



# Smart contracts security assessment

Final report

[Tariff: Standard](#)

## Champion Finance

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## Introduction

The report has been prepared for Champion Finance.

The Champion Finance Protocol allows users to farm ShareTokens and MainTokens. The ShareToken is an ERC20-like token with initial distribution for GenesisRewardPool and ShareTokenRewardPool farms. The MainToken is a rebase token and can be farmed in the NodePool contract.

Contracts Treasury and Boardroom allow keeping a stable price of the MainToken using rebase mechanism.

The code is available at the GitHub [repository](#) and was audited after the commit [8b709fcfafc540566084d6daf8c29e63fd78c4ad](#). The contracts' code was updated by the Champion Finance team (commit [4b584f24fc12aad0bc9220fcca6baa60364b0aab](#)) according to this report.

The inspected contracts are: Boardroom.sol, MainToken.sol, ShareToken.sol, Treasury.sol, GenesisRewardPool.sol, NodePool.sol, ShareTokenRewardPool.sol. The inspected contracts (not MainToken and ShareToken) use [upgradeable](#) deployment scheme. Users have to trust the owner, who can change the contracts' logic at their will.

Name	Champion Finance
Audit date	2022-07-11 - 2022-07-20
Language	Solidity
Platform	Avalanche Network

## Contracts checked

Name	Address
ShareToken	0xc65bC1E906771e105fBAcBD8dfE3862Ee7BE378E
MainToken	0x59B18817CA9f4ad2dEE6FBf30132dF6AEb9D763d

ContractGuard  
Boardroom  
Treasury  
GenesisRewardPool  
NodePool  
ShareTokenRewardPool

## Procedure

We perform our audit according to the following procedure:

### Automated analysis

- Scanning the project's smart contracts with several publicly available automated Solidity analysis tools
- Manual verification (reject or confirm) all the issues found by the tools

### Manual audit

- Manually analyze smart contracts for security vulnerabilities
- Smart contracts' logic check

## Known vulnerabilities checked

Title	Check result
<u>Unencrypted Private Data On-Chain</u>	passed
<u>Code With No Effects</u>	passed
<u>Message call with hardcoded gas amount</u>	passed
<u>Typographical Error</u>	passed
<u>DoS With Block Gas Limit</u>	passed

<u>Presence of unused variables</u>	passed
<u>Incorrect Inheritance Order</u>	passed
<u>Requirement Violation</u>	passed
<u>Weak Sources of Randomness from Chain Attributes</u>	passed
<u>Shadowing State Variables</u>	passed
<u>Incorrect Constructor Name</u>	passed
<u>Block values as a proxy for time</u>	passed
<u>Authorization through tx.origin</u>	passed
<u>DoS with Failed Call</u>	passed
<u>Delegatecall to Untrusted Callee</u>	passed
<u>Use of Deprecated Solidity Functions</u>	passed
<u>Assert Violation</u>	passed
<u>State Variable Default Visibility</u>	passed
<u>Reentrancy</u>	passed
<u>Unprotected SELFDESTRUCT Instruction</u>	passed
<u>Unprotected Ether Withdrawal</u>	passed
<u>Unchecked Call Return Value</u>	passed
<u>Floating Pragma</u>	passed
<u>Outdated Compiler Version</u>	passed
<u>Integer Overflow and Underflow</u>	passed
<u>Function Default Visibility</u>	passed

## 🛡️ Classification of issue severity

<b>High severity</b>	High severity issues can cause a significant or full loss of funds, change of contract ownership, major interference with contract logic. Such issues require immediate attention.
<b>Medium severity</b>	Medium severity issues do not pose an immediate risk, but can be detrimental to the client's reputation if exploited. Medium severity issues may lead to a contract failure and can be fixed by modifying the contract state or redeployment. Such issues require attention.
<b>Low severity</b>	Low severity issues do not cause significant destruction to the contract's functionality. Such issues are recommended to be taken into consideration.

## 🛡️ Issues

### High severity issues

#### 1. Reentrancy - FIXED (ContractGuard)

In the current version, the `onlyOneBlock()` modifier does not fully protect the contract from a reentrancy attack.

```
modifier onlyOneBlock() {
    require(!checkSameOriginReentranted(), "ContractGuard: one block, one function");
    require(!checkSameSenderReentranted(), "ContractGuard: one block, one function");

    _;

    _status[block.number][tx.origin] = true;
    _status[block.number][msg.sender] = true;
}
```

**Recommendation:** We recommend replacing function execution at the end of modifier `onlyOneBlock()` in the following way:

```
modifier onlyOneBlock() {
    require(!checkSameOriginReentranted(), "ContractGuard: one block, one function");
    require(!checkSameSenderReentranted(), "ContractGuard: one block, one function");

    _status[block.number][tx.origin] = true;
    _status[block.number][msg.sender] = true;

    _;
}
```

It will prevent re-reentrancy attacks in other contracts.

## 2. The issue of centralization - FIXED (Treasury)

The function `allocateSeigniorage()` calls the `_updatePrice()` function inside. And the `_updatePrice()` function is restricted by the `onlyOperator` modifier:

```
function allocateSeigniorage() external onlyOneBlock checkCondition checkEpoch checkOperator {
    _updatePrice();
    ...
}

function _updatePrice() internal onlyOperator {
    try IOracle(oracle).update() {} catch {
        revert("Treasury: failed to update price from the oracle");
    }
}
```

Only the `allocateSeigniorage()` function allows changing the `epoch`, which is important for contract `Boardroom`.

If the private key of the operator (owner) of the **Treasury** contract is lost (or the operator is gone), then the users who staked the tokens in the **Boardroom** contract will not be able to withdraw them until the epoch is changed.

**Recommendation:** Restrictions on calling function `_updatePrice()` by ordinary users should be removed.

### 3. Changing oracle - FIXED (Treasury)

The contract operator can change the implementation of the oracle using the `setOracle()` function. This can lead to a completely different calculation of the weighted token price.

```
function setOracle(address _oracle) external onlyOperator {  
    oracle = _oracle;  
}
```

**Recommendation:** Restrict operator (owner) ability to change oracle contract address.

### 4. Possible locked rewards - FIXED (GenesisRewardPool)

Rewards can become partially locked if new pools are added after the `poolStartTime` timestamp without calling the `massUpdatePools()` function inside the `add()` function.

**Recommendation:** We recommend using a hard-coded flag `_withUpdate = true` inside the `add()` function.

### 5. Possible locked rewards - FIXED (NodePool)

Rewards can become partially locked if new pools are added after the `poolStartTime` timestamp without calling `massUpdatePools()` function inside the `add()` function.

**Recommendation:** We recommend using a hard-coded flag `_withUpdate = true` inside the `add()` function.



## 6. Possible locked rewards - FIXED (ShareTokenRewardPool)

Rewards can become partially locked if new pools are added after the `poolStartTime` timestamp without calling the `massUpdatePools()` function inside the `add()` function.

**Recommendation:** We recommend using hard-coded flag `_withUpdate = true` inside the `add()` function.

## 7. Unreachable dev reward - FIXED (ShareTokenRewardPool)

The variable `_daoFundReward` must be replaced with `_devFundReward` in L292.

