

What Drives Stablecoin Interest Rates?

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1 Introduction

Stablecoins connect the cryptocurrencies world and conventional financial markets. They have the stability of fiat money while enjoying the convenience of blockchain technology. As Figure 1 shows, from 2017 to 2021, the total supply of stablecoins has increased tremendously. At the beginning of 2017, the total market value of stablecoins was less than 10 million dollars, while in November 2021, their capitalization has been close to 150 billion dollars.

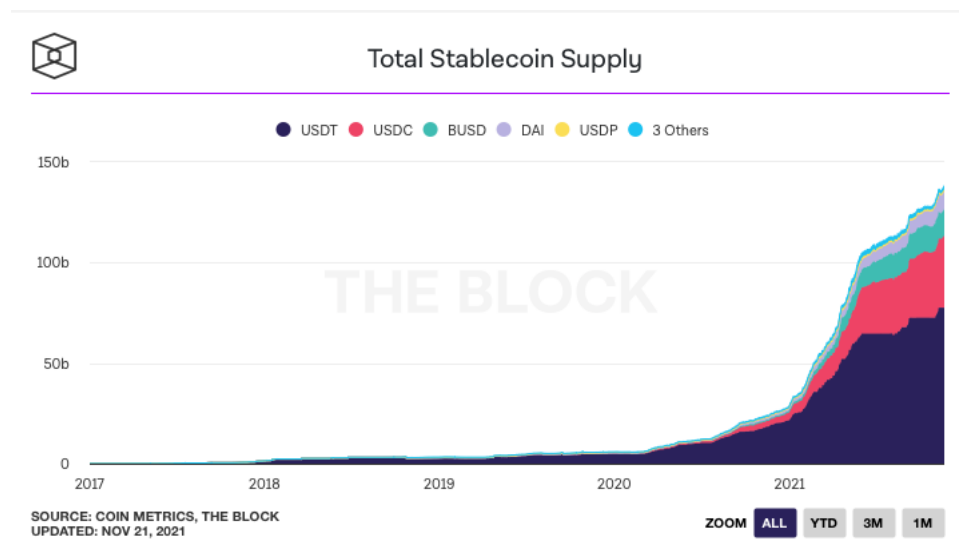


Fig. 1: Stablecoin Supply 2017-2021

The DeFi lending platforms, including Maker, Aave, Compound, and so on, have been offering attractive lending interest rates to stablecoins. DeFi lending is a growing business, as Figure 2 presents, since April 2020, the total amount of DeFi outstanding debt has taken off and has surpassed 20 billion dollars.

There have been various stablecoins, USDC, USDT, DAI, and so on. Among all stablecoins, DAI is the most popular one for DeFi lending/borrowing. Coincidentally, in Chinese, DAI means lending. The total value locked (TVL) of DAI in the DeFi lending/borrowing market demonstrates a strong upward trend and has already reached 13 billion dollars, as we can see in Figure 3.

Debt Outstanding (USD)

