refine regulatory frameworks to address AI's growing role in fraud prevention. Standardized AI auditing mechanisms should be introduced to ensure transparency in AI-driven fraud detection systems (Nweze et al., 2024).

## **THEORETICAL BACKGROUND**

Although there is a substantial body of evidence to suggest that the deployment of AI to prevent or detect corporate fraud has been successful to a large extent, there is a need for a theoretical framework to guide the use of AI in corporate fraud prevention and detection. In this paper, we analyze the use of AI in fraud detection through multiple theoretical lenses.

The Technology Acceptance Model suggests that AI adoption in fraud detection depends on perceived usefulness and ease of use. The original TAM was introduced by Fred D. Davis in 1986 and formalized in 1989. It posits that perceived usefulness (PU) and perceived ease of use (PEOU) are the primary

determinants of technology adoption. These constructs influence users' behavioral intentions, which in turn predict actual usage. Venkatesh and Davis (2000) extended TAM by incorporating social influence (e.g., subjective norms) and cognitive instrumental processes (e.g., job relevance). This version addressed limitations in explaining mandatory versus voluntary adoption contexts. Venkatesh and Bala (2008) integrated additional moderators like trust, self-efficacy, and anxiety, enhancing the model's predictive power in diverse settings. A meta-analytic study by Ali and Warraich (2024) using structural equation modeling (OSMASEM) validated TAM in educational contexts, confirming that PEOU directly impacts actual technology use (bypassing behavioral intentions in some cases). Al-Emran (2021) found that individual-technology fit and task-technology fit positively impacted the perceived usefulness of smartwatches, while no positive effects were reported on the ease of use of these wearables for educational purposes. Extensions of TAM incorporated variables like perceived security and trust to explain digital payment adoption in Islamic countries and e-commerce platforms (Muflih, 2023). Despite its widespread acceptance, TAM has been criticized for oversimplifying behavioral predictors and lacking contextual adaptability. For example, some studies found PEOU insignificant in mandatory environments (Mather et al., 2002).

The second theoretical lens that the proposed framework is based on is the Resource-Based View (RBV) (Wernerfelt, 1984). The Resource-Based View is a strategic management framework that posits firm-specific resources as the primary drivers of sustainable competitive advantage. It emphasizes that firms achieve superior performance by leveraging heterogeneous (unique) and immobile (difficult to transfer) resources that competitors cannot easily replicate or substitute. From the Resource-Based View, AI-driven fraud detection provides a competitive advantage by leveraging proprietary datasets, advanced analytics, and automation (Bello and Olufemi, 2024). Firms that successfully integrate AI in fraud risk management can develop unique capabilities, enhancing fraud prevention effectiveness. A key challenge remains ensuring continuous model updates to adapt to emerging fraud patterns (Faisal et al., 2024).

The Fraud Triangle Theory, developed by Donald Cressey (1953), posits that fraudulent behavior arises from three factors: opportunity, pressure, and rationalization. It forms the third theoretical lens of this framework. AI can mitigate fraud by eliminating opportunities through automated transaction monitoring and predictive risk analytics (Adelakun et al., 2024). Additionally, sentiment analysis on employee communications and financial statements can detect pressure points leading to fraud. AI-driven systems can also identify rationalization patterns through behavioral analysis, helping organizations implement preemptive fraud interventions.

Based on Max Weber's work on legitimacy and authority, Institutional Theory, the fourth theoretical lens of the framework, explains how regulatory environments and industry norms influence AI adoption in fraud detection. Organizations operating in jurisdictions with stringent compliance requirements are more likely to implement AI-driven fraud detection tools (Zayed et al., 2024). Compliance with frameworks such as GDPR, Basel III, and the Sarbanes-Oxley Act necessitates AI transparency, ensuring ethical data usage and bias mitigation in fraud detection algorithms.

The fifth theoretical lens is the Signal Detection Theory (SDT). SDT is relevant in AI-driven fraud detection, where algorithms differentiate between fraudulent and legitimate transactions. AI models must minimize Type I errors (false positives) to avoid disrupting genuine transactions while reducing Type II errors (false negatives) that allow fraudulent activities to go undetected (Hajek and Henriques, 2017). By continuously refining fraud detection thresholds, AI can improve predictive accuracy.

These theoretical perspectives collectively provide a foundation for understanding AI's role in corporate fraud detection. They highlight the importance of balancing technological capabilities with organizational readiness, regulatory frameworks, and behavioral dynamics.

## **PROPOSITIONS:**

Based on the foregoing theoretical background, we develop the following propositions.

First, RBV emphasizes that firms gain competitive advantages through unique, valuable, and inimitable resources (Bello and Olufemi, 2024). Firms that successfully integrate AI in fraud risk management can develop unique capabilities, enhancing fraud prevention effectiveness. Although a key challenge remains ensuring continuous model updates to adapt to emerging fraud patterns (Faisal et al., 2024), high-quality, structured, and diverse datasets form a crucial resource for AI-driven fraud detection. AI models trained on comprehensive and high-quality datasets exhibit greater accuracy, supporting the proposition that data quality is fundamental to fraud detection effectiveness.

*Proposition 1 (Data Quality): AI-powered fraud detection systems exhibit higher accuracy when trained on diverse, high-quality datasets than when trained on limited or biased data.*

Second, TAM posits that the adoption of new technologies depends on perceived usefulness and ease of use. AI-powered fraud detection systems will be more readily adopted if they are interpretable and explainable to users (Rehman, 2022). Organizations that provide transparency in AI decision-making will experience higher regulatory compliance and stakeholder trust, reducing resistance to AI adoption.

*Proposition 2 (Explainability and Trust): Organizations with explainable AI models in fraud detection experience higher regulatory compliance and stakeholder trust compared to those using black-box AI models.*

Third, the Fraud Triangle Theory suggests that fraud occurs due to opportunity, pressure, and rationalization (Adelakun et al., 2024). AI-driven real-time fraud detection systems reduce opportunities for fraudulent activities by identifying suspicious transactions instantly. Research on meta-learning frameworks, such as MetaFraud, suggests that AI can improve fraud detection performance by combining multiple learning models to detect complex fraud schemes (Abbasi et al., 2012). This proposition posits that AI models integrating real-time transaction monitoring mitigate financial losses more effectively than traditional rule-based systems.

*Proposition 3 (Real-Time Detection and Response): AI models that integrate real-time transaction monitoring reduce fraud-related financial losses more effectively than rule-based fraud detection systems.*

Fourth, institutional theory posits that compliance with regulatory and societal norms drives organizational behavior (Zayed et al., 2024). AI fraud detection models must align with legal and ethical standards, ensuring fairness and non-discrimination. Implementing bias mitigation strategies enhances regulatory acceptance, supporting the proposition that ethical AI models result in fewer false positives and false negatives.

*Proposition 4 (Ethical AI and Bias Mitigation): AI-driven fraud detection models with bias mitigation strategies result in fewer false positives and false negatives than those without such strategies.*

Fifth, SDT addresses how systems differentiate between genuine and fraudulent transactions while minimizing Type I and Type II errors (Hajek and Henriques, 2017). By continuously refining fraud detection thresholds, AI can improve predictive accuracy. AI models, when used in collaboration with human decision-makers, enhance fraud detection accuracy. Human-AI collaboration improves the ability to

correctly classify fraudulent cases while reducing errors, validating the proposition that hybrid fraud detection teams outperform those relying solely on AI automation or human judgment. Research suggests that AI-assisted audit systems can enhance fraud detection by improving auditors' ability to identify inconsistencies in financial statements (Sathisha and Sowmya, 2024).

*Proposition 5 (Human-AI Collaboration): Fraud detection teams that incorporate AI-assisted decision-making outperform teams relying solely on either AI automation or human judgment.*

## **CONCEPTUAL FRAMEWORK FOR AI USE IN FRAUD PREVENTION**

Based on the foregoing literature review, theoretical background and propositions, we propose the following framework for the use of AI in detecting and preventing corporate fraud.

The proposed framework integrates five key components that impact the variable of interest: AI-powered Fraud Detection Effectiveness (AIFDE). AI-powered Fraud Detection Effectiveness refers to the ability of AI-driven fraud detection systems to accurately identify fraudulent activities, minimize false positives and false negatives, and enhance the overall security and compliance of financial transactions. Effectiveness is determined by the precision, adaptability, and regulatory alignment of AI models used for fraud detection. The model depicts five independent variables impacting AIFDE. Each of these factors plays a crucial role in ensuring AI fraud detection systems function optimally by addressing accuracy, compliance, and scalability concerns.

The first is *data quality*. Effective fraud detection relies on high-quality, structured, and unstructured data sources. AI models perform optimally when trained on diverse datasets, including transactional records, communication logs, and publicly available financial reports (Lin, 2024). Organizations must invest in data governance strategies to ensure data integrity, security, and compliance with privacy regulations. High-quality data is essential for training accurate and reliable AI models. Poor data quality (e.g., missing, biased, or unstructured data) reduces model performance, leading to higher false positives and false negatives. Clean, well-structured, and diverse datasets enhance AI's ability to identify complex fraud patterns, improving fraud detection precision. Prior research (Fiore et al., 2019) has shown that synthetic data augmentation using generative adversarial networks (GANs) can enhance fraud classification accuracy.

The second independent variable is *AI model development and explainability*. Machine learning models must be interpretable to regulators and stakeholders. Black-box AI models pose significant challenges in compliance, making it essential for organizations to adopt explainable AI techniques, such as decision trees, SHAP (SHapley Additive exPlanations), and LIME (Local Interpretable Model-agnostic Explanations) (Bao et al., 2020). Providing transparent AI decision-making ensures trust and accountability in fraud detection processes. Explainability is crucial for regulatory compliance and organizational trust in AI-powered fraud detection. Black-box AI models may be highly accurate but suffer from resistance due to lack of interpretability. AI models with explainable decision-making processes are more likely to be adopted by financial institutions and regulators, thereby improving overall fraud detection effectiveness. The TAM (Technology Acceptance Model) suggests that transparency in AI decision-making increases adoption and trust (Rehman, 2022).

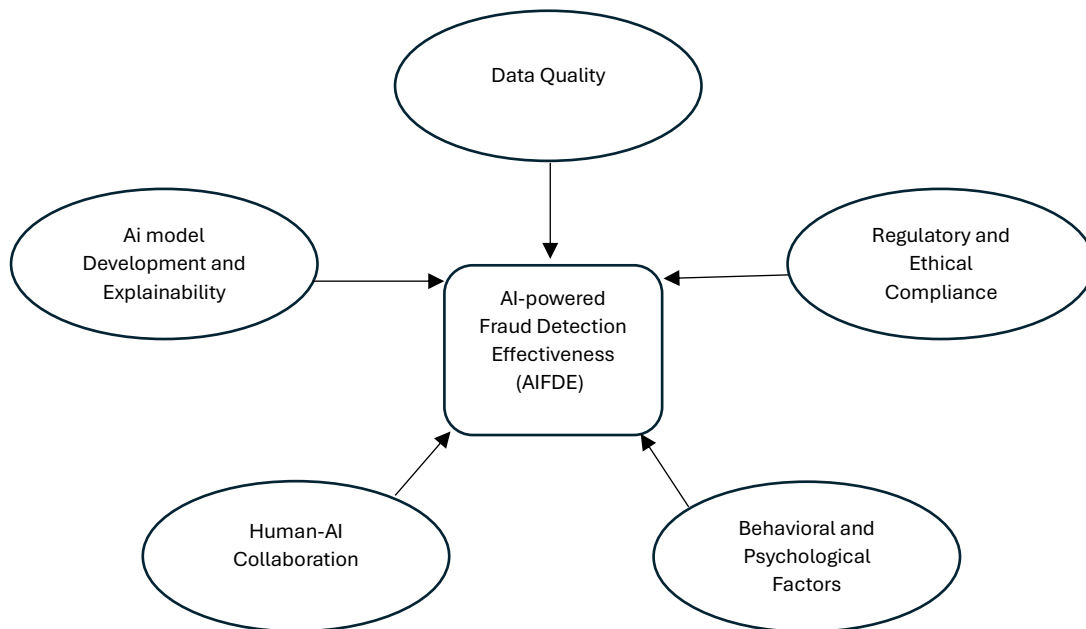
The third independent variable is *regulatory and ethical compliance*. AI adoption should align with global regulatory standards and ethical AI principles. Financial institutions must adhere to anti-money laundering (AML) directives, the Sarbanes-Oxley Act, and emerging AI governance frameworks (Garcia-Segura, 2024). Ethical AI considerations include fairness, non-discrimination, and bias mitigation to prevent disproportionate fraud targeting based on demographic factors. AI fraud detection must comply with evolving financial regulations (e.g., GDPR, SEC, Basel III). Unethical AI models may exhibit bias, leading

to discriminatory fraud detection (e.g., disproportionately flagging transactions from specific demographics). AI systems aligned with regulatory standards gain institutional legitimacy and reduce the risk of legal repercussions, thus enhancing fraud detection effectiveness. Wang and Xu (2018) demonstrated that bias-aware AI models reduce false positives in insurance fraud detection.

The fourth independent variable is *Human-AI collaboration*. AI should augment, not replace, human decision-making in fraud detection (Zheng et al., 2019). AI-driven fraud alerts require human expertise for validation, ensuring that contextual nuances are considered. Hybrid fraud detection models, combining machine intelligence with human oversight, improve fraud detection accuracy while minimizing false positives and negatives. While AI is efficient, human expertise is essential to interpret nuanced fraud cases. Fully automated fraud detection may result in false accusations or missed fraud cases. Hybrid fraud detection systems (AI in conjunction with human review) improve decision accuracy by balancing automation with human judgment. Signal Detection Theory (SDT) supports this by explaining how human oversight helps reduce both Type I (false positives) and Type II (false negatives) errors.

The fifth independent variable impacting AIFDE consists of *behavioral and psychological factors* such as trust in AI. Trust in AI fraud detection systems is influenced by employee and stakeholder perceptions. There is a need to investigate how transparency, explainability, and accountability influence AI adoption and decision-making (Rehman, 2022). Organizational acceptance of AI fraud detection depends on perceptions of trust, fairness, and transparency. Employees and compliance officers may resist AI-based fraud detection if they perceive it as unfair, opaque, or inaccurate. Enhancing AI transparency, reducing algorithmic bias, and fostering AI literacy in organizations improve trust, thereby increasing the effectiveness of fraud detection systems. Sathisha and Sowmya (2024) found that AI-assisted audit systems increased fraud detection effectiveness by improving human trust in AI-generated alerts.

The conceptual model based on the above theoretical supports is represented diagrammatically below:



## **DIRECTIONS FOR FUTURE RESEARCH**

The framework outlined in this paper has several implications for research and practice. Below, we outline key areas where further empirical studies can refine and validate the proposed framework and propositions.

First, validation of AI fraud detection models across industries. Future research should examine how AI-based fraud detection models perform in different sectors, such as banking, insurance, healthcare, and e-commerce. Industry-specific challenges, such as regulatory constraints and data availability, must be considered.

Second, longitudinal studies on AI trust and adoption. Given the central role of trust in AI adoption, longitudinal studies should be conducted to evaluate how explainability, transparency, and user acceptance evolve over time. This would provide valuable insights into factors that drive or hinder AI integration in corporate fraud detection.

Third, experimental testing of AI and human-AI collaboration models: Empirical research should design controlled experiments to compare fraud detection accuracy between AI-only models and hybrid models incorporating human oversight. This would help determine the optimal balance between automation and human intervention in fraud prevention.

Fourth, bias mitigation and regulatory compliance analysis. Further studies should investigate how bias mitigation strategies affect AI fraud detection accuracy and compliance with legal frameworks. Comparative analyses across jurisdictions (e.g., GDPR in Europe vs. SEC regulations in the U.S.) can offer insights into global best practices for ethical AI governance.

Fifth, case studies on real-time fraud detection impact. Organizations implementing AI-driven real-time fraud detection systems should be examined through case study research. This can assess whether real-time monitoring leads to measurable reductions in fraud losses and operational costs compared to traditional fraud detection approaches.

Sixth, cross-cultural differences in AI fraud detection adoption. Cultural factors influence how AI is perceived and adopted in fraud detection. Future studies should explore variations in AI adoption across countries and organizations, focusing on factors such as regulatory environments, corporate governance norms, and technological infrastructure.

Seventh, research on AI adoption strategies suggests that firms employing symbolic AI strategies may be more prone to corporate fraud due to superficial AI implementation, whereas substantive AI strategies have no direct effect on fraud occurrence (Fang et al., 2025). Future research should investigate how different AI deployment strategies impact corporate fraud risks.

Eighth, fraud datasets are often highly imbalanced, with fraudulent transactions being a small subset of overall data. Recent research on Generative Adversarial Networks (GANs) demonstrates that synthetic data augmentation can improve fraud classification accuracy (Fiore et al., 2019). Future research should focus on how GAN-generated synthetic data can mitigate class imbalance issues in fraud detection models.

Ninth, AI-powered text analytics, such as deep learning models combined with LDA (a topic modeling technique used to uncover hidden patterns in text data), have been shown to improve fraud detection in insurance claims (Wang and Xu, 2018). Future research should investigate how NLP techniques can enhance fraud detection in other financial applications, such as loan approvals and investment fraud. Additionally, research should consider the implications of using AI-powered text analytics for early fraud risk assessment in regulatory compliance and forensic auditing.

Finally, exploring blockchain integration with AI in fraud detection: Blockchain technology, with its immutable records, can enhance fraud detection when combined with AI. AI-powered analytics can detect anomalies within blockchain transactions, providing an added layer of security and transparency (Whiting et al., 2012). While blockchain technology offers enhanced transparency and security, its integration with AI for fraud detection remains an emerging area. Future research should investigate how AI-driven fraud detection models can leverage blockchain's immutable records to improve fraud prevention, particularly in financial transactions and regulatory compliance

By addressing these research gaps, future studies can enhance our understanding of AI's role in corporate fraud detection and contribute to the development of robust, fair, and effective fraud prevention strategies.

## CONCLUSION

This study presents a structured framework for the application of AI in corporate fraud detection, integrating key theoretical perspectives and empirically testable propositions. AI-driven fraud detection offers significant advantages, including real-time anomaly detection, improved accuracy, and enhanced regulatory compliance. However, successful implementation depends on high-quality data, explainable AI models, and ethical considerations.

The theoretical contributions of this paper link AI adoption to established models such as TAM, RBV, Fraud Triangle Theory, Institutional Theory, and Signal Detection Theory. While prior studies explore AI applications in fraud detection, existing frameworks lack a comprehensive theoretical foundation linking technological, regulatory, and behavioral factors to fraud detection effectiveness. This study addresses this gap by developing an integrated framework grounded in multiple theoretical lenses. By grounding AI fraud detection strategies in these frameworks, we provide a roadmap for future research and practical implementation.

From a practical perspective, organizations should invest in robust AI infrastructures, balance automation with human oversight, and ensure compliance with evolving regulatory frameworks. Future research should empirically test the proposed framework across industries, geographies, and organizational structures to refine AI fraud detection methodologies. Policymakers must consider guidelines that foster ethical AI deployment while balancing fraud prevention with privacy rights. Future research should also explore the socio-economic impact of AI fraud detection, particularly in emerging markets.

In conclusion, AI is a powerful tool for mitigating corporate fraud, but its effectiveness relies on thoughtful integration into financial systems, regulatory adaptation, and ongoing advancements in AI ethics. A balanced approach incorporating AI efficiency with human judgment and regulatory alignment will drive the future success of AI-powered fraud detection systems.

## REFERENCES

- Abbasi, A., Albrecht, C., Vance, A., and Hansen, J. (2012). "Metafraud: A Meta-Learning Framework for Detecting Financial Fraud." *MIS Quarterly*, 1293-1327.
- Adelakun, B. O., Onwubuariri, E. R., Adeniran, G. A., and Ntiakoh, A. (2024). "Enhancing Fraud Detection in Accounting Through AI: Techniques and Case Studies." *Finance & Accounting Research Journal*, Volume 6, Number 6, 978-999.

- Al-Emran, M. (2021). "Evaluating The Use of Smartwatches for Learning Purposes Through the Integration of the Technology Acceptance Model and Task-Technology Fit." *International Journal of Human-Computer Interaction*, Volume 37, Number 19, 1874-1882. <https://doi.org/10.1080/10447318.2021.1921481>.
- Ali, I., and Warraich, N. F. (2024). "Meta-Analysis of Technology Acceptance for Mobile And Digital Libraries in Academic Settings Using Technology Acceptance Model (TAM)." *Global Knowledge, Memory and Communication*. Advance online publication. <https://doi.org/10.1108/GKMC-09-2023-0360> DOI: <https://doi.org/10.1108/GKMC-09-2023-0360>.
- Bao, Y., Hilary, G., and Ke, B. (2022). "Artificial Intelligence and Fraud Detection." *Innovative Technology at the Interface of Finance and Operations*, Volume 1, 223-247.
- Bao, Y., Ke, B., Li, B., Yu, Y. J., and Zhang, J. (2020). "Detecting Accounting Fraud in Publicly Traded US Firms Using a Machine Learning Approach." *Journal of Accounting Research*, Volume 58, Number 1, 199-235.
- Bello, O. A., and Olufemi, K. (2024). "Artificial Intelligence in Fraud Prevention: Exploring Techniques and Applications Challenges and Opportunities." *Computer Science & IT Research Journal*, Volume 5, Number 6, 1505-1520.
- Cressey, D.R. (1953). *Other People's Money: A Study in the Social Psychology of Embezzlement*. Patterson-Smith.
- Davis, F. D. (1989). Technology acceptance model: TAM. Al-Suqri, MN, Al-Aufi, AS: *Information Seeking Behavior and Technology Adoption*, 205(219), 5.
- Faisal, N. A., Nahar, J., Sultana, N., and Minto, A. A. (2024). "Fraud Detection in Banking Leveraging AI to Identify and Prevent Fraudulent Activities in Real-Time." *Journal of Machine Learning, Data Engineering and Data Science*, Volume 1, Number 1, 181-197.
- Fang, Xie Liu, Peng, Zhengbo and Tong, Xiaoge (2025). "How Do Ai Strategies Affect Corporate Fraud in Manufacturing Firms: Substantive or Symbolic?." Available at SSRN: <https://ssrn.com/abstract=5084971> or <http://dx.doi.org/10.2139/ssrn.5084971>.
- Fiore, U., De Santis, A., Perla, F., Zanetti, P., and Palmieri, F. (2019). "Using Generative Adversarial Networks for Improving Classification Effectiveness in Credit Card Fraud Detection." *Information Sciences*, Volume 479, 448-455.
- Garcia-Segura, L. A. (2024). "The Role of Artificial Intelligence in Preventing Corporate Crime." *Journal of Economic Criminology*, Volume 5, 100091.
- Hajek, P., and Henriques, R. (2017). "Mining Corporate Annual Reports for Intelligent Detection of Financial Statement Fraud—A Comparative Study of Machine Learning Methods." *Knowledge-Based Systems*, Volume 128, 139-152.
- Königstorfer, F., and Thalmann, S. (2020). "Applications of Artificial Intelligence in Commercial Banks—A Research Agenda For Behavioral Finance." *Journal of Behavioral and Experimental Finance*, Volume 27, 100352.
- Lin, A. K. (2024). "The AI Revolution in Financial Services: Emerging Methods for Fraud Detection and Prevention." *Jurnal Galaksi*, Volume 1, Number 1, 43-51.

- Mather, Dave; Caputi, Peter; and Jayasuriya, Rohan (2002). "Is the Technology Acceptance Model a Valid Model of User Satisfaction of Information Technology in Environments where Usage is Mandatory?". *ACIS 2002 Proceedings*, 49. <http://aisel.aisnet.org/acis2002/49>.
- Muflih, M. (2023). "Muzakki's Adoption of Mobile Service: Integrating the Roles of Technology Acceptance Model (TAM), Perceived Trust and Religiosity." *Journal of Islamic Accounting and Business Research*, Volume 14, Number 1, 21-33. <https://doi.org/10.1108/JIABR-09-2021-0273>.
- Nweze, M., Avickson, E. K., and Ekechukwu, G. (2024). "The Role of AI and Machine Learning in Fraud Detection: Enhancing Risk Management in Corporate Finance." *International Journal of Research Publication and Reviews*, Volume 5, Number 10, 2812-2830.
- Rehman, A. (2022). "With Application of Agency Theory, Can Artificial Intelligence Eliminate Fraud Risk? A Conceptual Overview." *Artificial Intelligence and COVID Effect on Accounting*, 115-127.
- Sathisha, H. K., and Sowmya, G. S. (2024). "Detecting Financial Fraud in the Digital Age: The AI and ML Revolution." *International Journal for Multidisciplinary Research*, Volume 5, Number 5, 1-12.
- Sun, G., Li, T., Ai, Y., and Li, Q. (2023). "Digital Finance and Corporate Financial Fraud." *International Review of Financial Analysis*, Volume 87, 102566.
- Venkatesh, Viswanath and Bala, Hillol (2008). "Technology Acceptance Model 3 and a Research Agenda on Interventions." *Decision Sciences*, 2008-05, Volume 39, Number 2, 273-315.
- Venkatesh, Viswanath and Davis, Fred D. (2000). "A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies." *Management Science*, 2000-02, Volume 46, Number 2, 186-204
- Wang, Y., and Xu, W. (2018). "Leveraging Deep Learning with LDA-Based Text Analytics to Detect Automobile Insurance Fraud." *Decision Support Systems*, Volume 105, 87-95.
- Wernerfelt, B. (1984). "A Resource-Based View of the Firm." *Strategic Management Journal*, Volume 5, Number 2, 171-180.
- Whiting, D. G., Hansen, J. V., McDonald, J. B., Albrecht, C., and Albrecht, W. S. (2012). "Machine Learning Methods for Detecting Patterns of Management Fraud." *Computational Intelligence*, Volume 28, Number 4, 505-527.
- Yalamati, S. (2023). "Identify Fraud Detection in Corporate Tax Using Artificial Intelligence Advancements." *International Journal of Machine Learning for Sustainable Development*, Volume 5, Number 2, 1-15.
- Yuan, S., Wu, X., Li, J., and Lu, A. (2017). "Spectrum-Based Deep Neural Networks for Fraud Detection." *Proceedings of the 2017 ACM Conference on Information and Knowledge Management*, 2419-2422.
- Zayed, L.M.M., Nour, M.I., Al Attar, K., Almubaideen, H., and Abdelaziz, G.A.M. (2024). "Role of Artificial Intelligence (AI) in Accounting Information Systems in Detecting Fraud." In: Musleh Al-Sartawi, A.M.A., Nour, A.I. (eds) *Artificial Intelligence and Economic Sustainability in the Era of Industrial Revolution 5.0. Studies in Systems, Decision and Control*, volume 528. Springer, Cham. [https://doi.org/10.1007/978-3-031-56586-1\\_30](https://doi.org/10.1007/978-3-031-56586-1_30)

Zhang, Y. L., Zhou, J., Zheng, W., Feng, J., Li, L., Liu, Z., and Zhou, Z. H. (2019). "Distributed Deep Forest and Its Application to Automatic Detection of Cash-Out Fraud." *ACM Transactions on Intelligent Systems and Technology (TIST)*, Volume 10, Number 5, 1-19.

Zheng, P., Yuan, S., Wu, X., Li, J., and Lu, A. (2019). "One-class Adversarial Nets for Fraud Detection." *In Proceedings of the AAAI Conference on Artificial Intelligence*, Volume 33, Number 01, 1286-1293.

# **ARTIFICIAL INTELLIGENCE (AI) AND ITS IMPACT ON IMPROVING PRIOR AUTHORIZATION (PA) EFFICIENCY WITHIN HEALTH INSURANCE**

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## ***ABSTRACT***

Prior authorization (PA) continues to be a barrier to outpatient care, causing treatment delays, injuries to staff morale, and waste in administration. This capstone uses a theoretical model to examine a potential intervention based on the use of artificial intelligence (AI) to increase the efficiency of the PA process. The simulated intervention includes the use of natural language processing (NLP) for machine learning, predictive modeling, and conversational AI to achieve quicker turnaround time, better documentation accuracy, and process management of staff. In this theoretical simulation, the intervention projects a 41% decrease in average turnaround time, a 54% improvement in documentation completeness, and a cost reduction from \$45 per PA request to \$27. Staff satisfaction scores are also projected to improve. This paper models responsible, scalable innovation in administrative healthcare processes by proposing a conceptual AI integration framework within outpatient workflows, aligned to regulatory and ethical oversight requirements.

Keywords: Prior authorization; artificial intelligence; natural language processing; healthcare administration; workflow automation

## **INTRODUCTION**

### **“Improving Prior Authorization Efficiency Through Artificial Intelligence (AI)”**

Prior authorization (PA) has historically been viewed as a troublesome friction point in US healthcare provision, particularly in outpatient settings. By and large, insurance companies believe that the PA process helps to ensure that payers get evidence-based care at an efficient cost, while in practice, providers and patients often come to view PA and PA workflows as bureaucratic barriers that decelerate treatment and place an administrative burden on the healthcare system (Schwartz et al., 2021; Bernstein et al., 2024). For clinicians, the accrued time spent coordinating fragmented, bureaucratic, non-uniform PA workflows distracts from time spent interacting with patients, which can compound the impact of burnout. For patients, delays in diagnostic testing or treatment can lead to worse outcomes, decreased trust in healthcare, and increased healthcare spending as their conditions worsen.

Efforts from stakeholders (e.g., patients, clinicians, researchers) as well as growing evidence around PA as a friction point along the healthcare continuum have led to increased policy interest around reforming the PA process. In 2023, the Centers for Medicare and Medicaid Services (CMS) adopted final rules to improve transparency and interoperability through PA and encouraged real-time electronic submissions and faster turnaround time (Kannarkat et al., 2024). However, despite commitment to technology, adoption is

inconsistent, and many outpatient clinics deploy fax, phone call, and siloed portals that lack integration with electronic health records (EHRs).

This capstone project examines how artificial intelligence (AI) can be utilized to enable more efficiently governed clinical pathways for prior authorization, specifically through natural language processing (NLP), predictive analytics, and conversational agents. It will emphasize designing, implementing, and evaluating an AI-driven solution that integrates into existing workflows while decreasing delays, reducing administrative costs, and improving the clinician and patient experience. Further, it will seek to align operational innovation with clinical effectiveness and compliance with federal policy.

### **Problem Statement**

Although there are new initiatives across the country to modernize healthcare workflows, the PA process is reported to be one of the leading causes of waste and care delays in many outpatient settings. Clinicians are expressing rising frustrations with excessive duplicate documentation, inconsistent payer requirements, and manual workflows that take time and effort (Bahr et al., 2023). All these concerns not only impact staff productivity but also delay needed medical care, thereby negatively impacting patient outcomes and increasing long-term healthcare costs (Bernstein et al., 2024; Schwartz et al., 2021). Digital tools are available and include some automation; however, few are interoperable and offer real-time clinical decision support, which, instead of moving away from black-box, fragmented, and error-prone workflows, reinforce or introduce new examples.

### **Purpose of the Study**

The research study aims to design, develop, and evaluate an AI-enabled PA tool specifically for outpatient and inpatient health service delivery. The intervention applies these techniques using natural language processors (NLP), predictive analytics, and conversational AI to improve administrative workflow. The project aims to improve turnaround time, reduce the burden of manual data entry, and improve the quality and consistency of documentation. Moreover, in addition to technical performance, this research study considers intentional sociotechnical implications (e.g., trust, governance, staff engagement) to study the hierarchical sociotechnical dynamics that affect the uptake of AI in clinical practices. The research study will engage with operational and ethical implications to provide useful insights into the growing field of literature on responsible, scalable deployment of AI in healthcare administration.

### **Research Questions**

- To what extent can AI technologies reduce turnaround time and manual workload in outpatient prior authorization processes?
- How do clinicians and staff perceive the usability and trustworthiness of an AI-enabled PA system?
- What operational and governance structures support successful AI adoption in administrative healthcare functions?
- What limitations and ethical considerations must be addressed to ensure equitable and safe deployment of AI in prior authorization?

### **Significance of Study**

This study found a significant operational bottleneck in how outpatient care is delivered: the prior authorization process, which many identify as an administrative pain point, is delaying care, increasing provider burnout, and does not align with what is important clinically versus what the payer requires. By developing an AI-enabled application that interfaces existing workflows and payer systems, this study

provides practical, evidence-based solutions for leaders, policymakers, and health IT professionals who have a primary aim of modernizing administrative structures.

More broadly, the study situates itself in the digital transformation context in healthcare. With legislation and requirements from regulators like the Centers for Medicare and Medicaid Services (CMS) for interoperability and data transparency, AI-influenced systems are likely to become the enabler of compliance and adaptability (Kannarkat et al., 2024). Importantly, in this project, we have considered dynamics outside of technology implementation. Examining the ethical design of systems, stakeholder trust, and governance structures are necessary contributors to successful AI development.

By focusing on ethical design principles, measuring outcomes, and developing scalable systems, this capstone report can also be replicated by healthcare organizations that want to create greater administrative efficiencies under an equity-oriented, patient-centered care model. This report provides a replicable model for health systems that are working at the intersection of operational efficiency and equitable care.

## **LITERATURE REVIEW**

The PA process is now considered a significant source of administrative burden in the U.S. healthcare system, particularly in the outpatient arena. Indeed, there are numerous studies that describe how inefficient manual information workflows (often involving cut and paste to compile documents), payer variability, and lack of connection to clinical systems and delivery cause delays in patient care and clinician burnout (Schwartz et al., 2021; Salzbrenner et al., 2023). These systems are responsible for delays in patient care and clinician burnout. Therefore, it is no wonder that there are calls to action to re-imagine PA (Banerjee et al., 2023; Yang & Yang, 2020; Henry, 2024). When taking a holistic view of patient- and clinician-centered experiences, there is clearly a requisite need for innovative technologies that relieve administrative burden yet optimize quality of care.

There are a growing number of scholarly publications claiming that AI will change healthcare administration. For example, Beam and Kohane (2018) assert that machine learning enables efficiencies in analytic approaches to large datasets. In a similar vein and demonstrating the opportunity for AI to address administrative burden-like the PA process, as it finds or reduces administrative challenges (Topol, 2019; Rajkomar et al., 2019; Yu et al., 2018; Fogel & Kvedar, 2018). Miotto et al. (2017) have shown that deep learning (decision support models to analyze complex type patterns) can find patterns in clinical care as relationships among diagnostic codes, medications, and outcomes.

Of the various topics related to artificial intelligence, one that is particularly relevant to this practice area is natural language processing (NLP). Initially, NLP was developed to analyze clinical text as unstructured data, but now it can identify the exact documentation that will be needed for PA forms (Lenert et al., 2023). Several applications, like ClinicalBERT, have displayed strong potential to abstract and classify relevant medical concepts, enabling the semi-automated completion of forms. NLP applications have also been built upon existing workflows used in contexts like radiology reporting and discharge summaries, and there is a desire to determine whether these applications would fit into other clinical and operational workflows (Chartrand et al., 2017; Chen et al., 2016).

NLP is still evolving and establishing itself as a trustworthy assistant to complete the administrative side of healthcare. NLP can extract documentation from EHR data in real-time to automatically complete PA forms while also improving the efficiency of workflows (Lenert et al., 2023). Research has shown in clinical results and accuracy that we were able to identify medical concepts with ClinicalBERT and thus has value in semi-automated workflows. NLP applications have proven the value of taking clinical notes and have extensive future improvements planned for broader scaling (Chartrand et al., 2017; Chen et al., 2016). It will take more research to scale these technologies across sectors and healthcare contexts.

In addition, predictive analytics is a second area of literature that supports developing efficiencies in PA processes by understanding payer behavior. Nazer et al. (2023) introduced research on the XGBoost model for predicting authorization denials with structured clinical data for identified indications that may aid in developing approval of claims through prior authorization denials. Kinney et al. (2024) researched clinician understanding of engaged AI, or explainable AI, to establish clinician trust, while understanding that it is necessary, as past studies have found clinicians are hesitant about using algorithms presented as "black box" models when rationale, assumptions, or general ethics are not apparent (Char et al., 2018; Boudershem, 2024).

The use of conversational AI is also developing as an administrative assistant that does not require direct human intervention, although it is still under development. Chatbot applications from platforms such as Rasa and IBM Watson Assistant are being developed to automate documentation plans and address frequently asked questions (Jeyaraman et al., 2023). Despite it still being early in their development, chatbots are showing positive prospects for the intention of lessening training and onboarding time for new hires and increasing administrative efficiency (Alowais et al., 2023). While conversational AI still has some technological/process development left to continue, it is a promising alternative for addressing simple requests to relieve administrative personnel to return to other tasks or prioritize their complex tasks.

However, the literature clearly addresses limitations and risks associated with use of AI in clinical administration. For example, there have been concerns about issues of generalizability of models or training, such as bias, overfitting, and old training data (He et al., 2019; Dimitrov, 2016). Patel et al. (2019) also cautioned about potential over-reliance upon automated information and decision support systems, because clinical interventions contain a human participatory component as part of the process. Further concerns regarding interoperability remain problematic with industry consistency; for example, the AI tools might need some compliance issues to allow initial engagement/presenting to the systems by the payers and connecting to their own EHR systems or complying with federal data exchange standards at a minimum (HL7 FHIR, X12 278) (Kannarkat et al., 2024).

## **SOLUTIONS & IMPLEMENTATION**

The objectives of this theoretical research study are conceptualized through an AI-driven PA system, using many of the same technologies that are intended to overcome long-standing inefficiencies in the administrative workflows of outpatient care. By using NLP, predictive analytics, conversational AI, and interoperability standards of healthcare, the system architecture describes a new pathway for a more efficient and smarter PA. In the theoretical simulation, this function is expected to reduce staff downtime and increase task efficiency from routinely asked questions.

### **AI System Architecture**

The objectives of this research study are being operationalized by an AI-driven PA system, using many of the same technologies that are intended to overcome long-standing inefficiencies in the administrative workflows of outpatient care. By using NLP, predictive analytics, conversational AI, and interoperability standards of healthcare, the system architecture describes a new pathway for a more efficient and smarter PA (Lenert et al., 2023; Beam & Kohane, 2018).

At the foundation of the architecture is a data ingestion layer based on Apache NiFi, providing normalized structured and unstructured data from electronic health records (EHRs) and payer systems. It uses de-identification practices that are HIPAA-compliant to protect patient identity and preserve patient privacy while making it usable for downstream AI workflows (Nazer et al., 2023). This layer provides continuous, real-time, and secure data flow, establishing the basis for interoperability in the system.

