



HAL
open science

Beyond the Big Challenges facing Facebook's Libra

Jamal Bouoiyour, Refk Selmi

► **To cite this version:**

Jamal Bouoiyour, Refk Selmi. Beyond the Big Challenges facing Facebook's Libra. 2019. hal-02309316

HAL Id: hal-02309316

<https://hal.science/hal-02309316>

Preprint submitted on 9 Oct 2019

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Beyond the Big Challenges facing Facebook's Libra

Jamal Bouoiyour and Refk Selmi¹

IRMAPE, ESC Pau Business school, France.

CATT, University of Pau, France.

Abstract : The Facebook's announcement that it would create its new currency « Libra » sparked a debate with respect the added value, security and regulatory aspects of virtual currencies. Beyond the challenges facing Libra (i.e., regulatory concerns and the risk of money laundering and fraud, etc.), this study seeks to assess if the announcement of this type of project has an impact on the cryptocurrency market. A dynamic event-study methodology is used to examine the abnormal returns of Bitcoin and other major altcoin markets (in particular, Ethereum, Litecoin and Ripple) as a reaction of Facebook « Libra » announcement. Our results suggest that all the cryptocurrencies respond positively to the official announcement of Facebook's much-anticipated cryptocurrency project, and appear highly reactive during the succeeding days. Despite crucial differences between « Libra » and cryptocurrencies, the entrance of Facebook into the cryptocurrency market can be regarded as a stamp of approval that helps to legitimize the crypto space making it go mainstream.

Keywords : Facebook's new « Libra », Cryptocurrency market, Event study methodology.

JEL classification : E31, E42, G15, G18.

¹ *Corresponding author* : Refk Selmi (s.refk@yahoo.fr)

1. Introduction

Social media giant Facebook announced its ambitious cryptocurrency plan called «Libra» on June 18, 2019. Facebook's new cryptocurrency «Libra» is inspired from three different and potential elements: the Roman weight measurement system, the astrological sign for justice, and the French term for freedom. These elements represent the essence of «Libra», which mainly aims to be a dominant cryptocurrency. Facebook also published a white paper primarily aimed at explaining the basics of «Libra» based on the technology of the blockchain, and intended to become a global currency backed by its social networks. This document describes the usefulness and the main characteristics of new cryptocurrency based on a secure, stable, and reliable blockchain and backed by a reserve of real assets, that will provide the Facebook's cryptocurrency with stability, low inflation and global acceptance. Facebook plans to integrate WhatsApp, Instagram and Messenger in a bid to make moving money as easier as sending a text message. Facebook is working alongside different potential partners for «Libra» project, such as Mastercard, Visa, eBay, Coinbase, Vodafone and Uber. With the support of these popular brands, Facebook is moving into the fundamental heart of all commerce, and «Libra» can become a dominant global currency. In 15 years Facebook has amassed 2.3 billion monthly active users. If a fraction of them start to utilize «Libra» in their financial transactions, to buy and sell products, and transfer money, «Libra» would promptly gain large acceptance. Although «Libra» is based on the same blockchain technology as other cryptocurrencies, it is expected to be more effective. Facebook claims that its new digital coin system will be allowed to process 1,000 transactions per second, and have a transaction cost of zero. Moreover, unlike Bitcoin and other popular cryptocurrencies like Ether and Ripple, the «Libra» will be tied to real money backed by banks and government. It will be mainly designed not to be speculative and extremely volatile asset like Bitcoin. It will serve as a medium of exchange for billions of people around the world especially those who lack access

to traditional financial institutions. Since this impressive announcement, the Bitcoin's value continues its Bullish trend. After attaining \$5,000 at the beginning of April, Bitcoin reached \$8,000 at the end of May. Although it remains far from touching \$ 20,000, its record in late 2017, Bitcoin continues its momentum and surge toward \$14,000 on June 28, 2019, a level that had not been recorded since mid-January 2018. This recovery, after more than a year of slump, remains difficult to explain. Although it is often not easier to efficaciously explain Bitcoin's price fluctuations, the news of Facebook's contentious cryptocurrency might allow legitimise the industry. Arguably, Bitcoin's increased markedly just after Facebook announced the launch of «Libra».

The announcement of Facebook's new cryptocurrency has revived not only interest in Bitcoin but also in other major cryptocurrencies Ethereum, Litecoin and Ripple. Also, the technology on which they are based, the blockchain, seem to promise a bright future. According to financial analysts, Facebook's efforts in joining the cryptocurrency market have the potential of being one of the most awaited catalysts for Bitcoin, Ethereum, Ripple, Litecoin, and the entire cryptocurrency market in terms of adoption. It is also claimed that «Libra» could become more successful than other cryptocurrencies because it has the backing of several biggest international corporations.

Much significant research has been conducted to explore various characteristics of Bitcoin and other major cryptocurrencies (Bouoiyour and Selmi 2017 ; Bouoiyour et al. 2019 ; Selmi et al. 2019) and several facets of the link between the Bitcoin price and its fundamental sources including supply-demand determinants, Bitcoin's attractiveness for investors, and global macroeconomic and financial developments (Buchholz et al. 2012 ; van Wijk 2013 ; Bouoiyour and Selmi 2015 ; Ciaian et al., 2016 ; Bouoiyour and Selmi, 2017). The idea Facebook is primarily fuelling an abrupt surge in the prices of Bitcoin and other cryptocurrencies including Ethereum and Ripple continues to pervade mainstream media

titles. Other sources nonetheless absolutely agreed about Facebook's modest role. Accordingly, this paper seeks to assess the impact of the Facebook's official announcement of its «Libra» cryptocurrency project (June 18, 2019) on Bitcoin and other major altcoin markets (in particular, Ethereum, Litecoin and Ripple).

For empirical purpose, we carry out a dynamic event-study. An event study methodology is mainly applied to look at the changes in major cryptocurrencies following «Libra» announcement. Based on the modern financial theory, these asset prices incorporate all available information and expectations about the future. This research points out three possible findings for cumulative abnormal returns (CARs) following the impressive Facebook announcement. The first finding materializes when the events do not have significant influence on the price of cryptocurrency, highlighting that the expectations of the investors do not change on the event date. This could either be explained by the fact that the information is not new information on this day and the market regarded it as probable or the information is consistent with the expectations. The second finding is that the event has a positive effect on the cryptocurrency market as depicted by positive CARs. The third result consists of adverse responses of the cryptocurrencies under study to the focal event displayed by negative CARs. A huge number of studies have argued that the traditional event study methodology exhibits a bias toward detecting “event effects”, irrespective of whether such effects actually occur. To avoid possible econometric pitfalls, this study utilizes a flexible approach that controls for stochastic behaviors of the markets which are assumed away by the standard event study methodology. In particular, we use a dynamic event-study method which allows one to simultaneously include the time-varying systematic risk, the conditional heteroskedasticity and the leverage effect in the calculation of returns over the estimation period. This technique allows providing more appropriate indication regarding the point at which the market starts to react to the event.

