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“Alternative Methods for Decreasing Infrastructure Deficiencies in Iraq”

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Abstract

Economic Development is closely linked to efficient social and physical infrastructure systems. This paper investigates the impact of this tandem interrelationship with an emphasis on the case study of Iraq. A review of nature of the Iraqi economy and existing conditions of selected infrastructure sectors indicates clear deficiencies. This deficiency constitutes an obstacle to sustainable economic development needed for a steady population growth. Overcoming deficits to infrastructure service levels require the implementation of a Public-Private partnership to catch up with needs and demand.

One form of this partnership is the BOT contracts which can accelerate the delivery of services. Existing economic and business environment are not ideal for the local and foreign n investors to engage in such contracts, but impediments are diagnosed by concerned governmental entities which may reverse the infrastructure reality in Iraq.

"اساليب بديلة لتخفيض العجز في البنى الارتكازية في العراق"

المستخلص

ترتبط التنمية الاقتصادية ارتباطا وثيقا بوجود نظم فعالة للبنية التحتية الاجتماعية والمادية. تبحث هذه الدراسة في تأثير هذا الترابط جنبا إلى جنب مع التركيز على دراسة حالة العراق. يتناول البحث استعراض لطبيعة الاقتصاد العراقي والظروف القائمة في قطاعات البنية التحتية المختارة والتي تؤشر جوانب القصور الواضحة. يشكل هذا النقص عائقا أمام التنمية الاقتصادية المستدامة اللازمة لنمو السكان المطرد. التغلب على العجز في مستويات خدمة البنية التحتية تتطلب تنفيذ شراكة بين القطاعين العام والخاص للحاق بركب الاحتياجات والطلب.

التي يمكن BOT شكل واحد من هذه الشراكة هو عقود تسريع تقديم الخدمات. البيئة الاقتصادية والتجارية القائمة ليست مثالية للمستثمرين غير المحليين والأجانب على الانخراط في مثل هذه العقود، العوائق قد تم تشخيصها من قبل الؤسسات الحكومية المعنية والتي تنعكس ايجابا على واقع البنية التحتية في العراق.

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Stating the fact that adequate infrastructure leads to economic development is not a new concept. Physical infrastructure is always regarded as a prerequisite to economic development. No country embarking on an ambitious economic development plan is expected to reach the goals of such a plan without the proper planning, financing and implementation of integrated infrastructure network.

To start with, it is imperative to define the two terms that are fundamental to this paper, namely economic development and infrastructure in order to comprehend interrelations between them. **Economic D evelopment** generally refers to the sustained, concerted actions of policymakers and communities that promote the standard of living and economic health of a specific area. Economic development can also be referred to as the quantitative and qualitative changes in the economy. Such actions can involve multiple areas including development of human capital, critical infrastructure, regional competitiveness, environmental sustainability, social inclusion, health, safety, literacy, and other initiatives.

On the other hand, and almost by definition, **Infrastructure** is the basis for development. For an economy, it is the foundation on which the factors of production interact in order to produce output. This has long been recognized by development analysts, and infrastructure often termed "social overhead capital" is considered to include those services without which primary, secondary, and tertiary production activities cannot function. In its wider sense it include all public services from law and order through education, and public health to transportation, communication, power and water supply, as well as agricultural overhead capital as irrigation and drainage systems. To broaden this definition, infrastructure can include human infrastructure or those services designed to raise labor productivity such as health, education, and nutrition.

To cite a number of examples to illustrate this tandem relationship , two studies of 100 countries have found that 10% increase of secondary school enrolment has contributed to an increase of GDP per capita of 0.2 (barro, 1991)and 0.7 (baumol, 1989)respectively. Another example can be seen in table (1) through a cross country study of 58 countries, where it clearly shows that improvements in certain agriculture related infrastructure services are accompanied by an aggregate increase in economic output.

Table (1) Effects of Infrastructure on Agriculture

Due to 1% increase in	Increase of aggregate growth output %
irrigation	1.26
Paved roads	0.26
Rural roads density	0.12
Adult literacy rate	0.54

Source: inswager H 1991

Other scholars have pointed to additional benefits to improving infrastructure performance. Lederman, Maloney, and Servén (2005) have found that the efficient provision of infrastructure is crucial for the success of trade-liberalization strategies aimed at optimal resource allocation and export growth. Access to infrastructure services, on the other hand, has been found to play a significant role in helping reduce income inequality (Estache, Foster, and Wodon 2002; Calderón and Chong 2004; Calderón and Servén 2004a; Galiani and others 2005)

Assessing the Dual Impact

There are two sets of evidence to assess the impact of infrastructure on the development process. First is the aggregate country, regional and sectoral level has been used to the impact of infrastructure on economic indicators such as levels and growth of output. Micro level evidence is used to explain the influence of infrastructure on household and individual welfare levels (Human infrastructure) and profitability of firms (physical infrastructure).

