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The role of fiscal and monetary policy in stimulating Circular Economy in Iraq

The issue of the Circular Economy is not a new issue to several countries, especially the developed ones. Here in Iraq it is considered newly introduced, despite the few attempts to establish projects that concern recycling most of them were doomed to fail, due to two main reasons: the first one is the financial and administrative corruption widespread in all departments of the country, the second one is the priorities of public spending. It is well known that Iraq was subjected to two major attacks, the ISIS entry attack in 2014 to Iraq. ISIS occupied about a third of Iraqi lands which resulted in a collapse in oil prices, as Iraq depends almost entirely on oil revenues in its budget which is the second attack. This made the Iraqi governments point public spending towards the priority of preserving national security and liberating Iraqi lands. Therefore, the circular economy project proposals were not considered a priority under these circumstances.

1. Introduction

In the past decade, the circular economy (CE) has established itself as an influential model for economic development, with the Chinese government and European Union being the first to follow this policy in their country. The goal of the model is to create circularly material that flows to break the current linear economic state, taking into consideration creating business value for its participants. (Corvellec et al., 2020, p. 98).

The CE concept invites societies to reevaluate their use of waste and resources. The concept proposes the replacement of the current "take-make-use-dispose" system, with a system that addresses structural waste - encompassing visible, and hidden forms of waste. For example, recycling materials as opposed to landfilling or incinerating, and the intensive use of them through cascading approaches, as well as sharing and ownership models. The application of circular strategies in addressing structural waste to improve resource efficiency, productivity and reverse resource loss. (Blomsma and Tennant, 2020, p. 1).

The implementation of circularity materials is increasing in developed countries, while the developing countries are still struggling to transition to the circular economy due to the lack of economic funds, public awareness and political will, among other reasons. Developing countries like China, Serbia and India started to implement such principles meanwhile, low-income countries are commonly introducing new projects or plans with no effectiveness. (Ferronato et al., 2019, p. 367).

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The study aims to find the answer to these questions. Firstly, does Iraq have the basic elements for the transition to a circular economy? Secondly, what is the best source of funding to stimulate the transition to the circular economy in Iraq? The government by its fiscal instruments or monetary policy by banks will be more suitable? Lastly, what will be the results of the Iraqi economy if circular economy projects were implemented?

2. Literature Review

2.1 The concept of circular economy

The CE goes beyond recycling and is based around a restorative industrial system focused to treat waste as a resource. Whenever a product reaches the end of its useful life, the attempt is made to keep the materials within the production boundary and use them productively enough to create further value. In developing economies, the waste is being treated in the reduce, reuse and recycle (3R) concept under a broader concept of the circular economy. The CE is an industrial economy that is: restorative by intention; aims to rely on renewable energy; minimizes, tracks, and eliminates the use of toxic chemicals; and eradicates waste through careful design. In the circular economy model, durable goods would be designed so that they could be repaired rather than replaced, as well as biological materials to be managed so they could be returned to the biosphere without contamination. Coincidentally, the implementation of a circular economy is specifically based on both resource efficiency, eco-efficiency, and its purpose is to acquire a set of key measures to move to a more circular, green, and sustainable economy (Ghosh, 2020, pp. 3-4).

The concept of CE can be described through some of its components or strategies (like reusing, recycling, eco-design and performance economy). However, this is not sufficient if the aim is for a socio-economic system which has a resource-based point of view. The components have to be seen as parts of a larger system, or an ecosystem (Desing et al., 2020, pp. 2-3). In other words, in 2012 the Ellen MacArthur Foundation (EMF) introduced the concept of CE as "an industrial economy that is restorative or regenerative by intention and design", and later as "restorative and regenerative by design and aims". Since then, the definition of CE as restorative and regenerative has come to a common use or at least have reflected thousands of times throughout both academic and non-academic literature. This definition is by far the most employed one in CE studies. (Morseletto, 2020, p. 1).

There are five priorities characterized by specifications of their product or value chain, and their environmental footprint or dependency of material from outside. These priorities are represented by (Di Maria, 2020, p. 206):

- Plastics: Plastic materials are widely used in different products from packaging to vehicles. Currently. In the European Union (EU) about 25% is recycled and about 50% is landfilled. Improper plastic management causes also ocean pollution with a very high environmental burden.

- Food waste: Food production, distribution, storage and use generated in high impact increased edible food disposal. Furthermore, food waste happens at all levels of the value chain from production, reaching the final user (e.g. restaurants, canteen, home) making its quantification very difficult. The European Commission will elaborate a uniform calculation methodology for addressing these amounts. Data marking is also an issue to be addressed that usually did not indicate the expiration date. A wrong interpretation of this also causes a large generation of food waste.
- Critical raw materials: These are represented by high value and vulnerable supply distribution materials, known as electronic waste. The recycling rate will be hence improved, and the Commission will promote this activity.
- Construction and demolition waste: They are considered one of the largest amounts of waste generated in the EU. A lot of recyclables in such waste continue to be disposed of. Quality standard and selective demolition procedures are one of the main criticisms for their recycling. Green public procurement is also another important aspect to implement increasing construction and demolition waste.
- Biomass and bio-based products: Biomass can play an important role in replacing fossil and mineral resources for the production of fuels, energy and chemicals. In any case, it is mandatory to be analyzed with attention to the sustainability of the supply chain to the environmental impact. Wood packaging recycling will be also increased. Research funding for supporting the EU bio-based economy is also a fundamental factor for the full implementation of CE.

2.2 *Finance Sources of the Circular Economy*

Transitioning to the circular economy will require a large number of economic resources to be invested in target sectors. Like any other type of expenditure, investment needs to have firms at their disposal for a sufficient amount of financial means. Given the upfront costs of investments, firms are typically unable to finance them through their savings and thus necessitate access to external finance. In other words, they need to borrow or receive money from the government before being able to invest (Campiglio, 2016, p. 220).

