

## The impact of Some Public Finance variables on the Gross National Savings in Iraq<sup>(1)</sup>

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### Abstract:

The paper attempts to show the impact of public finance in on gross national savings in Iraq for the period 2004-2024, by using a regression analysis model in addition to adopting several statistical techniques in the purpose of testing the model validation. Unit root tests show that both gross national savings and public finance variables are stationary in levels. Regression analysis show that there are significant relationships between gross national savings and a couple public finance variables included in the model: current expenditure, capital expenditure, and Overall fiscal balance (including grants). The group of independent variables represented in this model are jointly significant. Cointegration test is established for gross national savings and public finance suggesting there is a long-run equilibrium relationship between the series. Finally, LM test result reveal that the proposed model is valid as there is no serial correlation in the errors in the model. The research came to the conclusion that there are still significant challenges for Iraq's financial system to work effectively, from which the continued need for security must be reinforced first and foremost. The suggestions from this research stress on the importance of maintaining a stable macro-financial environment and enhance the business environment. In addition, many structural reforms also have to be completed, in particular in the areas of public financial administration and banking restructuring.

**Keywords:** Gross National Savings; Public Finance; IMF; Multiple Regression Analysis; Cointegration.

### أثر بعض مؤشرات المالية العامة على الادخار المحلي الإجمالي في العراق

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### المستخلص:

يسعى البحث الى بيان أثر متغيرات المالية العامة على الادخار المحلي الإجمالي في العراق للمدة من ٢٠٠٤-٢٠٢٤، من خلال استخدام تحليل الانحدار المتعدد بالإضافة الي تبني عدد من الاختبارات الإحصائية التي تهدف الي التحقق من صلاحية النموذج المقدم. يظهر من اختبارات جذر الوحدة ان كل من الادخار المحلي الإجمالي ومتغيرات المالية العامة ثابتة عند المستوى. يتبين

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من اختبار تحليل الانحدار المتعدد أن هناك علاقة معنوية بين الادخار المحلي الإجمالي وعدد من متغيرات المالية العامة المشمولة بالنموذج وهي: الانفاق الجاري، الانفاق الرأسمالي، واجمالي الموازنة المالية الحكومية (ومن ضمنها المنح)، إضافة الى معنوية المؤشرات المقدمة في النموذج مع بعضها. وتم تبني اختبار التكامل المشترك للادخار المحلي الإجمالي مع متغيرات المالية العامة للتحقق من وجود علاقة طويلة الاجل ما بين متغيرات البحث. وأخيراً، تؤشر نتائج اختبار LM على صلاحية النموذج المقدم. استخلص البحث الى ان ما زال هناك تحديات كبيرة امام النظام المالي العراقي لكي يعمل بكفاءة، ومن ضمن اهم النقاط هي الحاجة الدائمة للأمان التي يجب تعزيزها. يقترح البحث على تأكيد أهمية الحفاظ على بيئة مالية مستقرة وتحسين بيئة الاعمال. بالإضافة الى الحاجة الى اجراء العديد من الإصلاحات وبالأخص في مجال إدارة المالية العامة وإعادة الهيكلة المصرفية.

**الكلمات المفتاحية:** الادخار المحلي الإجمالي، المالية العامة، صندوق النقد الدولي، تحليل الانحدار المتعدد، التكامل المشترك.

## 1. Introduction:

For each country to regulate the financial environment under which it operates, a balancing act and a suitable fiscal policy are required. The stability of the financial and economic system in the country is influenced by certain characteristics: (Okazaki and Fukumoto, 2011: 2-15)

- good economic and financial fundamentals: certain factors function favorably in keeping the economy relatively stable. These include (a) a strong external position, (b) a sound fiscal position, (c) moderate debt, (d) a high level of domestic savings, and (e) a stable banking system.
- Cross-border movement of capital to/from the country: (a) total flow of capital, (b) direct investment, (c) investment in the portfolio, (d) other capital transactions.

