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Do Islamic Stock Markets Diversify the Financial Uncertainty Risk? Evidence from Selected Islamic Countries

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Abstract

The study investigates the diversification behavior of Islamic stocks against US financial uncertainty. Considering limitations found in the literature, a comprehensive index of financial uncertainty (FU) is used, developed by Jurado, Ludvigson, and Ng (2015). The empirical analysis uses monthly data from four Islamic markets – Saudi Arabia, Malaysia, Indonesia, and Turkey – for the period from January 2010 to September 2019. Results of the bivariate EGARCH models show that Islamic stocks can be used for diversification purpose against the financial uncertainty of the US because the volatility of US uncertainty does not propagate in the Islamic stock markets. Moreover, findings show that the spillover effect of financial uncertainty varies with the FU forecast horizon. The spillover effect of FU increases with an increase in the FU forecast horizon and becomes significant over 3-month and 12-month periods in the case of Saudi Arabia. The current volatility of Islamic stock returns is independent of the size of shocks in past volatility. The leverage effect and asymmetry have been found in Saudi Arabia and Malaysia. The findings validate the arguments of the literature that Islamic markets are resilient facing uncertainties and perform well during crisis periods. The findings are important for investors in making better portfolio decisions.

Keywords: Islamic Stocks, Diversification, Financial Uncertainty, EGARCH, Spillover

JEL Classification Code: C32, G01, G12, G15, O57

1. Introduction

The efficient market hypothesis of Fama (1970) posits that the market price of stocks reflects the full information. In other words, there is no over/under investment and the stock prices stay at their fundamental value. However, practically, there are noises that significantly influence the stock market prices. For example, oil price, gold prices,

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macroeconomics, economic policy uncertainty, and financial development are found to be significant determinants of stock market returns (Arouri, Estay, Rault, & Roubaud, 2016; Contuk, Burucu, & Gungor, 2013; Funke & Matsuda, 2006; Narayan & Gupta, 2015; Pranata & Nurzanah, 2017). Besides, investors' sentiments also challenge the efficient market hypothesis (Nguyen & Pham, 2018; Malkiel, 2003; Ur Rehman, 2013). The financial system is key to investments that helps in funds raising and investment transactions. The uncertainty in the financial market influences the investors' sentiments and capabilities. In other words, financial uncertainty is a significant factor of stock market returns (Arestis, Demetriades, & Luintel, 2001; Fratzscher, 2002; Kakinuma, 2020).

The response of Islamic stocks to crises and uncertainties is found to be different than conventional stock markets (Al-Yahyaee, Mensi, Rehman, Vo, & Kang, 2020; Ho, Abd Rahman, Yusuf, & Zamzamin, 2014). The Islamic stock markets outperformed during the global financial crises and suffered fewer losses compared to other benchmark markets (Jawadi, Jawadi, & Louhichi, 2014). Therefore, after the global financial crises of 2008–09, the Islamic stock market attracts investors to use them as portfolio

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diversification. As a result, the Islamic stock industry is continuously expanding (Hassan, Aliyu, Saiti, & Halim, 2020). The total investment in Islamic assets recorded 2.2 trillion USD in 2016, which was approximately 7% of the total global investments (Alahouel & Loukil, 2020). Islamic stocks follow Shariah-compliant screening that excludes firms of higher leverage, illegal business, gambling business, and interest-based business. On the other hand, the empirical work related to the influence of financial uncertainty lags behind the theoretical/anecdotal evidence. The empirical literature overlooked the spillover effect of financial uncertainty and mainly focused on the influence of macroeconomic uncertainty, economic policy uncertainty, or dominant crises on the Islamic stock market returns. The information about reaction of Islamic stocks to financial uncertainty are important for portfolio decisions.

Therefore, the main objective of the study is to investigate the volatility spillover of financial uncertainty on Islamic stock markets. We use the new and comprehensive measure of financial uncertainty (FU), developed by Jurado et al. (2015). FU is a more accurate measurement of financial uncertainty than other single indicators (Su, Fang, & Yin, 2019). It comprises 147 financial time-series items. Further, the study uses the EGARCH model to investigate the volatility spillover of FU on Islamic stock returns. EGARCH model is more efficient than the simple GARCH model because it allows for leverage effect. Three major Islamic indices are considered, including Indonesia Islamic Index (Indonesia), Hijara Shariah Index (Malaysia), and Dow Jones Islamic market (Turkey).