King and Levine (1993) reiterate Schumpeter's idea of the key role played by financial institutions in appraising, managing and financing businesses. They also mention that investment decisions are made based on cost and benefit analysis. Subsequently, financial institutions mobilize funds from individual investors (surplus units) and finance the activity of the entrepreneur (deficit units), it is cost-effective for institutions more than individual investors (Acheampong, 2016, p. 29). Therefore, a new role for monetary and fiscal policy by finance the projects of the circular economy (innovation economy) is required by implementing unconventional policies. On the other hand, an explanation of the role of both monetary and fiscal policy will provide some financial resources to establish the valid circular economy.

2.2.1 Fiscal policy

The circular economy has received increased attention from policymakers in industrialized countries and is currently promoted by the EU as well as several national governments including China, Japan, UK, France, Canada, The Netherlands, Sweden and Finland. Research studies on how to stipulate appropriate policies that promote the circular economy suggests that governments should play a leading role by reforming existing laws, enacting new regulations, promoting the application of new environmental technologies, and organizing public education. Government policies can affect the cost of production and the supply curve through taxes, regulations, and subsidies. Other examples of policy that can affect cost are the wide array of government regulations that require firms to spend money to provide a cleaner environment or a safer workplace (Rabta, 2020, pp. 3-4).

Therefore, if governments wish to encourage investors to finance circular economy projects in the future, clear and consistent policies over a long period are needed. On one hand, the government needs a clear signal in terms of tax reduction on some activities that have a relation with the circular economy (e.g. plastic recycling projects). Government incentives and guarantees can also be used, from support for Research and Development (R&D) which affects operational efficiency to invest incentives (capital grants, loan guarantees and low-interest rate loans), taxes (accelerated depreciation, tax credits, tax exemptions and rebates), and price-based policies at the output stage (which affect revenue streams - e.g. feed-in tariffs), or policies which target the cost of investment in the capital by hedging or mitigating risk (Della Croce et al., 2011, p. 10). In addition to that, one of the vital instrument that could stimulate the move towards circularity is an adapted tax system. Currently, introducing circular products is harder, because they compete with products derived from "tax-free" pollution: virgin raw materials are too cheap to acquire and dispose of.

At the same time, high labor costs hold back labor-intensive R&D efforts as well as service-oriented business models, which inhibit the transition. The current tax barrier could be turned into a catalyst for the circular economy by applying the "polluter pays" principles and shifting taxes from labor to consumption and natural resources. The goal is to enable growth based on human capital rather than the extraction of natural resources (Goovaerts and Verbeek, 2018, p. 208). On the other hand, the government must impose taxes that achieve an environmental goal. Environmental taxes are environmentally effective, i.e. they contribute to the achievement of the environmental objectives for which they have been designed. The tax must be set at the right level to achieve the objectives and must be directed at the source of the environmental burden to be reduced. When it is implemented in this way, it is clear that numerous examples of environmentally-successful green taxes, among which may be mentioned the Danish energy/carbon taxes, the Swedish NOx tax, the German energy and transport taxes, the UK climate change levy and fuel duty escalator, the Finnish, Swedish and UK waste taxes, the London congestion charge and the Dutch wastewater effluent charge (Ekins et al., 2009, p. 24).

Thus, fiscal policy will be more efficient by using its financial tools to encourage the projects of circular economy and reduction of pollution, then more chances will be obtained from achieving sustainable development. Overall, fiscal tools provide a stimulus to producers and consumers to change their behavior towards a more eco-efficient use of natural resources by stimulating technological innovation and reducing consumption levels. Governments at all levels can also use a variety of non-fiscal tools to promote the development, uptake of circular economy-related technologies and services by modifying the attitudes, behavior of producers and consumers towards natural resources (Brears, 2018, p. 31).

Finally, the state can use both fiscal and monetary policies by coordination in some procedures to encourage the projects of the circular economy. For example, the Chinese experience which adopted Taxation, fiscal, pricing and industrial policies were introduced. A fund was allocated to support the conversion of industrial parks into eco-industrial agglomerations. Tax breaks were provided to enterprises in the reuse sector. To finance the initiatives through concessionary loans or direct capital financing, the National Development and Reform Commission (NDRC) joined with financial regulators including China's central bank and securities regulatory commissions (Mathews and Tan, 2016, p. 441). This coordination will be reflected on efficient domestic financial intermediation is likely to support the transition to the circular economy more effectively if there is some co-investment by the public sector (government), this will provide credibility about long-term strategy and if public agencies take the responsibility of the political risk associated with policy uncertainty. Specialized banking intermediaries (Development Banks and Government Banks) may have a role to play in this regard (Bowen et al., 2014, p. 32).

2.2.2 Monetary Policy

First coined by Keynes (1913) in the context of central banking in developing countries, promotional objectives have usually only been stated in the statutes of central banks in developing and emerging economies. Regardless of those of advanced economies' central banks, where at most promotional objectives were informally conveyed. Nevertheless, the central banks have numerous powerful tools at their disposal to affect credit allocation and the investment behavior of financial firms. Whether and to what extent a central bank should use its powers and actively engage in the circular economy by encouraging the financial system to promote projects involving circular economy. They depend on two main factors: its legal mandate, and the extent to which it is best placed to correct certain types of market failures. Considering the ability and suitability of other policy institutions to steer the circular transformation (Dikau and Volz, 2020, p. 12).

