Cryptocurrency Scams

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ABSTRACT

In recent years, cryptocurrencies have become an important part of the financial and economical market all around the world; a big portion of this success is due to their efficient and decentralized transaction system. Even though they were developed for a more trust-worthy financial system, one that does not depend on banks or governments, there have been organizations that had take advantage of this and other key factors of today's society, such as social media, news, etc. In this paper, we approach the transaction system of cryptocurrencies using system dynamics for a more wide study of how this currencies can increase their price only with a constant flow of investors and transactions. A dynamic hypothesis and Forrester diagram were constructed after defining some relationships between the variables that were considered relevant in the system. The model was validated and some policies were proposed in order to achieve some limits in the prices of cryptocurrencies.

1 Introduction

In the 1920s, Charles Ponzi duped investors when he convinced them that he will return a 50% revenue every 90 days; he was actually paying the old investors with the money given by the new ones. This is known as the Ponzi Scheme nowadays; since the virtual currencies lack of regulation and have enhanced privacy for trading, they can be and are being used by fraudsters to perpetrate their frauds in similar fashion [1].

In 2017, the cryptocurrency company BitConnect launched its new coin BitConnect Coin (BCC, not to be confused with BitCoin Cash), which assured every user that whatever investment they made in their currency and made part of their loan and exchange platform (which allowed them to loan the company USD and Bitcoin to the company in favor of some interests) they will return up to 40% of their initial investment every month. After using broad marketing strategies to avoid their investors to know about their fraudulent intentions and recollecting thousands of investments, they closed the loan and exchange platform; so, all the people who invested in the BCC lost all their money because of the 96% drop in the price of the coin. Even the company promised to return some money for the people who got affected by given them the average of the price of the coin in the last 15 days but, given that BCC was at such a low price there were several financial lossess by the investors. In this day and age, there are new companies like XRPConnect, EthConnect, Bunny Token and NEOConnect that are replicating the schemes that BCC made without any type of regulation which, as what happened with BitConnect, can lead to disastrous results [2].

In this manner, cryptocurrencies can over-inflate their price by artificially manipulating the price by marketing it with unrealistic expectations so people start buying the coin and in some delay, selling it to other people to obtain profit through the Exchanges or the Peer to Peer system, who would put more coins in the market through mining. As they exploit the price and people invest more in the coin, they then can abuse this by incrementing by a big margin their Exchange rate or, on the other side, the company changes the coins it possesses for USD or another currency and, proceed to devaluate their coin so they do not have to pay people back. [3].

On the other hand, price leveraging is not as hard in cryptocurrencies as other stocks that are available in the market. An article written in the Journal of Monetary Economics about the price manipulation in the bitcoin system, that the sudden spike in the price of bitcoin in 2013 happened due to suspicious activity in an exchanges called "Mt.Gox Bitcoin Currency Exchange", which 600000 BTC valued at 188 million USD were acquiered using bots, artificially inflating the price without any real substance; the article explains how this could have a massive effect in the growth rate of BTC in a positive manner, reaching a 4% growth rate each day after [4].

1.1 Problem of cryptocurrencies

Taking account of all the above, the cryptocurrency system allows for people to abuse it in fraudulent ways to augment the growth rate of the price of that coin without any type of repercusion, due to the lack of goverment regulation. On the other hand, as an articles of forbes says, most of investors in this currencies like this investment because of the same lack of government involvement [5]. In this manner, nowadays companies like Bunny Token, ETH Connect, XRPConnect and mire are expecting

1% growth in their price daily without any type of proof or security for the investors without too much control because, of the lack of control they have, leading to a easier atmosphere to scam people.

To conclude, it's important to notice that even if the problem and the variables have a very short span, there can be found a lot of documentation about them because they were one of the trending topics last year. Most people see Bitcoin and other cryptocurrencies as a safe economic investment and a way to make easy profit. Although we are not saying that is something that we should thrive to eliminate completely, it is important to examine how this system works and start to make policies that makes investing in this opportunity a safer place for the consumer and, stop catastrophes like BitConnect to don't ever happen again.

2 Theories that support the explanation or solution of the problem

- Ponzi Scheme: Is a fraudulent type of investment scheme that uses later investments to provided quick, high returns to early investors. These schemes focus on attracting new investors rather than engaging in any legitimate investment. In the 1920s, Charles Ponzi initially bought a small number of international mail coupons in support of his scheme, but quickly switched to using incoming funds from new investors to pay returns to earlier investors. While dealing with international exchange rates, postal organizations and foreign currency kept him from producing actual revenue, the scheme did allow him to brag and advertise about the investment opportunity. In a few months, he managed to convince hundreds of people to invest in his business; Ponzi used the funds to buy a mansion and deposited cash in banks all across New England (today UK) [1] [6].

- Foreign Exchange Market: Global online network where traders buy or sell currencies, its main objective is to set the exchange rate for currencies [7]. The basic concept behind the foreign exchange (or forex) market is for trading currencies, one pair against another. In 2010, it was the worlds largest market, consisting of almost $2 trillion in daily volume and is growing rapidly. The price of each currency within the pair is determined by a number of factors, such as changes in political leadership, economic booms or busts or even natural disasters [8].

- ICO (Initial coin offering): It is a method in which a cryptocurrency startup firm sells a number of its cryptocurrency to companies and investors to back their project up; it is similar to A IPO (initial public offering), where new companies sell shares to other companies or investors. Early investors in the operation are usually motivated to buy the cryptocoins in the hope that the plan becomes successful after it launches which could translate to a higher cryptocurrency value than what they purchased it for before the project was initiated. Since these fund-raising operations are not regulated by financial authorities, although there are successful ICOs, there are ICOs and crowd-sales campaigns that are fraudulent. Funds that are lost due to fraudulent activities may never be recovered [9].

- Blockchain Protocol: It is used to serialize transactions of the currency among its users, it is maintained by a replicated state machine that keeps user's transactions and balances. This state machine is managed by nodes, called miners. Cryptographic methods are used to ensure security on each transaction, the miners commit the transactions into a global-decentralized log called blockchain. This is the protocol that several cryptocurrencies use for their trades and transactions [10].

3 Analysis of the problem and variables identification

3.1 Scope of the problem

To approach the problem of this article, it is necessary to understand how the dynamic of buying and selling coins through the exchanges can affect the price of that specific cryptocurrency; at the same time, it is important to notice how goverment regulation can affect the price, so we can thoroughly determine how effective will goverment taxes affect the system.

3.2 Model purpose

Understand how the cryptocurrency buying-selling dynamic through exchanges, can increase growth rate and affect the price altogether. Therefore, understanding how fraudelent schemes can leverage this system exponentially and artificially manipulate the price.

3.3 Variables identification and historical background

We identified 10 variables that affect the problem of over inflating this types of currencies for scams. These are:

1. Price of the cryptocurrency (CC): this is the market value in US dollars that the actual coin has. Measurement units: $ USD

2. Number of CC bought: is the number of CC bought by the users through the Exchanges. Measurement units: dimensionless.

3. Number of CC sold: is the number of CC sold by the users to the Exchange company for another currency. Measurement units: Dimensionless.