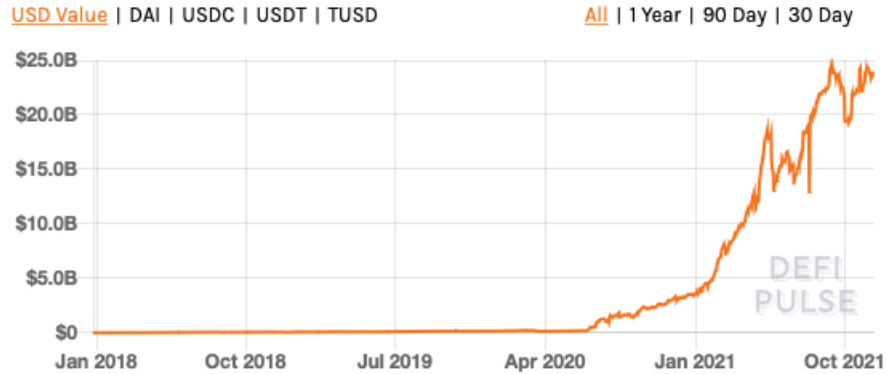


Fig. 2: Outstanding DeFi Lending

DAI Debt Outstanding

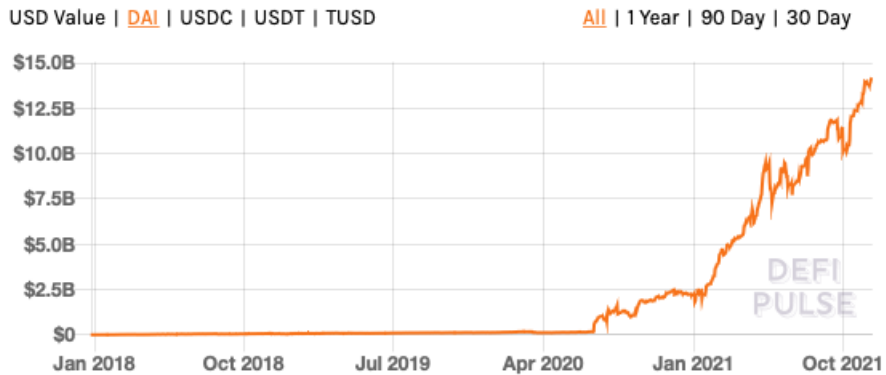


Fig. 3: DAI Debt Outstanding

In this article, I focus on the analysis of DAI. Figure 4 shows that the lending rates for DAI are both high and volatile in most DeFi lending platforms, except Maker, which is the organization creating DAI. Maker's lending rate for DAI is close to zero, meaning that it is different from other platforms' lending business. Although there are huge differences in DAI lending rates among platforms, the DAI lending rates interestingly present synchronous trends.

In November 2021, the DAI lending amount on Compound is the second highest (\$3.42 billion), while the highest one is Maker, \$8.97 billion, and the third one is Aave, \$1.75 billion. These three DeFi platforms represent the most lending of DAI. Also, Compound has the longest history of DAI lending. I therefore use Compound's lending rate for DAI as the research object for this paper.

I aim to answer the question: What drives the DeFi stablecoin interest rates? Stablecoin interest rates are important because they incentivize households to transfer fiat money from banks to the crypto world, which could affect the ef-

DAI Lend Rates

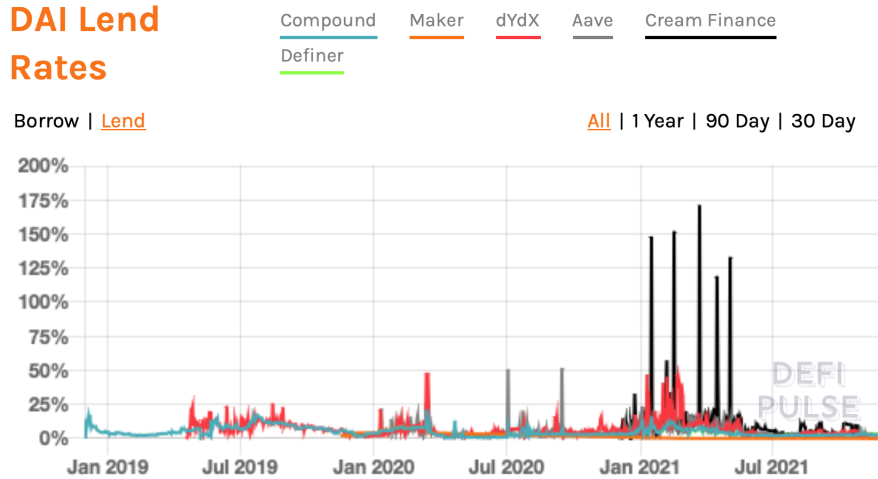


Fig. 4: DAI Lend Rates

fectiveness of conventional monetary policies of central banks. The stablecoin interest rates could influence global financial markets and are of policy relevance to central bankers. Now that stablecoins are rising rapidly, understanding the mechanisms underpinning stablecoin interest rates becomes an urgent issue. Few literature has touched on this question so far.

