

Economic Simulation in Video Games

Student: Alex Jones (lxj18gpr)

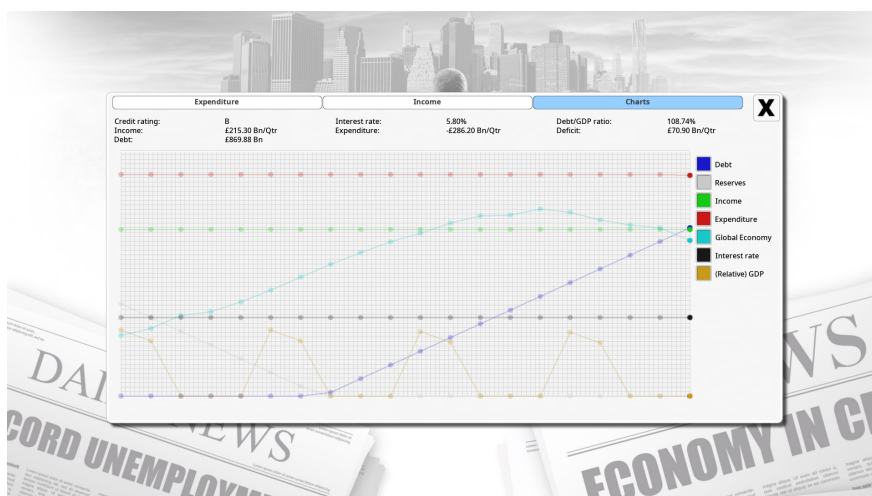
Supervisor: Dr. W. J. Teahan

Background And Motivation

In the last decade a new type of video game is evolving out of the strategy genre. These games place greater emphasis on long-term planning and economic management than the real time strategy games they build on [1]. This new "Grand Strategy" genre typically depicts Empire building with the player controlling a nation state. The player wins the game either by conquering enemy NPC controlled nations or in some cases by some non-militaristic path to supremacy. Most of these games however do not use a realistic economic simulation so there is a gap in the market.



Screenshot of the economy tab from "Europa Universalis IV" a game that allows you to collect taxes and control where they are spent.



Screenshot of the budget screen from "Democracy 3" showing some of the factors that affect their simulated economy.

Aims and Objectives

The aim of this project is to produce a novel economic strategy game.

- Conduct a review of the research of strategy games, and into heuristics that can be used to evaluate them.
- Design a novel video game prototype.
- Implement the design using the Unity game engine.
- Evaluate this game against chosen heuristics as revealed by the literature review.

Related Work

Early Real Time Strategy[2] games use an abstracted representation of an economy.

These either simple use a resources management system or have a static economy.

In these systems the economy is largely predetermined with only the player or one NPC agent making decisions.

Over time more ambitious games have refined the genre which feature more dynamic economies.

These are systems where there is more than one decision maker or agents.

References

- [1] F. Brown, 'The history of the strategy game.' *PC GAMER*, vol. 324-325, 2018
- [2] S. Dor, 'Strategy in games or strategy games: Dictionary and encyclopaedic definitions for game studies,' *Game Studies*, vol. 19,1 2018

A screenshot of a market simulation table from a game. The table is titled 'Redonia' and has columns for Population, RGO, Manufactories, and Market. Below these columns are rows for Food, Iron Ore, and Tools, with sub-columns for Price, Units, and Demand.

| Redonia | | | |
|------------|-------|---------------|--------|
| Population | RGO | Manufactories | Market |
| | Price | Units | Demand |
| Food | 0.01 | 750 | 1010 |
| Iron Ore | 0.01 | 166 | 4 |
| Tools | 0.01 | 4940 | 0 |

Image from an early build and mock up of my solution showing market simulation. Products are produced by business and are put on the market for other business to buy. The price is set by the supply and demand.

My Product

Current strategy video games do not use a realistic economic simulation. The overall aim of this project is to address this gap in the market.

The Product of this project is a strategy video game with a focus on simulation of economies. The player controls a nation on the map and indirectly influences the economy through policies they can enact. The player with the largest economy by the end of the game wins. Each business type is represented by an agent which buys and sells products on a simulated market.

Future Work

The game (once complete) needs an evaluation to determine if players find an "economic strategy game" can be enjoyable.

In future if the game could be further polished and expanded it could be sold as an indie title.