Our findings reveal that Bitcoin, Ethereum, Ripple (with less extent, Litecoin) react positively to the new Facebook cryptocurrency plan. This response becomes stronger over the days after the announcement. This underscores that the Facebook announcement can be perceived as a complete validation that mainstream is now focused on cryptocurrencies. Regardless of huge dissimilarities between «Libra» and Bitcoin (and other major altcoins), the Facebook announcement allows to legitimise cryptocurrencies. It should also be noted that Bitcoin seems to be the most impacted by this announcement.

The remainder of the paper is organized as follows. Section 2 recalls the main differences between Libra and major... Section 3 the methodology and data. Section 4 reports and discusses the empirical findings, while Section 5 concludes.

2. Background: Main differences between «Libra» and major cryptocurrencies

Bitcoin might be the most popular cryptocurrency in today's online market but it is merely one of several digital currencies out there. Regardless of being the most widely traded cryptocurrency, Bitcoin suffers from some shortcomings when compared to the newer digital currencies in terms of purpose, supply, security, mainstream adoption, transaction speed, transaction fees, information tracking and whether they are relying on decentralized exchange platforms (Burnie 2018; Chan et al. 2018; Ciaian et al. 2018). More accurately, the slow average block time of 10 minutes makes the transaction confirmation sluggish as well as the low amount of transactions per second, the relatively high transaction fees and the alarming amount of computer power that is spent on it (Ciaian et al. 2016). We may also add to these shortcomings the poor governance or the lack of a centralized authority in charge of policing it (Bouoiyour and Selmi 2019). Given these limitations, Bitcoin faces an increased competition from various cryptocurrencies inspired by this virtual currency. Those currencies

are collectively dubbed altcoins, which have attempted to present themselves as modified or improved versions of Bitcoin.

The main common point of «Libra» and the major cryptocurrencies is their use of blockchain technology. However, «Libra», Bitcoin and major altcoins (in particular, Ethereum, Litecoin and Ripple) differ in terms of purpose, supply, security, mainstream adoption, transaction speed, transaction fees, information tracking and whether they are relying on decentralized exchange platforms (see Table A1 for more details, Appendix). The digital currencies enable fast and cheaper payments to and from anywhere in the world, and there are no check clearing fees and no multi-day holding periods. Given the lack of centralized control, virtual currencies cannot be shut down by any one country. The cryptocurrencies are safe from capital controls. However, Facebook will give up the need to control «Libra» by referring to Geneva-based non-profit organization with a list of potential founding members such as Paypal, Mastercard, Visa, eBayUber, and Coinbase, etc. The «Libra» foundation seeks to accumulate a total of one hundred prominent partners with a reserve fund of \$1 billion that will be employed to effectively manage «Libra»'s price stability. One of the major shortcomings of Bitcoin and other crypto-currencies is their excessive volatility. This is largely explained by the lack of regulation. These cryptocurrencies are likely to be used for speculative purposes rather than transactions.

«Libra»'s main purpose is to allow a very simple and global currency and a financial infrastructure that empowers billion of people. One of the major advantages of Facebook's «Libra» is that it can be utilized in countries where the banking system is poorly or underdeveloped. Likewise, it can be an attractive new cash alternative for small and medium-sized enterprises in developing countries. This is also one of Bitcoin advocates' objectives, but its use as a means of transaction requires a wide knowledge and and high level of

technical sophistication, which has deterred many potential users. With «Libra», Facebook seeks to introduce a new payments and currency system based on the Blockchain technology. But «Libra» cannot be viewed as a pure digital asset like Bitcoin. While attempting to achieve a stable value, it will be dominantly backed by real assets including fiat currencies and securities. According to the white paper published by Facebook to explain «Libra», this currency will be backed by various low volatility assets including bank deposits as well as government securities in currencies from stable and reputable central banks. Interestingly, Facebook's «Libra», unlike Bitcoin, is expected to have modest environmental consequences. «Libra», like Ethereum, did not consider proof-of-work based protocols owing to their weak performance and huge energy and environmental costs.

3. Methodology and data

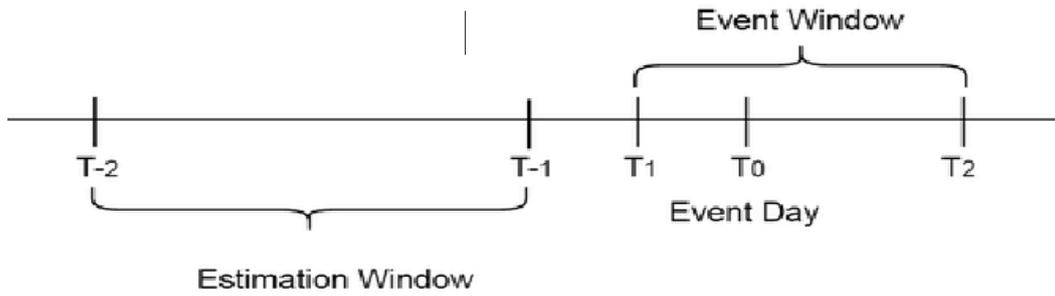
As mentioned at the outset, this study examines the reaction of the prices of Bitcoin and major altcoins (i.e., Ethereum, Litecoin and Ripple) to the announcement of Facebook's plan to launch a new cryptocurrency called »Libra« on Tuesday June 18, 2019. We focus on the period ranging from May 01, 2018 when the Facebook founder Mark Zuckerberg exposed his wish to work on cryptocurrency payment technology.

The dynamic event study is carried out based on a GARCH error market model in order to effectively capture how and to what extent a particular event exerts an impact on the market. More specifically, we apply a time series regression with a generalized autoregressive conditionally heteroskedastic (GARCH) effect market model. This specification allows one to examine the abnormal returns² of the prices of major cryptocurrencies in response to the announcement of Facebook's «Libra» (June 18, 2019), while accounting for certain potential features of market models for Bitcoin and other altcoins' prices (i.e., stochastic, time varying non-diversifiable risk and a time varying heteroskedastic error structure, Brockett et al. 1999).

²The abnormal returns are the difference between the observed returns and the expected returns based upon a model of the return-generating process.