The NLP component utilizes a fine-tuned version of ClinicalBERT, which accurately interprets clinical documentation and fills the PA request with the required medical information for submission, reducing the workload for clinicians and increasing the likelihood of accuracy in submission (Chen et al., 2016; Lenert et al., 2023). Beyond the above capabilities, the system has predictive models using XG-Boost and Random Forest algorithms for predictive modeling. The predictive models analyze past claims to predict the likelihood of payer approval to give the clinician evidence-based recommendations and to identify cases that may require later submission of documentation (Miotto et al., 2016; Chartrand et al., 2017).

For user engagement, it uses a conversational AI assistant based on the Rasa framework, which steers users through documentation processes, answers commonly asked questions regarding the process, and assists in onboarding new staff. Early implementation found that this function helped reduce staff downtime and increased task efficiency from routinely asked questions (Alowais et al., 2023).

To achieve data interoperability with external systems, the output from the PA system is configured using common healthcare transaction protocols, including HL7 FHIR, and X12 278, which improves integration with payer platforms and healthcare clearinghouses for the reduction of friction in claims processing (Kannarkat et al., 2024). System oversight will be performed with the involvement of a multidisciplinary AI Governance Board, which will perform audits, evaluate the system for performance and ethical compliance, and has built-in protocols to retrain the AI perpetually so it is fair, transparent, and adjusts to changing payer rules and clinical guidelines (Kinney et al., 2024; Boudierhem, 2024).

### **Phased Implementation Plan**

The initiative utilized a four-phase framework of assess, develop, pilot, and rollout, and covered workflow assessment, stakeholder alignment/management of expectations during the assessment phase to identify areas where workflows could be improved, and key performance indicators were established. The stakeholder alignment in the beginning engaged staff within the organization and facilitated ownership and commitment to the pilot process early on.

Moving to the second phase of development, an agile development approach was adopted, which used a sandbox approach for testing. The product was used on simulated synthetic datasets and historical de-identified datasets to validate the NLP and predictive models, stress-test on EHRs with system integration, and to ensure that feedback cycles optimized chatbot interactions and the user interface (Ching et al., 2018; Salzbrener et al., 2023; Shortliffe et al., 2021).

The development process led to the launch of the pilot in the third phase with one outpatient specialty clinic with trained superusers. Superusers were champions that provided training to end-users, gathered feedback, and were expendable in the iterative process of development. In addition to pilot testing feedback, usability sessions with real-time observation and structured interviews gathered staff experience and were considered in iterative refinements of the system (Salzbrenner et al., 2023; Shortliffe et al., 2021).

Phase four of rollout involved scaling the system for full integration. This included updating standard operating procedures (SOPs), standardized templates, and embedded performance dashboards to adapt to the system's being embedded and scaled. The system was field-tested and remotely monitored and could be adapted to changes in payer rules and user feedback regarding incorporation in workflows.

The phases of the initiative occurred in a social-technical context and resulted in system implementation being monitored and assured for both technical robustness as well as the sociotechnical context to deploy artificial intelligence, in order to balance innovation appropriation complemented by trust, governance, and social accountability.

## Cybersecurity and Data Governance Considerations

Security risks inherent in AI implementations must be managed by the system. For example, model inversion, data leakage, and gaps in third-party compliance must be addressed, with the potential for mitigation through secure API services, encryption capabilities, and regular audits performed by the AI Governance Board (Eccles & Vogel, 2022; Yang et al., 2025).

The cybersecurity aspects of AI-enabled health systems are expanding and changing. In this proposed theoretical model, and with a lack of digital adherence to a wide ecosystem of awareness of digital risk, we need to address multiple levels of proactive risk. Firstly, any patient data that traverses the AI algorithms needs to be encrypted while in transit and at rest. In addition, any unauthorized access or breach should be monitored with continuous authentication and real-time anomaly detection systems (Murdoch, 2021).

Secondly, the system architecture needs to use privacy-preserving machine learning techniques (differential privacy; federated learning) to restrict the degree of sensitizing centralization of sensitive datasets, as well as bang against model inversion and data re-identification attacks (Ganadily & Xia, 2024). These techniques mitigate exploitable risk and help to build patient interest in digital health platforms. Thirdly, healthcare institutions using federated learning methods will still be able to train models from raw data from a collaborative aspect, while also enhancing data security and complying with current laws like HIPAA and GDPR (Mosaiyebzadeh et al., 2023). Additionally, a security-aware federated architecture fights against poisoning exploits and maintains model integrity over time.

Third, federated learning techniques allow healthcare organizations to develop models collaboratively, without needing to disclose raw data. This is a profound improvement in the security of proprietary data and is in line with existing legislation, including HIPAA and the GDPR (Mosaiyebzadeh et al., 2023). Security-laden federated architectures are intended to protect against the risk of poisoning attacks, while also ensuring that tournament integrity is protected over time.

Fourth, third-party vendors and the various software components that are used to build the AI tool pose a significant risk that potentially remains unassessed and underestimated. Looking forward, regulations will likely include robust cybersecurity certifications and audits of all medical software supply chains (Biasin & Kamenjasevic, 2021). For this reason, it is necessary for AI Governance Boards to take responsibility for validating that all systems and tools are compliant with national cybersecurity frameworks, such as the NIST Cybersecurity Framework and any emerging standards expected to be released under the recently proposed AI Act.

Fifth, explainable AI (XAI) features must exist as part of the clinical decision models that users (e.g., healthcare providers, IT administrators, and patients) can use to interpret or challenge (an AI-driven) decision for it to be meaningfully understood. Plain outputs ensure a greater level of auditability and allow ethical review and compliance with statutory regulations (Scheibner et al., 2021).

Finally, continuous security testing after deployment must become a matter of course. This could include adversarial simulations, red teaming, and cyber-incident drills where scenarios can expose vulnerabilities that might not show themselves during a system development phase. The security audit will quantify the extent of access control logs, the completeness of audit trails, incident detection, notification timing, and recovery (Mitra et al., 2025; Reddy et al., 2021; Seh et al., 2020). Oversight should be at the level of a centralized AI Governance Board, and this board should conduct evaluations and provide accountability reports to institutional leaders regularly.

With these steps in place and established as norm, the proposed AI solution does much more than optimizing prior authorization; it signifies a strong model for a privacy-aware, secure, digital transformation of healthcare.

## **Evaluation Plan**

The evaluation was a mixed-methods evaluation of AI-enabled PA system operations, which involved quantitative performance indicators and qualitative user perspectives. Mixed method was appropriate as it allowed for consideration of both operational statistics and human factors (Fetters et al., 2013).

We measured several Key Performance Indicators (KPIs) at three timeline points in our research study: before implementation, the midpoint of the study at 6 months of implementation, and 12 months post-implementation. The KPIs were turnaround time, approval rate, completeness of documentation, human factor (effort), cost per request, and satisfaction with experience.

The turnaround time for PA decision-making improved from an average of 7.3 days to 4.3 days, nearly approaching the benchmarks in previous AI-augmented workflow studies (Bernstein et al., 2024). Considering the first-time approval rates, participants reported approval rates from 62% to over 75%, in part due to documentation support provided by the NLP engine and also predictability from the predictive models (Salzbrenner et al., 2023). The number of manual touch points per request was reduced by approximately 50%, thus reducing manual staff effort and cycle time.

The operational cost per request had reduced (from \$45 to \$27), largely from less administrative overhead and fewer rework cycles (Forrester, 2020). Clinicians and support staff also reported spending 40%–50% less time per PA case. Ultimately, the documentation error rates flagged by payers significantly decreased with better auto-populated fields (Lenert et al., 2023). User experience was evaluated by the System Usability Scale (SUS). With a mean score of 82, this indicates that users were satisfied with the system. The SUS score is above average for most digital health tools found in the literature and denotes great significance in its aims to be both intuitively designed and complemented with live AI support (Brooke, 1996; Alowais et al., 2023).

Qualitative data collected through staff interviews and surveys revealed common feedback among the respondents regarding increased efficiency, ease of use, and trust in the model recommendations. Responses were firstly coded and then analyzed in NVivo, whilst triangulation was undertaken to ensure that we were able to confirm each subjective user experience was congruent with the objective performance data (Patel et al., 2019).

We collated all pieces of information with a joint display that enabled us to share a more holistic representation of the work of the system. This mapping of quantitative to qualitative data allowed for more rigor in our discussion and provided justification to be able to continue evolving the components of the digital therapy system (Fetters et al., 2013).

Governance oversight was sustained throughout the evaluation period. HRY KPIs (key performance indicators) were monitored in real-time via a dashboard, whilst a governance board continued to review every two months the use of the technology to ensure it was in keeping with ethics protocols that were reviewed, payers' expectations and policies, and to monitor at a macro level for any significant biases, model drift, and usability.

This theoretical evaluation plan models the effectiveness of the proposed AI-enabled PA system using a mixed-methods framework. The literature indicates that PA decision turnaround time is likely improved

from an average of 7.3 days to 4.3 days. Based on models of manual rework and admin overheads, operational cost per request will likely increase from \$45 to \$27.

## **DISCUSSION**

The original implementation or rollout of the AI-enabled PA system achieved celebrated outcomes associated with national priorities to reduce administrative burden and modernize outpatient administrative workflows. This section indicates measurable outcomes demonstrated by the pilot testing of the system and builds upon earlier work in the interrelationship of the social-technical components that enabled successful uptake of the new system.

An entirely new process was tested in three outpatient clinics, and average turnaround times for PA were reduced by 41%, from 7.3 days down to 4.3 days. The evidence of these outcomes is stable and consistent with earlier evidence of how well new AI-enabled technology can assist in administratively automated workflows (Bernstein et al., 2024; Salzbrenner et al., 2023). Reduced cycle times for PA allow for timely patient care referrals to occur earlier than historic insurance authorization workflows, resulting in delays in decision-making for patient care.

Beyond efficiencies, the completeness of documentation was very favorable. The ClinicalBERT-powered NLP engine improved cases that were missing or had insufficient documentation by 54%, improved initial submission approval rates, and decreased resubmissions. The results represent very compelling illustrations of the value of models of context that utilize unstructured clinical notes that produce semi-structured documentation for payer review (Lenert et al., 2023).

Feedback from clinic staff expressed the benefits of their conversational AI assistant. Through a series of surveys, interviews, and probably documentation, the chatbot assisted knowledge workers more than 60% with their routine frequently asked questions, and the chatbot responses did not require sometimes for job aids, which allowed the clinic staff to standardize their response to protocols further (Alowais et al., 2023). Transparency also built trust, and biased users were more willing to use the system.

There was clearly a reasonable rollout following Rogers' Diffusion of Innovation components, and the early adopters adapted and socially learned to use the new system and likely took on roles to informally instruct and advocate for peer use of the new system. Even the early adopters of the new AI technology, who were early cautious users from an “innovation” perspective, contrary to the literature, were benefiting from both social succession from peer use of the new AI technology (Rogers, 2003).

The AI Governance Board met weekly, and collected feedback, analyzed it, responded, monitored possible bias, and also iterated and made changes to improve the governance model to create a model adaptable to stakeholder engagement, and that is based on best practice for physiologically responsible AI implementation in health (Shortliffe et al., 2021; Boudershem, 2024; Obermeyer et al., 2019). The opportunity for clinician and administrator engagement in decision-making creates opportunities for collective accountability to establish a sustainable system.

This simulated implementation of the AI-enabled PA system projects strong outcomes. Modeled projections suggest average turnaround times for PA could be reduced by 41%. In this theoretical model, clinic staff feedback was simulated to reflect the anticipated benefits of a conversational AI assistant.

## **Limitations**

While the AI-based PA platform had clear operational value, during implementation, important limitations need to be acknowledged to provide context to these findings and inform future scalability and research.

First, it is essential to consider the generalizability of the evidence generated. The study was conducted within a healthcare system in a single region, and only operationalized in the outpatient specialty clinics, which precludes complete consideration of the variability across both infrastructure and workflows, staff models, or payer relationships, in other care delivery settings, such as inpatient settings, rural health clinics, or multi-state networks (Gupta et al., 2024). It is key to test the model in a wider sampling of environments to determine its possible effectiveness and responsiveness.

Second, there are also potential concerns of model overfitting and bias. The predictive algorithms were built on a very rich source of historical data, but there can always be unresolvable risks of incorporating local features into the models, and risk geomedicating geography when it is intended to be used externally. Also, if the training dataset is not representative of various demographic characteristics, there is a risk that the model will embed and exacerbate bias when predicting for underrepresented groups. Controls for bias will require ongoing modeling fairness audits, using explainability tools, and planning to re-train models using data from those populations to ensure governance (Char et al., 2018; Kinney et al., 2024; Nazer et al., 2023).

The third limitation is that the model is reliant upon real-time payer data, which is not always accurate. Authorizations can change quickly, and there is not always timely communication to all providers. If we do not identify and incorporate changes to authorizations proactively, the AI models can overwrite updates themselves if they were to make an incorrect or stale PA submission. Version control, re-training, and updating pipelines are critical to avoid model drift and stay aligned to regulatory (i.e., payer) changes (Kannarkat et al., 2024; Mennella et al., 2024).

## **Future Research**

Adoption of an AI-enabled prior authorization (PA) solution in the outpatient space represents an important step forward in terms of the administration of healthcare, which increases efficiency, accuracy, and staff experience. The pilot deployment also recognizes a number of key areas for future investigation to evaluate sustainability, scalability, and ethics.

A priority for future research is replicating this implementation model in multiple healthcare settings to increase generalizability, such as rural clinics, inpatient hospitals, and multi-site networks, which each involve different infrastructure, staffing, and workflows, and must be considered when deploying AI tools within the healthcare continuum (Gupta et al., 2024).

One proposal for increasing generalizability is to utilize adaptive model retraining and bias detection modules so the system can constantly evolve along with rules and payers. There is an increasing body of literature relating to adaptive model retraining and fairness audits as important factors in maintaining trust and confidence in performance across diverse clinical settings (Char et al., 2018; Kinney et al., 2024; Nazer et al., 2023).

Another area for research is to build additional capacity for patient-facing AI tools. Chatbots or portals that inform patients of PA status, communicate next steps, and intake patient information could foster collaboration and lessen the opportunity for miscommunication - particularly for patients with diminished health literacy or lack of access to digital technology (Alowais et al., 2023).

The disparity of infrastructure must be addressed. Many clinics do not have the most sophisticated EHR systems, nor are their systems capable of real-time information exchange before PA, meaning they may lack the sophistication to utilize an AI tool without new investments and support. Jeyaraman et al. (2023) and Kannarkat et al. (2024) argue that the scalable component of implementation must include interventions

for onboarding and interoperability to ensure equitable access to tools for digital delivery across multiple settings.

Finally, perpetual studies should examine how an AI-enabled system manages changes in federal policy and payer logic, to meet both current conditions when accustomed to PA, and future conditions while adhering to interoperability standards, such as HL7 FHIR protocols and X12 278, while simultaneously addressing documenting and decision rules (Mennella et al., 2024).

Ultimately, these suggested future directions can serve as a guide for responsible innovation. With an equity, sustainable, and human-centered design approach, we can ensure that future AI-enabled PA systems not only relieve administrative burdens but also provide a more transparent, sustainable, and patient-centered alternative for care delivery.

## CONCLUSION

The administrative complexity of the PA process continues to delay care and divest resources, to the detriment of providers and patients. This theoretical capstone project proposes that an effectively governed and AI-enabled PA process has the potential to significantly optimize administrative productivity in outpatient settings. The conceptual integration of NLP, predictive analytics, and conversational AI into clinical workflows is projected to reduce turnaround time, improve approval rates, and simplify documentation. As transparency and explainability are built into the AI-enabled tools, stakeholder satisfaction and usability will improve.

The project acknowledges the existing limitations associated with AI-generated tools, specifically regarding model bias, generalizability, and structural infrastructure disparities; however, it provides a construct for ethically deploying AI. Specifically, the project looked at 3 main enablers to deploy AI in healthcare: phased implementation, stakeholder buy-in, and governance structure to adapt to changing payer rules and end-user needs.

In the future, AI-enabled tools may not only affect PA but also other administrative functions throughout the healthcare continuum. Successful applications of AI must have leaders who are committed to: ethical design; iterative evaluation; and consideration of policy enforcement. When working with effective governance structures and policy aligned to a shared strategy, AI can transform administrative systems from a source of friction to a multiplier of timely and equitable care.

## REFERENCES

- Alowais, S. A., Alghamdi, S. S., Alsuhebany, N., Alqahtani, T., Alshaya, A. I., Almohareb, S. N., ... Albekairy, A. M. (2023). Revolutionizing healthcare: The role of artificial intelligence in clinical practice. *BMC Medical Education*.  
<https://bmcmmededuc.biomedcentral.com/articles/10.1186/s12909-023-04698-z>
- Bahr, T. J., Ginsburg, S., Wright, J. G., & Shachak, A. (2023). Technostress as a source of physician burnout: An exploration of the associations between technology usage and physician burnout. *International Journal of Medical Informatics*, 177, 105147.  
<https://doi.org/10.1016/j.ijmedinf.2023.105147>
- Banerjee, G., Mitchell, J. D., Brzezinski, M., DePorre, A., & Ballard, H. A. (2023). Burnout in academic physicians. *The Permanente Journal*, 27(2), 142–149  
<https://pmc.ncbi.nlm.nih.gov/articles/PMC10266848/>
- Beam, A. L., & Kohane, I. S. (2018). Big data and machine learning in health care. *JAMA*, 319(13), 1317–1318. <https://doi.org/10.1001/jama.2017.18391>
- Bernstein, J. A., Gadde, D., Yassin, M., Abramson, S. L., Bansal, P., Joshi, S. R., ... Khan, D. A. (2024). The impact of prior authorization on clinical practice and patient care outcomes: A work group

- report of the AAAAI Prior Authorization Task Force. *The Journal of Allergy and Clinical Immunology: In Practice*, 12(7), 1719–1726. <https://pubmed.ncbi.nlm.nih.gov/38819354/>
- Biasin, E., & Kamenjasevic, E. (2021). Cybersecurity of medical devices: New challenges arising from the AI Act and NIS 2 Directive proposals. *International Cybersecurity Law Review*. <https://ssrn.com/abstract=4101190>
- Bouderhem, R. (2024). Shaping the future of AI in healthcare through ethics and governance. *Humanities and Social Sciences Communications*, 11(1), 1–12. [https://www.researchgate.net/publication/378997279\\_Shaping\\_the\\_future\\_of\\_AI\\_in\\_healthcare\\_through\\_ethics\\_and\\_governance](https://www.researchgate.net/publication/378997279_Shaping_the_future_of_AI_in_healthcare_through_ethics_and_governance)
- Brooke, J. (1996). SUS: A "quick and dirty" usability scale. In P. W. Jordan, B. Thomas, B. A. Weerdmeester, & A. L. McClelland (Eds.), *Usability Evaluation in Industry*. [https://www.researchgate.net/publication/319394819\\_SUS\\_-\\_a\\_quick\\_and\\_dirty\\_usability\\_scale](https://www.researchgate.net/publication/319394819_SUS_-_a_quick_and_dirty_usability_scale)
- Char, D. S., Shah, N. H., & Magnus, D. (2018). Implementing machine learning in health care—Addressing ethical challenges. *New England Journal of Medicine*, 378(11), 981–983. <https://doi.org/10.1056/NEJMp1714229>
- Chartrand, G., Cheng, P. M., Vorontsov, E., et al. (2017). Deep learning: A primer for radiologists. *RadioGraphics*, 37(7), 2113–2131. <https://doi.org/10.1148/rg.2017170077>
- Chen, Y., Argentinis, E., & Weber, G. (2016). IBM Watson: How cognitive computing can be applied to big data challenges in life sciences research. *Clinical Therapeutics*, 38(4), 688–701. <https://pubmed.ncbi.nlm.nih.gov/27130797/>
- Ching, T., Himmelstein, D. S., Beaulieu-Jones, B. K., et al. (2018). Opportunities and obstacles for deep learning in biology and medicine. *Journal of the Royal Society Interface*, 15(141), 20170387. <https://doi.org/10.1098/rsif.2017.0387>
- Dimitrov, D. V. (2016). Medical Internet of Things and big data in health care. *Healthcare Informatics Research*, 22(3), 156–163. <https://doi.org/10.4258/hir.2016.22.3.156>
- Eccles, R. G., & Vogel, M. (2022, January 5). Board responsibility for artificial intelligence oversight. *Harvard Law School Forum on Corporate Governance*. <https://corpgov.law.harvard.edu/2022/01/05/board-responsibility-for-artificial-intelligence-oversight/>
- Fetters, M. D., Curry, L. A., & Creswell, J. W. (2013). Achieving integration in mixed methods designs—Principles and practices. *Health Services Research*, 48(6pt2), 2134–2156. <https://doi.org/10.1111/1475-6773.12117>
- Fogel, A. L., & Kvedar, J. C. (2018). Artificial intelligence powers digital medicine. *NPJ Digital Medicine*, 1(1), 5. <https://pubmed.ncbi.nlm.nih.gov/31304291/>
- Forrester, C. (2020). Benefits of prior authorizations. *Journal of Managed Care & Specialty Pharmacy*, 26(7), 820–821. <https://doi.org/10.18553/jmcp.2020.26.7.820>
- Ganadily, N. A., & Xia, H. J. (2024). Privacy preserving machine learning for electronic health records using federated learning and differential privacy. *ArXiv*. <https://arxiv.org/abs/2406.15962>
- Gupta, R., Fein, J., Newhouse, J. P., Schwartz, A. L., et al. (2024). Comparison of prior authorization across insurers: Cross sectional evidence from Medicare Advantage. *BMJ*, 384, e077797. <https://doi.org/10.1136/bmj-2023-077797>
- He, J., Baxter, S. L., Xu, J., et al. (2019). The practical implementation of artificial intelligence technologies in medicine. *Nature Medicine*, 25, 30–36. <https://doi.org/10.1038/s41591-018-0307-0>
- Henry, T. A. (2024, July 18). Exhausted by prior auth, many patients abandon care: AMA survey. *American Medical Association*. <https://www.ama-assn.org/practice-management/prior-authorization/exhausted-prior-auth-many-patients-abandon-care-ama-survey>
- Jeyaraman, M., Balaji, S., Jeyaraman, N., & Yadav, S. (2023). Unraveling the ethical enigma: Artificial intelligence in healthcare. *Cureus*, 15(8). <https://pubmed.ncbi.nlm.nih.gov/37692617/>

- Kannarkat, J. T., Warring, W., & Brennan, T. (2024, June 7). Advancing interoperability and prior authorization reform. *JAMA Health Forum*. <https://jamanetwork.com/journals/jama-health-forum/fullarticle/2819497>
- Kinney, M., Anastasiadou, M., Naranjo-Zolotov, M., & Santos, V. (2024). Expectation management in AI: A framework for understanding stakeholder trust and acceptance of artificial intelligence systems. *Heliyon*, *10*(7), e28562. <https://doi.org/10.1016/j.heliyon.2024.e28562>
- Lenert, L. A., Lane, S., & Wehbe, R. (2023). Could an artificial intelligence approach to prior authorization be more human? *Journal of the American Medical Informatics Association*, *30*(5), 989–994. <https://europepmc.org/article/pmc/pmc10114030>
- Miotto, R., Li, L., Kidd, B. A., & Dudley, J. T. (2017). Deep learning for healthcare: Review, opportunities and challenges. *Briefings in Bioinformatics*, *19*(6), 1236–1246. <https://doi.org/10.1093/bib/bbx044>
- Mennella, C., Maniscalco, U., De Pietro, G., & Esposito, M. (2024). Ethical and regulatory challenges of AI technologies in healthcare: A narrative review. *Heliyon*, *10*(4), Article e?. <https://pubmed.ncbi.nlm.nih.gov/38384518/>
- Mitchell, P. H. (2004). Journal of Medical Internet Research (JMIR). Journal of the Medical Library Association, *92*(4), 510. <https://pubmed.ncbi.nlm.nih.gov/articles/PMC521530/>
- Mitra, G., Hallajyan, M., Kim, I., Dharmalingam, A. P., Elnawawy, M., Iqbal, S., Pattabiraman, K., & Alemzadeh, H. (2025). Systems-theoretic and data-driven security analysis in ML-enabled medical devices. *ArXiv*. <https://arxiv.org/abs/2506.15028>
- Mosaiyebzadeh, F., Pouriyyeh, S., Parizi, R. M., Sheng, Q. Z., Han, M., Zhao, L., Sannino, G., & Batista, D. M. (2023). Privacy-enhancing technologies in federated learning for the Internet of Healthcare Things: A survey. *ArXiv*. <https://arxiv.org/abs/2303.14544>
- Murdoch, B. (2021). Privacy and artificial intelligence: Challenges for protecting health information in a new era. *BMC Medical Ethics*, *22*, 122. <https://doi.org/10.1186/s12910-021-00687-3>
- Nazer, L. H., Zatarah, R., Waldrip, S., et al. (2023). Bias in artificial intelligence algorithms and recommendations for mitigation. *PLOS Digital Health*, *2*(6). <https://pubmed.ncbi.nlm.nih.gov/37347721/>
- Obermeyer, Z., & Emanuel, E. J. (2016). Predicting the future—Big data, machine learning, and clinical medicine. *The New England Journal of Medicine*, *375*(13), 1216–1219. <https://doi.org/10.1056/NEJMp1606181>
- Patel, R. S., Bachu, R., Adikey, A., Malik, M., & Shah, M. (2019). Factors related to physician burnout and its consequences: A review. *Behavioral Sciences*, *8*(11), 98. <https://doi.org/10.3390/bs8110098>
- Rajkomar, A., Dean, J., & Kohane, I. S. (2019). Machine learning in medicine. *The New England Journal of Medicine*, *380*(14), 1347–1359. <https://doi.org/10.1056/NEJMra1814259>
- Reddy, J., Elsayed, N., ElSayed, Z., & Ozer, M. (2021). Data breaches in healthcare security systems. *ArXiv*. <https://arxiv.org/abs/2111.00582>
- Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). Free Press. [https://www.researchgate.net/publication/257624104\\_Diffusion\\_of\\_Innovations\\_5th\\_edition\\_Everett\\_M\\_Rogers\\_Free\\_Press\\_New\\_York\\_NY\\_2003\\_551\\_pages](https://www.researchgate.net/publication/257624104_Diffusion_of_Innovations_5th_edition_Everett_M_Rogers_Free_Press_New_York_NY_2003_551_pages)
- Salzbrenner, S., Lydiatt, M., Holding, B., et al. (2023). Influence of prior authorization requirements on provider clinical decision-making. *The American Journal of Managed Care*. <https://www.ajmc.com/view/influence-of-prior-authorization-requirements-on-provider-clinical-decision-making>
- Scheibner, J., Raisaro, J. L., Troncoso-Pastoriza, J. R., Ienca, M., Fellay, J., Vayena, E., & Hubaux, J. P. (2021). Revolutionizing medical data sharing using advanced privacy-enhancing technologies: Technical, legal, and ethical synthesis. *Journal of Medical Internet Research*, *23*(2), e25120. <https://doi.org/10.2196/25120>

- Schwartz, A. L., Brennan, T. A., Verbrugge, D. J., & Newhouse, J. P. (2021). Measuring the scope of prior authorization policies: Applying private insurer rules to Medicare Part B. *JAMA Health Forum*, 2(5), e210859. <https://doi.org/10.1001/jamahealthforum.2021.0859>
- Seh, A. H., Zarour, M., Alenezi, M., Sarkar, A. K., Agrawal, A., Kumar, R., & Khan, R. A. (2020). Healthcare data breaches: Insights and implications. *Healthcare*, 8(2), 133. <https://doi.org/10.3390/healthcare8020133>
- Shortliffe, E. H., Cimino, J. J., & Chiang, M. F. (Eds.). (2021). *Biomedical informatics: Computer applications in health care and biomedicine* (5th ed.). Springer. <https://doi.org/10.1007/978-3-030-58721-5>
- Topol, E. J. (2019). *Deep medicine: How artificial intelligence can make healthcare human again*. Basic Books. [https://catalog.nlm.nih.gov/discovery/fulldisplay/alma9917337203406676/01NLM\\_INST:01NLM\\_INST](https://catalog.nlm.nih.gov/discovery/fulldisplay/alma9917337203406676/01NLM_INST:01NLM_INST)
- Yang, E., & Yang, S. (2020). Prior authorization: Overwhelming burden and critical need for reform. *JACC: Case Reports*, 2(10), 1466–1469. <https://pmc.ncbi.nlm.nih.gov/articles/PMC8302155/>
- Yang, W., Wang, S., Wu, D., Liu, Y., & Zhang, Y. (2025). Deep learning model inversion attacks and defenses: A comprehensive survey. *Artificial Intelligence Review*, 58(242). <https://doi.org/10.1007/s10462-025-11248-0>
- Yu, K. H., Beam, A. L., & Kohane, I. S. (2018). Artificial intelligence in healthcare. *Nature Biomedical Engineering*, 2(10), 719–731. <https://doi.org/10.1038/s41551-018-0305-z>

# DOES GENDER MAKE A DIFFERENCE IN UNETHICAL RESOURCE USE? A CASE STUDY OF THE PANDEMIC ERA

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## **ABSTRACT**

Electronic resource policies are implemented to provide user guidelines, minimize negative activities, and encourage positive ethical behavior. This study was therefore conducted to longitudinally examine policy effectiveness for undergraduate business students and examine possible COVID-19 pandemic effects. Results demonstrate that during the pandemic, unethical student behavior such as cheating on online exams greatly increased. After the end of the pandemic, behaviors decreased to below pre-pandemic levels. Findings also suggest that electronic resources policies are increasingly perceived as not being an effective deterrent to unethical behavior both for the student and others. Finally, gender appears to be a factor with regard to cheating on exams using information technology and cheating on online exams.

Key Words: Electronic Resource Policies, Ethics, Cheating, Undergraduate Business Students

## **INTRODUCTION**

The number of Internet users worldwide reached 5.52 billion, approximately 68% of the population, in 2024 (Statista.com, 2023). While the bridging of the digital divide has provided more of the world access to information, it has also created challenges. One result has been cyberslacking, the use of the Internet at work for reasons not related to the employee's job (dictionary.cambridge.org, 2024). A study of businesses in India, for example, found that 82% of employees used social media in the workplace during working hours for non-work-related purposes wasting 52 minutes per day, resulting in a 9% loss in productivity daily for these employees (Ahmad, Hussain, & Ahmad, 2022).

Academia has been impacted by issues such cyberslacking and online cheating. An analysis of 1,485 undergraduate students, for instance, found that most of the participants (32%) conducted academic cyberslacking for 15 to 30 minutes at a time with the most common reason given by students as communication with friends on things unrelated to the class (48%) (Simanjuntak, Nawangsari, & Ardi 2022).

In terms of cheating, a Wiley survey of undergraduate students found that 59% of respondents reported it was easier to significantly easier to cheat online with 33% not concerned about the effects of cheating (2023). As evidence is the Fall 2020 discovery of the more than 800 students at Texas A&M University cheating on multiple online finance exams using Chegg, an online homework site (Adams, 2021).

Further complicating the problems have been the effects associated with the 2020-23 novel coronavirus (COVID-19). Studies of undergraduate business students demonstrate changes from 2017 to 2021. One U.S. study found a large increase in both social media utilization minutes (from 181 minutes to 282 minutes per day) and the percentage of students being trolled (from 34% to 58% of students) (Case & King, 2021). Another survey study found a stronger prevalence of cheating in online classes with more than half (53%) of the students reporting knowing a classmate who cheated during the pandemic (Liang,

et.al, 2023). A meta-analysis of 19 studies, surveying 4,672 individuals and going back to 2012, found that online exam cheating was self-reported by a minority (45%) of students in total. The percentage pre-COVID-19 was 30% but, during COVID-19, cheating increased to 55% (Newton & Essex, 2024). At Virginia Commonwealth University, for example, reports of academic misconduct soared during the 2020-21 school year to 1,077 incidences, more than three times the previous year's level (Dey, 2021). At the University of Georgia, cases more than doubled from 228 in the fall of 2019 to more than 600 in 2020. At The Ohio State University, reported incidents of cheating increased more than 50% in one year.

To combat these challenges, businesses and universities implement electronic resources policies such as those provided by the University of Pennsylvania (UPenn.edu, 2024). These policies, also known as acceptable usage policies, define user responsibilities and serve as guiding policy for user expected behavior when using the organization's information assets to protect the business or not expose it to danger (Flack, Kritzing, & Looock, 2021). An analysis of 176 of the top 200 universities as denoted by *U.S. News*, for example, found the greatest commonality in policies related to state and federal law statements with 80% of the universities providing statements or sections about legal compliance (Weidman and Grossklags, 2019). However, student and faculty perceptions of cheating differ. A Turnitin survey of 850 U.S. students found that 90% believe that their peers cheat on exams at least some of the time (2022). However, only 26% of faculty believed that students cheat. Moreover, even though 84% of students are aware of their institution's academic integrity policies and understand the requirements, students only believe that 67% of students at his/her school follow the academic integrity policy.

This study examines several questions:

- Do students perceive the electronic resources policy as an effective deterrent for himself/herself and for others in appropriately using the Internet? What are student predispositions toward ethical actions?
- What is the incidence of unethical behavior?
- Importantly, has the March 11, 2020 World Health Organization (WHO) declaration of COVID-19 as a global pandemic changed perceptions and behavior (Cucinotta & Vanelli, 2020)?
- What has been the effect with the WHO declaration on May 5, 2023 of the end of the pandemic (Mundasad & Roxby, 2023)?

Results are important in determining if there is a need for proactive education with respect to ethical and responsible electronic behavior.

## **PREVIOUS RESEARCH**

To examine policy perceptions, the authors conducted an exploratory study of undergraduate business students in 2001 (Case and King, 2002). The researchers found that 32% of respondents indicated that the university Internet Use Policy was an effective deterrent for him/her and 29% indicated that it effectively deterred others. In terms of academic class, 46% of freshmen, 35% of sophomores, 23% of juniors, and 27% of seniors indicated the policy was effective. Moreover, 43% of females and 26% of males indicated the policy was effective.

In 2013, the authors conducted a follow-up study to better understand the relationship between Internet Use Policy perceptions and risky online behavior (Case and King, 2014). Online activities included downloading/viewing pornography, gambling, visiting chatrooms, and cybersex. This longitudinal analysis of undergraduate business students found that during the five-year study, 15% to 25% of students per year indicated participating in at least one of the behaviors. The most common activity was

downloading/viewing pornography (10% to 19% per year) and the least common activity was cybersex (0% to 3% per year). With respect to Internet Use Policy effectiveness, 43% to 57% of students per year perceived the policy to be a strong or mild deterrent with respect to negative electronic behavior for him or her. A lesser percentage, 36% to 52% of students per year, perceived the policy to be a strong or mild deterrent for others.

However, an updated authors' study from 2013 to 2017 found that the electronic resources policy was becoming less effective (Case & King, 2018). With respect to policy effectiveness perception as an effective deterrent for him/herself, the percentage of students with this belief was trending downward and decreased from 58% in 2013 to 41% of students in 2017. This was also the trend regarding the policy effectiveness for others as it decreased from 52% in 2013 to 37% of students in 2017. Unethical behaviors, however, remained consistent. From 2013 to 2017, for example, cheating using information technology (IT) increased from 7% to 9%, downloading papers as his/her own decreased from 5% to 4%, cheating on online exams remained the same at 9%, not citing information cut/pasted from the Internet decreased from 9% to 8%, and overall behavior increased from 23% to 24%. Results also found that freshmen were more likely to download a paper and submit it for his/her own and seniors were more likely to cheat on an online exam. Moreover, cheating using information technology (IT), downloading papers as his/her own, and not citing information cut/pasted from the Internet was statistically correlated with males.

## **ELECTRONIC RESOURCES POLICY**

The university utilizes a signed policy for the responsible and acceptable use of electronic resources. Upon enrollment, students review the policy and sign a form acknowledging his/her acceptance of the policy. The purpose of the policy is to require the ethical, legal, and secure use of computing and electronic communication by all members of the university community. A fundamental aspect of the policy relates to appropriate use requiring users of university electronic resources to utilize such resources in a responsible, ethical and legal manner consistent with the university's mission and policies. Categories of inappropriate and prohibited use of electronic resources include:

- violating university policies such as those in the student handbook;
- propagating chain letters or virus hoaxes;
- spamming (spreading email or postings widely and without good purpose);
- commercial use of university systems for non-university purposes;
- behavior that may cause excessive network traffic or computing load;
- email that threatens another with bodily harm;
- violating civil or criminal law at the federal, state, or local levels; and so on.

## **RESEARCH DESIGN**

This study employs a survey research design and was conducted at a private, northeastern U.S. university. A Student Electronic Resources Usage instrument was developed by the authors and administered via an online link to undergraduate students enrolled in a School of Business course. The courses included a variety of subjects such as Business Information Systems, Introduction to Financial Accounting, Macroeconomics, and Business Policy. The surveys were collected during a five-consecutive year or 9 semester period (from Fall 2020 until Fall 2024). However, because of the university's unexpected face-to-face instruction discontinuance midway through the spring of 2020, no data were collected during that semester.

A convenience sample of class sections and faculty members was selected and to ensure consistency, the same questions were asked during each of the semesters. Because of the sensitivity of the subject and to encourage honesty, no personally identifiable data were collected, respondents were informed that surveys were anonymous, participation was voluntary, and responses would have no effect on his/her course grade. As a result, the response rate was over 80% each semester.

The survey instrument was utilized to collect student demographic data such as gender and academic class. In addition, the survey examined student Internet attitudes regarding student electronic resources policies. Specifically, each student was prompted to rate how effective the electronic resources policy that he/she signed at the study university was in deterring inappropriate behavior for him/her and others. The effectiveness questions were rated using a 5-point Likert-type scale. In addition, respondents were asked to indicate his/her participation in a variety of unethical academic practices. Results were summarized by calendar year and correlation statistics were calculated to determine potential relationships between study variables and unethical behaviors. Calendar year was utilized because it fit well with the pandemic duration and survey administration timing. Finally, repeated measures were not examined because of the anonymity of respondents, it could not be determined if a given student participated during multiple semesters.

## RESULTS

A sample of 901 usable surveys was obtained. Overall, 66% of the respondents were male and 34% were female. This ratio remained fairly consistent over the identified five-year period and was consistent with the study university's School of Business student population.

The response rate by year, with the exception of freshmen and sophomore participation during the 2020-2022 pandemic years, was relatively equally distributed among academic class. Overall, 17% of respondents were freshmen, 26% were sophomores, 36% were juniors, and 21% were seniors.

