Libyan International Medical University

Faculty of Business Administration

Department of Finance and Bank Management

Quantifying the Interconnectedness and Contagion Transmits in the Cryptocurrency Market

Graduation Project

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Dedication

I dedicate this dissertation to those who helped and supported me in the journey of making the graduation project. Especially my supervisors, my father, Rifat Aqila, and my mother, Naziha Mohammed. I would also like to thank all of my friends, colleagues, and staff members from the Faculty of Business Administration at the Libyan International Medical University for their encouragement and support, as without it I would not have completed this project.

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Declaration

I, Munir Rifat Aqila, declare that this dissertation was completed in accordance with the criteria and regulations of the Libyan International Medical University (LIMU). This dissertation is the result of my own efforts and has not been submitted to any other academic institution for another degree or qualification. Therefore, it is the property of the Faculty of Business Administration at LIMU, and its reuse in whole or in part is forbidden without the faculty's permission.

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Acceptance and Approval

The graduation project entitled "Quantifying the Interconnectedness and Contagion Transmits in the Cryptocurrency Market:

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Abstract

This study applies a set of measures developed by Diebold and Yilmaz (2009, 2014) to examine the connectedness and spillover effects among five large cryptocurrencies, namely Bitcoin, Ethereum, Tether, Binance Coin, and Ripple, using the TVP-VAR model. This study aims to investigate the connectedness between leading cryptocurrencies. Where the sample period was from April 1, 2018 to April 1, 2023. To ensure that the analysis is not affected by any significant events, the sample period was divided into three panels: Over the whole period, before and after the COVID-19 pandemic. During each of the three sub-periods, the results indicate that each of the analyzed cryptocurrencies is highly interconnected. Bitcoin (BTC) and Ethereum (ETH) are categorized as shock transmitters, while Tether, Binance Coin, and Ripple are categorized as shock receivers. The COVID-19 pandemic causes minor changes in interconnectedness, including a decrease in overall connectedness and a shift in the contributions of certain cryptocurrencies, such as Binance Coin, which became a net transmitter during the pandemic. In addition, the findings indicate that the return total spillover connectedness (TCI) was higher before the pandemic but lower after it. These findings can help traders and investors make smarter choices. Investors may better manage their portfolios and lower their exposure to financial risk. The limitations of the study include a limited sample period from April 1, 2018, to April 1, 2023, which may not capture longer-term dynamics or recent market developments. The analysis focuses on only five specific cryptocurrencies, excluding others with different characteristics. Moreover, this research focused exclusively on the dynamic interconnectedness.

Keywords: Connectedness, Spillover effects, Cryptocurrencies, Bitcoin, Ethereum, Tether, Binance Coin, Ripple.

ملخص

تطبق هذه الدراسة مجموعة من المقاييس التي طورها Diebold وYilmaz (2009، 2014) لفحص آثار الترابط والانتشار بين خمس عملات مشفرة كبيرة، وهي Bitcoin وEthereum وTether و Binance Coin وRipple، باستخدام نموذج TVP-VAR. تهدف هذه الدراسة إلى التحقق من الترابط بين العملات المشفرة الرائدة. حيث كانت فترة العينة من 1 أبريل 2018 إلى 1 أبريل 2023. لضمان عدم تأثر التحليل بأي أحداث مهمة، تم تقسيم فترة العينة إلى ثلاث لوحات: طوال الفترة، قبل وبعد جائحة COVID-19. خلال كل فترة من الفترات الفرعية الثلاث، تشير النتائج إلى أن كل من العملات المشفرة التي تم تحليلها كانت شديدة الترابط. تم تصنيف Bitcoin (BTC) وEthereum (ETH) على أنها أجهزة إرسال للصدمات، بينما تم تصنيف Tether وBinance Coin وRipple على أنها أجهزة استقبال للصدمات. يتسبب جائحة COVID-19 في تغييرات طفيفة في الترابط، بما في ذلك انخفاض في الترابط العام وتحول في مساهمات بعض العملات المشفرة، مثل Binance Coin، التي أصبحت ناقلًا صافيًا أثناء الوباء. بالإضافة إلى ذلك، تشير النتائج إلى أن الترابط الكلي العائد (TCI) كان أعلى قبل الجائحة ولكنه كان أقل بعد جائحة كورونا. يمكن أن تساعد هذه النتائج المتداولين والمستثمرين على اتخاذ خيارات أكثر ذكاءً. قد يدير المستثمرون محافظهم بشكل أفضل ويقللوا من تعرضهم للمخاطر المالية. تشمل قيود الدراسة فترة عينة محدودة من 1 أبريل 2018 إلى 1 أبريل 2023، والتي قد لا تلتقط ديناميكيات طويلة الأجل أو التطورات الأخيرة في السوق. يركز التحليل على خمس عملات مشفرة محددة فقط، باستثناء العملات الأخرى ذات الخصائص المختلفة. علاوة على ذلك، ركز هذا البحث حصريًا على الترابط الديناميكي.

الكلمات الرئيسية: الترابط، التأثيرات غير المباشرة، العملات المشفرة، البيتكوين، الإيثريوم، التيثر، عملة بينانس، الريبل.