According to the standard market model event study methodology as depicted by Dodd and Warner (1983) and Brown and Warner (1985), we define day “0” as the announcement day of the lunch of «Libra». Then, the estimation and event windows can be determined (see Figure 1).

Figure 1. Data structure of an event study



Throughout this analysis, the relationship between Bitcoin and major altcoins and their benchmark index (CRIX³) is captured by the two parameters (α and β) depicted in Equation (1). According to Figure 1, the cumulative abnormal returns (CAR) can be defined as the difference made up by the returns of the cryptocurrency during the event window minus the return expected based on its past performance, as compared to the returns of the market over the estimation window. The CAR for the cryptocurrency market during the event window $[\tau_1; \tau_2]$ surrounding the event day $t = 0$, where $[\tau_1; \tau_2] = \in [-5; +5]$, is expressed as follows:

$$CAR_{i,[\tau_1,\tau_2]} = \sum_{t=\tau_1}^{\tau_2} (R_{i,t} - \alpha - \beta R_{M,t}) \quad (1)$$

where $CAR_{[\tau_1,\tau_2]}$ is the cumulative abnormal return of the prices of the considered cryptocurrencies during the event window $[\tau_1; \tau_2]$, $R_{i,t}$ is the realized return of each

³CRIX is the price benchmark for the crypto market.

cryptocurrency under study on day t ⁴, $R_{M,t}$ is the return of the benchmark index of the crypto market, α and β are the regression estimates from the ordinary least squares (OLS) regression in Equation (1).

We extend the single index market model (Equation (1)) to a time varying coefficient regression (TVCR) model. The idea here is that the β term may be modeled by ARMA (p, q) process in order to capture the volatility dynamics of each cryptocurrency studied in response to the Facebook announcement. This time-varying coefficient regression can be denoted as:

$$CAR_{i, [\tau_1, \tau_2]} = \sum_{t=\tau_1}^{\tau_2} (R_{i,t} - \alpha - \hat{\beta} R_{M,t}) \quad (2)$$

where $\hat{\beta} = \beta_t - \bar{\beta} = \phi(\beta_{t-1} - \bar{\beta}) + \alpha_t$, ϕ is the back shift operator.

Because the volatility clustering and leptokurtosis are commonly observed in economic and financial time series, we consider this in our model by performing the generalized autoregressive conditionally heteroskedastic Exponential-GARCH (1, 1)⁵ to the error or residual term. After determining the cumulative abnormal returns using the E-GARCH model (CAR*) while controlling for asymmetry, we investigate whether the Bitcoin market significantly responds to the announcement of «Libra», while incorporating potential determinants of Bitcoin price changes. The regression to be estimated is expressed as follows:

$$CAR^*_{i, [\tau_1, \tau_2]} = \delta_0 + \delta_1 Libra + \delta_2 VC_i + \delta_3 ETR_i + \delta_4 GTr_i + \delta_5 GP + \varepsilon_t \quad (3)$$

⁴The daily Bitcoin returns are calculated as the first natural logarithmic difference of the underlying Bitcoin prices.

⁵ One of the most important shortcomings of a standard GARCH model is that it is unable to capture the stylized fact that conditional variance tends to be stronger after a decrease in return than after an increase; hence the usefulness of E-GARCH model that accounts for possible asymmetry.

where $CAR^*_{[\tau_1, \tau_2]}$ is the dependent variable determined via E-GARCH model, i corresponds to the different cryptocurrencies under study, «*Libra*» is a dummy variable which takes the value of one on the first day of trading after the official announcement of Facebook's new cryptocurrency, and zero otherwise. We cater for relevant control variables that are considered as potential determinants of the focal cryptocurrencies (in particular, the velocity of cryptocurrencies in circulation (VC); the exchange – trade ratio (ETR); the gold price (GP); and speculative factors (i.e., the increased interest in the cryptocurrencies under study). Kristoufek (2013) and Bouoiyour and Selmi (2015) underscored the prominent role of global macroeconomic and financial development -captured by variables including ETR and GP- in determining Bitcoin price evolution. It must be pointed out that the effect of macroeconomic and financial factors on Bitcoin price may work via various channels. Among these channels, one can stress that favorable macroeconomic and financial conditions may improve the use of Bitcoin in trade and exchanges and thus stimulate its demand which may have a positive impact on the price of Bitcoin. Also, a fall in the prices of gold – is viewed in theory as a hedge and safe haven to protect against unforeseen risks and to effectively deal with heightened uncertainty- may allow Bitcoin price to sustain its climb. This hold true for other cryptocurrencies. Moreover, an increase in the attention toward a cryptocurrency leads to an increase in its demand and then to a surge of its prices. For example, Bouoiyour et al. (2016) indicated that the alteration of positive and negative news yield to a rise in the Bitcoin price.

The financial data set used in our empirical estimations consists of daily data for the price indices of Bitcoin, Ethereum, Litecoin, and Ripple. These are indices of the exchange rate between the US dollar (USD) and each of Bitcoin (BTC), Ethereum (ETH), Litecoin (LTC) and Ripple (XRP). All data are collected from Coin Market Cap. As a measure of the transactions use, we employ the ratio between trade and exchange transaction volume or the ratio between the volumes on the currency exchange markets and in trade (*ETR*). To measure

the speculative attitude of Bitcoin and major altcoins, we use the daily views from Google Trends (*GTr*) by searching the term “Bitcoin”, “Ethereum”, “Litecoin” and “Ripple”. Table A2 (Appendix) reports all the data used and their sources.

4. Empirical results

4.1. The simple market model

Figure 1 describes the cumulative abnormal return (CAR) of Bitcoin and other major altcoins in response to «Libra» announcement on June 18, 2019. We clearly observe that the responses of the different cryptocurrencies to the impressive Facebook announcement seem sensitive to the considered event window. The announcement of the lunch of the Facebook’s new cryptocurrency is associated with a rapid rise of the Bitcoin, Ethereum and Ripple prices, with less extent the Litecoin price. As the time passes the effect of this decision on the prices of crypto giants becomes stronger, especially for Bitcoin.