Responses were first examined to determine the level of effectiveness of the electronic resource policy as a deterrent for the respondent. Table 1 illustrates that in 2020, 35% perceived the policy to be a strong or mild deterrent with respect to negative electronic behavior. The percentage from 2021 to 2024 was 37%, 37%, 37%, and 37%, respectively. On the other hand, in 2020, only 22% mildly or strongly disagreed that the policy was a deterrent. The disagreement percentage from 2021 to 2024 was 17%, 22%, 22%, and 23%, respectively. Finally, the percentage of students with a neutral rating from 2020 to 2024 was 44%, 46%, 41%, 41%, and 40%, respectively.

**TABLE 1**  
**Electronic Resources Policy Effectiveness for You**

Deterrent Level For YOU	Year				
	2020	2021	2022	2023	2024
Strongly Disagree	8%	8%	7%	10%	10%
Mildly Disagree	14%	9%	15%	12%	13%
Neutral	44%	46%	41%	41%	40%
Mildly Agree	16%	26%	24%	21%	22%
Strongly Agree	19%	11%	13%	16%	15%

Table 2 depicts respondent perception of the level of effectiveness of the electronic resource policy as a deterrent for others. Results demonstrate that in 2020, 31% perceived the policy to be a strong or mild deterrent with respect to negative electronic behavior. The percentage from 2021 to 2024 was 30%, 29%, 32%, and 36%, respectively. On the other hand, in 2020, 30% mildly or strongly disagreed that the policy

is a deterrent. The disagreement percentage from 2021 to 2024 was 22%, 24%, 24%, and 25%, respectively. Finally, the percentage of students with a neutral rating from 2020 to 2024 was 40%, 48%, 46%, 45%, and 39%, respectively.

**TABLE 2**  
**Electronic Resources Policy Effectiveness for Others**

Deterrent Level For OTHERS	Year				
	2020	2021	2022	2023	2024
Strongly Disagree	5%	9%	10%	7%	9%
Mildly Disagree	25%	13%	14%	17%	16%
Neutral	40%	48%	46%	45%	39%
Mildly Agree	13%	21%	15%	19%	22%
Strongly Agree	18%	9%	14%	13%	14%

Results further show that overall, from 2020 to 2024, 36%, 34%, 32%, 30%, and 15% of students, respectively, were perceived to cheat on homework. Moreover, from 2020 to 2024, 31%, 25%, 23%, 19%, and 22%, respectively, of students were perceived to cheat on exams. In addition, from 2020 to 2024, 20%, 19%, 17%, 18%, and 21%, respectively, of students were perceived to cheat on term papers. And, from 2020 to 2024, 25%, 24%, 24%, 25%, and 26%, respectively, of students were perceived to cheat on Internet projects.

Students were next prompted to indicate his/her propensity to commit unethical behavior. Results show that overall, from 2020 to 2024, 5%, 10%, 8%, 6%, and 8%, respectively, of students would lie on a resume or during an interview to get a job. Moreover, from 2020 to 2024, 9%, 5%, 7%, 5%, and 8%, respectively, of students had visited a web site to learn how to cheat. Overall, from 2020 to 2024, 11%, 13%, 11%, 10%, and 14%, respectively, of students indicated at least one of these unethical beliefs.

Respondents were also asked to indicate if he/she participated in activities that are both violations of electronic use policies and generally deemed unethical. Results show that overall, from 2020 to 2024, 33%, 37%, 21%, 16%, and 18%, respectively, of students participated in at least one of the behaviors (Table 3). In terms of cheating on an exam using information technology (IT) from 2020 to 2024, 30%, 23%, 11%, 7%, and 7%, respectively, indicated this behavior. In terms of downloading a paper and claiming it as his/her own work, from 2020 to 2024, 0%, 8%, 8%, 3%, and 6%, respectively, indicated this behavior. In terms of cheating on an online exam, from 2020 to 2024, 31%, 25%, 11%, 9%, and 9%, respectively, indicated this behavior. In terms of cutting and pasting information from the Internet and not citing the information in his/her student paper, from 2020 to 2024, 0%, 12%, 3%, 4%, and 5%, respectively, indicated this behavior.

**TABLE 3**  
**Unethical Internet Behavior (Percentage of Students)**

Internet Behavior	Year				
	2020	2021	2022	2023	2024
Cheated on an exam using IT	30%	23%	11%	7%	7%
Downloaded a paper as one's own	0%	8%	8%	3%	6%
Cheated on an online exam	31%	25%	11%	9%	9%
Cut/Paste without citation	0%	12%	3%	4%	5%
Overall	33%	37%	21%	16%	18%

In terms of volume, results show that during the five-year study period, students cheated on 1-2 exams per year per student using IT. Moreover, students downloaded 0, 7, 4, 5, and 5 papers, respectively, per year from 2020 to 2024. In addition, students cheated on 1, 2, 1, 4, and 2 online exams, respectively, per year from 2020 to 2024. And, students cut and pasted from the Internet on papers with no citation on 0, 1, 1, 3, and 2 papers, respectively, per year from 2020 to 2024.

Finally, Spearman Rho correlation statistics were calculated to determine relationships between study variables and the various unethical behaviors (Table 4). The electronic resources policy had no statistically significant correlations with cheating on exams with IT, downloading papers as one’s own, cheating on online exams, and not citing information. However, gender had a statistically significant correlation with cheating on exams with IT (significant at the .05 level) and a statistically significant correlation with cheating on online exams (significant at the .01 level). In other words, females were more likely to cheat on an exam. In addition, academic class had a statistically significant positive correlation with cheating on online exams (significant at the .05 level). Thus, as academic class increases, students are more likely to cheat on online exams.

**TABLE 4**  
**Spearman Rho Correlations Between Study Variables and Practice**

Variable	Exams cheated using IT	Downloading Papers	Online exams cheated	Cutting and Pasting
The electronic resources policy is an effective deterrent for me	-.065	.144	-.091	-.002
Gender	-.209*	.083	-.266**	.125
Academic class	.070	.043	.232*	-.074

\* Correlation is significant at .05 level (2-tailed).

\*\* Correlation is significant at .01 level (2-tailed).

## CONCLUSIONS AND SUGGESTIONS FOR FUTURE RESEARCH

Results indicate the university electronic resources policy is generally perceived to be neutral (39% to 48% of students) as an effective deterrent both for the student and other students. However, from 2020 to 2024, 35% to 37% of students per year perceived the policy to be a strong or mild deterrent with respect to his/her negative electronic behavior. In addition, a slightly lower percentage of students perceived the policy to be a strong or mild deterrent for other students during each of the study years. This percentage ranged from 29% to 36% per year with the percentage increasing from 31% to 36% from 2020 to 2024.

Relative to the perception of all students’ behavior at the study university, in 2020, students perceived that the most common violation of ethical standards set by the institution were related to homework (36% of students) and exam cheating (31% of students). By 2024, the most common violations were related to Internet projects (26% of students). Overall, cheating on exams decreased from 36% to 15% of students and cheating on exams decreased from 31% to 22% of students.

Moreover, the propensity to commit unethical behavior was not commonly indicated. Only 5% to 10% of respondents per year reported that he/she would lie on a resume or during an interview to get a job and 5% to 9% of respondents per year reported that he/she had visited a web site to learn how to cheat.

Overall, the percentage of students that would exhibit either behavior increased from 11% to 14% of students.

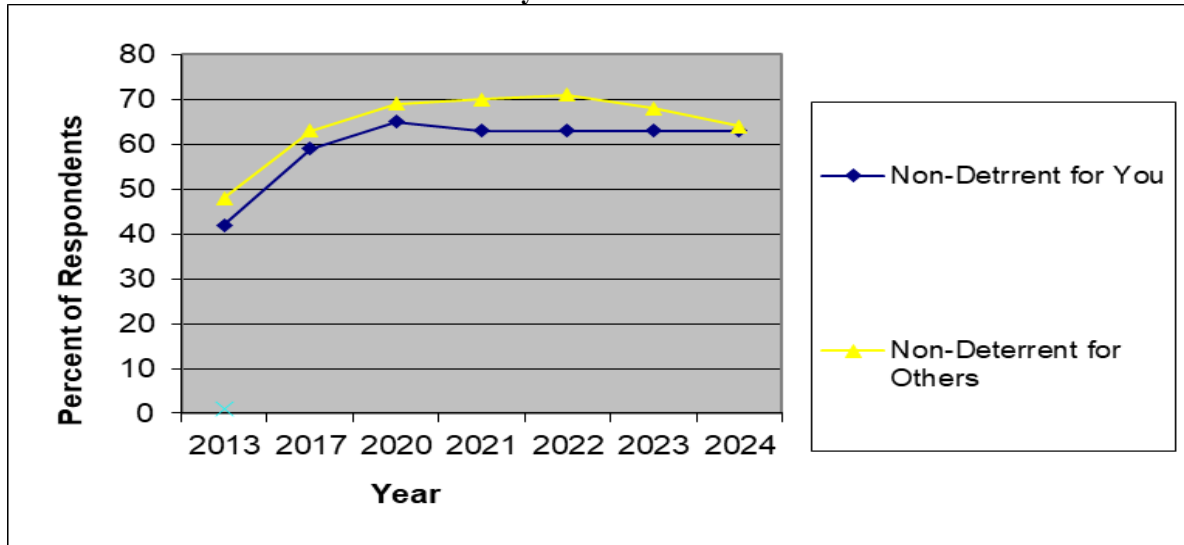
Findings further demonstrate that unethical activity among the student population varies by type of behavior. In 2020, for example, 30% indicated cheating on an exam using IT and 31% indicated cheating on an online exam. In 2024, however, the percentage of students cheating on an exam using IT decreased to 7% and the percentage cheating on online exams decreased to 9%. Moreover, during the study years, 0% to 8% per year downloaded papers as his/her own and 0% to 12% cut/pasted information from the Internet without citing the material. Overall, from 2020 to 2024, the percentage participating in at least one of the unethical behaviors decreased from 33% to 18% of students. The volume per activity per year was relatively low and consistent throughout the study years. For students reporting a given behavior, these students indicated cheating on 1 to 2 exams per year using IT, downloading 0 to 7 papers as his/her own, cheating on 1 to 4 online exams, and submitting 0 to 3 papers containing non-cited information that was cut/pasted from the Internet.

When examining study variables, electronic use policy effectiveness was not statistically significantly correlated with any of the four unethical activities. However, academic class was significantly correlated with cheating on online exams as the volume of violations increased from freshman to senior academic class. In addition, females were significantly correlated with cheating on an exam with IT and cheating on online exams.

There are three important implications from these findings:

1. One implication relates to the pandemic. Pre-pandemic, in 2017, 24% of undergraduates indicated participating in an unethical behavior. During the pandemic (2020-2021), the percentage increased to 33% and 37%. Post-pandemic, the participation percentage dropped dramatically to 21% in 2022 and to 18% in 2024, even lower than the pre-pandemic level. It is possible that after the pandemic, the return to traditional in-class education coupled with less dependence on on-line education has lessened student opportunities for negative behavior. Moreover, it is possible that improved ethical education and/or increased faculty vigilance in guarding against misuse may be factors. The implication is because there will likely be unplanned global events in the future that affect student behavior, educators need to be prepared in advance to implement educational pedagogies and techniques to minimize potential unethical student behavior. This may entail increased ethical emphasis in education, implementation of electronic monitoring tools to evaluate incidences, and preventative techniques such as biometric analysis during exams. The emergence of products such as ChatGPT, however, may further complicate this challenge as these tools provide a new, extensive, and not currently fully understood mechanism for student violation of ethical standards set by an institution. ChatGPT may be particularly challenging in that with 100 million new users within the first two months of implementation, it became the fastest growing computer application in history (IDX, 2023).
2. A second implication is that the electronic resources policy may be becoming a less effective deterrent to unethical student behavior. The percentage of students that perceive the policy is not a deterrent both for him/herself and others has increased steadily. As depicted in Chart 1, while 42% of students indicated that the policy was not a deterrent for him/herself in 2013, 63% indicated non-deterrence in 2024. In addition, while 48% of students indicated that the policy was not a deterrent for others in 2013, 64% indicated non-deterrence in 2014. Of note, is that for every year, students perceive the policy as less of a deterrent for other students. This implies that individuals feel an ethical superiority over others. In either case, these results suggest that improvements still need to be made regarding the ethical use of school electronic resources. It is also possible that ethics education, policy reinforcement, reprimands, enforcement methodologies, or punishments may need to be increased.

**CHART 1**  
**Policy Effectiveness Trends**



- Finally, results suggest that gender is a factor with respect to exam cheating. Females were statistically correlated with cheating on exams using IT and cheating on online exams. It is possible that females rather than males are more forthcoming in admitting violations and/or that females feel more pressure to achieve higher academic exam scores. Results suggest the further need for educational efforts directed at females with respect to IT/online course ethics and possible changes in online pedagogy to minimize the violations.

The limitations of this study are primarily a function of the sample, sample distribution, and type of research. The instrument relies on self-reporting so there could be recency effects and underreporting of activity. Moreover, the research was conducted using a sample from one university. Finally, although academic class was relatively equally distributed, there were less freshmen and seniors surveyed. As a result, replication at multiple universities and the inclusion of more freshmen and seniors would increase the research robustness. Future research needs to examine if these results are indeed trends and if educational efforts can be effectively employed to mitigate negative activities. The study does, however, further clarify the state of Internet ethics and associated pandemic effects upon undergraduate business student attitude and behavior.

## REFERENCES

- Adams, S. (2021). "This \$12 Billion Company Is Getting Rich Off Students Cheating Their Way Through Covid." *Forbes.com*, March 31, <https://www.forbes.com/sites/susanadams/2021/01/28/this-12-billion-company-is-getting-rich-off-students-cheating-their-way-through-covid/?sh=4111d468363f> retrieved on November 6, 2024
- Ahmad, M. B., Hussain, A. and Ahmad F. (2022). "The Use of Social Media at Work Place and its Influence on the Productivity of the Employees in the Era of COVID-19." *SN Business & Economics*, Volume 2, Number. 156, 1-29, <https://doi.org/10.1007/s43546-022-00335-x> retrieved on November 6, 2024
- Cambridge.org. (2024). "Cyberslacking." *Dictionary.cambridge.org*, <https://dictionary.cambridge.org/us/dictionary/english/cyberslacking> retrieved on November 6, 2024
- Case, C. J. and King, D. L. (2002). "Are Student Internet Use Policies Effective?" *Issues in Information Systems*, Volume III, Number1, 76-81.

- Case, C. J. and King, D. L. (2018). "Ethical Attitudes and Behaviors of Undergraduate Business Students: Trends and the Role of the Electronic Resources Policy." *Journal of Business and Behavioral Sciences*, Volume 30. Number 2, 75-88.
- Case, C. J. and King, D. L. (2014). "System Security: A Trend Analysis of Student Electronic Resources Use Policy Perceptions and Risky Behavior." *ASBBS E-Journal*, Volume 10. Number, 1, 31-42.
- Case, C. J. and King, D. L. (2021). "The 2020-2021 Pandemic: Undergraduate Business Student Social Media Use and Trolling Occurrence." *Proceedings of the Institute for Global Business Research International Conference*, Las Vegas, NV, October 20-22, Volume 5, Number 3, 17.
- Cucinotta, D. and Vanelli, M. (2020). "WHO Declares COVID-19 a Pandemic." *Acta Biomed*, Volume 91, Number 1, 157-160, March 19, <https://pubmed.ncbi.nlm.nih.gov/32191675/> retrieved on April 6, 2023
- Dey, S. (2021). "Reports Of Cheating At Colleges Soar During The Pandemic." *Npr.org*, August 27, <https://www.npr.org/2021/08/27/1031255390/reports-of-cheating-at-colleges-soar-during-the-pandemic> retrieved November 7, 2024
- Flack, G. P., Kritzing, E., and Loock, M. (2021). "Improving Compliance with the Acceptable Usage Policy. Informatics and Cybernetics in Intelligent Systems." *Computer Science On-Line Conference 2021. Lecture Notes in Networks and Systems*, Volume 228, 621-635, [https://link.springer.com/chapter/10.1007/978-3-030-77448-6\\_61](https://link.springer.com/chapter/10.1007/978-3-030-77448-6_61) retrieved on November 6, 2024
- IDX.COM (2024). "ChatGPT Is Exciting, But Is It Making Things Easier for Scammers?: *IDX.com*, March 29, [https://www.idx.us/knowledge-center/chatgpt-is-exciting-but-is-it-making-things-easier-for-scammers?utm\\_medium=email&utm\\_source=nurture&utm\\_campaign=N182\\_MembersEngaged90&utm\\_content=article-one](https://www.idx.us/knowledge-center/chatgpt-is-exciting-but-is-it-making-things-easier-for-scammers?utm_medium=email&utm_source=nurture&utm_campaign=N182_MembersEngaged90&utm_content=article-one) retrieved on November 6, 2024
- Liang, J. G., Watson, G. R., Sottile, J., and Behrend, B. A. (2023). "Academic Cheating in Online and Live College Courses during the COVID Pandemic." *Journal of Research in Education*, Volume 32, Number 2, 95-123, <https://eric.ed.gov/?id=EJ1412003> retrieved November 7, 2024
- Mundasad, S. and Roxby, P. (2023). "COVID-19 Global Health Emergency Is Over, WHO Says." *BBC.com*, May 6, <https://www.bbc.com/news/health-65499929> retrieved on December 1, 2024
- Newton, P.M., Essex, K. (2024). "How Common is Cheating in Online Exams and did it Increase During the COVID-19 Pandemic? A Systematic Review." *Journal of Academic Ethics*, Volume 22, 323–343, <https://doi.org/10.1007/s10805-023-09485-5> retrieved November 7, 2024
- Statista.com (2024). "Number of Internet and Social Media Users Worldwide as of October 2024." *Statista.com*. Available: <https://www.statista.com/statistics/617136/digital-population-worldwide/> retrieved on November 6, 2024
- Simanjuntak, E., Nawangsari, N.A. F., and Ardi, R. (2022). "Academic Cyberslacking: Why Do Students Engage in Non-Academic Internet Access During Lectures?" *Psychology Research and Behavior Management*, November, Volume 4, Number 15, 3257-3273, <https://pmc.ncbi.nlm.nih.gov/articles/PMC9642801/> retrieved on November 6, 2024
- Turnitin. (2022). "Student and Faculty Survey: Perceptions of Assessment and Academic Integrity", *Turnitin.com*, June, <https://www.turnitin.com/infographics/insights-survey> retrieved November 7, 2024
- UPenn.edu (2024). "Policy on Acceptable Use of Electronic Resources." *UPenn.edu*, <https://catalog.upenn.edu/pennbook/policy-acceptable-use-electronic-resources/> retrieved November 6, 2024.
- Weidman J, and Grossklags, J. (2019). "The Acceptable State: An Analysis of The Current State of Acceptable Use Policies in Academic Institutions." *Proceedings of the 27th European Conference on Information Systems (ECIS)*, Stockholm & Uppsala, Sweden, June 8-14, 1-16, <https://www.cs.cit.tum.de/fileadmin/w00cfj/ct/papers/2019-ECIS-Weidman.pdf> retrieved November 6, 2024

Case, King and McLanahan

Wiley. (2023). "New Insights Into Academic Integrity: 2022 Update." *Wileyplus.com*,  
May, [https://www.wileyplus.com/wp-content/uploads/2023/05/academic-integrity-infographic-  
Wiley.pdf](https://www.wileyplus.com/wp-content/uploads/2023/05/academic-integrity-infographic-Wiley.pdf) retrieved November 7, 2024

# SHAPING EFFECTIVE LEARNING SPACES: ESSENTIAL DIMENSIONS FOR STUDENT SUCCESS

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## ABSTRACT

Creating an optimal learning environment is imperative for fostering student success in higher education. Emerging from the synthesis of the scholarship of teaching and learning, this research presents the essential dimensions for student success and outlines key attributes that contribute to a thriving academic STUDENT experience: Supportive environment (S), Teaching strategies (T), Understanding and flexibility (U), Dynamic content (D), Encouragement and positive reinforcement (E), Nurturing student-faculty relationships (N), and Timely and clear communication (T). A supportive environment cultivates a sense of belonging and psychological safety, which boosts engagement and academic performance. Diverse and personalized teaching strategies accommodate different learning styles, enhancing comprehension and retention. Understanding and flexibility allow educators to adapt to students' individual circumstances, reducing stress and improving outcomes. Dynamic content, such as multimedia tools and gamified lessons, keeps learning relevant and engaging. Consistent encouragement and positive reinforcement foster motivation and confidence. Nurturing student-faculty relationships build trust and make students more likely to seek help and stay engaged. Finally, timely and clear communication ensures expectations are understood and support is accessible, which strengthens the overall learning experience. Together, these dimensions form a comprehensive approach to student-centered education that promotes both academic achievement and emotional well-being.

**Keywords:** Supportive, Teaching, Understanding, Dynamic, Encouraging, Nurturing, Timely

## INTRODUCTION

At the core of higher education lies the pursuit of an optimal learning environment for the holistic growth of students in academics, emotions, and social behavior (Xu et al., 2022). While institutions are making efforts to improve their academic programs, it is imperative to realize that students have complex needs, including mental and academic needs (Qvortrup & Lykkegaard, 2022). To address these needs, a comprehensive framework is introduced here that draws on evidence-based practices comprised of seven interrelated components organized by the mnemonic S-T-U-D-E-N-T (Supportive environment, Teaching strategies, Understanding and flexibility, Dynamic content, Encouragement and positive reinforcement, Nurturing student-faculty relationships, and Timely communication) (Aljohani, 2016; Engel, 2025; Fong et al., 2017; Parpala et al., 2013; Stone & Springer, 2019; Tinto, 2017; Umbach & Wawrzynski, 2005; Wheeler et al., 2019). This model underscores the importance of building an inclusive, engaging, and flexible classroom environment that meets the diverse needs of students and their learning styles.

An increasing number of research studies show how a positive classroom setting can conclusively impact engagement, retention, and academic progress (Bean, 1980; Murtaugh et al., 1999; Pascarella & Terenzini, 1977; Upcraft & Gardener, 1989). Research has shown that when students feel supported by their faculty and peers, they experience lower levels of stress, increased motivation, and better outcomes (Sahin et al., 2016; Willis et al., 2018). This process consists of adopting various teaching approaches based on students'

different learning styles known to improve retention and boost academic performance (Errabo et al., 2024). In a similar vein, the incorporation of dynamic content (i.e., the use of multimedia and interactive learning activities) has promoted higher levels of participation, satisfaction, and academic performance (Nordmann et al., 2019). All of these factors create a sense of empowerment, motivation, and support for students in their academic environment.

Beyond these precepts, the S-T-U-D-E-N-T framework recommends being flexible to accommodate the students' unique needs and challenges (Schreiner et al., 2018; Schunk et al., 2007). Increased flexibility with deadlines, learning modalities, and accommodations can relieve student stress, increase student retention rates, and contribute to feelings of inclusion and fairness (Ruthig et al., 2009). In addition, timely and unambiguous communication assures clarity and provides regular feedback, increasing the ability for students to get feedback, adjust, and stay engaged throughout the course (Zhan et al., 2024).

This paper composes the S-T-U-D-E-N-T model through a review of the current literature and investigates how each component of it can lead to the best learning experience possible. The framework is designed to offer actionable approaches to strengthening academic performance and creating a more inclusive, vibrant, and healthy learning environment for students, synthesizing advances made in research in this area to help faculty and institutions of higher learning build better systems and resulting outcomes.

## LITERATURE REVIEW

The S-T-U-D-E-N-T framework emerged from the synthesis of several key thematic topics found across the literature. These elements play an important role in establishing an ideal learning environment and boosting student outcomes such as academic achievement, engagement, retention, and mental health.

### **Supportive Environment (S)**

Having a supportive classroom environment is one of the essential factors contributing to the enhancement of student engagement and academic performance. When students view their classroom climate as welcoming, research consistently shows that they have greater motivation and academic achievement. Students who learn in a more supportive environment were likelier to be engaged and earn better grades than their counterparts in non-supportive environments. Furthermore, a social classroom environment has a considerable effect on academic stress and anxiety (Wang & Degol, 2016). Feeling supported by faculty and peers made students experience less stress coupled with an increase in academic performance and retention rates (Barbayannis et al., 2022; Korpershoek, 2020). This research offers that supportive environments are important in promoting not just academic achievement but also psychological well-being among students throughout their entire educational experience.

### **Teaching Strategies (T)**

One of the key factors in improving student engagement and academic performance is the use of teaching strategies that address the varying learning styles of students. Research on differentiated instruction, or how teaching evolves to reach the needs of different types of learning, has also emerged in educational research. Students provided with differentiated instruction performed better academically than those who receive a more one-size-fits-all approach (Deunk et al., 2018). Relatedly, classes that adopted a more varied teaching strategy had a higher retention rates, consistent with the perspective on learning that personalized instructional approaches may not only improve learning outcomes but also lead to greater persistence (Tomlinson et al., 2003). These implications suggest that flexibility and adaptability in teaching are necessary not only to meet the diverse needs of students but also to promote a more successful and engaging learning experience.

### **Understanding and Flexibility (U)**

A supportive learning environment that allows for adaptation is essential to meeting the needs of students as they progress. Students have different learning styles that range from auditory to visual to kinesthetic and tactile (VARK model), and these educational preferences can influence how engaged students become in their learning and how much (and how well) they retain the material (Fleming, 2001; Oxford et al., 1991). Institutions that prioritize a flexible pedagogical approach, incorporating adaptive technology, differentiated learning, and collaborative learning, will equip students with the skills they need to succeed (Kilbane & Milman, 2014).

Research suggests that students are more likely to be motivated and succeed academically when they perceive their learning environment as accommodating and supportive (Rusticus et al., 2023). An insightful and flexible learning environment not only positively contributes to students' learning performance but also enhances their mental well-being. Research has discovered evidence of students' persistence in answering academic and personal challenges when they were understood and supported in their learning environments (Cayubit, 2022). If students feel that they are part of the university community, they build resiliency to meet challenges and have a more positive attitude towards their studies. By offering flexibility in assessment, students can illustrate their knowledge in more than one way, leading to a better understanding of the content and increased self-efficacy. A comprehensive method of learning enhances academic success and long-term student engagement and satisfaction.

The need for differentiation in higher education has been increasingly gaining attention based on the recognition of students with a broad range of needs and expectations. Institutions of higher learning are working on strategies to make their spaces suitable for a variety of learners, and the need for flexible instructional strategies has become apparent. Studies indicate that alternative methods of teaching, like the use of customized tools and flexible deadlines, support improved academic performance and greater student engagement (du Plooy et al., 2024). Flexible environments recognize that students have different preferences for learning and may have challenges outside of the classroom, providing individualized support that can improve outcomes.

This curriculum change continues to shift our learning paradigm, encouraging students to learn at their own pace and succeed based on their individual needs, which fosters a culture of student ownership over learning. Research highlights that these pedagogical methods enable students to better engage with the material in a way that is natural to them, thereby improving academic outcomes (Li & Xue, 2023). Creating a flexible learning environment cannot be a top-down mandate, but one involving faculty in creating inclusive practices to be implemented across the institution over the long run. Since faculty are the primary drivers of learning, their use of a variety of pedagogical practices – from flipped classrooms to blended learning – is crucial to increased flexibility. Students have long established that flexible teaching practices and accommodations lead to better grades and higher retention. Students in flexible learning settings, where teachers tailored class pacing and deadlines to individual needs, achieved higher grades than those in more rigid ones. Additionally, when accommodations are made and instructional methods adapted, student engagement increased and completion rates improved (Walkington, 2013). Data has shown a consistent theme of flexibility driving student success and allowing them to learn at their own pace while getting the support they need.

### **Dynamic Content (D)**

Dynamic content fitted to the students is key to retaining their attention and improving their learning outcomes. It has been shown that using interactive and multimedia resources in the curriculum can expand student engagement, satisfaction, and academic achievement. Students performed better in tests when they

- Biasin, E., & Kamenjasevic, E. (2021). Cybersecurity of medical devices: New challenges arising from the AI Act and NIS 2 Directive proposals. *International Cybersecurity Law Review*.  
<https://ssrn.com/abstract=4101190>
- Bouderhem, R. (2024). Shaping the future of AI in healthcare through ethics and governance. *Humanities and Social Sciences Communications*, 11(1), 1–12.  
[https://www.researchgate.net/publication/378997279\\_Shaping\\_the\\_future\\_of\\_AI\\_in\\_healthcare\\_through\\_ethics\\_and\\_governance](https://www.researchgate.net/publication/378997279_Shaping_the_future_of_AI_in_healthcare_through_ethics_and_governance)
- Brooke, J. (1996). SUS: A "quick and dirty" usability scale. In P. W. Jordan, B. Thomas, B. A. Weerdmeester, & A. L. McClelland (Eds.), *Usability Evaluation in Industry*.  
[https://www.researchgate.net/publication/319394819\\_SUS\\_-\\_a\\_quick\\_and\\_dirty\\_usability\\_scale](https://www.researchgate.net/publication/319394819_SUS_-_a_quick_and_dirty_usability_scale)
- Char, D. S., Shah, N. H., & Magnus, D. (2018). Implementing machine learning in health care—Addressing ethical challenges. *New England Journal of Medicine*, 378(11), 981–983.  
<https://doi.org/10.1056/NEJMp1714229>
- Chartrand, G., Cheng, P. M., Vorontsov, E., et al. (2017). Deep learning: A primer for radiologists. *RadioGraphics*, 37(7), 2113–2131. <https://doi.org/10.1148/rg.2017170077>
- Chen, Y., Argentinis, E., & Weber, G. (2016). IBM Watson: How cognitive computing can be applied to big data challenges in life sciences research. *Clinical Therapeutics*, 38(4), 688–701.  
<https://pubmed.ncbi.nlm.nih.gov/27130797/>
- Ching, T., Himmelstein, D. S., Beaulieu-Jones, B. K., et al. (2018). Opportunities and obstacles for deep learning in biology and medicine. *Journal of the Royal Society Interface*, 15(141), 20170387.  
<https://doi.org/10.1098/rsif.2017.0387>
- Dimitrov, D. V. (2016). Medical Internet of Things and big data in health care. *Healthcare Informatics Research*, 22(3), 156–163. <https://doi.org/10.4258/hir.2016.22.3.156>
- Eccles, R. G., & Vogel, M. (2022, January 5). Board responsibility for artificial intelligence oversight. *Harvard Law School Forum on Corporate Governance*.  
<https://corpgov.law.harvard.edu/2022/01/05/board-responsibility-for-artificial-intelligence-oversight/>
- Fetters, M. D., Curry, L. A., & Creswell, J. W. (2013). Achieving integration in mixed methods designs—Principles and practices. *Health Services Research*, 48(6pt2), 2134–2156.  
<https://doi.org/10.1111/1475-6773.12117>
- Fogel, A. L., & Kvedar, J. C. (2018). Artificial intelligence powers digital medicine. *NPJ Digital Medicine*, 1(1), 5. <https://pubmed.ncbi.nlm.nih.gov/31304291/>
- Forrester, C. (2020). Benefits of prior authorizations. *Journal of Managed Care & Specialty Pharmacy*, 26(7), 820–821. <https://doi.org/10.18553/jmcp.2020.26.7.820>
- Ganadily, N. A., & Xia, H. J. (2024). Privacy preserving machine learning for electronic health records using federated learning and differential privacy. *ArXiv*. <https://arxiv.org/abs/2406.15962>
- Gupta, R., Fein, J., Newhouse, J. P., Schwartz, A. L., et al. (2024). Comparison of prior authorization across insurers: Cross sectional evidence from Medicare Advantage. *BMJ*, 384, e077797.  
<https://doi.org/10.1136/bmj-2023-077797>
- He, J., Baxter, S. L., Xu, J., et al. (2019). The practical implementation of artificial intelligence technologies in medicine. *Nature Medicine*, 25, 30–36. <https://doi.org/10.1038/s41591-018-0307-0>
- Henry, T. A. (2024, July 18). Exhausted by prior auth, many patients abandon care: AMA survey. *American Medical Association*. <https://www.ama-assn.org/practice-management/prior-authorization/exhausted-prior-auth-many-patients-abandon-care-ama-survey>
- Jeyaraman, M., Balaji, S., Jeyaraman, N., & Yadav, S. (2023). Unraveling the ethical enigma: Artificial intelligence in healthcare. *Cureus*, 15(8). <https://pubmed.ncbi.nlm.nih.gov/37692617/>
- Kannarkat, J. T., Warring, W., & Brennan, T. (2024, June 7). Advancing interoperability and prior authorization reform. *JAMA Health Forum*. <https://jamanetwork.com/journals/jama-health-forum/fullarticle/2819497>

- Kinney, M., Anastasiadou, M., Naranjo-Zolotov, M., & Santos, V. (2024). Expectation management in AI: A framework for understanding stakeholder trust and acceptance of artificial intelligence systems. *Heliyon*, *10*(7), e28562. <https://doi.org/10.1016/j.heliyon.2024.e28562>
- Lenert, L. A., Lane, S., & Wehbe, R. (2023). Could an artificial intelligence approach to prior authorization be more human? *Journal of the American Medical Informatics Association*, *30*(5), 989–994. <https://europepmc.org/article/pmc/pmc10114030>
- Miotto, R., Li, L., Kidd, B. A., & Dudley, J. T. (2017). Deep learning for healthcare: Review, opportunities and challenges. *Briefings in Bioinformatics*, *19*(6), 1236–1246. <https://doi.org/10.1093/bib/bbx044>
- Mennella, C., Maniscalco, U., De Pietro, G., & Esposito, M. (2024). Ethical and regulatory challenges of AI technologies in healthcare: A narrative review. *Heliyon*, *10*(4), Article e?. <https://pubmed.ncbi.nlm.nih.gov/38384518/>
- Mitchell, P. H. (2004). Journal of Medical Internet Research (JMIR). *Journal of the Medical Library Association*, *92*(4), 510. <https://pubmed.ncbi.nlm.nih.gov/articles/PMC521530/>
- Mitra, G., Hallajiyani, M., Kim, I., Dharmalingam, A. P., Elnawawy, M., Iqbal, S., Pattabiraman, K., & Alemzadeh, H. (2025). Systems-theoretic and data-driven security analysis in ML-enabled medical devices. *ArXiv*. <https://arxiv.org/abs/2506.15028>
- Mosaiyebzadeh, F., Pouriyeh, S., Parizi, R. M., Sheng, Q. Z., Han, M., Zhao, L., Sannino, G., & Batista, D. M. (2023). Privacy-enhancing technologies in federated learning for the Internet of Healthcare Things: A survey. *ArXiv*. <https://arxiv.org/abs/2303.14544>
- Murdoch, B. (2021). Privacy and artificial intelligence: Challenges for protecting health information in a new era. *BMC Medical Ethics*, *22*, 122. <https://doi.org/10.1186/s12910-021-00687-3>
- Nazer, L. H., Zatarah, R., Waldrip, S., et al. (2023). Bias in artificial intelligence algorithms and recommendations for mitigation. *PLOS Digital Health*, *2*(6). <https://pubmed.ncbi.nlm.nih.gov/37347721/>
- Obermeyer, Z., & Emanuel, E. J. (2016). Predicting the future—Big data, machine learning, and clinical medicine. *The New England Journal of Medicine*, *375*(13), 1216–1219. <https://doi.org/10.1056/NEJMp1606181>
- Patel, R. S., Bachu, R., Adikey, A., Malik, M., & Shah, M. (2019). Factors related to physician burnout and its consequences: A review. *Behavioral Sciences*, *8*(11), 98. <https://doi.org/10.3390/bs8110098>
- Rajkomar, A., Dean, J., & Kohane, I. S. (2019). Machine learning in medicine. *The New England Journal of Medicine*, *380*(14), 1347–1359. <https://doi.org/10.1056/NEJMr1814259>
- Reddy, J., Elsayed, N., ElSayed, Z., & Ozer, M. (2021). Data breaches in healthcare security systems. *ArXiv*. <https://arxiv.org/abs/2111.00582>
- Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). Free Press. [https://www.researchgate.net/publication/257624104\\_Diffusion\\_of\\_Innovations\\_5th\\_edition\\_Everett\\_M\\_Rogers\\_Free\\_Press\\_New\\_York\\_NY\\_2003\\_551\\_pages](https://www.researchgate.net/publication/257624104_Diffusion_of_Innovations_5th_edition_Everett_M_Rogers_Free_Press_New_York_NY_2003_551_pages)
- Salzbrenner, S., Lydiatt, M., Holding, B., et al. (2023). Influence of prior authorization requirements on provider clinical decision-making. *The American Journal of Managed Care*. <https://www.ajmc.com/view/influence-of-prior-authorization-requirements-on-provider-clinical-decision-making>
- Scheibner, J., Raisaro, J. L., Troncoso-Pastoriza, J. R., Ienca, M., Fellay, J., Vayena, E., & Hubaux, J. P. (2021). Revolutionizing medical data sharing using advanced privacy-enhancing technologies: Technical, legal, and ethical synthesis. *Journal of Medical Internet Research*, *23*(2), e25120. <https://doi.org/10.2196/25120>
- Schwartz, A. L., Brennan, T. A., Verbrugge, D. J., & Newhouse, J. P. (2021). Measuring the scope of prior authorization policies: Applying private insurer rules to Medicare Part B. *JAMA Health Forum*, *2*(5), e210859. <https://doi.org/10.1001/jamahealthforum.2021.0859>

- Seh, A. H., Zarour, M., Alenezi, M., Sarkar, A. K., Agrawal, A., Kumar, R., & Khan, R. A. (2020). Healthcare data breaches: Insights and implications. *Healthcare*, 8(2), 133. <https://doi.org/10.3390/healthcare8020133>
- Shortliffe, E. H., Cimino, J. J., & Chiang, M. F. (Eds.). (2021). *Biomedical informatics: Computer applications in health care and biomedicine* (5th ed.). Springer. <https://doi.org/10.1007/978-3-030-58721-5>
- Topol, E. J. (2019). *Deep medicine: How artificial intelligence can make healthcare human again*. Basic Books. [https://catalog.nlm.nih.gov/discovery/fulldisplay/alma9917337203406676/01NLM\\_INST:01NLM\\_INST](https://catalog.nlm.nih.gov/discovery/fulldisplay/alma9917337203406676/01NLM_INST:01NLM_INST)
- Yang, E., & Yang, S. (2020). Prior authorization: Overwhelming burden and critical need for reform. *JACC: Case Reports*, 2(10), 1466–1469. <https://pmc.ncbi.nlm.nih.gov/articles/PMC8302155/>
- Yang, W., Wang, S., Wu, D., Liu, Y., & Zhang, Y. (2025). Deep learning model inversion attacks and defenses: A comprehensive survey. *Artificial Intelligence Review*, 58(242). <https://doi.org/10.1007/s10462-025-11248-0>
- Yu, K. H., Beam, A. L., & Kohane, I. S. (2018). Artificial intelligence in healthcare. *Nature Biomedical Engineering*, 2(10), 719–731. <https://doi.org/10.1038/s41551-018-0305-z>

engaged with courses that incorporated dynamic content, including exercises like solving real-world problems and multimedia presentations (Li et al., 2024). Furthermore, adding gamification and interactive simulations increased student engagement with course materials (Smiderle et al., 2020). These results are consistent with an increasing body of research indicating that dynamic content heightens academic performance while producing a livelier and more interactive classroom that improves the overall student learning experience.

