Exploring the Impact of Oil Price Changes on Corporate Cash Holdings during VAT Era in UAE

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ABSTRACT

This study explores the impact oil price changes and corporate cash holdings during the VAE era. Using panel data analysis for 46 of the largest listed firms in the UAE stock markets, the study reveals that oil price changes adversely impact corporate cash holdings, confirming the transaction cost motive where firms are motivated to retain large amounts of cash to mitigate, among other transactions, the costs associated with oil price changes. However, the application of VAT after 2018 in UAE weakens the detrimental impact of oil price changes on the amount of cash held by corporations. This suggests that VAT plays a moderating role in reshaping the relationship between the cash held by the UAE corporations and oil price changes. However, when oil returns are divided into negative and positive returns, we find different results. During VAT era, firms tend to increase their cash holdings when oil returns are negative, while they tend to reduce the cash leak when oil returns are positive, arguing the application of the VAT system application enables firms to carefully manage their cash levels in order to reduce the decline in oil price. This research offers valuable insights for public authorities, managers, and shareholders by illustrating how oil price change can impact corporate cash holdings in an oil-exporting market during the VAT system. The results can guide policymakers and tax reformers in fostering sustainable financial and economic development.

Keywords: Value-Added Tax, Oil Price Change, Corporate Cash Holdings, United Arab Emirates
JEL Classifications: G3, Q4, N7, P18

1. INTRODUCTION

One of the most common external costs that influence corporate cash holdings is the changes in oil prices (oil price change). Although firms often follow a stable cash-holding strategy, oil price change may impact the level of cash held by corporations (Alomran and Alsubaiei, 2022; Lee et al., 2023; Demir and Ersan, 2017; Sarker et al., 2023). An increase in oil price change prevents firms from accurately forecasting information regarding their business activities. However, during periods of oil price changes, firms may increase their cash either to meet the effect of costs of oil price changes and its associated costs or to use for precautionary purposes.

In recent years, the value-added tax (VAT) system in United Arab

Emirates (UAE), which has been implemented since January 2018, become an influential financial policy tool that supports the overall economic system. It is implemented to support the 2023-2030 governmental economic and social plan of UAE where public authority tends to find another future source of income rather than relying totally on oil revenues. VAT is collected from end customers, a broad-based tax levied at multiple stages of production with taxes on inputs credited against taxes on output.[1]

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1   VAT is a consumption tax levied by governments on the final consumed goods and services, and it is charged at each stage of the production and distribution chain up to the retail stage. In some countries, VAT is also levied even on imported taxable goods and services (Ogbonna and Appah, 2016). Going beyond this definition, Ogbonna and Appah (2016) pointed out that VAT is a multi-stage tax process that charges whenever the producers supply goods and services. VAT is levied on the value gained or added to the products being sold.

Sellers are charged the amount of tax on all their sales, and they can claim a credit for taxes that they have been charged on their inputs (Ogbonna and Appah, 2016). The benefit of VAT comes from the revenue being collected throughout the production process but without altering production decisions. This allows governments to depend more on internally generated cash sources to meet their operating needs and unexpected expenses.

Given that VAT is collected based on sales, the firm's cash flow strongly affects the VAT payment. The increase in VAT collection allows firms to specify the amount of cash holding that should either meet their financial obligations (mostly transaction costs) or the sudden (precautionary) costs (Keynes, 1937; Miller and Orr, 1966; Ozkan and Ozkan, 2004).[2] However, holding extra cash might disadvantage firms since it might be treated as a zero-investment action. It might also lead to a waste of excess cash in low-return investments in the form of agency costs (Moolchandani and Kar, 2022; Jensen, 1986). Holding more cash may also prevent firms from making successful financial decisions instead of liquidating assets and meeting unanticipated events (Opler et al., 1999; Bates et al., 2009; Jiang et al., 2023). An increase in the costs of production inputs may raise the prices of goods and services, reducing consumers' purchasing power and discretionary spending and potentially affecting VAT revenues and the amount of cash corporations hold.

Due to the rise in political tension around the globe and oil price volatility in recent years, which have led to a turbulence in oil revenues, oil-exporting countries, such as countries in the Gulf Cooperation Council (GCC) region, specially UAE, have started adopting the VAT system as a non-oil source of income to diversify their sources of income. IMF (2023) indicated that the continuous dependence on oil reserves alone as a source of revenue, without implementing VAT or other sources of income, might not achieve sustainable economic growth. A rise in oil prices leads the prices of oil products to rise, incurring more input costs on users, such as transportation, manufacturing, and energy production costs. The increase in input costs could negatively impact consumers' purchasing powers by increasing the prices of goods and services, lowering corporate sales and profitability, and, ultimately reducing cash holdings. However, a fall in oil prices reduces production input costs, increases disposable income for consumers, and reduces risk generated by oil prices, corporate cash holding.[3] However, during the VAT era the issue is different whereby oil price changes might differently affect the cash held by corporations due to the higher pressure on corporate sales. Thus, it is of great interest to examine how oil price changes affect corporate cash holding before and during the VAT era.

The literature which examines the effect of VAT on the relationship between oil price change and cash holdings is still in need for more exploration, particularly in the UAE market. Prior studies mostly focus on examining the oil returns volatilities (Maghyereh, Abdoh & Al-Shboul, 2022; Al-Shboul & Maghyereh, 2023), but did not investigate the cash holdings as well as did not attention to the effect of VAT. Although few studies have examined the effect of VAT on cash holdings on different sets of countries' data (Xie et al., 2023; Pang et al., 2024; Li and Shen, 2023; Cui et al., 2022), they overlooked the effect of oil price changes, and they showed contradiction in their findings. Some studies found a positive relationship between VAT and cash holdings while others reached to a negative or insignificant relationship. Previous studies (Bugshan, 2022; Wu et al., 2021; Zhang et al., 2020; Alomran and Alsubaiei, 2022) focused on the effect of oil price volatility on cash holdings, but they ignored the impact of VAT in the UAE market. In general, prior studies rarely examined the connection between VAT and oil price changes. However, if they did, most of them focus on the effect of either one of these variables on cash holdings but not in combination. Finally, the main objective of the current paper is to provide a broader understanding of the relationship between oil price change and corporate cash holdings during the VAT era.

The paper offers two main contributions. First, for a sample of the largest non-energy firms listed in the UAE stock markets, it provides a comprehensive analysis of the impact of oil price change and corporate cash holdings. The UAE is an interesting case study because it is one of the oil-exporting countries where the level of corporate cash holdings in the UAE could be highly exposed to oil price change. The UAE economy has shown a need for public income diversification, as it significantly relies on oil revenue as the primary source of income for the government. Before 2021, the UAE economy heavily relied on petroleum and natural gas; most of the UAE's government revenues came from oil and natural gas (Khartukov, 2024; Destek et al., 2024). In 2023, the effect of non-oil revenues will take place in the UAE, where public income is generated from tax and service sectors. Although in recent years, the oil exports have dropped around 30% of the total UAE GDP, the long-term stability of the UAE economy contributes to the stability of the global oil markets since they hold over 10% of the world's oil and natural gas resources (International Trade Administration, 2023). Second, our paper examines whether VAT can impact the link between oil price change and corporate cash holdings. Unlike prior studies, which mainly examined the importance of VAT and how VAT can impact firm value, the impact of VAT as a financial policy tool on cash holdings is essential to investigate. Notably, government revenues in the UAE increased in 2022 by 27.0% to AED 596.8 billion due to higher total tax receipts and social contributions, partially offset by a decline in other revenues.

The main finding is that oil price changes adversely impact corporate cash holdings, confirming the transaction cost motive where firms are motivated to retain large amounts of cash to mitigate, among other transactions, the costs associated with oil

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[2] The transaction costs motive refers to holding more cash when the cost of external financing and the opportunity cost of unsuccessful investment are high. Furthermore, firms may have more cash to reduce the tax disadvantages resulting from double taxation of interest income (Foley et al., 2007) and stock-repurchase costs (Nyborg & Wang, 2021). The cash precautionary motive refers to meeting sudden financial incidents or crises and hedging against various types of risks.

[3] However, for oil-producing firms, whose revenues are highly and directly reliant on oil production, the impact of oil price risk on VAT and cash holdings differs from non-oil-producing firms. The former firms may enjoy more excellent cash-holding portfolios and allow for a greater VAT collection. See the literature review section 2.2. for more explanations.

price changes. However, the application of VAT in UAE weakens the detrimental impact of oil price changes on the amount of cash held by corporations. This suggests that VAT plays a moderating role in reshaping the relationship between the cash held by the UAE corporations and oil price changes. However, when oil returns are divided into negative and positive returns, we find different results. During VAT era, firms tend to increase their cash holdings when oil returns are negative, while they tend to reduce the cash leak when oil returns are positive, arguing the application of the VAT system application enables firms to carefully manage their cash levels to reduce the decline in oil price. Given this direct effect on oil and energy exporting firms, the impact of oil price changes on reducing corporate cash holdings is lower during the VAT era compared to non-VAT era. This is because during VAT era oil price changes have lesser impact of firms' competitive position and on their operating cash flows. Thus, the application of VAT could enable for more diversification of public income during periods of a sudden reduction in oil revenues, leading governments to maintain an appropriate level of public spending, and ultimately allowing corporations to maintain their proper amount of cash.

The paper is structured as follows: Section 2 contains the discussion of the review of literature. The data and methodologies are discussed in Section 3. Section 4 shows the analysis of the results reported by the paper. The concluding remarks are addressed in Section 5.

2. LITERATURE REVIEW

2.1. Oil Price Change and Cash Holdings

The theory of Miller and Orr (1966) suggests that the amount of cash a firm holds depends on the number of transactions and the cost of transactions. Afterward, the pecking order theory (Myers, 1984; Myers and Majluf, 1984) suggests that firms hold cash to hedge against price downside risk by reducing the cost of external financing and safeguarding future investment. The empirical literature, which examined oil price fluctuations' impact on cash holdings, has reported mixed results and conclusions. One strand of studies has argued that firms hold more cash to hedge against oil price change or for any other purposes. Alhassan (2019) argued that oil price change substantially impacts capital assets' investment and leads firms to hold less cash. Wu et al. (2021) found that due to the harmful effect of adverse oil price change, firms with oil-linked assets tend to experience reduced cash flow, affecting their future investments and leading to additional costs and losses.

Furthermore, Alomran and Alsubaiei (2022) reported that the positive effect of oil price volatility on corporate cash holdings is more pronounced in firms operating in oil-exporting countries and oil-exposed industries. Bugshan (2022) showed that firms in the petrochemical industries in the GGC countries hold more cash to eliminate oil price change compared to other industry sectors. Lee et al. (2023) argued that the correlation is positive between cash holdings and oil price uncertainty is more pronounced in financially constrained firms and those located in highly competitive industries or Asia and Europe. Sarker et al. (2023) documented that oil price uncertainty in the US market positively impacts cash holdings.

