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Speed Of Adjustment to Target Leverage Among Airlines in Developing Countries: The Role of Accrual Quality

Israa Qasem Mohammad Al Barakat[1] and Azwadi Ali[2*]

[1,2]*Faculty of Business, Economics and Social Development, Universiti Malaysia Terengganu, Malaysia*

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ABSTRACT

This study examined factors influencing the speed of adjustment (SOA) toward target leverage in the airline industry of developing countries, with a focus on the moderating role of accrual quality. It investigated how firm-specific and macroeconomic variables affect capital structure adjustments and whether accrual quality alters these relationships. Using a panel dataset of 149 airlines from 59 developing countries (2012–2020), the System Generalized Method of Moments was applied to address endogeneity and dynamic relationships. Financial strength, inflation, collateralized asset value, energy intensity, profitability, and non-debt tax shields significantly affected the SOA. In addition, high accrual quality reduced the negative influence of financial strength and non-debt tax shields, while enhancing the positive impacts of profitability and collateralized assets on the SOA. This indicated that stronger financial reporting quality facilitated more efficient capital structure adjustments. The study focused on airlines in developing countries between 2012 and 2020, limiting generalizability to other industries or periods. Nonetheless, the findings offered insights to policymakers, investors, and airline managers by highlighting the importance of financial reporting quality in capital structure dynamics.

1. INTRODUCTION

The airline industry plays a crucial role in the global economy by facilitating connectivity, trade, and tourism. However, airlines in developing countries face unique challenges in managing their capital structures and determining appropriate debt levels (El Kalak et al., 2024). Effective capital structure management is a vital component of financial strategy, as it influences a firm's cost of capital, financial risk, and overall firm value.

[2*]Corresponding author. *E-mail address*: azwadi@umt.edu.my

Several financial theories have explained how firms make capital structure decisions. The Dynamic Trade-off Theory suggested that companies maintain a target level of leverage by balancing the benefits and costs of debt (Drobetz et al., 2015). The Pecking Order Theory posited that firms prefer internal financing due to the costs associated with information asymmetry in external financing (Neves et al., 2020). The Agency Theory highlighted the conflict of interest between shareholders and managers in financing decisions (Jensen & Meckling, 1976). These Theories are particularly relevant in the aviation sector, where firms must navigate capital-intensive operations, cyclical demand, and sensitivity to macroeconomic changes.

In underdeveloped and emerging economies, airline companies often operate in more constrained financial environments. These firms tended to face limited access to capital markets, higher financing costs, and greater exposure to economic instability (Morrell, 2021). Therefore, understanding how these firms adjust their capital structure, particularly their speed of adjustment (SOA) to target leverage is critical for managers and policymakers aiming to enhance financial resilience and strategic agility.

This study aimed to identify the key determinants influencing SOA to target leverage in the airline industry of developing countries. A variety of firm-level and macroeconomic factors affected this adjustment process. For example, financial strength which is often reflected in a firm's ability to absorb risk, can determine how aggressively it adjusts its capital structure (Abdullah et al., 2023). Inflation can undermine debt management and increase financial uncertainty (Narayan et al., 2020). Collateral value, particularly in the form of aircraft, often plays a decisive role in debt accessibility (Castro et al., 2016).

In addition, fuel intensity, as a major cost component, significantly affected profitability and cash flow (Kiracı & Aydin, 2018). Profitability itself influenced leverage decisions, with more profitable firms potentially adjusting more quickly. Non-debt tax shields, such as depreciation, can also reduce reliance on debt and influence SOA (Alnori & Alqahtani, 2019).

This research incorporated the moderating role of accrual quality on the relationships between the antecedent factors and SOA. Accrual quality reflected the reliability of financial statements and the extent to which reported earnings represent actual cash flows (Mansali et al., 2019). High-quality accruals reduced information asymmetry and enabled quicker and more accurate financial decision-making (Chen et al., 2016), potentially enhancing the firm's ability to adjust toward its optimal leverage level.

Using panel data from 149 airline firms across 59 developing countries between 2012 and 2020, this study applied the System Generalized Method of Moments (SGMM) for estimation. This approach is well-suited to capturing the dynamic nature of leverage decisions while addressing endogeneity issues inherent in financial modelling.

The contribution of this research is threefold. First, it addressed a gap in the literature by focusing on SOA in a sector and regional context that remains underexplored. Second, it enriched capital structure research by incorporating aviation-specific and macroeconomic variables that influence financial decision-making. Third, by testing the moderating effect of accrual quality, it offered a more refined understanding of how financial reporting quality shapes capital structure dynamics in emerging market settings.

