

Axis-Finance

SMART CONTRACT AUDIT REPORT



Prepared by:
BlockAudit

Date Of Enrollment:
April 6th, 2023 - April 14th, 2023

Visit : www.blockaudit.report



TABLE OF CONTENTS

INTRODUCTION	2-3
• Summary	2
• Overview	3
FINDINGS	4-10
• Finding Overview	4
• AXFD01	5
• AXFD02	6
• AXFD03	7
• AXFM01	8
• AXFP02	9
• AXFF01	10
• AXFS01	11
APPENDIX	12
DISCLAIMER	14
ABOUT	16





SUMMARY

This Audit Report mainly focuses on the extensive security of **Axis-Finance** Smart Contracts. With this report, we attempt to ensure the reliability and correctness of the smart contract by complete and rigorous assessment of the system's architecture and the smart contract codebase.

The auditing process pays special attention to the following considerations:

- Testing the smart contracts against both common and uncommon attack vectors.
- Assessing the codebase to ensure compliance with current best practices and industry standards.
- Ensuring contract logic meets the specifications and intentions of the client.
- Cross referencing contract structure and implementation against similar smart contracts produced by industry leaders.
- Thorough line-by-line manual review of the entire codebase by industry experts.

The security assessment resulted in findings that ranged from critical to informational. We recommend addressing these findings to ensure a high level of security standards and industry practices. We suggest recommendations that could better serve the project from the security perspective:

- Enhance general coding practices for better structures of source codes;
- Add enough unit tests to cover the possible use cases;
- Provide more comments per each function for readability, especially contracts that are verified in public;
- Provide more transparency on privileged activities once the protocol is live.



OVERVIEW

Project Summary

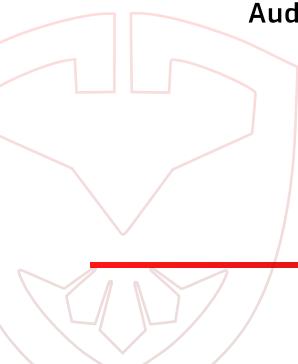
Project Name	Axis-Finance
Logo	
Language	Solidity

File Summary

ID	File Name
AXFD	FXFF0-DexLock.sol
AXFL	FXFRO-LBPCreation.sol
AXFM	FXFT0-MockERC20.sol
AXFP	FXFT0-PresaleRaise.sol
AXFF	FXFT0-PresaleRaiseFactory.sol
AXFS	FXFT0-Staking.sol

Audit Summary

Date of Delivery	11 APRIL 2023
Audit Methodology	Code Analysis. Automatic Assessment, Manual Review
Audit Result	Passed ✓
Audit Team	BlockAudit Report Team





FINDINGS

■ Critical	0	0.0%
■ High	2	28.5%
■ Medium	0	0.0%
■ Low	2	28.5%
■ Informational	3	42.00%
■ Ownership	0	0.0%



Vulnerability Findings Summary

ID	Type	Line	Severity	Status
AXFD01	Uninitialized state variables	14	■ High	Resolved ✓
AXFD02	Reentrancy	26-47 / 49-58	■ High	Resolved ✓
AXFD03	Public function that could be declared external	30 / 53	■ Informational	Resolved ✓
AXFM01	Public function that could be declared external	14 / 18	■ Informational	Resolved ✓
AXFP02	Reentrancy	118-187 / 215-226	■ High	Resolved ✓
AXFF01	Missing zero address validation	56-59 / 81 / 85	■ Low	Resolved ✓
AXFS01	Public function that could be declared external	57 / 70 / 87 / 121 / 154 / 194 / 200 / 207 / 214	■ Informational	Resolved ✓



AXFD01

Type	Uninitialized state variables
Severity	■ High Severity
File	DexLock.sol
Line	14
Status	Resolved ✓

Description

Owner is declared and never initialized. As a result, it takes zero address, therefore, withdrawLock(uint256, address, address) cannot be called.

Remediation

Initialize all the variables. If a variable is meant to be initialized to zero, explicitly set it to zero to improve code readability.

Snapshot

```
address public owner;
```



AXFD02

Type	Reentrancy
Severity	■ High Severity
File	DexLock.sol
Line	26-47 / 49-58
Status	Resolved ✓

Description

The functions below performs state variable changes or events emissions after external calls, making it a potential target for a reentrancy attack if the inputs are malicious contracts.