However, another strand of studies found heterogeneity in the relationship between oil price change and cash holdings. Henriques and Sadorsky (2011) stated that firms tend to hold more cash when oil price change is high due to the U-shape relationship between oil price uncertainty and corporate investments. According to Zhang et al. (2020), during periods of oil price uncertainty, corporations in China allocate additional funds to meet their liquidity shortage. The general conclusion of these studies suggests that the oil price change is nonlinearly related to corporate cash holdings in which cash holdings grow up to a certain threshold due to increase in oil risk, but the influence turns negative after a certain point (Zhang et al., 2020). Given the above strands of studies, the impact of oil price change on cash holdings remains as an issue of concerns to researchers.

The theoretical argument for the link between oil price change and cash holdings can be explained in a few ways. One way is that oil price changes reduce the company's investment position, ultimately leading to additional costs and losses. Thus, firms tend to hold more cash to diminish this negative relationship (Moawad Ahmed, 2016). However, this negative effect might reduce the ability of some firms to hold sufficient cash because a fall in oil price could reduce the firm's competitive position. Unlike energy-producing firms, the cash held by non-energy-producing firms might be more affected by oil and gas risk since their revenues directly relies on oil products. The cash held by these firms might decline due to the variability in oil production costs (Wu et al., 2021; Xiuzhen et al., 2022). Another argument suggests that oil price changes reduce cash holdings through decreasing the profitability and viability of capital-intensive projects, especially for firms operating in countries with substantial involvement in oil price changes (Asenso et al., 2023). In general, oil price change enables firms to retain higher cash balances to maintain flexibility in their capital expenditure plans. The investment opportunities of non-energy firms might decay due to a decline in oil revenues received by local governments. A decline in oil revenue may undermine the firm's production process and thus leads firms hold less cash to meet their financial needs.

The other argument suggests that oil price change could be viewed as a risk that allows firms to hold cash for precautionary intentions during uncertain times, indicating that firms may increase their cash holdings when oil price change rises (Bugshan, 2022, 2024). Moreover, a rise in oil price change may adversely affect the financial system, including bank's ability to offer loans, causing capital markets to be less efficient (Xiong et al., 2019; Yang et al., 2024), and therefore, firms could be more cautious about their cash levels during high volatility periods (Alhassan, 2019). In this case, firms may increase their cash holdings to meet their internal fund requirements and offset the scarcity of external financing.

However, since the focus of the current study is on nonoil-producing firms, the importance of cash holdings to such firms may resist the adverse effects of oil price uncertainty. The framework of our study considers that nonoil-producing firms may face a devaluation in cash flow, expensive external financing costs, and lesser future investment opportunity. These firms may require a pressing need to hedge against oil price changes because they are

vulnerable to cash flow deficits. According to the pecking order theory, cash holdings enable firms to hedge against negative oil price changes by reducing external financing costs and ensuring future investment.

Altogether, it is noticed that the research effort directed the oil-cash-holding nexus remains limited and inconclusive, leaving a few significant research gaps. First, it lacks clear evidence of the impact of oil risk on cash holdings, given that crude oil is one of the world's most essential resources for cash holdings, especially in oil-exporting countries, such as the UAE market. To the best of our knowledge, this is the first study to date that has examined this topic at the UAE level in recent years, given that the UAE is one of the oil-oriented countries. Second, the literature needs to consider the impact of cash holdings on oil price change for non-energy firms in an energy-oriented country. Furthermore, the literature has overlooked the asymmetric effect of oil price change (upside and downside risks) on cash holdings. This asymmetric effect could provide strong support for the evidence reported by the previous literature. Thus, the following hypothesis is posited: H_1: Oil price change reduces corporate cash holdings.

2.2. VAT and Corporate Cash Holdings

The literature which examined the impact of taxation on corporate cash holdings remains understudied. However, if it exists, it provides inconclusive evidence of the impact of VAT on a firm's cash holdings and primarily focuses on the income tax system. The traditional optimal tax theory (Ramsey, 1927; Mirrlees, 1986) suggests that the taxation system generates the desired revenue and income distribution with consistent efficiency. It also focuses only on burden costs, implying that the taxation system should minimize the excess burdens of taxation for a given amount of revenue. To develop this theory, Slemrod and Yitzhaki (1996) and Holcombe (2005) argued that, in addition to burden costs, the impact of taxation contains compliance costs and rent-seeking costs as well as the deadweight costs, the tax system is considered efficient when it minimizes the total costs of taxation.

Ironically, public authorities worldwide have started adopting the VAT system to find a new source of income, expands business enterprises, manages the stability of the economy, and encourages the public and private sectors to increase their investments and attract more private business entrepreneurs into the economy. The VAT incentive offers different objectives, namely, non-oil source of income, correction of market imperfections (Liu et al., 2024), reductions of transaction costs (Zhao et al., 2024), regional development (Liu et al., 2023), and prioritized investments (Wang and Zhu, 2023), productivity (Zhang et al., 2022), among others. Thus, an increase in the revenue generated by VAT is desirable for economic entities. If it is used efficiently, it lowers deficits or the cost of financing of the government service expansion. This means a rise in the efficiently provided public services leads to a decline in the marginal cost of public funds (Gale & Harris, 2011).

Although VAT can increase cash holdings (Pang et al., 2024; Ogbonna and Appah, 2016), in some countries where the necessary infrastructure and expertise in tax management are weak, VAT may reduce corporate cash holdings. According to the Money

Machine Theory (Keen and Lockwood, 2006), countries applying VAT raise more revenue than those not applying the VAT system. VAT weakly increases the demand for government services but has a greater effect on raising revenue (Pang et al., 2024). Other studies argued that VAT allows for efficient cash management and financial reporting practices because it changes the tax planning strategy and financial policies (Murphy, 2018; Pourali et al., 2015). However, it was argued that VAT might place more pressure on corporate liquidity through increased billing (Pourali et al., 2015), increased net foreign debt, and undermined levied energy earnings (Liu et al., 2024).

A recent theoretical model is developed by Lee et al. (2013), who indicated that two factors limiting the positive effect of VAT on the size of government, such as the substitution of the VAT for other tax sources and the low-price elasticity of demand for public goods. These factors decrease the cost of taxation at the margin but may not necessarily raise the size of the government. However, Ndu and Uguru (2022) argued that VAT increases economic growth and thus increases the possibility of cash holdings by privately owned corporations. Chika, Oshiogwemoh, and Promise (2022) found that the VAT system positively impacts real GDP, concluding that tax reforms in Nigeria had a sizable positive impact on economic growth because they reduced the risk produced by the excessive reliance on crude oil revenues to power the economy. Promise et al. (2022) . (2023) also showed a positive correlation between VAT and economic growth (GDP and GNP) because VAT generated more income for the government, allowing firms to hold more cash holdings.

Few studies found a nonlinear relationship between VAT and cash holdings. Pourali et al. (2015) showed that cash holdings respond asymmetrically to VAT in which firms with greater VAT hold less cash, while firms with lesser VAT hold greater cash. Xie et al. (2023), using a sample of non-financial sector firms, reported that the uncredited VAT refund policy exercises both resource and signaling effects, enabling firms to reduce cash holdings. Bubić et al. (2016) argued that the change in VAT rates in Croatia affects the overall business, including its liquidity, allowing firms to maintain an adequate level of liquidity. After adopting the VAT reform in China, Pang et al. (2024) argued that an increase in VAT enforcement enhances the tendency of firms to hold more cash. Li and Shen (2023) argued that the VAT reform in China significantly reduces corporate financialization, decreasing the demand for cash to hedge business risks. Bai and Wu (2024) found that China's tax reform increases liquidity but decreases the reliance on external financing. The negative effect between tax and liquidity is more significant among non-state-owned companies. During the COVID-19 crisis, Cui et al. (2022) argued that the tax cuts in the Chinese market decreased a firm's cash flow.

While the above-discussed studies examined the effect of VAT adoption on firm characteristics, there is a contradiction in their findings. Some studies reported positive relationships while others reached to negative or insignificant relationships between VAT and its determinants. Although prior research has mainly focused on specific aspects of VAT, they overlooked the inclusive impact of VAT on cash holdings. Previous studies have rarely examined

the impact of the adoption of VAT in UAE on oil price changes. The UAE market is characterized by oil-revenue-generating market as well as it does not apply the double taxation system where the interest income from liquid assets is collected at the firm's level, and the personal income generated by shareholders is collected from shareholders. This means that the cost of holding cash may stay the same as the firm's marginal tax rate, which would weakly harm the VAT-generated revenue and, thus, increase corporate cash holdings. In this case, we state the following hypothesis:

H_2: The implementation of VAT system increases corporate cash holdings.

2.3. VAT and Oil Price Change

The literature examining the link between oil price change and VAT is free of pure evidence and lacks clear direction. Extant literature has examined the role of VAT in different economic aspects and overlooked the direct link between VAT and oil price change. Some studies have examined the impact of VAT on government budgets (Keen and Lockwood, 2006; 2010), economic growth and GDP (Okoror and Onatuyeh, 2018; Chika et al., 2022), the real GDP (Afolayan and Okoli, 2015), public income and sustainability (Sarwar et al., 2021), and economic and human development (Unegbu and Irefin, 2011). These studies have offered inadequate evidence of the link between VAT and these economic aspects.

Another group of studies examined the link between energy markets and the VAT system. For example, Fouquet (1995) argued that the actual price of energy products for UK households rose due to the adoption of VAT. Due to reducing the VAT collected on residential fuel in the UK, VAT increases the use of natural gas consumption. However, other studies mainly focused on the link between VAT and oil characteristics, with rare attention paid to corporate cash holdings. Chemingui and Hajeeh (2011) argued that the Kuwaiti market concluded that the effect of VAT on non-oil activities does not significantly increase government revenues from oil exportation. Asatryan et al. (2017) found that remittances associated with oil price change significantly affect VAT revenues. Yahaya and Yusuf (2019) argued that VAT and oil revenue in Nigeria lead to infrastructural developments and economic growth. During the Russian-Ukraine war, Gars et al. (2022), when many European Union (EU) countries cut taxes on petrol and diesel to shield consumers, VAT cuts increased Russia's short and long-term oil profits.

Given the heavy reliance of the UAE economy on oil revenue as a unique source of income, the income received by the government will decrease (increase) due to the decrease (increase) in oil prices. Based on these stylized facts, a decline in oil prices would lead firms to hold less cash due to the decline in the oil revenue received by the government. The decline in oil revenue would lead to economic downturns and, thus, a slowdown in their local businesses' profitability. This is because governments might not be able to provide sufficient funds for future investment and infrastructural developments, thus harming the stability of public spending. In addition, the decline in oil revenue may reduce the disposable income for consumers and, finally, reduce the overall VAT revenue, and thus, lead to low cash holdings.