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This study has practical implications for airline managers, investors, and policymakers. Managers can better design capital structure strategies tailored to their firm's financial profile and operating environment (Touil & Mamoghli, 2020). Investors gain insights into factors that affect capital structure stability and risk in developing market airlines. For policymakers, the findings offer evidence to support regulations and interventions that enhance transparency, financial reporting, and sustainable growth in the aviation sector. The research also contributes to the broader theoretical discourse on the Trade-off, Pecking order, and Agency Theories, particularly in high-risk, capital-intensive industries within emerging economies (Warmana et al., 2020; Cumming et al., 2024).

2. LITERATURE REVIEW

The speed at which firms adjust toward their target capital structure is a critical aspect of dynamic capital structure decisions. A growing body of literature has explored the determinants of SOA, emphasizing both firm-specific characteristics and external macroeconomic conditions. Recent research has also highlighted the role of corporate governance in influencing capital structure adjustment behaviour, particularly through mechanisms like financial reporting quality.

The speed of adjustment to target leverage has been widely studied, with evidence suggesting that firm-specific characteristics, macroeconomic conditions, and institutional settings all play significant roles (Lemma & Negash, 2014; Drobetz et al., 2015; Memon et al., 2021). In Europe, Castro et al. (2016) demonstrated that profitability and tangibility remained stable determinants of capital structure across a firm's life cycle, while other research has examined how factors such as accrual quality (Dufour et al., 2020), social trust (Huang, 2021), and environmental risk post-Paris Agreement (Cumming et al., 2025) influence SOA. Corporate governance and ownership structures were also influential, with evidence from China, Italy, and Vietnam showing varied impacts on firms' capital structure decisions and leverage persistence (He & Kyaw, 2023; Morresi & Naccarato, 2016; Nguyen et al., 2020). While much of this research has focused on industrial and banking firms, limited work has been done in the airline sector. However, studies by Fernandes and Capobianco (2001) and Kiracı and Aydin (2018) suggested unique financing behaviours in this industry

2.1 Determinants of Capital Structure Adjustment

The dynamic Trade-off Theory posited that firms have a target leverage ratio and adjust toward it over time. However, this adjustment is rarely instantaneous due to various frictions such as adjustment costs, financial constraints, and market conditions. A range of determinants has been found to influence the speed at which firms adjust to their target capital structure.

Firms with strong financial positions tended to face fewer constraints in accessing external capital, potentially allowing for quicker capital structure adjustments. However, financially strong firms may also delay adjustment if the costs of deviating from the target are low (Booth et al., 2001; Frank & Goyal, 2009). Some studies have suggested that better financial strength led to slower adjustment, as the urgency to rebalance capital structure diminishes (Bei & Wijewardana, 2012). Based on this reasoning, the following hypothesis was proposed:

H1a: Financial strength negatively affects the speed of adjustment to target leverage.

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Inflation is a macroeconomic factor that may impact SOA by influencing the cost of capital and firm valuation. Higher inflation introduced uncertainty in financial markets, potentially reducing SOA (Öztekin & Flannery, 2012). Conversely, some argued that inflation may increase SOA as firms take advantage of inflation-driven adjustments in asset values (Frank & Goyal, 2008). Accordingly, this study posited the following hypothesis:

H1b: Inflation positively affects the speed of adjustment to target leverage.

Firms with higher collateralized value of assets (CVA) have easier access to debt financing, facilitating quicker adjustment toward target leverage (Mahakud & Mukherjee, 2011). However, findings are mixed, as some studies report insignificant effects, particularly in capital-intensive industries (Morellec et al., 2012). Thus, the following hypothesis was formulated:

H1c: Collateralized value of assets positively affects the speed of adjustment to target leverage.

In energy-dependent industries such as aviation, energy intensity can have a substantial impact on cash flows and risk exposure (Kumar & Fernandez, 2019). Fuel price volatility may pressure firms to rebalance their capital structures more frequently, thus affecting SOA (Empeh, 2013). Based on the above argument, this study proposes the following hypothesis:

H1d: Energy intensity positively affects the speed of adjustment to target leverage.

The Pecking Order Theory suggested that more profitable firms prefer internal financing and may delay capital structure adjustments, resulting in slower SOA. However, some empirical studies have suggested that profitability improved internal cash flows, enabling firms to adjust more rapidly toward their target leverage (Öztekin & Flannery, 2012). Therefore, the study hypothesized the following:

H1e: Profitability positively affects the speed of adjustment to target leverage.

Non-debt tax shields (NDTS) such as depreciation reduced the incentive to use debt for tax purposes, potentially lowering a firm's target leverage and slowing its adjustment speed (De Miguel & Pindado, 2001; Buvanendra et al., 2017). In line with this perspective, the following hypothesis was proposed:

H1f: Non-debt tax shield negatively affects the speed of adjustment to target leverage.