Recent studies at both the macro and micro level have reinforced the point that investments in human and physical infrastructure are critical elements for economic growth and for reducing poverty, although there have been fewer consensuses on the magnitude of that effect. While the literature continues to accept the key role of government in investment policy, there has been more of a debate about the nature of that role to improve efficiency and equity.

Status of Iraqi Economy

The economy of Iraq has suffered twenty years of neglect and degradation of the country's Infrastructure, environment, and social services. Since the mid-1980s, the ruling regime has neglected public infrastructure and investment, and conflicts have resulted in further damage to buildings, pipelines, communication equipment, and transportation links. The health and education systems, once widely regarded as among the best in the Middle East, have seriously declined as a result of both a severe lack of resources and years of politicization. In recent years, the Iraqi economy has experienced sharp changes compared to other countries in the region as can be concluded from table (2) and figure (1). Gross domestic product has risen from 1.5 percent in 2007, to a projected 12.60 percent in 2012, which

puts Iraq ahead of other countries in the region and perhaps the world.

Table (2) Average Real GDP Growth In Selected Middle Eastern Countries

COUNTRY	2007	2008	2009	2010	2011 Projections	2012 Projections
QATAR	18.00	17.7	12.00	16.6	18.70	6.00
IRAQ	1.50	9.50	4.20	.80	9.60	12.60
SAUDI ARABIA	2.00	4.20	0.10	4.10	6.50	3.60
UAE	6.50	5.30	-3.20	3.20	3.30	3.80
EGYPT	7.10	7.20	4.70	5.10	1.20	1.80
ARAB AVERAGE	6.70	4.50	2.60	4.30	3.10	3.20
GLOBAL	5.44	2.79	-0.66	5.11	3.96	4.00
DEVELOPED WORLD	2.76	0.09	-3.72	3.07	1.61	1.92
DEVELOPING WORLD	8.87	6.03	2.80	7.33	6.40	6.08

Source: IMF Data

The quartile nature of the Iraqi economy, whereby the crude oil extraction and exportation sector accounts for 44 percent of the domestic product generated and 93 percent of total exports. The Iraqi economy's significant exposure to the external world as a natural outcome of the low contribution by commodity sectors (excluding oil) in GDP generation, 28.6 percent for commodity activities, 38 percent for distributional activities, and 33.4 percent for service activities for the period 2004-2008. These rates explain Iraq's need to increase imports from the outside world to cover increasing local demand, as the increase in operating expenses in the public budget ultimately translated into increased demand in the domestic market.

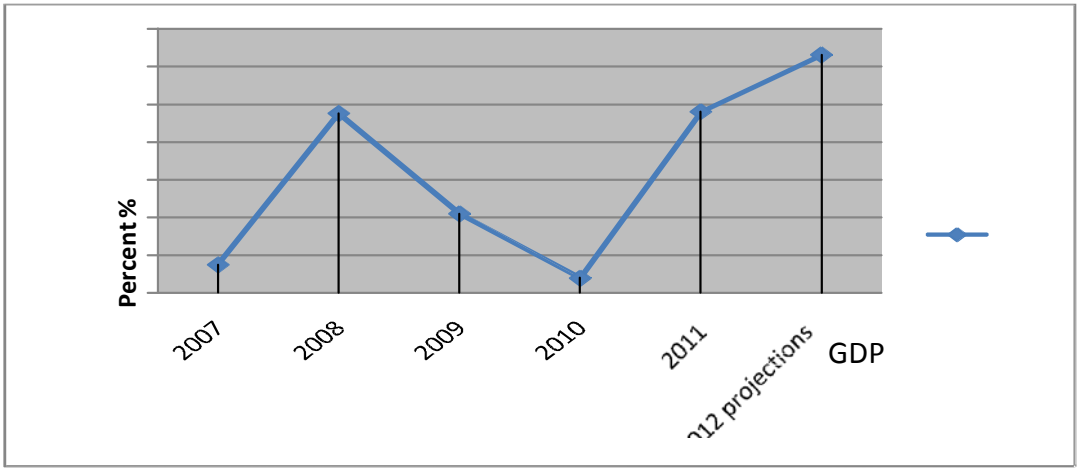

Figure (1) Iraq GDP Real Growth 2007-2012

The most telling evidence of this fact is the increase in the imported portion, as compared to the domestic portion, of commodity supply in the Iraqi market.