Under the assumption that VAT generates a stable source of income for governments, it might be an add-on function to the increase in oil revenue in UAE. However, if oil revenue declines, the income-generated by VAT might reduce the harmful effect of the decline of oil prices on economic growth. This role played by VAT might improve consumers' disposable income and thus enable firms to hold more cash due to increase in sales and cash inflows. The increase in consumption and household demand generates more VAT and thus reduces the degree of corporate mismatch between investment and financing (Zhao et al., 2024), allowing firms to reach the best trade-off profile between debt and equity. On the investment side, VAT might provide the best cost of capital for firms, incentivizing firms to hold more cash through investing on high liquid stocks when oil prices fall (Hartley, 2019). On the financing side, VAT may improve corporate profitability through reducing cost of borrowing and holding a mix of short-term and long-term debt instruments, enabling firms to hold more cash in period of breach oil markets.

If firms hold more cash to meet the transaction costs due to the decrease in oil prices, VAT might reduce the cash held by corporations through the VAT credit refund policy. Compared to the excess input tax carried forward, firms with refunded VAT credits could actuate the vacant funds occupied by VAT credits, and thereby increasing the firm's cash flow, and reducing capital costs. However, one can argue that firms seeking capital optimization could be less motivated to hold cash for meeting the transaction costs. This policy can advance the firm's expectations for tax burden and financial risks, while optimized fiscal and tax policies may directly improve the business environment, and thus reducing the firm's motivation to hold cash in periods of oil prices weakening. Lastly, despite the policy's limited influence on corporate governance, the eased tax burden, better capital conditions, and optimized market may prompt firms to reduce cash holdings due to the increase in agency cost associated with oil price declining.

VAT might be an effective way to avoid the employment of funds in sectors that pay a high tax rate in periods witnessing high changes in oil prices. If governments direct funds toward investment in one field rather than another, VAT might adjust cash holdings during periods of stressful oil markets Hammour and Mckeown (2022) stated that companies might increase their cash holdings after applying VAT to reduce the production and operational costs which are generated by oil price changes, at a time when the commodity reaches the consumer at a better price. VAT might generate make informed decisions that can contribute to their long-term growth and sustainability especially in periods of oil price changes. Increase in oil prices might lead to an increased after-tax profit margin which would allow firms to retain a greater portion of their profits for investment, and finally increase their cash holdings. However, if increase in oil prices leads to less cash holdings, imposing VAT would increase production costs, decline producers' profit, and deteriorate their incentives towards productivity. VAT may lead to an increase in consumer awareness, which takes the oil prices into account as one of the most important factors in buying the commodity, since the supply is large and varied which may cause some stagnation in the sales movement for some products (Bai et al., 2024). Therefore, the relationship

between VAT and cash holdings depends largely on the nature of the oil pricing system.

Altogether, the link between oil price change and cash holdings during the VAT era remains understudied; mainly, weak evidence is offered for the GCC region and the UAE market. A few studies examined the impact of VAT on oil price change, but they examined the effect of either of these variables on cash holdings, but not in combination. Furthermore, they generally focused on the impact of VAT and economic aspects and ignored the direct effect of VAT on the link between oil price change and cash holdings. Given that the UAE market contains a certain number of oil exporting firms and energy products distribution firms, VAT would impact the oil price upside and downside risks and, thus, local firms' cash holdings.

Obtaining more VAT might weaken the detrimental impact of the decline in oil prices by increasing productivity and enhancing the structure and the administration of the tax system, which might reduce the pressure on the prices of goods and services, allowing for greater purchasing power for consumers. Enhancing purchasing power allows firms to increase sales and profitability and finally corporations can hold more cash. In all cases, VAT might work as an income diversifier against the reduction in oil revenue, leading the UAE government to maintain a greater level of public spending. Therefore, firms would enjoy the positive effect of public spending, and would hold more amount of cash. Based on the above discussion, we state the following hypothesis:

H_3: Oil price changes have a lesser detrimental effect on corporate cash holdings during the VAT era, compared to non-VAT era.

3. METHODOLOGY AND DATA

3.1. Methodology
3.1.1. The baseline model
Following the framework of Palazzo (2012), Bugshan (2022), and Sarker et al. (2023), we examine the impact of oil price change on a firm's cash holdings using the panel data analysis as specified in Equation (1).

$$CH_{it} = \beta_0 + \beta_1 OIL_{it} + \sum_{l=1}^{L} \beta_l F_{it}^l + \sum_{k=1}^{K} \beta_k C_{it}^k + \varepsilon_{it} \qquad (1)$$

Where i and t are firm and time quarter, respectively. CH_{it} refers to corporate cash holdings proxies. Four different cash holding proxies are used, namely: (Cash to total assets (CH_1), cash to total shareholders' equity (CH_2), and cash and cash equivalent to total assets (CH_3), respectively). These proxies are adopted by a number of studies (Feng and Rao, 2018; Zhang et al., 2020). OIL_{it} is the return series of the oil price index calculated by the continuously compounding returns of price indices. Two oil price indices are used, namely, the returns of the West of Texas Intermediate crude oil price index (WTI) and the returns of the Brent (Northern Sea) crude oil price index (BRENT).

The first group of control variables contains the firm-specific variables, F_{it}^l. Some studies found that firm size (SIZE) is negatively associated with cash holdings (e.g., Tran et al., 2024;

Opler et al., 1999; Dalwai et al., 2024; Almaazmi et al., 2025), while other studies argued that firm size is positively associated with the amount cash hold by corporations (Ozkan and Ozkan, 2004; Magerakis et al., 2020). Firms engaging in more debt (LEV) may hold more cash (Zhang et al., 2020; Alomran and Alsubaiei, 2022), while engaging in corporate debt may adversely impact cash holdings (Ferreira and Vilela, 2004). Ali et al. (2024) elaborated that firms with higher ROE tend to hold more cash, while firms with higher ROE may hold less cash (Jiang et al., 2023). Adopting the consolidated financial statements method (ACC) allows firms to hold more cash, while following this method may reduce cash holdings (Nohria and Ghoshal, 1994; Roth and O'Donnell, 1996). The application of IRFS may reduce the cash held by firms (Ozkan et al., 2021), but it may increase cash holdings (Wang and Yu, 2021; Kim and Ryu, 2018). The second group of control variables contains the global risk variables,. The geopolitical risk factor (GPR)[4], which is developed by Caldara and Iacoviello (2022), may decrease a firm's cash holdings (Kotcharin and Maneenop, 2020), while GPR may increase a firm's cash holdings (Wang et al., 2021a, b; Opler et al., 1999).

Given that sovereign debt (SOV), developed by Baker et al. (2016), corporations may hold less cash due to paying off existing debt (Singh and Sirimaneetham, 2021), while it may hold more cash as insurance against financial losses and precautionary purposes. Climate policy uncertainty (CLIM)[5], developed by Gavriilidis (2021), may raise the amount of cash holdings (Ling and Gao, 2023), but it may reduce cash holdings (Zhang and Gao, 2023). The trade policy uncertainty (TRAD)[6], developed by Baker et al. (2016), can reduce cash holdings (Ahn, 2020). However, firms with larger exposures to trade policy risk may hold more cash (Demir and Ersan, 2017). To address the potential endogeneity in all regressors in our model specifications, which could lead to inconsistent estimates due to simultaneity and reverse causality, we use the system (SYS) GMM panel dynamic estimation developed by Arellano and Bover (1995) and Blundell and Bond (1998) (for more explanation see Sajwani et al., 2024). This estimation deals with endogenous regressors and unobserved individual-specific heterogeneity by employing moment conditions in first differences and levels.

3.1.2. Interaction model between VAT and oil price change
To examine the impact of VAT on the impact of oil price change and corporate cash holdings, the following model is specified in Equation (2):

$$CH_{it} = \beta_0 + \beta_1 OIL_{it} + \beta_2 VAT + \beta_3 VAT \times OIL_{it} + \sum_{l=1}^{L} \beta_l F_{it}^l + \sum_{k=1}^{K} \beta_k C_{it}^k + \varepsilon_{it} \qquad (2)$$

Where *VAT* refers to the use of the value-added tax. We use two proxies for VAT. VAT_1 which is measured by a dummy variable

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4   The geopolitical risk index is available at: https://www.policyuncertainty.com/gpr.html

5   The climate change uncertainty index is available at https://www.policyuncertainty.com/climate_uncertainty.html

6   The trade policy uncertainty and sovereign debt indices are available at: https://www.policyuncertainty.com/trade_uncertainty.html

taking the value of 1 for every quarter between Q1-2018 and Q4-2022, or zero otherwise. Due to adopting the VAT system effective after the beginning of 2018, VAT has become effective as a part of the overall taxation system in the UAE. As anywhere else, VAT is imposed on goods and services at a specific rate (in UAE, it was 5% and will rise to more after 2021). Due to the unavailability of the direct data about VAT in the UAE, the second proxy, VAT_2, is measured by the natural logarithm of the 5% of the total GDP pe capita of UAE. An increase in the collected VAT raises the government's revenue to fund its infrastructural developments, enhancing the stability of public spending. VAT diversifies public revenue by finding a non-oil source of income and provides compensation against the reductions in government revenues resulting from falling oil prices. The error term, ε_{it} is assumed to be normally distributed $\varepsilon_{it} \sim iid\ N(0,\ \sigma^2)$ in Equations 1 and 2. Similar to Equation (1), we use the same estimation methods and procedures in estimating the parameters in Equation (2). Table 1 summarizes the description of the variables.

3.2. Data

The sample of this study consists of firms listed in the UAE stock markets covering the period between Q1-2013 and Q4-2022. After collecting the data per firm, the firms operating in the energy and financial sectors are excluded from the sample since the excluded financial firms (such as banks and other financial firms) always have a certain amount of cash held to meet their daily business