2.3 The Moderating Role of Accrual Quality

Accrual quality, as a proxy for financial reporting quality, played a critical role in firm-level financial decisions, particularly in capital structure adjustments. High-quality accruals offer more accurate representations of a firm's financial position, thereby reducing information asymmetry and enhancing investor confidence (Garcia-Teruel et al., 2010; Gao & Zhu, 2015). Strong internal controls and oversight contributed to more reliable accruals, supporting the credibility of financial reports (Doyle et al., 2007). Conversely, poor accrual quality may distort the perceived financial health of a firm, potentially delaying or misguiding capital structure adjustments.

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The current study built on prior research by examining the moderating effect of accrual quality on the relationship between firm-level and macroeconomic factors and the SOA toward target leverage. It was hypothesized that higher accrual quality influenced these relationships by improving the quality of information used in financial decision-making, thereby affecting how firms adjust their leverage over time. The following hypotheses on the moderating role of accrual quality were tested in the study:

H2a: Accrual quality moderates the relationship between financial strength and SOA.

H2b: Accrual quality moderates the relationship between inflation and SOA.

H2c: Accrual quality moderates the relationship between collateralized value of assets and SOA.

H2d: Accrual quality moderates the relationship between energy intensity and SOA.

H2e: Accrual quality moderates the relationship between profitability and SOA.

H2f: Accrual quality moderates the relationship between non-debt tax shield and SOA.

3. METHODOLOGY

3.1 Data and Sample Selection

This quantitative study applied a panel data analysis approach to investigate the relationship between firm-level characteristics, macroeconomic conditions, and corporate governance factors with the speed of capital structure adjustment over time. Panel data enabled the examination of both cross-sectional and time series dimensions, allowing for better control of individual firm effects and providing more accurate estimations.

The sample consisted of 149 airline companies operating in 59 developing countries, covering the period from 2012 to 2020. The airline industry was selected due to its capital-intensive structure, sensitivity to external shocks, and relatively limited research on capital structure behavior in this sector. Data were collected over a three-month period from two comprehensive financial databases, namely DataStream Thomson Reuters and Eikon, which provided reliable and consistent firm-level and country-level data.

3.2 Model Specification

Initial data processing, including management, cleaning, and descriptive statistical analysis, was conducted and involved identifying and addressing missing values, outliers, and verifying data consistency. The primary empirical analysis was carried out using STATA software, utilizing the SGMM estimator. SGMM is particularly suitable for dynamic panel data models where the dependent variable, in this case SOA, was influenced by its own lagged values. It also effectively addressed potential endogeneity problems by employing internal instruments based on lagged differences and levels of explanatory variables (Chua et al. 2022).

The use of SGMM allowed for unbiased and consistent parameter estimates even when standard assumptions of ordinary least squares or fixed effects models were violated due to simultaneity, measurement error, or omitted variable bias. This made it a robust approach for studying financial

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adjustment behavior over time. Descriptions of the variables used in the analysis, including their measurement and sources, are summarized in Table 1. Our measure of accrual quality was consistent with methods used in prior studies (Garcia-Teruel et al., 2010; Dufour, 2020).

Table 1. Definitions of Variables

Variable	Description	Measure
BL	Book Leverage	The ratio of a firm's total debt to its book equity
ML	Market Leverage	The ratio of a firm's total debt to the market value of its equity
FS	Financial Strength	Altman's Z-score: $Z = 1.2Y_1 + 1.4Y_2 + 3.3Y_3 + 0.6Y_4 + 1.0Y_5$ Y1 =Working Capital/Total Assets Y2 =Retained Earnings/Total Assets Y3 =Earnings Before Interest and Taxes (EBIT)/Total Assets Y4 =Market Value of Equity/Book Value of Total Liabilities Y5 =Sales/Total Assets
INF	Inflation	Consumer Price Index (CPI)
CVA	Collateralized Value of Assets	The availability and tangibility of a company's assets: Property, Plant and Equipment/Total Assets
EI	Energy Intensity	The amount of energy consumed per unit of output: Jet Fuel Prices/Total Sales
PROF	Profitability	Utilizing resources to generate earnings: Earnings Before Interest and Tax/Total Assets
NTDS	Non-debt Tax Shield	Tax savings derived from non-interest expenses: Depreciation/Total Assets
AQ	Accrual Quality	Total accruals for each firm in year *t* are computed as working capital accruals (WCA) for firm *i* in year *t* minus depreciation and amortization expenses (Dep): $TA_t = WCA_{it} - Dep_{it}$ $WCA_{i,t} = \beta_0 + \beta_1 CFO_{i,t-1} + \beta_2 CFO_{i,t} + \beta_3 CFO_{i,t+1} + \varepsilon_{i,t}$ $CFO_{i,t}$, $CFO_{i,t-1}$ and $CFO_{i,t+1}$ represent cash flow from operations for firm i in years *t*, *t-1*, and *t+1*, respectively.