2 The Demand and Supply of Stablecoins

I consider both demand and supply side factors affecting stablecoin interest rates including:

Crypto-related: Bitcoin returns and trading volumes, total value locked (TVL) of DAI.

Money and bond markets: LIBOR of US dollar overnight, Treasury bills (One Month), corporate bond yield (Moody Aaa and Baa).

Foreign Exchanges: The US dollar index.

Stock Market: SP500 returns, VIX.

I collect stablecoin interest rates and crypto-related data from defipulse.com. Bitcoin prices and volumes are from Yahoo Finance. Additionally, I obtain other financial data from WIND, which is a leading financial information platform in China. For DAI lend/borrow interest rates, LIBOR, Aaa/Baa Corporate bond yields, and One-month Treasury Bills yield, I take first-order difference. For VIX, the US dollar Index, Bitcoin prices, Bitcoin trading volume, and TVL of DAI, I take first-order log difference. The research sample is from January 1st, 2019 to November 20th, 2021.

3 Results

3.1 Summary Statistics

Table 1 presents the descriptive statistics of variables.

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
lend	707	-.0026421	1.426804	-16.40745	12.60622
borrow	707	-.0107254	1.523723	-17.34246	13.31756
vix	707	-.0003928	.0843093	-.2662275	.4802141
dollar	707	-.0000183	.0035483	-.0152562	.0177477
libor	707	-.0032709	.0404897	-.8456	.1218
aaa	707	-.0017822	.0615539	-.55	.52
baa	707	-.0025318	.0518956	-.2200003	.4799995
tbills	707	-.0032249	.028034	-.3	.11
btc	707	.0037765	.0481748	-.4647302	.2030464
btcvol	707	.0029219	.218845	-1.873726	1.862374
tvldai	707	.0135725	.0958672	-.42963	.580417

3.2 Correlation Table

The correlation coefficients between any two variables are summarized into Table 2. The first column, the correlation between DAI lending rate and other variables, is my main interests in this table. * means 5% significance level. The correlation coefficient between LEND and BORROW is 0.975, which is a very high number, meaning that DAI's lending rate is highly correlated with its borrowing rate. Also, LEND has significantly negative relation with VIX, implying that uncertainty in the US stock market may dampen contemporary stablecoin lending rate. This suggests the flight-to-safety effect. Additionally, LEND is positively and significantly correlated with DOLLAR, LIBOR, AAA, and BAA, indicating that the appreciation of US dollar, and the increased yield in the money market and corporate bond market, can push up the DAI lending rate in the same day. This makes economic sense since the prices of substitutes should move in the same direction. Stablecoins, LIBOR, and Corporate bond are substitutes to some extent. Besides, LEND is not significantly related to concurrent TBILLS, BTC, and BTCVOL. Moreover, the TVL of DAI has negative and significant relationship with LEND. This aligns with economic intuition, the higher the supply of DAI, the lower its lending rate.

3.3 Regression Analyses

Table 3 shows the OLS regression results of LEND on other variables. In line with the results in the correlation table, the coefficient of VIX is negative and

Table 2: Correlation Table

	lend	borrow	vix	dollar	libor	aaa	baa
lend	1.0000						
borrow	0.9745*	1.0000					
vix	-0.1230*	-0.1183*	1.0000				
dollar	0.1057*	0.1099*	0.0272	1.0000			
libor	0.3427*	0.3345*	-0.1083*	0.0497	1.0000		
aaa	0.1043*	0.1079*	-0.0793*	0.1796*	0.1534*	1.0000	
baa	0.0805*	0.0782*	-0.1254*	0.2379*	0.1466*	0.8072*	1.0000
tbills	-0.0386	-0.0287	-0.0959*	0.0304	0.0788*	-0.1023*	-0.1286*
btc	0.0503	0.0531	-0.1779*	-0.1053*	0.0540	-0.0761*	-0.0752*
btcvol	0.0733	0.0780*	0.0595	0.0648	0.0740*	0.0209	0.0089
tvldai	-0.1686*	-0.1577*	0.0652	-0.0133	0.1028*	0.0370	0.0009
		tbills	btc	btcvol	tvldai		
tbills		1.0000					
btc		0.0174	1.0000				
btcvol		0.0255	0.0850*	1.0000			
tvldai		0.0009	-0.0243	-0.0031	1.0000		