4. Investors: is the number of investors that have invested on the coin or the company releasing it. Measurement units: dimensionless.

5. Number of Exchanges: this is the number of Exchanges that trade this specific CC. Measurement units: dimensionless.

6. Volatility: it's the uncertainty in percentage of, given a value of winning fee, how much one can lose or win in relation to that fee. Measurement units: %

7. Earnings: this is on average how much a given person earns by trading this CC. Measurement units: $ USD

8. Exchange fees: this is the fee that the Exchange uses in every trade you make with their rates. Measurement units: $ USD

9. Government taxes: this is the taxes that the government applies to the Exchange. Measurement units: $ USD

10. Growth rate: It refers to the price of the cryptocurrency divided by time[11]. Measurement units: USD/Time.

In order to give some historical background of these variables, we are going to use the BitConnect example because, although there exists several companies who work in a similar fashion, this is the only one in this span of time that has completed the scam completely. It is important to notice that, finding measurements of variables such as the CC sold and bought can be a real hard task because the number of transactions per day with this coin considerably big; and, although we could check the blockchain for every single operation in each CC, it is something to improve upon in the future with an algorithm that does this automatically.
In this manner, instead of measuring the CC sold and bought will find the historical background of the Volume of the CC which represents the amount of money in USD that has been traded of that CC every 24 hours; even if is not exactly the same as the variables mentioned, we could have a good knowledge of this variables through that graph. Figure 1 shows trading data on BitConnect.

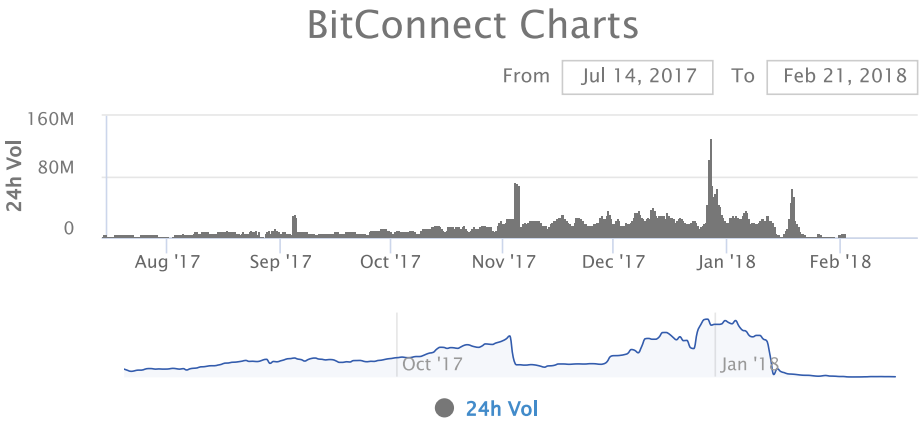


Figure 1. Trading data on BitConnect.

On the other hand, the same occurs when we try to find the number of investors; it would be something impossible to find at exact quantity of how much investors are investing in the CC. So, instead, we can find the graph of the Market Cap that is the number of investors multiplied the price of a unitary action of the company. In this way, we would get a very good grasp of the behavior of this variable. Figure 2 shows said data.

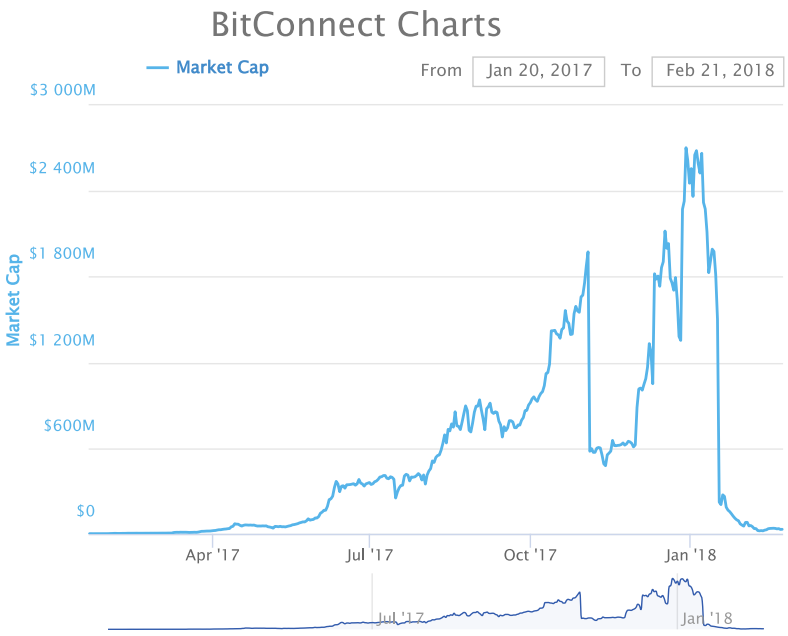


Figure 2. Market cap data on BitConnect.

Finally, the price of the CC is the easiest to find, as it is documented in a wide variety of websites. Figure 3 shows the price of the BitConnect Coin.

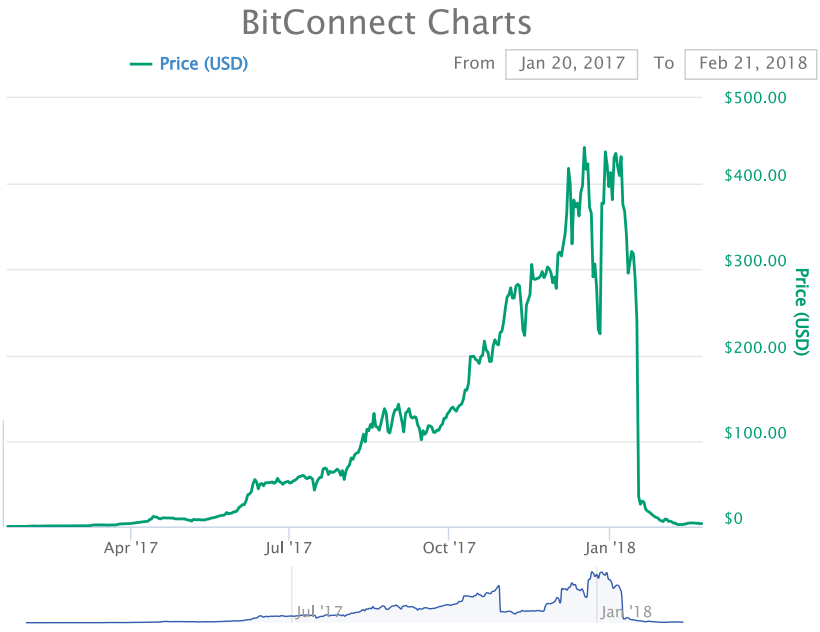


Figure 3. Price on BitConnect Coin.