So, the monetary policy may have a big impact on the transition process to the circular economy. There are three families of existing propositions of funding mechanisms based on unconventional monetary policies targeting green or climate investments. These "Smart Unconventional Monetary" (SUMO) policies are:

(*i*) the use of Special Drawing Rights (SDRs) issued by the International Monetary Fund (IMF); (*ii*) Green Quantitative Easing (Green QE); and (*iii*) the issuance of Carbon Certificates. Special Drawing Rights are international reserve assets, the original role of it was to supplement the foreign exchange reserves of the IMF's member countries. They are issued by the IMF and granted to the member countries according to their quota-share, which depends on their wealth. The idea here is to use existing or newly issued SDRs to capitalize an international climate fund that would provide grants and low-interest rate loans to fund low-carbon projects in developing countries (Ferron and Morel, 2014, p. 9).

Proponents of these SUMO mechanisms have identified a strong potential in terms of providing substantial low-cost funds to green projects and reducing the risks linked to green investments for private investors. Green QE and Carbon Certificates mechanisms are estimated by different proponents to generate hundreds of billions of dollars per year while staying in the proportions of QE policies that have been conducted in the United Kingdom and the United States. The justification for quantitative easing was the lowering of interest rates. It was hoped this would encourage spending whilst providing the banks with cash from the proceeds of the sale of their gilts lend to business (Murphy and Hines, 2010, p. 7). Regarding SDRs, the proposed scale of funding of most proposals is based on $100 billion per year as the amount in developed countries have devoted to low carbon development in developing countries.

Green QE is an unconventional monetary policy where the central bank enlarges its balance sheet to buy great quantities of assets, thus releasing great quantities of cash. The idea here is that those liquid assets could be used to finance low-carbon projects, thus triggering a green recovery that would lead to job creations and transition to a low-carbon economy.

Finally, the Carbon Certificates mechanisms consist of the central bank issuing new liquid assets providing low-carbon projects with low-cost debt through commercial banks. This debt can then be repaid using certificates (Ferron and Morel, 2014, p. 3).

3. Methodological approach

Relying on the deductive methodology, a type of deductive reasoning is used by modus tollens, or "the law of contrapositive" reaching to facts and reality that relates to the circular economy in Iraq by look for the actual projects of circular economy and all areas that concern it in Iraq (Blaug and Mark, 1992, pp. 4-5). Also, numbers and data from official institutions were analyzed: Ministry of Environment, Central Bank of Iraq, Ministry of Industry, etc. By using descriptive analysis of that data to discover the problems that Iraq suffers within the scope of the circular economy. The problems were cited by surveying CE projects which are really in work and another CE project which is still studied in Iraq.

4. The Circular Economy in Iraq: reality and ambition

4.1 The sight of the Iraqi economy

Transforming Iraq into a market economy is particularly challenging because the features that made Iraq function as a command economy are precisely the opposite of those needed for a market economy. Iraq lacked any of the legal, regulatory, political, and economic institutions which form the basis of market economies. Saddam's command economy had its relatively successful moments: before 1990, Iraq was one of the most prosperous and economically advanced countries in the Arab world, boasting a sizeable middle class; technical capacity; and has a relatively high standard of education and health care compared to other Middle Eastern countries, as well as high numbers of women educated and contributing to the economy (Crocker, 2004, p. 74).

After 2004 started the "Rehabilitation" process the economy of Iraq. Rehabilitation is defined here as a reversal of the process of decline. Through the utilization of existing production capacities, the reintroduction of capital accumulation, the reinvigoration of economic agents, the restoration of a measure of efficiency to markets, the preservation and development of skills, the rebuilding of key elements of the physical infrastructure, maintenance of existing facilities, and the achievement of balance, stability. This previous definition comes from that the economy during the 1990s has been going through a process of fragmentation and disintegration - a gradual and slow process that continues to decline accumulated capital assets and deplete natural resources. Through this prolonged process, the economy and society are shedding resources, institutions and skills which are needed for any rapid recovery (Mahdi, 1998, pp. 41-42). The greatest effect of the 2003 war on Iraq's economy was the subsequent decline in oil and electricity production. Oil production had been running at 2.5 million barrels per day before the war. It dropped to near zero in April 2003 exports ceased until June 2003. Electricity generation fell by about 25 percent, regaining pre-war levels in October 2003. Based in part on these figures, the International Monetary Fund (2003, p. 22) estimates that Iraq's Gross Domestic Product (GDP) fell about 22 percent in dollar terms for 2003 (Foote et al., 2004, p. 55).

Now, Iraq is in a fragile situation. It faces a difficult fiscal crunch, arising from the collapse in international oil prices coupled with persistent political and social turmoil. This situation is exacerbated by the rapid spread of COVID-19, which the country's healthcare system has limited capacity and limited fiscal buffers to contain and manage. Going forward, the economic outlook for Iraq is challenging. The collapse in international oil prices and other unfavorable global conditions, including disruptions caused by the spread of COVID-19, are expected to hit Iraq hard, leading to a 5% contraction in its economy in 2020. In the absence of significant reforms to boost private sector participation, it will be difficult to regenerate. The economy growth is projected to gradually revert to its low-base potential of 1.9-2.7% in 2021–2022. The budget rigidities, compounded over the past two years, are expected to have detrimental fiscal effects amidst weaker oil-related revenues.

At 30$ US a barrel of oil and in the absence of planned consolidation measures, the budget deficit was projected to surge to a staggering 19% of GDP by end-2020.

As a result, the GOI is expected to face a severe financing gap which could not only lead to postponing vital infrastructure projects in service delivery sectors, as well as postponing human capital programs, but also reduces the country's ability to respond to post-COVID-19 recovery needs. To sum up, Iraq is expected to face a persistent current account deficit in 2020, driven as well by lower oil prices and sticky imports. The gap is expected to be financed by the Central Bank of Iraq's reserves and State-Owned Banks, increasing the country's vulnerability in the near-term (World Bank, 2020b).