The SGMM estimator effectively addressed potential biases that arose from endogeneity and the presence of a short time dimension in panel data. Prior studies, including those by Gaud et al. (2005),

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Lemmon et al. (2008), Antoniou et al. (2008), Haron et al. (2013), Khan et al. (2022), and Abdullah et al. (2023), have employed the SGMM approach to overcome similar econometric challenges. This approach involved taking the first difference of the equation in SGMM.

$$Lev_{i,t} = (1-\lambda)Lev_{i,t-1} + \lambda\alpha_i + \lambda\beta X_{it-1} + \varepsilon_{i,t} \quad (1)$$

This leads to the expression given in equation (2):

$$Lev_{i,t} - Lev_{i,t-1} = (1-\lambda)\left(Lev_{i,t-1} - Lev_{i,t-2}\right) + \lambda\beta\left(X_{i,t-1} - X_{i,t-2}\right) + (\varepsilon_{i,t} - \varepsilon_{i,t-1}) \quad (2)$$

Target leverage is inherently unobservable. To estimate a firm's optimal capital structure, researchers typically begin by regressing current leverage on a set of lagged firm-specific variables. Then, the adjusted values derived from this regression are used to approximate the desired leverage level. The firm attribute function defines the target leverage. Dynamic trade-off theory and several empirical studies identify these variables as the key drivers of the ideal capital structure. Accordingly, the following equation was employed to model the target leverage function:

$$Lev^*_{i,t} = \beta X_{i,t} \quad (3)$$

Where:
β: Slope of the explanatory variables.
X: is the explanatory variables

$$Lev^*_{i,t} = \alpha_{i,t} + \beta_1 FS_{i,t} + \beta_2 INF_{i,t} + \beta_3 CVA_{i,t} + \beta_4 EI_{i,t} + \beta_5 PROF_{i,t} + \beta_6 NDTS_{i,t} + \varepsilon_{i,t} \quad (4)$$

Then, to measure SOA, this study used the partial adjustment model as the following equation:

$$Lev_{i,t} - Lev_{i,t-1} = \delta\left(Lev^*_{i,t} - Lev_{i,t-1}\right) + \varepsilon_{i,t} \quad (5)$$

The partial capital structure adjustment model described how firms gradually adjust their leverage over time toward a target level. It assumed companies had an ideal leverage ratio and adjusted it when deviation costs exceeded correction costs. The speed of adjustment measured the proportion of the gap between actual and target leverage that is closed within a given period. In this study, two models were specified using commonly employed leverage ratios as dependent variables, reflecting standard practice in literature. This modelling approach has been widely adopted in prior research, including Flannery and Rangan (2006), Demirhan (2009), Cotei and Farhat (2009), and more recently, Abdullah et al. (2023). The partial adjustment model enabled empirical estimation of the rate at which firms moved toward their target capital.

4. RESULTS AND DISCUSSION

4.1 Descriptive Statistics

Table 2 presents the descriptive statistics for airline companies in developing countries. The capital structure measures, market leverage (ML) and book leverage (BL), indicated a relatively balanced use of

debt and equity financing. The high collateralized value of assets (CVA) reflected significant reliance on tangible assets as collateral. The financial strength (FS) values suggested some degree of financial instability in the sample. Profitability (PROF) appeared modest, while energy intensity (EI) accounted for an average of 12 percent of total sales, highlighting a significant expense burden for airlines. The high variability in accrual quality (AQ) and the standard deviation of cash flows reflected earnings instability, likely driven by sales volatility and operational uncertainty in developing countries.

Table 2. Descriptive Statistics

Variable	Mean	Median	Maximum	Minimum	Std. Dev.
BL	0.502973	0.511879	0.9865	0	0.205461
ML	0.511218	0.564562	0.997655	0	0.299774
FS	0.562802	0.611907	0.911184	0.001388	0.224983
INF	1.647345	1.299994	4.941169	-0.770457	1.174117
CVA	4.954208	3.220934	59.21974	-2.595243	5.408435
NDTS	0.052292	0.043314	0.963151	-0.002405	0.052112
PROF	0.042841	0.039508	0.90761	-0.630542	0.149576
EI	0.120543	0.167310	0.18321	0.032183	0.143218
AQ	12.49351	12.1075	28.00578	7.00115	6.499356

Table 3 presents the correlation matrix for the variables. All coefficients were below 0.8, indicating the absence of serious multicollinearity concerns (Gogtay & Thatte, 2017). The highest correlation, 0.65 between market leverage and book leverage, remained under the 0.7 threshold commonly used to flag multicollinearity issues (Tabachnick & Fidell, 2007). These findings supported the suitability of the data for regression analysis.

