

## CLAIMS:

1. A computer-implemented method for automatically conducting a continuous forward rate agreement in a cryptocurrency using smart contracts, the method comprising:

5 Identifying, by one or more node devices, a first smart contract, the first smart contract having a first address and a first borrower address associated therewith, the first smart contract having (i) a owed amount value initially based on an amount of cryptocurrency transferred to the first borrower address, (ii) a collateral value representing a value of a collateral object committed to the smart contract associated with the first borrower address,  
10 (iii) an interest rate query routine configured to periodically determine a first variable interest rate based at least on an extrinsic rate or an intrinsic rate;

identifying, by the one or more node devices, at least one loan token associated with the first smart contract, the at least one loan token representing an interest in the collateral object;

15 identifying, by the one or more node devices, a second smart contract, the second smart contract having a second address and a first lender address associated therewith, the second smart contract having (i) a lender balance representing a lender amount of cryptocurrency associated with the first lender address, and (ii) a second interest rate query routine configured to periodically determine a second variable interest rate based at least on  
20 the extrinsic rate or the intrinsic rate;

generating, by the one or more node devices, an obligation object, wherein generating the obligation object comprises:

receiving control of the at least one loan token;

25 generating a borrower balance of the obligation object based on the collateral value associated with the at least one loan token;

receiving control of the lender amount;

generating the lender balance of the obligation object based on the lender amount;

generating at least one lender token and at least one borrower token;

associating the at least one lender token with the first lender address;

30 associating the at least one borrower token with the first borrower address; and

determining a predetermined interest rate associated with the obligation object; and

executing, by the one or more node devices, the obligation object, wherein executing the obligation object comprises:

receiving at least one first payment from the first borrower address;

35 receiving at least one second payment from the first lender address;

updating the borrower balance based on the at least one first payment and the at least one second payment;

detecting a triggering event; and

in response to detection of the triggering event, by the one or more node devices:

i) computing a lender return amount based on the lender balance and the at least one first payment;

5 ii) computing a borrower return amount based on the borrower balance and the at least one first payment; and

iii) releasing a cryptocurrency based on the lender return amount and the borrower return amount.

10 2. The method of claim 1, wherein the at least one lender token comprises a plurality of lender tokens.

3. The method of claim 2, wherein a subset of the plurality of lender tokens is associated with a second lender address, and wherein the lender amount is re-allocated between the first lender  
15 address and the second lender address according to a proportion of the plurality of lender tokens associated with the first and second lender addresses, respectively.

4. The method of claim 3, further comprising:  
de-associating, by the one or more node devices, the at least one lender token from the first  
20 lender address;  
transferring, by the one or more node devices, a subset of the loan amount to the first lender;  
and  
receiving, by the one or more node devices, a secondary loan amount to replace the subset of  
the loan amount, from the second lender.

25 5. The method of any one of claims 1 to 4, wherein the at least one borrower token comprises a plurality of borrower tokens.

6. The method of claim 5, wherein a subset of the plurality of borrower tokens is associated with  
30 a second borrower address, and wherein the borrower balance is re-allocated between the first borrower address and the second borrower address according to a proportion of the plurality of borrower tokens associated with the first and second borrower addresses, respectively.

7. The method of claim 6, further comprising de-associating the at least one borrower token from  
35 the first borrower address.

8. The method of any one of claims 1 to 7, wherein generating the obligation object further comprises querying an external server or smart contract to determine the predetermined interest rate.

9. The method of any one of claims 1 to 8, wherein the predetermined interest rate is fixed.

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10. The method of any one of claims 1 to 9, wherein executing the obligation object further comprises:

determining that the extrinsic rate has decreased relative to the predetermined interest rate;

and

10 increasing a proportion of the loan amount to be allocated to the lender address, based on the difference between the extrinsic rate and the predetermined interest rate.

11. The method of claim 10, wherein increasing the proportion of the loan amount to be allocated to the lender address further comprises:

15 computing the proportion of the loan amount;

invoking a partial liquidation function of the obligation object; and

receiving the proportion of the loan amount in an escrow account.

12. The method of any one of claims 1 to 11, wherein executing the obligation object further comprises:

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determining that the extrinsic rate has increased relative to the predetermined interest rate;

and

increasing a proportion of the loan amount to be allocated to the borrower address, based on the difference between the extrinsic rate and the predetermined interest rate.

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13. The method of claim 12, wherein receiving control of the lender amount comprises the obligation object receiving control of the lender amount, the method further comprising transferring, by the one or more node devices, a portion of the lender amount to the first smart contract to reduce the owed amount value.

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14. The method of any one of claims 1 to 13, wherein detecting the triggering event comprises detecting that the collateral value is lower than the loan amount presently allocated to the lender.

15. The method of any one of claims 1 to 13, wherein detecting the triggering event comprises detecting that a term of the obligation object has elapsed.

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16. The method of any one of claims 1 to 15, wherein the first payment is at least one borrower interest payment based on the first variable interest rate.
17. The method of any one of claims 1 to 16, wherein the second payment is at least one lender interest payment based on the second variable interest rate.
18. The method of any one of claims 1 to 17, wherein the obligation object is a smart contract.
19. The method of any one of claims 1 to 18, wherein the at least one first payment comprises a plurality of payments.
20. The method of any one of claims 1 to 19, wherein the cryptocurrency is based on a form of Dai.
21. The method of claim 20, wherein the extrinsic rate is a Dai Savings Rate.
22. The method of claim 20, wherein the extrinsic rate is based on a dividend rate.
23. A computer-implemented method for automatically conducting a continuous forward rate agreement in a cryptocurrency using smart contracts, the method comprising:  
generating, by one or more node devices, an obligation object, the obligation object having a first address and a first borrower address associated therewith, the obligation object having (i) an owed amount value initially based on an amount of cryptocurrency transferred to the first borrower address, (ii) a collateral value representing a value of a collateral object committed to the obligation object by the first borrower address, (iii) an interest rate query routine configured to periodically determine a first variable interest rate based at least on an extrinsic rate or an intrinsic rate, the obligation object further having a first lender address associated therewith, and (i) a lender balance representing a lender amount of cryptocurrency associated with the first lender address, wherein generating the obligation object further comprises:  
generating a borrower balance of the obligation object based on the collateral value associated with the at least one loan token;  
generating the lender balance of the obligation object based on the lender amount;  
generating at least one lender token and at least one borrower token;  
associating the at least one lender token with the first lender address;  
associating the at least one borrower token with the first borrower address; and  
determining a predetermined interest rate associated with the obligation object; and

executing, by the one or more node devices, the obligation object, wherein executing the obligation object comprises:

receiving at least one first payment from the first borrower address;

receiving at least one second payment from the first lender address;

5 updating the borrower balance based on the at least one first payment and the at least one second payment;

detecting a triggering event; and

in response to detection of the triggering event:

10 i) computing a lender return amount based on the lender balance and the at least one first payment;

ii) computing a borrower return amount based on the borrower balance and the at least one first payment; and

15 iii) releasing a cryptocurrency based on the lender return amount and the borrower return amount.

24. A non-transitory computer readable medium storing computer program code executable by a processor, which when executed by the processor causes the processor to carry out the method according to any one of claims 1 to 23.

20 25. A system for automatically conducting a continuous forward rate agreement in a cryptocurrency using smart contracts, the system comprising:

a data communications network;

at least one lender device;

at least one borrower device; and

25 at least one node device comprising a processor and a memory, the processor configured to carry out the method of any one of claims 1 to 23.