**Recommendation:** We recommend fixing this typo, otherwise, dev funds will be locked.

## Medium severity issues

### 1. Block gas limit in rebase - FIXED (MainToken)

The `maxExclusion` variable allows excluding from rebase up to 50000 address.

The `rebase()` function calls the functions `_burnExcludedAccountTokens()`, `_mintExcludedAccountTokens()` which update arrays of 50000 elements in a loop. Since the block gas limit is about 8M gas in the Avalanche C-chain, the call of the function `rebase()` with 50000 excluded addresses will fail.

**Recommendation:** Reduce the limit of addresses that can be excluded from rebasing.

### 2. Reentrancy problem - FIXED (GenesisRewardPool)

Reentrancy is possible if the pool's token address refers to an ERC20 token with transfer hooks. In that case, any user can claim a reward multiple times as `user.rewardDebt` is updated after the token transfer.

**Recommendation:** The contract owner must avoid adding pools with non-standard staking tokens.

### 3. Reentrancy problem - FIXED (NodePool)

Reentrancy is possible if the pool's token address refers to an ERC20 token with transfer hooks. In that case, any user can claim a reward multiple times as `user.rewardDebt` is updated after the token transfer.

**Recommendation:** The contract owner must avoid adding pools with non-standard staking tokens.

### 4. Reentrancy problem - FIXED (ShareTokenRewardPool)

Reentrancy is possible if the pool's token address refers to an ERC20 token with transfer hooks. In that case, any user can claim a reward multiple times as `user.rewardDebt` is updated after the token transfer.

**Recommendation:** The contract owner must avoid adding pools with non-standard staking tokens.

## Low severity issues

### 1. Gas optimization - FIXED (ShareToken)

The library `SafeMath` is never used in the contract and can be removed to save gas on deployment.

### 2. Function call order (ShareToken)

The Treasury contract is expected to be the ShareToken operator. But the Treasury contract hasn't the functionality to call the `distributeReward()` function. Thus, the `distributeReward()` function must be called before the transfer of operator rights.

**Recommendation:** Consider replacing the call of the `distributeReward()` function into the contract constructor.

### 3. Typos - FIXED (MainToken)

Typos in the code impair its readability:- 'FUNTION' in L219, L327.

#### 4. Unprotected mint by the owner - FIXED (MainToken)

The owner of the contract has the ability to change the operator of the contract to a controlled address at any time. Thus, the owner will be able to mint an unlimited number of tokens. It can lead to an unfair tokenomic.

**Recommendation:** It is important to restrict the owner's (operator's) right to mint tokens, e.g. by transferring ownership to a Timelock contract.

#### 5. Few events - FIXED (MainToken)

Many functions from the contract lack events:

1. `_transferOperator()`
2. `disableRebase()`
3. `enableRebase()`

#### 6. Gas optimization - FIXED (MainToken)

1. The library `SafeMath8` is never used in the contract and can be removed to save gas on deployment.
2. The state variable `MAX_UINT256` is never used and can be removed to save gas on deployment.
3. The value of the `excluded.length` in L153, L166, L182, L208 can be stored in the local variable to save gas.
4. Visibility of the functions `__Upgradeable_Init()`, `operator()`, `isOperator()`, `transferOperator()`, `grantRebaseExclusion()` can be declared as `'external'` to save gas.

#### 7. Lack of validation - FIXED (Boardroom)

We recommend adding non-zero validation for address parameters of the `initialize()` function.

#### 8. Few events - FIXED (Boardroom)

Most contract functions do not emit events. Consider adding events to the governance functions.

## 9. Double initialization (Boardroom)

The order of the contract initialization can be broken in the following way.

1. Deployer calls the `initialize()` function and changes the flag `initialized` to the 'true' value.
2. Deployer (or an arbitrary user) calls the `__Upgradeable_Init()` function and it changes the flag `initialized` back to the 'false' value.
3. Now any user has the ability to call the `initialize()` function again with other arguments (other token addresses).

**Recommendation:** It is necessary to rigidly fix the stages of the contract initialization.

## 10. Gas optimization - PARTIALLY FIXED (Boardroom)

1. Values `lastSnapshotIndex` and `epochTimerStart` of the `Memberseat` structure can be cast to `uint128` type and packed into one slot to save gas.
2. Visibility of the functions `__Upgradeable_Init()`, `initialize()`, `rewardPerShare()` can be declared as 'external' to save gas.

## 11. Few events - FIXED (Treasury)

Most contract functions do not emit events. Consider adding events to the 'setter' functions.

## 12. Lack of validation - FIXED (Treasury)

We recommend adding validation for parameters of the `initialize()` function.

## 13. Double initialization (Treasury)

The order of the contract initialization can be broken in the following way.

1. Deployer calls the `initialize()` function and it changes the flag `initialized` to the 'true' value.

2. Deployer calls the `__Upgradeable_Init()` function and it changes the flag `initialized` back to the `false` value.
3. Now any user has the ability to call the `initialize()` function again with other arguments (other token addresses).

**Recommendation:** It is necessary to rigidly fix the stages of contract initialization.

#### 14. Gas optimization - FIXED (Treasury)

1. Using the `if` statements in L279, L284, L296, L304 are redundant because the `daoFundSharedPercent`, `devFundSharedPercent` variables are constant and more than zero.
2. The variable `lastRebaseTimestampSec` is never used and can be removed.
3. Visibility of the functions `__Upgradeable_Init()`, `initialize()`, `isInitialized()`, `getTwapPrice()`, `getEstimatedReward()` can be declared as `external` to save gas.
4. The functionality of the `getMainTokenCirculatingSupply()` function is similar to the `MainToken.rebaseSupply()` function. Using a direct call to `MainToken.rebaseSupply()` will allow saving gas.
5. We recommend using `require` instead of `assert` statements. This will save gas on execution and make it easier to track errors.

#### 15. Gas optimization - FIXED (GenesisRewardPool)

1. Visibility of the functions `__Upgradeable_Init()`, `deposit()`, `withdraw()` can be declared as `external` to save gas.
2. The variables `TOTAL_REWARDS`, `TOTAL_USER_REWARDS`, `DAO_FUND_REWARDS` are never used and can be removed.

## 16. Lack of validation - FIXED (GenesisRewardPool)

We recommend adding non-zero validation for address parameters of the `__Upgradeable_Init()` function.

## 17. Pending rewards in view function - FIXED (GenesisRewardPool)

The `deposit()` and `withdraw()` functions take part of the reward (`airdropTip`) for the `airdropWallet` (L243, L285). But the `pending()` function doesn't take this into account. Thus, this will lead to the fact that users expected one number of rewards, but received another.

**Recommendation:** We recommend matching the function `pending()` with functions `deposit()` and `withdraw()`.

## 18. Lack of validation - FIXED (NodePool)

We recommend adding validation for parameters of the functions `__Upgradeable_Init()`, `add()`.