4.2 The reality of the circular economy in Iraq

The circular economy in Iraq is still in its early stages, and the projects that are established are very few, beneath standards, and most of these projects are governmental. It should be noted that there is a draft law "Waste Management at the Iraqi Parliament Council", which stresses in all its articles on the necessity of the recycling process in economic and environmental terms (Iraqi Parliament Council, 2018).

4.2.1 CE projects in Iraq

The following is an illustration of the projects that work in the sectors of the Iraqi economy.

- Basra Oil Company/Rumaila Authority has started, through the operator the field of British Petroleum (BP). To establish a center for recycling waste in the northern and southern Rumelia field, where the center was established in August 2015 and entered into actual work in March 2016. This center was designed with world-class properties, and it is the largest center in Iraq for recycling waste. It receives waste from all productive locations in the Rumelia operating field at an amount of 10 Cubic meters per day. These wastes are sorted and classified into: recyclable waste such as plastic water bottles, aluminum cans (soft drinks, iron or tin containers), and glass. As for non-recyclable waste, it is incinerated in the waste burning center, where there are two large incinerators with a burning capacity of 100 Cubic meters per day for each of them, and they are environmentally friendly. The center has warehouses for chemical waste and radioactive waste of natural origin, which is in a remote, isolated and safe area that allows entry only to persons who are authorized to enter. The center includes a yard for storing scrap. In 2018, more than 2,360 tons of waste were burned safely, along with the separation of 474 plastic bottles, 33 aluminum cans, 27 tin cans and 100 cubic meters of glass ready for future recycling (Basra Oil Company, 2016).
- The General Company for Rubber Industries and Tires, one of the subsidiaries of the Ministry of Industry and Minerals, has designed a factory for the production of bio-recycled rubber using large, wasted conventional tires with a ca-

pacity of 750 tons annually. It is now operating with a planned capacity of 400 tons annually, part of which feeds the Babylon Tire Factory and the other part is marketing to companies in the governmental sector, as well as to the private sector. The project can be considered as the first in Iraq of its kind in terms of high production capacity, modern machinery and advanced technology used in it. It contains a main mincing machine with a capacity (10 tons/hour), presses, modern machines and three production lines to produce granules and chopped Rubber with a capacity of (5 tons/hour) and rubber tiles and bumps with a capacity of (300 meters/day) in addition to, the oil production line of all kinds as well as the production of other products. "These products are used in sports stadiums, kindergartens, car garages, and in the squares, beaches and many other uses, according to demand in terms of strength, rigidity, measurements, qualities and uses", stressing at the same time that "these products are competitive with their imported counterparts, especially the Turkish product in terms of quality, high rigidity and appropriate prices". With the possibility to fully meet the needs of the local market (State Company for Tire Industry, 2016).

- Baghdad opened the first project for sorting and recycling the waste in Iraq in the Yusifiyah suburb of the Mahmudiya district with a design capacity of 200 tons per day. The cost of the project amounted to 15 million and 645 thousand dollars in 2014. The amount of waste received by the factory for the period from August 2018 to March 2019 amounted to 36,606 tons that were distributed during the 8 months. The sorted solid waste was distributed as follows (paper and cardboard, aluminum, iron, transparent champion, black plastic, colored plastic, transparent nylon, rubber, fertilizer, electronic devices), the factory suffered a loss due to high expenses and the scarcity of revenues (Mohameed and Ibraheem, 2019, pp. 394-395). This project needs technical and financial support to encourage it to achieve economic and technical efficiency.

4.2.2 CE priorities in Iraq

As mentioned before, there are priorities and elements for Iraq that must be taken into consideration when establishing circular economy projects, as follows:

- Water reuse

Fortune magazine suggests that due to water shortages, water will take place the oil in the twenty-first century (the precious commodity that determines the wealth of nations). Predictions concerning future water supplies are highly uncertain, due to the lack of adequate data, consumption patterns and technology can dramatically change the water demand, and as mentioned above climate change can have serious impacts on the hydrologic cycle, increasing evaporation rates and changing rainfall patterns (Daly and Farley, 2011, pp. 117-118).

Therefore, water reuse ought to be an important issue in Iraq, the good quality of water in the Tigris river is deteriorating as it approaches the estuary due to the pollution from urban areas prominent in the poor treatment of infrastruc-

ture (sewage) in Baghdad. The Euphrates river water quality is worse than water quality of Tigris river, it is currently suffering from a backflow of irrigation projects in Turkey and Syria. The quality of water in both the Tigris and Euphrates is detreating due to the influx of irrigated lands in Iraq and urban pollution. The quality and quantity of water entering southern Iraq from Iranian lands, is largely unknown, although it is clear that the flows are affected by the backwater irrigation flow coming from Iran. The deterioration of water quality and intense multi-source pollution has become a major threat to Iraq. The lack of an effective water monitoring network makes it difficult to take measurements to pinpoint issues of water quality and pollution. Consequently, the rehabilitation and construction of the water monitoring network have become necessary to ensure water security. Marshlands that used to be 17,000 square kilometers now it has shrunk to about 3,000 square kilometers. Water entering the Gulf Region became an issue that needs to be addressed as fisheries are an important source for food in the region. Other environmental issues to consider are the impact of water management and changing flows on migratory fish, wild species and the viability of river ecosystems across the Euphrates and Tigris basins (Frenken, 2009, pp. 66-67).

- CO2 emissions

The most prominent category of waste in the news today is CO2 emissions. Despite an impressive ability of ecosystems to absorb CO2, there is irrefutable evidence that currently, it is accumulating in the atmosphere and near-consensus in the scientific community which has already contributed to global climate change (Daly and Farley, 2011, p. 20).

Circular Economy reduces risk to supply by keeping materials in circulation and even though energy and resources will still be required for disassembly and recycling by eliminating the initial life cycle stage (extracting and processing bulk materials). Also reduces the quantity of spoil, up to 75% of embodied energy, embodied water, associated emissions, environmental and other impacts (Andrews, 2015, p. 310).