4 System synthesis

Figure 4 shows the spider web that represents the way the variables are relating; the abbreviation CC, corresponds to cryptocurrencies.

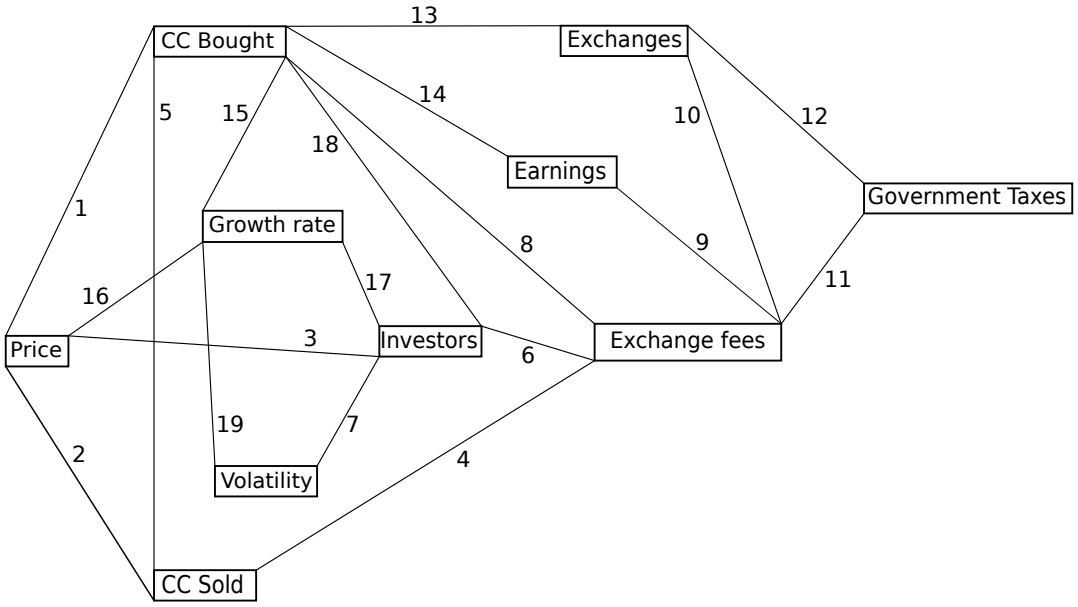


Figure 4. SpiderWeb for the system described

The numbers in the spider web represent the relationships between the variables, therefore it can be seen every relationship one by one. For this analysis it is necessary to know as much as cryptocurrencies bought or sold, referenced to a specific cryptocurrency.

1. Price of a cryptocurrency ↔ Cryptocurrencies bought: a simple directly proportional relationship, which is that the price depends on number of cryptocurrencies bought, for example if the people buy more of a cryptocurrency in specific, the price will increase.

2. Price of a cryptocurrency ↔ Cryptocurrencies sold: is a similar relation like the first one, because is also directly proportional; likewise, the number of the cryptocurrencies sold depends on the price.

3. Price of a cryptocurrency ↔ Number of investors: this is a relation that consist in the price basically, is that to say that number of investors depends on the price of a cryptocurrency, so if the price of a cryptocurrency increase, the number of investors will increase as well.

4. Cryptocurrencies sold ↔ Exchange fees: the taxes of the exchanges vary depends of the number of cryptocurrencies sold, because if the exchanges sold a lot of cryptocurrencies is not necessary to increase their taxes, but if the opposite happens they will need to augment their taxes.

5. Cryptocurrencies sold ↔ Cryptocurrencies bought: this can clearly be seen and is that the number of cryptocurrencies sold depends in the number that been bought.

6. Number of investors ↔ Exchange fees: a possible augment in the taxes of the exchanges, will decrease the number of investors, because they are not going to earn the same amount of money, accordingly the number of investors depends in the taxes of exchanges.

7. Volatility ↔ Number of investors: the relationship between these variables is inversely proportional, because as it increases the volatility, the number of investors decrease.

8. Exchange fees ↔ Cryptocurrencies bought: If the taxes of exchanges change, the number of cryptocurrencies bought will change.

9. Exchange fees ↔ Earnings of investors: a decrease in the taxes of the exchanges, will produce an increase in the earnings of an investor, because they are going to pay less to the exchanges to change an specific cryptocurrency for regular money.

10. Number of exchanges ↔ Exchange fees: supposed an increase in the number of exchanges, this will generate a competition in the market between the exchanges, so to sell more they are going to reduce their taxes.

11. Exchange fees ↔ Government taxes to exchanges: let us think in the taxes of the banks and the taxes of the government to the banks. What happened if the government augment their taxes? The answer to this question is very simple, if this happens the exchanges need to increase their taxes to cope that. The same thing happens with the taxes of exchanges and the government taxes.

12. Government taxes to exchanges ↔ Number of exchanges: if the taxes of the government are higher these in a lapse of time will generate a decrease in the number of exchanges because they are "losing" money paying to the government.

13. Number of exchanges ↔ Cryptocurrencies bought: in the case of the demand of cryptocurrencies increase, this will generate a increase of the number of exchanges, to solve the bought of cryptocurrencies.

14. Earnings ↔ Cryptocurrencies Bought: If consumers earn more, they can afford buying more.

15. Growth rate ↔ Cryptocurrencies bought: If the growth rate increases, consumers will buy more of that cryptocurrency.

16. Price ↔ Growth rate: A decrease in the price of a cryptocurrency implies that the growth rate reduces.

17. Growth rate ↔ Investors: If the cryptocurrency is growing, human beings will invest more to get more profit.

18. Investors ↔ Cryptocurrencies bought: If there are more investors, there will be more cryptocurrencies bought.

19. Growth rate ↔ Volatility: Am augment in the growth rate will generate an increase in the volatility.

Obviously, all the variables are important and it is necessary to see the relationships between them but is easy to see that one of the variables that more affect the system are the prices, both cryptocurrency and taxes of the exchanges and the government. It is important to highlight that the volatility affects the most of market, but anything affects it. Let us understand the volatility as the change of the market in an specific time, so it could be interpreted as the risk of making money on an investment, therefore if the volatility is high then the probability of making money is high as well, but also the probability of losing money, because the market is changing constantly.

5 Dynamic hypothesis

5.1 Causal loop diagram

Figure 5 shows the causal loop diagram for the model in study.

