The Impact of FinTech Technology on the UAE Financial Sector

The Third ERF GCC Conference - GCC Economies in an Era of Energy Transition
KAPSARC 30 – 31 October, 2023

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Presentation Outline

- Introduction and motivations
- Literature review
- Data and Methodology
- Construction of Variables
- Empirical results
- Conclusion

Introduction & Motivation

- **Elsayed, A. H.** & Yarovaya, Larisa (2019). Financial Stress Dynamics in the MENA Region: Evidence from the Arab Spring. *Journal of International Financial Markets, Institutions and Money*.
- Balcilar, Mehmet, **Elsayed, A. H.** & Hammoudeh, Shawkat (2022). Financial connectedness and risk transmission among MENA countries: Evidence from connectedness network and clustering analysis. *Journal of International Financial Markets, Institutions and Money*.
- **Elsayed, A. H**., Downing, G., Lau, C. K. M., & Sheng, X. (2022). Exploring the role of oil shocks on the financial stability of Gulf Cooperation Council countries. *International Journal of Finance & Economics*.

Introduction & Motivation

- The global financial system has been greatly impacted in recent years by the remarkable progress in financial innovations (FinTech).

- FinTech has facilitated the movement of capital across borders, reduced transaction costs, addressed information asymmetry, and uncovered new investment prospects (Cordella, 2006; Farhadi, 2011; Marszk et al., 2019; Marszk, A., & Lechman, E. 2021).

- FinTech could amplify financial contagion, procyclicality, and market volatility, thereby undermining the stability of the financial system. Algorithmic trading, a prominent aspect of FinTech, was identified as a source of contagion and vulnerability in financial markets. Kirilenko and Lo (2013)

Introduction & Motivation

- The United Arab Emirates (UAE) has emerged as a regional hub for capital movements and financial industry.
- Several policies and initiatives have been implemented aiming at encouraging the growth of Fintech ventures since 2017 such as the Emirates Blockchain Strategy in April 2018
- Consequently, the Dubai International Financial Centre (DIFC), Abu Dhabi Global Market (ADGM), and a set of venture capital corporations are looking to tap into the prospering FinTech industry. Currently, the UAE economy is home to the highest number of FinTech startups (around 67 startups), followed by 44 in Turkey and 30 in Jordan and Lebanon.

Contributions of the literature

- Yet, despite the importance of this topic, studies on the impact of FinTech on financial stability are relatively scarce. Besides, previous studies examined the impact of FinTech on financial contagion and financial stability in the context of UAE focused solely on information transmitted across one segment of the financial system such as the effects of FinTech on UAE stock markets (Othman et al., 2022), bond markets (Thaker et al., 2022), and the banking sector (Almashhadani and Almashhadani, 2022).

- This has motivated us to (i) To examine the dynamic relationship between the FinTech industry and the financial instability of the UAE; (ii) to investigate connectedness and risk transmission pattern between FinTech and financial instability; (iii) to study the connectedness under extreme market conditions; and (iii) to explore the impact of economic and financial turbulences such as COVID-19 on the risk transmission pettern.

Data Sources

- We collected daily data for the STOXX Global Fintech Index as a proxy for FinTech.
- A Composite Financial Stress Index comprises has been constructed to capture the conditions of the whole financial sector in UAE.
- Data for the CBOE volatility index (VIX), CBOE Oil Market volatility, and the Geopolitical risk index are included to account for the conditions of the international financial markets, oil markets and political conditions (see, e.g., Corbet al., 2018 and 2019; Gozgor et al., 2019a).
- All data has been collected form DataStream and the sample period spans from June 18, 2023 2012 to June 30, 2023.

Construction of FSI

Banking sector:

- Banking beta (CAPM)
- Bank equities return (negative)
- Bank volatility GARCH

Equity market:

- Stock market returns (negative)
- Stock market volatility GARCH

Bond market:

- Sovereign spreads

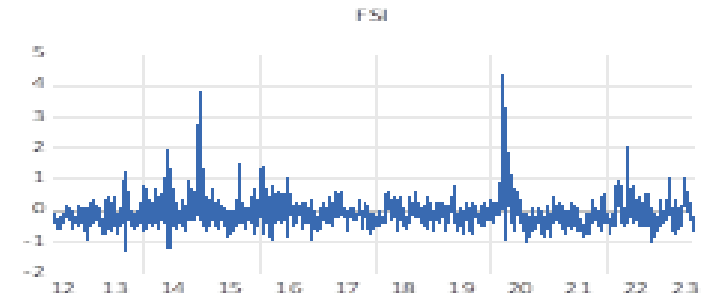
Foreign exchange market:

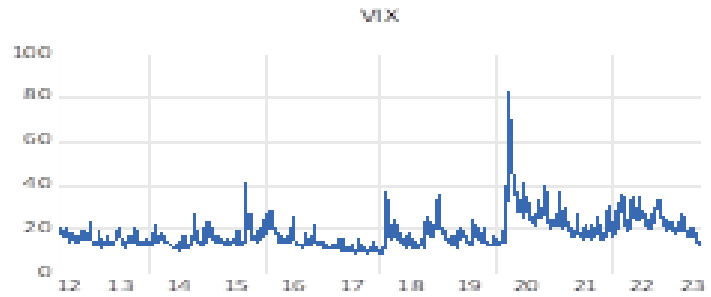
- Volatility of Foreign exchange market

Methodology

- The Time-Varying Parameter Vector Autoregressive (TVP-VAR) approach.
- The TVP-VAR model significantly improves the spillover method developed by Diebold and Yalmiz (2012, 2014) in several ways, such as the sensitivity of the model to outliers, no need to set an arbitrarily rolling window, and no loss of observations (Antonakakis et al., 2019; Korobilis and Yilmaz, 2018).
- Contrary to the DCC-GARCH models, the spillover technique is based on the Forecast Error Variance Decomposition (FEVD) function from a generalised Vector Autoregressive Model (VAR) and hence, is independent of conditional correlation estimates.

Empirical Methods





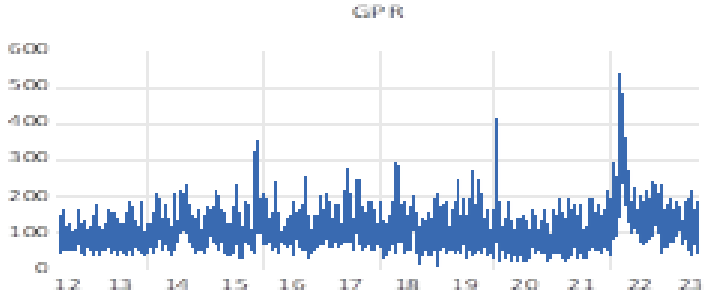


Table 1. Descriptive statistics and definitions

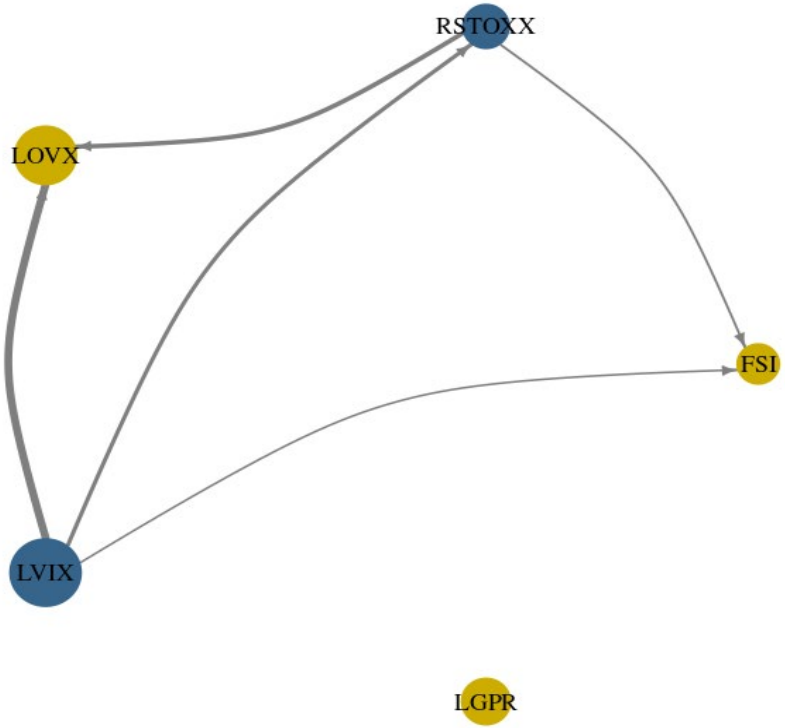
	FSI	RSTOXX	LOVX	LVIX	LGPR
Mean	-0.039	0.057	3.553	2.822	4.611
Variance	0.201	1.528	0.142	0.105	0.177
Skewness	3.302	-0.582	0.693	0.864	-0.051
Ex.Kurtosis	21.602	11.831	2.473	1.082	1.031
JB	61228.775***	16958.485***	964.220***	498.486***	128.767***
ERS	-6.565***	-24.649***	-3.610***	-5.251***	-11.921***
Q(10)	5302.750***	55.475***	14601.593***	13135.826***	2340.835***
Q2(10)	4807.203***	1715.162***	14417.960***	13121.049***	2675.340***