In Iraq, the average share of carbon dioxide emissions per capita in 2014 was 4.9 metric tons. Note that carbon dioxide emissions come mainly from burning fossil fuels and making cement. It includes CO2 emissions that are released during the consumption of solid, liquid and gaseous fuels and gas flaring (World Bank, 2020a). It is relatively a higher percentage compared to many other countries in the same report.

Finally, many projects have been submitted by national ministries and institutions to encourage the transition to the circular economy, and the Designated National Authority Committee (DNA) has approved the titles of 19 projects belonging to the Ministry of Industry and Minerals, announcing them as clean development projects to start registration procedures and implement them. This implementation has been delayed due to the Iraqi economy's exposure to external and internal attacks, especially the low oil prices, the lack of funding needed and the ISIS attack.

Appendix (1) that includes names and summaries of these projects (Ministery of Environment, 2016, pp. 15-17).

4.2.3 The limitations in the development of CE in Iraq

Many restrictions limit Iraq's ability to transition to the circular economy, perhaps the most prominent of which are the following:

- Corruption

Corruption results in an increase of production cost, a decrease of national and foreign investment, inefficient allocation of national sources, increase of inequality and poverty in the society and uncertainty in decision making. In all countries, corruption is considered harmful to government efficiency. It limits budgetary balance, lowers the efficiency of government spending and disturbs the budget allocation among individual budgetary functions. These disadvantages present transmission mechanisms of unfavorable effects of corruption on economic growth.

Government spending is one of transmission channels of corruption impact on economic growth that is currently ignored, especially the allocation of government spending. Regarding the growth of public expenditures in the few decades, the growing significance of this channel can be predicted and the attention to it is justified (Jajkowicz and Drobiszová, 2015, p. 1251).

According to the Transparency International report, Iraq's score was 18, which means that Iraq falls within the first quarter of the most corrupt countries among the 180 countries of the world that were included in the report, and it ranked 168 among the least integrity countries among the 180 countries of the world that were included in the report (Transparency International, 2019, p. 10).

- Spending priorities

In 2014, the double attacks of the ISIS invasion and the collapse in oil prices had a devastating effect on the economy as government finances were crushed by soaring expenses and plummeting revenues. Resources for maintaining basic services were diverted to military spending, the government was forced to make dramatic cuts. The years of conflict stretched the country's capacity to function to the extreme. Including Iraq's ability to implement proposed projects related to the circular economy (Tabaqchali, 2017, p. 5).

4.3 Transition to circular economy in Iraq, fiscal and monetary policy between stimulus and financing

4.3.1 Proposed procedures for fiscal and government policy in Iraq

Fiscal policy can be used as direct tools for the Iraqi central government to play the motivational role and financing function to establish a circular economy, so it is possible to make some proposals, including:

- The Iraqi government must develop a series of laws and regulations. For example, "circular economy promotion law" or "regulation of waste", etc.
- Investing in some circular economy projects with the participation of the private sector to encourage domestic and foreign private investment.

- Tax exemptions on business profits in new investments in the circular economy for a limited period, such as one year, to encourage investors to invest in such projects.
- Exemption partially or entirely from indirect taxes such as customs fees in all activities related to the project of the circular economy.
- Exempting retained profits from the project's circular activities from taxes if they were invested in establishing new projects or expanding existing ones.
- Providing investment (capital) subsidies, especially to small enterprises wishing to invest in circular economy activities.
- Increasing government spending on raising awareness of benefits of circular economy economically and environmentally, as well as establishing special industrial zones for circular projects in which infrastructure is provided by roads, transportation and fundamental services.
- The Iraqi government must take into his consideration development of citizens' behavior regarding the separation of valuables, their cultural background concerning waste management, and social norms must be taken into account when planning collection schemes. Convenient access to collection systems is essential. Citizens must become accustomed to these systems; long-term awareness-raising helps to optimize the successful collection of recyclables (Friege, 2017, p. 11). Especially if we know that Iraq's production of Biofuels and waste reached 47 kilotons of oil equivalent (ktoe) in 2017 (International Energy Agency, 2017).
- Impose Carbon taxes by the Iraqi government that charges on the carbon content of fossil fuels. Their principal rationale is that they are generally an effective tool for meeting domestic emission mitigation commitments. These taxes increase the prices of fossil fuels, electricity, general consumer products and lower prices for fuel producers, promotion to switch to lower-carbon fuels in power generation (Circular Economy) conserving on energy use and shifting to cleaner vehicles, among other things. A tax of 20$ a ton on CO2 emissions in 2030 would typically increase prices for coal, electricity, and gasoline by about (100%, 25% and 10 %) respectively. Carbon taxes also provide a clear incentive for redirecting energy investment toward low-carbon technologies like renewable power plants.

4.3.2 Proposed strategies for monetary policy in Iraq

In this research, the status of the Central Bank is analyzed and some suggestions about the measures will be provided, that can be followed to stimulate the establishment of the circular economy in Iraq, as well as providing some financial resources for it.

- Special Drawing Rights (SDRs) and Gold

The Central Bank of Iraq can restructure its assets and convert its investments from private drawing rights and gold into financial assets that encourage circular economy projects, for example giving the government an exception to Article 26 of the Central Bank of Iraq Law No. 56 of 2004 which states "not to grant any di-

rect or Indirect credits to the government to any public body or any state-owned entity" (Central Bank of Iraq, 2004, p. 21). The exception includes the direct purchase of governmental green or circular bonds only, to indicate the need to finance the circular economy projects, which will motivate the government to seriously establish many targeted projects (see Appendix 1 of many projects need financing). It is possible that these circular bonds have zero interest to stimulate the transition to a circular economy at zero financing cost for the government after studying all government projects and choosing the best ones economically and this can be called Circular Quantitative Easing (Circular QE) or Green Quantitative Easing (Green QE).