Table 1: Variables description

Variables	Description	Source
Dependent variables		
Cash holding1 (CH_1)	Total cash to total assets	Refinitiv/Datastream and authors' own calculations
Cash holding2 (CH_2)	Total cash to total shareholders' equity	Refinitiv/Datastream and authors' own calculations
Cash holding3 (CH_3)	Cash and cash equivalent to total assets	Refinitiv/Datastream and authors' own calculations
Independent variables		
Value-Added-Tax (VAT_1)	The value-added-tax, which is measured by a dummy variable taking a value of 1 from 2018-Q1 to Q4-2022, or zero otherwise	Authors' own calculations
Value-Added-Tax (VAT_2)	The natural logarithm of the 5% of the UAE's GDP per capita	World Bank and authors' own calculations
Return of Crude Oil Texas (WTI)	The continuously compounded return series of the daily observation of the West of Texas Intermediate crude oil price index. The price index is quantified by the US dollars per Barrel. The average prices of 6 months daily window is taken when converting them to quarterly basis.	Federal Reserve Bank of St. Louis and authors' own calculations
Return of Crude Oil Brent (BRENT)	The continuously compounded return series of the Brent crude oil price index (Northern Sea index). The price index is quantified by the US dollars per Barrel.	Federal Reserve Bank of St. Louis and authors' own calculations
Control variables		
Firm size (SIZE)	Natural logarithm of total assets	Refinitiv/Datastream and authors' own calculations
Leverage (LEV)	Total net debt divided by total assets	Refinitiv/Datastream and authors' own calculations
Return on equity (ROE)	Return on shareholders' equity, measured by dividing net income on total shareholders' equity	Refinitiv/Datastream and authors' own calculations
Long-term accounting method (ACC)	The implementation of long-term accounting method, which is measured by a dummy variable taking a value of 1 if the firm is reporting their statements following "all subsidiaries are consolidated", or zero otherwise.	Refinitiv/Datastream and authors' own calculations
International financial reporting standard (IFRS)	The implementation of IFRS, which is measured by a dummy variable taking a value of 1 if the firm use IFRS, or 2 if the company use local standards, or 3 if the company follows any other systems (e.g., GAAP, among others), or zero otherwise (such as, "No consolidation, cost basis (parent company only" or "not applicable").	Refinitiv/Datastream and authors' own calculations
Sovereign debt (SOV)	Sovereign debt currency crisis index	Categorical data, Baker et al. (2016) at www.PolicyUncertainty.com
Geopolitical risk (GPR)	Geopolitical Risk Index	Caldara and Matteo (2022) at: https://www.policyuncertainty.com/gpr.html
Climate policy uncertainty (CLIM)	Climate Policy Uncertainty Index	Gavriilidis (2021) at www.PolicyUncertainty.com
Trade policy uncertainly (TRAD)	Trade Policy Uncertainty Index	Categorical data, Baker et al. (2016) at www.PolicyUncertainty.com
Year-quarter	A dummy variable represents a year-quarter effect applied for each firm in every quarter.	Authors' own calculations
Industry	A dummy variable represents an industry effect applied for each firm in every quarter.	Authors' own calculations

activities by primarily relying on cash payments and receipts. Furthermore, since the main topic of our study is oil price change and some of the sample firms are linked directly and indirectly to oil refinery, explosion, and retail distribution of oil and gas, all firms linked to the energy sector are excluded from the sample. The other criterion for executing the sample is excluding firms with incomplete data for most of the sample period. Finally, the final sample firms are 58 for 40 quarters, with total observation of 2,320. The financial accounting data of such firms are extracted from Refinitiv.

4. RESULTS AND ANALYSIS

4.1. Univariate Analysis

The univariate analysis is reported in Tables 2 and 3. Table 2 reports the summary descriptive statistics of the variables used in the study. The mean values of all cash holdings measures are positive. The cash and cash equivalent to total current assets (CH_2) has the highest mean value, meaning that the UAE firms are highly liquid, where cash and cash equivalent occupied around 37.56% of total current assets with a higher standard deviation (25.93). The mean value of the other cash ratios ranged between 6.73% and 12.6%. This suggests that the UAE firms hold a higher percentage of cash. The mean values of the return for both oil price indices are negative. The mean value for the returns of WTI reaches -0.5423%, while it reaches to -0.8180 for the return of Brent (BRENT) index. This means that the downside risk is higher for both indices than the upside risk. The downside risk for the return of BRENT is higher than the same for WTI. However, returns of both indices show similar standard deviation. Comparing the proxies for VAT (VAT_1 and VAT_2), the mean values for both proxies are positive. Given the VAT_2 as the natural logarithm of 5% of the net sales, the mean value equals 10.43 while the VAT dummy mean value reaches 0.4. The VAT_2 standard deviation is more than for VAT_1.

Table 3 shows the correlation coefficients for the variables used in the study. It shows that returns of the crude oil indices are negatively correlated with all cash holdings proxies. The oil price change exposure is expected to reduce the level of cash holdings for firms in the UAE market, confirming the theory's prediction. Furthermore, the proxies for VAT positively impact all cash holdings proxies, suggesting that the collection of VAT by the UAE government is expected to enhance the cash liquidity position for firms in the UAE. This confirms the VAT theory, which states that VAT enables firms in the UAE to increase their cash holdings. More VAT collection leads to economic growth and an increase in public income, allowing firms to enjoy economic relaxation and expansion. The other issue is that returns of the crude oil indices are negatively correlated with VAT proxies. This means that VAT might reduce the impact of oil price change, and the downside risk of oil price would be minimized when the VAT system is adopted.

4.2. Multivariate Analysis

4.2.1. Results of the baseline model

Table 4 shows the results of the baseline model. We see that changes in oil prices adversely impact corporate cash holdings, confirming that an increase in oil prices tend to reduce the firm's

Table 2: Summary descriptive statistics

Variable Variable No	CH_1 (1)	CH_2 (2)	CH_3 (3)	WTI (4)	BRENT (5)	VAT_1 (6)	VAT_2 (7)	SIZE (8)	LEV (9)	ROE (10)	ACC (11)	IFRS (12)	GPR (13)	CLIM (14)	TRAD (15)	SOV (16)
Mean	0.0673	0.0983	0.1262	−0.5423	−0.8180	0.4000	10.650	15.0287	0.1138	1.6666	0.9604	0.9845	102.8898	156.7226	205.8688	60.3489
p50	0.0400	0.0688	0.0931	1.0516	1.0710	0.0000	10.427	14.7102	0.0818	5.7200	1.0000	1.0000	97.7050	147.5359	85.7754	38.5918
SD	0.0733	1.1244	0.1225	17.9047	17.7447	0.4900	2.1706	2.0113	0.3795	33.8826	0.1950	0.1236	40.6351	75.3843	297.3532	58.1992
Variance	0.0054	1.2642	0.0150	320.5794	314.8738	0.2401	4.7117	4.0454	0.1441	1148.0300	0.0380	0.0153	1651.21	5682.79	88418.95	3387.15
skewness	2.1257	−22.5183	2.9483	−0.3894	−0.4098	0.4082	−0.1550	0.3331	7.7112	−13.0891	−4.7230	−7.8397	4.0083	0.7177	2.2591	1.7210
Kurtosis	9.4080	537.2705	18.2010	3.4504	3.6937	1.1667	3.2402	2.6761	97.4003	242.2729	23.3072	62.4602	22.1706	2.7968	7.7826	5.7802
Count	2375	2375	2375	2320	2320	2320	2375	2375	2375	2375	2375	2320	2320	2320	2320	2320
Min	0.0000	0.0000	0.0000	−48.3291	−52.6391	0.0000	2.1690	10.5871	−0.9195	−655.2200	0.0000	0.0000	64.0700	58.0725	7.6726	5.9615
Max	0.5855	3.8899	0.9988	38.0136	36.8045	1.0000	16.1910	20.6388	5.5057	110.7700	1.0000	1.0000	324.23	346.612	1374.28	249.39

The table details the descriptive statistics of the variables used in the study. The definitions of variables are provided in Table 1

Table 3: Correlation coefficient matrix

Variable	CH_1	CH_2	CH_3	WTI	BRENT	VAT_1	VAT_2	SIZE	LEV	ROE	ACC	IFRS	GPR	CLIM	TRAD	SOV
Variable No	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
CH_1	1															
CH_2	0.1133*	1														
CH_3	0.4668*	0.0659*	1													
WTI	−0.0119	−0.0202	−0.0129	1												
BRENT	−0.0118	−0.022	−0.0139	0.9821*	1											
VAT_1	0.0389	0.0469*	0.0989*	−0.1176*	−0.1097*	1										
VAT_2	0.0378	0.0028	0.0770*	−0.0028	−0.0026	0.0011	1									
SIZE	−0.0657*	0.0016	−0.1092*	0.0108	0.0126	0.0478*	0.1867*	1								
LEV	−0.1669*	−0.0221	−0.3294*	0.0108	0.0105	0.0918*	0.1115*	0.1078*	1							
ROE	0.0698*	0.2031*	0.1174*	−0.0256	−0.0266	−0.0186	0.0544*	0.0386	−0.0983*	1						
ACC	−0.1496*	0.0087	−0.0788*	0.0009	−0.0001	−0.1259*	0.0488*	−0.0113	0.0652*	0.006	1					
IFRS	0.0214	−0.0073	−0.1181*	−0.0131	−0.0147	−0.1253*	−0.0262	−0.0272	0.039	−0.0134	−0.0489*	1				
GPR	0.0178	0.0033	0.0581*	0.0114	0.015	0.0702*	0.0265	0.0283	−0.0035	0.0399	−0.0754*	−0.0372	1			
CLIM	0.0224	0.0231	0.0570*	0.0778*	0.1016*	0.0699*	−0.0053	0.0293	0.0657*	−0.0274	−0.0113	−0.0850*	0.0757*	1		
TRAD	−0.0387	0.0003	−0.0580*	−0.1173*	−0.1221*	0.1659*	−0.0156	−0.0047	0.0242	−0.0448*	−0.0113	−0.0015	−0.1011*	0.2848*	1	
SOV	0.0001	−0.0316	0.0195	−0.1271*	−0.1628*	−0.0281	0.0094	−0.0047	−0.0072	−0.0191	−0.0091	−0.0044	0.0517*	−0.1302*	v0.0785*	1

The table reveals the correlation coefficients' matrix of the variables used in the study. * indicates significance at the 5% level

cash holdings. Our finding is against the trade-off theory, unveiling that the transaction costs motive is crucial to retaining lesser amount of cash by UAE corporations. Firms in UAE hold less cash because they tend to maintain less-diversified investments which require more complex hedging technique to mitigate the effect of oil price change. The managerial opportunism, where managers act to hold more cash to make more private benefits even in periods of oil price crashes, might be the reason behind the negative effect of oil price changes and cash reserve. Managerial opportunism rises moral hazard and information asymmetries, thereby reduces the cash held by firms due to heightening the firm's overall costs (Tawfik et al., 2022). Given that insiders are well-informed compared to outsiders and minority shareholders are also less informed compared to majority shareholders (possibly government in this case), increase in oil prices might lead to less cash held by corporations.

Considering the possibility that firms in UAE are directly influenced by changes in oil price, especially those are powered by the oil and gas products, decrease in oil prices might lead to increase in cash holdings due to government subsidies or deferment of repaying loans or financial obligations offered by government to such firms which might have contributed to offer a favorable opportunity to enhance the amount of cash held by corporations. The negative impact of oil price changes cash holding might result from the inefficiencies of financial markets in the UAE are inefficient (Al-Shboul and Alsharari, 2019) as well as from the social and cultural features of the UAE's community, given the differences in the derivers of the UAE markets and communities. Our findings contradict the results reported by Bugshan (2022) and Zhang et al. (2022), who stated that oil price risk increases the amount of cash held by corporations.

The other finding in Table 4 is that cash held by corporations is enhanced during the VAT era, supporting H2. This finding is consistent with the findings reported by Ndu and Uguru (2022) and Pang et al. (2024), who argued that VAT increases cash holdings. Furthermore, we report that VAT plays a vital role in reducing the detrimental effect of oil price changes. This means that during the VAT era firms might either not reduce or not rise their cash holding when they are negatively exposed to oil price changes due to being the misalignment between corporate investment and financing decision. In this case, firms might increase their cash holdings to encounter oil price failures. However, during VAT era, a decline in oil price may lead firms to hold more cash to meet the rise in overall costs.