Well-developed financial systems help promote the exchange of goods and services through the provision of payment services; help mobilize and pool investor savings; collect and process market information and potential investment projects, thus allocating the savings of society to its most beneficial use; track investments and exercise corporate governance; and help diversify and mitigate liquidity and inter temporal risk (Beck and Rahman, 2006: 1-2).

In other words, a well-functioning financial system plays a very important role in generating high levels of savings, promoting efficient investment distribution, and mitigating non-financial economic uncertainty. It is also one of the main elements to achieve optimum levels of productivity growth and growing incomes. The importance of this

contribution can be seen in the disparity in economic performance between countries with open financial system and the ones that have a tightly regulated financial system. This comparison of the financial world's contribution and value development demonstrates the relation between the use of financial systems and productivity. (Crockett, 2011: 6).

But in addition to its function as a medium for credit intermediation, the financial system also offers value in at least three other substantive areas: risk and insurance, savings and retirement, and inequality. The second cause is that a financial system can serve as a source of credit by allowing investment to take place outside the borders of banks, and in fact even outside of the banking system. And it can also, second, that financial systems can serve as a means of storing capital by defining loans and shares as safer than bonds and deposits because they put such a modest amount of money at risk while offering high interest. The transformation to maturity is a critical aspect in which the financial system contributes value to the rest of the economy in the long run. But, as we have seen in the recent crisis, a major source of vulnerability can also be the leverage with which it is generally associated. (Crockett, 2011: 7-8).

Although a number of major policy reforms have been introduced in Iraq to facilitate progress towards a more market-oriented economy, these reforms have included, inter alia, the completion of the exchange of banknotes, the adoption of new banking and central bank legislation, the introduction of new tax legislation and the simplification of the trade regime, all of which have contributed to the promotion of the overall macroeconomic stability, despite the difficult security environment this has greatly influenced Iraq economy and recovery. Although Iraq's medium-term economic outlook remains favorable because oil prices and production are projected to rise in the coming years.

### **1.1. The importance of the research:**

The importance of this research comes from several studies and researches that reveal the fact that countries with the most developed markets and financial institutions have the best capital markets and can most effectively guide the savings of society to their most beneficial use, and as a result, experience the most rapid economic growth and change, as well as for each country to regulate the financial environment under which it operates, a balancing act and a suitable fiscal policy are required.

## **1.2. The research problem:**

An analysis of Iraq's economic history in the past two decades will reveal several economic crises and failures for the country: two cycles of utter declines in GDP, persistent inflation, wholesale currency depreciation, virtually non-existent foreign investment, and crushing foreign debt burden accumulation. This research investigates the answer to the questions whether public finance has impacted gross national savings under such crises and circumstances.

## **1.3. The aim of the research:**

This paper is to provide a data analysis and assessment between gross national savings and how it is linked to the different public finance variables in Iraq. By using a multiple regression analysis, a dynamic model was established that explains the relationship between gross national savings and public finance in Iraq for the period 2004 to 2024.

## **1.4. The data source:**

For the purpose of this study, 21 observations were gathered from the International Monetary Fund publications in Iraq for the period 2004-2024. The data from 2004 to 2018 are actual as reported by the authorities and IMF, while the data from 2019 to 2024 are estimated by the IMF based on the latest data of the country and are published in the official country reports by International Monetary Fund.

## **2. The Empirical Literature:**

This section deals with past observations and study results relating to public finance and gross national savings and their variables.

Lowe (1992) explored the connection between development and a country's financial system. He argued that long-run growth has its roots in resource accumulation, and specifically in knowledge accumulation. He explained that the financial system has a major effect on both the amount and the form of resource accumulation which takes place. It was argued that the growing scale of financial sector is heavily dependent on the capacity of intermediary institutions to track and control lending. The paper suggests on policymakers to design an institutional framework in which the financial system ensures that savings are allocated to projects that maximize social welfare. The Australian experience showed that as the financial system evolves and the economy becomes more integrated into the global economy, the capacity to efficiently control the system by non-

price structures of the financial system decreases. This means that regulatory rules distort the distribution of limited financial capital.