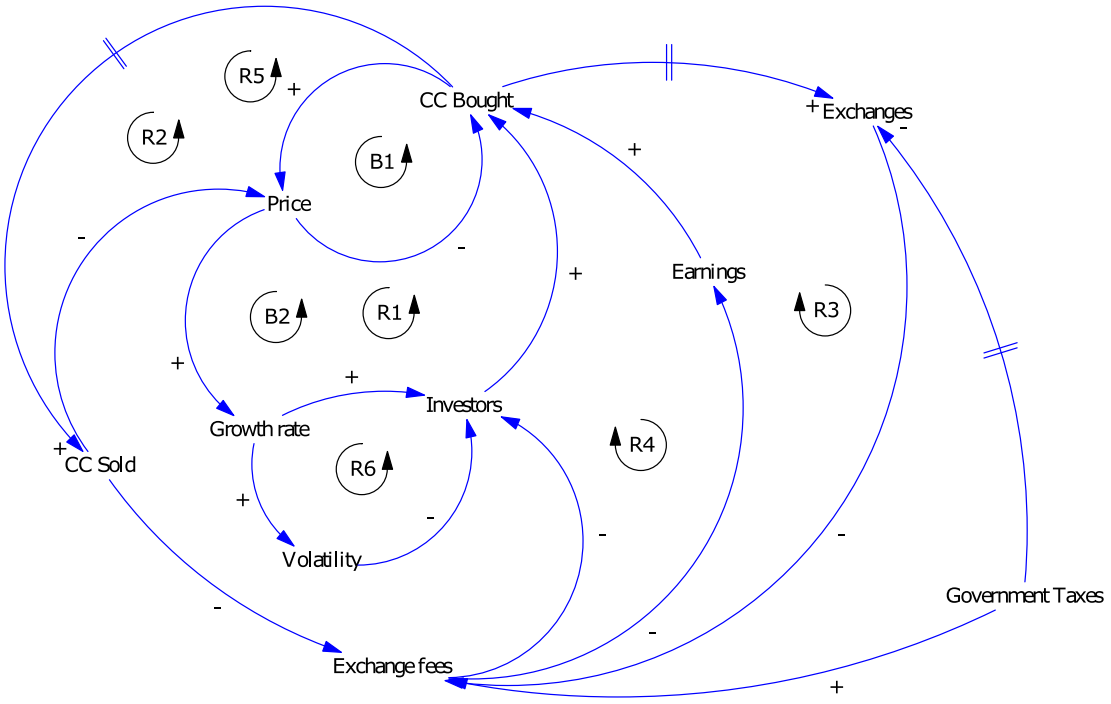


Figure 5. Causal loop diagram for cryptocurrency exchange market.

5.2 Feedback loops

5.2.1 Reinforcing

- *R1 - Amount of CC bought due to investors:* This loop explains how the price increases due to the purchase of new CC; because the growth is defined as a change in a period of time, it is clear that it will increment as well. Now, as the CC is growing, more people will be interested in investing, which implies more CC bought. Shown in Figure 6.

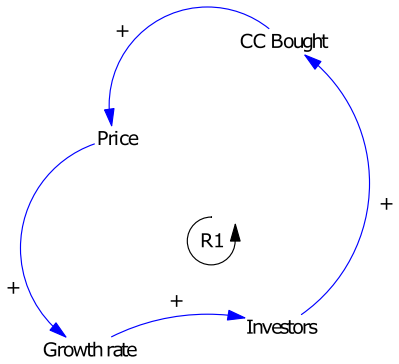


Figure 6. Loop R1.

- *R2 - Amount of CC bought due to earnings:* This reinforcing loop explains how exchange fees affect the amount of CC bought due to their earnings, which, in a future, will be sold; this implies a change on the exchange fees because the selling procedure is through a exchange house. Shown in Figure 7.

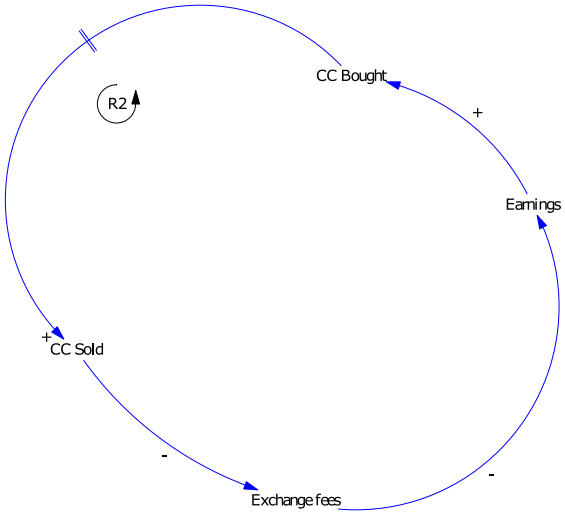


Figure 7. Loop R2.

- *R3 - Earnings due to exchange fees:* Let us imagine a market with a lot of exchanges, in order to compete with the other exchange houses, they will have to reduce their fees; therefore, people will obtain higher revenue. This encourages people to buy more CCs. Shown in Figure 8.

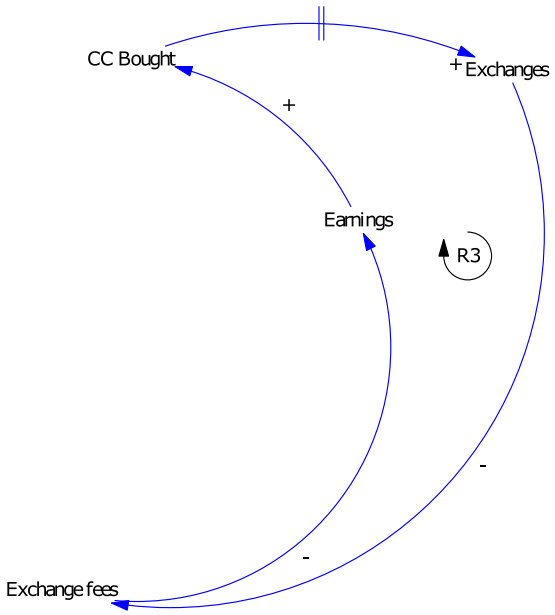


Figure 8. Loop R3.

- *R4 - Investors due to exchange fees:* This is similar to last loop, since the exchange fees determines the number of investors there will be; and they, as well, determine the number of CC bought. As we said, the number of CC bought influences the number of exchange houses and, due to market competition they will have to change their fees. Shown in Figure 9.

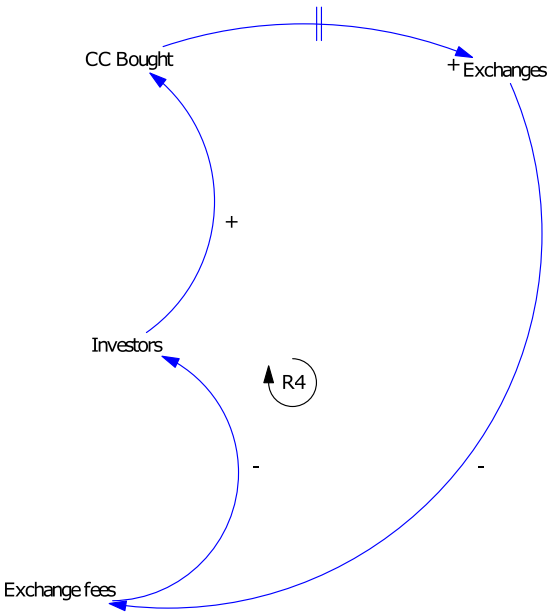


Figure 9. Loop R4.