### **Encouragement and Positive Reinforcement (E)**

In the literature, the effect of encouragement and positive reinforcement on student motivation and engagement has been well-documented. Research indicates that students are more likely to participate with the course materials and succeed academically when they receive consistent and constructive feedback, as well as the validation in their efforts (Williams, 2024).

*Positive Reinforcement.* Positive reinforcement refers to providing a reward stimulus after a desired behavior is exhibited, making the behavior more likely to happen in the future. In parallel, students who received regular encouragement showed higher levels of participation and intrinsic motivation. (Stone & Springer, 2019). These findings exhibit the need to create supportive and rewarding learning environments that contribute to greater student engagement and outcomes.

### **Nurturing Student-Faculty Relationships (N)**

The approach with the strongest evidence in the literature relates to fostering high-quality interactions between faculty and students, which has been shown to increase student satisfaction, engagement, and academic performance. Indeed, research shows that students perform better and stay engaged in their courses when they feel supported by the faculty. Students who had strong supportive relationships with faculty achieved higher GPAs than those with weaker relationships (Guzzardo et al., 2020). These findings showcase how faculty-student relationships can create a supportive learning environment while further enhancing student outcomes.

### **Timely and Clear Communication (T)**

Feedback, especially when it is clear and timely, helps students identify where they excelled and what they should work on, improving performance. Students who receive timely feedback saw an improvement in academic performance, leading to earlier identification of learning gaps and implementation of corrective measures (Hattie & Timperley, 2007). Research explained that clear communication can significantly lower student anxiety, with a decrease in stress and an increase in retention (England et al., 2019). These outcomes indicate that communication enhances academic performance and lowers stress, creating a better and more conducive learning atmosphere.

Research consistently demonstrates the positive effects of the S-T-U-D-E-N-T factors on student engagement, academic performance, psychological well-being, and retention. Yet, they inform through the lens of individual studies but highlight a lack of research investigating how these elements interact under one systemic lens. Nevertheless, the existing body of literature highlights various domains and emphasizes their cumulative effects across distinct student populations. As the following discussion will demonstrate, these insights can be put to use in productive educational contexts to improve the student experience, particularly in regard to business education.

## DISCUSSION

The fast-paced nature of business classes, along with challenging concepts and high stakes assessment, make it essential to create a supportive classroom environment conducive to engagement and achievement. The framework's *Supportive Environment* dimension is especially critical in business course to minimize anxiety and motivate students to confidently engage with tough material.

### **Supportive Environment (S)**

Business faculty can do this by giving timely feedback, helping peers work together, and creating an environment where students are not afraid to share different opinions. Encouraging a supportive business classroom promotes student engagement, motivation, and improved performance (Korpershoek et al., 2020). Business educators who use these kinds of practices will find that student retention and satisfaction improve, two vital ingredients in any successful business education program.

Strategies to encourage a supportive learning environment include promoting reflection and self-assessment among students. Set clear expectations, course objectives, grading criteria, and behavioral expectations from the first day of class, starting with the course syllabus. This transparency helps students understand what is required of them (Wheeler et al., 2019). Another way to be supportive is to acknowledge and celebrate student achievements, both big and small. Recognition can improve morale and motivate students to continue to strive for success.

Faculty must also establish ground rules for respectful discourse and ensure that students feel safe to express their opinions and ideas without fear of judgment. Any instances of bullying or discrimination must be addressed immediately. Inclusivity should be fostered and celebrated in the classroom. Inclusive language should be used, with materials that reflect diverse perspectives, which can create a space where all students feel valued and respected.

A supportive approach to the student learning environment is related to faculty availability. Faculty should make themselves available and accessible to students outside of class. Being approachable helps students feel comfortable seeking help or discussing challenges they are facing.

Faculty should also be aware of the mental health challenges that students might be dealing with; resources should be provided for counseling and stress management services to create an environment that promotes mental health and well-being (Goel et al., 2024).

### **Teaching Strategies (T)**

The second pillar, "Teaching Strategies," provides a guide for business educators in addressing diverse student needs. Differentiated methods of teaching, including project-based learning, flipped classrooms, and case studies, work especially well in business disciplines where they need practical application. The S-T-U-D-E-N-T model paves a solid foundation for diversified modes of teaching to address specific learning objectives that can affect student performance in business courses. Business faculty who adopt differential instruction by means of case research, simulations, or experiential-based learning will ultimately create extra compelling paths for students with various learning preferences. Research demonstrates that business courses using diverse teaching methods lead to an increase in test scores and a higher critical learning experience (Nold, 2019).

Several strategies to promote differentiated teaching strategies to address the diverse needs of students and enhance student retention, flexibility, and support. For one, faculty can assess student readiness and interests by determining their prior knowledge, skills, and interests through surveys and diagnostic

assessments. The results can be used to tailor teaching strategies and instructional materials to better meet the needs of each unique class of students.

Faculty can also offer multiple learning pathways by providing students with various options to engage with the material. This could include traditional lectures, online resources, case studies, simulations, and hands-on projects, allowing students to choose the format that works best for them. Another method is to use flexible grouping strategies, allowing students to work with peers of varying abilities and backgrounds, fostering collaboration and peer learning (Boticki et al., 2011; Hoffman, 2002). Further, faculty can create a ‘choice board’ to outline different activities or projects related to the course content. Students can select the tasks that interest them the most, promoting engagement and ownership of their learning.

Faculty should offer scaffolded learning to help students gradually build their skills. This could include guided notes, templates for assignments, or step-by-step instructions for complex tasks. A peer teaching strategy could be considered to encourage students to teach one another by facilitating peer-led study groups or presentations. This not only reinforces their understanding but also fosters a sense of community and collaboration (Hogan & Pressley, 1997). Regularly seeking feedback from students about their learning experiences and preferences should be used to adjust teaching strategies and to show students that their voices matter.

### **Understanding and Flexibility (U)**

The “Understanding and Flexibility” element in business classrooms is integral for academic and student retention. Business needs flexibility in order to respond to students juggling internships, athletics, part-time jobs, and academics. Some studies highlighted that flexibility in deadlines, personalization in feedback, and adaptability in summative or formative assessments allow students to manage their academic and work-life balance. Other research studies indicate that students perceive their professors to be more forgiving and accommodating than ever and that those perceptions of accommodation lead to higher academic performance and course completion rates (Buskirk-Cohen & Plants, 2019). Business educators who are flexible, be it online learning, different schedules, or individualized support options, will create an environment that drives long-term student engagement and success and better results during and post-education.

Recognizing that students have different learning preferences, faculty could offer a variety of resources, such as videos, readings, podcasts, and interactive tools. Faculty can model flexibility in teaching by sharing their experiences of adapting to challenges and learning from them. This can encourage students to adopt a similar mindset when facing obstacles. Faculty can also foster a growth mindset, encouraging students to view challenges as opportunities (Ma et al., 2024). Sharing stories of business successes and setbacks emphasizes the importance of resiliency and adaptability in the business world, which can translate to the classroom. Faculty should promote a work-life balance, acknowledging the challenges that students face outside of the classroom and encouraging students to prioritize their well-being. Faculty can provide time management guidance and campus-related resources to manage stress.

### **Dynamic Content (D)**

Adopting dynamic content in a business course can meaningfully enhance student engagement and learning by making the material more relevant and interactive (Huo et al., 2022). Several strategies faculty can use to implement dynamic content effectively include real-time data, multimedia resources, student-generated content, hosting guest speakers and panels, virtual and augmented reality and artificial intelligence, and regularly updated course materials. Real-time data references current business news, trends, and financial reports as case studies or discussion points in class. This approach allows students to analyze and apply theoretical concepts to real-world situations.

Multimedia resources, including videos, podcasts, and infographics to present complex information in various formats, enable different learning styles to engage with the content in profound ways (Saini & Baba, 2024). Students can generate their own content using blogs, podcasts, or videos to promote creativity and encourage learning. Inviting industry professionals to speak about current trends and challenges in the business world as guest speakers or panelists provides students with firsthand insights and to connect theory with practice. Immersing students with virtual reality (VR), augmented reality (AR), or artificial intelligence (AI) can simulate business environments and enhance understanding and retention of complex concepts (Moteljek & Alpay, 2023). Faculty should also continuously review and refresh course content to reflect the latest research, trends, and technologies in the business field (Yilmaz et al., 2020). This ensures that students are learning the most relevant and applicable information.

### **Encouragement and Positive Reinforcement (E)**

Being approachable, encouraging, and positive can significantly impact student motivation, engagement, and the learning experience. Faculty can do this in a number of ways. For one, faculty can celebrate achievements, acknowledging both big and small, whether it is a high average on an exam or the successful completion of a complex project. Secondly, faculty should adopt positive speaking, using language that is mindfully affirming, helpful, and inclusive (Alteneiji et al., 2023). Faculty can also engage in active listening, validating students' feelings and thoughts when they express concerns or ideas, and responding thoughtfully to show that their input is valued. Faculty body language in the classroom is a motivator. A smile, eye contact, and an inviting posture can make a significant difference in how students perceive faculty support (Bambaeeroo & Shokrpour, 2017).

Faculty can share success stories of alumni or industry professionals to inspire students about their career paths. This can encourage students to visualize their future and motivate them to work toward their goals. Faculty can facilitate networking opportunities with professionals in the business arena to build confidence. Faculty enthusiasm and positivity for teaching can be contagious. Faculty attitude, showing excitement for the course material, and students' successes can significantly influence motivation for learning (Benjelloun, 2009).

### **Nurturing Student-Faculty Relationships (N)**

To nurture student-faculty relationships, faculty must take the lead by learning students' names, interests, and career aspirations, personalizing their interactions to show they are valued and promote a sense of belonging. A welcoming faculty demeanor can help students feel comfortable reaching out for support (Stout & Wygal, 2010). Faculty can mentor students, provide guidance on academic and career decisions, offer to review resumes, conduct mock interviews, or connect them with industry professionals. Faculty members being present and engaged and showing passion for the subject matter can help students connect on a deeper level (Demir et al., 2019). Faculty can extend opportunities for students to conduct research or work on other initiatives. Collaborative research can strengthen relationships and provide students with valuable experiences.

Faculty can provide a clear pathway for students to succeed in the course, including study tips, resources, and strategies for managing their time effectively. Faculty should be mindful and considerate of students' workloads and avoid overwhelming them with assignments (Stevens, 2018). Discussing the rationale behind assignments can help students understand their importance without feeling stressed about them. Faculty can organize field trips or site visits to strengthen student relationships. When appropriate, humor can be used to lighten the mood and create a relaxed learning environment, breaking down barriers and making the faculty more relatable (Benjelloun, 2009).

### **Timely and Clear Communication (T)**

Promoting timely and clear communication is essential for fostering a positive learning environment (Marks et al., 2016). Several effective strategies include setting communication guidelines, regular announcements, use of a course calendar, encouraging questions, providing prompt feedback, hosting question-and-answer sessions, and being approachable (Leeds et al., 2013). The syllabus can set the communication tone with guidelines regarding expected response times to emails. For example, faculty might commit to responding within 24 hours during weekdays, which sets clear expectations. Regular announcements, emails, or learning management system notices to share important updates, reminders, and deadlines can help keep students informed. A course calendar, including important dates such as assignment due dates, class activities, and exam schedules, maintains a clear and accessible plan for students to stay organized (Goeddeke & Taschner, 2023; Karpen et al., 2023).

Faculty who encourage questions and foster an environment where students feel comfortable asking them demonstrate an investment in and consideration of the student experience (Fong et al., 2017; Richmond et al., 2016). To that end, faculty can hold regular question-and-answer sessions (in-person or online) where students can ask questions about course materials, assignments, career planning, or any concerns they may have (Dingel & Puntti, 2023). This can be especially helpful before major assessments. Being approachable and using a friendly, positive tone in communications with students will encourage student engagement (Zinger et al., 2024).

As supported by research and practice-based guidance, the S-T-U-D-E-N-T framework promotes a positive student learning environment essential for fostering engagement, motivation, and academic success. Prioritizing open communication, active learning strategies, and a supportive, positive learning climate where students feel valued and empowered enhances individual student learning outcomes and cultivates a vibrant, collaborative classroom community.

### **FUTURE RESEARCH DIRECTIONS**

Future research on the S-T-U-D-E-N-T paradigm will delve more deeply into some of the specific mechanisms through which individual factors affect student outcomes. Though the existing literature offers compelling evidence for the benefits of a positive classroom environment, differentiated teaching strategies, flexibility, and clear communication, there is limited understanding of how these factors intersect in practice.

Longitudinal studies should be pursued to follow the long-term effects these aspects have on students' academic achievement, mental health, and employment prospects after graduation. Comparative studies across different institutional contexts (e.g., public vs. private colleges, urban vs. rural) hold promise to identify whether the framework's components have universal relevance or if adaptations are needed to specific educational settings.

A further avenue for exploration is the design of professional development programs that encourage faculty to effectively implement the S-T-U-D-E-N-T framework. Insights into how faculty training and types of institutional support structures impact the implementation of these techniques might make similar instructional interventions more scalable and sustained. Exploring these open gaps will help advance the current literature and enable educators to sharpen their skills for designing student learning environments that are more engaging, inclusive, and supportive.

## RESEARCH LIMITATIONS

The S-T-U-D-E-N-T framework provides a broad approach to identifying the relationships between the key factors involved in determining student success, but research on the various domains remains limited. For one, much of the research examining these themes is cross-sectional, which precludes causal conclusions about the links between the elements of the framework and student success. Longitudinal studies are needed to establish how factors such as these contribute to student outcomes over time and at different points in their educational process.

The second limitation lies in the diversity of research settings. A number of studies use data from certain kinds of institutions, such as large public universities, may not be representative of the full range of educational contexts. Not all research is directly transferable to these settings; studies conducted in private universities or community colleges have often not been relevant, nor has the learning of students in more formalized learning environments, for example, in online contexts. Exploring a wider variety of institutional contexts would allow for a greater understanding of whether the framework's features are immutable or require modification for various student groups and educational contexts.

Third, the dependence on self-reported data in many studies is an innate source of bias. Self-reporting can skew results and lessen the reliability of the results. Objective measures should be included in future studies (e.g., academic performance data, institutional records, and behavioral observations) to better capture an accurate and holistic understanding of the framework's effectiveness. Such improvements would enhance the validity of the findings and give a more nuanced understanding of the factors facilitating student success.

## CONCLUSION

S-T-U-D-E-N-T is comprised of the most essential elements of an optimal learning experience. Each theme (Supportive environment, Teaching strategies, Understanding and flexibility, Dynamic content, Encouragement and positive reinforcement, Nurturing student-faculty relationships, and Timely and clear communication) is a prerequisite for promoting student success. Collectively, these themes present a multilevel framework to improve engagement, retention, and academic accomplishment. Ultimately, the S-T-U-D-E-N-T approach is more holistic in improving student learning outcomes across the higher education sector, with a particular focus on business courses. With accommodating environments, multifaceted teaching methods, adaptability, and clear lines of communication, faculty can form inclusive, stimulating learning environments that promote both academic success and well-being. By providing hands-on learning and real-world context, business education can implement this model as a way to increase emotional engagement and retention, making students more prepared to succeed after graduation.

With ongoing research, delving into the interplay of these components and their sustained impact will further enhance the model's precision, confirming its relevance for a wide array of educational environments. In conclusion, the S-T-U-D-E-N-T framework provides a practical guide for educators seeking to implement a student-centered approach to learning that is relevant to the needs and challenges of today's students. Further research will be important to understand how these components can be sequenced and sustained in order to optimize student outcomes across different areas of study and educational contexts.

## REFERENCES

Aljohani, O. (2016). A comprehensive review of the major studies and theoretical models of student retention in higher education. *Higher Education Studies*, 6(2), 1-18.

- Alteneiji, S., Alshahari, N. M., AbouSamra, R. M., & Houjeir, R. (2023). Happiness and positivity in the higher education context: An empirical study. *International Journal of Educational Management*, 37(1), 207-224.
- Bambaeeroo, F., & Shokrpour, N. (2017). The impact of the teachers' non-verbal communication on success in teaching. *Journal of Advances in Medical Education and Professionalism*, 5(2), 51-59.
- Barbayannis, G., Bandari, M., Zheng, X., Baquerizo, H., Pecor, K. W., & Ming, X. (2022). Academic stress and mental well-being in college students: Correlations, affected groups, and COVID-19. *Frontiers in Psychology*, 13(886344), 1-10.
- Bean J. P. (1980) Dropouts and turnover: The synthesis and test of a causal model of student attrition. *Research in Higher Education*, 12(2), 155–187.
- Benjelloun, H. (2009). An empirical investigation of the use of humor in university classrooms. *Education, Business and Society*, 2(4), 312-322.
- Boticki I., Looi, C. K., & Wong, L. H. (2011). Supporting mobile collaborative activities through scaffolded flexible grouping. *Educational Technology & Society*, 14(3), 190-202.
- Buskirk-Cohen, A. A. & Plants, A., (2019). Caring about success: Students' perceptions of professors' caring matter more than grit. *International Journal of Teaching and Learning in Higher Education*, 31(1), 108-114.
- Cayubit, R. F. O. (2022). Why learning environment matters? An analysis on how the learning environment influences the academic motivation, learning strategies and engagement of college students. *Learning Environments Research*, 25(2), 581-599.
- Demir, M., Burton, S., & Dunbar, N. (2019). Professor-student rapport and perceived autonomy support as predictors of course and student outcomes. *Teaching of Psychology*, 46(1), 22-33.
- Deunk M. I., Smale-Jacobse A. E., de Boer H., Doolaard S., Bosker R. J. (2018). Effective differentiation practices: A systematic review and meta-analysis of studies on the cognitive effects of differentiation practices in primary education. *Educ. Res. Rev.* 24, 31–54.
- Dingel, M., & Puntì, G. (2023). Building student-faculty relationships in higher education. *Mentoring & Tutoring*, 31(1), 61-82.
- du Plooy, E., Casteleijn, D., & Franzsen, D. (2024). Personalized adaptive learning in higher education: A scoping review of key characteristics and impact on academic performance and engagement. *Heliyon*, 10(21), 1-24.
- England, B. J., Brigati, J. R., Schussler, E. E., & Chen, M. M. (2019). Student anxiety and perception of difficulty impact performance and persistence in introductory biology courses. *CBE Life Sciences Education*, 18(2). <https://doi.org/10.1187/cbe.17-12-0284>
- Engle, H. (2025). Institutional profiling for educational development: Identifying which conditions for student success to address in a given educational setting – A case study. *Journal of College Student Retention: Research, Theory & Practice*, 26(4), 1100-1122.
- Errabo, D. D., Dela Rose, A., & Gonzales, L. J. M. (2024). Optimizing differentiated podcasts to promote students' self-regulation and engagement, self-efficacy and performance in asynchronous learning. *Journal of Research in Innovative Teaching & Learning*, 17(2), 368-390.
- Fleming, N. D. (2001). *Teaching and learning styles: VARK strategies*. N. D. Fleming.
- Fong, C. J., Davis, C. W., & Kim, Y. (2017). Psychosocial factors and community college student success: A meta-analytic investigation. *Review of Educational Research*, 87(2), 388-424.
- Goeddeke, A., & Taschner, A. (2023). Are students barking up the wrong tree? A causal model of factors driving student-faculty interactions. *Assessment and Evaluation in Higher Education*, 48(4), 566-580.
- Goel, A., Rubbia, A., Upsher, R., Padickaparambil, S., Byrom, N., & Ramachandran, S. (2024). How the faculty across higher education institutes are facilitated to develop skills on student mental health and well-being? A scoping review. *Perspectives: Policy and Practice in Higher Education*, 2024(8), 1-13.
- Guzzardo, M. T., Khosla, N., Adams, A. L., Bussmann, J. D., Engelman, A., Ingraham, N., Gamba, R., Jones-Bey, A., Moore, M. D., Toosi, N. R., & Taylor, S. (2020). The ones that care make all the

- difference: Perspectives on student-faculty relationships. *Innovative Higher Education*, 46(1), 41-58.
- Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, 77(1), 81-112.
- Hoffman, J. (2002). Flexible grouping strategies in the multiage classroom. *Theory into Practice*, 41(1), 47-52.
- Hogan, K., & Pressley, M. (1997). *Scaffolding student learning: Instructional approaches and issues*. Brookline Books.
- Huo, H., Messenger, R. A., & Miller, D. (2022). Students' perspectives on why they drop out and possible retention strategies. *Higher Education Skills and Work-Based Learning*, 12(5), 846-865.
- Karpen, S., Howlett, B., King-Robertson, A., & Sanders, J. (2023). The learner care dashboard: An innovation in student support. *Journal of Postsecondary Student Success*, 2(3), 98-112.
- Kilbane, C. R., & Milman, N. B. (2014). *Teaching models: Designing instruction for 21st century learners*. Pearson.
- Korpershoek, H., Canrinus, E. T., Fokkens-Bruinsma, M., & de Boer, H. (2020). The relationships between school belonging, students' motivational, social-emotional, behavioural, and academic outcomes in secondary education: A meta-analytic review. *Research Papers in Education*, 35(6), 641-680.
- Leeds, E., Campbell, S., Baker, H., Ali, R., Brawley, D., & Crisp, J. (2013). The impact of student retention strategies: An empirical study. *International Journal of Management in Education*, 7(1-2), 22-43.
- Li, Y., Chen, D., & Deng, X. (2024). The impact of digital educational games on student's motivation for learning: The mediating effect of learning engagement and the moderating effect of the digital environment. *PLoS One*, 19(1). doi: 10.1371/journal.pone.0294350
- Li, J., & Xue, E. (2023). Dynamic interaction between student learning behaviour and learning environment: Meta-analysis of student engagement and its influencing factors. *Behavioral Sciences*, 13(1), 1-15.
- Ma, W., Yang, W., & Bu, Q. (2024). Interconnected factors in EFL engagement: Classroom climate, growth mindset, and achievement goals. *Frontiers in Psychology*, 15.
- Marks, M. B., Haugh, J. C., & Huckabee, W. A. (2016). Understanding the factors that influence student satisfaction with the undergraduate business major. *Journal of Education for Business*, 91(5), 280-288.
- Moteljek, J., & Alpay, E. (2023). The retention of information in virtual reality-based engineering simulations. *European Journal of Engineering Education*, 48(5), 929-948.
- Murtaugh P., Burns L., & Schuster J. (1999). Predicting the retention of university students. *Research in Higher Education*, 40(3), 355-371.
- Nold, H. (2019). Using critical thinking teaching methods to increase student success: An action research project. *International Journal of Teaching and Learning in Higher Education*, 29(1), 17-32.
- Nordmann, E., Calder, C., Bishop, P., Irwin, A., & Comber, D. (2019). Turn up, tune in, don't drop out: The relationship between lecture attendance, use of lecture recordings, and achievement at different levels. *Higher Education*, 77(6), 1065-1084.
- OpenAI. (2025). *ChatGPT* [Large language model].
- Oxford, R., Ehrman, L., M., & Lavine, R. Z. (1991). *Style wars: teacher-student style conflicts in the language classroom*. In Magnan, S.S. (Ed.), *Challenges in the 1990s for College*.
- Parpala A., Lindblom-Ylänne S., Komulainen E., Entwistle N. (2013). Assessing students' experiences of teaching-learning environments and approaches to learning: Validation of a questionnaire in different countries and varying contexts. *Learning Environments Research*, 16(2), 201-215. <https://doi-org.nmu.idm.oclc.org/10.1007/s10984-013-9128-8>
- Pascarella, E. T., & Terenzini, P. T. (1977). Patterns of student-faculty interaction beyond the classroom and voluntary freshman attrition. *Journal of Higher Education*, 48(5), 540-552.
- Qvortrup, A., & Lykkegaard, E. (2022). Study environment factors associated with retention in higher education. *Higher Education Pedagogies*, 7(1), 37-64.

- <https://doi.org/10.1080/23752696.2022.2072361>
- Richmond, A. S., Slattery, J. M., Mitchell, N., Morgan, R. K., & Becknell, J. (2016). Can a learner-centered syllabus change students' perceptions of student-professor rapport and master teacher behaviors? *Scholarship of Teaching and Learning in Psychology, 2*(3), 159-168.
- Rusticus, S. A., Pashootan, T., & Mah, A. (2023). What are the key elements of a positive learning environment? Perspectives from students and faculty. *Learning Environments Research, 26*(1), 161-175.
- Ruthig, J. C., Haynes, T. L., Stupinsky, R. H., & Perry, R. P. (2009). Perceived academic control: Mediating the effects of optimism and social support on college students' psychological health. *Social Psychology of Education, 12*(2), 233-249.
- Sahin, S., Arseven, Z., & Kilic, A. (2016). Causes of student absenteeism and school dropouts. *International Journal of Instruction, 9*(1), 195-210.
- Saini, G., & Baba, M. M. (2024). Psychological expedient of multimedia in blended learning and metamemory satisfaction. *The Learning Organization, 31*(1), 68-87.
- Schreiner, L. A., Noel, P., Anderson, E. C., & Cantwell, L. (2018). The impact of faculty and staff on high-risk college student persistence. *Journal of College Student Development, 52*(3), 321-338.
- Schunk, D. H., Pintrich, P. R., & Meece, J. R. (2007). *Motivation in education: Theory, research, and applications* (3rd ed.). Prentice Hall.
- Smiderle, R., Rigo, S. J., Marques, L. B., de Miranda Coehlo, J. A. P., & Jaques, P. A. (2020). The impact of gamification on students' learning, engagement and behavior based on their personality traits. *Smart Learning Environments, 7*(3), 1-11.
- Stevens, J. (2018). Finding the balance: Creating meaningful assignments without overwhelming instructional workload. *Journal of Educators Online, 15*(3), 1-12.
- Stone, C., & Springer, M. (2019). Interactivity, connectedness, and 'teacher-presence': Engaging and retaining students online. *Australian Journal of Adult Learning, 59*(2), 146-169.
- Stout, D. E., & Wygal, D. E. (2010). Negative behaviors that impede learning: Survey findings from award winning accounting educators. *Journal of Accounting Education, 28*(2), 58-74.
- Tinto, V. (2017). Through the eyes of students. *Journal of College Student Retention: Research, Theory & Practice, 19*(3), 254-269.
- Tomlinson, C. A., Brighton, C., & Reynolds, T. (2003). Differentiating instruction in response to student readiness, interest, and learning profile in academically diverse classrooms: A review of the literature. *Journal for the Education of the Gifted, 27*(2/3), 119-145.
- Umbach, P. D., & Wawrzynski, M. R. (2005). Faculty do matter: The role of college faculty in student learning and engagement. *Research in Higher Education, 46*(2), 153-184.
- Upcraft, M. L., & Gardner, J. N. (1989). *The freshman year experience: Helping students survive and succeed in college*. Jossey-Bass Publishers.
- Walkington, C. A. (2013). Using adaptive learning technologies to personalize instruction to student interests: The impact of relevant contexts on performance and learning outcomes. *Journal of Educational Psychology, 105*(4), 932-945.
- Wang, M. T., & Degol, J. L. (2016). School climate: A review of the construct, measurement, and impact on student outcomes. *Educational Psychology Review, 28*(2), 315-352.
- Wheeler, L. B., Palmer, M., & Aneece, I. (2019). Students' perceptions of course syllabi: The role of syllabi in motivating students. *International Journal for the Scholarship of Teaching and Learning, 13*(3), 1-22.
- Williams, A. (2024). Delivering effective student feedback in higher education: An evaluation of the challenges and best practices. *International Journal of Research in Education and Sciences, 10*(2), 473-501.
- Willis, A., Grainger, P., Menzies, S., Dwyer, R., Simon, S., & Thiele, C. (2018). The role of teachers in mitigating student stress to progress learning. *The Australian Journal of Education, 65*(2), 122-138.

- Xu, X., Schonrock-Adema, J., Jaarsma, A.D.C., Duvivier, R. J., & Bos, N. A. (2022). A conducive learning environment in international higher education: A systematic review of research on students' perspectives. *Educational Research Review*, 37(2022), 1-15, <https://doi.org/10.1016/j.edurev.2022.100474>.
- Yilmaz, Y., Lal, S., Tong, X. C., Howard, M., Bal, S., Bayer, I., Monteiro, S., & Chan, T. M. (2020). Technology-enhanced faculty development: Future trends and possibilities for health sciences education. *Medical Science Educator*, 30(4), 1787-1796.
- Zhan, Y., Wan, Z. H., Chen, J., & Wang, M. (2024). How is student resilience affected by teacher feedback, teacher support, and achievement goals? A mediation model based on PISA 2018 survey data. *The Asia-Pacific Education Researcher*, 33(3), 671-682.
- Zinger, J. F., Lee, D. J., & Su, C. C. (2024). It's in the syllabus: The relationship between syllabi word use and teaching evaluations. *Journal of Language and Social Psychology*, 43(4), 503-517.

# **A NEED FOR MARKETING AGILITY; A STEP-BY-STEP NETNOGRAPHIC APPROACH TO GLEANING CONSUMER INSIGHTS FROM BIG DATA WITHIN THE CONTEXT OF THE RESTAURANTS INDUSTRY DURING COVID 19**

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## **ABSTRACT**

Uncontrolled factors like national disasters, pandemics, and political policy change increasingly demand marketing agility, the ability to shift quickly to address consumers' changing needs within a quickly changing marketplace. Consumer insights drawn from "big data" help create such agile tactics within these times of marketplace crises. However, little research or instruction has been published that explicitly delineates how marketers can leverage consumer insights drawn from big data to develop such. This paper introduces a four-step (SRCD) process grounded in netnography for Scraping social media, Recording themes, Crafting consumer insights, and finally, Developing marketing tactics. This model is further explained within a case study of restaurants during the COVID-19 Pandemic. In this case, over 200,000 social media posts published between April 4th and May 4th of 2020 focused on restaurants during the COVID-19 pandemic. These posts were mined using the Salesforce Social Studio (social media listening) software. Next, using the SRCD process, three five themes emerge that yield three consumer insights, and two corresponding marketing tactics. This article is the first to provide agile tactics for marketing during the pandemic based on consumer insights derived from big data. While this paper focuses on agility during the COVID-19 pandemic, this process is evergreen as firms in several industries may use the steps presented here to optimize their offerings in times of prosperity and crisis.

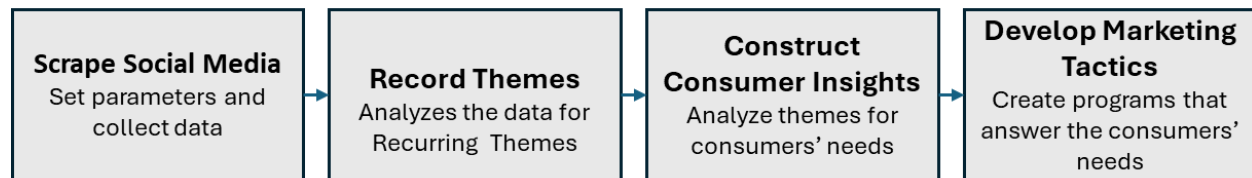
Keywords: Consumer Insights, Netnography, Marketing Agility, COVID-19

## **INTRODUCTION:**

One of the primary steps in creating a successful marketing campaign is understanding the consumers' insights. Consumer insights are statements of what consumers want, need, fear, and desire. They define the problem the consumer needs to address, and the attitude, beliefs, and perceived behavioral control attached to such problems that are key to consumer motivation and likeliness to take action (Bennett, 2024). These insights help marketing managers create and position products and messages that lead to consumer action. The power behind consumer insights is that they allow the marketer to hold a conversation with the consumer about the consumer's "universal truth": those situations, wants, needs, and desires, they cannot deny belong to them and then offer them a product as a solution for such (The Brand Hopper 2024). One simple example of this is the Snicker's "You're Not You When You're Hungry" Campaign. The campaign taps into the consumer's insight that hunger can drastically negatively alter a consumer's personality, making them irritable, prone to underperformance, and act out of character or even downright unpleasant. In short, this leads the consumer to an undesired state. While a million (healthier) products could help consumers avoid such feelings, Snickers' understanding of this consumer insight allowed the brand to make this problem salient and position itself as the answer to the problem. As a result of understanding and leveraging this consumer insight, Snickers went from a declining market share in an oversaturated market to an increase of \$375 million in sales in two years (The Brand Hopper, 2024). Indeed, understanding consumer insight is an essential key to success.

Consumer insights become even more relevant in the face of marketplace crises and uncertainty. Swift changes in the marketplace caused by national disasters, pandemics, and policy changes in trade within the marketplace demand marketing agility, the ability to shift quickly to address consumers' changing needs within a quickly evolving marketplace (Burton et al. 2024). While consumer insights can aid in such conditions, their use is not without constraints. Consumer insights have historically been sought through consumer immersion, focus groups, mystery shopping, and other qualitative techniques. These methods are costly and often too slow to produce the quick results needed for market agility in times of Crisis. However, the emergence of social media and, consequently, big data has created another avenue for gaining such insights in a timely and relatively inexpensive manner. While ample research and direction have been given on the use of big data to enhance marketers' activities, little has been directed to the specific use of such to 1) uncover consumer insights and 2) then quickly turn these insights into marketing activation and tactics. As such, instructions that allow for excavating insights from social media data to increase market agility are warranted. This paper aims to introduce a four-step (SRCD) process grounded in netnography for Scraping social media, Recording themes, Crafting consumer insights, and finally, Developing marketing tactics (see Figure 1) to increase marketing agility during times of crisis.

**Figure 1. SRDC Process**



Research and direction regarding netnography are not new. For example, Kozinets (2010) authored a coherent guide to conducting netnography. However, this seminal work focuses mainly on blogs and does not capture the usefulness of social media posts and social media listening tools that evolved later. Also, this and other works delineate steps for research (i.e., developing research questions, gaining access to blogs or online communities, collecting data, and interpreting recurring themes) yet stop short of moving past academic research to managerial practice, quickly distilling recurring themes into consumer insights and the insights then to marketing tactics, that is needed to allow firms agility in uncertain and quickly changing landscapes.

To this end, this paper is constructed in the following manner. First, we give an overview of big data and netnography's role in gleaning consumer insights from such. Next, we outline the four steps of distilling big data from themes to consumer insights to tactics, provide an example of such within the context of the restaurant industry during the 2019 COVID-19 pandemic, and discuss these findings.

## **BIG DATA AND NETNOGRAPHY: A PATHWAY TO CONSUMER INSIGHTS**

More than ever, people are connected. Through smartphones and social media, consumers share conversations, thoughts, pictures, videos and other information. This has resulted in an increasing pool of "big data." In fact, the amount of data created has increased from 2 Zettabytes in 2010 to 148 zettabytes in 2024 (Statista, 2023). Marketing scholars have found that consumer insights drawn from "big data" may be used to create adaptive marketing tactics (Erevelles, Fukawa, and Swayne 2016). However, this almost unending pool of data is underutilized by marketing researchers or managers in their attempts to uncover consumer insights within the context of market crises. To this end, we offer a netnography approach to conducting research with big data in order to create increase marketing agility in times of uncertainty. Netnography is an offshoot of Ethnography. As such, some review of the ethnographic approach is warranted. Ethnography is a qualitative research method carried out via long-term observation and interviews of participants. Ethnography has traditionally been used to form in-depth understandings

of marketplace cultures and actors (for example see [Schouten and McAlexander, 1995](#)). Ethnographers (in academia) typically immerse themselves in a culture for weeks (i.e. Marketing), months (i.e. Sociology) or even years (i.e. Anthropology) at a time. The goal of the ethnographer is to understand the lived experiences and shared meaning within the population and culture in question (Bennett and Ruvalcaba, 2024).

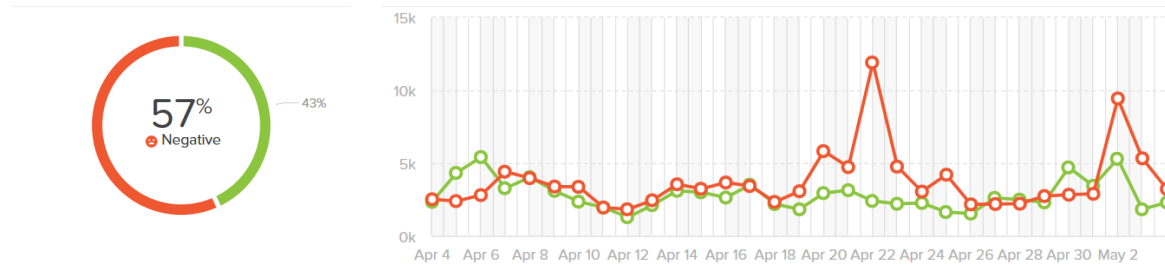
Netnography, an ethnographic approach that leverages web-based consumer generated data from social media has created unprecedented opportunities for gaining understanding of lived experiences and customer insights. Moreover, this methodology is cheaper, more flexible, and faster than traditional qualitative research methods, such as interviews, focus groups and surveys (Heinonen and Medberg 2018). To this end, we offer our four step (SRCD) model (Scraping social media, Recording themes, Crafting consumer insights, and finally, Developing marketing tactics) as one that moves researchers and practitioners through every facet of this process. Prior to providing an example of this process, it is important to delineate the classification of big data that will be used within in. With the rise of social media, there has been an unprecedented increase in consumer generated data. Such consumer data is classified as structured and unstructured. Structured data is easily collected and may be decipherable by machine learning algorithms. Examples include names, dates, addresses, and credit card numbers. While structured data is easy to use, the majority of data (80% to 90%) is unstructured and is not as easily captured and consists of information like text, pictures, video, audio, web server logs, social media posts, and more. Inside this data lies the answers from a lifetime of focus groups, in depth interviews and surveys. This data's importance is paramount when external factors create sudden shifts in the marketplace as they provide timely information of how those changes have altered consumers' needs, attitudes and intended behaviors. Indeed, our netnography approach to mining such data can be helpful in crafting consumer insights and marketing programs based on such. We next explore the use of said model within the context of the restaurant industry during the COVID 19 Pandemic.

