

## Popular Science Summary

In recent years, cryptocurrencies have attracted significant interest from academics, investors, and regulators alike. Cryptocurrencies, also commonly referred to as “coins,” are peer-to-peer electronic cash systems that enable online payments that are sent directly without the intermediation of financial institutions. Importantly, contrary to many other asset classes, cryptocurrencies have no association with higher authority, are indefinitely divisible, and have no physical representation. Their value depends on the security of an algorithm allowing to trace transactions and not on any tangible assets, firm’s financial standing, or country credibility. The rapid increase in the popularity of coins may result from their unique features: government-free design, peer-to-peer system, and minimal transaction costs.

The rising interest in cryptocurrencies markedly boosted their economic significance. Bitcoin, the first decentralized digital currency, maintains the lead within this new field. During its most dynamic growth period, from the 3<sup>rd</sup> quarter of 2016 to the 3<sup>rd</sup> quarter of 2017, its market capitalization skyrocketed from about \$10 to more than \$230 billion, and its current value steadily remains at this level. This surge was accompanied by an over 20,000% rate of return—a profit opportunity that can hardly be challenged by any other asset class. Anecdotal evidence corroborates its growing importance. For example, in 2020, J.P. Morgan admitted that Bitcoin is an alternative currency to Gold—seeing tenfold growth potential in the future. PayPal launched a new service that enabled its millions of users to buy, hold, and sell cryptocurrency. An increasing amount of family offices and private capital now include Bitcoin in their portfolio strategy; this includes even traditionally conservative players, such as pension funds or sovereign wealth funds, now hold “coins” in their portfolios. In other words, the fundamental importance and prevalence of cryptocurrencies can no longer be ignored.

Notably, the cryptocurrencies currently in the market are not just Bitcoin. As the blockchain space matured, many different cryptocurrencies proliferated. Today, there are thousands of different cryptocurrencies—contributing to their total market value of over \$1.3 billion. Consequently, investors need new evidence-based tools to move around in this fresh new field. Given the breadth of the market, and the rapidly increasing cross-section of cryptocurrencies, market participants need to make complicated decisions regarding security selection and portfolio composition; these decisions need solid scientific support. The primary purpose of this project is to fill this gap.

Investors in other asset classes have plenty of tools at their disposal—especially in stocks. The research on the predictability of stock returns has had long attracted academic attention. The gravity of this line of research has been acknowledged by the recent Nobel Prize awarded to Eugene F. Fama in 2012. The last 20 to 30 years have produced a cornucopia of studies on predicting stock returns and selecting securities. Researchers have documented a preponderance of variables that may predict future returns. Recent surveys of the academic literature have collected hundreds of different predictors literally; based on prices, accounting data, or other types of information; that assist in forecasting which stocks will be winners, which will become market laggards.

Unlike stocks, in the cryptocurrency universe, this race for return predictability has only just begun. Only in the most recent years, the growth of the market and the amassing of large volumes of data enable cross-sectional studies of cryptocurrency markets. Numerous authors have already examined and demonstrated that the return patterns well-known from other asset classes hold for cryptocurrencies. Nonetheless, this research is still far from complete and with numerous questions remaining open. Which features of cryptocurrencies help to predict their future performance? Can we use information from other asset classes? Does the predictability vary over time? Can it be translated into efficient trading strategies—surviving the impact of trading costs? Though all these questions have been thoroughly examined for stocks or bonds, in the world of cryptocurrencies, they are still waiting for their answers.

This research project aims at performing a comprehensive examination of cross-sectional return predictability in the cryptocurrency markets. Not only will we examine a range of return regularities, but we will also use them as a novel research universe for further examinations of their properties, including their predictability, the impact of trading costs, and illiquidity on their performance as well as links between different asset classes.

The results will impact the development of financial sciences in three areas. First, they will widen the knowledge of how the prices in cryptocurrency markets are set. Second, the soon-to-be-developed instruments from this paper can be used in economic studies. Third, the research will have serious implications for the practice of financial markets. It will create valuable tools for cryptocurrency selection, strategic and tactical asset allocation, and new investment strategies. The models studied and created in this way may allow for a more precise measurement of investment performance.