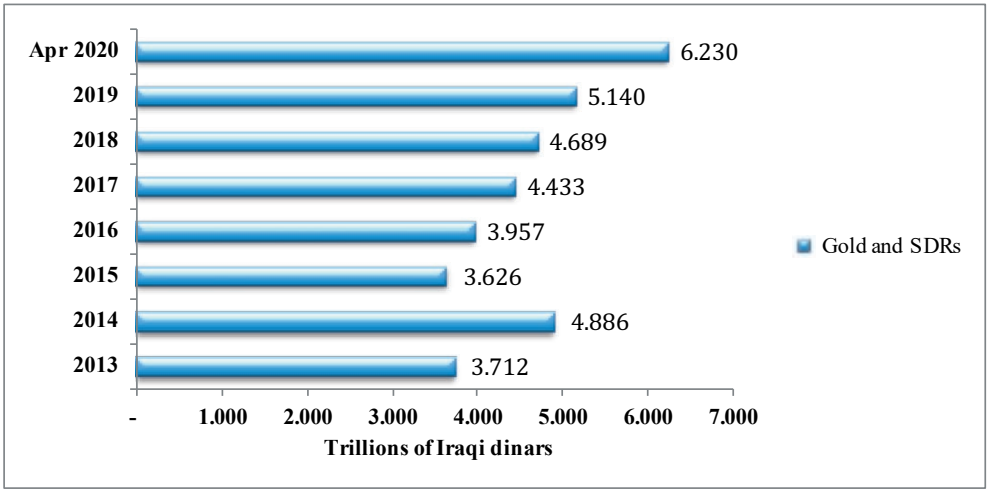
At the same time, the Central Bank of Iraq will have environmental goals to achieve like most central banks in the world.

Graphic 1 shows the development of the Central Bank of Iraq assets from gold and special drawing rights for the period 2013-2020, that the bank has approximately 6 trillion Iraqi dinars until April 2020, approximately equal to 5 $ billion (Central Bank of Iraq, 2020). These assets have developed significantly in recent years, where a certain percentage of them can be directed to circular financial assets that support the national economy and have future implications on the size of the national GDP.

- Circular certificates (CC)

The creation of Circular Certificates (CC) issued by the Central Bank of Iraq that would allow circular economy projects, developers, to repay a portion of their loans to commercial banks using these certificates gained through established their projects which have economic and environmental goals after assessing their feasibility by the Central Bank of Iraq.

Graphic 1. Central Bank of Iraq assets from gold and Special Drawing Rights (SDRs).



Source: CBI / Research & Statistics Dept. / Monetary & Financial statistics Division.

When the Central Bank issues such certificates to investors in the circular sector, this will lead to achieving many results:

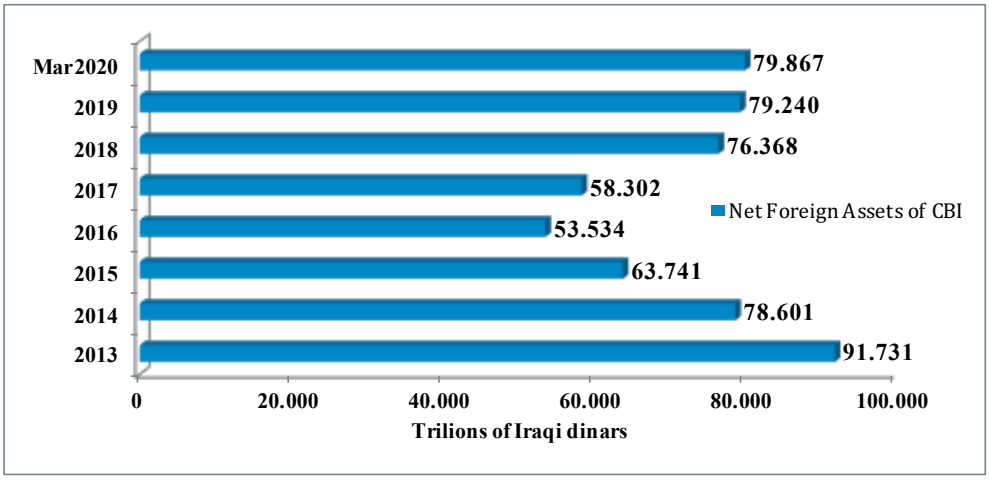
- Achieving the primary goal, which is to stimulate and encourage the establishment of circular economy projects.
- Encouraging investors from inside and outside Iraq to invest in circular projects and, as a result, diversify the Iraqi economy.
- Providing a new source for the flow of foreign reserves (foreign currency) and not relying solely on foreign currency resulting from exporting the oil.
- Development of the Iraq Stock Exchange.
- This needs to build relationships between the Central Bank of Iraq with other central banks in the world and set up auctions to issue circular or green certificates.
- Encourage the banking sector to create circular credit (or Green credit)
- The Central Bank of Iraq can encourage the banking sector (commercial or specialized banks) to increase the credit granted to circular economy projects thus provide funding and incentives for investors in this sector to increase their investments. Knowing that the number of banks operating in Iraq is 71 banks, including foreign banks operating in Iraq with total assets amounting to 124 trillion Iraqi dinars is equivalent to 110 $ billion (Central Bank of Iraq, 2018, p. 117). Some tools must be applied by the central bank to increase circular credit by using some quantitative tools such as reducing the re-discount rate for the banks that finance the targeted circular projects or follow certain specific tools such as granting loans to the banks with interest rates close to zero to encourage circular loans. In return asking them for a moral persuading method to finance circular activities to stimulate the transition to the circular economy.
- The initiative to support circular economy projects.