## 19. Gas optimization - FIXED (NodePool)

1. Visibility of the functions `__Upgradeable_Init()`, `set()`, `deposit()`, `getMainTokenCirculatingSupply()`, `withdraw()` can be declared as 'external' to save gas.
2. The variables `TOTAL_USER_REWARDS`, `DAO_FUND_REWARDS`, `DAO_FUND_REWARDS` are never used and can be removed.
3. The structures `UserTicket` and `DevFundInfo` are never used and can be removed.
4. The functionality of the `getMainTokenCirculatingSupply()` function is similar to `MainToken.rebaseSupply()` function. Using a direct call to `MainToken.rebaseSupply()` will allow saving gas.

## 20. Typos - FIXED (ShareTokenRewardPool)

There is a typo in the code comment in L62: there should be '650000' instead of '700000'.

## 21. Lack of validation - FIXED (ShareTokenRewardPool)

We recommend adding validation for parameters of the functions `__Upgradeable_Init()`, `add()`.

## 22. Gas optimization - FIXED (ShareTokenRewardPool)

1. Visibility of the functions `__Upgradeable_Init()`, `set()`, `deposit()`, `withdraw()` can be declared as `'external'` to save gas.

2. The variables `TOTAL_USER_REWARDS`, `DAO_FUND_REWARDS`, `DEV_FUND_REWARDS` are never used and can be removed.

## Conclusion

Champion Finance ShareToken, MainToken, ContractGuard, Boardroom, Treasury, GenesisRewardPool, NodePool, ShareTokenRewardPool contracts were audited. 7 high, 4 medium, 22 low severity issues were found.

According to this report 7 high, 4 medium, 19 low issues were fixed by the Champion Finance team.

Most of the contracts are upgradeable (not MainToken and ShareToken), they're going to be deployed via proxies. Users interacting with the contracts have to trust the owner. [MainToken](#) and [ShareToken](#) contract's ownership was renounced.



## Disclaimer

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This report should not be used in any way to make decisions around investment or involvement with any particular project. This report in no way provides investment advice, nor should be leveraged as investment advice of any sort. This report represents an extensive assessing process intending to help our customers increase the quality of their code while reducing the high level of risk presented by cryptographic tokens and blockchain technology.

## Slither output

Treasury.\_sendToBoardroom(uint256) (Treasury.sol#291-317) ignores return value by  
 mainTokenErc20.transfer(daoFund,\_daoFundSharedAmount) (Treasury.sol#299)  
 Treasury.\_sendToBoardroom(uint256) (Treasury.sol#291-317) ignores return value by  
 mainTokenErc20.transfer(devFund,\_devFundSharedAmount) (Treasury.sol#307)  
 EmergencyWithdraw.emergencyWithdrawTokenBalance(address,address,uint256) (utils/  
 EmergencyWithdraw.sol#45-52) ignores return value by erc20.transfer(\_to,\_amount) (utils/  
 EmergencyWithdraw.sol#51)  
 Reference: <https://github.com/crytic/slither/wiki/Detector-Documentation#unchecked-transfer>

NodePool.pendingShare(uint256,address) (distribution/NodePool.sol#204-236) performs a  
 multiplication on the result of a division:  
 -\_shareTokenReward = \_generatedReward.mul(pool.allocPoint).div(totalAllocPoint)  
 (distribution/NodePool.sol#219-221)

-accShareTokenPerShare =  
 accShareTokenPerShare.add(\_shareTokenReward.mul(1e18).div(totalTokenStaked))  
 (distribution/NodePool.sol#224-226)

NodePool.updatePool(uint256) (distribution/NodePool.sol#247-280) performs a  
 multiplication on the result of a division:

-\_shareTokenReward = \_generatedReward.mul(pool.allocPoint).div(totalAllocPoint)  
 (distribution/NodePool.sol#271-273)

-pool.accShareTokenPerShare =  
 pool.accShareTokenPerShare.add(\_shareTokenReward.mul(1e18).div(totalTokenStaked))  
 (distribution/NodePool.sol#275-277)

GenesisRewardPool.pending(uint256,address) (distribution/GenesisRewardPool.sol#165-180)  
 performs a multiplication on the result of a division:

-\_mainTokenReward = \_generatedReward.mul(pool.allocPoint).div(totalAllocPoint)  
 (distribution/GenesisRewardPool.sol#172)

-accMainTokenPerShare =  
 accMainTokenPerShare.add(\_mainTokenReward.mul(1e18).div(tokenSupply)) (distribution/  
 GenesisRewardPool.sol#173)

GenesisRewardPool.updatePool(uint256) (distribution/GenesisRewardPool.sol#208-228)  
 performs a multiplication on the result of a division:

-\_mainTokenReward = \_generatedReward.mul(pool.allocPoint).div(totalAllocPoint)  
 (distribution/GenesisRewardPool.sol#224)

-pool.accMainTokenPerShare =  
 pool.accMainTokenPerShare.add(\_mainTokenReward.mul(1e18).div(tokenSupply))

```
(distribution/GenesisRewardPool.sol#225)
```

Treasury.getEstimatedReward() (Treasury.sol#270-289) performs a multiplication on the result of a division:

```
-estimatedReward = mainTokenTotalSupply.mul(percentage).div(10000)
```

```
(Treasury.sol#276)
```

```
-_daoFundSharedAmount = estimatedReward.mul(daoFundSharedPercent).div(100)
```

```
(Treasury.sol#280)
```

Treasury.getEstimatedReward() (Treasury.sol#270-289) performs a multiplication on the result of a division:

```
-estimatedReward = mainTokenTotalSupply.mul(percentage).div(10000)
```

```
(Treasury.sol#276)
```

```
-_devFundSharedAmount = estimatedReward.mul(devFundSharedPercent).div(100)
```

```
(Treasury.sol#285)
```

Treasury.computeSupplyDelta() (Treasury.sol#385-398) performs a multiplication on the result of a division:

```
-rebasePercentage = rate.sub(targetRate).mul(ONE).div(targetRate)
```

```
(Treasury.sol#394)
```

```
-supplyDelta =
```

```
mathRound(getMainTokenCirculatingSupply().mul(rebasePercentage).div(ONE))
```

```
(Treasury.sol#397)
```

Treasury.mathRound(uint256) (Treasury.sol#400-408) performs a multiplication on the result of a division:

```
-valueFloor = _value.div(midpointRounding).mul(midpointRounding)
```

```
(Treasury.sol#401)
```

```
ShareTokenRewardPool.pendingShare(uint256,address) (distribution/
```

ShareTokenRewardPool.sol#171-187) performs a multiplication on the result of a division:

```
-_shareTokenReward = _generatedReward.mul(pool.allocPoint).div(totalAllocPoint)
```

```
(distribution/ShareTokenRewardPool.sol#178)
```

```
-accShareTokenPerShare =
```

```
accShareTokenPerShare.add(_shareTokenReward.mul(1e18).div(tokenSupply)) (distribution/ShareTokenRewardPool.sol#179)
```

```
ShareTokenRewardPool.updatePool(uint256) (distribution/
```

ShareTokenRewardPool.sol#232-252) performs a multiplication on the result of a division:

```
-_shareTokenReward = _generatedReward.mul(pool.allocPoint).div(totalAllocPoint)
```

```
(distribution/ShareTokenRewardPool.sol#248)
```

```
-pool.accShareTokenPerShare =
```

```
pool.accShareTokenPerShare.add(_shareTokenReward.mul(1e18).div(tokenSupply))
```

```
(distribution/ShareTokenRewardPool.sol#249)
```