The remaining paper is organized as follows: the second section reviews the literature that discusses and analyzes the relevant studies. The third section is the methodology, which presents the details about data, variables, and econometric models. The fourth section provides results and discussion, and the last section concludes.

2. Literature Review

Islamic stocks are different in nature compared to conventional stocks due to the need to fulfill the screening criteria of Shariah compliance. Generally, there are two levels of Shariah screening. The first level considers the nature of business whereas second level screens financial ratios. Dow Jones (DJ), Financial Times Stock Exchange (FTSE), and Morgan Stanley Capital International (MSCI) are major stock index providers that provide screening criteria for Islamic stocks. At the same time, there exist some national Islamic indices, such as the Indonesia Islamic Index, Hijara Shariah Index (Malaysia), and Pakistan Meezan Islamic Index. The exponential increase in the Islamic stock industry also grabbed the attention of researchers. In the previous decade, a plethora of studies explores the behavior of Islamic stocks from various perspectives. Empirical studies found a significant difference between the Islamic and conventional stock markets concerning returns' volatility, performance in crises, and response to various market uncertainties.

Islamic stocks are resilient to financial crises. The 2008–09 global financial crisis had a lower influence on Islamic stock as compared to conventional stocks and the Islamic stocks show better performance during the crisis (Jawadi et al., 2014). Similarly, Al-Khazali, Lean, and Samet (2014) examine the global Islamic indices and compare their performance with conventional stock indices. Their findings show that the Islamic stocks have better performance and outperformed the other benchmark conventional stock indices. The volatility of the interest rate does not influence the Islamic stock market (Rahmi et al., 2016). The benefits of Islamic stocks are not limited to the Islamic countries, but it also has the same advantage in the non-Muslim countries. Akhtar and Jahromi (2017) compare the performance of Islamic and conventional stocks in both Muslim and non-Muslim countries during the global financial crisis and found that Islamic stocks did well in both classes of countries. In contrast, Uddin, Hernandez, Shahzad, and Yoon (2018) found that Islamic stocks are more efficient than conventional stocks only in the medium-term in the context of non-Muslim countries, including UK and Japan. The performance of Islamic stocks also depends on time and frequency, major events, and sectors. For example, Al-Yahyaee et al. (2020) found that Islamic stocks have better performance than other benchmark stocks after the global crisis, however, the performance and co-movements among different sectors vary with major events and time.

The difference in the nature and performance between Islamic and conventional can be explained through the decoupling hypothesis, which states that the Islamic stocks are different than conventional stocks regarding risk and returns. Therefore, investors can use Islamic stocks for diversification purpose (Usman, Jibran, Amir-ud-Din, & Akhter, 2019). Kenourgios, Naifar, and Dimitriou (2016) investigate the contagion effect between different Islamic and conventional markets during the crisis period. They did not find significant contagion and support the decoupling hypothesis. However, empirical literature also found significant causal relationships and spillover effects between Islamic and conventional stocks that run counter to the decoupling hypothesis. For example, Furqani and Mulyany (2009), Ajmi, Hammoudeh, Nguyen, and Sarafrazi (2014) found a significant relationship and volatility transmission between Islamic and conventional markets.

In short, the Islamic stock markets show different behavior in time across different economic conditions. Overall, the Islamic stock markets performed well during the global financial crisis. The co-movements and spillovers between Islamic stocks and other conventional markets vary across countries, regions, and time. The financial system of a country plays a significant role in the performance of stock

