

Fixed Annuity Web3 Application

What it does

On the lender's side (think "retiree"):

Locks a lender's lump sum USDC payment **P** in a smart contract for a specified period **T**. In return the lender's payment grows by a fixed annual interest rate **R** for the duration of **T**, resulting in a net value of **V** ($V = P(1+RT)$). At the end of **T**, the lender can withdraw their USDC which has a value, **V**, greater than their original payment, **P**.

On the borrower's side (think "investor"):

Selects a lender's **[P,T,R]** agreement to borrow the USDC in exchange for locking ETH into the smart contract as collateral. The value of ETH must stay above $1.5 \times V$ throughout the agreement's period **T** or else it will be automatically liquidated by the smart contract. The borrower has **T** to pay back the loan+ interest **V** in USDC, no monthly payments are required. When the agreement's period **T** ends, the borrower must have paid back the loan+interest amount or else their ETH is liquidated. If they pay back the loan+interest, then they get all of their ETH collateral returned. If their ETH is liquidated, then they only get back the (ETH liquidation value – **V**).

An example from the lender's side:

Alice is planning to retire in 10 years. She's worried about stock market volatility so she wants to invest her money into something that offers a guaranteed rate of return. Rather than putting her money inside of a bank account CD (which has tax inefficiencies) or investing it with a web2 annuity company (which charges lots of fees and offers no real guarantees), she decides to invest it with the Annuity contract that offers her the guarantees and high interest rate that she's after.

So, Alice deposits 100k USDC into the smart contract in exchange for a guaranteed simple interest rate of 5% for 10 years. After 10 years she can withdraw 150k USDC and be happy that her investment grew so she is now better prepared for retirement.

An example from the borrower's side:

Sarah is an investor and believes in the long term potential of crypto but also the continuous rise of the stock market. She currently has 300k in ETH but very little USDC. Sarah wants to invest into the stock market but without much USD she can't invest very much. She could sell her ETH for USD but she knows that would be silly because ETH is will keep going up in value while USD won't.

So, Sarah decides to interact with the annuity smart contract. She spots Alice's offer and borrows Alice's 100k USDC in exchange for using her 300k ETH as collateral. As long as the value of her ETH doesn't fall below 225k in value, then she has 10 years to pay back the 150k loan and interest amount. During that time, she invested her money into a S&P

index fund which returned an average of 8% compounding per year. By the end of the 10 years, Sarah's investment grew to 215k, so she easily paid back the 150k loan and interest amount, and additionally profited 65k in USDC! Best of all, she also got her ETH back which grew to a value of 1.1 million just like she expected.