Figure 1. The cumulative abnormal returns of major cryptocurrencies in response to «Libra» announcement (CAR): [-5; + 5] event window

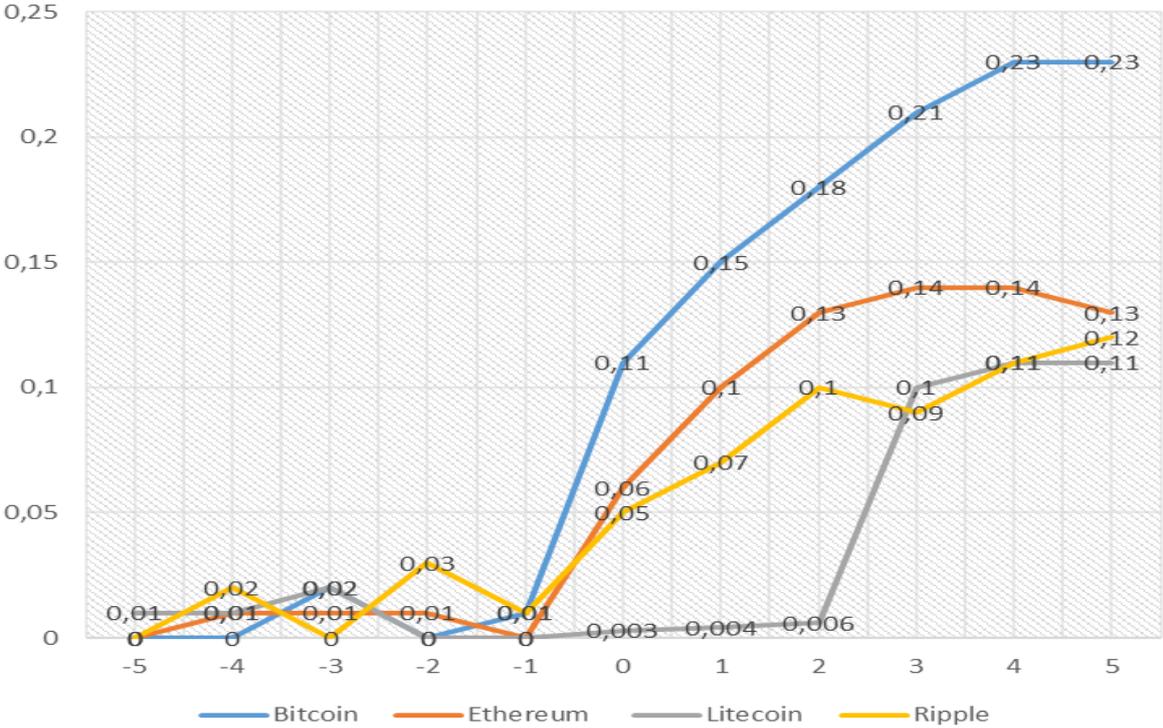


Table 1 reports the simple market model results used as a benchmarking test. This technique has been largely conducted to a variety of events. A common concern is that the event is rarely an unanticipated occurrence. Often, news about corporate events is publicly announced prior to their taking place. Differently, we are interested throughout this study in the reactions of major cryptocurrencies that occur immediately after the official announcement of Facebook's new «Libra». Due to the exogenous nature of this event, this assessment does not suffer from the problem of partial anticipation that may plague event studies. Nonetheless, we should be cautious and acknowledge the possible occurrence of idiosyncratic effects. Our findings reveal that the announcement of »Libra« was followed by a sharp increase in the Bitcoin price irrespective whether the [0; 0] and [+1; +5] window event CARs are accounted for. Not surprisingly, the Facebook's announcement has revived interest in cryptocurrencies. The launch of «Libra» could allow cryptocurrencies generally gain more mainstream acceptance, as payment tool and as a store of wealth. This project would yield to a massive increase in crypto users worldwide. This would undoubtedly take time, but by offering more information to its customers about the benefits of cryptocurrencies, Facebook will bring new users to Bitcoin, whether they want or not.

Our findings also indicate that the monetary velocity of cryptocurrency in circulation exerts a negative impact on the price of each cryptocurrency in question. This result is consistent with the quantity theory, underlying the evidence that the price of an asset decreases with its stocks. The money supply works as a standard supply so that its increase leads to a price decrease. In addition, we note that the exchange-trade ratio is positively and strongly correlated with the price of each cryptocurrency. In general, the price of the currency should be positively related to its usage for transactions, as it raises the utility of holding the currency leading to an increase in its prices. Using the Google search queries for each cryptocurrency term, we document that a growing attention to each of Bitcoin, Ethereum,

Litecoin and Ripple leads to increases in their prices. Gold and Bitcoin do not evolve in the same direction. As the two assets are viewed as a hedge and a safe haven in turbulence times, we can indicate that one causes the other, but the factors driving the price of Bitcoin and the price of gold may be dissimilar (Bouoiyour et al., 2019); likewise for the rest of cryptocurrencies.

Table 1. The effects of «Libra» announcement on crypto giants' cumulative abnormal returns (CAR)

	[0; 0] event window	[0 ;+1]event window	[+1; +5]event window
Bitcoin			
<i>Constant</i>	2.830045* (0.0482)	2.56701** (0.0049)	1.89762* (0.0555)
«Libra»	0.118754** (0.0015)	0.144009* (0.0109)	0.169138** (0.0071)
<i>MV</i>	-0.110998** (0.0054)	-0.033970*** (0.0003)	-0.021178** (0.0043)
<i>ETR</i>	0.159883** (0.0082)	0.10188* (0.0202)	0.121289* (0.0313)
<i>GP</i>	-0.00345*** (0.0004)	-0.00291*** (0.0007)	-0.00315** (0.0011)
<i>GTr</i>	0.143286* (0.0308)	0.12395** (0.0056)	0.013544 (0.5703)
Adjusted R ²	0.89	0.88	0.90
F-value	4.6789	4.3392	4.0078
Ethereum			
<i>Constant</i>	3.520116** (0.0089)	2.948055* (0.0243)	3.402721* (0.0487)
«Libra»	0.063594* (0.0739)	0.091307* (0.0680)	0.146832** (0.0091)
<i>MV</i>	-0.108786* (0.0400)	-0.180459 (0.1588)	-0.146793* (0.0538)
<i>ETR</i>	0.17306** (0.0019)	0.156097* (0.0115)	0.168131** (0.0087)
<i>GP</i>	-0.00855* (0.0546)	-0.0021564* (0.0317)	-0.007428* (0.0245)
<i>GTr</i>	0.108726* (0.0603)	0.117354 (0.1155)	0.090441** (0.0060)
Adjusted R ²	0.81	0.80	0.83
F-value	4.5123	4.1469	4.0984
Litecoin			
<i>Constant</i>	3.384910** (0.0074)	3.416156* (0.0179)	3.565019** (0.0063)
«Libra»	0.003450* (0.0871)	0.016156* (0.0176)	0.068467** (0.0077)
<i>MV</i>	-0.109619* (0.0707)	-0.127924* (0.0189)	0.119456* (0.0391)
<i>ETR</i>	0.124737** (0.0043)	0.146515* (0.0353)	0.159222** (0.0067)