markets (Gay Jr, 2008). The financial system includes the set of institutions, rules, and practices that connect the borrowers to lenders. A better financial system facilitates investors through a stable cost of funds and easy availability of funds that enable investors to maximize market opportunities; this ultimately enhances the stock market performance. In contrast, financial uncertainty offers a threat to stock markets. Investors react to financial news that affects the stock returns. For example, Narayan and Bannigidadmath (2017) found that financial news significantly predicts the stock market returns of both Islamic and conventional stock markets. Besides, the uncertainty in larger economies/markets also propagates to other markets. The shocks of US market significantly shift and influence the returns of non-US markets (Donadelli, 2015; Su et al., 2019). The influence of the US market becomes more dominant in the crisis period (McIver & Kang, 2020). It is found in the previous section that Islamic and conventional stock shows different behavior. However, there is a lack of consensus on how Islamic stocks react to the US financial uncertainty. Few studies investigate the association of Islamic stock returns with bond, mortgage, interest rate, and banking system (Akhtar, Akhtar, Jahromi, & John, 2017; Bahloul, Mroua, & Naifar, 2017; Farooq, Meo, Ali, & Rasheed, 2020; Hammoudeh, Kim, & Sarafrazi, 2016), however, the single item proxy is unable to capture the financial uncertainty (Su et al., 2019). Therefore, the current study contributes to the literature by investigating the spillover effect of financial uncertainty on Islamic stock markets and by using a comprehensive index of financial uncertainty (FU) developed by Jurado et al. (2015). Further, the study also considers the influence of forecast horizons of FU, by using different forecast horizons including 1-month, 3-months, and 12-months.

3. Methodology

3.1. Data

The study uses time-series monthly data of the Islamic stock markets and financial uncertainty of the US for the period from January 2010 to September 2019. The data on the Islamic markets is obtained from investing.com that provides streaming live stock market data, charts, financial news, and real-time quotes. Missing values are excluded and match the data of all markets based on date.

The data on financial uncertainty (FU) is obtained from a database developed by Sydney Ludvigson. The FU is an aggregate index that accounts for the common variance of 147 time-series financial items. Under the VAR setup, the data of FU is available for three different forecast horizons, including 1-month (FU1), 3-month (FU3), and 12-month (FU12). To capture the time-varying impacts of the FU, the current study uses FU data for all three forecast horizons.

2.2. Econometric Model

The study uses the bivariate EGARCH model to investigates the diversification behavior of Islamic stocks against the financial uncertainty of the US. The bivariate EGARCH model provides a spillover effect from one variable to another variable over time by allowing the leverage effect and asymmetries. The leverage effect generally means that negative shocks generate higher volatility in future returns than positive shocks.

In the current study, FU is an independent variable whereas the stock returns of Islamic markets are a dependent variable to use in the bivariate EGARCH model. The algebraic expression of the EGARCH models is shown below:

$$\ln\left(\delta_{t(r)}^2\right) = \alpha + \xi \ln\left(\delta_{t-1(r)}^2\right) + \psi \frac{u_{t-1}}{\sqrt{\delta_{t-1}^2}}$$
$$+ \psi \left[\frac{|u_{t-1}|}{\sqrt{\delta_{t-1}^2}} - \sqrt{\frac{2}{\pi}}\right] + \pounds Vol_{(FU)} \tag{1}$$

where $\ln\left(\delta_{t(r)}^2\right)$ is the natural log of conditional variance of stock returns; ξ is the coefficient of ARCH term that measures the size effect of shock on future volatility; ψ measures the leverage effect and asymmetries in the markets; ψ provides persistency of volatility; and $\pounds$ is the coefficient of volatility spillover from FU to the stock market returns. If the coefficient of FU is negative or insignificant then it indicates the Islamic stock has diversification benefits against the financial uncertainty of the US. We used the bivariate EGARCH model separately for each Islamic market and each forecast horizon.

4. Results and Discussion

4.1. Descriptive statistics and unit root test

Descriptive statistics and results of unit root tests are summarized in Table 1 and Table 2, respectively. Descriptive statistics show the characteristics of data distributions. Panel A of Table 1 provides the important statistics for stock market returns of Saudi Arabia, Malaysia, Indonesia, and Turkey.

