Financial debt levels and it's effect on the economy, business cycles and labour market

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1 Introduction

A debt servicing and efficient management of financial and social aspects of debt levels and its relationship on the business and economic cycles and its effect on the business activities in the global system. International relations are attracting significant attention from schools because technological innovation, production, and management of resources in the community is dominated by international relationships that are affected by increasing interconnectivity and globalization. Human, mercantile, and technology supply chains are extended and fragile to perturbations and external or internal shocks. Extended supply chains refocus attention on coordination and communication in opposition to integration, convergence, and technology development. With access to big data and open source data, it is easier than ever to model and quantify the supply chain and traffic movements and connect this domain with other social, economic, and market data. The most straightforward way to measure debt levels is to observe fixed income levels in some nations, follow government deficits, observe the attractiveness of the labor market, and, of course, watch how central banks control interest rate levels and communication. This environment favors or is inclined toward the financial and economic instrument toward handling relationships, debt levels, and other system entities. Other instruments for deleveraging the incurred debt in some systems would be austerity, restructuring, central bank liquidity creation, wealth transfer, and in the end the organization liquidation or defaults. The economic literature recognizes the different types of movement, such as short- and long-term cycles and productivity trends. Short-term or business cycles are short periodic increases/decreases of economic activities which are associated with the easy capital policy and the tougher capital policy where the capital is relatively tougher to access and is more expensive. Long-term cycles are the cycles that happen only a few times in someone's life, and they are usually called great recessions, characterized by big losses of unemployment, high interest rates and uncertainty. The economic system usually has a dual nature. On the one hand, we have an asset or favor-based economy where the transactions are exchanged and valuation is done over time by following preferences or volume of trade. On the other hand, the monetary system created a

standardized currency which makes transactions easier and faster.

One of the questions which this thesis would like to investigate is how more recent post-2008 quantitative easing policy affects the global debt levels and labour market preferences for corporations and institutions. The government bond yield curves are good indicators of the market's aptitude to take its view toward the future. At the same time, there exist movements or camps in the economy where the strength of the currency is measured by the quality of the connective, social relations, culture, antifragility, resilience and inventiveness.

Data shows that after the Bretton Woods agreement or abandonment of the Golden Standard, almost all nations transitioned from the fixed currency system toward the fiat currency system and there was a massive increase of excess liquidity in the system which didn't find a way to propagate itself toward the radical new inventions. Also, the analytical work would focus more closely on the latest 2008 recession and Corona crisis which had a tremendous impact on the economy and connectivity. The thesis would approach the quantitative analysis of the debt levels in the economical systems. In the foreign markets there exists a shift toward the development and adoption of logic-based formal expert systems which aim to develop the systematic rule of how to think about economic machinery and to enhance system– level thinking.

2 Using intelligence as the support for the game theory entity modeling

Forward looking intelligence cycle is the process where one is concerned with creation of the strategic planning based on the model of the world. This usually involves the collection of data from the real world and from digital world. On the picture below one could see the model of intelligence cycle where the end result is the strategic and game theory plan how would should interact with other agents and instruments.

Forward forecasting pipeline. One can see a few stages from the initial OSINT, and IOT devices to the strategic or game theory plan of how the strategist should act. The facts and data are passed to the Storage layer where they are stored in the databases. Structured data and facts make information with the holes which is then passed to the logic layer. The responsibility of this layer is the transformation of the database model to the logic layer which is implemented by some programming language. In this layer, one should expect to see the extraction and derivation of new knowledge which should fill the missing parts in the previous data assets. Data is further processed in the prediction layer which assigns the data to independent and dependent variables and makes models out of them. After that, there are two approaches to how one could approach the creation of the decision-making strategy. The first one is the creation of the article or report which is then read by the decision maker or decision-making council. The article contains descriptive and recommendation elements of how one should act. Another approach is the automatization

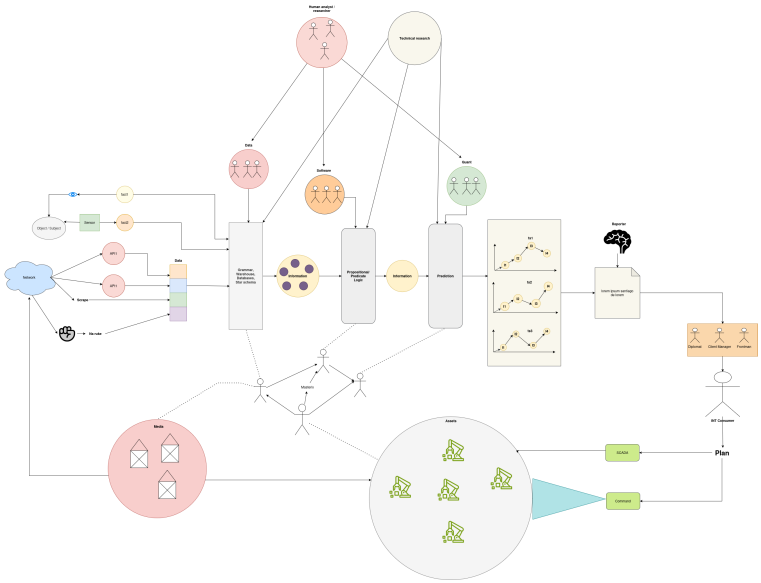

Figure 1: Circular intelligence cycle where one creates interventions based on the reports created from facts and data

of the strategy-making or creation of the Strat layer by issuing the commands that are understood by the targeted system (e.g., the stock exchange trading system, supervisory control and data acquisition system, and verbal orders). The organizational intelligence cycle is also supported by outside or internal organizations, such as human intelligence (HUMINT) processes and technical research, which aim to increase the speed and quality of the INT process.