significant. And the coefficients of DOLLAR, LIBOR, and AAA are positive and significant, which is the same as the pairwise correlation. I see the differences at the coefficients of BAA and TBILLS. The coefficient of BAA is positive and significant in the correlation table, now it turns negative and significant. And the coefficient of TBILLS changes from insignificant to significantly negative. The coefficients of BTC and BTCVOL remain insignificant. Moreover, after adding other variables into the equation, the coefficient of TVLDAI is still negative and significant.

By doing this regression, I demonstrate that the stablecoin interest rate is not simply a random outcome. It is closely correlated with indicators in conventional financial markets and follows the law of demand and supply. This is my original work initially identifying the determinants of stablecoin interest rates.

The regression results for BORROW is presented in Table 4. The signs and significance of coefficients are consistent with Table 3.

Table 3: Regression Analyses of DAI Lending Rate

Source	SS	df	MS	Number of obs	=	707
Model	265.325269	9	29.4805855	F(9, 697)	=	17.53
Residual	1171.929	697	1.68139024	Prob > F	=	0.0000
				R-squared	=	0.1846
				Adj R-squared	=	0.1741
Total	1437.25427	706	2.03577092	Root MSE	=	1.2967

lend	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
vix	-1.446005	.6045078	-2.39	0.017	-2.63288	-.2591309
dollar	37.77595	14.30848	2.64	0.008	9.683069	65.86884
libor	12.31668	1.2434	9.91	0.000	9.87542	14.75794
aaa	2.472086	1.349747	1.83	0.067	-.177971	5.122143
baa	-2.72032	1.635961	-1.66	0.097	-5.932322	.4916809
tbills	-4.084693	1.779006	-2.30	0.022	-7.577546	-.5918401
btc	.5783247	1.045368	0.55	0.580	-1.474123	2.630773
btcvol	.2926129	.2258291	1.30	0.195	-.150774	.7359998
tvldai	-2.989647	.514245	-5.81	0.000	-3.999302	-1.979992
_cons	.0596493	.0500366	1.19	0.234	-.0385911	.1578898

Table 4: Regression Analyses of DAI Borrowing Rate

Source	SS	df	MS	Number of obs	=	707
Model	287.049212	9	31.8943568	F(9, 697)	=	16.44
Residual	1352.09297	697	1.93987514	Prob > F	=	0.0000
				R-squared	=	0.1751
				Adj R-squared	=	0.1645
Total	1639.14219	706	2.32173114	Root MSE	=	1.3928

borrow	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
vix	-1.472772	.6493137	-2.27	0.024	-2.747617	-.1979268
dollar	42.40471	15.36902	2.76	0.006	12.22959	72.57983
libor	12.73114	1.33556	9.53	0.000	10.10894	15.35335
aaa	3.030164	1.449789	2.09	0.037	.1836858	5.876642
baa	-3.268559	1.757217	-1.86	0.063	-6.718632	.1815144
tbills	-3.775985	1.910865	-1.98	0.049	-7.527727	-.0242437
btc	.7628334	1.12285	0.68	0.497	-1.441741	2.967408
btcvol	.3412783	.2425675	1.41	0.160	-.1349723	.8175288
tvldai	-3.011277	.5523607	-5.45	0.000	-4.095768	-1.926787
_cons	.0530524	.0537453	0.99	0.324	-.0524696	.1585744