Table 2. The static connectedness table

	FSI	RSTOXX	LOVX	LVIX	LGPR	FROM
FSI	85.88	4.55	3.51	3.92	2.14	14.12
RSTOXX	3.24	63.15	5.29	27.03	1.29	36.85
LOVX	3.61	7.85	71.2	15.56	1.79	28.8
LVIX	2.78	24.82	11.35	58.62	2.43	41.38
LGPR	2.87	2.23	2.49	3.23	89.18	10.82
TO	12.5	39.44	22.63	49.75	7.64	cTCI = 32.99
NET	-1.61	2.58	-6.17	8.37	-3.18	

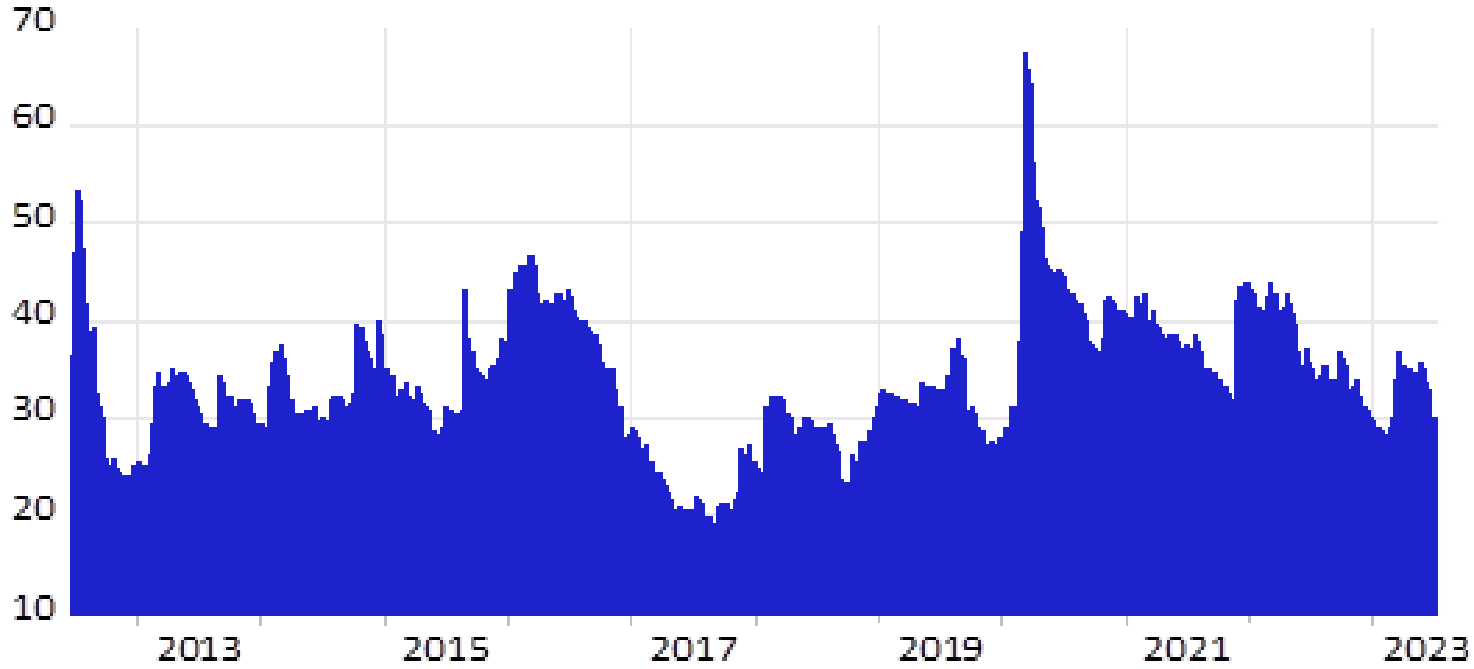
Note: these empirical results are from a TVP-VAR model of order (3) based on BIC criteria and a 10-step-ahead generalized forecast error variance decomposition function.

Figure 2. Directional connectedness network of pairwise spillovers.



Note: This graph shows the network connectedness between Fintech, UAE financial stress index, oil volatility, geopolitical index and VIX over the sample period from a TVP-VAR model. The node colour indicates whether the index is a net receiver (yellow) or a net transmitter (dark blue) of spillover. Furthermore, the node size indicates the magnitude of the net spillover to other indices whereas the thickness of the arrow reflects the strength of pairwise spillover between each two indices.