Merton and Bodie (1995) discussed the main public-policy issues facing the global financial system from a practical perspective. The concerns included: risk-allocation, government control of over-the-counter derivatives, deposit insurance reform, pension reform and privatization, international harmonization of regulatory policies, macro-stabilization, etc. This paper also considered the changes in financial infrastructure and regulation necessary to support further improvements, among these is the need to develop a new branch of accounting to measure the exposure of firms to the risk of unanticipated changes in the economic environment. It suggested that in the future public managers are likely to become increasingly familiar with financial engineering, derivatives, and the advanced financial technology and concepts currently used in the private sector. It also pointed out that public sector managers must do so not only so they can understand the parts of the financial system they regulate, but also to execute their own functions more effectively.

Gorton and Winton (2002) surveyed the last fifteen years of theoretical and empirical research on financial intermediation, they focused on the role of bank-like intermediaries in the saving-investments process, as well as investigating the literature on bank instability and the role of the government. They presented their paper based on some questions: Why do financial intermediaries exist? What are their roles? Are they inherently unstable? Must the government regulate them? Why is financial intermediation so pervasive? How is it changing?

Beck and Rahman (2006) discussed a substantial change in the role of government as a requirement for a sustainable long-term expansion of the financial system. They argued that the government should move from an operator and arbiter in the financial system to a facilitator role, by using recent research and international comparisons. This redefinition of the position of the government is not limited to the banking sector but extends to other areas of the financial system as well, including markets and micro finance, and should be seen as one of the important aspects of the governance reform agenda and in the drive towards a more market-oriented economy that favors economic partnership. The paper suggests on the countries to address the agenda about the importance of financial and

institutional development to sustain long-term economic growth, as cross-country experience had shown.

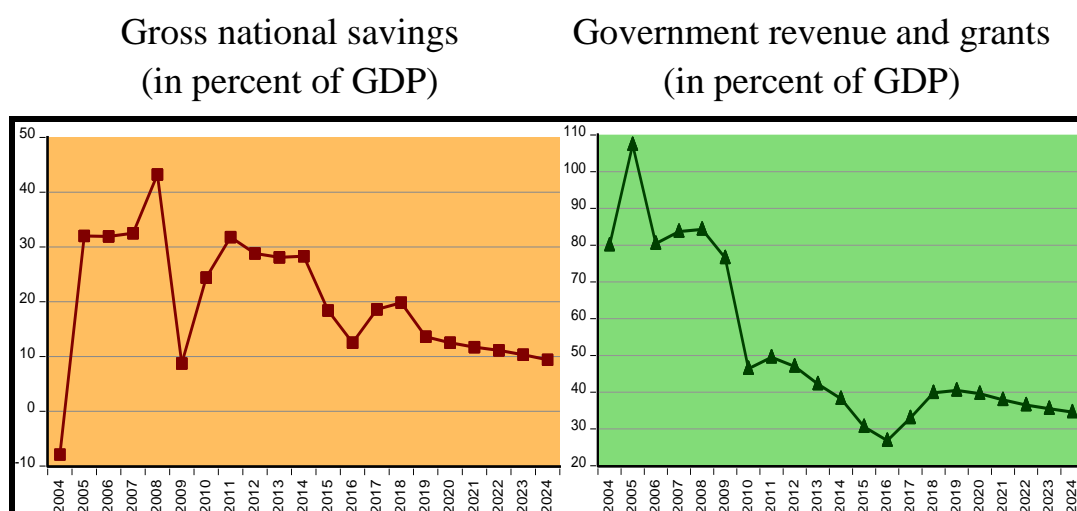
### 3. Data Methodology:

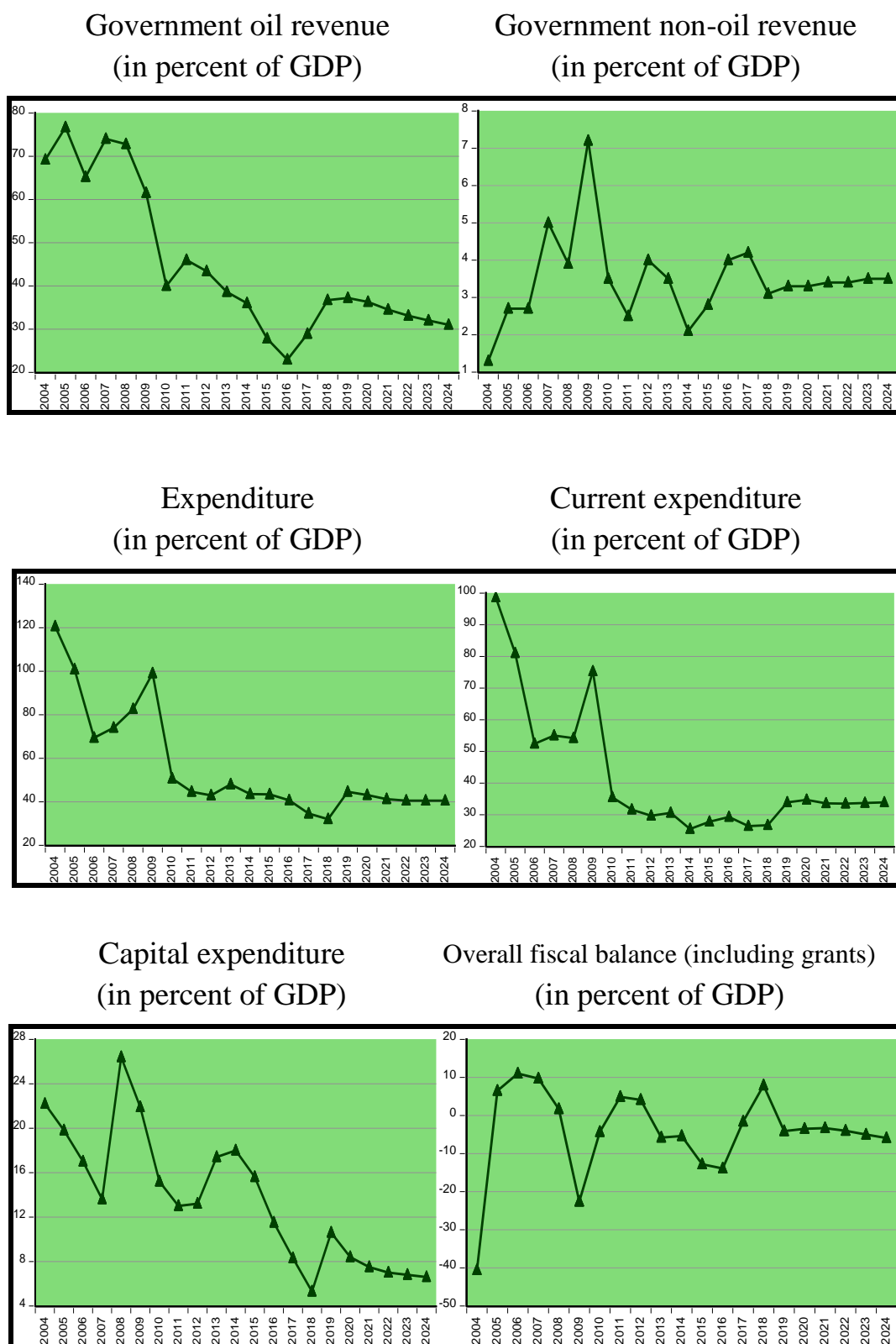
The data used for this study consists of 21 observations, obtained from International Monetary Fund (IMF) publications for the period 2004-2024. The variables we evaluated are Gross National Savings and Public Finance variables that include: Government revenue and grants, Government oil revenue, Government non-oil revenue, Expenditure, Current expenditure, Capital expenditure, and Overall fiscal balance (including grants) respectively.