## **A CASE FOR NETNOGRAPHY AND MARKETING AGILITY: THE RESTAURANT INDUSTRY AND THE COVID 19 PANDEMIC**

Within the context of restaurants during the COVID-19 Pandemic, this paper delineates the use of big data to uncover consumer insights to create marketing in the face of a quickly changing market.

The restaurant industry during the COVID pandemic provides a perfect case study to explore how netnography and big data (within the SRDC framework) can be used to create meaningful marketing tactics during everchanging marketing conditions. With a projected revenue loss of approximately \$225 billion (Gangitano, 2020), restaurants were one of the most noticeable industrial casualties of COVID-19. Almost as rapidly as the coronavirus spread, ushering in the first global pandemic of the 21st century, our way of life and business changed. Shelter in place and similar orders caused enterprises, especially in the service industries, to grind to a halt. Marketers quickly tried to adjust to the new circumstances. As marketers reacted, several industries suffered from a marketing myopia (Gallo, 2016), promoting products without considering consumers' new and evolving needs. At the same time, consumers took to social media and shared their thoughts and feelings about eating out in posts that numbered in the millions. Thus, the needs of the restaurant industry and the increased consumer use of social media during the shelter-in-place orders that framed the pandemic make it a perfect case study for leveraging social media posts to derive consumer insights and create agile marketing solutions in times of crisis.



**Figure 3. Main Study: Restaurant and Coronavirus Social Media Sentiment Trend**

## Step 2: Recording Themes

The next step in the SRCD process is to draw out and analyze recurring themes from our initial findings. To determine consumer insights, a smaller sample of Twitter messages was selected and coded for recurring themes. The messages were reviewed until saturation (no further themes emerged). Saturation occurred around 150 messages. While ethnographic measures typically rely on saturation to determine sample size, netnographers due to the size of the cases being studied, often use statistical analysis to determine the needed sample size (for example, see Sajjadian, Sheikh, Souri, and Sana 2018). Based on Cochran's formula for calculating the needed sample size from a population of 208,000 posts (with a 95% confidence interval), a [sample size calculator](http://www.qualtrics.com/blog/calculating-sample-size/) (www.qualtrics.com/blog/calculating-sample-size/) was used to determine that a sample of 384 posts should be reviewed. To ensure the strength of the findings, an additional 216 samples were reviewed for a total sample of 600 posts. From these samples, five recurring themes emerged.

### 1) Stability

One theme that emerged was concern for the restaurant industry's stability and the livelihood of owners and employees. Several of these comments expressed consumers' frustration or approval of the restrictions placed on restaurants and were political (sometimes referring to political figures, political parties, or some level of the government). Still, a larger picture materialized that captured consumers' worry about the viability of restaurants and the financial welfare of restaurant workers.

### 2) Safety

Another theme reflected in consumer posts was concern over the safety of eating at restaurants. These posts often focused on whether restaurant employees might be sick or if they were following safety precautions and warned others of these possibilities.

### 3) Loss

Several messages reflected consumers' feelings of loss due to restaurant restrictions and a desire for things to return to the way they were. These posts included mentions of how much consumers missed eating out at restaurants. Others expressed feelings of loss framed by looking forward to eating out again. Here, consumers posted plans for eating out when the restriction on restaurants is lifted or the coronavirus threat is perceived to be over.

### 4) Giving Back

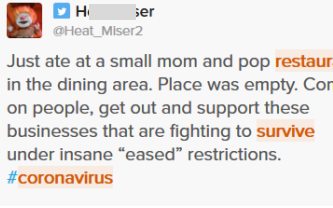
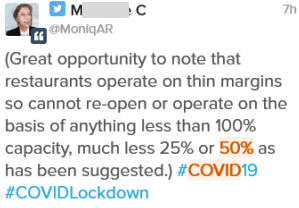


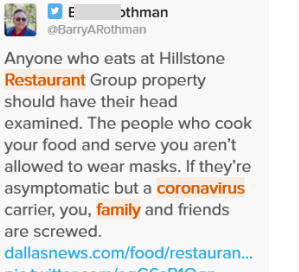

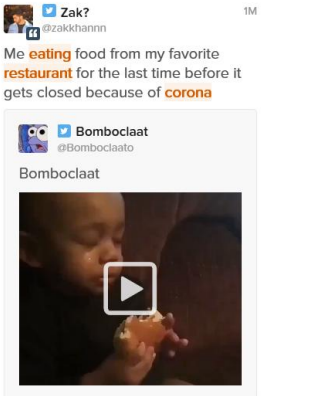
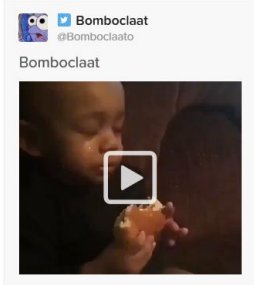

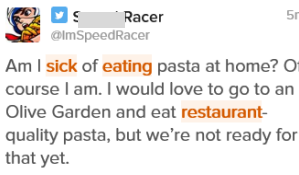

While not captured in the word cloud, consumers' posts prevalently featured stories of giving back. These references include mentions of celebrities and corporations that donated money to restaurants or partnered


with restaurants to feed hospital workers or restaurants feeding hospital workers. Consumers also posted, reposted, and replied to posts about patrons leaving large tips for restaurant staff.

5) Cooking at Home

A final theme that emerged was consumers' enjoyment of eating at home. Consumers mentioned restaurant-quality recipes and treats that make orders like shelter in place more enjoyable. Table 1 captures examples of all these themes.

**Table 1. Social Media Themes and Exemplary Post**

<p>Stability</p>	 <p>Just ate at a small mom and pop <b>restaurant</b> in the dining area. Place was empty. Come on people, get out and support these businesses that are fighting to <b>survive</b> under insane "eased" restrictions. <b>#coronavirus</b></p>	 <p>(Great opportunity to note that restaurants operate on thin margins so cannot re-open or operate on the basis of anything less than 100% capacity, much less 25% or <b>50%</b> as has been suggested.) <b>#COVID19 #COVIDLockdown</b></p>	 <p>NOW is a great <b>time</b> to support your local <b>restaurant</b> establishments that you either love to <b>dine-in</b> or take out. They need every dollar to stay afloat and maintain their staff. <b>#covid19 #supportlocal #takeout</b></p>
<p>Safety</p>	 <p>My brother manages a <b>fast food</b> place. In the last week, he's had 2 employees come to work <b>sick</b>, one of whom is married to a guy who works at Tyson &amp; tested + for <b>Covid</b>. They were both sent home &amp; ordered not to come back w/o a doctor's note. <b>#Iowa</b></p>	 <p>Anyone who eats at Hillstone <b>Restaurant</b> Group property should have their head examined. The people who cook your food and serve you aren't allowed to wear masks. If they're asymptomatic but a <b>coronavirus</b> carrier, you, <b>family</b> and friends are screwed. <a href="https://dallasnews.com/food/restaurant...">dallasnews.com/food/restaurant...</a> <a href="https://pic.twitter.com/agG6sB1Oqn">pic.twitter.com/agG6sB1Oqn</a></p>	 <p>Always disappointing when you spend 60+ hours a week doing <b>work</b> to enforce social distancing / <b>corona</b> preventative measures and you walk into a <b>restaurant</b> that is practicing 0 social distancing, not wearing gloves or masks... feels like it's all for nothing 🤔</p>
<p>Loss</p>	 <p>Me <b>eating</b> food from my favorite <b>restaurant</b> for the last time before it gets closed because of <b>corona</b></p>  <p>Bomboclaat</p> 	 <p>Am I <b>sick</b> of <b>eating</b> pasta at home? Of course I am. I would love to go to an Olive Garden and eat <b>restaurant-quality</b> pasta, but we're not ready for that yet.</p>	 <p>I wanna be at an outdoor <b>restaurant</b> on the beach with my pals <b>eating</b> some fire spicy crab legs and pounding back <b>corona</b> lights. That's all thank you</p>

<p><b>Giving Back</b></p>	<p><b>Lyn</b> news.stonybrook.edu 8m</p> <p><b>COVID-19 Donation Spotlight #3: Donations Pour In from Far and Wide</b></p> <p>took off. The girls teamed up with Mangiamo's <b>Restaurant</b> in Ronkonkoma, which provides the meals directly to the healthcare <b>workers</b>. While the girls themselves could not be involved with delivering the food for safety reasons, they were happy to see photos of staff with their meals and the thank you cards...</p>	<p><b>Cl</b> rphy 5m</p> <p><b>City of Roseville CA</b> @CityofRoseville</p> <p>Family Meal Roseville to provide 15,000 <b>restaurant</b> meals to those in need. Public-private partnership launches with \$75k from the City of Roseville, Placer Community Foundation <b>COVID-19</b> Response Fund and Sutter <b>Health</b>. Find out more -&gt; <a href="https://ow.ly/M0wV5OzyZvf">ow.ly/M0wV5OzyZvf</a> <a href="https://pic.twitter.com/ihEolophgN">pic.twitter.com/ihEolophgN</a></p>	<p><b>K</b> ded. 1M</p> <p><b>Complex</b> @Complex</p> <p>Tyler Perry leaves massive \$21,000 tip for Atlanta <b>restaurant</b> employees amidst <b>#coronavirus</b> pandemic: <a href="https://cplx.co/DUuvgg1">cplx.co/DUuvgg1</a> <a href="https://pic.twitter.com/xH0M15GJHE">pic.twitter.com/xH0M15GJHE</a></p> 
<p><b>Cooking at Home</b></p>	<p><b>kel</b> ncer 1d</p> <p><b>Banana bread is having a moment</b></p> <p>If there 's an informal snack of the <b>coronavirus</b> pandemic, it's a sweet, soft loaf of home-baked banana bread. The easy-to-make reward has been the most searched-for <b>recipe</b> throughout all US states for the last 1 month. Web searches skyrocketed 54% over the same duration, as Americans searched for both...</p>	<p><b>J</b> forums.delphiforums.com 2d</p> <p><b>Cakes to Carry You Through</b></p> <p>Cake All Day: Cakes to Carry You Through, from Morning to Midnight <a href="https://www.thekitchn.com/cake-all-day-recipes-23012390">https://www.thekitchn.com/cake-all-day-recipes-23012390</a> Throughout the <b>coronavirus</b> quarantine, bread baking and sourdough cultivating have emerged as popular pastimes, keeping people busy with baking projects they've never tried before. My...</p>	<p><b>er</b> res 2d</p> <p><b>#erinexplores #quarantinebakes #oatmealraisins #nyc #astoriany #pandemic2020 #covid19</b></p> <p>Quarantine bakes can be fun, especially when you successfully manage to tweak a oatmeal raisin <b>recipe</b> to be tastier..... <a href="https://instagram.com/p/B_yo80JJuOy/">instagram.com/p/B_yo80JJuOy/...</a></p>

**Step 3: Constructing Consumer Insights:**

The next step in the process is to construct consumer insights. Here, the goal is to uncover common consumer needs that underline each theme as we distill them down to the consumer's root need.

The five themes from the social media post were then distilled to develop three consumer insight statements, further reflecting consumers' feelings.

Insight 1: Consumers are afraid.

Consumers are not purchasing food for convenience's sake, habit, or taste as much as before. With the exception of the theme of giving back, some form of fear was expressed in each theme. Indeed, during times like these, several consumers think primarily about safety (Clough, 2020), which restaurant brands offered heuristically just weeks ago. Indeed, a recent study found that during the pandemic, nearly 80% of Americans were uncomfortable dining at a restaurant (Balz & Guskin, 2020). From this vantage point, it is easy to understand that many consumers were afraid to have others cook or have contact with their food. At this time, several consumers thought cooking at home was safer as it minimized contact and allowed them to cook and kill off anything harmful. These consumers needed restaurant options that relieved these fears. While contactless delivery is one option for alleviating these fears, other options should be explored.

Insight 2: Consumers still want restaurant-quality food.

In their posts about loss and eating at home, consumers desire restaurant-quality food. Consumers missed eating out and look forward to returning to this activity. In the meantime, they sought ways to have restaurant-quality food. One result of the pandemic is that millions of employees were asked to work from home. Researchers suggest that this results in stressed-out, remote-working parents who, without schools, have to make breakfast, lunch, dinner, and snacks (Bennett et al. 2020, April). These parents needed something fun to do with their children while, at the same time, appetizing foods to feed their families.

Insight 3: Consumers are fascinated with helping.

The themes of sustainability and giving back suggest that Americans wanted to pitch in during this crisis. Reports of the thousands of medical workers who came out of retirement to help hospitals are a testament to this (Mansoor 2020, March). However, it was difficult for professionals in other lines of work to figure out how to contribute when doing so means being physically present and endangering their lives. There is a paralyzing paradox: the greater the effect of the pandemic in an area, the greater the need for help, but the greater the need for help, the greater the danger for those who want to help. Thus, consumers had a substantial need to help that they could not readily act upon.

**Step 4: Developing Marketing Tactics**

This step aims to develop agile marketing solutions based on fulfilling consumers' needs, as defined by consumer insights, rather than by what marketers have to offer. The results specify tactics that better help consumers satisfy their current needs. The following two examples provide such tactics.

Solution 1: Take-n-Bake.

The take-n-bake option satisfies the first two consumer insights. Take-n-bake, allowing the consumer to purchase pre-packaged and pre-measured meals to take home to bake, is not a new offering, just one forgotten by several (though not all) restaurants during the pandemic. For example, the local owner of a Your Pie franchise in South Carolina offered consumers take-n-bake pizza kits. He reported that children enjoyed spreading the sauce and cheese and that teenagers had fun taking and posting pizza selfies. For people stuck in the house for weeks, this meal prep became a family bonding experience that was fun rather than a chore. Using the consumer insights, managers may identify possible offerings from their menus--freezing batches of nuggets, assembling burgers, stir-fry, or orange chicken kits, for example--and position them as take-n-bake options in promotions to address the first two insights of consumers' needs.

Solution 2: Give, and you shall receive.

The next solution leverages the third consumer insight based on donations and giving back. One tactic is for restaurants to partner with local hospitals or those hospitals further away that may be in the greatest need. Partnerships could focus on consumers' purchasing gift cards, with a portion of that purchase (15–20%) going to feeding those on the front lines of the pandemic, like doctors, nurses, and first responders, or to funding personal protection equipment (PPE) for frontline workers. If done correctly and responsibly, this solution could help consumers meet the needs of healthcare providers and first responders. At the same time, restaurants increase their much-needed cash flow while generating PR for both. Another option is for restaurants to offer gift cards of more significant value, e.g., \$75, for a discounted price, e.g., \$65, especially if the card cannot be used for fifteen to thirty days, thus aiding restaurants' cash flow. Solutions such as these tap into the consumer insight above and offer consumers a way to help. Table 2 displays the themes discovered and the consumer insight, along with the tactics that intersect each.

**Table 2. Social Media Themes, Consumer Insights, and Corresponding Activation Ideas**

	Insight 1: Consumers are afraid	Insight 2: Consumers still want restaurant quality food	Insight 3: Consumers are fascinated with helping
Stability	Take-n-Bake		Give, and you shall receive
Safety	Take-n-Bake	Take-n-Bake	
Loss		Take-n-Bake	
Giving Back			Give, and you shall receive
Cooking at Home	Take-n-Bake	Take-n-Bake	

## DISCUSSION

This paper strives to offer a four-step process to help marketers create agile marketing tactics during times of crisis. Moreover, the paper provides insights into the underuse of netnography and the advantages of using it properly. The SRDC process implemented here serves as a guide for leveraging big data to uncover themes, create consumer insights, and then leverage such within marketing plans. The marketing tactics provided here are only examples; more solutions can be derived from the insights. We also recommend that firms of all sizes leverage the procedure used here to explore additional consumer insights and add keywords that may be more germane to their business. Leveraging big data in this manner promises better outcomes for marketers in restaurants and other industries in times of prosperity and crisis. It should be noted that not all data scraping software is effective and may be expensive. We recommend taking advantage of free trial periods to explore software and ensure that the netnographic process is best for the industry and research question at hand.

## RESEARCH AND MANAGERIAL IMPLICATIONS

This paper adds to the greater body of work in qualitative research in general and netnography in specific by detailing a process (SRDC) for leveraging big data to create consumer insights and agile marketing tactics in times of crisis. Future research should explore the use of this process, in part or in whole, to analyze big data in other industries and to address different problems. For managers, this paper clearly outlines how to conduct netnographic research and provides an example of how to handle such. While the process of moving from data to themes to consumer insights, like any skill, takes time to master, this paper provides a framework for practicing and improving skills and a case example to guide the process.

## REFERENCES

- Balz, D. & Guskin, E. (2020, May). Americans widely oppose reopening most businesses, despite easing of restrictions in some states, Post-U. Md. poll finds. [https://www.washingtonpost.com/politics/americans-widely-oppose-reopening-most-businesses-despite-easing-of-restrictions-in-some-states-post-u-md-poll-finds/2020/05/04/495ddc3a-8e36-11ea-9e23-6914ee410a5f\\_story.html](https://www.washingtonpost.com/politics/americans-widely-oppose-reopening-most-businesses-despite-easing-of-restrictions-in-some-states-post-u-md-poll-finds/2020/05/04/495ddc3a-8e36-11ea-9e23-6914ee410a5f_story.html) retrieved on 8/19/24
- Bennett, D. (2024). Knowledge isn't everything: Development of a theory of planned behavior questionnaire for the exploration of healthy beverage consumption. *Global Journal of Management & Marketing*, Volume 8, Number 1.
- Bennett, D., Andonova, Y., Anaza, N., & Burton, E. (2020), Remote Working 2.0: Balancing Work and Family during the Coronavirus Pandemic. *California Management Review*; <https://cmr.berkeley.edu/2020/04/remote-work/> retrieved on 7/3/24
- Bennett, D. H. S., & Ruvalcaba, C. (2024). I think I can, I think I can; A qualitative investigation of celebrity endorsement and meaning transfer's role in building consumer self confidence. *Journal of Global Scholars of Marketing Science*, Volume 34, Issue 3, 416–438.
- Burton, E., Bennett, D., & Burton, L. (2024). Creating the New Normal: A Historical Approach to Understanding Marketing Agility and its Implications Across Business, Healthcare, and Social Welfare in a Post Pandemic World. *Atlantic Marketing Journal*, Volume 13, Issue 2.
- Clough, B. (2020, March) Fewer dining out as coronavirus fear spreads. Here's what Fresno restaurants are doing. <https://www.fresnobee.com/living/food-drink/bethany-clough/article241133811.html> retrieved on 8/15/2024
- Erevelles, S., Fukawa, N., & Swayne, L. (2016). Big Data consumer analytics and the transformation of marketing. *Journal of Business Research*, Volume 69, Issue 2, 897-904.

- Gallo, A. (2016). A Refresher on Marketing Myopia. <https://hbr.org/2016/08/a-refresher-on-marketing-myopia> retrieved on 6/26/24
- Gangitano, A. (2020). Restaurant industry estimates \$225B in losses from coronavirus. <https://thehill.com/business-a-lobbying/business-a-lobbying/488223-restaurant-industry-estimates-225b-in-losses-from> retrieved on 4/15/24
- Harbert, T. (2021). Tapping the power of unstructured data. [Tapping the power of unstructured data | MIT Sloan](https://mitsloan.mit.edu/ideas-made-to-matter/tapping-the-power-of-unstructured-data) retrieved on 5/12/24
- Heinonen, K., & Medberg, G. (2018). Netnography as a tool for understanding customers: Implications for service research and practice. *Journal of Services Marketing*, Volume 32, Issue 6, 657-679.
- Kotler, P., & Levy, S. J. (1969). Broadening the concept of marketing. *Journal of Marketing*, Volume 33, Issue 1, 10-15.
- Kozinets, R.V. (2002), The field behind the screen: Using netnography for marketing research in online communities, *Journal of Marketing Research*, Volume. 39, Issue 1, 61-72.
- Mansoor, S. (2020, March) 'I've Been Missing Caring for People.' Thousands of Retired Health Care Workers Are Volunteering to Help Areas Overwhelmed By Coronavirus. [https://www.yahoo.com/news/ve-missing-caring-people-thousands-234252093.html?guccounter=1&guce\\_referrer=aHR0cHM6Ly93d3cuZ29vZ2xILmNvbS8&guce\\_referrer\\_sig=AQAAAEIcjenw4Nf7TpyPzG6\\_IPnrhiuE7tNCP2yc2goUJRIZf6H\\_u\\_ULVORoIbkguCfLmXY07TQnoRCxoKXdUobm921ePqNyVM5M0IbJXIXY6KhCRd02QgxOFRgQZ7IVSBmyevLVLUnKyOO8yU34ck1pa1OLcqjSmWbKzIfeN6NfNDz](https://www.yahoo.com/news/ve-missing-caring-people-thousands-234252093.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xILmNvbS8&guce_referrer_sig=AQAAAEIcjenw4Nf7TpyPzG6_IPnrhiuE7tNCP2yc2goUJRIZf6H_u_ULVORoIbkguCfLmXY07TQnoRCxoKXdUobm921ePqNyVM5M0IbJXIXY6KhCRd02QgxOFRgQZ7IVSBmyevLVLUnKyOO8yU34ck1pa1OLcqjSmWbKzIfeN6NfNDz) retrieved on 1/3/24
- Reardon, K. K., & Enis, B. (1990). Communication forum: Establishing a companywide customer orientation through persuasive internal marketing. *Management Communication Quarterly*, Volume 3, Issue 3, 376-387
- Sajjadian, F., Sheikh, R., Soury, M. E., & Sana, S. S. (2018). Application of rough set and netnography in tourism marketing analysis. *Journal of Modelling in Management*, Volume 13, Issue 4, 1025-1036.
- Schouten, J. W., & McAlexander, J. H. (1995). Subcultures of consumption: An ethnography of the new bikers. *Journal of Consumer Research*, Volume 22, Issue 1, 43-61.
- Taylor, P. (2023) Volume of data/information created, captured, copied, and consumed worldwide from 2010 to 2023, with forecasts from 2024 to 2028, <https://Statista.com> retrieved on 12/12/24
- The Brand Hopper (2025, January) Dissected: Snickers “You’re Not You When You’re Hungry,” <https://thebrandhopper.com/2024/01/04/dissected-snickers-youre-not-you-when-youre-hungry-campaign/> retrieved on 3/4/2024
- Xun, J., & Reynolds, J. (2010). Applying netnography to market research: The case of the online forum. *Journal of Targeting, Measurement and Analysis for Marketing*, Volume 18, 17-31.

# **FORTUNE 50 FIRMS' EMPHASIS ON ETHICS IN MISSION, VISION, AND VALUES STATEMENTS BEFORE AND AFTER THE PANDEMIC**

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## **ABSTRACT**

This paper studies how frequently the terms ethics or integrity are mentioned by Fortune 50 companies in the three major communications issued by large public corporations. These three communications are the mission, vision, and values statements. The years under study are 2019 and 2024, which are the years prior to and after the COVID-19 pandemic. The authors reviewed these Fortune 50 statements to determine how important ethics or integrity were to these largest corporations. Following an analysis of the 150 mission, vision, and values statements for Fortune 50 firms from 2019 and 2024, the results showed that the terms ethics, integrity, or similar terms were most often included in the value statements of these companies. In a few cases, ethical behavior or integrity were also included in the firm's mission or vision statement. The results from 2019 and 2024 are compared to see if the pandemic may have affected the company's views on the importance of ethical behavior and/or acting with integrity. A surprising result was the low percentage of firms that did not include the concepts of ethics or integrity in any of these three major communications to stakeholders. Examples from both years are also included to better understand the importance of ethics and integrity in these major stakeholder communications from the Fortune 50 firms.

Key Words: Fortune 50, Value Statements, Ethics, Integrity, Pandemic

## **INTRODUCTION/PREVIOUS RESEARCH**

The COVID-19 pandemic affected nearly everything on the planet. This includes the three major corporate stakeholder communications. In particular, the authors are investigating if the *Fortune 50* firms modified their mission, vision, or values statements when comparing these communications from 2019 and 2024 as far as the importance of ethics is concerned. In other words, are the *Fortune 50* firms stressing ethics in their communications more or less in 2024 compared to 2019? According to the World Health Organization (WHO), the agency declared COVID-19 a pandemic on March 11, 2020 (CDC, 2020). More than three years later, the federal COVID-19 Public Health Emergency declaration ended on May 11, 2023 (CDC, 2023). Based on these dates, the authors chose 2019 and 2024 as appropriate years to study pre-pandemic and post-pandemic corporate communications and the firm's emphasis on integrity and ethical behavior.

The Fortune 500 companies are the highest-revenue-generating companies in the United States by rank of total revenue. The "Fortune 500" name is derived from "Fortune Media", a magazine & media company.

To understand the role of the Fortune 50 in society it is necessary to look back to the mid-1950s. According to a Library of Congress Article entitled “First Fortune 500 List Published,” the concept of the Fortune 50 began to take shape in 1955. During that year the first Fortune 500 list was published. The goal of this list was to identify the top companies based on total revenues. During the initial publication “the top companies were General Motors, Jersey Standard, U.S. Steel, General Electric, Esmark, Chrysler, Armour, Gulf Oil, Mobil and DuPont. (Library of Congress, 1). This list would continue to evolve with society and over time several sub-lists were developed including the Fortune 50. The Fortune 50 follows the same structure as the Fortune 500 and offers an in-depth look at the top 50 companies based on total revenues.

The first ten companies included in the 2024 Fortune 50 list were Walmart, Amazon, Apple, United-Health Group, Berkshire Hathaway, CVS Health, Exxon Mobil, Alphabet, McKesson, and Cencora. These firms were followed by Costco, JP Morgan Chase, Microsoft, Cardinal Health, Chevron, Cigna Group, Ford Motors, Bank of America, General Motors, and Elevance Health. The next ten firms included Citigroup, Centene, Home Depot, Marathon Petroleum, Kroger, Phillips 66, Fannie Mae, Walgreens Boots Alliance, Valero Energy, and Meta Platform. The next ten largest companies were Verizon Communications, AT&T, Comcast, Wells Fargo, Goldman Sachs Group, Freddie Mac, Target, Humana, State Farm Insurance, and Tesla. The last ten firms in the Fortune 50 for 2024 were Morgan Stanley, Johnson & Johnson, Archer Daniels Midland, PepsiCo, United Parcel Service, FedEx, Walt Disney, Dell Technologies, Lowe’s, and Proctor & Gamble.

As a comparison, the top ten Fortune 50 firms for 2019 were Walmart, Exxon Mobil, Apple, Berkshire Hathaway, Amazon, United Health Group, McKesson, CVS Health, AT&T, and Cencora. These firms were followed by Chevron, Ford Motor, General Motors, Costco Wholesale, Alphabet, Cardinal Health, Walgreens Boots Alliance, JPMorgan Chase, Verizon Communications, and Kroger. The next ten firms were General Electric, Fannie Mae, Phillips 66, Valero Energy, Bank of America, Microsoft, Home Depot, Boeing, Wells Fargo, and Citigroup. The next ten firms were Marathon Petroleum, Comcast, Elevance Health, Dell Technologies, DuPont, State Farm Insurance, Johnson & Johnson, IBM, Target, and Freddie Mac. Finally, the last group of firms were United Parcel Service, Lowe’s, Intel, U.S. Postal Service, MetLife, Proctor & Gamble, FedEx, PepsiCo, Archer Daniels Midland, and Prudential Financial.

For many years, public corporations have used three important vehicles to communicate vital information about the company to all of its stakeholders. These communications include the firm’s mission, vision, and values statements. Each of these convey valuable information about the firm and what they are about. The mission statement became popular after Peter Drucker, management consultant and author, advised corporate executives to define the purpose and mission of their business as a kind of strategic imperative (Drucker, 1973). Corporations have used mission statements as a common practice, since the 1980s, given the desire to advise both internal and external stakeholders of the firm’s reason for being. For example, when a company promotes its mission to its employees, it results in a higher level of employee engagement and positive work culture, keeping them invested in the good work the company does when they go about their day-to-day tasks (Craig, 2018).

Vision Statements became popular over the years following the emphasis on mission statements. Kirkpatrick defines a vision statement as a “shared picture of the future of a company” (Kirkpatrick, 2016, p.1). According to Peter Drucker and other researchers, a business is defined by its vision statement. Drucker states that “only a clear definition of the firm’s vision allows for clear and realistic business objectives” (Drucker, 1973, p.59). Authors, including Leontiades, view the vision statement as the first step in the strategic planning process. (Leontiades, 1982). Since the vision statement describes the firms’ “reason

for being,” it is customary practice today for public corporations to publish a vision statement in addition to the mission statement. Like a mission statement, a vision statement should also motivate the firm’s employees. A strong vision statement has two objectives: clearly articulating strategic goals and motivating the workforce. Therefore, it must be exciting and convincing (Blount & Leinwand, 2019).

Schaap & Gonzalez (2025) have also studied the vision statements of *Fortune 50* companies. They address the question of whether current vision statements are convincing to stakeholders. They argue that well-crafted vision statements can provide the focus and motivation to take a firm to the next level—it should be easy to remember, and it should inspire and motivate the workforce. Schaap & Gonzalez also state that many companies cannot clearly define their vision. These firms often use generic vision terms and buzzwords such as “being the company of choice” or “maximizing shareholder wealth.” These generic visions do little to motivate employees. The vision of the firm must be clearly understood and appreciated by the workforce such as maintaining the highest level of ethical behavior in all business operations.

In addition to mission and vision statements, it has become common for large public corporations to communicate the firm’s core values on an annual basis. Core values are principles that should be the guide for all of the firm’s actions. Lencioni argues that a firm must ensure that their values really mean something and are not simply “feel good” terms. He states that most value statements are bland, toothless, or just plain dishonest (Lencioni, 2002). He used the example of Exxon with stated values of “Communication. Respect. Integrity. Excellence.” in its 2000 annual report. Later disastrous events show that instead of being meaningful, these values proved to be hollow. Lencioni argues that empty value statements create cynical employees, distance customers, and weaken managerial credibility. Core values define the employee experience. Therefore, the set of core values must provide clear expectations for the workforce. In addition, employees who epitomize company values must be recognized and rewarded on a regular basis. This communicates to the workforce the importance of supporting and following the firm’s core values.

According to Timothy Max, the most common core values of *Fortune 500* firms include teamwork, innovation, customer service, and integrity (Max, 2025). Max stresses that core company values are an essential part of ensuring every employee works towards the same common goal. In addition, they really have to mean something for the company. If not, the values statement is simply an exercise in vanity. Having the right group of core values makes it easy for employees to work together and make accurate decisions that will move the business forward. Finally, Max states that values do not have to be unique, but they must be truthful and clearly reflect what the firm wants to see and in itself and its workforce.

Qualtrics Corporation (2023) argues that a firm’s core values are its cultural cornerstones. Specifically, core values communicate the central guiding beliefs and principles that support a company and its employees. Qualtrics adds that core values must never be compromised either for convenience or short-term financial gain. These values must be more than meaningless “buzzwords.” Values should be truly meaningful for many reasons. They shape employees’ workplace mentality, guide employees’ interaction with each other and with customers, and hold business leaders accountable. In addition, the core values help the business to grow with vision and purpose and are unique for every firm.

The Qualtrics 2023 Employee Experience Trends Report asked employees if they felt that their company embodies its stated core values. For employees who felt that their firm was living its core values, the employees were 31% more likely to have their expectations exceeded by their employer, 27% more likely to have higher engagement scores, 23% more likely to work with their current employer for 3+ years, and

20% more likely to have higher well-being scores (Qualtrics, 2023). Therefore, a meaningful group of core values provides a multitude of benefits for the company.

Alexander Chandler (2023) also emphasizes the importance of these three communication devices. He says that a mission statement defines what you do daily for the next few years. In addition, a vision statement describes your long-term goals for up to five or ten years in the future. Creating a mission, values and vision makes a statement as to how a company and its personnel will interact with the consumer, its colleagues and even competitors. Chandler stresses that the value, mission, and vision statements of a company are the foundation on which all business is conducted, and decisions are made.

Since the mission, vision, and values statements are such critical communications for large corporations, this paper involves reviewing the 2024 and 2019 *Fortune 50* firms specifically to determine how often ethics and/or integrity are cited in these three crucial communications for the 50 largest companies. The majority of the *Fortune 50* mentioned ethics, ethical behavior, integrity, or a similar term in at least one of these statements. A surprising number of firms, however, did not mention ethics or integrity in either the mission, vision, or values statements. An analysis of the 2024 *Fortune 50* firms is presented first followed by the *Fortune 50* from 2019. Examples emphasizing ethics and/or integrity are also included in the following discussion.

## **2024 FORTUNE 50 MISSION, VISION, AND VALUES STATEMENTS**

For the 2024 *Fortune 50*, a total of 8 companies did not include the words ethics or integrity in any of the three basic statements. Firms with no mention of ethics included Amazon, Apple, Cigna Group, Ford Motors, Meta Platforms, AT&T, Humana, and Johnson & Johnson. It is surprising, given the nature of these firms, that ethical behavior or integrity is not mentioned in mission, vision, or values statements. One would assume that ethics would be critical for health care firms such as Cigna Group, Humana, and Johnson & Johnson. Cigna's values included caring about customers, patients, and coworkers, innovating and adapting, acting with speed and purpose, and creating a better world together. However, Cigna does not mention ethics or integrity as a core value. Likewise, Humana's listed values are caring, curiosity, and commitment. Again, no mention of integrity or ethics. Finally, Johnson & Johnson's values are described as the three pillars of improving global health, improving local communities, and protecting our planet (Johnson & Johnson, 2024). These are certainly admirable, but ethics or integrity are again missing.

Four of the *Fortune 50* companies, in 2024, included ethics or integrity in two of the three basic statements. United Health Group (UHG) specifically mentioned integrity in both its vision and values statements. The company unified its vision and values statements and included integrity in both. Related to integrity, United Health Group (2024) states "We do the right thing and follow through on our shared commitment to Quality." The values of compassion, relationships, innovation, and performance completed what the firm calls its five-core vision and values statements. According to UHG, these five core values and embedded into our greater mission of helping people live healthier lives and making the health care system work better for everyone (Ibid).

Three other companies included ethics in both its mission and vision statements. These firms are Costco, Wells Fargo, and FedEx. Costco (2024) states that it achieves its mission through its Code of Ethics by obeying the law, taking care of members and employees, and respecting its suppliers. Costco's first identified value is "Doing the right thing," which shows that ethics are important to the company. Wells Fargo's mission statement (2024) declares, "We are committed to maintaining the highest standards of

integrity and professionalism.” In addition, the first value identified by Wells Fargo is “Do what’s right-set high standards for how you treat colleagues, customers, and clients.” Finally, FedEx (2024) also includes ethics in both its mission statement and list of values. FedEx’s mission states that “Corporate activities will be conducted in the highest ethical and professional standards.” The company states that “The FedEx Board of Directors and management teams are dedicated to maintaining our strong culture of ethics, integrity, and reliability.” These three organizations believe that ethics and integrity are important enough to include in both their mission and values statements.

Thirty-eight of the *Fortune 50* in 2024 mentioned ethics or integrity only in its values statement. These firms include Walmart, Berkshire Hathaway, CVS Health, Exxon Mobil, Alphabet, McKesson, Cencora, JP Morgan Chase, Microsoft, Cardinal Health, Chevron, Bank of America, General Motors, Elevance Health, Citigroup, Centene, Home Depot, Marathon Petroleum, Kroger, Phillips 66, Fannie Mae, Walgreen Boots Alliance, Valero Energy, Verizon Communications, Comcast, Goldman Sachs Group, Freddie Mac, Target, State Farm Insurance, Tesla, Morgan Stanley, Archer Daniels Midland, PepsiCo, United Parcel Service, Walt Disney, Dell Technologies, Lowe’s, and Proctor & Gamble.

Five examples from this list of firms with a detailed description of the importance of ethics include Proctor & Gamble, United Parcel Service (UPS), Morgan Stanley, Goldman Sachs Group, and Fannie Mae. First, Proctor & Gamble’s values (2024) included “Integrity-We always try to do the right thing. We are honest and straightforward with each other. We operate within the letter of the law. We uphold the values and principles of P & G in every action and decision.” Second, United Parcel Service values (2024) include “Integrity – We deliver what we promise with honesty and transparency-every day, in every way. We commit to doing what’s right, even when its hard.” Morgan Stanley is the third notable company listed above. One of its five core values is “Do the right thing-Act with integrity. Think like an owner to create long-term shareholder value. Value and reward honesty and character” (Morgan Stanley, 2024). The fourth firm listed above is the Goldman Sachs Group. Its value statement includes “Integrity-We hold ourselves accountable to the highest ethical standards, insisting on transparency and vigilance from our people as we learn from our experiences and make decisions that instill a sense of pride in our firm” (Goldman Sachs Group, 2024). The fifth and final example of stated ethical values comes from Fannie Mae. The firm’s values include “Integrity-We are committed to the highest ethical and professional standards to inspire trust and confidence in our work and in one another” and “Accountability – We are responsible for carrying out our work with transparency and professional excellence” (Fanny Mae, 2024).

The next portion of this paper is a discussion of the 2019 *Fortune 50* firm’s mission, vision, and values statements. Following that information is a final discussion of the differences between the three types of statements in the year prior to the pandemic (2019) and the year following the pandemic (2024). The authors conclude this paper with a look at whether the pandemic had any effect on the number of firms that included the terms ethics or integrity in their mission, vision, or values statements.

## **2019 FORTUNE 50 MISSION, VISION, AND VALUES STATEMENTS**

The summary of ethics included in 2019 *Fortune* companies is quite different from the 2024 distribution discussed in the previous portion of this paper. The terms ethics and/or integrity were mentioned significantly less often in 2019. Specifically, there were 19 *Fortune 50* firms that made no mention of ethics in either their mission, vision, or values statement for 2019. These companies included Apple, Amazon, AT&T, Cencora, Alphabet, Walgreen Boot Alliance, JPMorgan Chase, General Electric, Fannie Mae, Phillips 66, Valero Energy, Home Depot, Comcast, Johnson & Johnson, Target, Intel, US Postal Service,

MetLife, and Prudential Financial. As mentioned above, this compares to only 8 of the *Fortune 50* omitting the concept of ethics or integrity in 2024. The pandemic may well have had some effect on the number of firms that included ethics or integrity in its 2024 statements.

Only one of the 2019 firms included ethics in two of the basic statements. Namely, Berkshire Hathaway included ethics in both its mission statement and its list of values. Its mission statement stated “Doing business with integrity, strength, and stability, prioritizing long-term value for shareholders through prudent investments and a focus on ethical business practices (Berkshire Hathaway, 2019). Berkshire Hathaway’s list of values for 2019 were Honesty, Integrity, Courtesy, Continuous Improvement, Customer Satisfaction, Individual Respect and Responsibility, Loyalty to Valued Relationships, Trust, and Innovation. Berkshire Hathaway emphasized ethics and integrity more than any of the other *Fortune 50* for 2019.