- *R5 - Delay between purchase and sell of CCs:* The price defines both the amount of CC bought and sold; if, in the future, there are more CC bought, it will produce more sells. Shown in Figure 10.

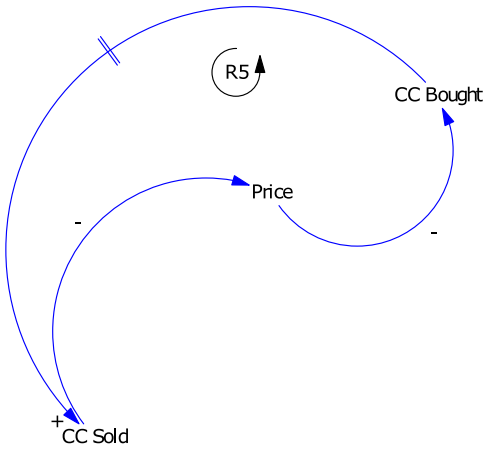


Figure 10. Loop R5.

- *R6 - Investing leads to more investors:* If we define the volatility as the risk of an investment, if there is more, there will be less investors and CC bought; therefore, there will not be an increment in the CC sold and the price will increase. Clearly, the growth rate will increase as well. Shown in Figure 11.

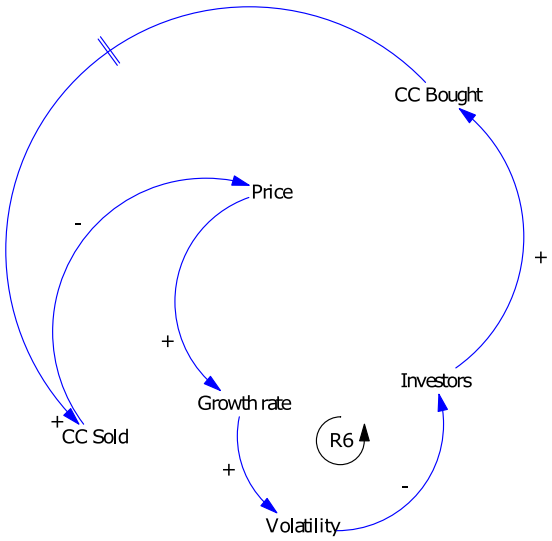


Figure 11. Loop R6.

5.2.2 Balancing

- *B1 - Balancing price:* If investors start buying more coins of a CC, then the price increments. On the other hand, when the price starts to go up, then people can't afford to buy as much CC as before so, naturally it reduces the number of CC bought by the public. Shown in Figure 12.

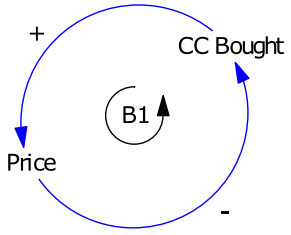


Figure 12. Loop B1.

- *B1 - Price due to Investors:* If the CC price starts growing faster, then more costumers will invest in that CC as it shows

better profits. In this manner, a increase in investors will augment the number of CC bought. In a delay, investors who bought this coins will sell them which accordingly reduces the price. Finally, the growth rate reduces because of the decline of price. Shown in Figure 13.

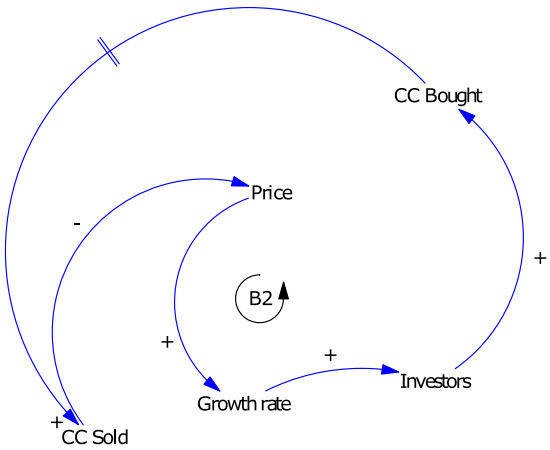


Figure 13. Loop B2.

6 Forrester diagram

The time scope selected for the simulation was 4 years (48 months for Vensim), this is due to the fact that the exchange market, in general, is highly volatile and unpredictable; it would be a mistake to attempt a larger simulation. Besides, for the kind cryptocurrency that is being modeled, the price tends to increase in a short period of time. The complete Forrester Diagram is shown in Figure 14.

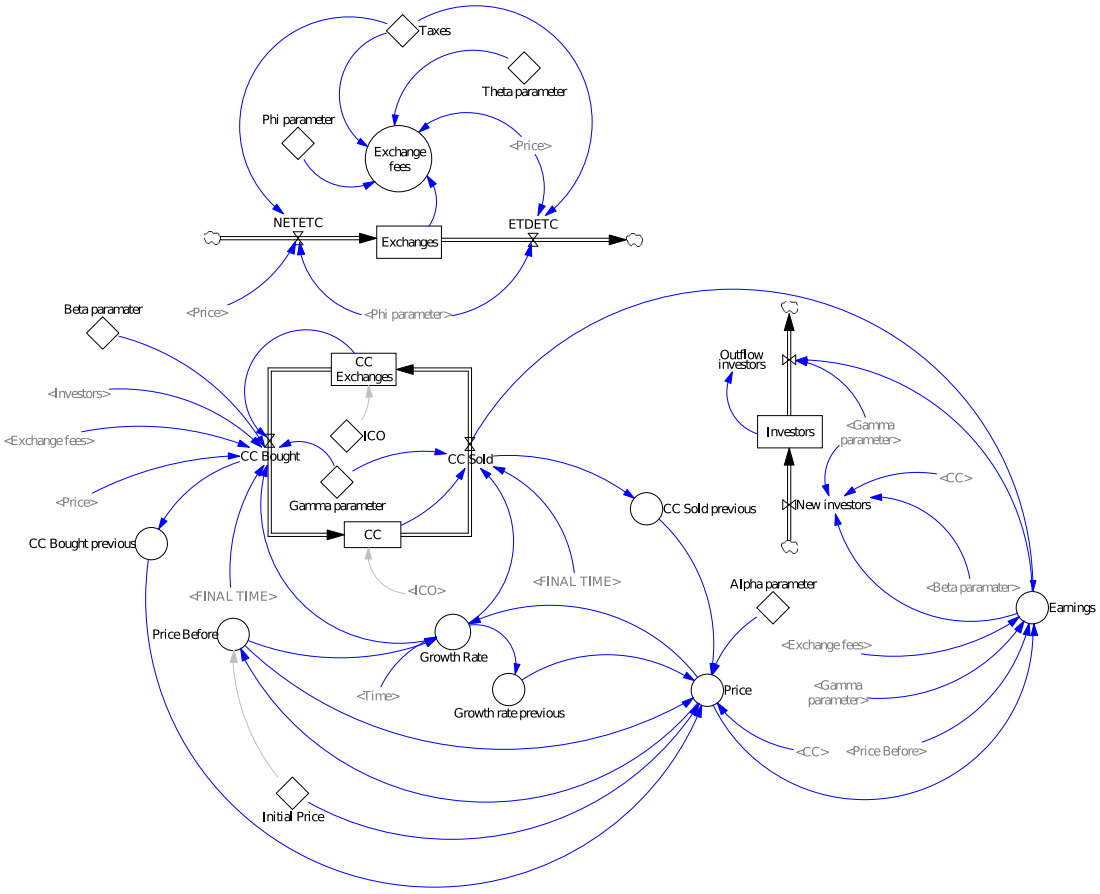


Figure 14. Forrester diagram for cryptocurrency exchange market.

