

## Abstract

CryptoCLASH is a digital board game that aims to highlight the volatilities of online currency and competitive capitalist markets. In Thomas Piketty's book *Capital in the Twenty-First Century*, he illustrates the relationship between markets, capital, and volatility. He notes that as capital becomes concentrated in fewer hands, the stability of markets decreases. While Piketty focuses on global, long-term trends, we noticed a similar pattern in online currency. Bitcoin, the most commonly used digital currency, fluctuates in value at extremely high rates. We believe that Bitcoin could act as a microcosm to educate an audience about volatility in small and large scale markets.

## Research



Bitcoin, a digital cryptocurrency, is high in value but also high in volatility, as the exchange rate can change over \$800 USD in a single month. In short, Bitcoin is maintained by solving, or "mining," a series of cryptographic functions which enable transactions and produce more bitcoins. Anyone can mine and use Bitcoin, and it seeks to solve the problems of current monetary systems through its security, innovation, versatility, and decentralization.

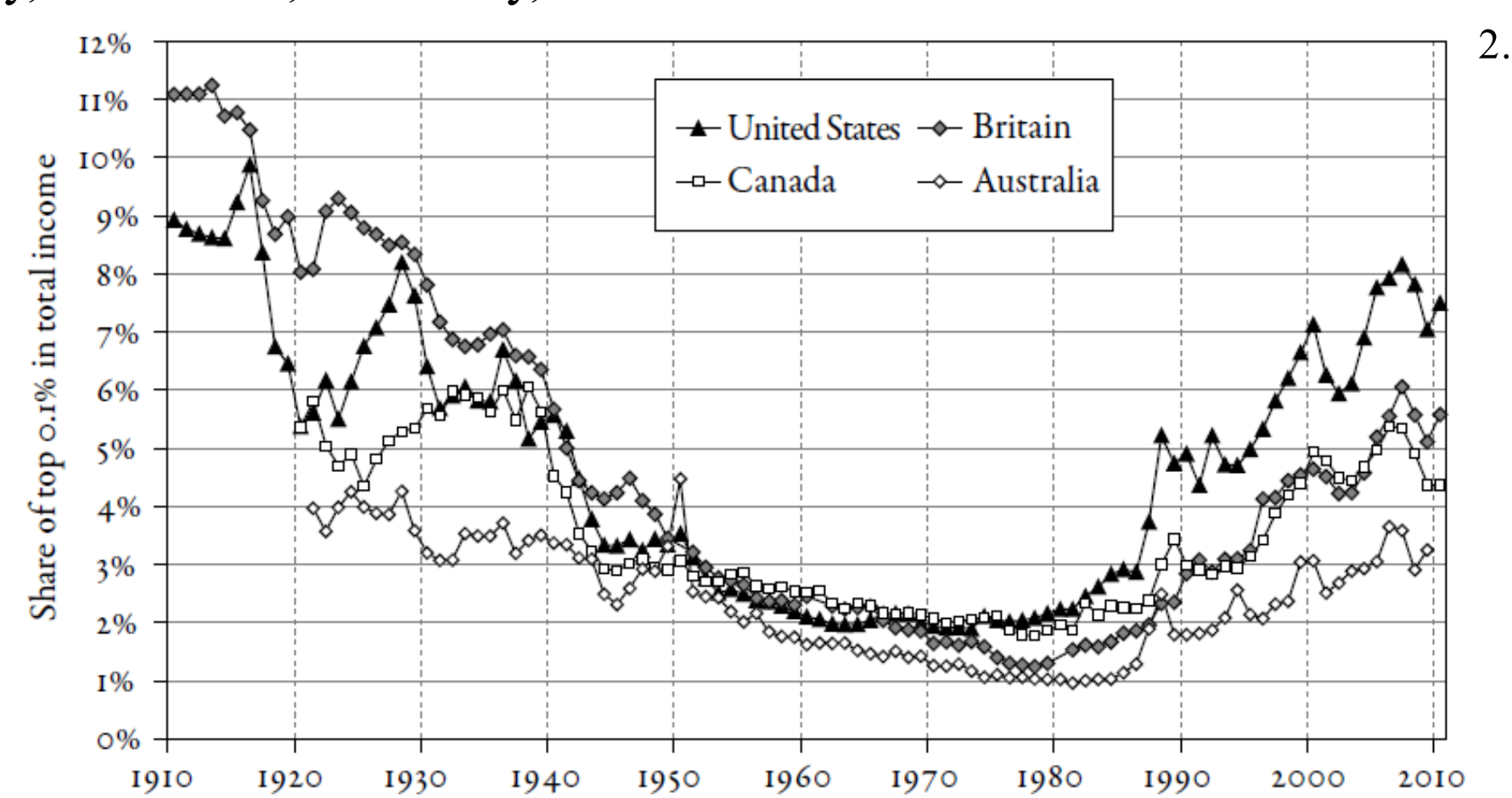


FIGURE 9.5. The top decile income share in Anglo-Saxon countries, 1910–2010

Thomas Piketty's groundbreaking book *Capital in the Twenty-First Century* describe how capital and income inequality have evolved over the past hundred years. While wealth from income and goods fluctuates wildly with the markets, wealth from capital is relatively stable and only harmed in extreme cases. Over time, this capital accumulates in fewer and fewer hands, and inevitably leads to massive income inequality between the top 10% and bottom 90% of people.