Remediation

Update all bookkeeping state variables and events emissions before transferring execution to an external contract or use Openzeppelin's ReentrancyGuard.

Snapshot

```
function depositLock(
    uint256 amount,
    address tokenAddress,
    address _for
) public {
    // TODO: What ? store some metadata for the lock
    // lock start time

    // should be Presale or LFBO sale
    // require(
    //     msg.sender == owner || msg.sender == clanFactory,
    //     "Unauthorized"
    // );

    IERC20(tokenAddress).transferFrom(msg.sender, address(this), amount);

    lockedFor[tokenAddress][amount] = _for;

    emit TransferFrom(msg.sender, address(this), amount, tokenAddress);
    totalERC20TokensLocked += 1;
    emit totalERC20TokensLockedUpdated(totalERC20TokensLocked);
}

function withdrawLock(
    uint256 amount,
    address tokenAddress,
    address recipient
) public {
    require(msg.sender == owner, "Unauthorized");

    IERC20(tokenAddress).transferFrom(address(this), recipient, amount);
    emit TransferFrom(address(this), recipient, amount, tokenAddress);
}
```



AXFD03

Type	Public function that could be declared external
Severity	■ Informational
File	DexLock.sol
Line	30 / 53
Status	Resolved ✓

Description

Public functions that are never called by the contract should be declared external, and its immutable parameters should be located in calldata to save gas.

Remediation

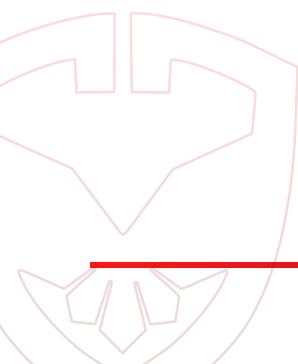
Use the external attribute for functions never called from the contract, and change the location of immutable parameters to calldata to save gas.

Snapshot

```
function depositLock(
    uint256 amount,
    address tokenAddress,
    address _for
) public {
}

function withdrawLock( ...
) public {
    require(msg.sender == owner, "Unauthorized");

    IERC20(tokenAddress).transferFrom(address(this), recipient, amount);
    emit TransferFrom(address(this), recipient, amount, tokenAddress);
}
```





AXFM01

Type	Public function that could be declared external
Severity	■ Informational
File	MockERC20.sol
Line	14 / 18
Status	Resolved ✓

Description

Public functions that are never called by the contract should be declared external, and its immutable parameters should be located in calldata to save gas.

Remediation

Use the external attribute for functions never called from the contract, and change the location of immutable parameters to calldata to save gas.

Snapshot

```
function mint(address account, uint256 amount) public onlyOwner {
|   _mint(account, amount);
}

function burn(uint256 amount) public {
|   _burn(msg.sender, amount);
}
```



AXFP01

Type	Reentrancy
Severity	■ High
File	PresaleRaise.sol
Line	118-187 / 215-226
Status	Resolved ✓

Description

The functions below performs state variable changes or events emissions after external calls, making it a potential target for a reentrancy attack if the inputs are malicious contracts.

Remediation

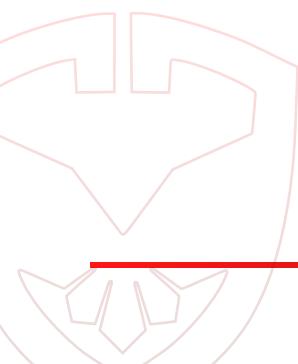
Update all bookkeeping state variables and events emissions before transferring execution to an external contract or use Openzeppelin's ReentrancyGuard.

Snapshot

```
function triggerTGEandDexList(uint256 dexVersion, bool burnSurplus) public { ... }

function withdrawUnusedTokens() public {
    require(msg.sender == creator, "Only creator can claim");
    require(triggerTGE, "TGE not triggered");
    require(block.timestamp > endTime, "Presale is still active");
    require((hardCap * presaleRate)/10 ** 18 - totalBoughtTokens + refundTgeToken > 0, "No tokens to claim");

    IERC20(tokenAddress).transfer(
        msg.sender,
        (hardCap * presaleRate)/10 ** 18 - totalBoughtTokens + refundTgeToken
    );
    refundTgeToken = 0;
}
```





AXFF01

Type	Missing zero address validation
Severity	■ Low
File	PresaleRaiseFactory.sol
Line	56-59 / 81 / 85
Status	Resolved ✓

Description

The function below does not check if inputs are zero addresses. So if Bob inputs zero addresses, funds can be lost.