It is important to highlight that, in comparison with the dynamic hypothesis, the Forrester Diagram has a considerably more variables; this is due to the fact that, during the construction of said diagram, we considered more calculations and relations between the variables defined in first place. Although, the dynamic hypothesis has the general system behavior. This diagram was developed in Vensim.

6.1 Variables

The variables used for the Forrester Diagram are shown in Table 1, with each of their units, type and equation.

Table 1. Variables used in Forrester Diagram

Units	Variable	Variable type	Formula
Exc/Month	NETETC	Flow	$\texttt{NETETC} = \texttt{IF THEN ELSE}\left(\frac{\texttt{Taxes}}{\gamma} > \texttt{Price} * \phi, 0, 10\right)$
Exc	Exchanges	Level	$\texttt{Exchanges} = \int (\texttt{NETETC} - \texttt{ETDETC})dt,\ \texttt{In} = 0$
Exc/Month	ETDETC	Flow	$\texttt{ETDETC} = \texttt{IF THEN ELSE}\left(\frac{\texttt{Taxes}}{\gamma} > \texttt{Price} * \phi, 10, 0\right)$
USD/Exc	Theta param	Constant	$\theta = 1$
CC	Phi param	Constant	$\phi = 1$
USD	Exc fees	Auxiliary	$\texttt{ExcFees} = (\texttt{Price} * \phi) * 0.0026 + \left(\frac{\texttt{Taxes}}{\gamma}\right) - \theta * \texttt{Exchanges}$
USD	Taxes	Constant	$\texttt{Taxes} = 0$
CC/People	Beta param	Auxiliary	$\beta = 5$
CC	CC Exc	Level	$\texttt{CCExc} = \int (\texttt{MAX}(\texttt{CCSold} - \texttt{CCBought}, 0))dt$
CC/Month	CC Bought	Flow	$\texttt{CCBought} = \texttt{DELAY N}\left(\texttt{IF THEN ELSE}\left(\texttt{GrowthRate} > 0, \frac{\texttt{CCExc} * \gamma}{16} + \texttt{Investors} * \beta * \gamma, \texttt{IF THEN ELSE}\left(\frac{\texttt{ExcFees}}{\texttt{Price}} < 0.0035, 0, \frac{\texttt{CCExc} * \gamma}{32} + \texttt{Investors} * \beta * \gamma\right)\right), \texttt{FINAL TIME}, 0, 3\right)$
CC	CC	Level	$\texttt{CC} = \int (\texttt{MAX}(\texttt{CCBought} - \texttt{CCSold}, 0))dt,\ \texttt{In} = \frac{\texttt{ICO}}{2}$
CC/Month	CC Sold	Flow	$\texttt{DELAY N}\left(\texttt{IF THEN ELSE}\left(\texttt{GrowthRate} < 0, \frac{\texttt{CC}}{16 * \gamma}, \frac{\texttt{CC}}{32 * \gamma}\right), \texttt{FINAL TIME}, 0, 3\right)$
1/Month	Gamma param	Constant	$\gamma = 1$
CC	ICO	Constant	$\texttt{ICO} = 4.8 \times 10^6$
CC/Month	CC Sold previous	Auxiliary	$\texttt{CCSoldPrev} = \texttt{DELAY FIXED}(\texttt{CCSold}, 1, 0)$
People/Month	New Investors	Flow	$\texttt{NewInvestors} = \texttt{IF THEN ELSE}\left(\texttt{Earnings} > \texttt{WantedEarnings}, \frac{\texttt{CC} * \gamma}{\beta}, \frac{\texttt{CC} * \gamma}{64 * \beta}\right)$
USD/Month	Wanted Earnings	Auxiliary	$\texttt{WantedEarnings} = 250$
People	Investors	Level	$\texttt{Investors} = \int (\texttt{NewInvestors} - \texttt{OutflowInvestors})dt,\ \texttt{In} = 0$
People/Month	Outflow Investors	Flow	$\texttt{OutflowInvestors} = \texttt{IF THEN ELSE}\left(\texttt{Earnings} < 0, \texttt{INTEGER}\left(\frac{\texttt{Investors}}{16}\right) * \gamma, \texttt{INTEGER}\left(\frac{\texttt{Investors}}{64}\right) * \gamma\right)$

USD/Month	Earnings	Auxiliary	$\texttt{Earnings} = (\texttt{Price} - \texttt{PriceBefore}) * \texttt{CC Sold} - \texttt{ExcFees} * \gamma$
USD/CC	Price	Auxiliary	$\texttt{Price} = \texttt{MAX}(\texttt{Initial Price}, \texttt{Initial Price}) + \texttt{GrowthRatePrev} * \texttt{PriceBefore} + \alpha * \frac{(\texttt{CCBoughtPrev} - \texttt{CCSoldPrev})}{\texttt{CC}}$
USD* Month/CC	Alpha param	Constant	$\alpha = 742$
Dmnl	Growth rate prev	Auxiliary	$\texttt{GrowthRatePrev} = \texttt{DELAY FIXED}(\texttt{GrowthRate}, 1, 0)$
Dmnl	Growth rate	Auxiliary	$\texttt{GrowthRate} = \texttt{IF THEN ELSE}(\texttt{Time} > 0, \frac{(\texttt{Price} - \texttt{PriceBefore})}{\texttt{Price Before}}, 1.42)$
USD/CC	Initial price	Auxiliary	$\texttt{InitialPrice} = 0.5$
USD/CC	Price before	Auxiliary	$\texttt{PriceBefore} = \texttt{DELAY FIXED}(\texttt{Price}, 1, \texttt{InitialPrice})$
CC/Month	CC bought previous	Auxiliary	$\texttt{CCBoughtPrev} = \texttt{DELAY FIXED}(\texttt{CC Bought}, 1, 0)$