A direct result of this structural deficiency is the continuous deficit in public investment funds to match the growing demand for various social and physical infrastructure services. Current estimates of funds that will be spent and needed to upgrade the Iraqi economy are enormous. Iraqi investment commission estimated Iraqi infrastructure needs to be around $700 billion over the coming 10 years. Table (3) estimates this deficit to around $21 billion over the next four years.

Table (3) Total Iraqi Economy Revenues 2010-2014

year	$Price / barrel	Daily export mil barrel	Oil Revenues $ Billion	Non oil Revenues $ Billion	Total Revenues $ Billion	Investment allocation	Available Investment allocation $billion	Investment Deficit $ Billion	Needed investment $ Billion
2011	76.5	2.30	63,342	4,000	67,342	0.40	26,937	3,063	30,000
2012	78.5	2.70	76,302	4,400	80,702	0.42	33,895	6,105	40,000
2013	80.5	3.30	95,634	4,840	100,474	0.44	44,209	5,791	50,000
2014	84.5	4.00	121,680	5,324	127,004	0.48	60,962	6,038	67,000
							166,002	20,998	187,000

Despite being a middle-income country, Iraq faces challenges commonly found in countries at Lower income levels. These include: (i) excessive dependence on one primary commodity, namely, crude oil; (ii) significant infrastructure reconstruction and rehabilitation needs; and (iii) declining absolute standards of living. This picture becomes more problematic when looking at the demographic trends. The absolute population growth rate in Iraq has risen rapidly and continually and has not been affected by growth or decline in the Iraqi economy over time. This was confirmed by the results of the five general population censuses conducted in Iraq beginning in 1947 and ending with the most recent in 1997. It was also confirmed by population surveys and estimates prepared by the Iraqi Central Statistics Organization (CSO) in 2003. Data show that the Iraqi population increased from about 8 million people in 1965 to 12 million people in 1977, to 16 million people

in 1987, to 22 million peo ple in 1997, to 26 million people in 2003 to 30.5 million people in 2008. The Iraqi population is expected to reach 35 million people by the year 2014.

Iraq Infrastructure Conditions

Years of conflict, deferred maintenance, weakened technical and management capacity, and neglect have resulted in serious degradation of Iraq's infrastructure.
Most Iraqis today have limited or no access to essential basic services or must rely on costly alternatives for electricity and water services. Billing systems and associated revenues that maintained operations have collapsed and need to be reinstated as a critical priority.

The education system in Iraq was widely regarded as one of the best in the Middle East until the 1980s. In the preceding years, the country had made great progress at all levels of education and had achieved nearly universal primary enrollment by 1980. Thereafter, the system went into a steady decline driven by a combination of: (i) lack of resources, as public funds were siphoned off for military expenditures and other priorities of the ruling regime; and (ii) the politicization of the education system, which influenced everything from curriculum, to teaching staff, to admissions policies. In 1989, the education budget was US$2.5 billion (some 6 percent of GDP) with a per student expenditure of US$620. Over the period 1993-2002, expenditure per student dropped to only US$47. Of the approximately 13,000 primary and secondary schools, some 80 percent require significant reconstruction; and 700 of these need to be completely rebuilt.

About 300,000 students are enrolled in higher education institutions. Faculty numbered around 14,500 in 2001. Higher education currently suffers from both a decade of under-investment and great damage from the latest conflict and the subsequent looting and arson.

The rest of the decline in higher education can be attributed to the high level of political interference in the university curriculum, instruction, and management that drove experienced staff out in the 1980s and 1990s. Sanctions, which cut off access to up-to-date knowledge and technology, also severely damaged the higher education system. There is a strong demand for decentralization and increasing autonomy, meaning that there will be a need for extensive management training for both administrative and teaching staff. To date, higher education has been funded almost exclusively by the state, with very low user-fees only recently being introduced in the center and south of Iraq.