The amount of Gross National Saving is the total of private, public and foreign saving. This indicates the amount of funds available for investment domestically and/or abroad. Saving depends on shifts in household, government and private consumption and expenditure trends. The amount of economic growth determines the real rate of financial savings.

The word public finance refers to the role of governments in the economy. It is the study of economics which looks at the level of public officials' revenue and expenditure and the way they use it to achieve desired effects and avoid undesirable ones.

In order to understand the data used, we first plotted the time series for Gross National Savings and Public Finance variables as shown in Figure 1.





**Figure 1:** Time Series Plots for the research variables

Source: Derived by the researcher from EViews outcomes analysis based on IMF reports.

Shown in Figure 1 above the normality plots for the 8 variables studied in this research. Results indicate that the variables' series Gross National Savings, Government revenue and grants, Government oil revenue, and Capital expenditure; are normally distributed. Whilst the rest of series; Government non-oil revenue, Expenditure, Current expenditure, and Overall fiscal balance (including grants) do not appear normally distributed, and findings from the figures support these results. Apparent is that all series in this research depict stationarity in their levels.

#### 4. Results and Discussion

The next parts present empirical time series analysis on the relationship between Gross National Savings and Public Finance:

##### 4.1. Johansen Cointegration Test:

Cointegration tests are used to determine the existence of long-run equilibrium relationship between independent and dependent variables. The Johansen cointegration test was adopted for this purpose. Presented below is the test result for the research model.

Table (1): Cointegration test outcome for public finance and gross national savings model

Sample (adjusted): 2006 2024				
Included observations: 19 after adjustments				
Trend assumption: Linear deterministic trend				
Series: B5 C2 C3 C5 C6 C7				
Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
<b>No. of CE(s)</b>	<b>Eigenvalue</b>	<b>Statistic</b>	<b>Critical Value</b>	<b>Prob.**</b>
None *	0.999982	411.0111	95.75366	0.0001
At most 1 *	0.992715	203.5085	69.81889	0.0000
At most 2 *	0.980562	109.9925	47.85613	0.0000
At most 3 *	0.688206	35.12226	29.79707	0.0111
At most 4	0.483977	12.97943	15.49471	0.1156
At most 5	0.021294	0.408955	3.841466	0.5225
Trace test indicates 4 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Source: Derived by the researcher from EViews outcomes analysis based on IMF reports.

From the table above, the null hypothesis of no-cointegration is rejected in the model, implying that Gross National Savings and Public Finance variables are cointegrated. This verifies that there is a long-run equilibrium relationship between Gross National Savings and Public Finance variables in Iraq. The result of this testing procedure is reported at the bottom of the table as (\*) symbol denotes rejection of the hypothesis at the 0.05 level.

#### 4.2. Multiple regression analysis model:

This model examines the relationship between a set of public finance variables and gross national savings, and it shows the level of effect that multiple public finance variables have on gross national savings in Iraq for the period 2004-2024.

$$y_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \beta_3 x_{i3} + \beta_4 x_{i4} + \beta_5 x_{i5} + \epsilon$$

where, for  $i=21$  observations

$y_i$  = Gross national savings (dependent variable)

$x_{i1}$  = Government oil revenue

$x_{i2}$  = Government non-oil revenue

$x_{i3}$  = Current expenditure

$x_{i4}$  = Capital expenditure

$x_{i5}$  = Overall fiscal balance (including grants)

$\beta_0$  = constant term

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$  = slope coefficients for explanatory variables

$\epsilon$  = the model's error term

Table (2): Multiple regression analysis outcome for public finance variables and gross national savings in Iraq for the period 2004-2024

Dependent Variable: B5				
Method: Least Squares				
Sample: 2004 2024				
Included observations: 21				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C2	0.111790	0.132898	0.841176	0.4135
C3	-0.043632	0.400359	-0.108983	0.9147
C5	-0.280641	0.100418	-2.794734	0.0136
C6	1.484245	0.155350	9.554199	0.0000
C7	0.770367	0.109156	7.057466	0.0000
C	9.938941	1.912012	5.198159	0.0001