7 Model Validation

7.1 Units Consistency

The units check validation is shown in Figure 15

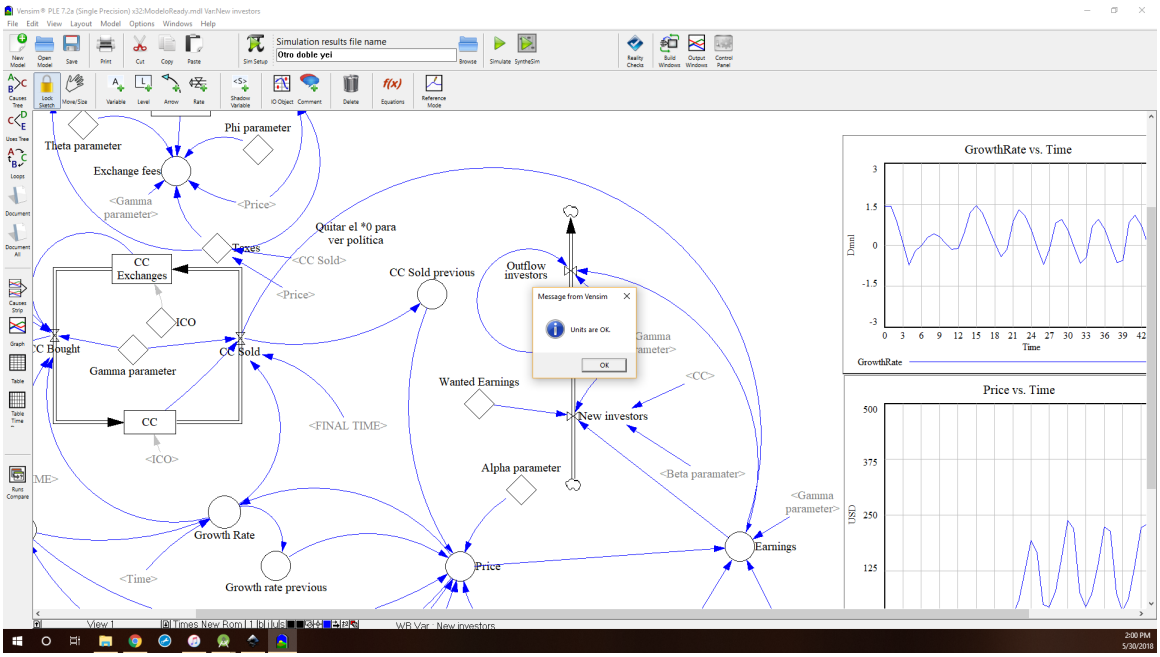


Figure 15. Units check in Vensim

Though, it must be noted that the units check approval was achieved using some parameters, this proves that some of the equations proposed for the model are not the best options, even though they are consistent with whether the dependency was proportional or inversely proportional.

7.2 Stress Test

The variables selected for the stress test are CC Bought and New Investors. They were set as follows:

- CCBought= 0
- NewInvestors= 0

7.2.1 CC Bought

Setting the number of cryptocurrencies bought as zero, would imply an important drop in the price, this is shown in Figure 16. This shows that the model behaves correctly after changing CCBought.

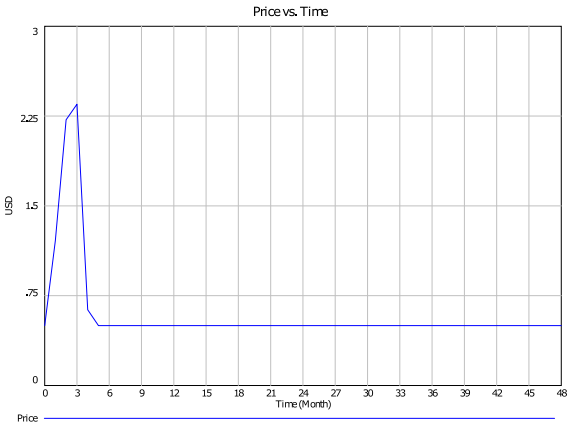


Figure 16. Price after setting CCBought as zero.

On the other hand, it is important to note that the growth rate also behaves accordingly, as it is shown in Figure 17. This is because it settles after a few months, which proves that it depends on the price change and it if it does not change, the growth rate will be constant.

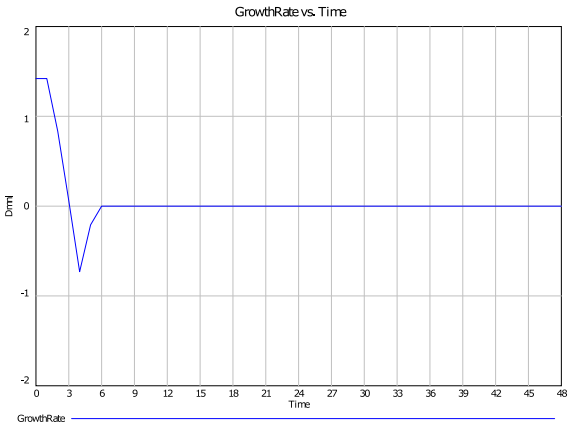


Figure 17. Growth rate behavior for CCBought as zero.

7.2.2 New Investors

Setting the number of new investors as zero, implies that there will not be new buyers and the market would, kind of, get stuck with the same people. As the cryptocurrency market needs people to invest and them being in a constant flow, the price of the CC would drop after a few months. This was achieved during this test, as shown in Figure 18

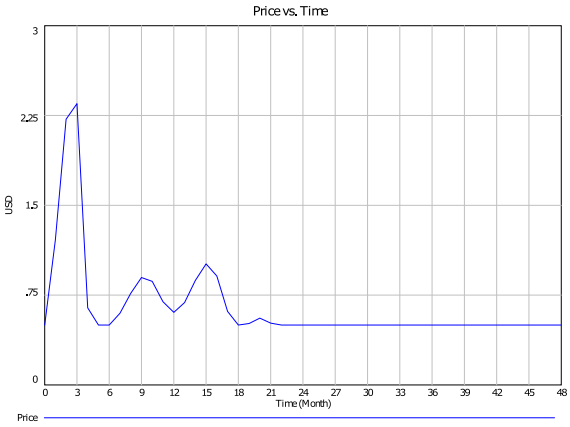


Figure 18. Results for price after setting the new investors as zero.

Same for the growth rate, which proves accordingly the behavior, shown in Figure 19.

