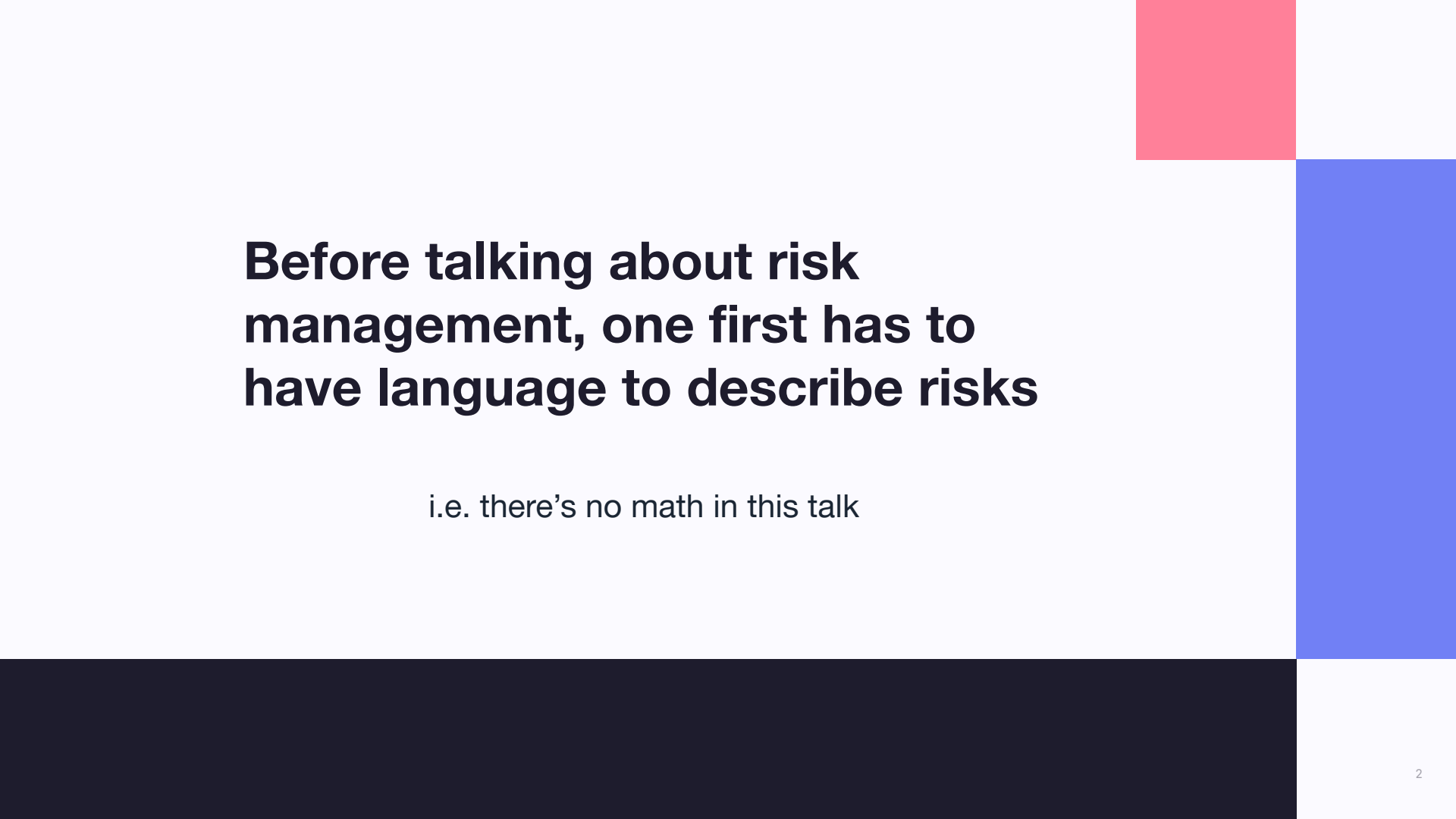


Risks of LRTs

Establishing a common language

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(This work was co-authored with Mike Neuder of the Ethereum Foundation)



**Before talking about risk
management, one first has to
have language to describe risks**

i.e. there's no math in this talk

What are LRTs?

Liquid Restaking Tokens (LRTs): Why?

AVS selection is hard

Despite there being a lack of AVSs (other than the 'null' AVS of EL restaking) until EigenDA launches, figuring out how to allocate to the cambrian explosion of AVS is going to be hard.



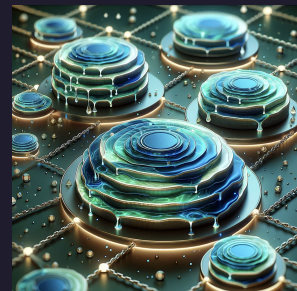
Delegation not DevOps

Fewer people deal with the DevOps of maintaining a normal Ethereum CL/EL client let alone another client that interacts with them (e.g., AVS clients) — and just like LSTs, people find alternative vehicles.