Thirty of the 2019 *Fortune 50* firms included ethics or integrity in only one of the three statements under study. Twenty-seven of the companies included it only in its value statement. These were Walmart, Exxon Mobil, United Health Group, McKesson, CVS Health, Chevron, Ford Motor, General Motors, Costco Wholesale, Cardinal Health, Verizon Communications, Kroger, Bank of America, Microsoft, Boeing, Wells Fargo, Marathon Petroleum, Elevance Health, Dell Technologies, DuPont, State Farm Insurance, Freddie Mac, United Parcel Service, Proctor & Gamble, FedEx, PepsiCo, and Archer Daniels Midland.

The last three firms from the group of 30 mentioned above were Citigroup, Lowe’s, and IBM. These three firms included ethics in their vision statement but not in their values statement. Citigroup’s vision states, “We strive to earn and maintain the public’s trust by constantly adhering to the highest ethical standards” (Citigroup, 2019). Second, Lowe’s vision was to “Reduce the environmental footprint of our operations. Protect and build our reputation as a responsible business. (Lowe’s, 2019). Finally, IBM’s vision statement (2019) stated “At IBM we not only solve business problems, but also ‘put smart to work for good,’ delivering our best technology and talent at scale in an ethical fashion to positively impact individuals, communities and the world. That’s what #GoodTechIBM means.”

Examples of strong emphasis on ethics can be found in the 2019 values of Exxon Mobil. They state “We commit to being a good corporate citizen in all the places we operate worldwide. We will maintain high ethical standards, obey all applicable laws, rules, and regulations, and respect local and national cultures” (Exxon Mobil, 2019). A second strong ethics statement can be found in the values of DuPont. The firm states the value of “Highest ethical behavior. We conduct ourselves in accordance with the highest ethical standards, and in compliance with all applicable laws, always striving to be a respected corporate citizen worldwide” (DuPont, 2019). Overall, there were more good examples of emphasis on ethics in 2024 compared to 2019. The following section discusses the similarities and differences in the year following the pandemic compared to the year previous to the pandemic.

## **DIFFERENCES AND SIMILARITIES BETWEEN 2024 AND 2019 STATEMENTS**

Table 1 includes a distribution from the *Fortune 50* in 2024 and 2019. It summarizes the number of mission, vision, and values statements that included the terms ethics, integrity, or other similar terms from the two years under study. Starting with differences between 2024 and 2019, the first major difference is the number of companies that did not mention ethics or ethical behavior in any of the three statements. In 2019, there were 19 (38%) firms that did not mention ethics or integrity in either the mission, vision, or values statement. In 2024, that number dropped to only 8 (16%) firms. It is surprising that in 2019 well over one-

third of the *Fortune 50* firms did not consider ethics or integrity to be important enough to add of either the values, vision, or mission statement.

This, no doubt, was the result of many factors, but the authors argue that the pandemic was likely a major factor affecting the change. During the pandemic, many frauds and scams were created by unscrupulous individuals with the intent of getting rich during this horrific period. Examples include fraud schemes associated with the Paycheck Protection Program and the Employee Retention Credit. Given these massive frauds, the authors believe that Fortune 50 corporations felt the need to communicate to stakeholders the need for ethical and honest business practices.

**TABLE 1**  
**2024 vs. 2019 Mission, Vision, and Values Statements (Pre and Post Pandemic Years)**

<b>Ethics/Integrity Mentioned</b>	<b>2024</b>	<b>2019</b>
None of Statements	8	19
Values Statement Only	38	27
Vision Statement Only	0	2
Mission Statement Only	0	1
Mission & Values Statements	3	1
Vision & Values Statements	1	0
<i>Fortune 50</i> Totals	50	50

A second difference evident in this table is the significant increase in the number of firms that included ethics or integrity in their value statement in 2024. In 2019, there were 27 firms (54%) that mentioned ethics as one of their stated values. This increased to 38 companies (76%) in 2024 values statements. Many of the 2019 firms that made no mention of ethics decided to include that value in 2024. That accounts for the 11 firm decrease in the “none of the statements column” dropping from 19 in 2019 to only 8 in 2024, and the 11 company increase in “values statements only column” increasing from 27 in 2019 to 38 in 2024.

A final difference is the number of firms who mentioned ethics in two of the three statements. In 2019, only one firm mentioned ethics in both the mission and values statements. This figure tripled to three firms in 2024 that included ethics or integrity in both the mission and values statements.

A similarity from both years is the fact that most firms included ethics or integrity in their value statements only. In 2019, 27 companies (54%) included ethics in their values statement only, and this figure swelled to 38 firms (76%) five years later in 2024. A second similarity is that very few firms included ethics in two of the three communications, only one in 2019 and four in 2024. Finally, none of the *Fortune 50* firms included ethics in all three statements in either year.

## **SUMMARY AND CONCLUSION**

The review of mission, vision, and values statements for 2019 and 2024 show a number of significant changes. First, the *Fortune 50* firms are including the concept of ethics or integrity in more of their major communications when 2019 results are compared to those of 2024. Table 1 shows that 84% (42 of 50) of the 2024 *Fortune 50* companies mention ethics or integrity in at least one statement. This compared to only 62% of the 2019 *Fortune 50* firms. This is a notable change as these large companies realize that they must communicate this value to all of their stakeholders. In today’s business environment, the importance of

ethical business practices cannot be overstated. For this reason, it is strange that all the *Fortune 50* firms do not include ethics or integrity in at least the company's value statement.

As a conclusion to this paper, the authors felt it would be appropriate to briefly discuss ethical concerns surrounding the largest corporations by various stakeholder groups. Faster Capital operates a website that discusses several major ethical concerns often voiced by the public. The four major concerns included the exploitation of workers, damage caused to the environment, unethical business dealings, and income inequality (Faster Capital, 2025). Some large corporations, such as Nike and Adidas, have been accused for many years of exploiting workers in developing countries by providing low wages, poor working conditions, and lack of job security. Specifically, Nike has been accused of exploiting workers in its factories in Indonesia by paying them less than the minimum wage as well as other types of unethical treatment (Piazza, 2023).

Second, many of these largest corporations have been accused of having a significant negative effect on the environment. For example, ExxonMobil was accused of contributing to negative climate change by denying the existence of global warming and funding climate change denial campaigns (Reed, 2023). Third, several of these large corporations were accused of unethical or illegal business practices such as tax evasion, bribery, and corruption. Specifically, Walmart has been accused of bribing Mexican officials to accelerate new store openings in the country (Foroohar, 2012).

The fourth ethical concern involves income equality between workers and the CEO. According to Faster Capital, the CEOs of *Fortune 100* firms earned an average of 320 times more than the average worker (Faster Capital, 2025). In addition, Josh Bivens and Jori Kandra (2021), reporting for the Economic Policy Institute (EPI), found that CEOs were paid 399 times as much as a typical worker in 2021. Many other estimates exist, but the bottom line is that CEOs are paid extremely high and the gap between them and the average worker continues to grow.

Given these significant ethical concerns, publicly traded companies should do more to express their commitment to ethical behavior in all business operations. The importance of integrity and ethical behavior must be communicated to the public and the firm's stakeholders. It has been the authors' experience that locating the mission, vision, and values statements is often a very tedious process. These vital communications should be highlighted in both quarterly and annual reports due to their significance.

## REFERENCES

- Blount, S. & Leinwand, P. (2019). "Why are we here?" *Harvard Business Review*, November-December, <https://hbr.org/2019/11/why-are-we-here> retrieved on January 16, 2025
- Berkshire Hathaway. (2019). *Berkshirehathaway.com*, <https://www.berkshirehathaway.com/2019ar/2019ar.pdf> retrieved on January 16, 2025
- Bivens, J. & Kandra, J. (2022). "CEO Pay Has Skyrocketed 1,460% Since 1978." *Economic Policy Institute*, October 4, <https://www.epi.org/publication/ceo-pay-in-2021/> retrieved on January 16, 2025
- CDC. (2020). "CDC Museum COVID-19 Timeline." *CDC.gov*, <https://www.cdc.gov/museum/timeline/covid19.html> retrieved on January 16, 2025
- CDC. (2023). "End of the Federal COVID-19 Public Health Emergency (PHE) Declaration." *CDC.gov*, [https://archive.cdc.gov/www\\_cdc\\_gov/coronavirus/2019](https://archive.cdc.gov/www_cdc_gov/coronavirus/2019) retrieved on January 16, 2025

- Chandler, A. (2023). "Why Mission And Value Statements Matter." *Forbes*, Aug 18.
- Citigroup. (2019). "Global Investor Quarterly 2020 Annual Report." *Citigroup.com*, <https://www.citigroup.com/global/investor/quarterly/2020/annual-report#:~:text=Citi's%20mission%20is%20to%20serve,enable%20growth%20and%20economic%20progress> retrieved on January 16, 2025
- Costco. (2024). "Mission Statement." *Costco.com*, <https://customerservice.costco.com/app/mission-statement> retrieved on December 25, 2024
- Craig, W. (2018). "The Importance Of Having A Mission-Driven Company." *Forbes*, May 18, <https://www.forbes.com/sites/williamcraig/2018/05/15/the-importance-of-having-a-mission-driven-company/> retrieved on January 16, 2025
- DuPont. (2019). "2019 English Code of Conduct." *Dupont.com*, [https://www.dupont.com/content/dam/dupont/amer/us/en/news/corporate/documents/2019\\_English\\_Code\\_of\\_Conduct\\_public.pdf](https://www.dupont.com/content/dam/dupont/amer/us/en/news/corporate/documents/2019_English_Code_of_Conduct_public.pdf) retrieved on January 16, 2025
- Drucker, P.F. (1973). "Management: Tasks, Responsibilities, and Practices." New York, NY: Harper & Row.
- Exxon Mobil. (2019). "2019 Outlook for Energy." *Exxonmobil.com*, [https://corporate.exxonmobil.com/-/media/global/files/outlook-for-energy/2019-outlook-for-energy\\_v4.pdf](https://corporate.exxonmobil.com/-/media/global/files/outlook-for-energy/2019-outlook-for-energy_v4.pdf) retrieved on January 16, 2025
- Fannie Mae. (2024). "About." *Fanniemae.com*, <https://www.fanniemae.com/about-s#> retrieved on January 16, 2025
- Faster Capital. (2025). "The Ethical Concerns Surrounding The Fortune 100 Companies." *Fastercapital.com*, <https://fastercapital.com/topics/the-ethical-concerns-surrounding-the-fortune-100-companies.html> retrieved on January 16, 2025
- FedEx. (2024). "Company Overview." *Fedex.com*, <https://investors.fedex.com/company-overview/mission-and-goals/default.aspx> retrieved on January 16, 2025
- Foroohar, R. (2012). "Walmart's Discounted Ethics." *Time Magazine*, May 7, <https://time.com/archive/walmarts-discounted-ethics> retrieved on January 16, 2025
- Goldman Sachs Group. (2024). "Our Firm." *Goldmansachs.com*, <https://www.goldmansachs.com/our-firm/purpose-and-values> retrieved on January 16, 2025
- IBM. (2019). "Annual Report 2019." *Ibm.com*, [https://www.ibm.com/annualreport/assets/downloads/IBM\\_Annual\\_Report\\_2019.pdf](https://www.ibm.com/annualreport/assets/downloads/IBM_Annual_Report_2019.pdf) retrieved on January 16, 2025
- Johnson & Johnson. (2024). *Jnj.com*, <https://www.jnj.com> retrieved on January 16, 2025
- Kirkpatrick, S. A. (2016). "Build a Better Vision Statement." Lexington Books.
- Lencioni, P. M. (2002). "Make Your Values Mean Something." *Harvard Business Review*, July.
- Leontiades, M. (1982). "The Confusing Words of Business Policy." *Academy of Management Review*, 7(1), 45-48.
- Library of Congress. (2025). "First Fortune 500 List Published" *Library of Congress*,, <https://guides.loc.gov/this-month-in-business-history/may/first-fortune500-published> retrieved on October 3, 2025
- Lowe's. (2019). "2019 Final." *Lowes.com*, [https://corporate.lowes.com/sites/lowes-corp/files/2020-07/Lowes\\_2019\\_FINALOptimized.pdf](https://corporate.lowes.com/sites/lowes-corp/files/2020-07/Lowes_2019_FINALOptimized.pdf) retrieved on January 16, 2025
- Max, T. (2025). "Fortune 500 Company Values Examples." *Mkt.io*, <https://mkt.io/blog/fortune-500-company-values/> retrieved on January 16, 2025
- Morgan Stanley. (2024). "About Us." *Morganstanley.com*, <https://www.morganstanley.com/about-us/morgan-stanley-core-values> retrieved on January 16, 2025,

- Piazza, B. (2023). "Just Do It," but at What Cost? Exploring the Complex History of Nike's Ethics." *Greenmatters.com*, August 7, <https://www.greenmatters.com/style/is-nike-ethical> retrieved on January 16, 2025
- Proctor & Gamble. (2024). "Policies and Practices." *Pg.com*, <https://pg.com/policies-and-prctices/purpose-values-and-principles/> retrieved on January 16, 2025
- Qualtrics. (2023). "50 Examples of Strong Company Core Values." *Qualtrics.com*, February 22, <https://www.qualtrics.com/blog/company-core-values/> retrieved on January 16, 2025
- Reed, B. (2023). "New Files Shed Light on ExxonMobil's Efforts to Undermine Climate Science." *The Guardian*, September 14, <https://www.theguardian.com/usnews/2023/sep/14/exxonmobil-documents-wall-street-journal-climate-science> retrieved on January 16, 2025
- Schaap, J. I. & Gonzalez, A. F. (2025). "Are the Vision Statements of Fortune 50 Companies Convincing? You Can Make That Decision." *Subr.edu*, <https://www.subr.edu/assets/subr/COBJournal/Vision-Statement-Study---Final.pdf> retrieved on January 16, 2025
- United Health Group. (2024). "Mission Value." *Unitedhealthgroup.com*, <https://www.unitedhealthgroup.com/uhg/mission-values.html> retrieved on January 16, 2025
- United Parcel Service (UPS). (2024). "Our Impact/Value." *Ups.com*, <https://about.ups.com/us/en/our-impact/values> retrieved on January 16, 2025
- Wells Fargo. (2024). "About." *Wellsfargo.com*, <https://www.wellsfargo.com/about/corporate> retrieved on January 16, 2025

# HOW LEADERSHIP CHANGES INFLUENCE CORPORATE FINANCIAL POLICIES

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## ABSTRACT

This study examines the impact of CEO turnover on corporate financial policies from a theoretical perspective, focusing on how leadership transitions influence leverage decisions and market uncertainty. Using an integrative framework that incorporates Agency Theory, Upper Echelons Theory, Stewardship Theory, and Dynamic Managerial Capabilities, this paper develops theoretical propositions that explain how CEO background and origin (internal vs. external) shape corporate financial strategies. The analysis suggests that externally hired CEOs are more likely to implement significant financial policy changes, while internally promoted CEOs favor continuity. Additionally, a CEO's prior experience with leverage influences their decision-making in the new firm, and leadership transitions contribute to short-term market volatility. This conceptual approach provides a foundation for future empirical research and offers practical insights for corporate boards, investors, and policymakers in assessing the financial implications of executive succession.

Keywords: CEO turnover, Corporate financial policy, Capital structure, Corporate culture

## INTRODUCTION

CEO transitions are among the most critical events in a firm's lifecycle, influencing corporate financial policies, particularly capital structure decisions. Leadership changes often signal strategic realignment, shifts in investor expectations, and varying degrees of market uncertainty. These transitions are not merely administrative changes but serve as inflection points that reshape corporate decision-making and financial strategies. The selection of a new CEO, whether from within the organization or externally, has far-reaching implications for financial policy, investment strategies, and corporate governance structures.

Prior research has established that managerial styles, risk preferences, and personal characteristics significantly influence financial decision-making. Bertrand and Schoar (2003) demonstrate that CEOs develop persistent decision-making styles that impact firm policies, suggesting that leadership changes can introduce new financial strategies. Graham, Harvey, and Puri (2013) further document wide heterogeneity in CEO preferences and financial beliefs, finding that executives differ systematically in their views on debt, risk, and capital structure. Cain and McKeon (2016) further highlight how a CEO's personal risk tolerance influences corporate leverage choices, reinforcing the idea that leadership turnover has substantial financial repercussions. While much of the existing literature acknowledges the importance of CEO transitions, relatively few studies have developed a structured framework explaining how different types of leadership changes drive financial policy shifts.

Importantly, financial policy changes following CEO turnover are not just academic abstractions, they have real consequences for firm valuation, credit ratings, and stakeholder perceptions. Consider the return of Bob Iger to Disney in 2022 amid declining performance and strategic uncertainty. Iger's reappointment was widely interpreted by markets as a stabilizing move that would re-anchor the firm's strategic and financial discipline. In contrast, Elon Musk's takeover of Twitter in 2022 led to a rapid overhaul in corporate direction, including a sharp change in cost structure, ownership leverage, and funding models. These examples underline how leadership transitions can trigger dramatic shifts in capital structure and financial risk-taking, shaped by the incoming CEO's philosophy, urgency for change, and stakeholder dynamics.

A critical aspect of CEO turnover is whether the incoming executive is an internal successor or an external hire. Research suggests that internally promoted CEOs are more likely to maintain strategic continuity, whereas external hires are often associated with bold policy shifts (Weisbach, 1995). External CEOs bring new perspectives, experiences, and financial philosophies, which can result in major corporate restructuring efforts, including adjustments to capital structure, debt levels, and financial risk-taking. Shleifer and Vishny (1997) and Huson et al. (2004) emphasize the role of governance structures in determining the extent to which a new CEO initiates financial policy changes. More recent studies, such as Jenter and Lewellen (2021), provide empirical evidence that CEO replacements, particularly those motivated by firm performance concerns, lead to significant shifts in financial structure. However, while these studies shed light on broad trends, they do not fully address how a CEO's financial background specifically influences leverage decisions, nor do they systematically explain when and why such shifts occur.

This paper bridges this gap by providing a conceptual framework that explains how leadership transitions, particularly external hires, influence corporate leverage policies. Theoretical perspectives from Agency Theory, Upper Echelons Theory, Stewardship Theory, and Dynamic Managerial Capabilities Theory offer complementary explanations for the mechanisms through which CEO turnover shapes financial strategies. This study aims to clarify the conditions under which CEO transitions lead to aggressive leverage adjustments versus more conservative financial strategies, considering the impact of CEO backgrounds, strategic motivations, and governance constraints.

By offering a structured approach to CEO-driven financial decision-making, this paper contributes to corporate finance literature in several ways. First, it integrates theoretical perspectives to develop a comprehensive framework that links CEO turnover with capital structure changes. Second, it refines existing arguments by highlighting the role of prior financial experiences in shaping executive decision-making. Third, it underscores the importance of board-level strategic considerations in CEO selection and financial policy realignment. These contributions provide valuable insights for academics, practitioners, and policymakers concerned with corporate governance, executive succession, and financial risk management.

The remainder of the paper is organized as follows. Section 2 presents the theoretical background and hypotheses, drawing upon key theories in corporate finance and strategic leadership. Section 3 discusses the implications of these theoretical perspectives for practitioners and outlines avenues for future research. Section 4 concludes by summarizing the contributions of this study and reinforcing the importance of leadership-driven financial policy adjustments.

## **THEORETICAL BACKGROUND AND PROPOSITION**

### **Agency Theory and CEO Turnover**

Agency Theory (Jensen and Meckling, 1976) suggests that conflicts between shareholders and executives arise due to misaligned incentives, as managers may prioritize personal interests over shareholder value. CEO turnover fundamentally modifies these agency dynamics, often reshaping the monitoring environment and the power balance between the board and the executive.

When long-tenured CEOs are replaced, particularly after periods of poor firm performance, it often reflects the board's attempt to reduce managerial entrenchment. Entrenched CEOs may resist value-enhancing changes, such as leverage adjustments or divestitures, to preserve control and avoid scrutiny. Replacing them with externally hired CEOs, who typically lack deep social and political capital within the firm, can reduce information asymmetry and enable stronger board oversight. These new CEOs, facing high performance pressure and keen to establish credibility, may adopt bold financial strategies, including restructuring debt, changing payout policies, or pursuing acquisitions (Weisbach, 1995; Parrino, 1997).

Conversely, internal successors may benefit from established trust with the board and are more likely to operate within existing governance norms. While this may result in greater alignment with long-term strategic goals, it could also continue risk-averse or suboptimal capital structures inherited from their

forerunners (Finkelstein et al., 2009; Chen and Hambrick, 2012). External CEOs, often granted more autonomy in response to prior underperformance, tend to receive performance-linked, equity-based compensation packages that encourage decisive financial policy shifts, particularly involving leverage and capital allocation.

Thus, the post-turnover phase becomes a window where the balance between monitoring intensity and managerial discretion plays a critical role in shaping corporate financial outcomes. Entrenchment-related inefficiencies may be corrected by governance changes that accompany CEO turnover, but the effectiveness of this shift depends on the CEO's origin, incentives, and strategic alignment with the board.

### Upper Echelons Theory and CEO Background

Upper Echelons Theory (Hambrick and Mason, 1984) suggests that a CEO's strategic decisions are shaped by their personal characteristics, experiences, and cognitive frames. These cognitive frames, mental models developed over time, act as filters through which executives interpret information, evaluate risks, and formulate strategies. One of the most enduring aspects of these frames is imprinting, or the lasting influence of formative professional experiences on decision-making patterns (Marquis and Tilcsik, 2013).

In the context of financial policy, CEOs who previously led firms with aggressive capital structures may perceive debt as a strategic tool for signaling confidence or financing growth, leading them to favor higher leverage. On the other hand, CEOs shaped by environments that emphasized financial conservatism, such as cash-rich tech firms or firms that survived financial crises, may imprint cautious debt philosophies that persist even when operating in new contexts. These imprints influence how CEOs react to financial slack, risk-taking opportunities, or investor pressures, and help explain heterogeneous capital structure outcomes following CEO turnover.

This theory also highlights bounded rationality, the idea that executives make decisions not in a vacuum but under cognitive constraints and personal values. As such, two CEOs facing similar firm conditions may choose divergent leverage policies simply because their prior experiences predispose them to interpret risk, control, and market signals in a different way. For instance, an executive trained in private equity may focus on financial engineering and capital optimization, while a CEO from a founder-led startup may emphasize organic growth and equity financing.

CEO succession events, therefore, mark a cognitive and strategic reset in the firm's financial posture. Upper Echelons Theory offers a powerful explanation for why CEO origin alone (internal vs. external) is insufficient to predict financial policy shifts, what truly matters is where the CEO is coming from, cognitively and experientially.

### Stewardship Theory and Internal Successions

Stewardship Theory (Donaldson and Davis, 1991) offers a contrasting perspective to Agency Theory by proposing that executives are intrinsically motivated to act in the best interests of the firm and its stakeholders. Rather than viewing CEOs as self-serving agents, this theory casts them as stewards, leaders whose values are aligned with organizational goals and who prioritize the firm's longevity and health over short-term personal gain.

This framework is particularly relevant in the case of internally promoted CEOs. These executives often have long tenures within the firm, which fosters a deep understanding of its culture, operations, and strategic trajectory. Their promotion represents a continuation of legacy and trust, not just a leadership change. Therefore, internal successors are more likely to pursue incremental adjustments to financial policy rather than extreme restructuring. Their approach to leverage decisions, for example, may reflect a careful balance between maintaining stakeholder confidence and supporting sustainable growth, rather than signaling change through aggressive debt issuance or capital restructuring.

Internally promoted CEOs are also bound by an implicit psychological contract with the board and employees, often having risen through the ranks by demonstrating loyalty, dependability, and competence.

This trust-based relationship reinforces long-term alignment and discourages decisions that could disrupt internal cohesion or corporate reputation. Financial conservatism, therefore, can be a manifestation of this stewardship role, favoring stability over volatility, stakeholder trust over signaling effects, and organic growth over leveraged expansion.

Moreover, boards may select internal candidates specifically to preserve strategic continuity during periods of uncertainty. These appointments often send reassuring signals to investors and employees, reducing the perceived risk associated with leadership transitions. Thus, internal CEO successions are generally associated with more predictable and stable financial policies, reinforcing the idea that stewardship dynamics shape not only leadership styles but also firm-level financial behavior.

### Dynamic Managerial Capabilities and Strategic Adaptation

Dynamic Managerial Capabilities Theory (Teece, 2007) emphasizes the role of top executives in sensing opportunities, seizing them through strategic initiatives, and reconfiguring organizational assets in response to changing environments. This perspective is especially relevant during CEO turnovers, which often mark inflection points where firms must navigate evolving market conditions, technological disruption, or stakeholder pressures. New CEOs bring with them unique capabilities that shape how a firm adapts strategically and financially.

A CEO's prior experience in dynamic environments, such as managing through recessions, restructurings, or digital transformation, can shape their adaptive toolkit. Leaders with a track record of successful change management are more likely to implement swift, decisive changes to capital structure in order to support a broader reorientation of corporate strategy. For example, when Satya Nadella became CEO of Microsoft, he pivoted the company toward cloud computing and platform services, restructuring both operations and financial priorities to support long-term innovation.

Conversely, CEOs with limited exposure to turbulent strategic environments may adopt more incremental or conservative approaches to change. Their strategic adaptation may involve preserving cash flows, reducing leverage, or avoiding risky capital investments until they have fully assessed internal capabilities and external threats. These differences in managerial capabilities directly influence the direction of financial policy post-turnover.

Moreover, dynamic capabilities extend beyond individual knowledge to include the ability to reconfigure organizational routines, teams, and culture. CEOs who proactively reshape the firm's strategic direction may also adjust its financial structure to align with new objectives. Elon Musk's acquisition of Twitter (now X) illustrates this concept: Musk not only changed leadership and operational models but also made significant adjustments to cost structure, financing strategy, and investment priorities, demonstrating how leadership change can drive simultaneous strategic and financial transformation.

Hence, the degree to which a new CEO leverages dynamic managerial capabilities will influence whether a firm maintains its existing financial structure or pursues a more significant capital structure shift. These capabilities serve as an important moderating factor in the relationship between CEO turnover and financial policy change.

### Institutional Theory and External Pressures on New CEOs

Institutional Theory (DiMaggio and Powell, 1983) focuses on how organizational behavior is shaped by external norms, expectations, and pressures from influential stakeholders. In the context of CEO turnover, newly appointed leaders, especially those stepping in during times of crisis or under public scrutiny, often operate within a tight web of institutional expectations. These include pressures from activist investors, credit rating agencies, regulatory bodies, the media, and even peer benchmarking within the industry.

Unlike the internally driven decision-making processes highlighted by Agency or Stewardship theories, Institutional Theory suggests that conformity to external expectations can significantly constrain or shape CEO behavior, especially regarding financial policy. A new CEO may face immediate pressure to stabilize

leverage ratios, reduce perceived risk, or demonstrate a commitment to shareholder value through visible financial actions (e.g., dividend increases, share repurchases, or reducing leverage).

Consider the case of GE's CEO transition in 2017, when John Flannery took over from Jeff Immelt. Facing pressure from shareholders and credit rating agencies concerned about the firm's financial health, Flannery's early tenure focused on shrinking GE's balance sheet, deleveraging, and divesting non-core assets, moves largely motivated by external institutional expectations rather than just internal strategy. Similarly, CEOs brought in under activist investor influence, such as those at Procter & Gamble or Bed Bath & Beyond, are often constrained in their financial strategy, as they must quickly demonstrate alignment with shareholder demands.

In this way, Institutional Theory complements the other theoretical lenses by emphasizing the contextual constraints under which CEOs operate. Even highly skilled and forward-looking CEOs may moderate or delay their preferred financial policies to preserve legitimacy in the eyes of key institutional stakeholders. This highlights the importance of understanding not only who the new CEO is, but also the environment into which they step.

## Hypotheses

Building on the theoretical perspectives outlined above, this study proposes a set of testable propositions to explain how CEO turnover influences corporate financial policy, particularly leverage decisions. These hypotheses are motivated by the notion that leadership transitions are not uniform events but vary systematically depending on the origin of the CEO, their prior experience, and the institutional and strategic context into which they are appointed. CEO transitions bring both opportunities and constraints: new leaders may introduce fresh strategic direction, but they are also shaped by governance structures, external expectations, and their own decision-making imprints.

Hypothesis 1 focuses on the distinction between externally hired and internally promoted CEOs. Agency Theory states that external appointments often occur in response to perceived managerial entrenchment or firm underperformance, leading boards to seek more aggressive strategic realignment. Unburdened by legacy decisions, new CEOs may pursue bold shifts in financial policy to assert control, build credibility, and respond to pressure for improved performance. Stewardship Theory, in contrast, highlights how internally promoted CEOs, typically nurtured within the firm, tend to show continuity in financial behavior, with a preference for stability and gradualism. Together, these theories suggest that the origin of the CEO strongly moderates the likelihood and magnitude of financial policy shifts.

Moreover, externally hired CEOs may also have more leeway from the board to implement major changes, particularly when their appointment follows a governance-driven initiative to reset leadership. They may face strong market expectations to deliver results quickly, often using leverage-related decisions (e.g., debt restructuring or dividend signaling) to convey commitment to shareholder value. Internally promoted CEOs, by contrast, may interpret their role as stewards of a legacy, maintaining established financial norms unless external pressures demand otherwise.

**Hypothesis 1:** *Externally hired CEOs are more likely to initiate significant changes in corporate financial policies, such as adjustments to capital structure, payout policy, or debt composition, compared to internally promoted CEOs, who are more likely to maintain continuity in financial strategy.*

A CEO's prior exposure to financial strategy, especially their historical use of leverage, plays a critical role in shaping firm financial policies post-turnover. Drawing from Upper Echelons Theory, executives do not make decisions in a vacuum; rather, they rely on cognitive frames shaped by prior experience. CEOs who previously managed firms with aggressive capital structures are more likely to view debt as a tool for strategic flexibility, signaling confidence or enabling expansion. These individuals often bring a "financial engineering" mindset to their new roles, using leverage more readily to pursue performance goals.

In contrast, CEOs from conservatively financed firms, such as those operating in volatile industries or post-crisis environments, may maintain a cautious stance toward debt. Their decision-making style often reflects a preference for financial stability and liquidity preservation. These imprints shape not only the CEO's attitude toward debt but also how they respond to performance pressure, stakeholder expectations, or investment opportunities.

**Hypothesis 2:** *Firms that hire CEOs from previously low-leverage or conservatively financed firms are more likely to experience a reduction in leverage following the leadership transition.*

CEO turnover is inherently a destabilizing event in the short term, particularly when paired with changes in strategic direction or financial policy. Dynamic Managerial Capabilities Theory suggests that new CEOs engage in sensing, seizing, and reconfiguring strategic resources, a process that often unsettles investor expectations in the early stages. Regardless of the long-term benefits of these changes, the immediate effect can be heightened uncertainty as stakeholders reassess the firm's trajectory.

This uncertainty can reveal as increased stock price volatility in the aftermath of the transition. Markets may interpret early signals from the new CEO, such as shifts in tone, investment focus, or cost structure, as indicators of broader realignment. Moreover, financial analysts and investors often need time to adjust their valuation models to reflect the new leadership's philosophy, leading to a temporary increase in information asymmetry and speculative behavior in the market.

**Hypothesis 3:** *CEO transitions are associated with short-term increases in stock price volatility due to strategic uncertainty and market reassessment of the firm's future trajectory.*

Finally, while internal firm dynamics heavily influence financial decision-making, Institutional Theory reminds us that CEOs, especially new ones, must also navigate a complex web of external pressures. These include expectations from activist investors, credit rating agencies, institutional shareholders, and media scrutiny. For externally appointed CEOs brought in during times of crisis, these pressures can be particularly intense, effectively constraining their autonomy and shaping the direction and timing of financial decisions.

Even CEOs with bold financial philosophies may moderate their strategies to align with institutional norms. For example, new CEOs may feel compelled to initiate deleveraging or divest non-core assets if credit agencies signal concern, or they may accelerate shareholder-friendly actions like buybacks to gain early legitimacy with investors. In this way, external institutional forces act as gatekeepers of financial policy discretion in the post-turnover period.

## IMPLICATIONS AND FUTURE RESEARCH

The theoretical framework presented in this study has several important implications for both academic research and practical corporate governance. By integrating multiple theories, this paper provides a structured approach to understanding how CEO turnover influences financial policy, particularly leverage decisions and market stability. These insights have direct relevance for corporate boards, investors, policymakers, and scholars interested in executive leadership and financial decision-making.

### Managerial and Board Implications

For corporate boards, understanding how CEO backgrounds shape financial strategies is essential when selecting new leadership. If firms seek to modify their financial policies—whether by increasing leverage, reducing debt, or maintaining stability—board members should consider the financial philosophies and prior experiences of potential CEO candidates. External hires with aggressive financial backgrounds may

drive transformative changes, while internally promoted CEOs tend to prioritize continuity. This understanding can help firms align their leadership choices with strategic financial goals.

Additionally, CEO turnover is associated with market uncertainty. Boards should anticipate potential volatility in stock prices and develop clear communication strategies to manage investor expectations. Providing transparency about leadership changes and intended financial strategies can mitigate market disruptions and build confidence among shareholders.

Boards may also benefit from scenario planning and stress testing financial policies during executive succession planning. For instance, simulation exercises that incorporate various CEO profiles can help directors anticipate how different leadership styles might affect capital allocation, risk tolerance, and stakeholder engagement. By institutionalizing such forward-looking assessments, boards can better align leadership decisions with long-term financial resilience.

Further, succession decisions should take into account not only the CEO's individual capabilities but also their fit with the firm's evolving external environment. In dynamic markets or during crises, appointing a CEO with demonstrated strategic agility and capital restructuring experience may be more beneficial than prioritizing cultural continuity alone. This strategic alignment between CEO traits and organizational context should form a key element in succession planning protocols.

### Investor Considerations

From an investor perspective, CEO transitions present both risks and opportunities. The market reaction to a new CEO often depends on whether they are an internal or external hire, as well as their financial decision-making history. Investors should evaluate the new CEO's background to predict potential shifts in corporate strategy, particularly concerning leverage policies. If a new CEO has a track record of favoring high leverage, investors may expect increased debt levels and adjust their valuation models accordingly. Conversely, if a CEO comes from a more conservatively financed firm, investors might anticipate risk-averse strategies and lower debt levels.

Short-term market volatility following CEO changes is another key consideration. As suggested by Dynamic Managerial Capabilities Theory, firms undergoing leadership transitions often experience fluctuations in stock prices as investors react to anticipated policy shifts. Understanding the likely direction of financial strategies can help investors make informed decisions regarding firm valuation and portfolio adjustments.

Moreover, the institutional context into which a CEO is appointed can signal to investors how constrained or empowered the new leadership will be. For example, investors may view CEO transitions accompanied by activist pressure or regulatory scrutiny as more likely to result in conservative, risk-averse financial strategies. By contrast, transitions framed as part of a strategic transformation may increase expectations for bolder financial maneuvers. These interpretive cues play a significant role in shaping investor sentiment and stock price responses in the early post-turnover period.

For fixed income investors and credit analysts, CEO turnover introduces credit risk considerations. A shift toward more aggressive capital structure policies may affect debt covenants, interest coverage, and refinancing risk. Understanding the new CEO's historical relationship with leverage and financial restructuring becomes especially relevant for assessing bondholder risk exposure and credit rating outlooks.

### Future Research Directions

Future research can build upon this conceptual framework by empirically testing the proposed hypotheses and further refining the relationship between CEO turnover and corporate financial policies. Longitudinal studies that track financial policy changes before and after CEO transitions can provide empirical validation for the theoretical arguments presented in this paper. Analyzing a large dataset of CEO turnovers across industries and time periods could yield robust insights into the causal relationship between leadership changes and capital structure decisions.

Another important area of research is the role of CEO career histories in shaping financial decision-making. Investigating how prior experiences influence a CEO's strategic choices in their new role can further illuminate the CEO imprinting hypothesis. CEOs who previously led firms with aggressive leverage policies may continue similar strategies when transitioning to new organizations, whereas those from conservatively financed firms may favor risk-averse financial approaches.

Furthermore, market reactions to CEO turnover events warrant additional investigation. Empirical research on stock price movements following CEO changes can clarify the extent to which leadership transitions drive investor uncertainty. Using event-study methodologies, researchers can determine whether external hires generate greater volatility than internal promotions and whether certain financial policy changes trigger stronger investor responses.

Future research can also examine the mediating role of firm-specific factors such as financial slack, existing governance strength, or competitive intensity in moderating the impact of CEO turnover on leverage policy. For example, firms with greater cash reserves or lower debt obligations may allow new CEOs more flexibility in financial experimentation. Conversely, firms facing liquidity constraints or hostile environments may restrict the scope of financial innovation post-turnover.

Another avenue worth exploring is how digital transformation and technological disruptions interact with CEO succession and financial strategy. As firms increasingly operate in volatile and tech-driven environments, understanding how new leaders navigate capital allocation and risk under digital uncertainty becomes an urgent research priority.

Lastly, the interaction between corporate governance mechanisms and CEO-driven financial policies remains an open area for exploration. The extent to which strong governance frameworks constrain external CEOs from making drastic financial shifts is an important consideration. Future studies could assess whether firms with more independent boards, higher institutional ownership, or stronger regulatory oversight experience less dramatic leverage adjustments following CEO transitions. By addressing these research areas, scholars can refine and expand the theoretical contributions of this study, offering more nuanced insights into the relationship between executive leadership and financial decision-making.

## CONCLUSION

CEO turnover plays a fundamental role in a firm's financial trajectory. It not only reshapes internal leadership dynamics but also serves as a catalyst for reconfiguring capital structure, risk posture, and investor perception. This paper develops a multi-theoretical framework that integrates Agency Theory, Upper Echelons Theory, Stewardship Theory, Dynamic Managerial Capabilities, and Institutional Theory to explain how and why financial policies, particularly leverage decisions, are affected by leadership change. A key insight from this framework is that not all CEO transitions have the same financial consequences. The distinction between internal and external hires, while important, is only one part of the story. What matters more are the CEO's cognitive imprints, adaptive capabilities, motivational alignment with stakeholders, and sensitivity to institutional constraints. A CEO's past experience with leverage, their perceived mandate for change, and the external pressures they face all interact to shape post-turnover financial outcomes.