Figure 3. Rolling spillover index estimates



Note: This graph displays the time-varying behaviour of the total spillover index between Fintech, UAE financial stress index, oil volatility, geopolitical index and VIX. The index has been estimated based on a VAR(3) with 10 H-steps forecast horizon.

Figure 4. Net directional spillover indices.

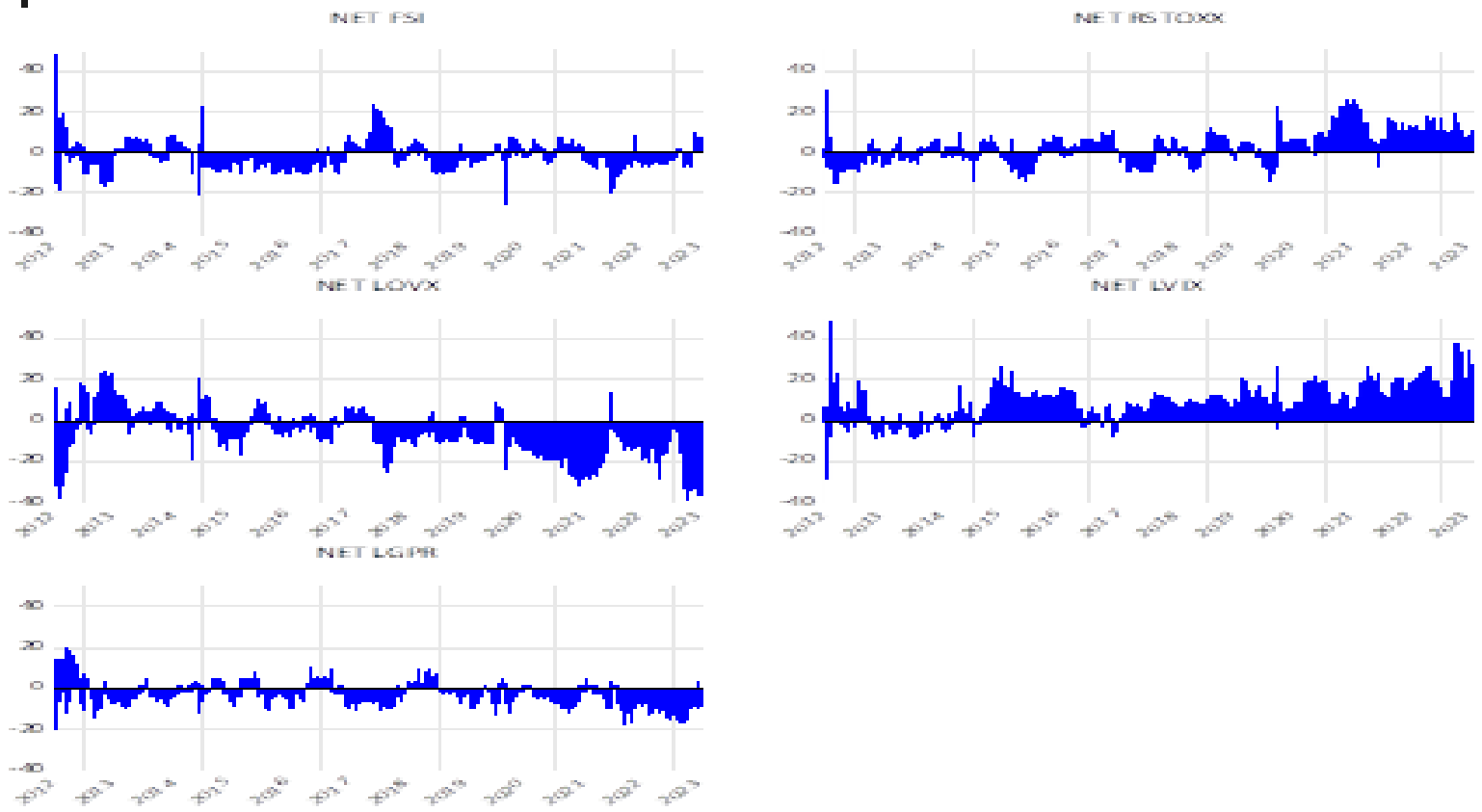


Table 3. Extreme Quantile connectedness

Table 3. Static Quantile connectedness analysis

Panel a. connectedness at lower quantile ($\tau = 0.05$)

