



DEBT BASED MONETARY SYSTEM
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ABSTRACT

Application of systems engineering can be modelled in such different layers respectively as product, project, business, industry and socio-economic systems. A bottom-up view reveals that many products constitute a system. Many projects constitute a business. Many businesses constitute an industry. Many industries may constitute to a socio economic system. In a general application, industrial/systems engineers take this bottom-up view to their problem solving efforts as well as educational/training syllabus. It is assumed that a top-down view would result in similar consequences.

From a top-down approach, a socio economic system is an integrated system. One part of it is dealing with the production of goods and services and counter part of it is dealing with the production of money. Production of goods and services is a well-studied and well-defined scope. On the other hand, production of money is not well-studied by systems/industrial engineers. Having the concept of reciprocity in mind, production of money is creating significant problems that cannot be underestimated. Current production of money is based on a Debt Based Monetary System (DBMS) which is behaving irrespective of the production of goods and services.

This article is explaining the DBMS and its deficiencies to support its reason of existence i.e. production of goods and services. Furthermore, it advises some fundamentals to come up with a sustainable socio economic system.

Keywords: Debt Based Monetary System, Systems Engineering, Fractional Reserve System, Fractional Reserve Banking.

I. INTRODUCTION

Systems engineering is an important discipline to understand and study many systems to create a unified whole that is potentially greater than the sum of its parts. Such unified whole can also

be called the system of systems. It brings together a number of independent enterprises or businesses. Systems engineering gives a good basis to handle current multi-faced problems in a unified whole. Today's world problems are crucial problems facing humanity. They result in environmental, political, cultural, social, economic, technological and psychological consequences.

In general, there are two ways of approaches to handle problems i.e. mechanistic approach and systems approach. In a mechanistic approach, the idea is to decompose parts firstly to more basic components then study each component. Finally, reassemble components and hence explain how things worked. In a system approach, on the other hand, behaviours or properties of the unified whole is firstly explained. Then the unified whole is decomposed into independent functional units. Behaviours and properties of independent units are studied in terms of their roles and functions. Finally, the unified whole is redesigned or reconstructed in such a way that the value of the unified whole should be greater than the sum of its parts.

II. SOCIO-ECONOMIC SYSTEMS ENGINEERING

Systems approach can be successfully adopted to deal with current problems as a unified whole or partially unified whole.

One of the systems engineering model is the five layer model [1]. The first layer is product/subsystem engineering. This is to make products or goods and services which is also at the core of all systems. The systematisation starts with some problem and ends with a proven solution to the problem. The solution proves the symptoms of the problem to be neutralised and as well as to be effective, compatible with and adapted to its environment [2].

The second layer is the project systems engineering which is related to the corporate wealth creation. This again starts with some problem and conceives solution options which are traded against the criteria as effectiveness, reliability, affordability and so on. The unified whole system i.e. product and process, may be partitioned into manageable parts. Then each part may be separately developed before being brought together. The model contains subsystem design which would be a layer 1 activity and customers' and users' requirements as well.

The third layer is the business/enterprise systems engineering that are to create industrial wealth. Many businesses make an industry. At this level, there are two integrated views. One is to design the process. The design includes design, develop, create, test, integrate and prove the whole solution system. The second is to design the project. That is done in conjunction with project management and takes into account business factors and the business environment.

The fourth layer is the industrial systems engineering which is about the national wealth creation. This layer models and characterises the nesting of the various layers of systems engineering. It also includes end users, suppliers and markets as well. The industrial systems engineering does not seem to have a life cycle because it recreates itself using the financial return on sales. It undertakes researches, identifies, designs and makes innovative new products and continually replaces and updates their equipment and facilities. In this respect, they are similar to biological organisms like the human body.

The fifth layer is the socio-economic systems engineering that is related to government regulations and control. This is also including legal and political influences. For instance, the former USSR developed five year economic plans. In contrast, free market economies do not plan ahead in that manner. It is soundly based on financial motivation.

From this perspective, money which is created, circulated and accumulated in a country is the solely financial base of the fifth layer systems engineering i.e. socio-economic systems engineering. In a socio-economic system, there should be some reasonable relationship between the two parts, namely quantity of money in circulation and production of goods and services.