Variable	Coefficient	Std. Error	t-Statistic	Prob.
R-squared	0.977073	Mean dependent var		19.98571
Adjusted R-squared	0.969431	S.D. dependent var		11.76713
S.E. of regression	2.057361	Akaike info criterion		4.515682
Sum squared resid	63.49104	Schwarz criterion		4.814117
Log likelihood	-41.41466	Hannan-Quinn criter.		4.580450
F-statistic	127.8518	Durbin-Watson stat		2.208553
Prob(F-statistic)	0.000000			

Source: Derived by the researcher from EViews outcomes analysis based on IMF reports.

This model proposes the best multiple regression model that allow us to predict the outcome (gross national savings) based on information provided on multiple explanatory variables (public finance variables). The significant explanatory variables included in this model are current expenditure, capital expenditure, and Overall fiscal balance (including grants). The group of independent variables represented in this model are jointly significant and F value support the significance of this model. As seen from Table 1 there is a significant relationship between three independent variables with the dependent variable, and the variation in the outcome can be explained by the variation in the independent variables. This relationship is supported by  $R^2$  which indicates that 97.7% of the variations in the gross national savings can be explained by changes in a set of public finance variables included in the model.

The output coefficients for explanatory variables from Table 1 interprets that if other variables are held constant, gross national savings will increase by 1.48 if capital expenditure increases by one unit, as well as gross national savings will increase by 0.77 if overall fiscal balance increases by one unit. The model also explains that gross national savings will decrease by 0.28 following a one unit rise in current expenditure. The significant relationship that the dependent variable has with current expenditure is a logical one. Here we refer to the significant relationship that gross national savings has with capital expenditure, they seem to be positively related and that's because any increase in savings leads to an increase in investments as economic theory suggests. The t-Statistic stands for the affect that independent variables have on gross national savings. These results can be confirmed from t-Statistic values; (-2.79) for current

expenditure, (9.55) for capital expenditure, and (7.05) Overall fiscal balance (including grants) as shown from Table 1.

#### 4.3. Breusch-Godfrey Serial Correlation LM Test:

Another test to assess the validity of modelling assumptions in regression models is Breusch-Godfrey Serial Correlation LM Test. It tests for autocorrelation in the errors in the regression model. In other words, it tests for the presence of serial correlation that has not been included in a proposed model structure. Presented below is the test result for the proposed model.

Table (3): LM test outcome for public finance and gross national savings model

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.232246	Prob. F(2,13)	0.7960
Obs*R-squared	0.724447	Prob. Chi-Square(2)	0.6961

Source: Derived by the researcher from EViews outcomes analysis based on IMF reports.

From the table above, we accept the null hypothesis for the proposed model, which means there is no serial correlation in the errors in the model. This result can be confirmed from F-statistic and Chi-Square values for the model, both of them seem to be insignificant as observed from their probabilities where they are bigger than 0.05.

#### 5. Conclusion:

Dynamic relationship between gross national savings and public finance was analyzed using time series data of Iraq for period 2004-2024. Regression analysis indicates that there is a significant relationship between gross national savings and a couple public finance variables included in the model. Cointegration test for gross national savings and public finance show that there is a long-run equilibrium relationship between the series. Over the medium term, Iraq faces immense challenges in restoring its economy. Over the past quarter century, Iraq's social indicators have worsened dramatically, reflecting the deterioration in its infrastructure, chronic economic mismanagement and three destructive wars. Rebuilding Iraq's economy and restoring its people's health and welfare would put considerable demands on the resources of the country. The public spending composition is strongly tilted towards salaries, benefits and transfers.

For Iraq financial system to be functioning in an efficient way there are still serious obstacles. First and foremost is the continuing need for protection to be strengthened. In order to build a viable private sector in order to sustain economic growth and provide much-needed employment for Iraq's labor force, it is also necessary to maintain a stable macroeconomic environment and improve the business climate. Furthermore, several systemic changes, particularly in the areas of public financial management and bank restructuring, have yet to be completed.

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