



Does Digital Transformation Reflect the Adjustment of Capital Structure?

Mohamad Anas Ktit
University of Doha for Science & Technology, Qatar

Abstract:

The thesis examines the influence of digital transformation on capital structure adjustment in non-financial firms throughout Europe by controlling for firm characteristics (Firm size, tangibility, profitability, non-debt tax shield), board characteristics (board size, board gender diversity and board meeting), and macro-economic characteristics (GDP and Inflation). The analysis utilizes a dataset of 514 non – financial enterprises across 51 European countries from 2010 to 2023. This thesis applied Panel GMM regression analysis. The outcomes indicated that digital transformation had a positive and substantial effect on capital structure adjustment, as positive relationships between board size, frequency of board meetings, tangibility, and firm size. However, profitability, board gender diversity, and inflation all had negative effects; and the non-debt tax shield and GDP were found to be statistically insignificant.

Objectives:

The main aim of this thesis is to fill the gap by examining how digital transformation impacts the capital structure adjustment, with a particular implementation on the control variable characteristics like firm characteristics (firm size, tangibility, profitability, non-debt tax shield) board characteristics (board size, board gender diversity and board meeting), macro-economic characteristics (GDP and inflation) that are influencing the process.

Methodology:

Panel GMM regression is applied to investigate the impact of digital transformation on the adjustment of capital structures and address the issue of endogeneity. The following model has been used to investigate the relation;

CapStAd(i,t)=α+β1 CapStAd(i,t-1)+β2 DT(i,t)+β3 FSize(i,t)+ β4 Tang(i,t)+ β5 NTShield(i,t)+β6 Prof(i,t)+β7 BSize(i,t)+β8 BGD(i,t)+β9 BMeet(i,t)+ β10 GDP(t)+β11 Inf(t)+ ε (1)

Where;

CapStAd: Capital Structure Adjustment toward the optimal capital structure.

DT: digital transformation measured through data text mining via the ratio of keyword occurrences to the total word count in the annual report.

Fsize: Firm Size which is measured by the natural logarithm of total assets.

Tang: Tangibility which is measured by fixed assets divided by total assets.

NTShield: non-debt-tax shield which is measured by accumulated depreciation divided by total assets.

Prof: Profitability measured through return on assets

BSize: Board Size and measured by the number of members on board.

BGD: is board gender diversity and measured by the percentage of females on board.

BMeet: is a board meeting and measured by the number of board meetings in a year.

GDP: is the growth in the Gross Domestic Product.

Inf: is inflation and measured by the percentage of consumer price index. i,t: i denotes entities, and t indicates the time.

a: It's constant.

Result and Discussions:

- Digital transformation positively and significantly impacts the capital structure adjustments of non-financial firms. The capital structure adjustments of these companies become more stable and appealing to investors as digital transformation activities expand. This results suggest that digitally advanced enterprises may have greater development potential, enhanced operational efficiency, and increased profitability, as well as a better capacity to manage their leverage efficiently and adapt their capital structures in response to financial and market conditions. This suggestion indicates that companies engaged in digital transformation exhibit greater dynamism in financial decision-making, while also maintaining a capital structure that aligns with their changing strategic goals.

- Larger firms are more inclined to modify their capital structure adjustment. This corresponds to trade-off theory, which posits that companies modify their capital structures to achieve an optimal debt ratio by weighing the tax benefits of debt against bankruptcy expenses.

- The size of a board is positive and significant with a capital structure adjustment. So, a larger board typically provides varied experience, improved governance, and enhanced oversight, hence augmenting the corresponding firm's capacity to effectively modify its leverage ratio

Panel GMM regression Results			Robustness of results		
Dependent Variable: Capital Structure Adjustment			Dependent Variable: Capital Structure Adjustment		
Variables	Coefficient	p value	Variables	Coefficient	p value
CapStAd _(t-1)	0.035	0.000	CapStAd _(t-1)	0.022	0.000
DT	0.068	0.000	DT	0.059	0.000
FSize	0.096	0.000	FSize	0.088	0.000
Tang	0.062	0.000	Tang	0.057	0.000
NTShield	0.021	0.218	NTShield	0.020	0.352
Prof	-0.147	0.000	Prof	-0.177	0.000
BSize	0.078	0.028	BSize	0.085	0.032
BGD	-0.051	0.000	BGD	-0.047	0.000
BMeet	0.044	0.010	BMeet	0.049	0.025
Inf	-0.054	0.062	Inf	-0.053	0.081
GDP	0.030	0.255	GDP	0.035	0.284
Intercept	0.235	0.000	Intercept	0.288	0.000
Country Dummies		Yes	Country Dummies		Yes
AR1		0.135	AR1		0.121
AR2		0.172	AR2		0.198
Hansen Test		0.404	Hansen Test		0.452
Wald Chi ²		1952.23 (0.000)	Wald Chi ²		1845.25 (0.000)

Conclusion and/or Recommendations:

This research underscores the significant impact of digital transformation on capital structure adjustment in European non-financial enterprises. The results indicate that companies with advanced digital transformation demonstrate enhanced financial flexibility, allowing for more effective capital structures modifications. The incorporation of control variables enhances the intricacy of the analysis firm size and tangibility are found to have positive affect on capital structure adjustment, whereas profitability exhibits a negative correlation, suggesting that more profitable firms rely more heavily on internal financing. Digital transformation improves enterprise performance by alleviating financial constraints, improving transparency, and streamlining operations, which leads to improved non-financial results.

Recommendation

Enterprises and policymakers should leverage these insights to formulate regulatory frameworks that facilitate digital adoption in corporate financial management. Promoting digital innovation and offering financial incentives can improve firms' financial adaptability, enhance access to external capital, and foster long-term financial resilience in a digital-first landscape.

References:

All references can be found in the reference list at the end of the thesis.

Descriptive Statistics

	CapStAd	DT	FSize	Tang	Prof	NTShield	BSize	BGD	BMeet	GDP
Mean	0.199	0.015	22.583	0.633	0.069	0.184	10.492	0.259	8.044	0.014
St Dev	0.058	0.001	1.671	0.203	0.116	0.030	3.765	0.143	2.347	0.025
Min	-0.285	0.009	15.008	0.111	-0.140	0	3	0	2	-0.057
Max	0.578	0.032	27.211	1.000	1.493	0.318	26	0.75	12	0.060