Purposes of mechanics in game:

- Claiming of markets simulates competition and acquisition of finite resources
- Randomly generated exchange rate represents volatility of Bitcoin, affects inputs and outputs of Function cards
- Outputs are introduced and generate income in Bitcoins every round
- Capital cards, representing capital, are a permanent, and lucrative, form of wealth
- Volatility cards allow players to directly interfere in other players' progress

## Finalized Game

**OBJECTIVE:** Players, or "entrepreneurs," seek to gain as much wealth as possible through the accumulation of output, capital, and bitcoins. Completion of Function cards are the most straightforward way to gain output and bitcoins, but there are many other ways to undermine your opponents and change the course of the game. The entrepreneur with the most Victory Points at the end of the game is the winner!

**INSTRUCTIONS AND RULES:** The main objective of the game is the completion of Function cards via accumulating bitcoins and inputs (electricity, energy, labor, steel). In return, they give the player rewards in the forms of bitcoins and outputs (stocks, factories, computers). These outputs generate income in the form of bitcoins at the beginning of every round. The Exchange Rate, which is randomly set from 1-6 at the start of each round, also affects the amount of inputs and outputs necessary to complete some Function cards. On any given turn, players "claim" Lucrative Markets in order to facilitate the completion of Function cards, but have many other actions available, such as claiming Market Expansion, creating new markets; claiming Function Markets, acquiring new Function cards; and playing Volatility cards, which allow a player to, among other things, steal other players' inputs and change the Exchange Rate. However, once a market is claimed, no other player can claim that market until the next round when the board is cleared. Capital cards, which are extremely valuable, can also be acquired, but only if a player has enough bitcoins and inputs. Have fun!



### How to Win

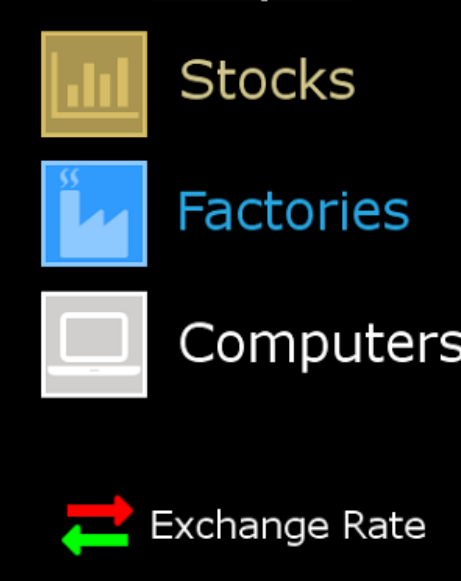
#### Victory Points

The player with the most VPs (victory points) wins! Outputs turn into VPs. Maximize outputs and Bitcoins to gain VPs.

#### Input



#### Output



If you have this, you skip your turn the next round.

### Card Types

#### Market Cards

These cards give you inputs. You can choose to pick one up on your turn.

#### Function Cards

Complete these cards using inputs in order to gain outputs.

#### Volatility Cards

You can't pick these up directly but they help you get inputs and effect other players.

#### Capital Cards

These cards give you VPs! However, you must have at least 30 Bitcoins and 5 of any other type of resource to obtain it.

#### Other Cards

If you have this, you start first on the next round. Choose any type of input to spend or gain.