The mean value of Turkey's Islamic market return is higher than the other Islamic stock markets over the sample period whereas the average return of Saudi Arabia Islamic market is lowest among the Islamic markets. The mean value of the Malaysian Islamic market fluctuates between a maximum value 7.55 and a minimum value −8.92 with the lowest standard deviation compared to the other Islamic market. This fact shows that the Malaysian Islamic market is less volatile than other Islamic markets. All the distributions of market returns have higher values of Kurtosis and negative values of

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skewness that show the non-normal and asymmetric nature of the data distribution. The values of Jarque-Bera statistics are also statistically significant for all markets except Turkey, which confirms that the data is not normally distributed. The mean value of FU3 is higher than FU1 and FU2, which shows the financial uncertainty is increasing with an increase in the forecast horizon. The results Jarque-Bera test shows the FU1, FU2, and FU3 are not normally distributed over the sample period. Panel B on Table 1 provides the correlations across the Islamic markets. The correlation between all the stock markets is positive, which shows that on average the Islamic markets are moving in the same directions over the sample period. The correlation between Malaysian and Turkish Islamic markets is higher than cross-correlation between other markets. Similarly, the lowest correlation exists between the Islamic stock markets of Indonesia and Saudi Arabia. Table 2 presents the results of the Augmented Dickey-Fuller test (ADF) and Phillip Perron unit root test (PP). The results of both the tests show that the stock returns of all the Islamic markets are stationary at first difference.

Table 1: Descriptive Statistics

Panel A	Saudi Arabia	Malaysia	Indonesia	Turkey	FU–1	FU–3	FU–12
Mean	0.22	0.29	0.50	0.68	0.85	0.90	0.97
Median	0.46	0.58	0.93	1.60	0.79	0.86	0.95
Maximum	14.95	7.55	9.43	10.65	1.15	1.13	1.04
Minimum	−19.98	−8.92	−10.66	−11.71	0.66	0.74	0.91
Std.Dev	5.26	2.74	4.19	5.23	0.13	0.10	0.03
Skewness	−0.62	−0.65	−0.64	−0.44	0.72	0.65	0.50
Kurtosis	5.19	4.09	3.19	2.63	2.26	2.17	2.01
Jarque-Bera	31.06*** (0.00)	14.06*** (0.00)	8.33** (0.01)	4.59 (0.10)	12.78*** (0.00)	11.75*** (0.00)	9.69*** (0.00)
Panel B	**Cross-correlations**						
Saudi Arabia	1.00						
Malaysia	0.25	1.00					
Indonesia	0.05	0.26	1.00				
Turkey	0.25	0.30	0.25	1.00			

The table shows descriptive statistics (market returns and US financial uncertainty) and correlations matrix in panel A and pane B, respectively. The FU–1, FU–3, and FU–12 show the financial uncertainty of the US with 1-month, 3-months, and 12-months forecast horizons, respectively. The values in parenthesis show the *p*-values of the Jarque-Bera test statistics. *, **, *** represents the significance at 10%, 5%, and 1%, respectively.

Table 2: Unit Root Test

Market	ADF		PP	
	Level	1st Difference	Level	1st Difference
Saudi Arabia	−2.08	−9.58***	−2.09	−9.48***
Malaysia	−2.32	−11.08***	−2.40	−11.22***
Indonesia	−1.39	−10.86***	−1.39	−10.87***
Turkey	−0.90	−12.49***	−0.55	−14.32***

The table summarizes the results of two unit roots tests including the Augmented Dickey-Fuller test (ADF) and Phillip Perron test (PP). *, **, *** represents the significance at 10%, 5%, and 1%, respectively.

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4.2. Estimation results of EGARCH models

Table 3 shows the results of bivariate EGARCH models that investigate the volatility spillover of financial uncertainty (FU1) of the US on the stock returns of Islamic markets. We used separate models for each stock market. The results show that the coefficient of FU1 (£) is positive, but not statistically significant for all the Islamic markets.

This finding shows that the volatility of the Islamic market is not influenced by the volatility of US financial uncertainty. The coefficient of the GARCH term (Ψ) measures the persistence of volatility. The coefficient is significant only for the Islamic markets of Saudi Arabia and Turkey. Similarly, the coefficient ψ provides the leverage and asymmetric effect. However, the coefficient is not significant for all the Islamic markets; the leverage effect exists in the Malaysian Islamic market. In other words, the negative shocks in the past volatility cause higher volatility in future returns than the positive shocks. However, there is no leverage effect or asymmetry found in the Islamic markets of Saudi Arabia, Indonesia, and Turkey. The coefficient of ARCH (ξ) measures the effect of size of shocks on future volatility. The results found no size effect in the case of all the Islamic stock markets. It means the size of shocks has no meaning for the volatility of the Islamic market. The results of bivariate EGARCH models that examine the volatility spillover from US financial uncertainty (FU3) to the Islamic stock markets are summarized in Table 4.