<i>GP</i>	-0.002243** (0.0079)	-0.003439* (0.0161)	-0.009454 (0.6279)
<i>GTr</i>	0.080562** (0.0051)	0.089070** (0.0044)	0.043145* (0.0139)
<i>HR</i>	-0.006735* (0.0875)	-0.010408* (0.0524)	-0.139422 (0.3617)
Adjusted R ²	0.81	0.79	0.78
F-value	4.1872	3.6983	3.8455
Ripple			
<i>Constant</i>	2.81713* (0.0519)	3.345612* (0.0467)	2.961771* (0.0616)
« <i>Libra</i> »	0.052312** (0.0046)	0.088912** (0.0059)	0.12869** (0.0037)
<i>MV</i>	-0.144272* (0.0929)	-0.108889* (0.0640)	-0.12317* (0.0655)
<i>ETR</i>	0.133039* (0.0309)	0.196641 (0.3530)	0.140951*** (0.0247)
<i>GP</i>	-0.002641** (0.0025)	-0.001390 (0.1835)	-0.001819*** (0.0000)
<i>GTr</i>	0.022084** (0.0014)	0.054893* (0.0216)	0.057922** (0.0010)
Adjusted R ²	0.88	0.82	0.84
F-value	4.1019	3.8134	3.9265

Notes: All regressions are controlled for heteroskedasticity, and the p-values are given in parentheses. *, **, *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

4.2. The dynamic market model

This study contributes to the event studies literature by conducting a stochastically flexible event-study methodology to assess the abnormal returns of each major cryptocurrency under study as response to the announcement of Facebook's new digital currency. We adopt a new procedure of calculating the cumulative abnormal returns by taking into account certain known characteristics of financial time series including the time-varying beta, the autocorrelated squared returns, and the fat-tailed property of daily return data. An autoregressive process with order 1, AR (1) is initialized for β , and an Exponential-GARCH(1,1) process is utilized to model the time-varying conditional variance while accounting for asymmetry. This model specifies the conditional variance in logarithmic form denoted as:

$$\log(\sigma_t^2) = \omega + \sum_{i=1}^q (\alpha_i z_{t-i} + \gamma_i (|z_{t-i}| - \sqrt{2/\pi})) + \sum_{j=1}^p \beta_j \log(\sigma_{t-j}^2) \quad (4)$$

where $\omega, \alpha_i, \beta_j, \gamma$ and z_t are the parameters to estimate (the reaction of conditional variance, the ARCH effect, the GARCH effect, the leverage effect and the standardized value of error, respectively).

Our findings displayed in Table 2 reveal that the ARCH and GARCH effects and the leverage effect are statistically significant and in turn are present in the cumulative returns of all the cryptocurrencies under study, which highlights the efficacy of the conducted methodology (i.e., the dynamic market model).

Table 2. The crypto giants' cumulative returns via E-GARCH model (CAR*)

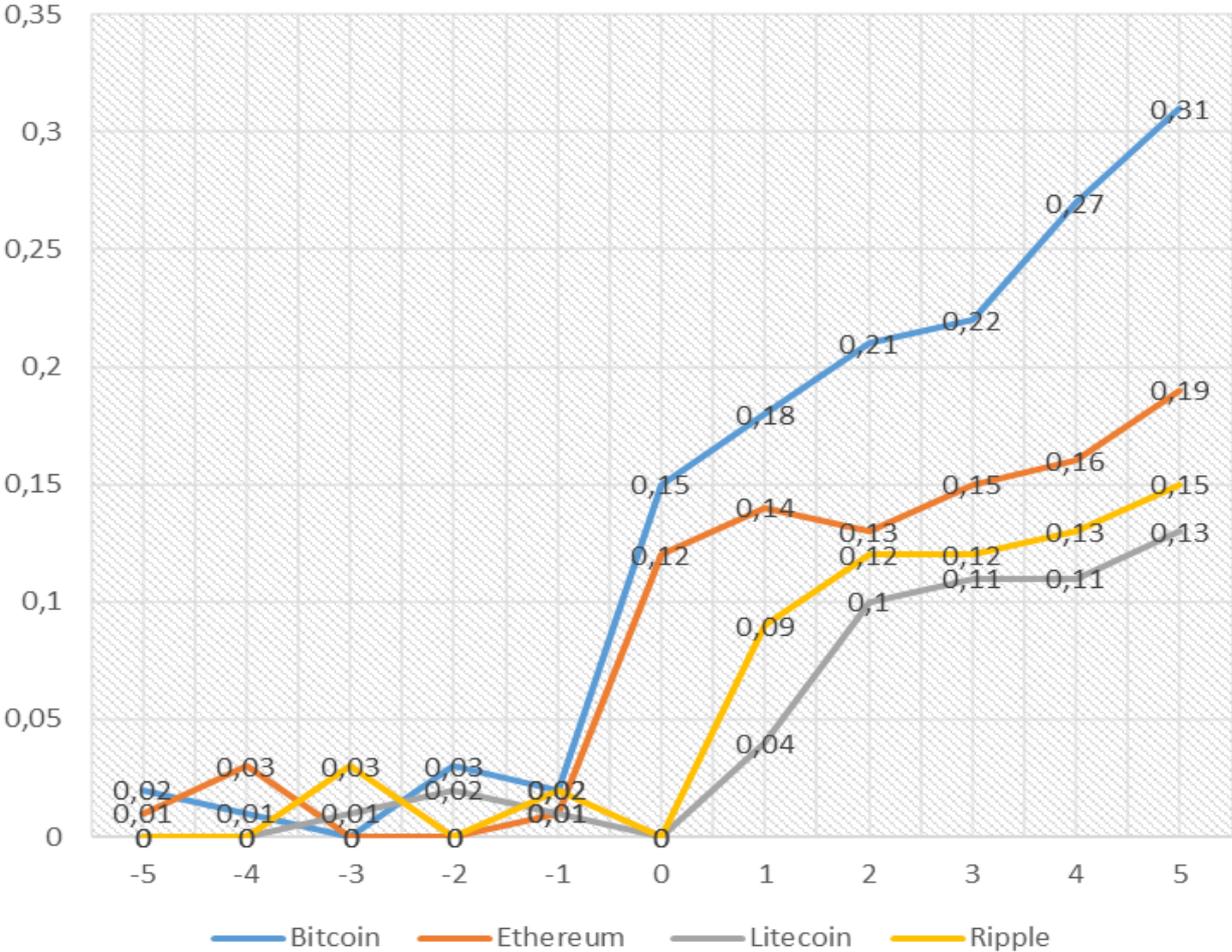
	Bitcoin	Ethereum	Litecoin	Ripple
Dependent variable: (r_t)				
Mean equation				
C	0.0412** (0.0011)	0.1134*** (0.0000)	0.5213*** (0.0007)	0.1946** (0.0010)
r_{t-1}	-0.2678*** (0.0005)	0.0945* (0.0967)	-0.11678** (0.0092)	-0.0568* (0.0411)
Variance equation				
ω	-0.0214 (0.1875)	0.1456** (0.0072)	0.1672*** (0.0003)	0.1452** (0.0013)
α	0.4562* (0.0101)	0.1345 (0.0342)*	0.1567** (0.0098)	0.1467*** (0.0006)
β	0.3814* (0.0213)	0.2145** (0.0036)	0.1892* (0.0244)	0.0923** (0.076)
γ	0.1398** (0.0064)	0.1456* (0.0104)	-0.0934** (0.0067)	0.1145* (0.0137)