The functional capacity of health care services was further weakened by widespread looting in April 2003, the subsequent unpredictability of electricity and water supply, and the general insecurity that created an extremely inhospitable working environment for health personnel.

Iraq suffers from a decline in the rate of quantitative and qualitative facilities for drinking water; coverage is no more than 90 percent in urban areas and 65 percent in rural areas. There is an even bigger

problem with respect to sanitation. In Baghdad, coverage by sanitation projects is approximately 75 percent and no more than 3 percent in other urban areas. There is a complete lack of these services in rural areas. The sewerage collection and treatment system serves mainly the city of Baghdad, where it reaches approximately 80 percent of the population. Only 9 percent of the urban population outside of Baghdad is served by sewage systems while the rural areas and the north of Iraq does not have piped sewerage systems. The sanitation system is becoming a serious environmental and health concern.

Because Iraq is a relatively large country with a total land area in excess of 432,000 sq. km and a population of approximately 32 million, transportation systems play a central role in the movement of people and goods. In the short term, it will be essential to restore basic transport infrastructure to enable the efficient delivery of essential commodities and services, i.e. grain to mills, pharmaceuticals, spare parts for the electrical and water/sanitation networks, and inputs for reconstruction works to sustain the overall reconstruction effort. As the system is modernized, it will also be an opportunity to reduce detrimental environmental and health impacts.

Vision of the National Development Plan (NDP) 2010-2014

In an attempt to use its economic resources, the government of Iraq has drawn a mid range plan in which the private sector has a leadership role in generating wealth and jobs, while the government performs an organizational and enabling role to address market failures and ensure equitable distribution of national income so as to enable the most vulnerable social groups to fulfill their role effectively in achieving economic and social progress One of the main assumptions upon which the plan is built is reliance on a comprehensive and sustainable model of development so as to achieve economic prosperity and the quality of life, and effectiveness of the Iraqi people. The major element of the plan is based upon the following sectors:

- **Crude oil extraction**, as it guarantees sustainable financial resources at this timeframe.
- **Electricity** as one of the central activities relied upon by all production and life activities and areas
- **Agriculture**, as it guarantees food security, reduces food imports, and creates a vast number of job opportunities that can reduce unemployment in rural areas and alleviate Poverty
- **Social development services**, as it is the sector focused on building up the citizenry and providing a Social umbrella. It includes the basic infrastructure supporting services (water and sanitation, education, health, culture, youth and sports, as well as enablement in the area of housing), other services related to the MDGs, and achievement of strategic poverty alleviation objectives.
- **Transportation**, as it is an important sector that supports the flow of economic activity and increases its efficiency. It also has a profound impact on the population's quality of life.
- **Conversion industries**, as Iraq possesses capabilities, in terms of natural and human resources, that guarantee it a comparative advantage in many industrial activities such as petrochemical, chemical, fertilizer, cement, and food industries. They also constitute a crucial starting point for diversifying the national economy,

invigorating participation by the private sector, and ensuring job opportunities.

The magnitude of investment needed to achieve the plan's target growth rate of 9.38 percent annually is 217,637 trillion dinars, or US$186 billion. It is anticipated that development partners (the domestic and foreign private sector) will fund US $86 billion, which will be spent in the various fields specified by the plan, as well as other activities not set forth in the plan such as insurance, banks, and other personal services.

Alternative Infrastructure Provision Method

It is clear that required levels of investments cannot be met by the government alone. Major Infrastructure project have always been formidable to finance and operate. For example, at one time, the interest on the debt from the construction of the Suez Canal was larger than Egypt's national income. As a result, the Egyptian government was forced to sell the canal to the British. The public/private sector partnership in various infrastructure sectors has evolved to become an important option to overcome liquidity constraints faced by many countries around the world. Iraq is no exception to this trend.

Infrastructure rehabilitation will play a key role not only in improving service quality and coverage across a range of subsectors but also in enhancing Iraq's competitiveness and security as it seeks to attract investment and promote development of the private sector. Some of the proposed investments in the sector assessments are also critical to facilitate the import and distribution of strategic commodities and construction inputs necessary for the overall reconstruction effort.

Despite of the unattractive environment for the private sector to participate effectively in the much needed rebuilding and rehabilitation of existing infrastructure, it seems that private sector involvement is a strategic alternative to the meeting the needs of the economy and population. The telecommunication sector was perhaps the first experiment in Iraq since 2003.