Reference: <https://github.com/crytic/slither/wiki/Detector-Documentation#divide-before-multiply>

NodePool.checkPoolDuplicate(IERC20Upgradeable,uint256) (distribution/NodePool.sol#109-115) uses a dangerous strict equality:

- isPoolDuplicate = poolInfo[pid].lockTime == \_lockTime && poolInfo[pid].token == \_token (distribution/NodePool.sol#112)

GenesisRewardPool.updatePool(uint256) (distribution/GenesisRewardPool.sol#208-228) uses a dangerous strict equality:

- tokenSupply == 0 (distribution/GenesisRewardPool.sol#214)

ShareTokenRewardPool.updatePool(uint256) (distribution/

ShareTokenRewardPool.sol#232-252) uses a dangerous strict equality:

- tokenSupply == 0 (distribution/ShareTokenRewardPool.sol#238)

Reference: <https://github.com/crytic/slither/wiki/Detector-Documentation#dangerous-strict-equalities>

Reentrancy in Treasury.\_rebase(uint256) (Treasury.sol#410-428):

External calls:

- newTotalSupply = IMainToken(mainToken).rebase(epoch,supplyDelta,negative)

(Treasury.sol#422)

State variables written after the call(s):

- previousEpoch = epoch (Treasury.sol#424)

Reentrancy in Treasury.initialize(address,address,address,address,uint256)

(Treasury.sol#174-202):

External calls:

- IMainToken(mainToken).grantRebaseExclusion(address(this)) (Treasury.sol#195)

- IMainToken(mainToken).grantRebaseExclusion(address(boardroom))

(Treasury.sol#196)

State variables written after the call(s):

- initialized = true (Treasury.sol#198)

Reference: <https://github.com/crytic/slither/wiki/Detector-Documentation#reentrancy-vulnerabilities-1>

Treasury.setSupplyTiersEntry(uint8,uint256) (Treasury.sol#225-236) contains a tautology or contradiction:

- require(bool,string)(\_index >= 0,Index has to be higher than 0)

(Treasury.sol#226)

Treasury.setMaxExpansionTiersEntry(uint8,uint256) (Treasury.sol#238-244) contains a tautology or contradiction:

- require(bool,string)(\_index >= 0,Index has to be higher than 0)

(Treasury.sol#239)

Treasury.calculateMaxSupplyExpansionPercent(uint256) (Treasury.sol#319-333) contains a tautology or contradiction:

- tierId >= 0 (Treasury.sol#325)

Reference: <https://github.com/crytic/slither/wiki/Detector-Documentation#tautology-or-contradiction>

Treasury.getTwapPrice().price (Treasury.sol#165) is a local variable never initialized  
Treasury.getMainTokenPrice().price (Treasury.sol#157) is a local variable never initialized

Treasury.calculateMaxSupplyExpansionPercent(uint256).maxSupplyExpansionPercent (Treasury.sol#320) is a local variable never initialized

Reference: <https://github.com/crytic/slither/wiki/Detector-Documentation#uninitialized-local-variables>

Treasury.getMainTokenPrice() (Treasury.sol#156-162) ignores return value by  
IOracle(oracle).consult(mainToken,1e18) (Treasury.sol#157-161)

Treasury.getTwapPrice() (Treasury.sol#164-170) ignores return value by  
IOracle(oracle).twap(mainToken,1e18) (Treasury.sol#165-169)

Treasury.\_sendToBoardroom(uint256) (Treasury.sol#291-317) ignores return value by  
mainTokenErc20.mint(address(this),\_amount) (Treasury.sol#293)

Treasury.allocateSeigniorage() (Treasury.sol#335-379) ignores return value by  
IMainToken(mainToken).mint(daoFund,\_savedForBoardroom) (Treasury.sol#354)

Reference: <https://github.com/crytic/slither/wiki/Detector-Documentation#unused-return>

Treasury.setOperator(address) (Treasury.sol#204-206) should emit an event for:

- operator = \_operator (Treasury.sol#205)

Treasury.setBoardroom(address) (Treasury.sol#208-210) should emit an event for:

- boardroom = \_boardroom (Treasury.sol#209)

MainToken.\_\_Upgradeable\_Init(string,string) (MainToken.sol#47-57) should emit an event for:

- \_operator = \_msgSender() (MainToken.sol#53)

Boardroom.setOperator(address) (Boardroom.sol#142-144) should emit an event for:

- operator = \_operator (Boardroom.sol#143)

Reference: <https://github.com/crytic/slither/wiki/Detector-Documentation#missing-events-access-control>

NodePool.add(uint256,IERC20Upgradeable,bool,uint256,uint256) (distribution/NodePool.sol#118-160) should emit an event for:

- totalAllocPoint = totalAllocPoint.add(\_allocPoint) (distribution/NodePool.sol#158)

NodePool.set(uint256,uint256) (distribution/NodePool.sol#163-172) should emit an event for:

- totalAllocPoint = totalAllocPoint.sub(pool.allocPoint).add(\_allocPoint)

```
(distribution/NodePool.sol#167-169)
GenesisRewardPool.add(uint256,IERC20Upgradeable,bool,uint256) (distribution/
GenesisRewardPool.sol#107-137) should emit an event for:
    - totalAllocPoint = totalAllocPoint.add(_allocPoint) (distribution/
GenesisRewardPool.sol#135)
GenesisRewardPool.set(uint256,uint256) (distribution/GenesisRewardPool.sol#140-148)
should emit an event for:
    - totalAllocPoint = totalAllocPoint.sub(pool.allocPoint).add(_allocPoint)
(distribution/GenesisRewardPool.sol#144)
ShareTokenRewardPool.add(uint256,IERC20Upgradeable,bool,uint256) (distribution/
ShareTokenRewardPool.sol#104-142) should emit an event for:
    - totalAllocPoint = totalAllocPoint.add(_allocPoint) (distribution/
ShareTokenRewardPool.sol#140)
ShareTokenRewardPool.set(uint256,uint256) (distribution/
ShareTokenRewardPool.sol#145-154) should emit an event for:
    - totalAllocPoint = totalAllocPoint.sub(pool.allocPoint).add(_allocPoint)
(distribution/ShareTokenRewardPool.sol#149-151)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#missing-events-arithmetic
```

```
GenesisRewardPool.__Upgradeable_Init(address,address,uint256)._airdropWallet
(distribution/GenesisRewardPool.sol#80) lacks a zero-check on :
    - airdropWallet = _airdropWallet (distribution/
GenesisRewardPool.sol#90)
Treasury.initialize(address,address,address,address,uint256)._mainToken
(Treasury.sol#175) lacks a zero-check on :
    - mainToken = _mainToken (Treasury.sol#181)
Treasury.initialize(address,address,address,address,uint256)._shareToken
(Treasury.sol#176) lacks a zero-check on :
    - shareToken = _shareToken (Treasury.sol#182)
Treasury.initialize(address,address,address,address,uint256)._oracle (Treasury.sol#177)
lacks a zero-check on :
    - oracle = _oracle (Treasury.sol#183)
Treasury.initialize(address,address,address,address,uint256)._boardroom
(Treasury.sol#178) lacks a zero-check on :
    - boardroom = _boardroom (Treasury.sol#184)
Treasury.setOperator(address)._operator (Treasury.sol#204) lacks a zero-check on :
    - operator = _operator (Treasury.sol#205)
Treasury.setBoardroom(address)._boardroom (Treasury.sol#208) lacks a zero-check on :
    - boardroom = _boardroom (Treasury.sol#209)
Treasury.setOracle(address)._oracle (Treasury.sol#216) lacks a zero-check on :
```