The Central Bank of Iraq can adopt an initiative to support circular economy projects such as the 1 trillion initiative launched by the Central Bank in 2019 to support small and medium enterprises with the participation of government and private banks (Central Bank of Iraq, 2019). The effect of this initiative is to give a general impression to banks and investors that the Central Bank of Iraq supports the circular economy projects directly. In addition to stimulating the transition to a circular economy and providing sufficient financing resources, this will lead to achieving economic growth, diversifying and providing job opportunities. It is possible to invest some foreign reserves that The Central Bank of Iraq has developed well in the recent period (Graphic 2) to finance this initiative and to be a major initiative at the level of Iraq.

5. Results and Dissection

Iraq possesses the basic elements for establishing the activity associated with the circular economy and its types, especially those related to fossil production waste, as it is from the oil-producing countries. From data collection, it is clear that the steps to transition to a circular economy have not yet started but there are

Graphic 2. Net Foreign Assets of Central Bank of Iraq.



Source: CBI / Research & Statistics Dept. / Monetary & Financial statistics Division.

very few projects that have been mentioned and all of them need to develop and grow with the rest of the economic sectors.

There are many projects submitted by the ministries with the efforts of the economic authorities in Iraq to set up 19 projects that are awaiting approval by the government since 2016 (Appendix 1) and their activities fall directly within the activities of the circular economy (Ministery of Environment, 2016, pp. 15-17), they were not implemented either because of the lack of financing resources or the security conditions that went through Iraq in recent years. It should be noted that most of these projects represent the public sector, and there is no essential role for the private sector that the government must encourage him to invest in such projects even if the starting point is the establishment of linked projects between the public and private sectors.

As for the monetary and fiscal policy in Iraq that were focused on because they represent the main tools of economic policy that did not play the role required to stimulate and finance circular projects. These two policies are still in most aspects with traditional methods and goals, several proposals were given as unconventional policies and procedures, it was applied to will encourage investors to invest in the circular projects.

The Iraqi government should take real steps towards setting up investment projects in circular activities or encouraging their establishment by the private sector, as they have large dual effects on the Iraqi economy. The first one being diversifying the Iraqi economy, move the economic cycle and drive towards economic growth, which means low unemployment, the second effect is to achieve the environmental goal and provide a good quality of life for citizens who suffered from high pollution rates as a result of wars that they went through.

Therefore, in the first step, the Iraqi government must stimulate and finance the transition to a circular economy through its fiscal tools and monetary policy

strategy, and then there will be a basis for creating a circular economy that attracts the private sector to invest in its projects as a second step.

6. Conclusions

- Iraq is characterized by an abundance of natural and human resources, but this abundance was not invested, instead of that it was neglected, as it was possible to invest the waste of water, energy, other resources, especially as Iraqi cities suffer a lot from neglecting. For example, Basra is one of the largest Iraqi cities in terms of oil production, so it is clear that the size of cancerous diseases people of this city suffer from as a result of the combustion of gas accompanying the production of oil. Combustion of gas is a cause of environmental pollution and it also represents a waste of an important source of energy sources, it is about the lack of services provided to the city's residents, which made the Iraqi government pay more attention by providing desalinated drinking water since the drinking water provided to them is salty water, as well as the necessity of providing hospitals and medicines to treat many diseases. The authorities (the governor) think seriously about getting rid of the residents from the waste that filled the streets, then taking care of the population and the environment.
- There are no real government programs that aim to stimulate circular economy projects despite their great benefits at the economic and social levels, both fiscal and monetary policy has not taken a real role in achieving this goal.
- There is a delay in the legislative side in adopting laws that contribute to achieving the goal of adopting circular projects, such as "the Clean Energy Law" or "the Circular Investment Law" or other laws that may represent a program that the government is obligated to abide by.
- Financial and administrative corruption, as well as the fight against terrorism, are two major obstacles to implementing and financing project proposals for recycling in Iraq.

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Appendix 1. CE Projects Waiting for Approval

1. Automatic burning systems for brick factories: proposed by the General Directorate of Industrial Development. Replacement of burning systems for brick factories belonging to the private sector, amounting to 650 factories, with various production capacity and green, modern systems achieve a 40% reduction in greenhouse gas emissions and heat recycling of chimneys, which leads to an increase in the efficiency of the current factories in using less fuel and more quality products.
2. Solar heater project: proposed by the Research and Development Authority. Creating a production line for the solar water heater industry with a production capacity (3000 heaters per year) as a first stage and then increase production capacity to (100,000 heaters/year) as a second stage after the success of the first stage and increasing the awareness of the use of the solar heater and the accompanying energy rationalization. The fact that the heater is one of the most energy-consuming home appliances, and the consequence of this rationalization is to reduce greenhouse gas emissions resulting from the electric power generation that the normal heater works on.
3. Lime cement project: proposed by the General Company for Iraqi Cement. Product lime cement with special specifications that is using in the construction works depends on increasing the heap compared to the material of carnacle and alumina i.e. increasing the cement production with the same energy used for the current burning.
4. Rehabilitation project for Basra Fertilizers Factory (NAMAs): proposed by the General Fertilizer Industry Company. It is a project to rehabilitate Basra Fer-

tilizer Factory in a way that has increased the efficiency of the factory as the product has increased with the rationalization of energy as well as the use of environmentally friendly chimneys and heat recycling. The associated qualification is to reduce greenhouse gas emissions and a significant reduction in carbon and to reduction in other equivalent gases.