Notes: ω is the reaction of conditional variance; α is the ARCH effect; β is the GARCH effect; γ is the leverage effect; r is the return of each cryptocurrency price index; *, **, *** denote significance levels of 10%, 5%, 1%, respectively.

Unlike the abnormal returns of the different cryptocurrencies (CAR) drawn from the classical event-study approach (Figure 1), the CAR* plots (see Figure 2) reveal that the

responses of CAR* to the Facebook’s announcement are much more pronounced than the reactions of CAR. What remains robust is that the «Libra» announcement is accompanied with a sharp increase in the price of Bitcoin and the rest of major altcoins.

Figure 2. The cumulative abnormal returns of major cryptocurrencies in response to «Libra» announcement (CAR*): [-5; + 5] event window



By controlling for the time-varying beta, the autocorrelated squared returns, and the leverage effects and the fat-tailed property of the cryptocurrencies’ returns data (Table 3), we find sharp changes in the reaction of the crypto giants’ abnormal returns to «Libra» announcement (in terms of timing and intensity): (1) the Bitcoin price immediately responds to «Libra» announcement. Such response appears positive and strong; (2) the Litecoin and

Ripple prices take some time to react after the announcement. This effect is positive but less pronounced; and (3) after some days of the occurrence of the event, the effect of Facebook announcement on the prices of the focal cryptocurrencies become more important. This result is not in line with the efficient market hypothesis, assuming that the price adjustments become less severe after the happening of the event. In short, our results suggest that the cryptocurrencies react heterogeneously to the «Libra» announcement in terms of timing and magnitude. Regarding the additional control variables, it is usually shown that the use of Bitcoin in trade and speculation (proxied by the investors' attractiveness towards each cryptocurrency under study) are the most potential contributors of all the cryptocurrencies. The velocity of cryptocurrency in circulation and the gold price were found to be the fundamentals that negatively affect the price of a cryptocurrency.

Table 3. The effects of «Libra» announcement on crypto giants' cumulative abnormal returns (CAR*)

	[0; 0] event window	[0 ;+1] event window	[+1; +5] event window
Bitcoin			
<i>Constant</i>	4.1567** (0.0011)	3.9862*** (0.0007)	4.6134*** (0.0000)
<i>«Libra»</i>	0.1545*** (0.0002)	0.1789** (0.0011)	0.3208*** (0.0006)
<i>MV</i>	-0.1109** (0.0054)	-0.0339*** (0.0003)	-0.0211** (0.0043)
<i>ETR</i>	0.1598** (0.0082)	0.1018* (0.0202)	0.1212* (0.0313)
<i>GP</i>	-0.0034*** (0.0004)	-0.0029*** (0.0007)	-0.0031** (0.0011)
<i>GTr</i>	0.1432* (0.0308)	0.1239** (0.0056)	0.0135 (0.5703)
Adjusted R ²	0.89	0.88	0.90
F-value	4.6789	4.3392	4.0078
Ethereum			
<i>Constant</i>	1.8125*** (0.0000)	1.6113*** (0.0003)	2.0132*** (0.0006)
<i>«Libra»</i>	0.12145** (0.0089)	0.15673** (0.0058)	0.1921** (0.0010)
<i>VC</i>	-0.1368** (0.0013)	-0.12941** (0.0034)	-0.12584** (0.0025)
<i>ETR</i>	0.1195*** (0.0004)	0.12611** (0.0013)	0.12804** (0.0011)
<i>GP</i>	-0.0019*** (0.0006)	-0.0065** (0.0034)	-0.0083** (0.0017)

<i>GTr</i>	0.10256** (0.0052)	0.14105* (0.0121)	0.11342** (0.0089)
Adjusted R ²	0.84	0.84	0.86
F-value	4.1376	4.2209	4.3855
Litecoin			
<i>Constant</i>	-2.4123** (0.0059)	-3.1024* (0.0122)	0.0098* (2.164)
« <i>Libra</i> »	0.0046** (0.0041)	0.1151** (0.0069)	0.1392** (0.0019)
<i>VC</i>	-0.1397* (0.0404)	-0.14152* (0.0132)	-0.13256* (0.0116)
<i>ETR</i>	0.13541** (0.0049)	0.14521** (0.0032)	0.13255** (0.0028)
<i>GP</i>	-0.00098*** (0.0002)	-0.00128** (0.0011)	-0.00962 (0.2130)
<i>GTr</i>	0.12449** (0.0091)	0.13452** (0.0038)	0.14059* (0.0112)
Adjusted R ²	0.87	0.89	0.88
F-value	3.9421	4.1110	3.9962
Ripple			
<i>Constant</i>	-1.69832*** (0.0005)	-2.13461** (0.0012)	-2.11452* (0.0004)
« <i>Libra</i> »	0.0081*** (0.0000)	0.12237** (0.0039)	0.15721** (0.0041)
<i>MV</i>	-0.15421*** (0.0009)	-0.14438** (0.0011)	-0.141092** (0.0012)
<i>ETR</i>	0.150221* (0.0234)	0.14618* (0.0214)	0.13678* (0.0196)
<i>GP</i>	-0.00651** (0.0089)	-0.00432** (0.0044)	-0.004235 (0.1052)
<i>GTr</i>	0.10359* (0.0586)	0.092810* (0.0613)	0.111235* (0.0595)
Adjusted R ²	0.91	0.89	0.90
F-value	4.6542	4.1123	4.6145

Notes: All regressions are controlled for heteroskedasticity, and the p-values are given in parentheses. *, **, *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

5. Conclusions

This study carries out a dynamic event-study methodology suited to explore the changes in Bitcoin prices and other major cryptocurrencies (i.e., Ethereum, Litecoin and Ripple) beyond expectation with the announcement of Facebook about a digital coin that it developed, called «Libra». Our results robustly reveal that an increase in the prices of crypto giants have coincided with Facebook's announcement about a digital coin that it developed. More particularly, an immediate effect (announcement day, i.e., t=0) appears positive and

significant. The effect of «Libra» announcement on the prices of Bitcoin, Ethereum, Ripple and Litecoin (in this order) becomes more pronounced during the succeeding days. Even though «Libra» is ostensibly a competitor to crypto market, since it would enable people to buy and sell goods and services with a cryptocurrency, it could also be a highly prominent proof-of-concept for widespread adoption of digital currencies. As «Libra» will be managed by a large group of companies such as Mastercard, PayPal, Visa, eBay, it will evidently help to legitimise cryptocurrencies.