This study also advances the literature by emphasizing that capital structure decisions are not purely firm-specific optimizations, they are filtered through the personal, strategic, and institutional lenses of new leaders. The framework encourages a more nuanced understanding of financial policy changes, particularly in the immediate aftermath of CEO succession, when uncertainty and strategic recalibration are most pronounced. In doing so, this paper provides a platform for future empirical research to test the propositions developed here. Future work may examine whether the effects of CEO turnover on leverage are moderated by industry conditions, board composition, or activist investor involvement; or explore how capital markets respond to different CEO profiles during transition periods.

By offering a structured theoretical perspective on how leadership change influences financial policy, this study contributes to corporate finance, strategic management, and governance literatures. It also provides

practical insights for boards, investors, and policymakers seeking to understand or influence financial decision-making in the context of executive succession.

## REFERENCES

- Bertrand, M., & Schoar, A. (2003). Managing with style: The effect of managers on firm policies. *The Quarterly Journal of Economics*, 118(4), 1169-1208.
- Cain, M. D., & McKeon, S. B. (2016). CEO personal risk-taking and corporate policies. *Journal of Financial and Quantitative Analysis*, 51(1), 139-164.
- Chen, G., & Hambrick, D. C. (2012). CEO replacement in turnaround situations: Executive (mis) fit and its performance implications. *Organization Science*, 23(1), 225-243.
- DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48(2), 147-160.
- Donaldson, L., & Davis, J. H. (1991). Stewardship theory or agency theory: CEO governance and shareholder returns. *Australian Journal of management*, 16(1), 49-64.
- Finkelstein, S., Hambrick, D. C., & Cannella, A. A. (2009). *Strategic leadership: Theory and research on executives, top management teams, and boards*. Oxford University Press, USA.
- Graham, J. R., Harvey, C. R., & Puri, M. (2013). Managerial attitudes and corporate actions. *Journal of Financial Economics*, 109(1), 103-121.
- Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review*, 9(2), 193-206.
- Huson, M. R., Malatesta, P. H., & Parrino, R. (2004). Managerial succession and firm performance. *Journal of Financial Economics*, 74(2), 237-275.
- Jenter, D., & Lewellen, K. (2021). Performance-induced CEO turnover. *The Review of Financial Studies*, 34(2), 569-617.
- Marquis, C., & Tilesik, A. (2013). Imprinting: Toward a multilevel theory. *The Academy of Management Annals*, 7(1), 195-245.
- Meckling, W. H., & Jensen, M. C. (1976). Theory of the Firm. Managerial behavior, agency costs and ownership structure, 3(4), 305-360.
- Parrino, R. (1997). CEO turnover and outside succession a cross-sectional analysis. *Journal of Financial Economics*, 46(2), 165-197.
- Shleifer, A., & Vishny, R. W. (1997). A survey of corporate governance. *The Journal of Finance*, 52(2), 737-783.
- Teece, D. J. (2007). Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, 28(13), 1319-1350.
- Weisbach, M. S. (1995). CEO turnover and the firm's investment decisions. *Journal of Financial Economics*, 37(2), 159-188.

# **US INVASION OF AFGHANISTAN: A TEST OF MARKET EFFICIENCY IN THE DEFENSE SECTOR**

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## **ABSTRACT**

This study tests market efficiency theory on and around the Afghanistan invasion announcement by the US on October 7<sup>th</sup>, 2001. This research analyzes the risk adjusted rate of return of the S&P 500 index and 10 companies considered a part of the defensive industry and traded on the New York Stock Exchange (NYSE). The purpose of this study was to test how efficiently the market reacts to new information, more specifically, how efficiently defensive companies' stocks react to announcements of war. Results support the semi-strong form efficient market hypothesis since no investor could earn an above normal risk adjusted return by acting on the announcement date. Results show an increase in risk adjusted returns from day -10 to day 0, then a significant decrease from day 0 to day +27. Possibly the observed positive reaction prior to the October 7<sup>th</sup> announcement of Afghanistan invasion surfaced because of the anticipation of the US invasion in response to the September 11 attack. Consistent with market efficiency and behavioral finance theories (Fama, 1997), we observe a negative overreaction from day 0 to day +20 followed by another negative overreaction from day +20 to day +30 and finally leveling off to equilibrium in by day +30. We can see a large dip between days -20 and -10 which includes the September 11<sup>th</sup> attacks. No evidence shows significant excess returns being made on the announcement date.

Key Words: market, efficiency, defense firms, event study.

## **INTRODUCTION**

Military conflicts have existed throughout history. While wars result from political and humanitarian factors, there is also a large economic aspect. During the fiscal year of 2022 the United States spent 766 billion on national defense which accounts for 12 percent of federal spending. Currently, the defense sector is a large business that creates weapons and equipment for different militaries around the world. Military expansion in the world has become extremely profitable for defense companies due to the demand for weapons and equipment sold by defense companies.

How efficiently and quickly do markets react to new information and can excess returns be earned based on past information? This study hypothesizes that the US announcement of invasion of Afghanistan would increase the demand for companies in the defensive sector, especially ones that directly provide equipment to the US army. Since the 2001 US invasion of Afghanistan, the US has spent \$2.313 trillion on the conflict including operations both in Afghanistan and Pakistan.

Pentagon spending has totaled \$14 trillion since the start of the war in Afghanistan with about one third to a half of this money going to military contractors. One third of total contracts have gone to five corporations: Lockheed Martin, Boeing, General Dynamics, Raytheon, and Northrop Grumman. It follows that announcements of conflicts regarding the US military would have a positive effect on these companies' stocks due to the increase in demand for war equipment.

Using an event study, this research tests how efficiently the stock market reacts to new information and determines if an investor can earn above normal risk adjusted returns by acting on the announcement. The purpose of this study is to measure how quickly the stock market reacts to the announcement of the US

invasion of Afghanistan in 2001. Can an investor make excess risk adjusted returns by trading defense industry stocks on and around the announcement of the Afghan invasion on October 7<sup>th</sup>, 2001.

According to the efficient market hypothesis (EMH), the stock market should have an immediate reaction to the announcement of the Afghan war and no investor should be able to make excess returns by acting on the information. (Bacon & Howell, 2021; Bacon & Cannon, 2018; Bacon & Gobran, 2017; Bacon & Spradlin, 2019; Bacon & George, 2023)

## LITERATURE REVIEW

This study tests the EMH on and around the announcement of the US invasion of Afghanistan in 2001. Fama (1970, 1976) defined three forms of market efficiency: weak-form, semi-strong-form and strong-form. Under weak form efficiency no investor can earn an above normal return by making investment decisions based on past information. Numerous studies support the weak form market efficiency hypothesis (Fama, 1965; Alexander, 1961; Fama and Blume, 1966; Granger and Morgenstern, 1970). Under weak form efficiency, stock price reacts so fast to past information that no investor can earn an above normal risk adjusted return (i.e., higher than the risk adjusted return using the S&P 500 index) by acting on this information. If an investor reviews a firm's annual report, discovers strong positive earnings results for the past year, and buys the firm's stock and the stock price remains constant, the market is said to be weak form efficient based on past information (Bacon & Howell, 2021; Bacon & Cannon, 2018; Bacon & Gobran, 2017; Bacon & Spradlin, 2019; Bacon & George, 2023).

The semi-strong form of EMH claims that no investor can earn an above normal, risk adjusted return by acting on publicly available information. Tests of semi-strong form efficiency (Fama, Fisher, Jensen, & Roll, 1969; Ball & Brown, 1968; Aharony & Swary, 1980; Joy, Litzenberger, & McEnally, 1977; Watts, 1978; Patell & Wolfson 1979; Scholes, 1972; Kraus & Stoll, 1972; Mikkelsen & Partch, 1985; Dann, Mayers, & Raab, 1977 Ross 2008,) support the semi-strong-form EMH that no investor can earn an above normal risk adjusted return using public information such as dividend announcements, sale of stock announcements, repurchase of stock announcements, accounting statements, stock split announcements, block trades, and earnings announcements. If the market is semi-strong form efficient, then stock price reacts so fast to all public information that no investor can earn an above normal risk adjusted return by acting on the public announcement. If one buys the stock on the announcement and still does not make an above normal risk adjusted return, the market is semi-strong form efficient (Bacon & Spradlin, 2019; Bacon & Gobran, 2017, Bacon & Hutchinson, 2020; Bacon & George, 2023, Bacon and Greis, 2008) Tung & Marsden (1998) discovered a positive relationship between information quality and market trading profits in support of semi-strong form efficiency.

The strong-form EMH claims that no investor can earn an above normal risk adjusted return using past, public or private information. Studies testing strong form efficiency (Jaffe, 1974; Finnerty, 1976; Givoly & Palmon, 1985; Friend, Blume, & Crockett, 1970; Jensen, 1968, Bodie, Kane., and Marcus 2007) show mixed results. The market reacts to an event even before it is made public. Basically, investors must act on insider information, an illegal act. If an investor uses inside information and buys the stock on the event, and earns no above normal risk adjusted return, the market is strong form efficient (Bacon & Hutchinson, 2021; Bacon & Spradlin, 2019; Bacon & Gobran, 2017; Bacon & George, 2023).

## METHODOLOGY

The event analyzed in this study is the announcement of an Afghan invasion by the US on October 7<sup>th</sup>, 2001. The announcement day (October 7, 2001) is day 0 and stock market data for the sample of 10 large cap defense sector firms and the S&P 500 is gathered from 180 days before October 7, 2001, to 30 days after the event using (<http://finance.yahoo.com>). The pre-event period will serve as 180 days before to 30 days before the event period or 150 days. The 30 days before to 30 days after the event will serve as the event period (60 days).

The following steps were taken to conduct the event study test: Holding period returns for the 10 different stocks as well as the S&P 500 were calculated. ( $HPR = (\text{current day close price} - \text{previous day close price}) / \text{previous day close price}$ ). A regression analysis between the 10 companies and the S&P 500 is calculated to determine the firm's alphas and betas. The 10 companies' stock returns will serve as the dependent variable (Y values) and the S&P 500 returns serve as the independent variables (X values). This regression analysis will be calculated from the pre-event period, 180 days to 30 days before the event. The expected return for each company is calculated using the alphas and betas from the regression analysis for the event period (30 days before to 30 days after the event).  $\text{Expected return} = \text{alpha} + \text{beta} (\text{HPR S\&P 500})$ . From this the excess returns can be calculated for each company:  $\text{Excess returns} = \text{actual returns} - \text{expected returns}$ . With the excess returns, the average excess returns (AER) for the event period can be calculated (30 days before to 30 days after the event).  $\text{AER} = \text{Sum of all excess returns for each day/number of stocks (10 defense firm stocks in this study)}$ . With the AER the cumulative average excess return can be calculated (CAER) for the event period (30 days before to 30 days after the event).  $\text{Daily CAER} = \text{daily sum of AER}$ .

## QUANTITATIVE TESTS AND RESULTS

The study examines stock performance of 10 companies that are a part of the defensive sector and hypothesized to be impacted by the October 7<sup>th</sup> announcement of Afghanistan invasion conducted by the US. The hypothesis tested were as follows:

H1<sub>0</sub>: The risk adjusted return of the stock price of the sample of defense firms is not significantly affected by this type of information on the announcement date.

H1<sub>1</sub>: The risk adjusted return of the stock price of the sample of defense firms is significantly positively affected by this type of information on the announcement date.

H2<sub>0</sub>: The risk adjusted return of the stock price of the sample of defense firms is not significantly affected by this type of information around the announcement date as defined by the event period.

H2<sub>1</sub>: The risk adjusted return of the stock price of the sample defense firms is significantly positively affected around the announcement date as defined by the event period.

Alphas and betas are shown in Table 1 below. Alphas and betas are calculated by regressing the sample of defense firm HPRs on the S&P HPRs during the pre-event period. The HPRs of the S&P 500 serve as the independent variable in the regression (x-values), while the companies HPR's serve as the dependent values (y-values).

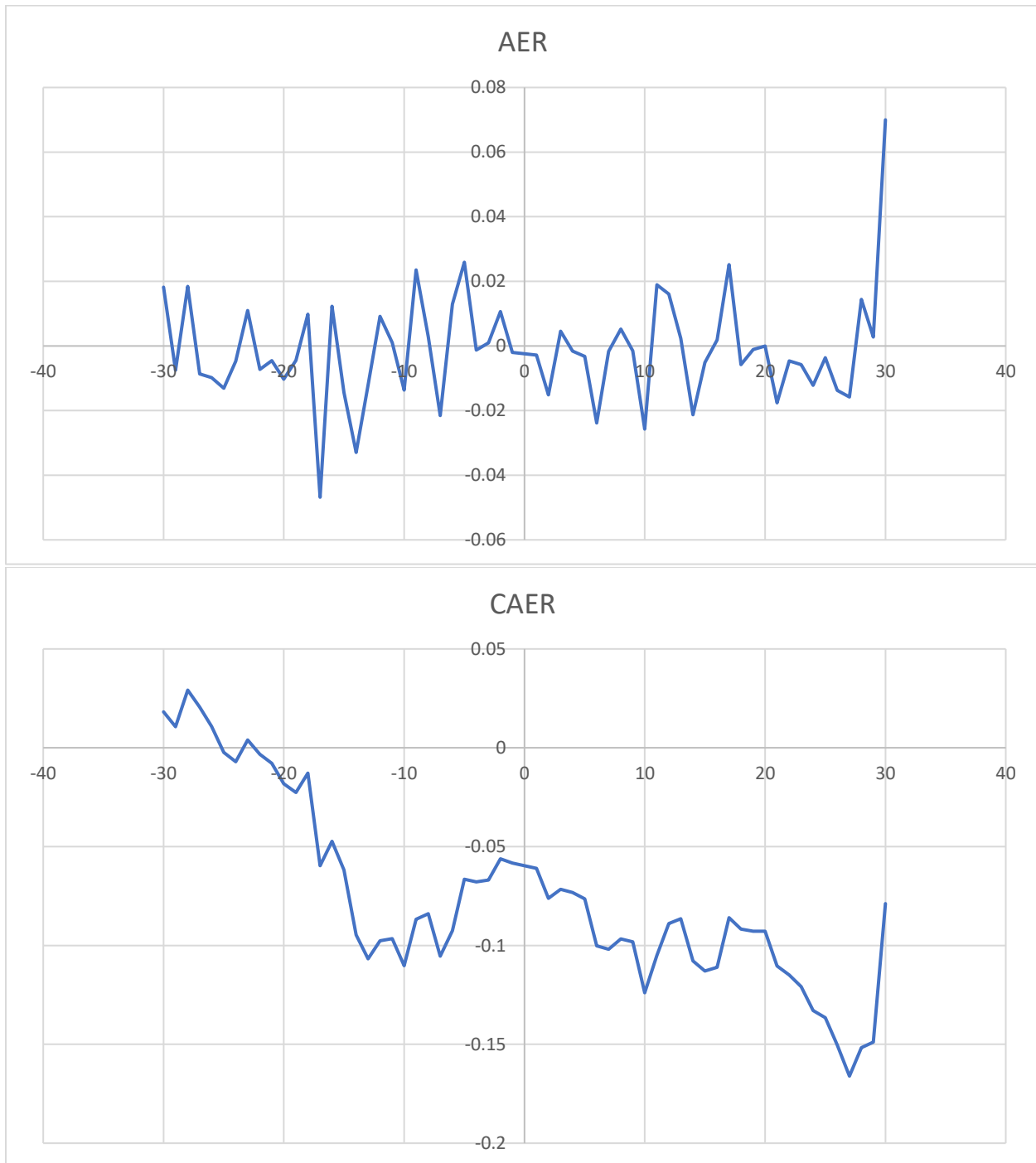
**Table 1. Alphas and Betas**

<u>Name of Company</u>	<u>Alpha</u>	<u>Beta</u>
Lockheed Martin Company (LMT)	0.00092786	0.29899765
The Boeing Company (BA)	-0.001521	0.6756485
Northrop Grumman Corporation (NOC)	-0.0007803	0.39948409
General Dynamics Corporation (GD)	0.00175922	0.70534333
RTX Corporation (RTX)	-0.0004549	0.76196952
Textron Inc. (TXT)	-0.0005208	0.78606226
L3Harris Technologies, Inc. (LHX)	0.00233977	1.35830452
HEICO Corporation (HEI)	0.00139922	0.02621765
Hexcel Corporation (HXL)	-0.0009248	0.23085949
Leonardo DRS, Inc. (DRS)	-0.0012684	-0.22266492

If the information surrounding the event introduced new information, the average excess daily returns would exhibit a statistically significant departure from zero. A paired t-test was used to determine the statistical distinction between risk-adjusted daily average excess returns and cumulative average excess daily returns over the event period (day -30 to +30). The findings substantiated alternative hypotheses  $H_{11}$  and  $H_{21}$ . T-tests of AER and CAER indicate a difference at the 5% significance level. (Bacon & Howell, 2021; Bacon & Cagigas, 2022; Keely & Bacon, 2023)

It is also important to determine how fast the market reacted to the October 7<sup>th</sup> announcement of Afghanistan invasion conducted by the US to assess the level of efficiency of the market response. Basically, did the market display weak, semi-strong, or strong form market efficiency? Specifically, are the AERs and the CAERs for the sample of stocks significantly different than zero? T-tests of AERs and CAERs indicate a difference at the 5% significance level. Observation of AER and CAER over the event period for Exhibits 1 shows a significant positive reaction of the risk adjusted returns of the stock prices of the sample prior to the event date. (Bacon & Howell; Bacon & Cagigas, 2022; Keely & Bacon, 2023) When analyzing the CAERs over the event period in Exhibit 1, the goal is to determine how fast the market reacted to the event. According to Exhibit 1, there is an increase from day -10 to day 0, then a significant decrease from day 0 to day +27. Possibly the observed positive reaction prior to the October 7<sup>th</sup> announcement of Afghanistan invasion surfaced because of the anticipation of the US invasion in response to the September 11 attack. Consistent with market efficiency and behavioral finance theories (Fama, 1997), we observe a negative overreaction from day 0 to day +20 followed by another negative overreaction from day +20 to day +30 and finally leveling off to equilibrium in by day +30. We can see a large dip between days -20 and -10 which includes the September 11<sup>th</sup> attacks.

**Exhibit 1. Graph of the AER and CAER over the Event Period**



**CONCLUSION**

The study focused on market efficiency and tested if possible excess risk adjusted returns were possible if one bought defensive stocks after on the announcement of war on Afghanistan on October 7<sup>th</sup> 2001. Results support the semi-strong form EMH since no investor could earn an above normal risk adjusted return by acting on the announcement date. The analysis shows a decline in return after the

event date. Arguably the September 11<sup>th</sup> attacks affected the actual returns for the event period drastically. The entire market systematically declined after the September 11, 2001, terrorist attack making it difficult to isolate the effects of the declaration of war in Afghanistan on October 7<sup>th</sup> 2001. Another factor to consider is the sample of defensive stocks selected. A more scientific sample would include the 5 biggest US military contractors in the US during 2001 (LMT, BA, NOC, GD, RTX). The US army mostly works with these contractors, and they would have been affected the most by declaration of war in Afghanistan on October 7<sup>th</sup> 2001.

## REFERENCES

- Alexander, S. (1961). "Price Movements in Speculative Markets: Trends or Random Walks." *Industrial Management Review*, May 7-26.
- Aharony, J., and I. Swary (1980). "Quarterly Dividend and Earning Announcements and Stockholders' Returns: An Empirical Analysis." *Journal of Finance*, March 1-12.
- Bacon, F. W. and C. Cannon. (2018). Brexit Announcement: A Test of Market Efficiency. *Journal of Applied Business and Economics*, 20 (8), 19-25.
- Bacon, F. W. and G. Cagigas. (2022). Merger Announcements, Financial Performance and Stock Price: A Test of Market Efficiency. *Journal of Applied Business and Economics*, 24 (4), 215-225.
- Bacon, F. W. and D. George. (2023). The Covid-19 Pandemic and the Consumer Staples Sector: A Test of Market Efficiency. *Journal of Applied Business and Economics*, 25 (6), 127-135.
- Bacon, F. W. and Gobran P. (2017). Presidential elections and industry stock returns: A test of market efficiency. *Journal of Business and Behavioral Sciences*, 29, (2), 21-31.
- Bacon, F.W. and Greis, J. (2008). Stock split announcements: A test of market efficiency. *Journal of Business and Behavioral Sciences*, 18, (1), 18-27.
- Bacon, F. W. and Howell, W. N. (2021). COVID-19 and the Health Industry: A Test of Market Efficiency. *Journal of Applied Business and Economics*, 23, (6), 60-67.
- Bacon, F. W. and Hutchinson, J. A. (2020). Corporate Sponsorship of 2008, 2012, and 2016 Summer Olympics: A Test of Market Efficiency. *Journal of Applied Business and Economics*, 22, (10), 13-25.
- Bacon, F. W. and Spradlin, K. M. (2019). Forward and Reverse Stock Splits: A Test of Market Efficiency. *Journal of Applied Business and Economics*, 21, (5), 18-28.
- Ball, R., and P. Brown (1968). "An Empirical Evaluation of Accounting Income Numbers." *Journal of Accounting Research*, Autumn, 159-178.
- Beaver, W. (1981). Market Efficiency. *The Accounting Review*, 56(1), 23-37.
- Blalock, G., Kadiyali, V., & Simon, D. (2007). The Impact of Post-9/11 Airport Security Measures on the Demand for Air Travel. *The Journal of Law & Economics*, 50(4), 731-755.

- Bodie, Z., A Kane., and A. Marcus (2007). *Essentials of Investing* (The McGraw-Hill Irwin Series in Finance, 6<sup>th</sup> ed.) United States: Mcgraw-Hill Irwin.
- Dann, L., D. Mayers, and R. Raab (1977). "Trading Rules, Large Blocks and the Speed of Adjustment." *Journal of Financial Economics*, January, 3-22.
- Fama, Eugene F. (1965). "The Behavior of Stock–Market Prices." *The Journal of Business*, Volume 38, Number 1 (January), 34-105.
- Fama, E. F., and M. Blume (1966). "Filter Rules and Stock Market Trading Profits." *Journal of Business*, January, Volume 39, 226-241.
- Fama, E. F., L. Fisher, M. Jensen, and R. Roll (1969). "The Adjustment of Stock Prices to New Information." *International Economic Review*, Volume 10, Number 1 (February), 1-21.
- Fama, Eugene F. (1970). "Efficient Capital Markets: A review of Theory and Empirical Work." *The Journal of Finance*, Volume 25, Number 2 (May), 383-417.
- Fama, E. F. (1976). *Foundations of Finance*. Basic Books, New York.
- Fama, E. F. (1998). "Market Efficiency, Long-Term Returns, and Behavioral Finance." *Journal of Financial Economics*, Volume 39, Number 3 (September), 283-306.
- Finnerty, J. E. (1976). "Insiders and Market Efficiency." *Journal of Finance*, Volume 31 (September), 1141-1148.
- Friend, I., M. Blume, and J. Crockett (1970). *Mutual Funds and Other Institutional Investors*. McGraw-Hill, New York.
- Givoly, D., and D. Palmon (1985). "Insider Trading and the Exploitation of Inside Information: Some Empirical Evidence." *Journal of Business*, January, 69-87.
- Granger, C. W. J., and O. Morgenstern (1970). *Predictability of Stock Market Prices*. Heath Lexington Books, Lexington, Mass.
- Jaffe, J. (1974). "The Effect of Regulation Changes on Insider Trading." *Bell Journal of Economics and Management Science*, Spring, 93-121.
- Jensen, M. (1968). "The Performance of Mutual Funds in the Period 1945-64." *Journal of Finance*, May, 389-416.
- Joy, M., R. Litzenger, and R. McEnally (1977). "The Adjustment of Stock Prices to Announcements of Unanticipated Changes in Quarterly Earnings." *Journal of Accounting Research*, Autumn, 207-225.

Jesper and Bacon

Keely P. & Bacon, F. W. (2023). Terrorist Attacks on September 11, 2001: A Test of Market Efficiency in the Insurance Industry. *Journal of Business and Behavioral Sciences*, 35, (1), 84-91.

Kraus, A., and H. R. Stoll (1972). "Price Impacts of Block Trading on the New York Stock

Mikkelsen, W., and M. Partch (1985). "Stock Price Effects and the Costs of Secondary Distribution." *Journal of Financial Economics*, June, 165-194.

Patell, J., and M. Wolfson (1979). "Anticipated Information Releases Reflected in Call Option Prices." *Journal of Accounting and Economics*, August, 117-140.

Ross, S. (2008). *Corporate Finance* (Stephen A. Ross, Randolph W. Westerfield, Jeffrey Jaffe -13<sup>th</sup> ed.). United States: McGraw-Hill Companies.

Rosenberg, E. (2022). *5 recession resistant industries*. Investopedia. [5 Recession Resistant Industries \(investopedia.com\)](https://www.investopedia.com/articles/economy/05/recession-resistant-industries/)

Scholes, M. (1972). "The Market for Securities: Substitution vs. Price Pressure and the Effects of Information on Share Prices." *Journal of Business*, April, 179-211.

Summers, Lawrence H. (1985). "Does the Stock Market Rationally Reflect Fundamental Values?" *The Journal of Finance*, Volume 41, Number 3 (July), 591-601.

Tung, Y. A., & Marsden, J. R. (1998). Test of Market Efficiencies Using Experimental Electronic Markets. *Journal of Business Research*, 41(2), 145-154.

Watts, R. (1978). "Systematic 'Abnormal' Returns after Quarterly Earnings Announcements." *Journal of Financial Economics*, June/September, 127-150.

Yahoo Finance. (2020). [S&P 500 \(^GSPC\) Historical Data - Yahoo Finance](https://finance.yahoo.com/quote/%5E%GSPC/history/)

# JAPANESE DISTRIBUTOR ATTITUDINAL FACTOR AND THEIR IMPACT ON IMPORT INTENTIONS AND BEHAVIOR

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## ABSTRACT

The balance of trade has recently become an issue of concern for the U.S. This study explores the opportunity to build exports of fruit to Japan, the world's sixth largest importer of fresh fruit. The attractiveness of the Japanese market is enhanced due to the declining self-sufficiency of Japanese fruit growers, and the premium prices Japanese consumers are willing to pay for fruit. The study departs from others by 1) examining informal rather than formal trade barriers and 2) focusing on distributor attitudes rather than consumer attitudes. The study lays a methodological foundation to examine distributors in other countries and builds upon our understanding of informal trade barriers in Japan. Data are first analyzed to identify salient attitudinal factors of concern to Japanese distributors. The study then tests the ability of these factors to affect Japanese distributor import intentions and behavior. Hypothesis tests demonstrate that the distributor attitudinal factors are related to both import intentions and import behavior. The study contributes to the body of knowledge on the attitudinal factors that are important to distributor intentions and behaviors of exporter of fruits.

**Keywords:** Distributors, Attitudes, Importing, Exporting

## INTRODUCTION

The balance of trade deficits has recently become a significant concern for the U.S. Consequently, it is important to identify export opportunities for U.S. suppliers. This study explores the opportunity to build exports to Japan. Japan is the world's sixth largest importer of fresh fruit and the U.S is Japan's fifth largest fruit export source (Nakagawa, 2023). The attractiveness of the Japanese market to U.S. fruit exporters is enhanced due to the declining self-sufficiency of Japanese fruit growers (Satake, 2022). Japan's attractiveness is further augmented by the premium prices Japanese consumers are willing to pay for fruit (McCafferty and Jozuka, 2017).

Efforts to penetrate the Japanese market in the past have focused on overcoming formal trade barriers including tariffs, quotas, and product standards. Progress on this front has been slow and alternative avenues of intervention have been overlooked. More successful penetration of the Japanese market may depend upon overcoming informal trade barriers. Informal trade barriers in Japan, partly manifested in unfavorable attitudes toward imported products, remain a formidable challenge (Hilpert, 2019).

Unlike the preponderance of attitudinal studies that focus on consumers, this study will focus on an equally important link in the export chain; namely, the attitudes of Japanese distributors. The U.S is a leading exporter of fruit to Japan. The U.S. is the leading exporter of

lemons and cherries and second largest exporter of apples, kiwi fruit, and grapefruit to (Nakagawa, 2023). Despite this favorable situation, inroads into the Japanese market by other exporting countries has eroded the position of the U.S. Sound market intelligence must be the foundation of developing appropriate strategies for U.S. exporters.

## **PURPOSE OF THE STUDY**

The purpose of this study is to explore key attitudinal factors that exist in Japanese distributor perceptions of U.S. fruit. This will involve first measuring the importance of a comprehensive list of business-related attributes that are salient to Japanese distributors with respect to U.S. fruit imports. This data will then be statistically summarized into the fundamental attitudinal factors of concern to Japanese distributors that U.S. exporters must manage. Beyond the exploratory analysis, the study will examine the relationship between the distributor attitudinal factors and 1) intentions to import U.S. apples (Hypothesis 1) and 2) actual import behavior (Hypothesis 2), as well as whether 3) intentions to import predict actual import behavior (Hypothesis 3). The study is designed to provide U.S. and other exporters with growing understanding of how to overcome informal Japanese trade barriers of the attitudinal type which reside, not among consumers, but in a preceding link in the export chain, distributors.

## **LITERATURE REVIEW**

### **Fishbein Attitude-Behavioral Intention Model:**

Attitude is the learned predisposition to react consistently, favorably or unfavorably, toward a stimulus (Hoyer, MacInnis, and Pieters, 2023). The Fishbein attitude-behavioral intention model is a tool that, among other things, examines the importance of multiple attributes that are considered by subjects. The multi-attribute nature of the model provides diagnostic utility by making it possible to identify attributes of consequence.

The attitude-behavioral intention model's ability to predict behavioral intention has been widely tested. It has been a successful predictor in many scenarios, including in Japan (Omar, Lahath, Astuti, Jamaludin, and Alam, 2023), in other collectivist cultures (Huang, 2024; Wong and Park, 2023), regarding food products (Ashfahany, Farrahanaya, Apriantoro, and Subhi, 2024), luxury products (Wong and Park, 2023), services (Huang, 2024), public issues (Takahashi and Takahashi, 2024), and a myriad of other circumstances. Research on distributor attitudes has received limited attention other than tangentially related research (Adanacioglu, 2017; Nguyen, Thai, Chan, Lau, Nguyen, and Do, 2025).

### **Japanese Distributors and Fruit:**

Japanese fruit distributors, large and small, ultimately sell to consumers who tend to regard fruit as less of a staple food but rather more as a luxury item, generally reserving fruit for dessert or for gift-giving (McCafferty and Jozuka, 2017). Larger Japanese retailers have been able to gain power relative to manufacturers and wholesalers in the distribution channel, including sourcing from overseas suppliers to a greater extent (Riethmuller, 1996). With regard to gift-giving, fruits are important gift items and compete with prepared foods such as cakes, confectionery, Japanese red-bean sweets, dried seafood, various other food products, and a relatively limited array of nonfood items (McCafferty and Jozuka, 2017). But whether distributors are aiming at consumers' personal consumption or gift-giving, Japanese consumers

value high quality and are willing to pay commensurate price when it comes to fruit (Musa, Hassan, Yusof, and Daud, 2010). Japan's iconic fruit parlors are noteworthy sources for the highest quality fruit although even supermarkets and convenience stores tend to offer better quality than what you would expect in the U.S. (McCafferty and Jozuka, 2017).

## METHODS

### **Instrument Development:**

A total of 22 business-related attributes related to importing fruit were identified based on the results of two, one-hour, eight-person focus group interviews, restricted to importing wholesalers. One interview was conducted in Tokyo, the other in Yokohama. The face validity of the survey instrument was assessed via collaborative discussion between 1) Japanese and American researchers, 2) a Japanese business practitioner, and 3) a Japanese MBA translator.

### **Questionnaire Construction:**

Fishbein's attitude-behavioral intention model was adopted to measure the evaluations/importance of salient attributes of the business of importing Apples, the fruit chosen as the questionnaire response object. Apples were chosen due to 1) the prominent share of Japanese apple imports coming from the U.S. as well as 2) the fact that imported apples must still compete with Japan's abundant supply of domestic apples (Satake 2022). The latter condition would tend to make respondents keenly cognizant of the attributes of imported apples.

Behavioral intentions to import U.S. fruit and past purchase behavior of U.S. fruit were also measured. A pretest for of the questionnaire was conducted to identify potential problems with instrument ambiguities. For a pretest of the questionnaire, 15 distributors drawn from a list of Tokyo distributors completed the questionnaire. Respondents were debriefed upon completion of the questionnaire. The debriefings indicated that only minor modifications of the instrument were necessary.

### **Sample:**

A two-step sampling method that is commonly used in Japanese research was used to elicit questionnaire responses from Japan's seven largest metropolitan areas. The Tokyo and Osaka areas alone are considered to be representative of consumption behavior in Japan (US ATO, Tokyo 2009) which is much more highly urban compared to the U.S. Distributors were first prescreened via a two-way postcard. The request was made to 1000 distributors divided as follows: Tokyo and surrounding areas (30%), Osaka and surrounding areas (20%), Sendai (10%), Sapporo (10%), Nagoya (10%), Hiroshima (10%), and Fukuoka (10%). 314 respondents agreed to participate and 289 ultimately returned a complete questionnaire within the requested two week's time. The high response rate is at least partly a reflection of the collectivistic nature of Japanese culture. Each respondent who agreed to participate received a 500-yen gift card as an incentive.

## DATA ANALYSIS

A two-stage data analysis procedure was employed. In the first stage, exploratory factor analysis was performed to identify the dimensionality of Japanese distributors' attitudes toward importing U.S. apples. Responses to the 22 fruit attribute statements were factor analyzed.

Measures examined to determine the number of factors to interpret were the percentage of variance explained and eigenvalues. Also, only factors with at least three statements loading  $> .50$  were interpreted.

The measure to determine which statements to include in the interpretation of retained factors was their factor loadings. Statement loadings on a factor that is greater than  $.30$  are considered somewhat meaningful, greater than  $.50$  are considered moderately meaningful, and greater than  $.70$  highly meaningful (Hair, Black, Babin, Anderson, and Tatham, 2010). Only loadings that were greater than  $.50$  were included. Varimax extraction was chosen due to its tendency to provide an easily interpretable factor matrix. Orthogonal rotation was chosen because the factor matrix was to be subjected to subsequent data analysis (Hair et al., 2010). Cronbach's alpha was computed to assess the reliability of each factor.

In the second stage, attitude factor scores were saved, and regression analysis was used to determine whether Japanese consumer's attitude factors affect their consumption intentions (H1). Next, analysis was performed to determine whether Japanese consumers' intentions affect their actual U.S. fruit consumption behavior (H2). Finally, the direct relationship between U.S. fruit import intentions and U.S. fruit import behavior was examined (H3).

## RESULTS

### **First Stage-Distributor Attitudinal Factors:**

Factor analysis of the 22 business-related attribute evaluations of importing fruit resulted in four attitudinal factors with eigenvalues  $> 1.00$  and three or more statements with loadings  $> .50$ . The solution explained 62 percent of the variance. The factors accounted for a very balanced percent of variance rather than, as is frequently the case, the first factor running away with a disproportionate percentage of the variance. The high collective amount of variance explained is partly attributable to the fact and of the 22 factor analyzed statements, 20 came into play. There were no statements with cross-factor loadings. One factor with an Eigenvalue  $> 1.00$ , explaining 6.3 percent of variance, was not interpreted since it consisted of only one statement. The factors extracted and interpreted included 1) Vendor Media and Supply, 2) Profit Issues, 3) Ordering Process, and 4) General Vendor Aspects (Table 1). The procedure yielded factors with Cronbach Coefficient reliabilities ranging from  $.852$  to  $.747$ , all above the recommended critical value of  $.70$ . The solution's measure of sampling adequacy measured by the KMO Coefficient of  $.85$  exceeded the level of  $.80$ , which is considered a high standard. Bartlett's Test of Sphericity yielded a Chi-Square of 1467.41, significant at  $< .001$ , which indicates the assumption of multivariate normality has been met (Norusis, 2010).

**Vendor Media and Supply.** A total of seven statements loaded on Vendor Media and Supply attitudinal factor which accounted for 15.9 percent of variance. "Vendor mass media support" ( $.770$ ) and "coop advertising support" ( $.736$ ) were the two highest loadings, both squarely pointing toward the importance of vendor media support. Statements related to the merchandise supply theme included "reliable supply" ( $.565$ ), "consumer demand growth" ( $.556$ ), "fair return policy" ( $.540$ ), and "consistent quality" ( $.505$ ). The Cronbach Alpha reliability coefficient for the factor of  $.852$  was well above the recommended  $.700$  cutoff.

**Profit Issues.** Three statements loaded on the Financial factor. The statements were all focused to financial outcomes. The attitudinal factor accounted for 13.2 percent of variance. It had a

Cronbach Alpha reliability coefficient of .801. “Fair cost” was the highest loading statement on the factor (.817). It was followed by “profit margin potential” (.807) and “turnover potential” (.601).

**Ordering Process.** The third attitudinal factor to emerge was Ordering Process. The factor accounted for 13.2 percent of the variance and had a Cronbach Alpha reliability coefficient of .808, retaining another very high reliability value. The two highest loading statements for the Ordering Process factor are bookends of the order processing: “easy to reorder” (.794) and “easy to order” (.781). “Direct procurement” had a loading of .691 and “financial conditions of sale” had a loading of .584. It is worth noting that this quantitative finding is consistent with a noteworthy theme from the focus group sessions. Focus group respondents were particularly vocal about issues related to the ordering process.

**Vendor General Issues.** Five statements loaded on the Vendor General Issues factor. Three of them are very specifically about the vendor and the other two related to 1) what vendors/growers have for sale and how it complements the distributor’s product mix (“products complementary to our product mix” (.581)) and 2) a service that vendors offer to distributors (“availability of buyer taste test” (.664)). Of the three very vendor-specific statements, two were the highest loading for the Vendor General Issues factor. Those were “vendor used before” (.752) and “availability buyer/distributor taste test” (.712). The other statement was “reputable vendor” (.509). The Vendor General Issues factor explained 12.9 percent of the variance and had a Cronbach Alpha reliability coefficient of .747.