Liquidity within DeFi

AVS positions, akin to staking positions, are non-fungible (barring you selling your private key) whereas LRTs are generally fungible and useful within DeFi.



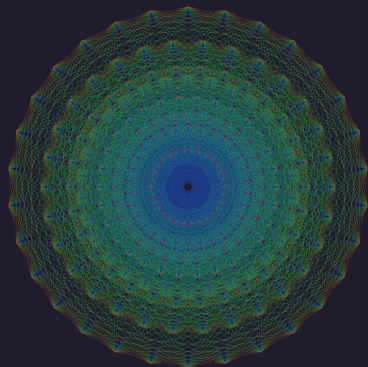
These aren't risk-free though!



Goals of this (short) talk

Define 'eigen'-dimensions of risk

Coming up with a language for the highest weight dimensions of risk within these systems is important for comparing and contrasting how different assets behave



Comparing risk to TradFi

While crypto provides a far more transparent view of risk, there are lessons to learn from TradFi — especially bond funds



Non-Fungible Assets

Sovereign Bonds

Sovereign bonds are issued by countries who control their own monetary supply (and can print more money to pay interest coupons).

Note that we consider a *single* sovereign bond to be non-fungible in a manner similar to US Savings Bonds.

L1 Staking Positions

A single validator in Ethereum is a non-fungible position that can only be made liquid (unless it is part of an LST) by entering the withdrawal queue.

AVS Positions

AVS positions can also be thought of as non-fungible with conditions for exit depending on the particular EigenPod specification.

Fungible Assets of Interest

Bond Funds

Most people don't buy bonds directly — they hold a share in a bond fund (such as a money market fund or savings account).

These funds have custodians/third-parties who manage the individual non-fungible bonds and give the yield to shareholders (less a fee).

Liquid Staking Tokens (LSTs)

Similarly, ETH holders delegate validation to node operators who earn the yield (by not getting slashed, being online, etc.) and take a fee.

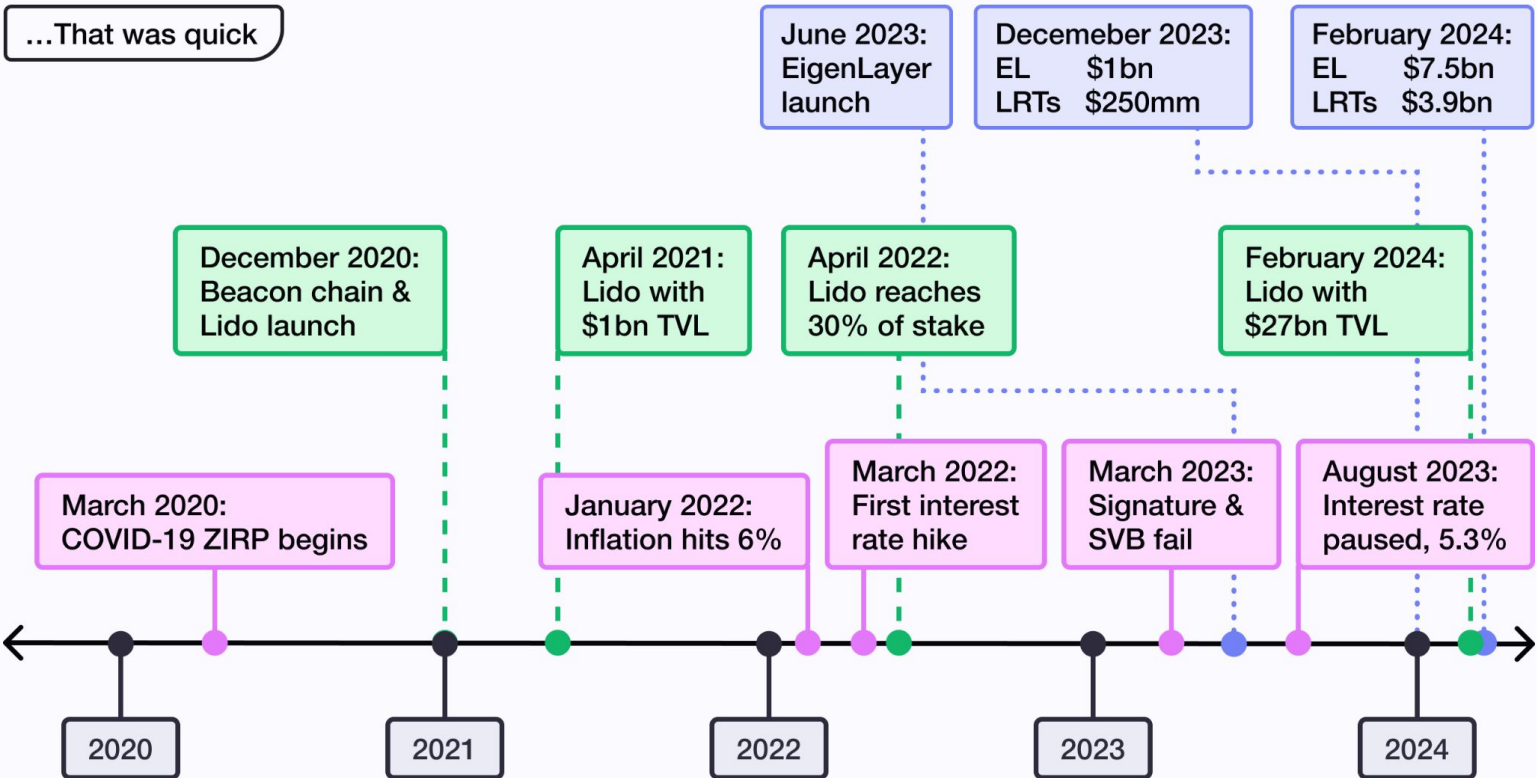
These assets are amongst the most liquid assets in DeFi on many L2s and rollups. User risk depends on their choice(s) of operators.