The interpretation of the coefficients is the same as in Table 3, however, the findings are different. The coefficient of volatility spillover (£) and its level of significance is increased which show that the financial uncertainty of US with the 3–month forecast horizon has higher spillover on Islamic stock markets as compared to FU, however, the coefficients are statistically not significant except in the case of Islamic market of Saudi Arabia. The coefficient of GARCH term is significant only for the Islamic markets of Saudi Arabia and Turkey. The leverage effect is found in the markets of Saudi Arabia and Malaysia. On the other side, all the Islamic markets are free from the size effect of shocks. Table 5 shows that the spillovers of US financial uncertainty on Islamic stocks further increase with an increase in the forecast horizon, however, the coefficient is only significant for Saudi Arabia. The results for leverage effect, size effect, and volatility persistency are the same as in Table 4.

Table 3: Bivariate EGARCH for FU1

$$\ln\left(\delta^2_{t(r)}\right) = \alpha + \xi \ln\left(\delta^2_{t-1(r)}\right) + \psi \frac{u_{t-1}}{\sqrt{\delta^2_{t-1}}} + \Psi\left[\frac{|u_{t-1}|}{\sqrt{\delta^2_{t-1}}} - \sqrt{\frac{2}{\pi}}\right] + £\mathrm{Vol}_{(FU1)}$$

	Saudi Arabia	**Malaysia**	**Indonesia**	**Turkey**
α	−0.14(0.78)	0.92(0.17)	2.06(0.24)	3.55(0.07)
ξ	0.26(0.15)	−0.18(0.31)	−0.36(0.13)	−0.14(0.43)
ψ	−0.16(0.25)	−0.31(0.03)	−0.25(0.12)	−0.17(0.16)
Ψ	0.82(0.00)	0.28(0.51)	0.29(0.56)	−0.76(0.00)
£	0.59(0.10)	0.73(0.31)	0.25(0.74)	2.68(0.20)
LL	−355.57	−280.19	−331.41	−355.86
SS	6.32	5.03	5.90	6.32

The table shows the results of the EGARCH model that investigate the spillover effect of US financial uncertainty with the forecast horizon of 1-month (FU1) on the stock returns of Islamic markets. *α* is the constant term of the model; *ξ* is the coefficient of ARCH term; *ψ* shows the leverage effect; *Ψ* is the coefficient of GARCH term; and £ measures the volatility spillover effect. The values in parenthesis show the *p*-values of respective coefficients.
"The *p*-values less than 0.01, 0.05, and 0.10 shows the significance at 1%, 5%, and 10%".
"LL shows the log-likelihood and SS shows the Schwarz info criteria SIC".

Table 4: Bivariate EGARCH for FU3

$$\ln\left(\delta^2_{t(r)}\right) = \alpha + \xi \ln\left(\delta^2_{t-1(r)}\right) + \psi \frac{u_{t-1}}{\sqrt{\delta^2_{t-1}}} + \Psi\left[\frac{|u_{t-1}|}{\sqrt{\delta^2_{t-1}}} - \sqrt{\frac{2}{\pi}}\right] + £\text{Vol}_{(FU3)}$$

	Saudi Arabia	Malaysia	Indonesia	Turkey
α	−0.25(0.69)	0.73(0.33)	1.95(0.29)	2.90(0.24)
ξ	0.22(0.24)	−0.18(0.31)	−0.36(0.13)	−0.14(0.43)
ψ	−0.28(0.04)	−0.32(0.03)	−0.25(0.11)	−0.17(0.15)
Ψ	0.73(0.00)	0.28(0.50)	0.29(0.55)	−0.77(0.00)
£	1.06(0.08)	0.88(0.32)	0.35(0.71)	3.28(0.20)
LL	−355.51	−280.22	−331.39	−355.90
SS	6.32	5.03	5.9	6.24

The table shows the results of the EGARCH model that investigate the spillover effect of US financial uncertainty with the forecast horizon of 3-month (FU3) on the stock returns of Islamic markets. α is the constant term of the model; ξ is the coefficient of ARCH term; ψ shows the leverage effect; Ψ is the coefficient of GARCH term; and £ measures the volatility spillover effect. The values in parenthesis show the p-values of respective coefficients.
"The p-values less than 0.01, 0.05, and 0.10 shows the significance at 1%, 5%, and 10%".
"LL shows the log-likelihood and SS shows the Schwarz info criteria SIC".