Before looking at the financial accumulation of the socio-economic systems, it is essential to know the nature of manufacturing/production and its economic and social implication. Production is to transform raw materials and ideas into marketable goods and services which are known as economic goods. Economic goods cannot be obtained without expenditures. Expenditures can be made with money. In other terms, production is to transform raw materials into goods and services to transfer money from a set of holders to another.

In developed countries, production industries may be viewed as the backbone of the nation's economy where the real wealth is created. It has been estimated that in such a country on average about a quarter of the population is involved in some form of manufacturing activity, and the rest of the population benefits from the products (Harrington, 1984) [3]. According to 2013 Turkish Statistics Institution [4], in Turkey, manufacturing industries (agriculture, hunting, forestry, fishing, mining, quarrying, manufacturing, and construction) generate approximately 28.6 percent of the nation's wealth and employ 49.1 percent of the working population. 50.9 percent of the working population is in the service industries. Interestingly, the jobs of half of those employed in non-manufacturing sectors depend on the close links that exist between these sectors and the manufacturing industries.

The internal significance factors of manufacturing are continued employment, quality of life, and the creation and preservation of skills. The external factors of manufacturing are national defence, and the nation's position and strength in world affairs.

The important thing is that the strength of production determines the strength and scale of socio-economic systems engineering. With this respect, it is not surprising for over two centuries many prominent people have stressed the importance of production especially manufacturing. Many people attempted to evaluate effects of manufacturing on the nation's macroeconomics. However, it is surprising that very few people from the production area are working on the economic counterpart of the production that is money and its creation and accumulation.

The fifth layer mentioned, the socio-economic systems engineering of a country, requires us to study the unified whole system in two parts. Producing goods and services on one part and producing money on the other. This concept can be depicted as Natural Economic Cycle (NEC) in the Figure 1 as shown below [5].

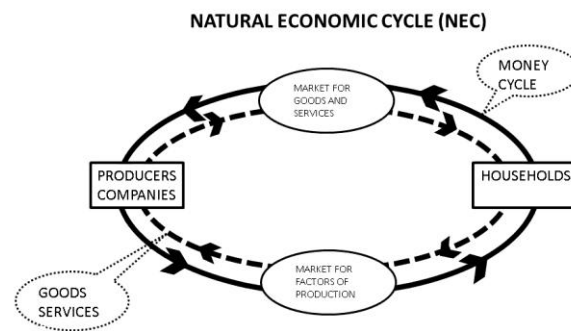


Figure 1: Natural Economic Cycle (NEC)

As is stated earlier, the most essential thing in a country is the production. Existence of money is to support the production cycle of goods and services. The production part of the NEC is well-studied. Various methods of optimisations are employed to reduce costs and to maximise profits. But, how the other part of the NEC is worked and how money is created is kept beyond the scope of industrial engineering. In fact, it is too important to leave it to economists only [6]. With the help of systems engineering approach, this article is dealing also with the money creation phenomenon. Here, we avoid using well defined financial jargon i.e. terms and definitions. We rather used general terms and definitions to work out the systematisation deficiencies of the current money creation mechanism.

III. DEBT BASED MONETARY SYSTEM

The current monetary system is the Debt Based Monetary System (DBMS) [7]. We did not choose it. It is not the case that, at some point, we thought the process through and concluded that this was the best and most appropriate system to satisfy our needs. When President Nixon closed the “gold window” in 1971, the western world embraced a debt based monetary system for the first time. Prior to that moment the west had a commodity based system with gold being the acceptable commodity [8, 9]. Under the gold standard, gold was the internationally accepted means of exchange. Exchange rates between international currencies were de facto fixed: each national currency was fixed vis-à-vis gold, and so the exchange rates between national currencies were also fixed [16].

It is the very nature of the DBMS that it produces all of the monetary and economic turbulences which affects directly all of the manufacturing/production sectors. At the moment, economy needs to create new jobs to reduce the level of unemployment. Within a DBMS, that means that interest rates must be reduced. People will then borrow money both to spend and to invest. That is the current wisdom about how to achieve a healthier economy. In other words, in order for the economy to improve, either more people must get into debt or those who are already in debt must get deeper into debt. This is one of the characteristics of a DBMS. Debt which was once a source of shame has become an essential part of the modern lifestyle [17].

In order to understand the DBMS, it is essential to comprehend how money is created. Figure 2 shown below depicts the modern mechanism of money creation.