- oracle = \_oracle (Treasury.sol#217)

Boardroom.setOperator(address).\_operator (Boardroom.sol#142) lacks a zero-check on :

- operator = \_operator (Boardroom.sol#143)

ShareTokenRewardPool.\_\_Upgradeable\_Init(address,address,uint256).\_mainToken (distribution/ShareTokenRewardPool.sol#77) lacks a zero-check on :

- mainToken = \_mainToken (distribution/ShareTokenRewardPool.sol#83)

EmergencyWithdraw.emergencyWithdrawEthBalance(address,uint256).\_to (utils/EmergencyWithdraw.sol#28) lacks a zero-check on :

- address(\_to).transfer(\_amount) (utils/EmergencyWithdraw.sol#29)

Reference: <https://github.com/crytic/slither/wiki/Detector-Documentation#missing-zero-address-validation>

NodePool.getMainTokenCirculatingSupply() (distribution/NodePool.sol#356-364) has external calls inside a loop: balanceExcluded =

balanceExcluded.add(mainToken.balanceOf(excludedFromTotalSupply[entryId])) (distribution/NodePool.sol#361)

GenesisRewardPool.updatePool(uint256) (distribution/GenesisRewardPool.sol#208-228) has external calls inside a loop: tokenSupply = pool.token.balanceOf(address(this))

(distribution/GenesisRewardPool.sol#213)

Treasury.getMainTokenCirculatingSupply() (Treasury.sol#259-268) has external calls inside a loop: balanceExcluded =

balanceExcluded.add(mainTokenErc20.balanceOf(excludedFromTotalSupply[entryId])) (Treasury.sol#265)

ShareTokenRewardPool.updatePool(uint256) (distribution/

ShareTokenRewardPool.sol#232-252) has external calls inside a loop: tokenSupply = pool.token.balanceOf(address(this)) (distribution/ShareTokenRewardPool.sol#237)

Reference: <https://github.com/crytic/slither/wiki/Detector-Documentation/#calls-inside-a-loop>

Variable 'Treasury.getMainTokenPrice().price (Treasury.sol#157)' in

Treasury.getMainTokenPrice() (Treasury.sol#156-162) potentially used before declaration: uint256(price) (Treasury.sol#158)

Variable 'Treasury.getTwapPrice().price (Treasury.sol#165)' in Treasury.getTwapPrice() (Treasury.sol#164-170) potentially used before declaration: uint256(price)

(Treasury.sol#166)

Reference: <https://github.com/crytic/slither/wiki/Detector-Documentation#pre-declaration-usage-of-local-variables>

Reentrancy in Treasury.allocateSeigniorage() (Treasury.sol#335-379):

External calls:

- \_updatePrice() (Treasury.sol#336)

- IOracle(oracle).update() (Treasury.sol#254-256)

State variables written after the call(s):

- previousEpochMainPrice = getMainTokenPrice() (Treasury.sol#338)

Reentrancy in Treasury.initialize(address,address,address,address,uint256)

(Treasury.sol#174-202):

External calls:

- IMainToken(mainToken).grantRebaseExclusion(address(this)) (Treasury.sol#195)

- IMainToken(mainToken).grantRebaseExclusion(address(boardroom))

(Treasury.sol#196)

State variables written after the call(s):

- operator = msg.sender (Treasury.sol#199)

Reference: <https://github.com/crytic/slither/wiki/Detector-Documentation#reentrancy-vulnerabilities-2>

Reentrancy in Treasury.\_rebase(uint256) (Treasury.sol#410-428):

External calls:

- newTotalSupply = IMainToken(mainToken).rebase(epoch,supplyDelta,negative)

(Treasury.sol#422)

Event emitted after the call(s):

- LogRebase(epoch,supplyDelta,targetRate,\_oldPrice,newTotalSupply,oldTotalSupply,block.timestamp) (Treasury.sol#427)

Reentrancy in Treasury.\_sendToBoardroom(uint256) (Treasury.sol#291-317):

External calls:

- mainTokenErc20.mint(address(this),\_amount) (Treasury.sol#293)

- mainTokenErc20.transfer(daoFund,\_daoFundSharedAmount) (Treasury.sol#299)

Event emitted after the call(s):

- DaoFundFunded(block.timestamp,\_daoFundSharedAmount) (Treasury.sol#300)

Reentrancy in Treasury.\_sendToBoardroom(uint256) (Treasury.sol#291-317):

External calls:

- mainTokenErc20.mint(address(this),\_amount) (Treasury.sol#293)

- mainTokenErc20.transfer(daoFund,\_daoFundSharedAmount) (Treasury.sol#299)

- mainTokenErc20.transfer(devFund,\_devFundSharedAmount) (Treasury.sol#307)

Event emitted after the call(s):

- DevFundFunded(block.timestamp,\_devFundSharedAmount) (Treasury.sol#308)

Reentrancy in Treasury.\_sendToBoardroom(uint256) (Treasury.sol#291-317):

External calls:

- mainTokenErc20.mint(address(this),\_amount) (Treasury.sol#293)

- mainTokenErc20.transfer(daoFund,\_daoFundSharedAmount) (Treasury.sol#299)

- mainTokenErc20.transfer(devFund,\_devFundSharedAmount) (Treasury.sol#307)

- IERC20Upgradeable(mainToken).safeApprove(boardroom,0) (Treasury.sol#313)

- IERC20Upgradeable(mainToken).safeApprove(boardroom,\_amount)