**Table 1.** Distributor Attitudinal Factors

	Factor Name			
	Vendor Media & Supply	Profit Issues	Ordering Process	Vendor General Aspects
Cronbach Reliability Coefficient	0.852	0.801	0.808	0.747
Percentage of Variance Explained	15.9	13.2	13.2	12.9
<b>Factor Statements</b>				
Vendor Media Support	0.77			
Coop Ad Support	0.746			
Reliable Supply	0.565			
Demand Growth	0.556			
Vendor Ideas	0.555			
Fair Return Policy	0.54			
Consistent Quality	0.505			
Cost		0.817		
Profit Margin Potential		0.807		
Sales Poetential		0.601		
Reordering Process			0.794	
Ordering Process			0.781	
Direct Procurement			0.691	
Financial Conditions			0.584	
Minimum Order Quantity			0.518	
Vendor Used Before				0.752
Vendor Flexibility				0.712
Vendor Offers Taste Test				0.664
Vendor Offers Complementary Products				0.581
Vendor Reputable				0.509

**Second Stage-Attitudinal Factor Influence on Import Intentions and Import Behavior:**

Results for H1, H2, and H3 are shown in Table 2. Regarding H1, the regression results show that there is a significant positive relationship between the attitudinal factors and import intentions. All but the Vendor Media and Supply factor were significantly related to import intentions, providing support for Hypothesis 1. Noteworthy is the fact that the Ordering Process

factor (<.001 significance) had the largest standardized Beta Coefficient (.322) and is consequently the attitudinal factor most capable of moving the needle in terms of distributor importing intentions. This may be somewhat surprising since for many importers focus first on profit matters (Dupraz, 2024). The Profit factor (<.001 significance) had a standardized Beta Coefficient of .266 and the Vendor General Issues factor (<.006) had a standardized Beta Coefficient of .235.

With regard to import behavior (H2), all four attitudinal factors were significantly and positively related at <.01, providing support for Hypothesis 2. Finally, the direct relationship between import intentions and import behavior (H3) was positive and significant at <.01, providing support for Hypothesis 3. This provides strong empirical support for the efficacy of attitudinal factors as predictors of distributor intentions and behavior as well as the ability of import intentions to manifest in import behavior.

**Table 2.** Results of Regression Analysis

<b>Factors × Import Intention</b>		
	<b>Significance</b>	<b>Standardized Beta</b>
Vendor Media and Supply Issues	0.598	0.046
Financial Issues	0.001	0.244
Ordering Process	0.001	0.322
Vendor General Issues	0.006	0.235

<b>Factors × Import Behavior</b>		
	<b>Significance</b>	<b>Standardized Beta</b>
Vendor Media and Supply Issues	0.020	0.202
Financial Issues	0.001	0.274
Ordering Process	0.012	0.219
Vendor General Issues	0.006	0.235

<b>Import Intent × Import Behavior</b>		
	<b>beta</b>	<b>significance</b>
	0.609	0.001

## CONCLUSIONS

The study lays a methodological foundation to examine distributors in other countries and builds upon our understanding of informal trade barriers in Japan. By identifying salient business-related issues of distributors via focus groups, developing survey statements on the basis

of those issues, and factor analyzing the responses of a sample of distributors to those survey statements, attitudinal factors of the distributors were identified. The four factors identified included 1) Vendor Media and Supply, 2) Profit Issues, 3) Ordering Process, and 4) Vendor General Issues.

Hypothesis tests demonstrated that the distributor attitudinal factors are related to not only import intentions but also import behavior. Thus, by understanding the attitudinal factors that are important to distributor intentions and behavior, U.S. exporter have a checklist that helps them to ensure products aimed at the Japanese market measure up to the attitudinal factors identified. The importance of this lies in the fact that incremental progress in penetrating the Japanese market resides substantially in overcoming informal trade barriers of which attitudes are one type.

### **LIMITATIONS AND FUTURE RESEARCH**

The focus of this study is on Japanese distributors. The methodological foundation utilized by this research could also be used to examine distributors in other countries. China's enormous economy would certainly be of interest. But it would also be useful to examine whether this methodology and the employment of attitude research will work equally well in Western, non-collectivistic cultures and economies. Further, the concept of values could be incorporated in the investigation. For instance, it is important to understand the value differences that exist between collectivistic and individualistic societies and how those differences could alter the impact of attitudinal informal trade barriers on distributor intentions and behavior.

The product of focus for this study was fruit. Informal attitudinal trade barriers in the context of other products could also be examined. There are many other types of food products and, more generally, consumable products that could be examined. Future studies could also examine non-consumable durable products. Although the export of fruit to Japan is an important product category for U.S. exports, other product categories should be examined to develop a more complete picture of attitudinally based informal trade barriers. This would make it possible to assess the extent to which knowledge of attitudinal trade can be beneficial to U.S. export endeavors.

Although the global market is currently in flux and tariffs may overwhelm the fine-tuning that exporters continually undertake, research must continue to build our knowledge of the world and the way it works.

### **REFERENCES**

- Adanacioglu, H. (2017). Factors affecting farmers' decisions to participate in direct marketing: A case study of cherry growers in the Kemalpaşa district of Izmir, Turkey. Renewable Agriculture and Food Systems. 32(4), 291-305.
- Ashfahany, A., Farrarhvanaya, S., and Apriantoro, M. (2024). Analysis of factors influencing intention to purchase halal Japanese food: The moderating role of religiosity. Innovative Marketing. 20(1), 66-76.
- Dupraz, R. (2024). What are the main problems for importers. Shipping and Commodity Academy. June 20.
- Hair, J., Black, W., Babin, B., Anderson, R., and Tatham, R. (2010). Multivariate Data Analysis

- with Readings. (7th ed.). McGraw Hill.
- Hoyer, W., MacInnis, D., and Pieters, R. (2023). Consumer Behavior. Cengage.
- Huang, H. (2024). Factors influencing attitudes toward and intention of citizens' engagement with solar energy in Taiwan. Energy Efficiency. 17(5), 43.
- McCafferty, G. and Jozuki, E. (2017). \$27,000 melons? Unwrapping the high price of Japan's luxury fruit habit. CNN Travel. March 25.
- Musa, R., Hassan, F., Yusof, J., and Daud, N. (2010). Examining market accessibility of Malaysia's Harumanis mango in Japan: Challenges and potentials. Business Strategy Series. 11(1), 3-12.
- Nakagawa, H. (2023). Fresh fruit update 2023. U.S Department of Agriculture, Foreign Agricultural Service. September 12, 2023.
- Nguyen, M., Thai, V., Chan, C., Lau, K., Nguyen, M., and Do, H. (2025). The interplay among trust, reciprocity and commitment factors in facilitating supply chain collaboration: the case of Vietnamese fishery industry. Asia Pacific Journal of Marketing and Logistics. 37(1), 150-170.
- Norusis, M. (2010). IBM SPSS Statistics 19 Advanced Statistical Procedures Companion. Prentice-Hall.
- Omar, N., Lahath, A., Astuti, R., Jamaludin, N., and Alam, S. (2023). The mediating role of attitude in the relationship between the extrinsic and intrinsic attributes of Japanese frozen foods and consumers' intention to purchase them: evidence from Malaysia. Asian Journal of Management. 17(1), 98-129.
- Riethmuller, P. (1996). Reform of the Japanese food distribution system: Implications for consumers. Journal of Consumer Policy, 19, 69-82.
- Satake, A. (2022). Long term trends in Japanese agriculture and agricultural imports. U.S Department of Agriculture, Foreign Agricultural Service.
- Takahashi, A. and Takahashi, S. (2024). Does economic self-interest determine public attitudes toward immigrants? An econometric case study in Japan. Asian Economic Journal. 38(1), 61-85.
- U.S. Agriculture Trade Office, Tokyo. (2009). The market for fresh fruits and vegetables in Japan. Japan Market Resource Network, Tokyo, Japan.
- Wong, K. and Park, S. (2023). That's so Gucci: a comparison of cultural values and the influence of perceived values on luxury good attitudes and purchase intention among Korean and Dutch millennials. Asian Business and Management. 22(5), 1804-1829.
- World Horticultural Trade & U.S. Export Opportunities. (2004). World fresh citrus situation. Washington, DC: U.S. Department of Agriculture.

# **MEDICAL LABORATORY SCIENTIST (MLS) SHORTAGES AND ITS IMPACT ON THE US HEALTHCARE SYSTEM**

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## ***ABSTRACT***

The United States (U.S.) healthcare system, a complex and multifaceted entity, relies heavily on the intricate interplay of various professionals to deliver quality patient care. While physicians and nurses often occupy the forefront of public perception, the critical role of Medical Laboratory Scientists (MLSs) in the diagnostic process remains largely unseen, yet extremely impactful. These highly skilled professionals, responsible for analyzing biological specimens and generating data crucial for disease detection, diagnosis, and treatment monitoring, are facing a significant and growing shortage. This paper aims to explore the impact the MLS shortage has on the United States healthcare system. Additionally, it provides a comprehensive understanding of the impact on patient care and safety, consequences for laboratory operations and efficiency, and economic implications. This analysis also delves into the various solutions to the shortage, such as enhancing recruitment and retention strategies, improving education and training pathways, effectively leveraging technology, and advocating for supportive policy changes. If these solutions are implemented, it is entirely possible to alleviate the impact of this critical shortage and ensure a strong, sustainable, and highly qualified medical laboratory workforce for the future health and well-being of the U.S. healthcare system.

Key Words: Medical Laboratory Scientist (MLS), American Society of Clinical Pathologists (ASCP), Medical Laboratory Technician (MLT), shortage, vacancy.

## **INTRODUCTION**

Medical Laboratory Scientists (MLSs), also known as medical technologists, form the bedrock of modern diagnostic medicine. These dedicated professionals are responsible for performing and analyzing a vast array of laboratory tests that are indispensable for the detection, diagnosis, and monitoring of diseases, as well as for guiding treatment decisions and ensuring comprehensive patient care. MLSs are often motivated by a strong interest in science and the desire to help people by contributing to accurate diagnoses through test analyses. They revel in the intellectual challenge of solving problems through testing, the hands-on nature of the work, and the opportunity to stay updated with evolving technologies in their field. Their work, while often occurring behind the scenes, is fundamental to the effective functioning of the entire healthcare system. In fact, over 70% of all medical diagnoses rely on the accurate and timely results of laboratory tests (Sikaris, 2017), underscoring the profound and crucial role that MLS professionals play in the healthcare ecosystem. Also, the total number of clinical tests has surged by 388%, rising from 12,683 in 1993 to almost 62,000 in 2023 (Kaur, 2023). Additionally, the Centers for Disease Control (CDC) reports that of the 500 million annual primary care visits in the United States, 33% include at least one laboratory test.

Despite their vital contributions, MLS professionals often operate in the shadows, receiving inadequate public recognition for their essential roles in maintaining public health (Robinson, 2023). This lack of visibility can diminish the general public's understanding and appreciation of their work, which may adversely affect the profession in several ways, including attracting new talent and retaining existing staff.

According to the American Society of Clinical Pathologists (ASCP), the United States is currently grappling with a significant and escalating shortage of qualified MLS professionals (ASCP, n.d.). This issue, which has been a growing concern within the healthcare community for some time, has now reached concerning levels, prompting serious concerns about the capacity of clinical laboratories to effectively meet the ever-increasing demands for diagnostic testing (ASCP, n.d.). Roche Diagnostics North America states that the recent COVID-19 pandemic has further amplified this pre-existing problem, bringing the vital role of laboratory testing into sharp focus for the public while simultaneously placing an unprecedented strain on the already understaffed laboratory workforce. The intense workload and sustained pressure experienced by MLS professionals during the pandemic, coupled with the existing workforce deficits, likely contributed to increased stress and burnout (Roche Diagnostics North America, n.d.). This situation may have unfortunately led some experienced professionals to consider early retirement or even leave the profession entirely, thereby further exacerbating the already critical shortage.

To grasp the magnitude and severity of the MLS shortage, one must review key workforce statistics. As reported by the Bureau of Labor Statistics (BLS) in 2022, approximately 337,800 clinical laboratory technologists and technicians were employed in the United States as of 2019. However, BLS projections forecast a significant upward trend in demand for these professionals, estimating growth rates ranging from 7% to 13% in various sectors and a substantial projected increase of 19% by 2030. These metrics highlight the urgent need for MLS professionals to meet the healthcare demands of an increasingly diverse and aging population.

Alarming, current vacancy rates within clinical laboratories across the US are already exceptionally high. Overall vacancy rates are reported to be between 7% and 11%, but some specialized areas and rural regions are experiencing even more acute shortages ranging between 15% and 25% (Rhode, 2024). This considerable disparity between the projected demand and the already high current vacancy rates emphasizes that the US healthcare system is not just facing a potential future crisis but is actively experiencing a substantial and immediate shortage of qualified MLS professionals. This ongoing deficit directly impacts the ability of laboratories to provide essential diagnostic services in a timely and efficient manner.

A major factor contributing to this shortage is the persistent mismatch between the number of MLS professionals graduating from accredited programs and the number of available job openings. Each year, approximately 4,900 students graduate with degrees in medical laboratory science. However, the number of job openings annually exceeds 9,000, resulting in a substantial and concerning vacancy rate (Rhode, 2024). This fundamental imbalance between the supply of newly qualified MLS professionals and the ever-increasing demand for their services points to a systemic deficiency within the educational pipeline and potentially a lack of attractiveness of the profession to prospective students. The persistent gap suggests that either the educational system lacks the capacity to produce a sufficient number of graduates, or the profession is not effectively attracting and retaining individuals to fill the growing number of positions.

Furthermore, the MLS shortage is not uniformly distributed across the United States. According to the ASCP, rural areas and smaller hospitals often face greater challenges in recruiting and retaining qualified laboratory personnel compared to their urban counterparts (ASCP, n.d.). These facilities may struggle due to factors such as lower salaries, fewer professional development opportunities, and geographic isolation. This uneven distribution suggests that addressing the MLS shortage effectively may require localized and

targeted strategies tailored to the specific challenges faced by different geographical regions and healthcare settings.

## LITERATURE REVIEW

### Factors Contributing to the Shortage of MLSs

Several interconnected factors have led to the current critical shortage of MLSs in the United States. One notable factor is the aging workforce. A substantial proportion of practicing MLS professionals are nearing retirement age, with the average age of certified medical technologists being higher than that of nurses (ASCP, n.d.). This trend indicates that a large segment of the workforce will be leaving the profession in the near future. As a result, there is an urgent need for proactive and effective measures to recruit and train enough new professionals to prevent a further decline in the workforce and ensure the continued provision of essential laboratory services.

At the same time, the demand for laboratory services has been steadily increasing due to several demographic and medical advancements. Factors like the aging population, overall population growth, increased human longevity, and the continuous expansion of complex and specialized medical testing have collectively contributed to a significant surge in demand for laboratory services (PRS Global Team, 2025). As noted by Lee et al. (2019), the need for specialized testing, particularly in areas such as molecular diagnostics and personalized medicine, further exacerbates the shortage. According to Grand View Research (Figure 1), the North America clinical laboratory service market size is estimated at \$84.2 billion in 2023 and is projected to grow at a compound annual growth rate of 2.9% from 2024 to 2030.

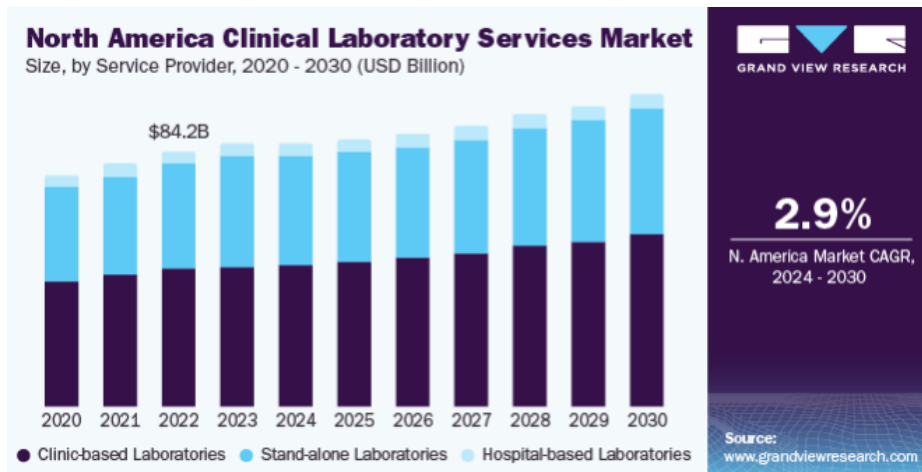


Figure 1: North American Laboratory Market by Provider Type

Another major factor contributing to the MLS shortage is the concerning decline in the number of accredited MLS and Medical Laboratory Technician (MLT) training programs across the country over the past several decades. According to the National Accrediting Agency for Clinical Laboratory Sciences, the number of MLS/MLT training programs reduced by approximately 30% from 659 in 1992 to 468 in 2002 (ASCP, n.d.). More recently, MLS/MLT-accredited programs have decreased by a further 6.5% from the years 2002 to 2017 (ASCLS, n.d.). This reduction in training programs limits the number of new MLS professionals entering the workforce each year. The decrease in educational opportunities restricts institutions' capacity to produce an adequate number of qualified graduates, perpetuating and worsening the existing shortage. Based on data from the U.S. Bureau of Labor Statistics (Figure 2), by 2021, there will be a projected workforce shortage of more than 150,000 clinical laboratory science professionals in the United States (roughly 39% of the total workforce need) (Bearce et al., 2017).

## CLS Workforce Projection

By 2021, there will be a CLS workforce shortage of ~150,000 individuals, a 39% workforce demand deficit.

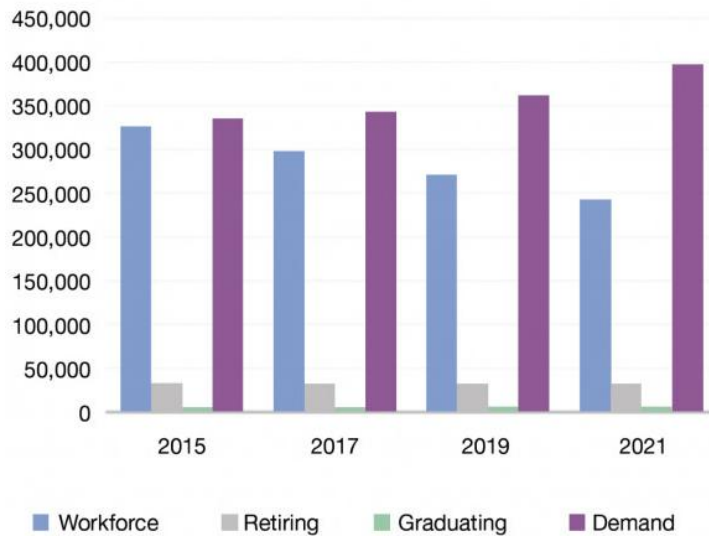


Figure 2: Clinical Laboratory Service Workforce Projection

Finally, the MLS profession faces ongoing challenges in both recruiting new individuals and retaining those currently in the field. There is approximately only 1 MLS per 1,000 people (Robinson, 2024) as compared to 12.2 nurses per 1,000 people (U.S. Bureau of Labor Statistics, 2024). The profession often suffers from a lack of visibility and awareness among students, career counselors, and the general public, leading to low interest in pursuing MLS as a career path (Newton, 2024). Compared to other healthcare professions that require similar levels of education and training, MLS professionals may experience lower compensation and a perceived lack of professional recognition and respect in the broader healthcare community (Newton, 2024). In 2023, the median salary of a licensed MLS was \$60,780/yr compared to \$86,070/yr for a registered nurse (U.S. Bureau of Labor Statistics, 2024). Additionally, according to the American Society for Clinical Laboratory Science (ASCLS), insufficient opportunities for career advancement and a lack of clearly defined career ladders can hinder retention efforts and as a result, professionals may seek alternate careers with greater potential for growth and development (ASCLS, n.d.). Addressing these multifaceted issues related to visibility, compensation, recognition, and career advancement is crucial for effectively attracting and retaining a qualified and dedicated workforce within the MLS profession.

### Impact on Patient Care and Safety

The critical shortage of MLSs has a significant negative impact on various aspects of patient care and safety within the United States healthcare system. Accurate and timely laboratory results are essential for effective clinical decision-making. Delays in reporting results, caused by understaffing and increased workloads, can lead to postponed diagnoses and initiation of treatment, potentially worsening patient outcomes (Smith & Jones, 2022).

Moreover, the increased pressure on existing MLSs can elevate the risk of errors in sample processing and result interpretation, ultimately affecting the quality of patient care. With fewer staff members available to manage an ever-growing workload, current MLS professionals often experience heightened stress and fatigue, which can, unfortunately, increase the likelihood of errors occurring throughout all phases of

laboratory testing (PRS Global Team, 2025). The direct link between inadequate staffing and a higher risk of such errors emphasizes the desperate need to maintain sufficient numbers of qualified MLS professionals to protect patient safety and ensure the integrity of laboratory results.

### Consequences for Laboratory Operations and Efficiency

The MLS shortage not only impacts patient care and safety directly but also has considerable consequences on daily operations and the overall efficiency of clinical laboratories. One immediate consequence is the substantial increase in workload for the existing laboratory staff. The macro trends in the clinical laboratory are focused on how the decreasing population of trained MLSs will keep pace with the ever-increasing testing workload (Wilson, 2017).

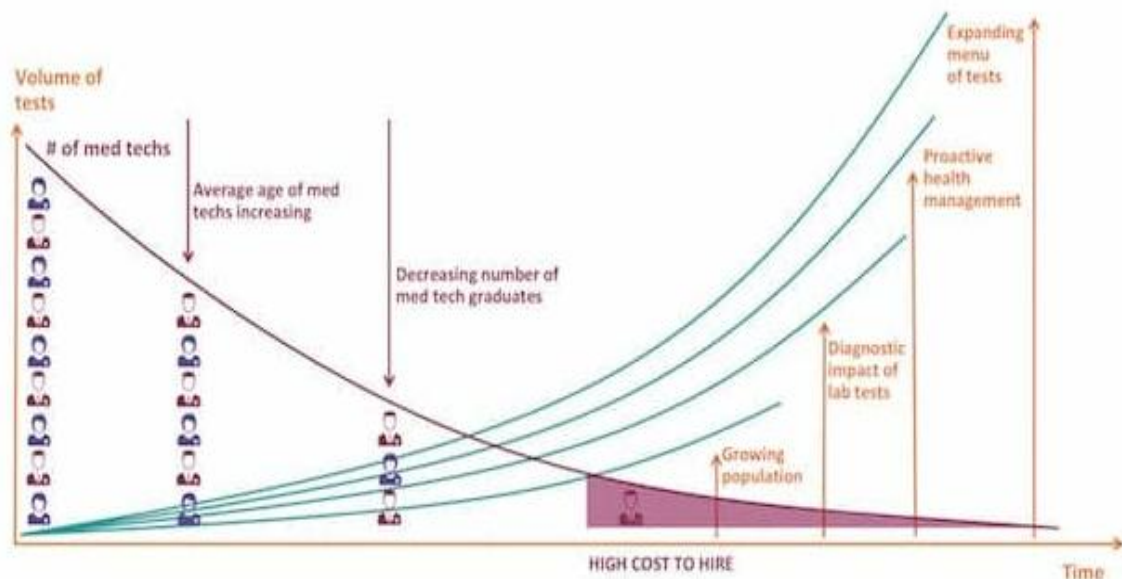


Figure 3: MLS Workload and Staffing Trend

To address the personnel shortage, current employees often need to work extended hours, including overtime and double shifts, and take on additional responsibilities beyond their regular duties (PRS Global Team, 2025). This constant pressure to meet rising demands with limited resources can lead to burnout, decreased productivity, and higher turnover rates. Consequently, this creates a vicious cycle where the shortage is further exacerbated by the loss of experienced professionals (Wilson & Davis, 2023).

Additionally, maintaining acceptable turnaround times for laboratory tests becomes a significant challenge in light of the MLS shortages. With fewer staff members available to process and analyze the same, or even an increasing number of patient samples, the efficiency of laboratory workflows can be severely impacted. While technological advancements, such as sophisticated Laboratory Information Systems (LIS) and automated testing platforms, can streamline certain aspects of laboratory operations, they cannot fully compensate for the fundamental lack of qualified personnel (Roche Diagnostics North America, n.d.). These technologies still require skilled MLS professionals to operate, maintain, troubleshoot, and most importantly, interpret the complex data they generate. Therefore, relying solely on technological solutions without adequately addressing the underlying staffing shortage is unlikely to ensure the timely and accurate delivery of laboratory results that are essential for effective patient care.

## **Economic Implications of the MLS Shortage on the Healthcare System**

The shortage of MLSs has considerable economic ramifications for the healthcare system in the United States, affecting far more than just staffing costs. One notable financial impact is the increased expense associated with hiring temporary staff and intensified recruitment efforts. As clinical laboratories struggle to fill permanent positions, they often resort to temporary staffing agencies to maintain adequate coverage, especially in critical areas (ASCP, n.d.). However, utilizing temporary staff can be considerably more expensive than employing permanent personnel, creating a substantial financial burden on laboratory budgets (ASCP, n.d.).

Another substantial economic consequence of the MLS shortage is the high cost of employee turnover. When experienced MLS professionals leave their positions, healthcare organizations face considerable expenses related to recruiting, hiring, and training new employees (ASCP, n.d.). Research has shown that the turnover rate for medical laboratory technologists is among the highest in hospitals, resulting in an average annual loss of millions of dollars per hospital due to these turnover-related costs (Roche Diagnostics North America, n.d.).

In addition to the direct costs of staffing and turnover, the MLS shortage can lead to various inefficiencies in healthcare delivery, which also have economic implications. For instance, delays in processing and reporting laboratory results due to understaffing can prolong patients' hospital stays, ultimately leading to higher overall healthcare costs (Surriga, 2025). These indirect economic effects of the MLS shortage, resulting from operational inefficiencies and potential compromises in care quality, can significantly impact the overall cost and effectiveness of the U.S. healthcare system.

### **Literature Review Summary**

With factors such as MLS retirement, increased demand for laboratory services, decreased accredited MLS/MLT training programs, and recruiting and retention problems contributing to the critical shortage of MLSs in the U.S., and the impact this shortage has on patient care and safety, laboratory operations and efficiency, and economic implications, it is imperative that solutions are formulated and implemented to ensure increased MLS numbers in the near future. This is vital to ensure a sustainable and effective future for healthcare in the U.S.

## **PROPOSED SOLUTIONS**

Addressing the complex challenges posed by the shortage of Medical Laboratory Scientists (MLS) requires a comprehensive and collaborative approach. This approach includes various strategies to enhance recruitment, improve education and training pathways, foster better retention, effectively leverage technology, and advocate for supportive policy changes.

### **Enhance Recruitment of MLSs**

To enhance recruitment and increase awareness of the profession, healthcare leaders must implement targeted outreach programs in middle and high schools, participate in career fairs, and actively collaborate with Science, Technology, Engineering, and Mathematics (STEM) initiatives to expose students to the rewarding possibilities within medical laboratory science (Robinson, 2023). Many healthcare professionals and the general public are unaware of the complexity and importance of the work performed by MLSs. Educational campaigns and outreach programs can help raise awareness and attract more individuals to the profession (Nguyen et al., 2020). Promoting the MLS profession as a vital and promising healthcare career with diverse specialization opportunities and a significant impact on patient well-being is essential to

attracting a new generation of professionals (Robinson, 2024). Encouraging mentorship programs that connect experienced MLS professionals with students and providing clear transfer pathways for college students pursuing general science degrees can also help to guide and support individuals interested in entering the field (Robinson, 2024). Many healthcare facilities have quality improvement/education (QI) coordinators who can facilitate and promote these educational campaigns, as well as the outreach and mentorship programs.

### **Improve Education and Training Pathways**

Improving educational pathways and expanding training opportunities are also vital components of a sustainable solution. This includes increasing financial support and resources for accredited MLS and Medical Laboratory Technician (MLT) training programs to ensure their continued operation and growth (ASCP, n.d.). This too can be spearheaded by the healthcare facility's QI coordinator. Expanding the number of available clinical rotation sites through strengthened collaborations between academic institutions and clinical laboratories is necessary to provide students with the hands-on experience they need for competency (Robinson, 2023). Moreover, healthcare institutions can partner with academic programs to offer scholarships, internships, and mentorship opportunities to attract and retain aspiring MLSs (Martinez et al., 2021).

### **Retention of Current MLSs**

Enhancing the retention of current MLS professionals is just as important as recruiting new ones. This can be achieved by offering competitive salaries and comprehensive benefits packages that reflect their education, skills, and the critical nature of their work (PRS Global Team, 2025). Human Resource (HR) departments can perform market surveys to ensure MLS salaries are on par with their competitors. Also, providing ample opportunities for ongoing professional development, career advancement into leadership roles, and specialization in specific areas of laboratory medicine can significantly improve job satisfaction and reduce turnover rates (PRS Global Team, 2025). Creating a positive and supportive work environment that actively fosters teamwork, encourages effective communication, and consistently recognizes the valuable contributions of MLS professionals is essential for boosting morale and reducing burnout (PRS Global Team, 2025). Additionally, offering flexible work scheduling options can help improve the work-life balance of MLS professionals, making the profession more sustainable in the long term (PRS Global Team, 2025). Fostering interprofessional collaboration between MLSs and other healthcare professionals can also enhance communication and improve patient care. Recognizing and valuing the expertise of MLSs allows healthcare institutions to create a more supportive and collaborative work environment, improving job satisfaction and retention.

### **Effectively Leveraging Technology**

Leveraging advancements in technology and automation can also help mitigate the impact of the MLS shortage. Expanding the use of automated testing platforms and implementing auto-verification processes can streamline laboratory workflows, increase efficiency, and potentially reduce the overall workload on MLS professionals. This reduction allows them to focus on more complex and essential tasks (PRS Global Team, 2025). Utilizing trained laboratory assistants to perform pre-analytical tasks, such as specimen processing, and post-analytical tasks, such as data entry and report distribution, can also free up valuable time and expertise for MLS professionals (Robinson, 2024). Implementing and optimizing comprehensive Laboratory Information Systems (LIS) is crucial for improving overall laboratory efficiency, reducing the potential for errors, and ensuring seamless data management (Futrell, 2022). However, it is important to recognize that while technology can be a valuable tool, it is not a replacement for the critical thinking and expertise of qualified MLS professionals. It should be implemented strategically to enhance their capabilities rather than to supplant them.

The development of alternative staffing models, such as the utilization of point-of-care testing and remote laboratory services, can also help address the shortage in certain settings. Point-of-care testing can provide rapid results at the patient's bedside, reducing the need for centralized laboratory testing (Kim et al., 2018). Remote laboratory services can provide access to specialized testing and expertise in underserved areas. Professional organizations such as Lean Six Sigma can help implement these alternative staffing models to streamline operations and improve efficiency.

### **Advocate for Supportive Policy Changes**

Finally, effective advocacy and supportive policy changes are essential for creating a sustainable solution to the MLS shortage. This includes increasing the visibility and ensuring a strong voice for laboratory leadership within healthcare organizations and at the level of policy formulation (Robinson, 2024). Healthcare legal teams can advocate for federal policy initiatives such as dedicated grant programs, service-learning opportunities, and public service announcements aimed at promoting the medical laboratory science profession and can help raise awareness to attract more individuals to the field (ASCP, n.d.). Supporting legislative actions, such as the Saving Access to Laboratory Services Act (SALSA), to ensure adequate and stable reimbursement for essential laboratory services is also crucial for the financial health of laboratories and their ability to invest in their workforce (Robinson, 2024). Furthermore, advocating for the implementation of the right to practice professional licensure for MLS professionals in all states can help to establish and maintain consistent entry-level standards and ensure a qualified workforce across the nation (Robinson, 2024).

### **Proposed Solutions Summary**

A multi-pronged approach that encompasses the various strategies of enhancing recruitment, improving education and training pathways, fostering better retention, effectively leveraging technology, and advocating for supportive policy changes is necessary to effectively address the complex and pressing challenges of the Medical Laboratory Scientist shortage. Fostering collaboration among professional organizations, educational institutions, healthcare facilities, and government agencies is essential to achieving success in increasing the number of qualified MLSs in the U.S.

## **CONCLUSION**

The findings from the reviewed literature unequivocally highlight a crucial and steadily growing shortage of MLSs within the United States. This shortage is driven by a complex interplay of factors, including the impending retirement of a large portion of the experienced workforce, a continuous increase in the demand for laboratory testing services, a concerning decline in the number of accredited training programs, and persistent challenges in both recruiting new individuals into the profession and retaining those currently employed. The consequences of this shortage are far-reaching and significantly impact the quality and safety of patient care, the operational efficiency of clinical laboratories, and the overall economic stability of the healthcare system.

Given the absolutely vital role that MLSs play in the diagnostic process and the subsequent management of patient health, addressing this critical workforce shortage is of paramount importance for maintaining the integrity and effectiveness of healthcare delivery in the United States. The literature offers a multitude of potential strategies that, if implemented collaboratively and comprehensively, hold promise for mitigating the current and future workforce gaps. These strategies encompass a wide range of actions from enhancing recruiting and retention efforts and improving the accessibility and number of educational and training programs, to strategically leveraging technological advancements, and advocating for impactful

policy changes at both the state and federal levels. It is imperative that these solutions are implemented now to ensure a robust MLS workforce for the future to foster a healthier society for generations to come.

## REFERENCES

- ASCLS (n.d.) Addressing the Clinical Laboratory Workforce. *The American Society for Clinical Laboratory Science*. <https://ascls.org/addressing-the-clinical-laboratory-workforce-shortage/>
- ASCP (n.d.). The Medical Laboratory Personnel Shortage Background and Rationale. *Policy number 04-04*. Retrieved March 25, 2025, from: <https://www.ascp.org/content/docs/default-source/policy-statements/ascp-pdf-pp-med-lab-personnel-short.pdf>
- Bearce H. A., Spiegel K., and Hulse R. (2017). Laboratory Staffing and a Faltering Connection. *MedicalLab Management Magazine*. Vol.6 No. 10 – pp14. <https://www.medlabmag.com/article/1437>
- Bureau of Labor Statistics. (2022). Clinical laboratory technologists and technicians. *Occupational Outlook Handbook*. <https://www.bls.gov/ooh/healthcare/clinical-laboratory-technologists-and-technicians.htm>
- Putrell, K. (2022). Mitigate the Laboratory Labor Shortage with Process Improvements. *Orchard Software*. [https://www.orchardsoft.com/white\\_paper/mitigate-the-laboratory-labor-shortage/](https://www.orchardsoft.com/white_paper/mitigate-the-laboratory-labor-shortage/)
- Google. (2025) Gemini (March 24 version) [Large language model]. <https://gemini.google.com/>
- Grand View Research (n.d.). Clinical Laboratory Services Market Size, Share & Trends Analysis Report By Test Type (Human & Tumor Genetics, Clinical Chemistry), By Service Provider, By Application, By Region, And Segment Forecasts, 2024 – 2030. <https://www.grandviewresearch.com/industry-analysis/clinical-laboratory-services-market>
- Kaur, T. (2023). MEDICAL LABORATORY SCIENTISTS' ROLE IN THE CARE OF AN AGING POPULATION. *Innovation in Aging*, 7(Suppl 1), 515. <https://doi.org/10.1093/geroni/igad104.1691>
- Kim, S. H., Park, J. Y., & Choi, H. J. (2018). Point-of-care testing: A solution for medical laboratory scientist shortages in rural settings. *Journal of Rural Health*, 34(4), 387-395.
- Lee, J. H., Kim, D. Y., & Park, S. J. (2019). The impact of specialized testing demands on medical laboratory scientist staffing. *Molecular Diagnostics & Therapy*, 23(5), 567-575.
- Martinez, A. G., Lopez, I. M., & Sanchez, R. D. (2021). Innovative recruitment and retention strategies for medical laboratory scientists. *Journal of Allied Health*, 50(4), 289-296.
- Newton, E (2024). Why is There a Shortage of Clinical Laboratory Technologists? *Contract Pharma*. <https://www.contractpharma.com/exclusives/why-is-there-a-shortage-of-clinical-laboratory-technologists/>
- Nguyen, T. T., Tran, P. L., & Vo, H. D. (2020). Raising awareness about the role of medical laboratory scientists in healthcare. *Journal of Medical Laboratory Science*, 27(2), 78-85.

- PRS Global Team (2025). Medical Technologist Shortage: A Growing Concern for Healthcare Providers. *PRS Global*. <https://prsglobal.com/blog/medical-technologist-shortage-a-growing-concern-for-healthcare-providers>
- Robinson, A. T. (2023). Healthcare: Severe Shortages of Qualified Medical Laboratory Professionals. *Biomedical Sci & Tech Res* 48(3)-2023. <https://doi.org/10.26717/BJSTR.2023.48.007651>
- Robinson, A. T. (2024). Workforce in the Shadow of Healthcare –An Update on the Survival Status of Laboratory Medicine and Public Health. *Biomedical Journal of Scientific & Technical Research*, 54(5). <https://doi.org/10.26717/bjstr.2024.54.008604>
- Roche Diagnostics North America (n.d.). Addressing laboratory staffing shortages is critical for healthcare’s future. *Thought Leadership. Indianapolis Business Journal*. <https://www.ibj.com/thought-leaderships/addressing-laboratory-staffing-050324-shortages-is-critical-for-healthcares-future>
- Rohde, R. E., and Robinson, A. T. (2024). Workforce in the Shadow of Healthcare –An Update on the Survival Status of Laboratory Medicine and Public Health. *Biomed J Sci & Tech Res* 54(5)-2024. <https://biomedres.us/fulltexts/BJSTR.MS.ID.008604.php>
- Sikaris K. A. (2017). Enhancing the Clinical Value of Medical Laboratory Testing. *The Clinical biochemist. Reviews*, 38(3), 107–114. <https://pubmed.ncbi.nlm.nih.gov/articles/PMC5759162/>
- Smith, K. L., & Jones, B. C. (2022). The impact of medical laboratory scientist shortages on patient safety and timeliness of laboratory results. *American Journal of Clinical Pathology*, 158(1), 23-31.
- Surriga J.J.A (2025). Medical Laboratory Technologist Labor Market and Industry Initiatives to Address Labor Shortages. *ScholarWorks. Walden University*. <https://scholarworks.waldenu.edu/cgi/viewcontent.cgi?article=19052&context=dissertations>
- U.S. Bureau of Labor Statistics. (2024). *Registered nurses: Occupational Outlook handbook: U.S. Bureau of Labor Statistics*. Bls.gov. <https://www.bls.gov/ooh/healthcare/registered-nurses.htm>
- Ward-Cook K., Chapman S., Tannar S. (2002). Wage and Vacancy Survey of Medical Laboratories: Part I: Salaries Continue to Show Moderate Gains. *Laboratory Medicine. Volume 34, Issue 9, September 2003, Pages 631–638*. <https://doi.org/10.1309/G98MPJQ3EG60U3UA>
- Wilson, E. R., & Davis, M. A. (2023). Burnout and turnover among medical laboratory scientists: A national survey. *Clinical Laboratory Management Review*, 37(1), 12-20.
- Wilson, E. S. (2017, July 17). Tackling Evolving Market Challenges. *Clinical Lab Products*. <https://clpmag.com/resource-center/research/tackling-evolving-market-challenges/>