Remediation

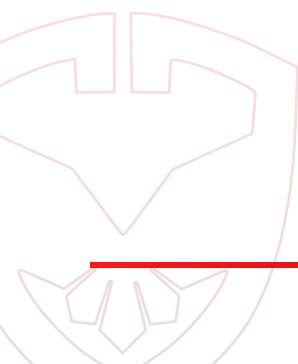
Check for zero address validation

Snapshot

```
constructor(address _implementation, address _proxyAdmin, address _uniswapUtilsAddress) {
    implementation = _implementation;
    proxyAdmin = _proxyAdmin;
    uniswapUtilsAddress = _uniswapUtilsAddress;
}

function setAxisOwner(address _axisOwner) public onlyOwner {
    axisOwner = _axisOwner;
}

function setAxisStaking(address _axisStaking) public onlyOwner {
    axisStaking = _axisStaking;
}
```





AXFS01

Type	Public function that could be declared external
Severity	■ Informational
File	Staking.sol
Line	57 / 70 / 87 / 121 / 154 / 194 / 200 / 207 / 214
Status	Resolved ✓

Description

Public functions that are never called by the contract should be declared external, and its immutable parameters should be located in calldata to save gas.

Remediation

Use the `external` attribute for functions never called from the contract, and change the location of immutable parameters to calldata to save gas.



APPENDIX

Auditing Approach and Methodologies applied

The Block Audit Report team has performed rigorous testing of the project including the analysis of the code design patterns where we reviewed the smart contract architecture to ensure it is structured along with the safe use of standard inherited contracts and libraries. Our team also conducted a formal line by line inspection of the Smart Contract i.e., a manual review, to find potential issues including but not limited to

- Race conditions
- Zero race conditions approval attacks
- Re-entrancy
- Transaction-ordering dependence
- Timestamp dependence
- Check-effects-interaction pattern (optimistic accounting)
- Decentralized denial-of-service attacks
- Secure ether transfer pattern
- Guard check pattern
- Fail-safe mode
- Gas-limits and infinite loops
- Call Stack depth

In the Unit testing Phase, we coded/conducted custom unit tests written against each function in the contract to verify the claimed functionality from our client. In Automated Testing, we tested the Smart Contract with our standard set of multifunctional tools to identify vulnerabilities and security flaws. The code was tested in collaboration of our multiple team members and this included but not limited to;

- Testing the functionality of the Smart Contract to determine proper logic has been followed throughout the whole process.
- Analyzing the complexity of the code in depth and in detail line-by-line manual review of the code.
- Deploying the code on testnet using multiple clients to run live tests.
- Analyzing failure preparations to check how the Smart Contract performs in case of any bugs and vulnerabilities.
- Checking whether all the libraries used in the code are on the latest version.
- Analyzing the security of the on-chain data.



Issue Categories:

Every issue in this report was assigned a severity level from the following:

Critical Severity Issues

Issues of Critical Severity leaves smart contracts vulnerable to major exploits and can lead to asset loss and data loss. These can have significant impact on the functionality/performance of the smart contract.

We recommend these issues must be fixed before proceeding to MainNet..

High Severity Issues

Issues of High Severity are not as easy to exploit but they might endanger the execution of the smart contract and potentially create crucial problems.

Fixing these issues is highly recommended before proceeding to MainNet.

Medium Severity Issues

Issues on this level are not a major cause of vulnerability to the smart contract, they cannot lead to data-manipulations or asset loss but may affect functionality.

It is important to fix these issues before proceeding to MainNet.

Low Severity Issues

Issues at this level are very low in their impact on the overall functionality and execution of the smart contract. These are mostly code-level violations or improper formatting.

These issues can be remain unfixed or can be fixed at a later date if the code is redeployed or forked.

Informational Findings

These are finding that our team comes accross when manually reviewing a smart contract which are important to know for the owners as well as users of a contract.

These issues must be acknowledged by the owners before we publish our report.

Ownership Privileges

Owner of a smart contract can include certain rights and privileges while deploying a smart contract that might be hidden deep inside the codebase and may make the project vulnerable to rug-pulls or other types of scams.