Liquid Restaking Tokens (LRTs)

One important extra piece that LRTs deal with over LSTs is portfolio selection — and this makes the discussion of LRT risk significantly more difficult.

Recent Important Events

...That was quick



Risk Factor 1: Liquidity and Leverage

Table 1: Non-fungible yielding assets

Attribute	Sovereign bonds	L1 staking positions	AVS restaking positions
<i>Liquidity/Leverage</i>	Illiquid as individual assets, not easy to borrow against		

Table 2: Fungible baskets of non-fungible yielding assets

Attribute	Bond funds	LSTs	LRTs
<i>Liquidity/Leverage</i>	Liquid because of fungibility, easy to borrow against		

Risk Factor 2: Yield

Table 1: Non-fungible yielding assets

Attribute	Sovereign bonds	L1 staking positions	AVS restaking positions
<i>Yield</i>	<u>Source:</u> Sovereign treasury <u>Denomination:</u> Sovereign currency	<u>Source:</u> L1 protocol <u>Denomination:</u> L1 token	<u>Source:</u> AVS protocol <u>Denomination:</u> AVS specified

Table 2: Fungible baskets of non-fungible yielding assets

Attribute	Sovereign bonds	LSTs	LRTs
<i>Yield</i>	<u>Source:</u> Sovereign treasury <u>Denomination:</u> Sovereign currency <u>Aggregation:</u> Many different interest rates	<u>Source:</u> L1 protocol <u>Denomination:</u> L1 token <u>Aggregation:</u> Many different node operators	<u>Source:</u> AVS protocol <u>Denomination:</u> AVS specified <u>Aggregation:</u> Many different AVS's <i>and</i> node operators

Risk Factor 3: Duration

Table 1: Non-fungible yielding assets

Attribute	Sovereign bonds	L1 staking positions	AVS restaking positions
<i>Duration</i>	Fixed maturity	Withdrawal rate limited by the L1 protocol	Withdrawals rate limited by both the AVS <i>and</i> the L1 protocol

Table 2: Fungible baskets of non-fungible yielding assets

Attribute	Bond funds	LSTs	AVS restaking positions
<i>Duration</i>	Many different maturities	Withdrawals rate limited by the LSt protocol <i>and</i> the L1 protocol	Withdrawals rate limited by the LRT protocol <i>and</i> each underlying AVS <i>and</i> the L1 protocol

Risk Factor 4: Default/Slashing Conditions

Table 1: Non-fungible yielding assets

Attribute	Sovereign bonds	L1 staking positions	AVS restaking positions
<i>Default</i>	No fault because the Sovereign controls the money supply	L1 slashing where some or all of principal can be destroyed	Both AVS slashing <i>and</i> L1 slashing where some or all of the principal can be destroyed

Table 2: Fungible baskets of non-fungible yielding assets

Attribute	Bond funds	LSTs	LRTs
<i>Liquidity/Leverage</i>	Liquid because of fungibility, easy to borrow against		
<i>Default</i>	No fault because the Sovereign controls the money supply	L1 slashing where some or all of principal can be destroyed	Both AVS slashing <i>and</i> L1 slashing where some or all of the principal can be destroyed

Risk Factor 5: Portfolio Selection

Table 1: Non-fungible yielding assets

Attribute	Sovereign bonds	L1 staking positions	AVS restaking positions
<i>Portfolio construction</i>	Single asset portfolio		

Table 2: Fungible baskets of non-fungible yielding assets

Attribute	Bond funds	LSTs	LRTs
<i>Portfolio construction</i>	<u>Low complexity</u> , balancing many low risk assets	<u>Medium complexity</u> , choosing L1 node operators and/or collateral ratios	<u>High complexity</u> , choosing AVS's, AVS node operators, different interest denominations, L1 node operators and and/or collateral

Putting it all together