The results of the control variables are also discussed. We notice that firm size increases cash holdings. Large firms tend to have better access to funds from external resources at low costs, own high-liquid stocks, and hold more cash. This finding is consistent with the findings of Zhang et al. (2020). Engaging in corporate debt (leverage) adversely impacts cash holdings because it increases risk and transaction costs, undermining the level of cash holdings. This finding corroborates the findings of Ferreira and Vilela (2004) and Alomran and Alsubaiei (2022). A higher ROE leads to higher cash holdings, confirming the findings of Ali et al. (2024), who argued that firms hold more cash to afford

Table 4: Estimation of the baseline model - Impact of oil risk and value-added tax on corporate cash holdings

Estimated models	(1)	(2)	(3)
Dependent variable	CH_1	CH_2	CH_3
L.CH_1	0.8920*** (718.43)		
L.CH_2		0.7694*** (1641.41)	
L.CH_3			0.8272*** (426.68)
WTI	−0.0000*** (−21.37)	−0.0013*** (−168.75)	−0.0001*** (−35.96)
VAT_1	0.0008** (2.02)	0.0166*** (12.26)	0.0180*** (68.78)
SIZE	0.0020*** (18.15)	0.0311*** (65.24)	0.0075*** (25.06)
LEV	−0.0312*** (−52.68)	−0.0894*** (−108.52)	−0.1159*** (−61.25)
ROE	0.0000*** (8.26)	0.0058*** (221.69)	0.0000 (0.83)
ACC	0.0017*** (4.62)	0.0417*** (20.96)	0.0077*** (9.14)
IFRS	0.0068*** (22.38)	0.1618*** (57.19)	0.0173*** (11.59)
Cons	−0.0112*** (−12.89)	−0.6501*** (−69.66)	−0.1083*** (−18.86)
Year-quarter	Yes	Yes	Yes
Industry	Yes	Yes	Yes
N	2262	2262	2262
AR (1) Blundell-Bond	−3.0554***	−5.0255***	−4.8604***
P-value (AR1)	0.0022	0.0000	0.0042
AR (2) Blundell-Bond	−2.1404	−1.0391	−1.4224
P-value (AR2)	0.2323	0.2988	0.2549
Sargan	51.777	273.279	51.96481
P-value (Sargan)	0.675	0.558	0.578
Wald test	2.37E+07***	5.66E+12***	3.83E+07***

The table shows the results of the baseline model - the link between oil price change and corporate cash holdings with respect to firm-specific including VAT. The models are estimated using the GMM system dynamic panel estimation as proposed by Arellano-Bover (1995)/Blundell and Bond (1998). The indicators (***, **, and *) represent the level of significance at (1%, 5% and 10%), respectively

Table 5: Endogeneity - Estimation of the baseline model with respect to global risk factors

Estimated models	(1)	(2)	(3)
Dependent variable	CH_1	CH_2	CH_3
CH_1	0.8026*** (140.34)		
CH_2		0.7142*** (450.31)	
CH_3			0.4759*** (70.53)
BRENT	−0.0000*** (−18.42)	−0.0015*** (−133.48)	−0.0001*** (−26.59)
VAT_2	0.0041*** (12.25)	0.0096*** (2.73)	0.0027*** (4.52)
SIZE	0.0076*** (23.35)	0.2799*** (91.72)	0.0212*** (18.26)
LEV	−0.0439*** (−45.62)	−0.0098* (−1.79)	−0.1683*** (−27.85)
ROE	0.0000*** (5.42)	0.0056*** (85.54)	0.0000 (0.66)
ACC	0.0000 (0.22)	0.0419*** (9.77)	0.0046*** (3.20)
IFRS	0.0029* (1.89)	0.1336*** (53.32)	0.0052* (1.78)
SOV	−0.0000*** (−6.90)	−0.0003*** (−141.09)	−0.0000*** (−28.78)
GPR	−0.0000*** (−24.54)	−0.0007*** (−152.99)	−0.0001*** (−22.02)
CLIM	0.0000*** (43.22)	0.0003*** (147.75)	0.0001*** (33.75)
TRAD	−0.0000*** (−30.38)	−0.0000*** (−11.96)	−0.0000*** (−29.15)
Cons	0.0978*** (20.89)	−4.4256*** (−97.24)	−0.2725*** (−12.93)
Year-quarter	Yes	Yes	Yes
Industry	Yes	Yes	Yes
N	2149	2149	2149
AR (1) Blundell-Bond	−3.0752***	−4.6761***	−2.9056***
P-value (AR1)	0.0021	0.0000	0.0037
AR (2) Blundell-Bond	−1.3499	−1.2391	−1.3806
P-value (AR2)	0.2404	0.2829	0.1674
Sargan	57.253	57.871	55.197
P-value (Sargan)	0.725	0.691	0.715
Wald test	2.21E+09***	2.78E+07***	4.15E+06***

The table shows the results of the baseline model - the link between oil price change and corporate cash holdings by adding global risk factors. The models are estimated using the GMM system dynamic panel estimation as proposed by Arellano-Bond (1998). The indicators (***, **, and *) represent the level of significance at (1%, 5% and 10%), respectively

more funds for strategic investments. Adopting the consolidated financial statements method (ACC) decreases cash holdings, suggesting that the UAE's parent firm finds it costly to manage and monitor their cash, including its foreign subsidiaries, and this ends up with inefficient use of cash. This confirms the results of Nohria and Ghoshal (1994) and Roth and O'Donnell (1996). IRFS reduces the cash held by firms because of the over-transparency of information, which increases the information asymmetry between firms and investors and thus reduces cash holdings; this is in line with the findings of Ozkan et al. (2021).

To address possible endogeneity in the measurement of the main independent variables used in the study, the baseline model is re-estimated using the GMM system developed by Arellano and Bover (1995) and Blundell and Bond (1998). The results as in Table 5, alternative proxies for VAT and oil price change are used, and four global risk factors are also added to the model (climate uncertainty risk, geopolitical risk, sovereign debts, and trade policy

uncertainty). The alternative proxy of VAT used is measured by the natural logarithm of the 5% of the firm's net sales (VAT_2). The proxies for the global risk factors are used to examine the effect of these factors jointly with oil price change on cash holdings. The alternative proxy for oil price change is the return series of the Brent crude oil price index (BRENT). The results in Table 5 conclude that oil price change reduces corporate cash holdings while implementing the VAT system increases cash holdings.

Additionally, this may suggest that the interaction hypothesis of VAT and BRENT (VAT_2×BRENT) might lead to that VAT could weakens the impact of oil price changes on cash holdings. These results are similar to those reported in Table 4, confirming that possible endogeneity is weak or does not exist.

The results of the global risk factors provide exciting findings. The geopolitical risk factor (GPR), which is the risk associated with military and terrorist actions and political tensions, significantly increases cash holdings because it induces a fall in gross trade and a decline in economic activities, thus affecting the firm's earnings. In this case, firms may hold more cash as a precaution against cash shortfalls due to an increase in GPR (Kotcharin and Maneenop, 2020; Aksoy-Hazır and Tan, 2023). We find that sovereign debt adversely affects cash holding. Firms are paying off existing debt instead of building cash reserves (Singh and Sirimaneetham, 2021). Thus, monetary policy tightening through government debt increases firms' incurring fewer cash holdings. We also notice that climate policy uncertainty (CLIM) raises cash holdings. This can happen when firms adopt aggressive long-term growth plans for innovation and investments into clean technology (Ling and Gao, 2023) due to their involvement in divestment from carbon-intensive assets or purchasing good green credentials. The trade policy uncertainty (TRAD) also lowers cash holdings. This means higher exposure to global trade allows firms to hold less cash because the domestic-market orientation would insulate firms at least partially from the immediate effects of international trade tensions. As firms are less diversified in their operations, they are less willing to hold cash. Thus, firms with more extensive direct exposures to the risks from trade disputes may hold less cash. This finding is consistent with the findings of Huang and Mazouz (2018).

4.2.2. Interaction between VAT and oil price change

Table 6 shows that VAT weakens the detrimental effect of oil price change on corporate short-term liquidity for the total sample firms, confirming the results in Tables 4 and 5. Although it is normally observed that the reliance of crude oil exports is generating more financial support to the government in UAE, it harmfully affects the degree of liquidity within corporations. This harmful effect has risen in the era of VAT implementation. VAT tend to reduce the pressure on cash holding when oil prices rise.

VAT allows governments to increase their productivity and enhance their administration of the tax system, which leads to obtaining more tax revenue. As the VAT revenue is secured and collected throughout production and sales, firms may consequently depend more on internally generated cash sources to meet their operating needs and unanticipated expenses. VAT is also advantageous to businesses and governments because it prevents the variability of foreign income generated by changes in oil prices. However, low oil prices can reduce input costs, increasing consumer disposable income, and influence the overall VAT revenue the government generates. VAT as a consumption tax levied on petroleum products (i.e., gasoline, diesel, and heating oil) could reduce the risk generated by oil prices. This means that during VAT period the mismatch between investment and financing decisions might be reduced, leading to leser effect of oil price changes on cash liquidity (Zhao et al., 2024).

Table 6: The impact of VAT on the interaction between oil price change and corporate cash holdings

Estimated models	(1)	(3)	(4)
Dependent variable	CH_1	CH_3	CH_4
CH_1	0.8876***		
	(592.97)		
CH_2		0.7692***	
		(886.89)	
CH_3			0.8119***
			(153.61)
WTI	−0.0001***	−0.0030***	−0.0001***
	(−3.94)	(−121.88)	(−2.81)
VAT_1	0.0026***	0.0240***	0.0173***
	(8.18)	(13.17)	(20.60)
VAT_1×WTI	−0.0000***	−0.0029***	−0.0000***
	(−10.35)	(−121.08)	(−13.11)
SIZE	0.0026***	0.0350***	0.0065***
	(12.70)	(102.11)	(10.03)
LEV	−0.0322***	−0.0939***	−0.1189***
	(−29.20)	(−23.67)	(−25.44)
ROE	0.0000***	0.0057***	0.0000
	(8.34)	(290.66)	(1.09)
ACC	0.0018***	0.0283***	0.0080***
	(2.71)	(5.77)	(6.10)
IFRS	−0.0113***	−0.1454***	−0.0250***
	(−24.22)	(−63.36)	(−10.15)
SOV	−0.0000***	−0.0003***	−0.0000***
	(−7.86)	(−110.92)	(−7.78)
GPR	−0.0000***	−0.0006***	−0.0001***
	(−15.89)	(−101.49)	(−17.59)
CLIM	0.0000***	0.0004***	0.0000
	(27.29)	(264.54)	(1.41)
TRAD	−0.0000***	−0.0000***	−0.0000***
	(−5.29)	(−10.80)	(−15.44)
Cons	−0.0098***	−0.6627***	−0.1042***
	(−3.75)	(−145.56)	(−9.53)
Year-quarter	Yes	Yes	Yes
Industry	Yes	Yes	Yes
N	2262	2262	2262
AR (1) Blundell-Bond	−3.0745***	−1.0269***	−2.8785***
P-value (AR1)	0.0021	0.0001	0.004
AR (2) Blundell-Bond	−2.1148	−0.70031	−1.3516
P-value (AR2)	0.2344	0.4837	0.1765
Sargan	55.20664	57.69931	53.06007
P-value (Sargan)	0.456	0.549	0.489
Wald test	3.76E+07***	1.51E+08***	5.03E+07***

The table shows the results of the interaction model where the role of VAT on the link between oil price change and corporate cash holdings is estimated. The models are estimated using the GMM system dynamic panel estimation as proposed by Arellano-Bover (1995)/Blundell and Bond (1998). The indicators (***, **, and *) represent the level of significance at (1%, 5% and 10%), respectively.