Partnership contracts allows the public sector to offer the private sector concessions to build and operate facilities for pre determined timeframe and with its expiring all ownership rights shall return to the government. Such time frame allows the private sector entity to recover all costs and gain significant dividends. During the period of the partnership contract, the government pledge to buy the service at hand. The most implemented form of these contracts is the build-operate-transfer agreement known as "BOT". The terminology that has been used to describe BOT type projects varies widely. Some of the terms encountered are listed in Table (4). In a **BOT Project** the project company or operator generally obtains its revenues through a fee charged to the utility/ government rather than tariffs charged to consumers. A number of projects are called concessions, such as toll road projects, which are new build and have a number of similarities to BOTs.

Table (4) Terms Used to Describe BOT Projects

Acronym	Title
BOT	Build-Operate-Transfer
BOOT	Build-Own-Operate-Transfer
BOT	Build-Own-Transfer
DBOT	Design-Build-Operate-Transfer
DBOM	Design-Build-Operate-Maintain
BOO	Build-Own-Operate

Source: S C Macarthy and R L K Tiong, 2009

In France, the first concession for water supply was let by Perrier brothers in 1782.In the nineteenth century, concessions were widely used in France, Spain, and Germany for water supply projects. Many roads in Britain, the USA, France, and other countries were constructed as turnpike roads. A turnpike road was privately owned, and tolls were levied by the owner on all road users. In the period after the Second World War concessions were let in France and Spain for the construction and operation of some of the major motorways. Due to mixed results in the face of increasing construction and operation costs, and a slowdown of traffic growth interest in BOT has declined somehow until the 1980's.

Since the early 1980s, there has been a remarkable interest in BOT schemes. As construction contractors become more competitive in the quest for business, and as capital markets became more sophisticated, it is increasingly possible to assemble the necessary ingredients for BOT projects. In addition, there is an increased willingness by many governments to privatize infrastructure projects, and there are increasing difficulties with obtaining sovereign loans from commercial banks for developing countries. The achievement of the Eurotunnel in raising equity of approximately $1500M for the channel tunnel project further inspired worldwide interest in BOT schemes.

There are numerous examples of successful implementation of these partnership contracts around the world whether in the electricity production, railroads, ports, airports, or hospitals.

BOT schemes are often regarded as a new development, and the term itself is widely thought to have been coined in 1984 by the then prime minister if Turkey. However, this type of arrangement has been used for several centuries, and much of the infrastructure of a number of countries was put into place by the use of concessionary arrangements that were similar to BOT methods.

To better understand the nature of BOT contracts, the following discussion provide an overview of major characteristics.

-In a **BOT project**, the public sector grantor grants to a private company the right to develop and operate a facility or system for a certain period (the "Concession Period"), in what would traditionally be a public sector project.
-Usually a discrete, greenfield new build project.

-Operator finances, owns and constructs the facility or system and operates it commercially for the concession period, after which the facility is transferred to the authority.
-BOT is the classic tool for project finance. As it relates to new build, there is no revenue stream from the outset. Lenders are therefore anxious to ensure that project assets are ring-fenced within the operating project company and that all risks associated with the project are assumed and passed on to the appropriate actor. The operator is therefore usually a special purpose vehicle.
-The revenues are often obtained from a single "offtake purchaser" such as a utility or government, who purchases project output from the project company (this is different from a pure concession where output is sold directly to consumers and end users). In the power sector, this will take the form of a Power Purchase Agreement.
-Project Company obtains financing for the project, and procures the design and construction of the works and operates the facility during the concession period.
-Project Company is a special purpose vehicle; its shareholders will often include companies with construction and/or operation experience, and with input supply and offtake purchase capabilities. It is also essential to include shareholders with experience in the management of the appropriate type of projects, such as working with diverse and multicultural partners, given the particular risks specific to these aspects of a BOT project. The offtake purchaser/ utility will be anxious to ensure that the key shareholders remain in the project company for a period of time as the project is likely to have been awarded to it on the basis of their expertise and financial stability.
-Project Company will co-ordinate the construction and operation of the project in accordance with the requirements of the concession agreement. The off-taker will want to know the identity of the construction sub-contractor and the operator.
-The project company (and the lenders) in a power project will be anxious to ensure it has a secure affordable source of fuel. It will often enter into a bulk supply agreement for fuel, and the supplier may be the same entity as the power purchaser under the Power Purchase Agreement, namely the state power company. Power is also the main operating cost for water or wastewater treatment plant and so operators will need certainty as to cost and source of power.
-The revenues generated from the operation phase are intended to cover operating costs, maintenance, repayment of debt principal (which represents a significant portion of development and construction costs), financing costs (including interest and fees), and a return for the shareholders of the special purpose company.
-Lenders provide non-recourse or limited recourse financing and will, therefore, bear any residual risk along with the project company and its shareholders.
-The project company is assuming a lot of risk. It is anxious to ensure that those risks that stay with the grantor are protected. It is common for a project company to require some form of guarantee from the government and/ or, particularly in the case of power projects, commitments from the government which are incorporated into an Implementation Agreements.
-In order to minimize such residual risk (as the lenders will only want, as far as possible, to bear a limited portion of the commercial risk of the project) the lenders will insist on passing the project company risk to the other project