Table 3. Correlation Matrix

Variable	**BL**	**ML**	**FS**	**INF**	**CVA**	**EI**	**PROF**	**NTDS**	**AQ**
BL	1								
ML	0.6566	1							
FS	0.4688	0.5453	1						
INF	-0.6979	-0.7194	-0.6223	1					

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Variable	BL	ML	FS	INF	CVA	EI	PROF	NTDS	AQ
CVA	0.0180	0.0901	0.1243	-0.0373	1				
EI	-0.0360	-0.0768	-0.0144	-0.0784	-0.0551	1			
PROF	0.3427	0.2321	0.2838	-0.1851	0.0728	0.1366	1		
NTDS	-0.3694	-0.3789	-0.2559	0.5259	-0.0378	0.0921	0.0261	1	
AQ	0.0826	0.0876	-0.0455	0.0757	-0.0461	-0.0600	0.0846	0.1669	1

4.2 Determinants of Speed of Adjustment to Target Leverage

This study investigated the speed at which airline companies in developing countries adjust toward their target capital structure, focusing on both target book leverage (TBL) and target market leverage (TML). For book leverage, airlines achieved approximately 66 percent of their target annually (see Table 4), as indicated by a lagged leverage coefficient of 0.34 ($p < 0.05$). This implied a full adjustment period of roughly 1.5 years. In contrast, adjustments in market leverage occurred more slowly, with only 39.2 percent of the target reached each year, suggesting a full adjustment period of about 2.5 years.

Several firm-level characteristics significantly influenced the speed of adjustment (SOA) toward both TBL and TML. Table 4 presents the estimated coefficients and significance levels for these variables. Financial strength (FS) exerted a negative impact on SOA for TBL (-0.090) and TML (-0.082), indicating that financially stronger firms adjusted more slowly. This finding supported Hypothesis 1a (H1a) and aligned with the dynamic Trade-off Theory, as documented in prior studies (Booth et al., 2001; DeJong et al., 2008; Frank & Goyal, 2009; Choi & Richardson, 2016; Belkhir et al., 2016; Mirza et al., 2016; Khan et al., 2022; Abdullah et al., 2023). The negative relationship between financial strength and adjustment speed was also consistent with the concept of financial flexibility introduced by DeAngelo and DeAngelo (2007), which posited that firms maintained debt capacity to preserve flexibility. This characteristic was especially valuable in the volatile economic environments commonly experienced in developing countries.

Table 4. The Effects of Explanatory Variables on SOA

	Model 1(TBL)		Model 2(TML)	
Variable	**β**	**Sig.**	**β**	**Sig.**
$Lev_{i,t-1}$	0.340	0.002***	0.608	0.000***
SOA	0.660		0.392	
Years	1.515		2.551	
$Lev_{i,t-1}$ ×FSit	-0.090	0.000***	-0.082	0.000***

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	Model 1(TBL)		Model 2(TML)	
$Lev_{i,t-1}$ ×INFit	0.126	0.028**	0.402	0.000***
$Lev_{i,t-1}$ ×CVAit	0.077	0.002***	0.112	0.000***
$Lev_{i,t-1}$ ×EIit	0.142	0.023**	0.896	0.000***
$Lev_{i,t-1} \times PROF$it	0.007	0.000***	0.003	0.000***
$Lev_{i,t-1} \times NTDS$it	-0.066	0.001***	-0.058	0.000***
AR (1)	-3.00	0.003	-6.07	0.000
AR (2)	-0.58	0.560	-1.88	0.360
Sargant Test	122.48	0.518	70.75	0.604
Hansen Test	49		49	
Instrument	55.35	0.181	64.44	0.415

Note: This table presents the findings of average SOA and the determinants of the target leverage by controlling endogeneity using two step SGMM. Models 1 and 2 were developed using the dependent variable proxies TBL (target book leverage) and TML (target market leverage), respectively. AR (1): first-order autocorrelation, AR (2): second-order autocorrelation. Hansen p-value statistics to test whether the model was overidentified. ⟦LEV⟧_(i,t-1)= Lagged dependent variable; SOA=1-γ; γ=coefficient ⟦of LEV⟧_(i,t-1); Year = 1/SOA; Year and industry fixed effects were included in all models. Significance at the 10%, 5% and 1% levels is indicated by *, **, and ***, respectively.