We at BlockAudit believe in transparency and hence we showcase Ownership privileges separately so the owner as well as the investors can get a better understanding about the project.

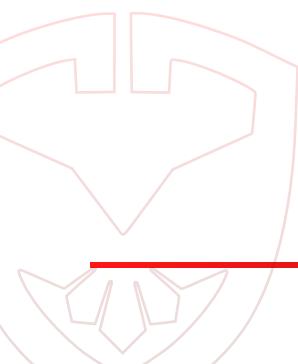


DISCLAIMER

This is a limited report on our findings based on our analysis, in accordance with good industry practice as at the date of this report, in relation to cybersecurity vulnerabilities and issues in the framework and algorithms based on smart contracts, the details of which are set out in this report. In order to get a full view of our analysis, it is crucial for the client to read the full report. While we have done our best in conducting our analysis and producing this report, it is important to note that the client should not rely on this report and cannot claim against us on the basis of what it says or doesn't say, or how we produced it, and it is important for the client to conduct the client's own independent investigations before making any decisions. We go into more detail on this in the below disclaimer below – please make sure to read it in full.

By reading this report or any part of it, the client agrees to the terms of this disclaimer. If the client does not agree to the terms, then please immediately cease reading this report, and delete and destroy any/all copies of this report downloaded and/or printed by the client. This report is provided for information purposes only and stays on a non-reliance basis, and does not constitute investment advice. No one/NONE shall have any rights to rely on the report or its contents, and BlockAudit and its affiliates (including holding companies, shareholders, subsidiaries, employees, directors, officers and other representatives).

(BlockAudit) owes no duty of care towards the client or any other person, nor does BlockAudit claim any warranty or representation to any person on the accuracy or completeness of the report. The report is provided "as is", without any conditions, warranties or other terms of any kind except as set out in this disclaimer, and BlockAudit hereby excludes all representations, warranties, conditions and other terms (including, without limitation, the warranties implied by law of satisfactory quality, fitness for purpose and the use of reasonable care and skill) which, but for this clause, might have effects in relation to the report.

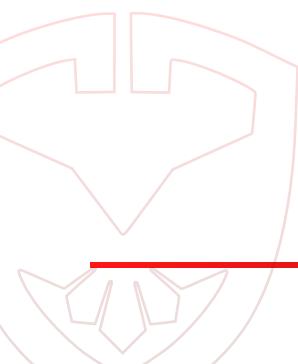




Except and only to the extent that it is prohibited by law, BlockAudit hereby excludes all liability and responsibility, and neither the client nor any other person shall have any claim against BlockAudit, for any amount or kind of loss or damage that may result to the client or any other person (including without limitation, any direct, indirect, special, punitive, consequential or pure economic loss or damages, or any loss of income, profits, goodwill, data, contracts, use of money, or business interruption, and whether in delict, tort (including without limitation negligence), contract, breach of statutory duty, misrepresentation (whether innocent or negligent) or otherwise under any claim of any nature whatsoever in any jurisdiction) in any way arising from or connected with this report and the use, inability to use or the results of use of this report, and any reliance on this report.

The analysis of the security is purely based on the received smart contracts alone. No related/third-party smart contracts, applications or operations were reviewed for security. No product code has been reviewed.

Note: The statements made in this document should not be interpreted as investment or legal advice, nor should its authors be held accountable for decisions made based on them. Securing smart contracts is a multistep process. One audit cannot be considered enough. We recommend that the **Axis-Finance** team put a bug bounty program in place to encourage further analysis of the smart contracts by other third parties





About BlockAudit

BlockAudit is an industry leading security organisation that helps web3 blockchain based projects with their security and correctness of their smart-contracts. With years of experience we have a dedicated team that is capable of performing audits in a wide variety of languages including HTML, PHP, JS, Node, React, Native, Solidity, Rust and other Web3 frameworks for DApps, DeFi, GameFi and Metaverse platforms.

With a mission to make web3 a safe and secure place BlockAudit is committed to provide it's partners with a budget and investor friendly security Audit Report that will increase the value of their projects significantly.



www.blockaudit.report



team@blockaudit.report



[@BlockAudit](https://twitter.com/BlockAudit)



github.com/Block-Audit-Report