These results should be interpreted with caution for at least two reasons: First, the geopolitical and global political unrest may also be playing a role in pushing up cryptocurrencies' demand. There has been an increase in tension between the US and China (trade war), the US and Iran in recent days. Also, nearly two million protesters took to the streets of Hong Kong this month demanding the withdrawal of an extradition bill. Bitcoin and other major altcoins are independent of governments and financial institutions (i.e., decentralized); hence the more we observe an erosion of trust, the more the demand for cryptocurrencies and accordingly their prices. Second, traders were overlooking huge differences between «Libra» and “traditional” cryptocurrencies. While the new Facebook's «Libra», Bitcoin, Ethereum, Litecoin and Ripple fall all under the cryptocurrency umbrella, they have different features. Unlike Bitcoin, «Libra» is backed by a reserve of real assets including bank deposits and treasury bills, giving it intrinsic value. «Libra» will be pegged to fiat currencies such as the US dollar and euro in an attempt to avoid wider swings like the case of cryptocurrencies (with large extent, Bitcoin). Because the «Libra» is pegged to well-known currencies backed by traditional banking system, it will not provide neither the same investment benefits or risks as “traditional” digital currencies. As the latter aren't pegged to a real-world currency, they are far more volatile, risky and speculative. Overall, unlike Bitcoin and other major cryptocurrencies, «Libra» is a stablecoin. This characteristic has its merits

and its shortcomings: it makes it possible to invest in a “supranational” cryptocurrency that is modestly vulnerable to extreme real assets changes. For a speculator, investing in «Libra» is not a quite interesting choice. However, for investors or traders who want to safeguard against sudden changes in a fiduciary currency - as for example in a country with heightened economic and political uncertainty, the «Libra» seems an ideal option. But one shouldn't ignore that Facebook brand had a long history of mistrust that have to be taken into consideration when assessing its potential to successfully achieve its cryptocurrency project. Even though Facebook is older, has a larger user base and in turn a dominant player in social media, it is also largely criticized because it is a platform for frauds, hat speech and multiple malicious attacks on users. With this history, Facebook confronts a crisis of trust. People do not trust this social media for their financial purposes. To estimate the trust people have in Facebook and other world's biggest technology corporations such as Amazon, Apple and Google, the University of Geneva pursued an online poll of 2100 Americans and 2100 French citizens. Only 11% of those surveyed argued they trusted Facebook whereas 35% asserted they didn't trust it at all. The rest proclaimed they neither trusted nor distrusted it. Among French respondents, 13% indicated they trusted it and 43% said they absolutely distrusted it. Only Bitcoin appears less trusted than Facebook (see Figure A1 for more details, Appendix).

Regardless of whether «Libra»'s real promise is as a coin, as a great opportunity to revolutionize the concept of digital identity, or something else, it will be of paramount importance to carefully follow «Libra»'s launch, further development and the insurmountable obstacles facing it. In fact, Facebook has a long history of contentious business models and provacy practices. Given this, Central Banks and regulators should attentively look over all aspects of Facebook's ambitious blockchain plan. This concern requires a tremendous attention since Facebook also has a long history of launching products and services, such as

political ads and live-streaming videos, without taking into account their potential to harm democracy and the global society.

References

Bouoiyour, J. and Selmi, R. (2015). What Does Bitcoin Look Like? *Annals of Economics and Finance* 16(2): 449-492.

Bouoiyour, J., Selmi, R., Tiwari, A-K. and Olayeni, O-R., (2016). What drives Bitcoin price? *Economics Bulletin* 36(2): 843-850.

Bouoiyour, J., Selmi, R., and Wohar, M-E., (2019). Bitcoin: competitor or complement to gold? *Economics Bulletin* 39(1): 186-191.

Brockett, P-L., Chen, H-W. and Garven, J., (1999). New stochastically flexible event methodology with application to Proposition 103. *Insurance: Mathematics and Economics* 25: 197–217.

Brown, S.J., and Warner, J.B., (1985). Using daily stock returns: the case of event studies. *Journal of Financial Economics* 14 (1): 3–31.

Buchholz, M, Delaney, J, Warren, J, and Parker, J, (2012). Bits and Bets, Information, Price Volatility, and Demand for Bitcoin. *Economics* 312: 1-48.

Ciaian, P. Rajcaniova, M. and Kancs, D.A. (2016). The economics of BitCoin price formation. *Applied Economics* 48(19): 1799-1815.

Dodd, P., and Warner, J.B., (1983). On corporate governance: a study of proxy contests. *Journal of Financial Economics* 11 (1–4): 401–438.

Fama, E., (1965). The behavior of stock market prices. *Journal of Business* 38: 34–105.

Fama, E., (1970). Efficient capital markets: a review of theory and empirical work.

Journal of Finance 25: 383–417.

Selmi, R., Tiwari, A-K., and Hammoudeh, S. (2018). Efficiency or speculation? A dynamic analysis of the Bitcoin market. *Economics Bulletin* 38(4): 2037-2046.