	FSI	RSTOXX	LOVX	LVIX	LGPR	FROM	
FSI	32.33	18.46	15.98	16.25	16.98	67.67	
RSTOXX	17.82	33.72	15.6	13.63	19.23	66.28	
LOVX	16.57	13.73	32.94	20.19	16.57	67.06	
LVIX	16.3	13.91	19.75	33.28	16.76	66.72	
LGPR	16.74	18.09	17.46	17.07	30.65	69.35	
TO	67.42	64.19	68.79	67.14	69.54	cTCI	=
NET	-0.26	-2.09	1.73	0.43	0.18	84.27	

Panel b. connectedness at upper quantile ($\tau = 0.95$)

	FSI	RSTOXX	LOVX	LVIX	LGPR	FROM	
FSI	26.71	14.27	19.33	23.68	16.01	73.29	
RSTOXX	18.77	27.72	17.31	18.9	17.3	72.28	
LOVX	18.62	12.38	28.49	24.6	15.91	71.51	
LVIX	20.05	11.87	20.36	32.14	15.58	67.86	
LGPR	17.95	15.79	18.18	20.75	27.33	72.67	
TO	75.39	54.31	75.19	87.93	64.8	cTCI	=
NET	2.1	-17.97	3.68	20.07	-7.87	89.40	

Note: This table presents the empirical results of the GFEVD obtained from a Quantile-VAR model of order three and 10-step ahead forecast. The lag length is selected following the Bayesian information criterion (BIC).

Figure 5. Directional connectedness network of pairwise spillovers.

Fig. a (0.05 quantile)

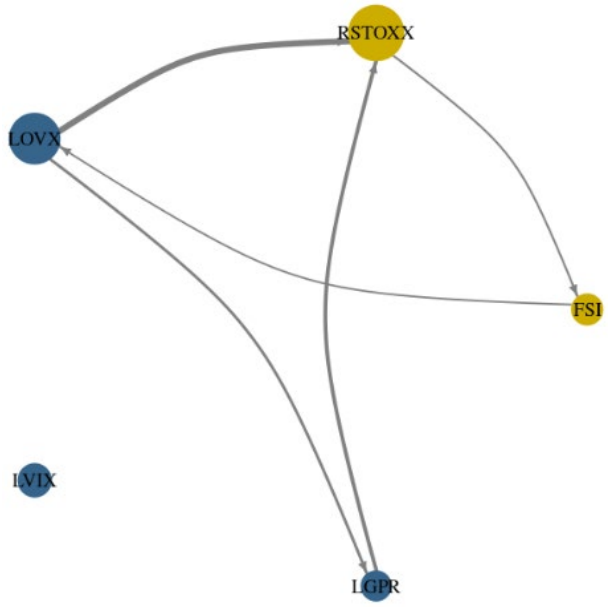
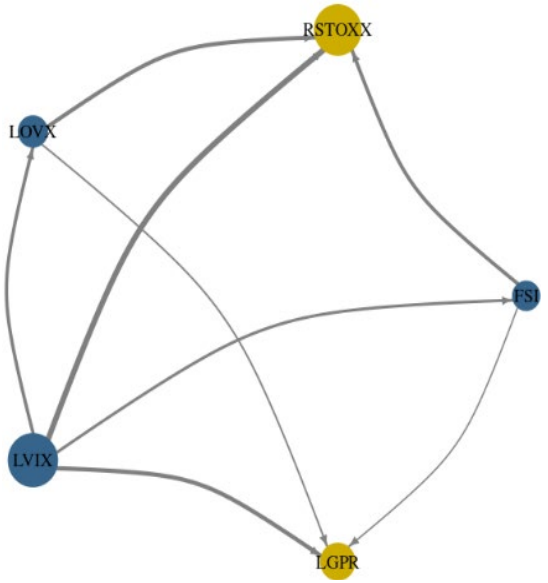
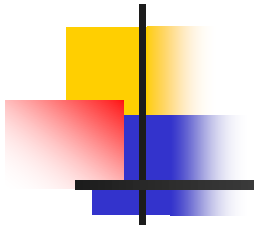


Fig. c (0.95 quantile)



Conclusion

- The CBOE Volatility Index (VIX) and Global Fintech Index are identified as a dominant player, significantly impacting vulnerability of the UAE financial stability.
- The post-COVID analysis reflected shifts in the roles of indices, such as the OVX transitioning from being a volatility receiver to a transmitter, emphasizing evolving market sentiments in the wake of major crises.
- Under extreme market condition volatility spillovers increased across markets indicating that UAE is fully integrated with the global financial markets.



Thank you!