(Treasury.sol#314)



```

- IBoardroom(boardroom).allocateSeigniorage(_amount) (Treasury.sol#315)
Event emitted after the call(s):
- BoardroomFunded(block.timestamp,_amount) (Treasury.sol#316)
Reentrancy in Boardroom.allocateSeigniorage(uint256) (Boardroom.sol#231-244):
  External calls:
  - mainToken.safeTransferFrom(msg.sender,address(this),amount)
(Boardroom.sol#242)
  Event emitted after the call(s):
  - RewardAdded(msg.sender,amount) (Boardroom.sol#243)
Reentrancy in Boardroom.claimReward() (Boardroom.sol#220-229):
  External calls:
  - mainToken.safeTransfer(msg.sender,reward) (Boardroom.sol#226)
  Event emitted after the call(s):
  - RewardPaid(msg.sender,reward) (Boardroom.sol#227)
Reentrancy in Treasury.initialize(address,address,address,address,uint256)
(Treasury.sol#174-202):
  External calls:
  - IMainToken(mainToken).grantRebaseExclusion(address(this)) (Treasury.sol#195)
  - IMainToken(mainToken).grantRebaseExclusion(address(boardroom))
(Treasury.sol#196)
  Event emitted after the call(s):
  - Initialized(msg.sender,block.number) (Treasury.sol#201)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#reentrancy-
vulnerabilities-3

NodePool.__Upgradeable_Init(address,address,uint256) (distribution/NodePool.sol#88-102)
uses timestamp for comparisons
  Dangerous comparisons:
  - require(bool,string)(block.timestamp < _poolStartTime,late) (distribution/
NodePool.sol#93)
NodePool.checkPoolDuplicate(IERC20Upgradeable,uint256) (distribution/
NodePool.sol#109-115) uses timestamp for comparisons
  Dangerous comparisons:
  - pid < length (distribution/NodePool.sol#111)
  - isPoolDuplicate = poolInfo[pid].lockTime == _lockTime && poolInfo[pid].token
== _token (distribution/NodePool.sol#112)
  - require(bool,string)(! isPoolDuplicate,NodePool is existed) (distribution/
NodePool.sol#113)
NodePool.add(uint256,IERC20Upgradeable,bool,uint256,uint256) (distribution/
NodePool.sol#118-160) uses timestamp for comparisons
  Dangerous comparisons:

```

```

- block.timestamp < poolStartTime (distribution/NodePool.sol#129)
- _lastRewardTime == 0 (distribution/NodePool.sol#131)
- _lastRewardTime < poolStartTime (distribution/NodePool.sol#134)
- _lastRewardTime == 0 || _lastRewardTime < block.timestamp (distribution/
NodePool.sol#140)
- _isStarted = (_lastRewardTime <= poolStartTime) || (_lastRewardTime <=
block.timestamp) (distribution/NodePool.sol#144-145)
NodePool.getGeneratedReward(uint256,uint256) (distribution/NodePool.sol#175-201) uses
timestamp for comparisons
    Dangerous comparisons:
    - _fromTime >= _toTime (distribution/NodePool.sol#180)
    - _toTime >= poolEndTime (distribution/NodePool.sol#182)
    - _toTime <= poolStartTime (distribution/NodePool.sol#192)
NodePool.pendingShare(uint256,address) (distribution/NodePool.sol#204-236) uses
timestamp for comparisons
    Dangerous comparisons:
    - block.timestamp > pool.lastRewardTime && totalTokenStaked != 0 (distribution/
NodePool.sol#213)
NodePool.updatePool(uint256) (distribution/NodePool.sol#247-280) uses timestamp for
comparisons
    Dangerous comparisons:
    - block.timestamp <= pool.lastRewardTime (distribution/NodePool.sol#249)
NodePool.pendingDaoFund(uint256,uint256,address) (distribution/NodePool.sol#282-297)
uses timestamp for comparisons
    Dangerous comparisons:
    - _fromTime >= _toTime (distribution/NodePool.sol#284)
    - _toTime >= poolEndTime (distribution/NodePool.sol#285)
    - _toTime <= poolStartTime (distribution/NodePool.sol#290)
NodePool.pendingDevFund(uint256,uint256,address) (distribution/NodePool.sol#299-314)
uses timestamp for comparisons
    Dangerous comparisons:
    - _fromTime >= _toTime (distribution/NodePool.sol#301)
    - _toTime >= poolEndTime (distribution/NodePool.sol#302)
    - _toTime <= poolStartTime (distribution/NodePool.sol#307)
NodePool.deposit(uint256,uint256) (distribution/NodePool.sol#317-354) uses timestamp
for comparisons
    Dangerous comparisons:
    - timeDeposit < poolStartTime (distribution/NodePool.sol#328)
NodePool.withdraw(uint256,uint256) (distribution/NodePool.sol#382-428) uses timestamp
for comparisons
    Dangerous comparisons:

```

```

- require(bool,string)(user.amount >= _amount,withdraw: not good) (distribution/
NodePool.sol#386)
- timeWithdraw < poolStartTime (distribution/NodePool.sol#390)
- _daoFundReward > 0 (distribution/NodePool.sol#396)
- _devFundReward > 0 (distribution/NodePool.sol#402)
- require(bool,string)(duringTime > pool.lockTime,Not enough time to claim
reward) (distribution/NodePool.sol#411)
- require(bool,string)(duringTime_scope_0 > pool.lockTime,Not enough time to
withdraw) (distribution/NodePool.sol#418)
NodePool.safeShareTokenTransfer(address,uint256) (distribution/NodePool.sol#431-440)
uses timestamp for comparisons
    Dangerous comparisons:
    - _amount > _shareTokenBalance (distribution/NodePool.sol#434)
GenesisRewardPool.__Upgradeable_Init(address,address,uint256) (distribution/
GenesisRewardPool.sol#78-92) uses timestamp for comparisons
    Dangerous comparisons:
    - require(bool,string)(block.timestamp < _poolStartTime,late) (distribution/
GenesisRewardPool.sol#83)
GenesisRewardPool.checkPoolDuplicate(IERC20Upgradeable) (distribution/
GenesisRewardPool.sol#99-104) uses timestamp for comparisons
    Dangerous comparisons:
    - pid < length (distribution/GenesisRewardPool.sol#101)
    - require(bool,string)(poolInfo[pid].token != _token,GenesisPool: existing
pool?) (distribution/GenesisRewardPool.sol#102)
GenesisRewardPool.add(uint256,IERC20Upgradeable,bool,uint256) (distribution/
GenesisRewardPool.sol#107-137) uses timestamp for comparisons
    Dangerous comparisons:
    - block.timestamp < poolStartTime (distribution/GenesisRewardPool.sol#117)
    - _lastRewardTime == 0 (distribution/GenesisRewardPool.sol#119)
    - _lastRewardTime < poolStartTime (distribution/GenesisRewardPool.sol#122)
    - _lastRewardTime == 0 || _lastRewardTime < block.timestamp (distribution/
GenesisRewardPool.sol#128)
    - _isStarted = (_lastRewardTime <= poolStartTime) || (_lastRewardTime <=
block.timestamp) (distribution/GenesisRewardPool.sol#132)
GenesisRewardPool.getGeneratedReward(uint256,uint256) (distribution/
GenesisRewardPool.sol#151-162) uses timestamp for comparisons
    Dangerous comparisons:
    - _fromTime >= _toTime (distribution/GenesisRewardPool.sol#152)
    - _toTime >= poolEndTime (distribution/GenesisRewardPool.sol#153)
    - _toTime <= poolStartTime (distribution/GenesisRewardPool.sol#158)
GenesisRewardPool.pending(uint256,address) (distribution/GenesisRewardPool.sol#165-180)

```

uses timestamp for comparisons

Dangerous comparisons:

- block.timestamp > pool.lastRewardTime && tokenSupply != 0 (distribution/

GenesisRewardPool.sol#170)

GenesisRewardPool.pendingDaoFund(uint256,uint256,address) (distribution/

GenesisRewardPool.sol#182-197) uses timestamp for comparisons

Dangerous comparisons:

- \_fromTime >= \_toTime (distribution/GenesisRewardPool.sol#184)
- \_toTime >= poolEndTime (distribution/GenesisRewardPool.sol#185)
- \_toTime <= poolStartTime (distribution/GenesisRewardPool.sol#190)

GenesisRewardPool.updatePool(uint256) (distribution/GenesisRewardPool.sol#208-228) uses timestamp for comparisons

Dangerous comparisons:

- block.timestamp <= pool.lastRewardTime (distribution/

GenesisRewardPool.sol#210)

GenesisRewardPool.withdraw(uint256,uint256) (distribution/

GenesisRewardPool.sol#260-298) uses timestamp for comparisons

Dangerous comparisons:

- \_daoFundReward > 0 (distribution/GenesisRewardPool.sol#270)
- \_reward > 0 (distribution/GenesisRewardPool.sol#279)
- airdropTip > 0 (distribution/GenesisRewardPool.sol#281)
- userReward > 0 (distribution/GenesisRewardPool.sol#286)

GenesisRewardPool.safeMainTokenTransfer(address,uint256) (distribution/

GenesisRewardPool.sol#301-310) uses timestamp for comparisons

Dangerous comparisons:

- \_amount > \_mainTokenBalance (distribution/GenesisRewardPool.sol#304)

ShareTokenRewardPool.\_\_Upgradeable\_Init(address,address,uint256) (distribution/

ShareTokenRewardPool.sol#75-89) uses timestamp for comparisons

Dangerous comparisons:

- require(bool,string)(block.timestamp < \_poolStartTime,late) (distribution/

ShareTokenRewardPool.sol#80)

ShareTokenRewardPool.checkPoolDuplicate(IERC20Upgradeable) (distribution/

ShareTokenRewardPool.sol#96-101) uses timestamp for comparisons

Dangerous comparisons:

- pid < length (distribution/ShareTokenRewardPool.sol#98)
- require(bool,string)(poolInfo[pid].token != \_token,ShareTokenRewardPool:

existing pool?) (distribution/ShareTokenRewardPool.sol#99)

ShareTokenRewardPool.add(uint256,IERC20Upgradeable,bool,uint256) (distribution/

ShareTokenRewardPool.sol#104-142) uses timestamp for comparisons

Dangerous comparisons:

- block.timestamp < poolStartTime (distribution/ShareTokenRewardPool.sol#114)

```

- _lastRewardTime == 0 (distribution/ShareTokenRewardPool.sol#116)
- _lastRewardTime < poolStartTime (distribution/ShareTokenRewardPool.sol#119)
- _lastRewardTime == 0 || _lastRewardTime < block.timestamp (distribution/
ShareTokenRewardPool.sol#125)
- _isStarted = (_lastRewardTime <= poolStartTime) || (_lastRewardTime <=
block.timestamp) (distribution/ShareTokenRewardPool.sol#129-131)
ShareTokenRewardPool.getGeneratedReward(uint256,uint256) (distribution/
ShareTokenRewardPool.sol#157-168) uses timestamp for comparisons
    Dangerous comparisons:
- _fromTime >= _toTime (distribution/ShareTokenRewardPool.sol#158)
- _toTime >= poolEndTime (distribution/ShareTokenRewardPool.sol#159)
- _toTime <= poolStartTime (distribution/ShareTokenRewardPool.sol#164)
ShareTokenRewardPool.pendingShare(uint256,address) (distribution/
ShareTokenRewardPool.sol#171-187) uses timestamp for comparisons
    Dangerous comparisons:
- block.timestamp > pool.lastRewardTime && tokenSupply != 0 (distribution/
ShareTokenRewardPool.sol#176)
ShareTokenRewardPool.pendingDaoFund(uint256,uint256,address) (distribution/
ShareTokenRewardPool.sol#189-204) uses timestamp for comparisons
    Dangerous comparisons:
- _fromTime >= _toTime (distribution/ShareTokenRewardPool.sol#191)
- _toTime >= poolEndTime (distribution/ShareTokenRewardPool.sol#192)
- _toTime <= poolStartTime (distribution/ShareTokenRewardPool.sol#197)
ShareTokenRewardPool.pendingDevFund(uint256,uint256,address) (distribution/
ShareTokenRewardPool.sol#206-221) uses timestamp for comparisons
    Dangerous comparisons:
- _fromTime >= _toTime (distribution/ShareTokenRewardPool.sol#208)
- _toTime >= poolEndTime (distribution/ShareTokenRewardPool.sol#209)
- _toTime <= poolStartTime (distribution/ShareTokenRewardPool.sol#214)
ShareTokenRewardPool.updatePool(uint256) (distribution/
ShareTokenRewardPool.sol#232-252) uses timestamp for comparisons
    Dangerous comparisons:
- block.timestamp <= pool.lastRewardTime (distribution/
ShareTokenRewardPool.sol#234)
ShareTokenRewardPool.withdraw(uint256,uint256) (distribution/
ShareTokenRewardPool.sol#276-313) uses timestamp for comparisons
    Dangerous comparisons:
- _daoFundReward > 0 (distribution/ShareTokenRewardPool.sol#287)
- _devFundReward > 0 (distribution/ShareTokenRewardPool.sol#292)
- _reward > 0 (distribution/ShareTokenRewardPool.sol#302)
ShareTokenRewardPool.safeShareTokenTransfer(address,uint256) (distribution/

```

ShareTokenRewardPool.sol#316-325) uses timestamp for comparisons

Dangerous comparisons:

- `_amount > _shareTokenBalance` (distribution/ShareTokenRewardPool.sol#319)

Reference: <https://github.com/crytic/slither/wiki/Detector-Documentation#block-timestamp>

NodePool.updatePool(uint256) (distribution/NodePool.sol#247-280) has costly operations inside a loop:

- `totalAllocPoint = totalAllocPoint.add(pool.allocPoint)` (distribution/NodePool.sol#261)

GenesisRewardPool.updatePool(uint256) (distribution/GenesisRewardPool.sol#208-228) has costly operations inside a loop:

- `totalAllocPoint = totalAllocPoint.add(pool.allocPoint)` (distribution/GenesisRewardPool.sol#220)

MainToken.revokeRebaseExclusion(address) (MainToken.sol#205-217) has costly operations inside a loop:

- `excluded.pop()` (MainToken.sol#212)

ShareTokenRewardPool.updatePool(uint256) (distribution/

ShareTokenRewardPool.sol#232-252) has costly operations inside a loop:

- `totalAllocPoint = totalAllocPoint.add(pool.allocPoint)` (distribution/ShareTokenRewardPool.sol#244)

Reference: <https://github.com/crytic/slither/wiki/Detector-Documentation#costly-operations-inside-a-loop>

Pragma version0.8.13 (distribution/NodePool.sol#3) necessitates a version too recent to be trusted. Consider deploying with 0.6.12/0.7.6/0.8.7

Pragma version0.8.13 (distribution/GenesisRewardPool.sol#3) necessitates a version too recent to be trusted. Consider deploying with 0.6.12/0.7.6/0.8.7

Pragma version0.8.13 (Treasury.sol#3) necessitates a version too recent to be trusted. Consider deploying with 0.6.12/0.7.6/0.8.7

Pragma version0.8.13 (owner/Operator.sol#3) necessitates a version too recent to be trusted. Consider deploying with 0.6.12/0.7.6/0.8.7

Pragma version0.8.13 (utils/Epoch.sol#3) necessitates a version too recent to be trusted. Consider deploying with 0.6.12/0.7.6/0.8.7

Pragma version0.8.13 (utils/ContractGuard.sol#3) necessitates a version too recent to be trusted. Consider deploying with 0.6.12/0.7.6/0.8.7

Pragma version0.8.13 (ShareToken.sol#3) necessitates a version too recent to be trusted. Consider deploying with 0.6.12/0.7.6/0.8.7

Pragma version0.8.13 (ERC20TokenDecimal6.sol#2) necessitates a version too recent to be trusted. Consider deploying with 0.6.12/0.7.6/0.8.7

Pragma version0.8.13 (MainToken.sol#3) necessitates a version too recent to be trusted.