Appendix

Table A1. Summary of the differences between Bitcoin and the major cryptocurrencies

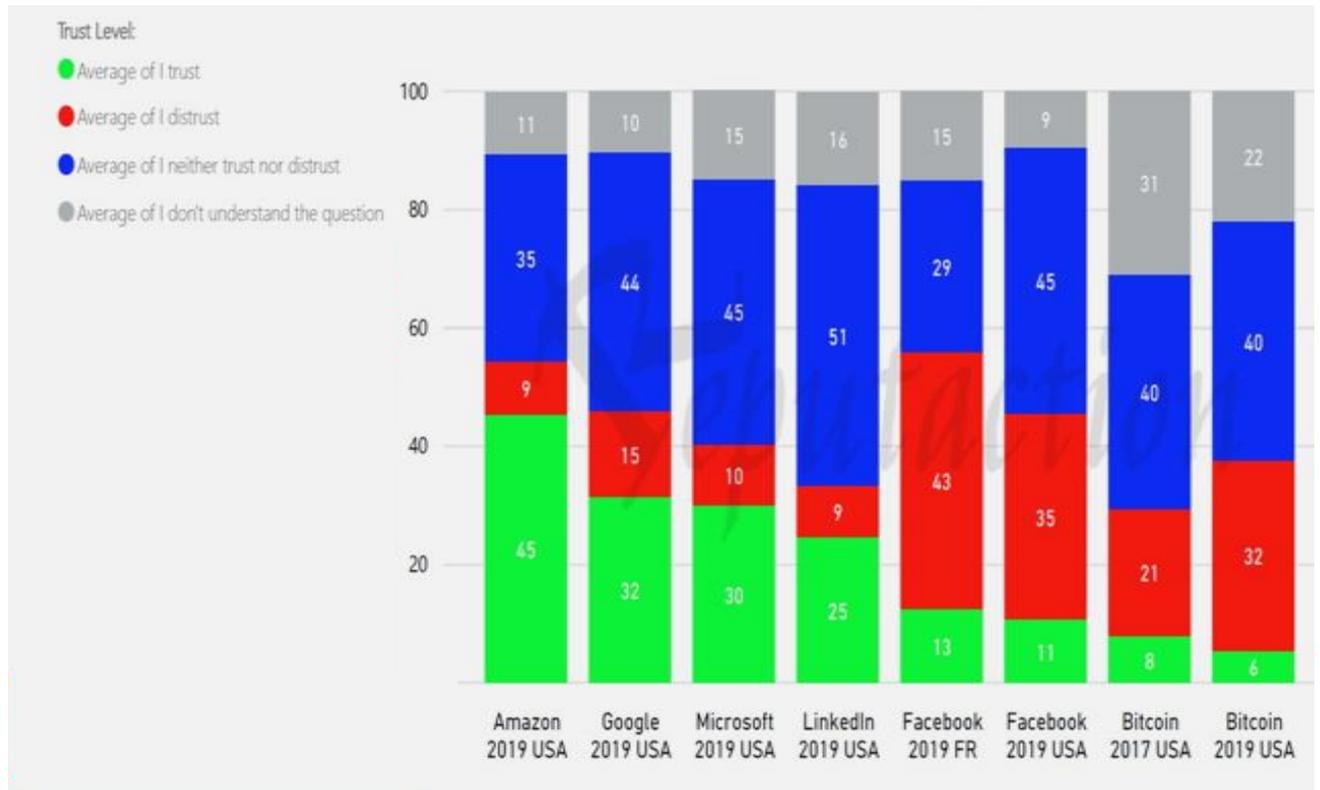
	«Libra»	Bitcoin	Ethereum	Litecoin	Ripple
Lunched	Facebook announced the launch of «Libra» on June 18, 2019. <u>But the currency itself is set to launch in the first quarter of 2020.</u>	January 04, 2009	August 07, 2015	April 28, 2013	August 04, 2013
Purpose	One of the main objectives of «Libra» is to serve people who do not currently have access to traditional banking and financial tools.	Bitcoin was intended to serve as the first peer-to-peer cryptocurrency protocol.	Ethereum is a platform for running decentralized applications (i.e., smart contracts)	Litecoin was created to serve as a currency exchange.	Ripple was developed to serve as a payment system, a remittance network, and a currency exchange.
Supply	The amount of «Libra» in circulation will be determined by the balances of «Libra» users, unlike major digital currencies like Bitcoin that is characterized by its fixed supply limit.	The Bitcoin is deflationary : the Bitcoin supply is limited	The Ethereum is infinitely inflationary: The Ethereum supply is unlimited	The Litecoin is deflationary.	The Ripple is deflationary.
Security	«Libra» will be backed by “real” government-backed assets from central banks to give it stability.	The built-in language is not Turing-complete, implying that there are some programs that are impossible to write.	Ethereum has a <u>rich programming language built-in</u> . The built-in language is Turing-complete, implying that you can code anything you want.	The first cryptocurrency to use <u>Scrypt</u> as a hashing algorithm.	Ripple employs less computing power. Ripple has its own exchange platform, and therefore there is no fear of an exchange vanishing.
Mainstream	To generate adoption	The most famous and	Ether is the	Litecoin is less	Less known.

adoption	level, the new Facebook's «Libra» has developed an incentive program in order to encourage more developers to create applications on «Libra» blockchain.	popular cryptocurrency.	second largest and known cryptocurrency.	known and younger (the Litecoin community is not larger).	
Transaction speed	The speed will be approximately 1000 transactions per second.	10 minutes for a transaction confirmation.	Ethereum was managed to handle 20 transactions per second.	2.5 minutes is the time needed to generate a block.	Ripple transactions take 4 seconds to be confirmed.
Transaction fees	Transaction fees will be lower.	As the public interest in Bitcoin has grown remarkably in recent months, the market cap for cryptocurrency has risen. With it, transaction fees for Bitcoin have increased accordingly.	High fees.	Low fees.	low fees.
Information tracking	With the Facebook network, one can track the trading history as well wallet movements.	Bitcoin network only tracks the movement of Bitcoins.	With Ethereum network, one can track the trading history and wallets movements.	It's virtually impossible to track Litecoin' movements.	Ripple is able to track information of any kind.
De/centralized exchange	«Libra» is centralized. It is backed by Facebook and more than two dozen <u>Founding companies</u> , including Ebay, Uber, Visa, etc.	One can buy and sell bitcoins anonymously without having to rely on a centralized exchange.	Ethereum has a decentralized exchange platform	Without centralization.	Ripple has its own secure network.

Table A2. Variables, definition and data sources

Variables	Definition	Sources
BTC	Bitcoin price index	CoinDesk (www.coindesk.com/price)
ETH	Ethereum price index	CoinDesk (www.coindesk.com/price)
LTC	Litecoin price index	CoinDesk (www.coindesk.com/price)
XPR	Ripple price index	CoinDesk (www.coindesk.com/price)
VC	The velocity of each cryptocurrency	Blockchain (http://www.blockchain.info)
ETR	The exchange trade ratio	Blockchain(http://www.blockchain.info)
GP	The gold price	DataStream of Thomson Reuters
GTr	The attention towards each cryptocurrency	Google Trends (http://trends.google.com)

Figure A1. The level of trust among Facebook and other world's major internet technology companies



Source: Geneva University.