This negative association between oil price changes and cash holdings might be related to the rise in information asymmetry within different groups of shareholders as well as between shareholders and managers. Minor and major shareholders might be differently informed, and the conflict between agents and principals might lead to higher agency costs. Given the unique structure of the firms' leadership and owners in the UAE where the dual duty of managers either they represent the government or own a high percentage of shares (government and family shareholders),

oil price changes might place more control on the management to determent the level of cash held by these firms. As government's participation in the management as well as in the ownership may involve bureaucratic and delay in the administrative procedure, oil price changes might not enhance the amount of cash held by corporations, but firms to hold a lesser amount of cash in period of oil prices enhancement. The high controlling power exerted by the firm's family share ownership with UAE firms might have led them to hold a lesser amount of cash due to the more restrictions on managerial actions.

To address endogeneity in the measurement of the leading independent variables used in the study, the interaction model is re-estimated using alternative proxies for VAT and oil price change. The interaction variable (VAT_2 × WTI) represents the interaction between the second proxy for VAT (VAT_2) and the second proxy for oil price change (WTI). The results are reported in Table 7, suggesting that VAT weakens the effect of oil price changes on corporate cash holdings. The results are quantitatively similar results to those reported in Table 6, confirming that possible endogeneity is weak or does not exist.

4.2.3. Interaction between VAT and positive and negative oil returns

The results of the interaction between VAT and positive and negative oil returns are reported in Table 8. In columns (1-3) of Table 8, the results show that during the VAT period the detrimental impact generated by the rise in oil prices on corporate cash holdings is reduced. This means that the VAT system acts as a supporting tool to the level of short-term liquidity in UAE corporations when prices of oil increase. When increase in oil prices exposes firms to higher transaction and operational costs, VAT enables firms either to stabilize their cash levels or increase the amount of cash to meets these costs. In this case, firms might be more flexible to reduce or increase their cash levels since VAT dilutes the severe impact of the rise in oil prices on cash holdings. An increase in crude oil prices allows the UAE's government to engage in more investment opportunities and reduce sovereign debt, strengthening the local currency's value against foreign currencies, local firms in this case may enjoy a stable business environment through generating more sales and they may hold more cash.

In columns (4-7) of Table 8, similar findings are reported in terms of the impact of oil prices on cash held by organizations. We report that when oil returns are negative (oil price declining), there is an adverse impact of oil price changes on cash holdings, suggesting that changes in oil prices reduces cash holdings. However, when VAT is introduced, we find that the effect of oil price changes on cash held by firms is reduced. This means that during the VAT system enabled firms to more cash when decline in oil returns. This confirms that VAT tends to degrade the impact of the detrimental impact of oil price changes on cash holdings. Although the decline in oil prices adversely affects the overall public income, harms public investment growth, and adversely affects consumers' purchasing power, it might release the pressure on the firm's cash boundaries and sales because it may reduce the firm's costs of productions. This release of pressure might allow firms to generate more VAT which would remain a supporting

Table 7: The impact of VAT on the link between oil price change and corporate cash holdings: Alternative proxy for VAT

Estimated models	(1)	(3)	(4)
Dependent variable	CH_1	CH_2	CH_3
CH_1	0.7974***		
	(136.68)		
CH_2		0.7123***	
		(326.22)	
CH_3			0.4883***
			(59.19)
WTI	−0.0001***	−0.0013***	−0.0001***
	(−19.54)	(−5.01)	(−11.01)
VAT_2	0.0022***	0.1403***	0.0028***
	(3.61)	(22.84)	(3.58)
VAT_2 × WTI	−0.0000***	−0.0000***	−0.0000***
	(−30.80)	(−15.40)	(−13.82)
SIZE	−0.0048***	0.2659***	0.0228***
	(−7.32)	(79.61)	(7.47)
LEV	−0.0454***	0.0506***	−0.1657***
	(−31.94)	(8.13)	(−29.14)
ROE	0.0000***	0.0057***	0.0000
	(5.73)	(530.64)	(0.86)
ACC	0.0008**	0.0291***	0.0051***
	(2.00)	(4.24)	(3.33)
IFRS	0.0000***	0.0004***	0.0000***
	(15.02)	(62.39)	(31.63)
SOV	−0.0000***	−0.0008***	−0.0001***
	(−34.91)	(−34.34)	(−18.18)
GPR	−0.0000***	−0.0004***	−0.0001***
	(−8.67)	(−45.79)	(−31.75)
CLIM	−0.0000***	0.0000***	−0.0000***
	(−37.05)	(4.06)	(−27.01)
TRAD	−0.3213***	−0.3896***	−0.0059*
	(−32.00)	(−35.00)	(−1.85)
Cons	0.0740***	−5.0913***	−0.2967***
	(9.95)	(−77.26)	(−6.59)
N	1967	1990	2090
Year-quarter	Yes	Yes	Yes
Industry	Yes	Yes	Yes
AR (1) Arellano-Bond	−2.3436***	−1.0208***	−2.2941***
P-value (AR1)	0.0191	0.3073	0.0218
AR (2) Arellano-Bond	−1.0502	1.058	−1.8006
P-value (AR2)	0.2936	0.2901	0.198
Sargan	51.2345	52.6921	50.873
P-value (sargan)	0.356	0.321	0.342
Wald test	5.81e+06***	1.80e+07***	7.73e+06***

The table shows the results of the interaction model where the role of VAT on the link between oil price change and corporate cash holdings is estimated. The models are estimated using the GMM system dynamic panel estimation as proposed by Arellano-Bond (1991). The indicators (***, **, and *) represent the level of significance at (1%, 5% and 10%), respectively

tool to stabilize the level of cash. This is because the extra income generated by VAT might not fluctuate the same as the fluctuations in oil prices. Given that decline in oil prices would diminish the overall operating costs, the general levels of prices goods and services (reduces consumers' purchasing power), and firm workers' wages and salaries, it allows firms to generate greater profit margin, thereby pay more VAT. This could permit firms to retain their levels of cash reserves or reduce the cash leak generated by managerial

Table 8: The impact of VAT on the relationship between oil price change (positive and negative) and corporate cash holdings

Oil return case	Positive oil return			Negative oil return		
Estimated models	(1)	(2)	(3)	(5)	(6)	(7)
Dependent variable	CH_1	CH_2	CH_3	CH_1	CH_2	CH_3
CH_1	0.6640***			0.7022***		
	(94.95)			(229.28)		
CH_2		0.7423***			−0.0256***	
		(5447.71)			(−405.51)	
CH_3			0.7820***			0.6373***
			(147.76)			(80.20)
WTI	−0.0001***	−0.0078***	−0.0002***	−0.0001***	−0.0006***	−0.0003***
	(−10.75)	(−217.12)	(−21.10)	(−4.80)	(−22.93)	(−19.98)
VAT_1	0.0031***	0.1613***	0.0320***	0.0035***	0.4731***	0.0259***
	(10.26)	(71.94)	(30.57)	(8.47)	(163.59)	(15.01)
VAT_1×WTI	−0.0000***	−0.0009***	−0.0001***	0.0002***	0.0050***	0.0001***
	(−27.84)	(−22.23)	(−18.73)	(16.73)	(93.32)	(3.98)
SIZE	0.0046***	0.0395***	0.0086***	−0.0003	−0.0456***	−0.0120***
	(13.94)	(49.32)	(13.06)	(−0.89)	(−43.27)	(−7.82)
LEV	−0.0514***	−0.1440***	−0.1607***	−0.0266***	−0.1050***	−0.1752***
	(−28.88)	(−53.37)	(−19.92)	(−12.18)	(−27.39)	(−24.46)
ROE	0.0001***	0.0047***	0.0000	0.0001***	−0.0048***	0.0000
	(8.38)	(274.35)	(0.96)	(4.85)	(−402.13)	(1.44)
ACC	0.0086***	0.0061	0.0027	0.0104***	−0.0278***	0.0249***
	(9.17)	(0.98)	(1.18)	(9.68)	(−6.30)	(9.61)
IFRS	0.0366***	0.3803***	0.0876***	−0.0498***	−0.1202***	−0.0647***
	(15.92)	(89.56)	(24.40)	(−16.41)	(−14.80)	(−4.56)
SOV	−0.0000***	0.0003***	0.0000***	0.0000***	0.0001***	0.0000***
	(−2.61)	(55.13)	(7.67)	(6.14)	(16.10)	(14.79)
GPR	−0.0001***	0.0001***	0.0001***	0.0001***	0.0024***	0.0002***
	(−27.92)	(9.55)	(10.78)	(10.78)	(230.41)	(16.33)
CLIM	−0.0000***	−0.0008***	−0.0001***	−0.0000***	−0.0030***	0.0000**
	(−18.28)	(−189.92)	(−36.54)	(−5.82)	(−104.36)	(2.42)
TRAD	−0.0000***	0.0002***	−0.0000***	−0.0000***	0.0002***	0.0000
	(−12.87)	(101.49)	(−5.89)	(−4.99)	(105.75)	(0.16)
cons	−0.0134***	−0.7868***	−0.1749***	0.0750***	0.9729***	0.2362***
	(−4.08)	(−62.87)	(−14.57)	(13.27)	(55.09)	(6.63)
N	986	1044	1044	928	928	870
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
AR (1) Blundell-Bond	−2.272***	−2.813***	−2.7018***	−2.344***	−2.932***	−2.832***
P-value (AR1)	0.0022	0.0023	0.0026	0.0001	0.0012	0.0015
AR (2) Blundell-Bond	−1.259	−1.3521	−1.3521	−1.392	−1.456	−1.543
P-value (AR2)	0.2314	0.2991	0.1856	0.334	0.3131	0.3454
Sargan	52.490	53.781	52.927	49.657	50.987	50.823
P-value (Sargan)	0.653	0.684	0.645	0.456	0.519	0.567
Wald test	2.31E+08***	2.68E+06***	3.16E+07***	3.21E+06***	2.34E+07***	3.56E+06***

The table shows the results of the interaction model where the role of VAT on the impact of upside and downside oil price change on corporate cash holdings. The models are estimated using the GMM system dynamic panel estimation as proposed by Arellano-Bond (1991). The indicators (***, **, and *) represent the level of significance at (1%, 5% and 10%), respectively

opportunism. Hence, VAT impacts the rise and the decline in oil prices differently, confirming the findings of Zhang et al. (2020). Changes in oil prices have a nonlinear effect on corporate cash holdings. In summary, the results in Table 8 align with those reported in Tables 6 and 7.