5. Electrical Power Improvement Factor Project (NAMAs): proposed by the Communications and Capacity Equipment Company. It is a project that is being implemented by the Communications and Capacity Equipment Company, the Ministry of Electricity and some formations of the Ministry of Industry, where the power improvement factor is added to the energy sources of these buildings, which leads to the exploitation of wasted energy that reaches 25% of the equipped energy and this leads to rationalization In the consumption of electricity, with 25% reduction in carbon.
6. Electrical power improvement coefficient project (CDM): create a project to add power improvement factories to electrical power supplies to reduce waste and reuse of currently lost energies to increase resource efficiency by 25%, and the Ministry of Industry hopes to support this project by registering it within CDM projects.
7. Tire recycling project: proposed by the General Company for Engineering Support. It is a project to reuse tires through cut it and grind it to be valid for flooring, sports stadiums and other uses instead of burning them and causing greenhouse gases emissions.
8. Hydrogen cell generator project: proposed by Al-Zawra State Company. It is an electric power production project using a hydrogen cell. It supplies water and methanol and releases oxygen instead of greenhouse gases that accompany the generation of electricity from sources currently used.
9. RO Water Purification and filtering System Project: proposed by the Research and Development Authority. It is to create a production line for the manufacture of solar powered water purification and filtering systems and the consequent non-use of traditional electric energies and the resulting greenhouse gas emissions.
10. Photoelectric energy project for the Energy Research Center building proposed by R&D Authority is to provide the building of the Renewable Energy Research Center with electric energy using optical cells and the accompanying use of smart energy consumption systems and economic and smart lighting systems and the accompanying project of the lack of greenhouse gas emissions accompanying the generation of this energy, even if its generation depends on traditional methods.
11. Waste recycling project proposed by Al-Rasheed Compact Company: works to recycle waste with a production capacity of 1000 tons for every factory and twenty recycling factories distributed to all governorates, and these capacities will be increased in the future. As is well known, waste recycling is one of the most important global reduction projects, as it prevents leakage methane and other greenhouse gases for the atmosphere, as well as using the gases and materials emitted from recycling process to produce clean energies.

12. Hydroelectric Welding Machine Project proposed by the General Company for Hydraulic Industries: it is to create a production line for the welding machine that is powered by hydroelectric energy instead of electrical energy. As is well known, the global consumption of electrical energy for these machines produces gases in large quantities if these machines continue to operate with electric energy.
13. Submersible pumps project proposed by the General Engineering Support Company: is a project to manufacture water pumps of various types, capacities and horsepower capabilities powered by solar energy, and in this project double benefit can be achieved by reducing emissions and adapting to climate change in terms of not using electricity or fuel-powered pumps that are accompanied by a large emission of gases as well as the ability to operate pumps in remote areas and away from energy sources, which would allow it to work on cultivating new areas, it might add green spaces and air-purifying belts to surround cities and reduce desert areas.
14. Solar barley cultivation project (adaptation), proposed by the General Company for Hydraulic Industries: the project is to produce high-quality animal feed through the cultivation and cultivation of barley in multi-shelves incubators and air-conditioned layers with a specific moisture content and standard heat and the use of solar panels in generating the required for these incubators and production will be during a period not exceeding 10 days only and without emissions of greenhouse gases contrary to the way of cultivating them in the ground in the traditional way which are accompanied by the exploitation of lands with vast areas, longer times and wastage of water, in addition to the greenhouse gas emissions that are caused by tillage and cultivation.
15. Tissue buds project (adaptation) proposed by the private sector: a project that aims to multiply palm seedlings and buds of economic plants such as olives and citrus fruits in a laboratory by adopting tissue reproduction and cultivation in a standard laboratory setting, the project's productivity reaches half a million buds annually with high-quality specifications that are resistant to the external environment and disease-resistant as these distinctive shoots with the required specifications are replanted in regular lands and each according to the region's need and the project works to re-develop the Iraqi agricultural activity The resulting purification of the climate, the consumption of CO2 gas and the release of O2 gas.
16. Project for the production of general lighting fixtures (LED) proposed by the General Electric and Electronic Industries Company: is a project to produce lighting compositions working with LED, with production capacity meets the need for the local market, and this project is accompanied by a very large rationalization of electrical energy in the event that these lamps are used in place of the traditional high-consumption light bulbs currently used.
17. Scrap metal recycling project proposed by the General Engineering Support Company: it is a project that aims to collect scraps of military waste and cars and recycle them to produce iron clips, plastic granules and other by-prod-

ucts, and it is considered one of the most important projects to preserve the environment from iron waste and a great rationalization of energy in the event of recycling instead of obtaining primary materials through their production from natural sources.

18. Carbon Dioxide Retention Project proposed by a ministerial committee chaired by the Ministry of Industry and the membership of the ministries of oil, health and electricity: it is a joint strategic project between the four ministries and has prepared a full technical and economic feasibility study aimed at separating and capturing carbon dioxide gas, liquefying, transporting and injecting it in geological structures in Basra governorate to improve the viscosity of oil and get rid of CO2 gas from power plants, iron and steel, petrochemical, paper and fertilizers factories, which are very large quantities in the event of retention, a significant reduction in emissions is achieved, in addition to reducing the use of water for injection associated with the production of oil, so this project is one of the most promising projects and achieve the largest quantities of desired reduction.
19. Project for the production of building sections using palm waste – (palm –fiber polymers (pfp)) proposed by the private sector: it is a multi-benefit project that works on the exploitation of palm waste and its accompanying areas to clean the lands and increase the encouragement of agriculture and not to burn waste by random methods or neglecting it and its decomposition and emission of gases from it, in addition to the manufacture of construction sections of high thermal insulation and quality works to adapt to the rise in the temperature of the land and also will reduce the use of other constructional sections such as blocks and bricks and the accompanying production of energy consumption and greenhouse gas emissions, as well as to preserve the coolness of the buildings that are built from them, which reduces energy consumption for refrigeration, so this project is one of the most important modern private sector projects with indirect benefits in the field of emission reduction of gases greenhouse and adaptation to climate change (Ministery of Environment, 2016, pp. 15-17).