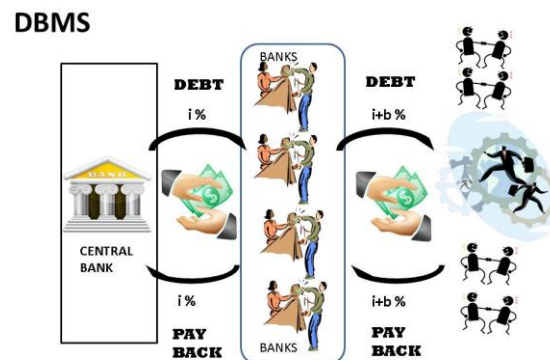


Figure 2: Money creation mechanism of the DBMS

In a country, parliament passes a decree indicating that the money created by the central bank is the only legal tender to be used. Central Banks then create money based on empirical and theoretical estimations. The money is given to banks with interest rate i . Banks sell that money with a reasonable profit $(i+b)$ to people for production or consumption. People pay money (credit) back to bank with an interest $(i+b)$ on due date. Bank pays money back to the central bank with an interest i .

Furthermore, if we take a closer look at the mechanism, we see it drifts the system to an unstoppable chaos. Now, suppose the system is at the state of nature and first lot of money M created is lent to a bunch of banks with an interest rate i for a maturity date T . Suppose, the central bank will not create any more money until the date $T+1$. Then how the banks will pay their debts back to central bank with interest rate i ? This is not possible because the total amount of money in the system is M and the total amount of money the central bank is demanding is $M*(1+i\%)$. M is always less than $M+M*i\%$. Therefore, banks will compulsorily ask more money to pay their debts and will naturally get deeper into debt. Additionally, the compound interest embedded into money creation process makes the growth of debts in an exponential manner. This is a deathly recursive mechanism drifting all of the system into a chaos [10].

As understood from the Figure 2 and its explanation, money comes to existence (created) as a debt. The whole mechanism is based on that debt. This is why the system is to be called as a Debt Based Monetary System.

From this mechanism, one can think that the whole money is created by central bank with an interest rate i and then is distributed by banks with an interest rate $(i+b)$. In Turkey, for instance, the amount of money created by the central bank is approx. 80 billion Turkish Lira [11]. On the other hand, if we look at the total money sold by banks, either as consumption or production credit, is about 1060 billion Turkish Lira [12].

Now, we have a good question to be answered here. If the central bank is creating 80 billion TL, how come the banks are giving 1060 billion TL money to their customers? Who creates the remaining 980 billion TL (as much as 12 fold of 80) money and how? Who gives the authority to create such amount of money as 980 billion TL to the banks?

In order to understand how that money is created we should look at the Fractional Reserve System (FRS) [13,14]. This is the term used for modern banking system practiced in almost all countries today. In the UK for instance, 27 times of money created by the Bank of England is given as credit [18,19]. Figure 3 depicts the FRS mechanism shown below.

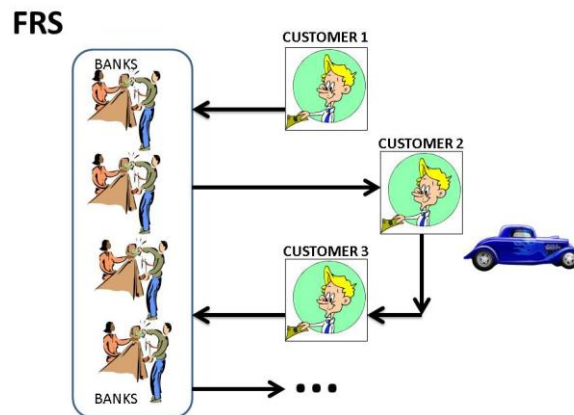


Figure 2: Money creation mechanism of the FRS

As shown in Figure 3, suppose, a bank Customer-1 brought to a bank a banknote (money) to deposit. Bank gives a receipt for the money. S/he then leaves the bank confident that s/he can spend her/his money in the marketplace with security. Suppose next that Customer-2 comes to the bank because s/he wants to purchase Customer-3's car and s/he is short of money. S/he would like borrow a certain amount of money. The bank finds her/him credit-worthy and, therefore, lends her/him the money asked. Customer-2 pays the money to Customer-3 and then Customer-3 becomes the bank's second depositor, leaving his money to the bank. The bank gives her/him a receipt and customer-3 leaves also the bank confident that s/he, too, can spend her/his money in the marketplace with security.