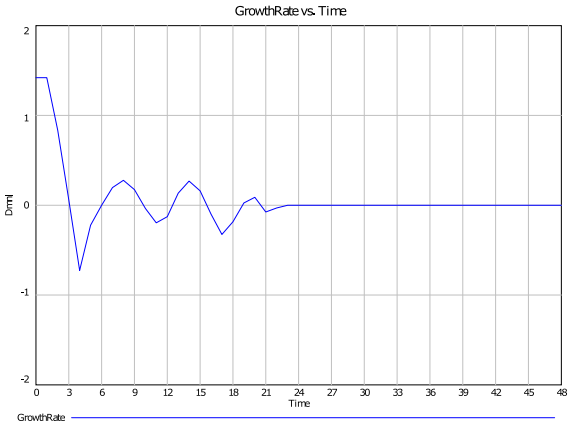


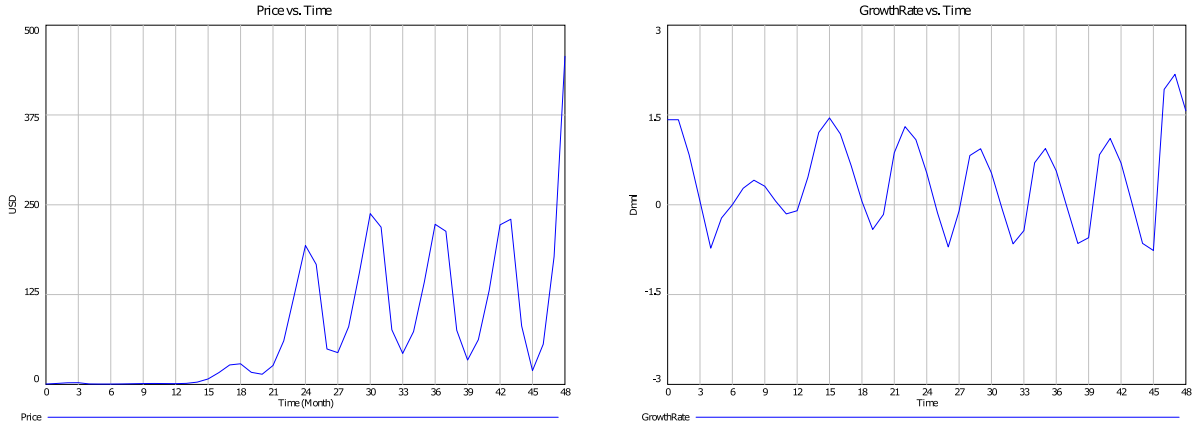
Figure 19. Results for Growth Rate for zero new investors.

8 Policies

8.1 Base Model

Before the policies for addressing the problem are presented, it is necessary to show that, indeed, there is a problem and that it can be seen in the model constructed. For this, the base model will be presented, with results for both price and growth rate.

The results for the base model test are shown in Figure 20, for both price (a) and growth rate (b).



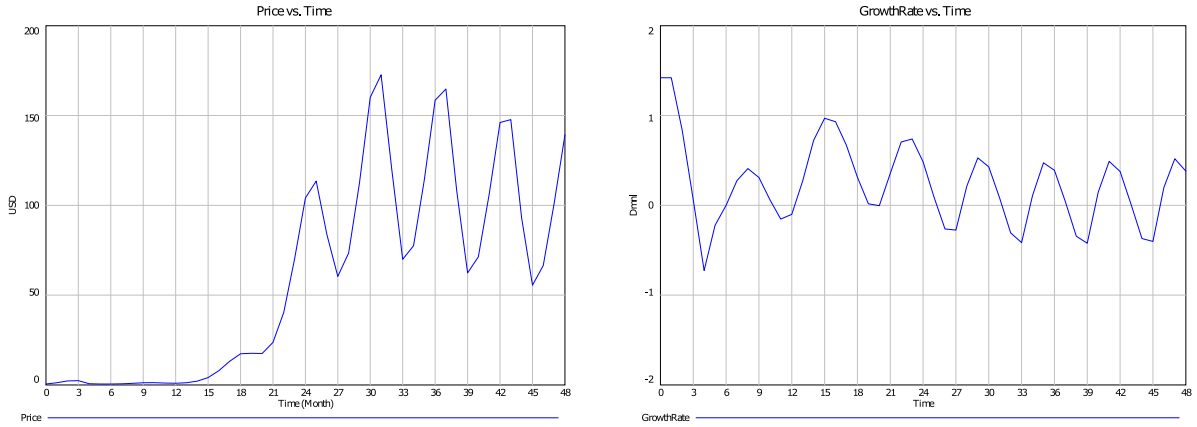
(a) Results for price. **(b)** Results for growth rate.

Figure 20. Base model test.

It can be noted that the plot of price (Figure 20.a) for the base model is similar to Figure 3, which shows price of BitConnect Coin; showing a significant growth in the price of the CC in a very short time period. The problem that is going to be addressed is attempting to limit this growth or, at least, extend the time that the market needs to reach similar prices. A possible improvement to control the system using the model, can be through two specific variables: taxes and investors.

8.2 Policies: Government Taxes to Exchanges

The first one is controlling the trading in the exchanges, this may be achieved through the government imposing taxes to the exchanges; as the exchanges have to pay to the government, they have to augment their own taxes (exchange fees), so this will represent a change in the price and obviously in the growth rate, as is shown in Figure 21.



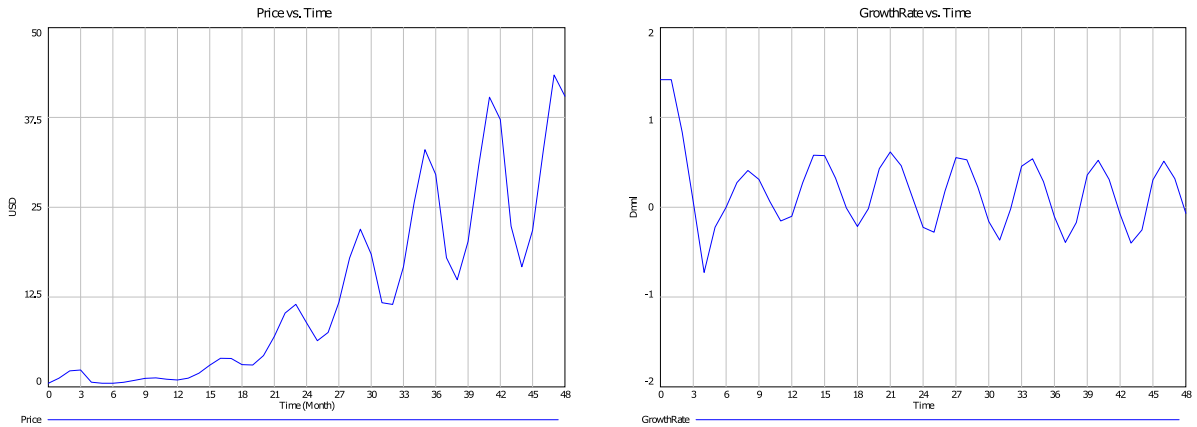
(a) Results for price. **(b)** Results for growth rate.

Figure 21. Results after setting government taxes.

Note that the growth rate keeps a normal fluctuation and that the price is oscillating and tending to drop, as well as the price maximum is around 175USD, whereas the base model was around 480USD; this shows that the policy is effective and changes are taking place in the model results.

8.3 Policies: Limit the Number of New Investors

one of the most important factors that rise the price of a cryptocurrency is the number of investors that a certain cryptocurrency can handle a great amount of people. In this order, it is of the utmost importance to regulate the number of investors that can enter the system monthly so the price grows in a more balanced way. Therefore, we tested the system allowing only ten thousand people maximum to enter the system per month; in the real system, is not that hard to control this aspect but it needs government regulation to make it achievable. The results of this policy can be observed in Figure 22



(a) Results for price. **(b)** Results for growth rate.

Figure 22. Results after limit in New Investors.

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