Consider deploying with 0.6.12/0.7.6/0.8.7

Pragma version0.8.13 (ERC20Token.sol#2) necessitates a version too recent to be trusted. Consider deploying with 0.6.12/0.7.6/0.8.7

Pragma version0.8.13 (Boardroom.sol#3) necessitates a version too recent to be trusted. Consider deploying with 0.6.12/0.7.6/0.8.7

Pragma version0.8.13 (distribution/ShareTokenRewardPool.sol#3) necessitates a version too recent to be trusted. Consider deploying with 0.6.12/0.7.6/0.8.7

Pragma version0.8.13 (utils/EmergencyWithdraw.sol#2) necessitates a version too recent to be trusted. Consider deploying with 0.6.12/0.7.6/0.8.7

solc-0.8.13 is not recommended for deployment

Reference: <https://github.com/crytic/slither/wiki/Detector-Documentation#incorrect-versions-of-solidity>

Variable NodePool.lastDaoFundRewardTime (distribution/NodePool.sol#74) is too similar to NodePool.lastDevFundRewardTime (distribution/NodePool.sol#77)

Variable NodePool.shareTokenPerSecondForDaoFund (distribution/NodePool.sol#73) is too similar to NodePool.shareTokenPerSecondForDevFund (distribution/NodePool.sol#76)

Variable GenesisRewardPool.TOTAL\_REWARD\_POOL\_0\_NEXT\_PHASE (distribution/GenesisRewardPool.sol#58) is too similar to

GenesisRewardPool.TOTAL\_REWARD\_POOL\_1\_NEXT\_PHASE (distribution/GenesisRewardPool.sol#57)

Variable GenesisRewardPool.TOTAL\_REWARD\_POOL\_0\_NEXT\_PHASE (distribution/GenesisRewardPool.sol#58) is too similar to

GenesisRewardPool.TOTAL\_REWARD\_POOL\_2\_NEXT\_PHASE (distribution/GenesisRewardPool.sol#56)

Variable GenesisRewardPool.TOTAL\_REWARD\_POOL\_1\_NEXT\_PHASE (distribution/GenesisRewardPool.sol#57) is too similar to

GenesisRewardPool.TOTAL\_REWARD\_POOL\_2\_NEXT\_PHASE (distribution/GenesisRewardPool.sol#56)

Variable Treasury.maxPercentExpansionTier (Treasury.sol#77) is too similar to Treasury.minPercentExpansionTier (Treasury.sol#76)

Variable ShareTokenRewardPool.lastDaoFundRewardTime (distribution/ShareTokenRewardPool.sol#66) is too similar to

ShareTokenRewardPool.lastDevFundRewardTime (distribution/ShareTokenRewardPool.sol#69)

Variable ShareTokenRewardPool.shareTokenPerSecondForDaoFund (distribution/ShareTokenRewardPool.sol#65) is too similar to

ShareTokenRewardPool.shareTokenPerSecondForDevFund (distribution/ShareTokenRewardPool.sol#68)

Reference: <https://github.com/crytic/slither/wiki/Detector-Documentation#variable-names-are-too-similar>





```

isInitialized() should be declared external:
    - Treasury.isInitialized() (Treasury.sol#146-148)
getTwapPrice() should be declared external:
    - Treasury.getTwapPrice() (Treasury.sol#164-170)
initialize(address,address,address,address,uint256) should be declared external:
    - Treasury.initialize(address,address,address,address,uint256)
(Treasury.sol#174-202)
getEstimatedReward() should be declared external:
    - Treasury.getEstimatedReward() (Treasury.sol#270-289)
isOperator() should be declared external:
    - Operator.isOperator() (owner/Operator.sol#27-29)
transferOperator(address) should be declared external:
    - Operator.transferOperator(address) (owner/Operator.sol#31-33)
getCurrentEpoch() should be declared external:
    - Epoch.getCurrentEpoch() (utils/Epoch.sol#57-59)
getPeriod() should be declared external:
    - Epoch.getPeriod() (utils/Epoch.sol#61-63)
getStartTime() should be declared external:
    - Epoch.getStartTime() (utils/Epoch.sol#65-67)
getLastEpochTime() should be declared external:
    - Epoch.getLastEpochTime() (utils/Epoch.sol#69-71)
__Upgradeable_Init(string,string) should be declared external:
    - MainToken.__Upgradeable_Init(string,string) (MainToken.sol#47-57)
operator() should be declared external:
    - MainToken.operator() (MainToken.sol#59-61)
isOperator() should be declared external:
    - MainToken.isOperator() (MainToken.sol#68-70)
transferOperator(address) should be declared external:
    - MainToken.transferOperator(address) (MainToken.sol#72-74)
grantRebaseExclusion(address) should be declared external:
    - MainToken.grantRebaseExclusion(address) (MainToken.sol#192-199)
__Upgradeable_Init() should be declared external:
    - Boardroom.__Upgradeable_Init() (Boardroom.sol#117-119)
initialize(IERC20Upgradeable,IERC20Upgradeable,ITreasury) should be declared external:
    - Boardroom.initialize(IERC20Upgradeable,IERC20Upgradeable,ITreasury)
(Boardroom.sol#122-140)
rewardPerShare() should be declared external:
    - Boardroom.rewardPerShare() (Boardroom.sol#188-190)
__Upgradeable_Init(address,address,uint256) should be declared external:
    - ShareTokenRewardPool.__Upgradeable_Init(address,address,uint256)
(distribution/ShareTokenRewardPool.sol#75-89)

```

set(uint256,uint256) should be declared external:

- ShareTokenRewardPool.set(uint256,uint256) (distribution/  
ShareTokenRewardPool.sol#145-154)

deposit(uint256,uint256) should be declared external:

- ShareTokenRewardPool.deposit(uint256,uint256) (distribution/  
ShareTokenRewardPool.sol#255-273)

withdraw(uint256,uint256) should be declared external:

- ShareTokenRewardPool.withdraw(uint256,uint256) (distribution/  
ShareTokenRewardPool.sol#276-313)

Reference: <https://github.com/crytic/slither/wiki/Detector-Documentation#public-function-that-could-be-declared-external>



 Guard