Intelligence cycle and game theory. Game theory is the field of economics and mathematics which studies the ways in which agents, entities and players are part of some dynamic system where each participant can get the payoff based on the actions and strategic algorithm which he will use in the game. In international relations the entities which one studies are the nation-states, city states, international organizations and institutions, alliances, public and non-public corporations, their subsidiaries and influential individuals/families, intelligence agencies and in recent decades, artificial intelligence agents. The international relation actors are chosen based on their level of direct or indirect influence on the world or state events. For example, corporations are optimization machines which are optimizing their profit margin and they are competing or playing the zero-sum game on some market. In this scenario, the one party gain is another party loss. They are using direct or indirect strategic approaches how to decrease or increase someone's score or payoff. In an international environment, the game type is different and more complicated.

Views of debt. From the perspective of corporations debt is the process of acquiring capital from the alternative and fixed income financing channels. In

classical scenario the public corporations are issuing bonds or they borrowing additional funds because they believe that they posses the operational capability to solve problems and manage the projects. Other strategy is quick profit for the shareholders. Debt is a future obligation to somebody which could be defined by the scenario modelling.

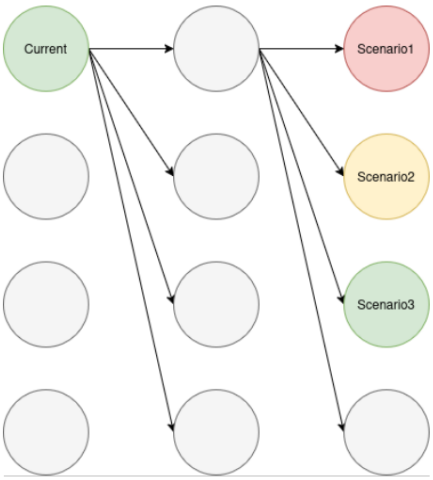

Figure 2: Diagram shows the lattice where we can see future scenarios classified by the criticality level.

In another view, the debt is the difference between the realized outcome and (wanted and capable) outcomes interleaved over some time period T, as shown in the graph below. The accumulation of debt is the situation where the realizations fall into the red or unwanted scenario for some limit L.

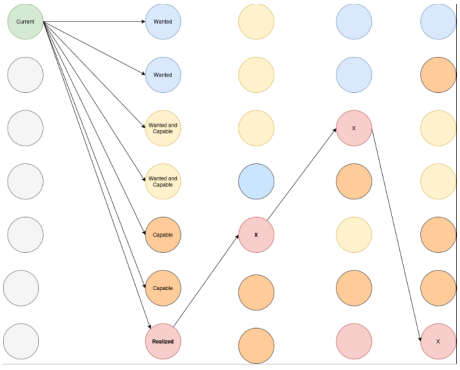

Figure 3: We can see the worst case trajectory where we can see the realizations of the worst case scenarios in every step. In this view debt is difference measure applied to the wanted and capable scenario and worst case scenario.

Game theory and debt. Financial debt is for sure one of the most important criteria for making a decision but it is not the only one. Financial debt is the promise that organizations have to their partners, investors and other organizations and it is expressed in the form of currency which could be national currency or foreign currency. Motivation for issuing new debt is to finance already prepared project plans and strategies which offer some return on investment and estimate financial projections of the project revenue and expenditures. Different actors react differently to how they interpret financial debt and how they react to it. Although there exist other kinds of debts they won't be considered in this thesis.

Digital diplomacy. Digital diplomacy is the concept where the organization presents itself to the masses or to the public. The purpose of presentation can have multiple roles and different natures depending on the context. Different types of organizations have different ways how they present themselves to the public or masses. Public institutions pay more attention to how are they presented to the public and have more sophisticated verbal diplomacy than private sector corporations which tend to favor ambiguous communication. This idea is supported by the style of the web which is usually dynamic, loaded with content and where the message and the mission tend to be obscured and cannot be easily automatically processed, rearranged and stored in the structured databases. Without detailed analysis, the private sector views digital diplomacy and the web as the information gate or door to the internal information cyberspace (e.g pipeline architecture) while public institutions tend to be much more transparent in their work. Both of these approaches have some pros and cons which should be analyzed. These two rough architectural communication styles have a consequence on international relations and the type of visitors which are attracted to them.

3 Data resources

In the following table one can see some important data resources which are generated by institutions and organizations.

Entity	Web	Description
National debt	https://mfin.gov.hr/proracun-86/drzavni-proracun-2025-godina/3816	Croatian national budget.
ECB balance sheet	https://www.ecb.europa.eu/press/annual-reports-financial-statements/annual/balance/html/index.en.html	ECB annual consolidated balance sheet
Military recommendations	https://www.nato.int/cps/en/natohq/topics_111582.htm#tbl	NATO military budget recommendations
Financial statements	https://finance.yahoo.com/quote/MSFT/financials/	Yahoo financial public company statements
IMF	https://www.imf.org/external/np/fin/data/query.aspx	IMF data center
World Bank	https://data.worldbank.org/	World bank data
Economic trading	https://tradingeconomics.com/	Economic trading data for each country
The org	https://theorg.com/discover	The organization charts and organization strategic apex

Figure 4: Data resources