Table 5: Bivariate EGARCH for FU12

$$\ln\left(\delta^2_{t(r)}\right) = \alpha + \xi \ln\left(\delta^2_{t-1(r)}\right) + \psi \frac{u_{t-1}}{\sqrt{\delta^2_{t-1}}} + \Psi\left[\frac{|u_{t-1}|}{\sqrt{\delta^2_{t-1}}} - \sqrt{\frac{2}{\pi}}\right] + £\text{Vol}_{(FU12)}$$

	Saudi Arabia	Malaysia	Indonesia	Turkey
α	−2.39(0.18)	−0.97(0.65)	0.88(0.75)	−2.52(0.72)
ξ	0.22(0.25)	−0.18(0.31)	−0.36(0.11)	−0.14(0.42)
ψ	−0.31(0.01)	−0.32(0.03)	−0.26(0.10)	−0.18(0.14)
Ψ	0.68(0.00)	0.29(0.48)	0.31(0.51)	−0.78(0.00)
£	3.31(0.08)	2.56(0.33)	1.36(0.58)	8.68(0.23)
LL	−355.45	−280.16	−331.30	−355.99
SS	6.32	5.03	5.90	6.32

The table shows the results of the EGARCH model that investigate the spillover effect of US financial uncertainty with the forecast horizon of 12-month (FU12) on the stock returns of Islamic markets. α is the constant term of the model; ξ is the coefficient of ARCH term; ψ shows the leverage effect; Ψ is the coefficient of GARCH term; and £ measures the volatility spillover effect. The values in parenthesis show the p-values of respective coefficients.
"The p-values less than 0.01, 0.05, and 0.10 shows the significance at 1%, 5%, and 10%".
"LL shows the log-likelihood and SS shows the Schwarz info criteria SIC".

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Overall, the results show that the Islamic stock markets are not influenced by the financial uncertainty of the US, except the Islamic market of Saudi Arabia. It means that all the Islamic markets have diversification benefits against the financial uncertainty of the US, except the Islamic market of Saudi Arabia. The stock returns volatility of the Saudi-Arabian Islamic market increases with an increase in volatility of FU3 and FU12. The volatility spillover of FU is increasing with the increase in forecast horizon. The volatility of the Islamic markets is independent of the size of the shocks. Similarly, the leverage effect is found only in the Islamic market of Saudi Arabia and Malaysia. Hence, the Islamic markets may stand as good diversifiers to the conventional stocks, as discussed in the literature that conventional stocks are highly influenced by US markets uncertainties. The findings are in line with Jawadi et al. (2014), Al-Khazali et al. (2014), Usman et al. (2019), and Al-Yahyaee et al. (2020), who argue that Islamic markets have better efficiency to cope with internal and external uncertainties and crises.

5. Conclusion

The study examines the volatility spillover of US financial uncertainty on the Islamic stock markets to check the diversification behavior of Islamic stocks against US financial uncertainty. The study considers the Islamic stock market of four Muslim countries, including Saudi Arabia, Indonesia, Turkey, and Malaysia. To remedy the limitations found in the literature, the study used a comprehensive index (FU) for financial uncertainty and employed a bivariate EGARH model. The study finds that Islamic stock markets have less association with the volatility of the US financial uncertainty. Hence, the Islamic markets can diversify portfolios against the financial uncertainty of the US. However, the Islamic stock markets of Saudi Arabia lose the property of diversification against the financial uncertainty of US with 3-month and 12-months forecast horizons. The findings are important for investors in making portfolio decisions because investors need additional information about the performance of stock markets and their connection with internal and external risks and uncertainties.

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