5. CONCLUSION AND POLICY IMPLICATIONS

The paper examined the impact of value-added tax (VAT) on the relationship between oil price change exposure and corporate cash holdings in UAE. Using a panel regression analysis for a sample of

46 listed firms in the UAE stock markets, the paper confirms that oil prices change tends to reduce short-term liquidity. We also find that VAT significantly impacts the relationship between oil price changes and corporate cash holdings, confirming that VAT weakens the detrimental effect of oil price change on cash holdings. When the sample of oil price returns is divided into two subsamples, namely the upside and downside risks, VAT enables firms to increase their cash holdings when returns are negative while it enables firms to reduce the cash leak when returns are positive, arguing VAT is a supporting tool to the link between cash holdings and oil price extreme changes.

The study offers important policy implications. As VAT is an essential source of government revenue, authorities can

benefit from our results by understanding the effect of VAT on the government's budgets and determining the main factors influencing VAT revenue. Given that the VAT system requires a certain level of economic and financial development, our results are advantageous to public authorities where governments can control tax avoidance, fraud, evasion, and financial losses. Our results could enhance the procedures to apply the VAT and facilitate the collection process of VAT in periods of greater changes in oil markets. Our results also provide valuable guidance to private businesses (listed firms) where managers can efficiently manage the VAT collections and payables, alleviating losses and any delay in VAT payments. Managers can understand when the VAT deductibility policy can directly affect their account payables. Dealing with qualified taxpayers who provide VAT invoices for the purchase of equipment and services helps firms reduce the tax burden, increase operating profit, and reduce the firm's costs. Shareholders may set appropriate monitoring strategies to control the actions of managers toward dealing with the VAT system, allowing firms to enjoy better VAT track records with lesser managerial opportunism. A better VAT track record attracts more investors and, finally, increases firms' cash holdings.

This study has some limitations. One of these limitations is the measurement error associated with the alternative proxy for VAT in which firms in some sectors does not pay VAT like their counterpart in other industry sectors. Furthermore, since the sample of our study focuses on non-energy firms, the results of our paper might not be valid for energy firms. Another limitation is that our study examined the impact of VAT on the nexus between oil price changes on cash holdings, not oil prices volatility on cash where the second movement in the level of oil prices was not fully captured. One can also run a difference-in-difference test for the effect of oil price change on cash liquidity before and after the implementation of the VAT system.

Possible future research could be conducted to in this area of research. Given the scarcity of the value-added tax data per quarter collected by public authorities at the time being, future research can be performed by constructing a VAT index by taking a percentage of VAT from GDP. In addition, given that not all industry sectors are subject to VAT, this study can be developed by selecting only the group of firms subject to VAT. Furthermore, given that our sample covered the COVID-19 crisis, the summary variable representing this crisis was not included in our model due to its strong collinearity with the VAT dummy, so future researchers may find a way to add it to their studies' models. This study can also be made per industry sector. Given that the GCC region has witnessed many political, oil, and economic crises in the most recent years, the effect of these crises can be taken in the models of future studies, with careful consideration of multicollinearity across the variables representing such crises.

REFERENCES

Afolayan, S.M., Okoli, M.N. (2015), The impact of value added tax on Nigerian economic growth (1994-2012): An investigation. European Journal of Business and Management, 7(9), 226-235.

Ahn, J. (2020), A theory of domestic and international trade finance. In: Emerging Market Finance: New Challenges and Opportunities. Vol. 21. England: Emerald Publishing Limited.; pp. 203-229.

Aksoy-Hazır, Ç., Tan, O.F. (2023), The impact of geopolitical risk on cash holdings policy: Evidence from an emerging market. Managerial Finance, 49(9), 1400-1419.

Ali, M.A.S., Aly, S.A.S., Abdelazim, S.I., Metwally, A.B.M. (2024), Cash holdings, board governance characteristics, and Egyptian firms' performance. Cogent Business Management, 11(1), 2302205.

Alhassan, A. (2019). Oil price volatility and corporate decisions: evidence from the GCC region. Emerging markets finance and trade, 55(9), 2057-2071.

Almaazmi, G., Al-Shboul, M., Barood, G. (2025), How does climate policy uncertainty impact corporate cash holdings? Evidence from UAE. International Journal of Economics and Financial Issues, 2025, 15(3), 1-17.

Alomran, A.A., Alsubaiei, B.J. (2022), Oil price uncertainty and corporate cash holdings: Global evidence. International Review of Financial Analysis, 81, 102115.

Al-Shboul, M., Alsharari, N. (2019), The dynamic behavior of evolving efficiency: Evidence from the UAE stock markets. The Quarterly Review of Economics and Finance, 73, 119-135.

Al-Shboul, M., Maghyereh, A. (2023), Did real economic uncertainty drive risk connectedness in the oil-stock nexus during the COVID-19 outbreak? A partial wavelet coherence analysis. Journal of Economic Structures, 12(1), 11.

Arellano, M., Bover, O. (1995), Another look at the instrumental variable estimation of error-components models. Journal of Econometrics, 68(1), 29-51.

Asatryan, Z., Bittschi, B., Doerrenberg, P. (2017), Remittances and public finances: Evidence from oil-price shocks. Journal of Public Economics, 155, 122-137.

Asenso, J.K., Nagudi, B., Aanyu, K. (2023), Oil and gas exploration, development and production in emerging markets and developing economies. In: The Economics of the Oil and Gas Industry. 1st ed. London: Routledge, p. 30-42.

Bai, Y., Wu, M. (2024), Tax reform and investment efficiency: Evidence from China's replacement of business tax with VAT. International Journal of Emerging Markets, 19(3), 775-797.

Bai, Chong-En and Li, Yan and Wu, Binzhen, (2023), How Does the Substitution of VAT for GRT Affect Outsourcing Behavior and Production Efficiency? Evidence from China (January 19, 2023). Available at SSRN: https://ssrn.com/abstract=4331143 or http://dx.doi.org/10.2139/ssrn.4331143

Baker, S.R., Bloom, N., Davis, S.J. (2016), Measuring economic policy uncertainty. The Quarterly Journal of Economics, 131(4), 1593-1636.

Bates, T.W., Kahle, K.M., Stulz, R.M. (2009), Why do US firms hold so much more cash than they used to? The Journal of Finance, 64(5), 1985-2021.

Blundell, R., Bond, S. (1998), Initial conditions and moment restrictions in dynamic panel data models. Journal of Econometrics, 87(1), 115-143.

Bubić, J., Mladineo, L., Susak, T. (2016), VAT rate change and its impact on liquidity. Management Journal of Contemporary Management Issues, 21, 151-166.

Bugshan, A. (2022), Oil price volatility and corporate cash holding. Journal of Commodity Markets, 28, 100237.

Bugshan, A. (2024). Oil price uncertainty and corporate cash policy: does Islamic financial development matter?. Journal of Economic and Administrative Sciences. https://doi.org/10.1108/JEAS-01-2024-0006

Caldara, D., Iacoviello, M. (2022), Measuring geopolitical risk. American Economic Review, 112(4), 1194-1225.

Chika, O. V., Oshiogwemoh, D., & Promise, E. (2022), Impact of Tax Reforms on Economic Growth of Nigeria. Goodwood Akuntansi

dan Auditing Reviu, 1(1), 79-95.

Chemingui, M.A., Hajeeh, M. (2011), Fiscal policy responses to oil price volatility in an oil-based economy. Public Finance Review, 39(2), 288-308.

Cui, W., Hicks, J., Norton, M. (2022), How well-targeted are payroll tax cuts as a response to covid-19? Evidence from china. International Tax and Public Finance, 29(5), 1321-1347.

Dalwai, T., Mohammadi, S.S., Satrovic, E. (2024), Intellectual capital efficiency, institutional ownership and cash holdings: A cross-country study. Review of Accounting and Finance, 23(1), 104-129.

Demir, E., & Ersan, O. (2017). Economic policy uncertainty and cash holdings: Evidence from BRIC countries. Emerging Markets Review, 33, 189-200.

Destek, M.A., Saha, T., Destek, G., Sinha, A. (2024), The resource-based Kuznets curve hypothesis: An empirical exploration. Geoscience Frontiers, 15, 101841.

Feng, H., Rao, R.P. (2018), Cash holdings and CEO risk incentive compensation: Effect of CEO risk aversion. International Review of Financial Analysis, 60, 162-176.

Ferreira, M.A., Vilela, A.S. (2004), Why do firms hold cash? Evidence from EMU countries. European Financial Management, 10(2), 295-319.

Foley, C.F., Hartzell, J.C., Titman, S., Twite, G. (2007), Why do firms hold so much cash? A tax-based explanation. Journal of Financial Economics, 86(3), 579-607.

Fouquet, R. (1995), The impact of VAT introduction on UK residential energy demand: An investigation using the cointegration approach. Energy Economics, 17(3), 237-247.

Gale, W. G., & Harris, B. H. (2011). A VAT for the United States: Part of the Solution. Tax Analysts, 64-82.

Gars, J., Spiro, D., Wachtmeister, H. (2022), The effect of European fuel-tax cuts on the oil income of Russia. Nature Energy, 7(10), 989-997.

Gavriilidis, K. (2021), Measuring Climate Policy Uncertainty. Available from: https://ssrn.com/abstract=3847388

Hammour, H., Mckeown, J. (2022), An empirical study of the impact of VAT on the buying behavior of households in the United Arab Emirates. Journal of Accounting and Taxation, 14(1), 21-29.

Hartley, A. (2019). Tax directors should change how they think about VAT in the GCC. International Tax Review (London). https://www.proquest.com/docview/2187363688?pq-origsite=gscholar&fromopenview=true&sourcetype=Scholarly%20Journals

Henriques, I., Sadorsky, P. (2011), The effect of oil price volatility on strategic investment. Energy Economics, 33(1), 79-87.

Holcombe, R.G. (2005), Government growth in the twenty-first century. Public Choice, 124(1), 95-114.

Huang, W., Mazouz, K. (2018), Excess cash, trading continuity, and liquidity risk. Journal of Corporate Finance, 48, 275-291.

IMF. (2023), Gulf Cooperation Council - Economic Prospects and Policy Priorities for the GCC Countries, International Monetary Funds Country Report No. 23/413, December 5, 2023. Available from: https://www.imf.org/en/publications/cr/issues/2023/12/14/gulf-cooperation-council-economic-prospects-and-policy-challenges-for-the-gcc-countries-542513

International Trade Administration. (2023), United Arab Emirates - Oil and Gas, United Arab Emirates - Country Commercial Guide. Available from: https://www.trade.gov/country-commercial-guides/united-arab-emirates-oil-and-gas [Last accessed on 2023 Nov 25].