## Moving Forward

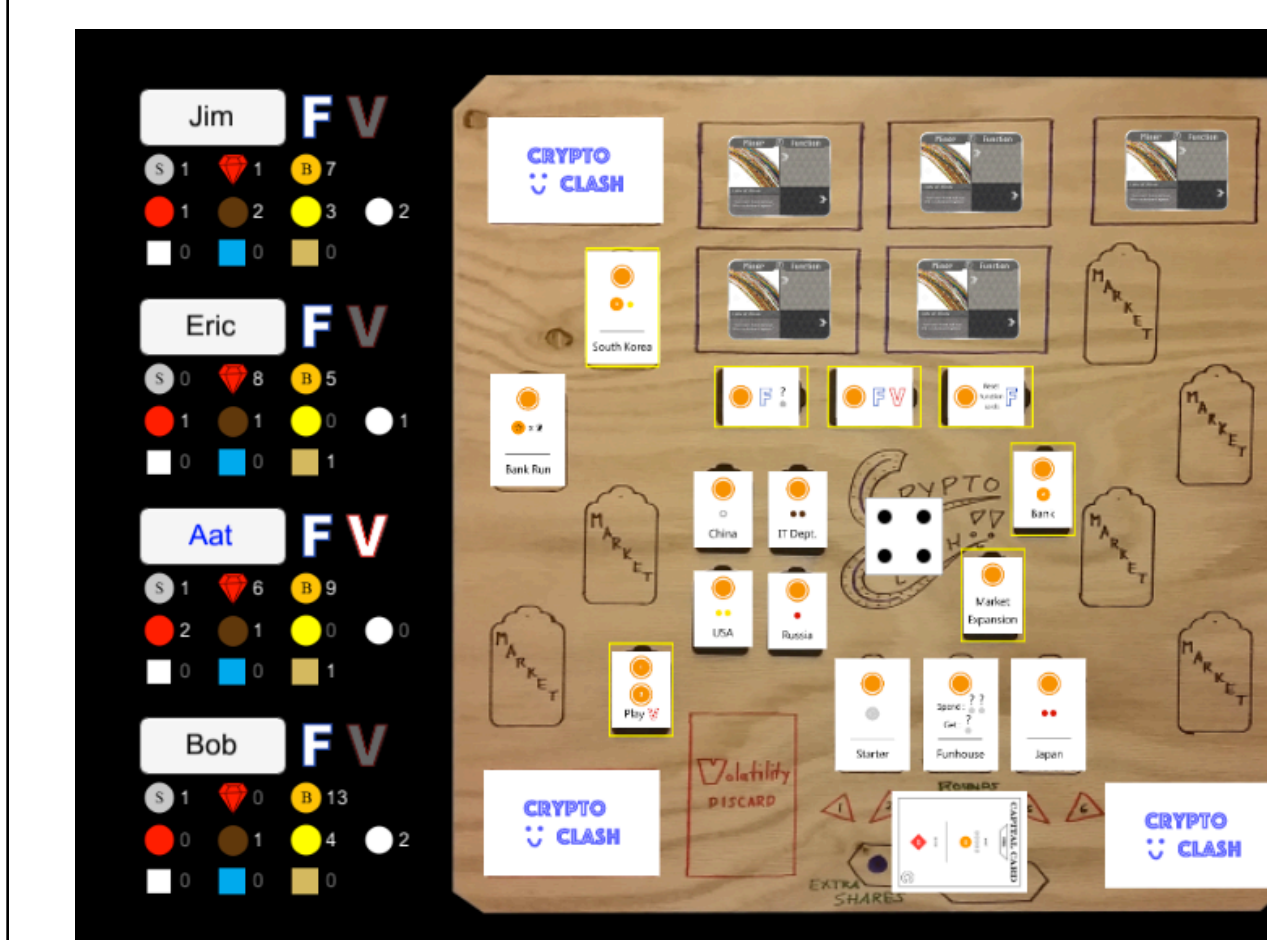
Alex, Marisa, and I are planning on finalizing the Function cards, further play-testing, tweaking user-friendly functionality, and creating a basic tutorial for newcomers to play through at Stony Brook University's Game Programming Competition on May 12<sup>th</sup>. Then, once the semester is over, we will continue working on the educational portion of the game, hopefully including features such as more advanced AI, custom AI playthroughs and evaluations, and game theory applications. We also hope to enter our game into the 2017 Games For Change Festival in NYC which runs from July 31<sup>st</sup> to Aug. 2<sup>nd</sup>.

## Development



CryptoCLASH is based off of the strategy game *Lords of Waterdeep* by Wizards of the East Coast, the game board of which can be seen on the left. Like CryptoCLASH, it is a worker-placement board game but has its roots in Dungeons and Dragons lore. Here, players, or "lords," compete for followers, money, and power in order to gain the most wealth by the end of the game.

To the right is the first iteration of the game constructed for Prof. Anthony Scarlatos's HON 301 final project featuring plywood from Lowe's as the game board and knick-knacks from Michael's as the playing pieces.



The left displays the first digital iteration of the game as coded by Alexander Scarlatos. The entire game is fully functional, but play-testing and a graphics redesign, courtesy of Marisa DePasquale, are still necessary.

Notable changes from *Lords of Waterdeep*:

- Redesign of user interface including board, card types, game pieces, card actions, etc.
- Introduction of Exchange Rate
- Introduction of Capital cards
- Introduction of outputs
- Outputs contribute bitcoins to the player at the beginning of every round

Notable changes from the first physical design:

- Complete overhaul of graphic user interface (GUI)
- "CryptoClash"-type Function cards are increased in difficulty, other Function cards revised
- Creation of permanent Starter market
- Revision of Volatility cards, actions
- Introduction of artificial intelligence (AI) players

## References

1. "Bitcoin Money Supply." Coinbase. Coinbase, 24 Apr. 2017. Web. 24 Apr. 2017.
2. Piketty, Thomas. *Capital in the Twenty-First Century*. Cambridge Massachusetts: The Belknap Press of Harvard U Press, 2014. Print.