The non-debt tax shield (NDTS) also had a negative influence on SOA for both TBL (-0.066) and TML (-0.058), suggesting that firms with higher NDTS adjusted more slowly. This supported Hypothesis 1f (H1f) and aligned with the dynamic Trade-off Theory. While consistent with findings in several studies, this result contrasts with those of Ozkan (2003) and Mahakud and Mukherjee (2011). In the airline industry, the presence of substantial capital investment often results in significant depreciation costs, explaining the slower adjustment in firms with higher NDTS.

Profitability (PROF) showed a modest positive impact on SOA for both TBL (0.007) and TML (0.003), suggesting that more profitable firms made slightly quicker adjustments to their target leverage. This result supported Hypothesis 1e (H1e) and was consistent with the dynamic trade-off theory. While the finding corroborated some existing studies, it stood in contrast to others that observed a significant negative relationship between profitability and SOA.

Inflation (INF) had a significant positive effect on SOA, with coefficients of 0.126 for TBL and 0.402 for TML. This indicated that higher inflation rates led to faster adjustment, particularly for market leverage. These results supported Hypothesis 1b (H1b) and were consistent with the dynamic Trade-off Theory. In periods of high inflation, the tax advantages of debt become more prominent as nominal profits increased, possibly pushing firms into higher tax brackets (DeAngelo & Masulis, 1980).

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The collateral value of assets (CVA) positively influenced SOA for both TBL (0.077) and TML (0.112), indicating that firms with higher levels of collateral adjusted more quickly toward their target leverage. This supported Hypothesis 1c (H1c) and was in line with the Dynamic Trade-off Theory. This finding resonated with previous literature, although some studies reported contradictory evidence. In developing countries, where financial markets were often less mature and information asymmetries are more pronounced, asset collateral served a vital role in easing financial constraints and enhancing borrowing capacity (Benmelech & Bergman, 2009).

Energy intensity (EI) exhibited the strongest positive influence on SOA, with coefficients of 0.142 for TBL and 0.896 for TML. This suggested that rising fuel costs significantly accelerated the pace at which airlines adjusted their leverage, particularly in terms of market value. These findings supported Hypothesis 1d (H1d) and aligned with the Dynamic Trade-off Theory. However, they diverged from the findings of Empeh (2013), who observed a significant negative effect of fuel costs on capital structure decisions.

4.3 The Moderating Role of Accrual Quality

This study further explored how accrual quality moderated the relationship between firm-level and macroeconomic factors and the speed of adjustment to target leverage among airline companies in developing countries. The analysis was conducted separately for TBL and TML using a moderated regression framework. The results are presented in Table 5, which summarizes the moderation effects of AQ on the determinants of SOA.

Table 5. The Moderating Effects of Accrual Quality

Variable	Model 1(TBL)		Model 2(TML)	
	***t*-value**	**Sig.**	***t*-value**	**Sig.**
$Lev_{i,t-1}$	0.078	0.000***	0.224	0.000***
SOA	0.922		0.776	
Years	1.08		1.28	
$AQ_{it} \times Lev_{i,t-1} \times FS_{it}$	-0.011	0.000***	-0.021	0.000***
$AQ_{it} \times Lev_{i,t-1} \times INF_{it}$	-0.021	0.025**	-0.301	0.000***
$AQ_{it} \times Lev_{i,t-1} \times CVA_{it}$	0.047	0.000***	0.095	0.000***
$AQ_{it} \times Lev_{i,t-1} \times EI_{it}$	0.368	0.016**	0.752	0.000***
$AQ_{it} \times Lev_{i,t-1} \times PROF_{it}$	0.048	0.000***	0.001	0.000***
$AQ_{it} \times Lev_{i,t-1} \times NTDS_{it}$	-0.066	-0.029***	-0.094	0.000***
AR (1)	-2.99	0.003	-6.17	0.000

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Variable	Model 1(TBL)		Model 2(TML)	
	t-value	Sig.	*t*-value	Sig.
AR (2)	0.12	0.908	-2.21	0.127
Sargant Test	197.02	0.801	117.31	0.310
Hansen Test	88.50	0.347	99.71	0.116
Instrument	98		98	

Note: This table presents the findings of average SOA and the determinants of the target leverage by controlling endogeneity using two step SGMM. Models 1 and 2 were developed using the dependent variable proxies TBL (target book leverage) and TML (target market leverage), respectively. AR (1): first-order autocorrelation, AR (2): second-order autocorrelation. Hansen p-value statistics to test whether the model was overidentified. ⟦LEV⟧_(i,t-1)= Lagged dependent variable; SOA=1-γ; γ=coefficient ⟦of LEV⟧_(i,t-1); Year = 1/SOA; Year and industry fixed effects were included in all models. Significance at the 10%, 5% and 1% levels is indicated by *, **, and ***, respectively.