What is now the bank's position? The bank has one amount of money deposited in the bank and have issued two receipts against it. What is the collateral? By issuing two claims against the same amount of money, the bank would also have misled the marketplace into believing that one more amount of money exists than actually exists. This practice of banks can go on as much as they want. In other simple words, banks can create as much money as they want with a stroke of a pen i.e. giving credit! Do they have the right of creating new ownership out of nothing? With the current FRS mechanism, de facto, yes. [15].

This mechanism of money lending makes money appear to reproduce itself. But money does not reproduce itself, nor can it. Bankers are also aware of the risks they are taking. From time to time, depositors at particular banks became worried about whether there was sufficient amount of money available to meet their claims and went to those banks to remove their deposits. If too many arrived at the same time the bank could not honour them all and the business of that bank was disrupted. Depositors who had not succeeded in withdrawing their deposits before the disruption lost their deposits and the owners of the banks lost their own investments. This is a

basic feature of fractional reserve system. Furthermore, one bank failure can snowball and bring with it an epidemic of bank failures [20].

The FRS mechanism motors on relentlessly, increasing simultaneously both the money supply and the burden of debt. In the DBMS, each new claim represents a new debt. As the number of claims grew, so too did the amount of personal, business and government debt.

Citizens of a country, elect a parliament. The parliament charges central bank with the responsibility of creating and maintaining a stock of money for their use. The government then licenses banks to lend money created for them. With the FRS practice, banks create more money out of nothing with a stroke of a pen. One of the most curious aspects of this arrangement is that the banks do not pay a cent piece by way of royalty or license fee to the government for the use of the money which they create for the government and then use for themselves.

Moreover, any currency attack that yields depreciation of the exchange rate reduces the value of banks' investments relative to the value of their liabilities. When foreign creditors run on domestic banks and pull their money out of the economy, they indirectly reduce the amount of foreign reserves held by the government. Then the government faces a higher cost of defending the currency and abandons the fixed exchange rate regime in more circumstances. Foreign capital might generate some undesirable outcomes [21,22].

To say the least, this is not a commercial arrangement. Worse of all, when the government needs to spend more money on our behalf than it has raised in taxes, instead of creating it as we have authorised them to do and which would have a one-off cost but no further running costs, it borrows money from the pool created by the banking system. Then we have to pay both the one-off cost and the running cost of annual interest on it. This is neither a commercial nor a reasonable arrangement and to be studied in a unified whole from a systems engineering perspective. Various alternatives must be studied to replace such unjust mechanism. There are some proposals within the current system but not sufficient to solve problems as a whole. One of these proposals is, for example, that banks may serve as monitors of ventures. Banks offer lower risk through diversification and lower monitoring costs than people could find by lending on their own. With currency fully backed with assets, a central bank can ward off speculative attacks against its currency [23]. In fact, any right solution to the problem should emerge within the system of the NEC. Then, one can talk about the unified whole mentioned earlier. Representation of goods and services produced can then be justified.

IV. CONCLUSION

Every manufacturer has to buy raw materials. On the other hand, bankers receive the raw material for creating money every time a customer deposits money. As is understood that under the DBMS, the government is a minor player when it comes to creating money. Worse, if the government had itself printed hundreds of billions of liras that the banks produced, it could have paid off the entire national debt. Nor would it have had to pay tens of billions of interest yearly. We could now have the finest infrastructure, the finest public transportation system, the finest national health facilities, the finest education facilities, and the finest energy supply that can be obtained.

Nor can there be equality of opportunity according to merit under the DBMS. A person with a sound idea and not assets finds it extremely difficult to get his idea financed. A person, on the other hand, with an unsound idea and assets will have little difficulty getting his idea financed.

Furthemore, DBMS together with FRS has not compatible with the production of goods and services in a unified whole. At the layer-5 systems engineering view, national stock of money should have been in some relation with the production of goods and services. But in fact, it is the other way round. Money reproduces itself out of nothing but owns goods and services. DBMS together with FRS represents the largest redistribution of wealth by bankers. Through this mechanism, bankers exercise a power which is not given to them by the people.

Certainly, modern economy cannot function without some kind of medium of exchange which must be created by human beings. At the moment, society uses the FRS expansion method to create money. Therefore, there are three questions to be answered for further studies. First of all, who owns (should own) the money that we are using? Secondly, who decides (should decide) how much money is to be created? Lastly, who decides (should decide) the level of debt burden on the government?

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