Jensen, M.C. (1986), Agency costs of free cash flow, corporate finance, and takeovers. The American Economic Review, 76(2), 323-329.

Jiang, Y., Mubarik, M.S., Zaman, S.I., Alam, S.H., Arif, M. (2023), Corporate governance, cash holding, and firm performance in an emerging market. International Journal of Finance and Economics, 9(3), 2804.

Keen, M. (2007), VAT attacks! International Tax and Public Finance, 14, 365-381.

Keen, M., Lockwood, B. (2006), Is the VAT a money machine? National Tax Journal, 59(4), 905-928.

Keen, M., Lockwood, B. (2010), The value added tax: Its causes and consequences. Journal of Development Economics, 92(2), 138-151.

Keynes, J.M. (1937), The general theory of employment. The Quarterly Journal of Economics, 51(2), 209-223.

Khartukov, E.M. (2024), Oil issues of the smallest Arabic member of the OPEC. Journal La Lifesci, 5(1), 12-26.

Kim, S., & Ryu, H. (2018). The impact of mandatory IFRS adoption on capital markets: evidence from Korea. International Journal of Accounting & Information Management, 26(1), 38-58.

Kotcharin, S., Maneenop, S. (2020), Geopolitical risk and corporate cash holdings in the shipping industry. Transportation Research Part E Logistics and Transportation Review, 136, 101862.

Lee, C.C., Wang, C.W., Thinh, B.T., Purnama, M.Y.I. (2023), Cash holdings and cash flows: Do oil price uncertainty and geopolitical risk matter? Economic Analysis and Policy, 79, 134-152.

Lee, D., Kim, D., Borcherding, T.E. (2013), Tax structure and government spending: Does the value-added tax increase the size of government? National Tax Journal, 66(3), 541-569.

Li, X., Shen, G. (2023), Do tax incentives decelerate corporate financialization? Evidence from the VAT reform in China. Economic Modelling, 125, 106357.

Ling, S., Gao, H. (2023), How does climate risk matter for corporate green innovation? Empirical evidence from heavy-polluting listed companies in China. Frontiers in Energy Research, 11, 1177927.

Liu, L., Cao, L., Cao, Y., Lu, M., Shan, Y. (2024), VAT credit refunds and firm productivity: Evidence from China's VAT reform. International Review of Financial Analysis, 93, 103171.

Liu, Y., Liu, J., Dong, P. (2023), VAT rate cut and enterprise deleveraging: Evidence from China. Economic Analysis and Policy, 78, 1254-1266.

Magerakis, E., Gkillas, K., Tsagkanos, A., Siriopoulos, C. (2020), Firm size does matter: New evidence on the determinants of cash holdings. Journal of Risk and Financial Management, 13(8), 163.

Maghyereh, A., Abdoh, H., Al-Shboul, M. (2022), Oil structural shocks, bank-level characteristics, and systemic risk: Evidence from dual banking systems. Economic Systems, 46(4), 101038.

Miller, M.H., Orr, D. (1966), A model of the demand for money by firms. The Quarterly Journal of Economics, 80(3), 413-435.

Mirrlees, J. A. (1986). The theory of optimal taxation. Handbook of mathematical economics, 3, 1197-1249.

Moawad Ahmed, S. (2016). The impact of oil prices on the economic growth and development in the MENA countries. MPRA Paper No. 89073, posted 20 Sep 2018 03:47 UTC, https://mpra.ub.uni-muenchen.de/89073/

Moolchandani, R., Kar, S. (2022), Family control, agency conflicts, corporate cash holdings and firm value. International Journal of Emerging Markets, 17(10), 2636-2654.

Myers, S.C. (1984), Capital structure puzzle. Journal of Finance, 39, 575-592.

Myers, S.C., Majluf, N.S. (1984), Corporate financing and investment decisions when firms have information that investors do not have. Journal of Financial Economics, 13(2), 187-221.

Ndu, C., Uguru, L.C. (2022), Non-oil tax revenue and economic growth in Nigeria. Journal of Taxation and Economic Development, 21(2), 12-25.

Nohria, N., Ghoshal, S. (1994), Differentiated fit and shared values: Alternatives for managing headquarters-subsidiary relations. Strategic Management Journal, 15(6), 491-502.

Nyborg, K.G., Wang, Z. (2021), The effect of stock liquidity on cash holdings: The repurchase motive. Journal of Financial Economics,

142(2), 905-927.

Ogbonna, G.N., Appah, E. (2016), Effect of tax administration and revenue on economic growth in Nigeria. Research Journal of Finance and Accounting, 7(13), 49-58.

Okoror, J.A., Onatuyeh, E.A. (2018), Value-added tax and economic growth: New evidence from Nigeria. Accounting and Taxation Review, 2(4), 99-112.

Opler, T., Pinkowitz, L., Stulz, R., Williamson, R. (1999), The determinants and implications of corporate cash holdings. Journal of Financial Economics, 52(1), 3-46.

Ozkan, A., Ozkan, N. (2004), Corporate cash holdings: An empirical investigation of UK companies. Journal of Banking and Finance, 28(9), 2103-2134.

Ozkan, S., Yaacoub, C., El-Kanj, N., Dzenopoljac, V. (2021), The effect of IFRS adoption on corporate cash holdings: Evidence from MENA countries. Emerging Markets Finance and Trade, 57(11), 3275-3300.

Pang, J., Wang, K., Zhao, L. (2024), Tax enforcement and corporate cash holdings. Journal of Business Finance and Accounting, 51, 9-10.

Palazzo, B. (2012). Cash holdings, risk, and expected returns. Journal of Financial Economics, 104(1), 162–185. https://doi.org/10.1016/j.jfineco.2011.12.009

Pourali, M.R., Samadi, M., Hajjami, M. (2015), Effect of VAT on the asymmetric sensitivity of the level of cash holdings ratio to cash flows (evidence from Iran). Asian Journal of Research in Banking and Finance, 5(9), 91-100.

Promise, E., Victory, C. O., & Ibinabo, T. W. (2022). Value added tax and Nigeria's economic growth (2000-2020). Journal of Production, Operations Management and Economics, 2(4), 28-38.

Ramsey, F. P. (1927). A Contribution to the Theory of Taxation. The economic journal, 37(145), 47-61.

Roth, K., O'donnell, S. (1996), Foreign subsidiary compensation strategy: An agency theory perspective. Academy of Management Journal, 39(3), 678-703.

Sajwani, B., Al-Shboul, M., & Maghyereh, A. (2024). Do board characteristics affect financial sustainability? The COVID-19 pandemic experience. Journal of Financial Reporting and Accounting. https://doi.org/10.1108/JFRA-11-2023-0648

Sarker, M.S.R., Mazumder, S., Amin, M.R. (2023), Oil price uncertainty, workplace misconduct, and cash holding. International Review of Financial Analysis, 89, 102757.

Sarwar, S., Streimikiene, D., Waheed, R., Dignah, A., Mikalauskiene, A. (2021), Does the vision 2030 and value added tax leads to sustainable economic growth: The case of Saudi Arabia? Sustainability, 13(19), 11090.

Singh, C., Sirimaneetham, V. (2021), Adopting Good Practices on Public Debt Management in Asia and the Pacific. MPFD Policy Brief, No. 119. Bangkok: Economic and Social Commission for Asia and the Pacific. Available from: https://hdl.handle.net/20.500.12870/3873

Slemrod, J., Yitzhaki, S. (1996), The costs of taxation and the marginal efficiency cost of funds. Staff Papers, 43(1), 172-198.

Tawfik, O.I., Alsmady, A.A., Rahman, R.A., Alsayegh, M.F. (2022), Corporate governance mechanisms, royal family ownership and corporate performance: Evidence in gulf cooperation council (GCC) market. Heliyon, 8(12), e12389.

Tran, L.T.H., Tu, T.T.K., Hoang, T.T.P. (2021), Managerial optimism and corporate cash holdings. International Journal of Managerial Finance, 17(2), 214-236.

Unegbu, A.O., Irefin, D. (2011), Impact of VAT on economic development of emerging nations. Journal of Economics and International Finance, 3(8), 492-503.

Wang, C., Yu, M. (2021), The impact of forecasting cash flows on enhancing analysts' own earnings forecasts: International evidence and the effect of IFRS adoption. Journal of International Financial Management and Accounting, 32(3), 237-258.

Wang, K.H., Su, C.W., Umar, M. (2021a), Geopolitical risk and crude oil security: A Chinese perspective. Energy, 219, 119555.

Wang, K.H., Xiong, D.P., Mirza, N., Shao, X.F., Yue, X.G. (2021b), Does geopolitical risk uncertainty strengthen or depress cash holdings of oil enterprises? Evidence from China. Pacific-Basin Finance Journal, 66, 101516.

Wang, X., Zhu, L. (2023), How does export VAT rebates policy affect corporate investment efficiency? Evidence from corporate tax stickiness. Pacific-Basin Finance Journal, 82, 102130.

Wang, Y., Xiang, E., Ruan, W., Hu, W. (2017), International oil price uncertainty and corporate investment: Evidence from China's emerging and transition economy. Energy Economics, 61, 330-339.

Wu, X., Wang, Y., Tong, X. (2021), Cash holdings and oil price uncertainty exposures. Energy Economics, 99, 105303.

Xie, Y., Qin, J., Jin, Z., Geng, M. (2023), VAT neutrality and corporate cash holdings-based on the research of uncredited VAT refund policy. China Finance and Economic Review, 12(2), 49-71.

Xiong, X., Meng, Y., Li, X., Shen, D. (2019), An empirical analysis of the adaptive market hypothesis with calendar effects: Evidence from China. Finance Research Letters, 31, 321-33.

Xiuzhen, X., Zheng, W., Umair, M. (2022), Testing the fluctuations of oil resource price volatility: A hurdle for economic recovery. Resources Policy, 79, 102982.

Yahaya, K.A., Yusuf, K. (2019), Impact of non-oil tax revenue on economic growth in Nigeria. The Journal of Accounting and Management, 9(2), 56-69.

Yang, B., An, H., Song, X. (2024), Oil price uncertainty and corporate inefficient investment: Evidence from China. The North American Journal of Economics and Finance, 70, 102089.

Zhang, L., Gao, J. (2023), Does climate policy uncertainty influence corporate cash holdings? Evidence from the US tourism and hospitality sector. Tourism Economics, 30(3), 1-25.

Zhang, X., Zhang, Z., Zhou, H. (2020), Oil price uncertainty and cash holdings: Evidence from China. Energy Economics, 87, 104732.

Zhang, T., Xu, S., & Zhang, S. (2022). Are export tax rebates patronage for Chinese firms? An analysis of productivity. China Economic Review, 75, 101844.

Zhao, L., Peng, G., Feng, Q. (2024), VAT rate cut and corporate maturity mismatch: Evidence from China's VAT rate reform. International Review of Financial Analysis, 93, 103131.