participants through contracts, such as a construction contract, an operation and maintenance contract.

Impediments

Successful implementation of BOT contracts requires the presence of vibrant private sector.

Reliance on foreign partners to implement the BOT method to upgrade and modernize the infrastructure stock in Iraq is not always feasible due uncertain long range political outlook and structural deficiencies. This is taking place despite the vast wealth of the Iraqi economy stemming from huge reserves of natural resources. The World Bank in its annual ranking of ease of doing business in Iraq classifies the country as 164 place out of 183 countries throughout the world .Hence, it is vital that the local private sector in Iraq assume a larger role. However, the private sector in Iraq is confronted with a multiple chronic dilemmas which in effect limit its efficiency. Iraq national development plan outlines the challenges facing the private sector as follows:

1. Absence of a suitable investment environment that encourages mobilization of the local and foreign private sector's potential and capabilities in support the national economy
2. Lack of clarity on the private sector's role in effective development, along with absence of a clearly defined vision for this role once the economy is restructured and its production base is built.
3. Overly complex government procedures on the business front that have pushed businessmen and investors out of the Iraqi arena.
4. Shortage of laws and regulations that activate the private sector's role in economic activities, limiting the possibility of maximizing this role and eroding its competitiveness.
5. Shortage of the specialized banking system's credit capabilities has limited the possibilities for lending and borrowing by the private sector to finance its investment objectives, and limited the effectiveness of specialized banks.
6. The Iraqi stock market lags behind and is far removed from developed financial rules and principles adopted internationally, which has undermined the Iraqi investor's financial strength
7. Increases in interest rates are considered a monetary constraint on the credit offered to the private sector by government banks for investment purposes
8. Reliance on state protection and support systems as opposed to competition has caused the Iraqi private sector to disregard efficiency and competitiveness standards in its investment decision-making process.
9. Economic reform programs lack the necessary economic, financial, legal, and administrative measures necessary to restructure public institutions. This has limited the possibility of commencing privatization operations or merger of public or private institutions. If they do commence, these operations will be far removed from proper economic, accounting, financial, and legal standards because these requirements are absent
10. Inadequate infrastructure and basic services for the private sector have led to the deterioration of the private sector's competitive position locally, regionally, and internationally.
11. The private sector's inadequate knowledge, information, and technology base; its inability to absorb or keep up with rapid changes in the global market—factors essential to competition and access to foreign markets.

Conclusion

It is evident from the preceding discussion that Iraq is experiencing a serious problem with regard to infrastructure provision sectors despite a vast natural and human resources. Meeting the needs of a growing population, while embarking on an ambitious economic development with double digit growth rates, requires significant investments in all infrastructure services. To bring adequate level of service, while taking into consideration all existing economic and social conditions indicate the need for alternative methods and techniques to meet needs and demand. One possible alternative is the adaptation of public-private sector partnership to promote a healthy economic environment and to upgrade the living standards of the population. This cannot be achieved without resolving the numerous challenges facing the local private sector as well as obstacles preventing foreign investors from showing interest to do business in Iraq. It is somehow comforting to know that the Iraqi government through its proposed National Development Plan has recognized the impediments, but formulating solutions is not an easy task. The issue takes the shape of a viscous cycle. Better Infrastructure requires significant involvement from the private sector, while the private sector is not able or hesitant to take part. In order to sustain the projected economic growth, major structural economic changes should be implemented to escape this cycle.

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