For the TBL model, the moderated SOA was estimated at 0.078, implying a relatively quick adjustment period of about one year. In the TML model, the moderated SOA increased to 0.224, corresponding to an adjustment period of approximately 1.28 years. These results suggested that better accrual quality supported more efficient leverage adjustments, particularly in market-based measures of leverage. The findings were consistent with Dufour et al. (2020), who found that firms with higher AQ adjusted their capital structure more quickly. However, earlier studies such as Chen et al. (2016) found that higher AQ was associated with lower financial leverage, while García-Teruel et al. (2010) reported that firms with better AQ secure longer debt maturities.

The moderating effect of AQ was found to be significant across all variables, shaping how each determinant influences SOA. For TBL, AQ weakened the effects of inflation (-0.021), non-debt tax shield (-0.066), and financial strength (-0.011). Similar patterns were observed in the TML model, with stronger moderation effects noted for inflation (-0.301) and energy intensity (0.752). These results supported the study's hypotheses that AQ moderated the relationships between these variables and the speed at which airlines adjust to their target capital structures.

The negative moderating effect of AQ on the inflation–SOA relationship supported the Pecking Order Theory. As AQ improved, reducing information asymmetry, firms were less pressured to adjust quickly to leverage targets in response to inflation. Instead, they can rely on internal funds or make better-informed financing choices, minimizing adjustment costs (Shyam-Sunder & Myers, 1999).

Similarly, the interaction effects between AQ and NDTS were negative and statistically significant for both TBL and TML. This aligned with the Dynamic Trade-off Theory, where tax shields like depreciation can substitute for debt tax benefits, thus reducing the urgency to adjust leverage levels (Paseda, 2025). AQ also dampened the influence of financial strength on SOA, which was interpretable through the Agency Theory (Jensen & Meckling, 1976). Improved financial reporting quality reduced managerial discretion and information asymmetry, facilitating more stable capital structure decisions (Chen & Gong, 2019).

Conversely, AQ enhanced the positive influence of several variables on SOA. The moderating effect of AQ on jet fuel prices (energy intensity) was particularly notable. As AQ improved, the positive

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relationship between fuel prices and SOA became stronger, especially for TML. This suggested that firms with higher AQ were perceived as more capable of managing cost shocks, thereby earning greater investor and lender confidence.

AQ also strengthened the impact of profitability on SOA. Profit-making firms with strong AQ were better positioned to adjust toward their target leverage, confirming prior findings (Azofra et al., 2020; Touil & Mamoghli, 2020; Sinha & Vodwal, 2022). Higher AQ reduced the information gap, enabling quicker market reactions and more efficient access to external financing. A similar moderating effect was observed between AQ and the collateral value of assets. Firms with high-quality accruals provided more credible collateral information, leading to increased debt capacity and improved credit terms.

These findings underscored that accrual quality not only moderated individual firm-level and macroeconomic variables but also played a crucial role in shaping the overall capital structure adjustment behavior. Comparatively, while this study found SOA rates of 34% for TBL and 60% for TML without AQ moderation (corresponding to 1.5 years and 2.5 years adjustment periods respectively), these rates shifted notably with AQ incorporated into the models. Such variations were consistent with international evidence. For instance, in the U.S., SOA ranged from 10% to 35% annually (Flannery & Rangan 2006; Kayhan & Titman, 2007; Faulkender et al., 2012; Öztekin & Flannery, 2012); in Europe, it varied from 19.8% in Switzerland (Drobetz & Wanzenried, 2006) to 79% in Spain (De Miguel & Pindado, 2001); while in Asia, adjustment rates span 12.7% to 45.4% (Arioglu & Tuan 2014; Abdajawad & Nor, 2017; Buvanendra et al. (2017).

5. CONCLUSION

This study offers important insights into the capital structure behavior and adjustment dynamics of airline companies operating in developing countries. It revealed that airlines tended to adjust their book leverage more quickly than market leverage, suggesting that internal accounting-based targets may guide short-term capital structure decisions, while market-based targets were more sensitive to external economic and industry-specific conditions. This finding underscored the multifaceted nature of leverage adjustment and the distinct roles played by both firm-specific and macroeconomic factors.

A central contribution of this study was its examination of accrual quality as a moderating factor. The results showed that higher accrual quality enhanced the positive effects of profitability, asset collateral, and fuel cost sensitivity on the speed of adjustment (SOA), while mitigating the negative effects of inflation, non-debt tax shields, and financial strength. These findings indicated that superior financial reporting can facilitate more efficient capital structure adjustments by reducing information asymmetry and enabling more timely and strategic financial responses. This reinforced the practical relevance of financial transparency, especially in developing countries with evolving institutional frameworks.

The study contributes to the theoretical understanding of capital structure by integrating the Dynamic Trade-off and Pecking Order Theories with industry-specific characteristics and institutional contexts. It highlighted that standard theoretical assumptions may not fully apply to capital-intensive, highly regulated industries such as aviation, particularly in developing economies. The findings also suggested that book and market leverage reflect different dimensions of financial strategy, emphasizing the importance of choosing appropriate leverage metrics when analyzing capital structure.

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From a managerial perspective, the study provides airline executives with a clearer understanding of the factors that influenced the speed of capital structure adjustments. Recognizing the effects of financial strength, inflation, and fuel costs enables more informed and strategic financial planning, which is especially important in economies that are prone to instability. By understanding how accrual quality interacts with these variables, managers can adopt better financial strategies and strengthen their companies' financial stability.

In terms of theoretical contributions, this research builds on existing capital structure theories, particularly the Dynamic Trade-off Theory and the Pecking Order Theory. By incorporating the influence of accrual quality and industry-specific factors, the study revealed that conventional assumptions may not always apply in the airline sector, particularly in the context of developing countries. When applying these theories to understand SOA in certain industries, researchers may need to account for the distinctive characteristics of capital-intensive and highly regulated industries such as aviation.

Practically, the research offers valuable insights for investors and policymakers seeking to assess the creditworthiness and financial stability of airlines in emerging markets. The interaction of accrual quality with capital structure decisions highlights the importance of strong financial reporting standards in facilitating access to external financing and improving capital allocation efficiency. Furthermore, the findings have broader economic and social implications. Strengthening financial management in the airline industry can contribute to more reliable air transport services, which are crucial for regional integration, economic development, and social mobility in developing countries.

Despite these contributions, the study has limitations. Its focus on the airline sector in developing economies restricts the generalizability of the findings to other industries or contexts with different financial dynamics. The analysis period of 2012–2020 excludes the COVID-19 pandemic, which introduced unprecedented shocks that may have significantly altered capital structure behaviors. The reliance on secondary data may have also introduced concerns about data quality, while the system generalized method of moments approach, although robust, has limitations in addressing all forms of endogeneity. Future research may employ other advanced econometric methods (e.g., augmented mean group and common correlated effects mean group) to better capture capital structure dynamics and macroeconomic effects. Additionally, using accrual quality as a proxy may not fully capture the complexity of financial reporting practices across varied institutional environments.

Future research should expand to diverse industries and include developed countries to test the applicability of these findings more broadly. Extending the analysis to cover the post-pandemic period would also help capture the effects of recent global disruptions. Incorporating primary data through surveys or interviews could provide richer insights into managerial decision-making and help validate results drawn from secondary data.

In summary, this study contributes to cross-country capital structure research by presenting sector-specific evidence from developing countries and emphasizing the importance of firm-level and institutional factors in understanding corporate financial behavior. It advocates improving institutional quality and financial reporting standards to enhance external financing access and optimize capital structure management in emerging markets.

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7. CONFLICT OF INTEREST STATEMENT

The authors agree that this research was conducted in the absence of any self-benefits, commercial or financial conflicts and declare the absence of conflicting interests with the funders.

8. AUTHORS' CONTRIBUTIONS

Israa Qasem Mohammad Al Barakat: Conceptualisation, methodology, formal analysis, investigation and writing-original draft; **Azwadi Ali**: Conceptualisation, supervision, writing- review and editing, and validation.

9. DECLARATION OF GENERATIVE AI IN THE WRITING PROCESS

During the preparation of this work, the authors used ChatGPT (OpenAI) to improve language quality, enhance sentence clarity, and refine the overall readability of the manuscript. After using this tool/service, the authors reviewed and edited the content as needed and took full responsibility for the content of the publication.

10. DATA AVAILABILITY/SUPPLEMENTARY MATERIALS

The data analysed in this study were obtained from publicly available annual reports and authorised financial databases. The processed dataset, variable measurement details, and replication information are available from the corresponding author on reasonable request, subject to applicable data access restrictions.

11. ETHICS STATEMENT

The authors declare that this research did not involve human or animal subjects. All procedures undertaken in this study were conducted in accordance with the institutional Safety, Health, and Environmental (HSE) protocols of Universiti Malaysia Terengganu and complied with the applicable institutional research ethics guidelines in force at the time the study was carried out. Formal ethics committee clearance was not required by the institution for this type of study during the period in which the research was conducted. No personal data from human participants or live animal experimentation were involved in this research.

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