AIZANOI FINANCE REVIEW

ISSUE: 4 / 2024

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# BUDGET DEFICIT, PUBLIC DEBT, AND ECONOMIC GROWTH: EVIDENCE FROM SINGAPORE

*BÜTÇE AÇIĞI, KAMU BORCU VE EKONOMİK BÜYÜME: SİNGAPUR'DAN KANITLAR*

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**ARTICLE INFO**

**Received**
17.08.2024
**Revized**
13.09.2024
**Accepted**
20.10.2024
**Article Classification:**
Research Article

**JEL Codes**
H10
H60
O40

**ABSTRACT**

The Singaporean government borrowed resources to fund its budget deficit, resulting in public debt. This work examines the impact of this deficit and debt on growth and the direction of the relationship between these three variables in 1980-2015. The findings indicate that budget deficit positively impacts the economy's growth both in the short run and in the long run. Moreover, public debt has a negative impact on development in the short run and has no statistically meaningful impact in the long run. The causality results reveal that there is a one-way causality between budget deficit, public debt and economic growth in the study period.

**Keywords:** Budget Deficit, Public Debt, Economic Growth, Singapore

**MAKALE BİLGİSİ**

**Gönderilme Tarihi**
17.08.2024
**Revizyon Tarihi**
13.09.2024
**Kabul Tarihi**
20.10.2024
**Makale Kategorisi**
Araştırma Makalesi

**JEL Kodları**
H10
H60
O40

**ÖZ**

Singapur hükümetinin bütçe açığını finanse etmek için borçlanması kamu borcunun artmasına yol açtı. Bu çalışma, 1980-2015 yılları arasında bu açık ve borcun büyüme üzerindeki etkilerini ve bu üç değişken arasındaki nedenselliğin doğasını araştırmaktadır. Sonuçlar, bütçe açığının hem kısa hem de uzun vadede ekonomik büyümeyi olumlu yönde etkilediğini göstermektedir. Buna karşılık kamu borcunun kısa vadede kalkınma üzerinde olumsuz etkisi vardır, uzun vadede ise önemsizdir. Nedensellik, çalışma döneminde bütçe açığı, kamu borcu ve ekonomik büyüme arasında tek yönlü bir nedensellik olduğunu göstermektedir.

**Anahtar Kelimeler:** Bütçe Açığı, Kamu Borcu, Ekonomik Büyüme, Singapur

**Atıf (Citation):** Amin, H. I. M., & Çek, K. (2024). "Budget Deficit, Public Debt, And Economic Growth: Evidence from Singapore", *Aizanoi Finance Review*, (4): 1-15

**Introduction**

The overhauling of the public obligation has seriously infringed on assets accessible for the financial turn of events, in this manner, applying an incredible drag on development possibilities. Since it is hard to draw out the negative impact of a substantial public obligation and spending shortfall on monetary development, it will be ideal on the off chance that we get an excellent acknowledgement of the issue from its base to abstain from focusing on and chipping away at the indications and failing to remember the underlying driver. The public authority of Singaporeans is by all accounts unendingly considering the issue of obligation, constantly following the 'temporary' strategies focused on the decrease or the crossing out of debt without taking a gander at decent conduct of her monetary arrangement, which is probably the best purpose of worry in our examination. The present circumstance of falling incomes because of fall in oil costs, repetitive twin deficiencies, and swelling obligation stocks have driven us to ask the accompanying exploration questions:

- Given its tremendous obligation and steady spending deficiencies brought about by a fall in oil costs, can Singapore accomplish its development objective of becoming a new nation?
- What is the massive commitment of a spending shortfall and public debt to Economic development in Singapore?
- What is the connection between spending deficiency, general obligations, and financial development in Singapore?

Our work is additionally a push to exhibit the movement of interest in executing monetary financial projects before controlling future needs and offering significance to past ways of investigating the connection between open obligation, spending shortage, and economic development, taking experimental proof from Singapore.

At long last, most investigations have contemplated the impacts on spending shortage and public obligations freely without indicating the connection between the three factors. Our work comes in to fill this hole. Thus, we will characterise the factors that are in question, give its development, and conduct a writing audit. In addition, we will be completing an exact investigation in the wake of directing primer tests, and from that point will be the translation of results, which will comprise connecting deficiencies, obligations, and development, trying to discover the relationship among these three factors.

**1. Theoretical Literature Review**

Lately, there has been significant public worry about the shortage of general authority spending. The accompanying sections cover the expanding impacts of spending shortage as a genuine monetary issue, the hypothetical clarifications of the spending shortfall by different schools of musing (Standard et al.), and the impacts of spending deficiency on macroeconomic factors (loan costs, public spending, private utilisation, private venture, public pay public obligation and so on) This subsection gives an audit of the above schools of contemplations, Hameed, Ashraf and Chaudhary (2008) Taking a gander at the standard model of spending shortage, there is a supposition that the replacement of a spending shortfall for current tax collection prompts an extension of total buyer interest. The higher actual financing cost swarms out speculation, which appears over the long haul as a more modest load of gainful capital, Sen, Kasibhatla, and Stewart (2007).

In the Ricardian viewpoint, a shortfall financed by quitting raising current government expenditures for a given way of government spending prompts higher future charges with a similar present incentive as the underlying cuts. This outcome follows from the public authority spending imperative, which compares complete use for every period (counting financing costs) to incomes from tax collection to different sources and the net issue of interest-bearing public obligation. Government spending should be paid for the time being or in the future, with the absolute present estimation of receipts that is permanent by the all-out current expenditure benefit. Thus, holding fixed the way of government consumptions and non-charge incomes, a quit rise in the present expenses should be coordinated by a related increment in the current estimation of future duties, Nayab, H. (2015).

In the least complicated and most local Keynesian model, expanding the spending shortage extends yield by the backwards of the peripheral affinity to save. In the standard IS-LM investigation of financial economies, this yield extension collects the interest for cash. If the cash supply is fixed (the shortages are security financed), loan fees should rise, and private speculation falls. This lessens yield and mostly balances the Keynesian multiplier impact.

The imperative of public authority spending is a connection between obligation, shortages, government spending, and expenses. It can develop government obligation as a component of both expenditure and duties. The primary method of communicating the requirement is that the adjustment owed debtors (the shortfall) is equivalent to the essential shortage and intrigue in instalments on the obligation. The critical shortage is the distinction between government spending on products and enterprises and duties net of moves. The public authority spending imperative is pivotal in examining the supportability of monetary strategy and obligation adjustment because both spotlight the adjustment underwater given by the requirement. The size of the financial shortfalls run by a nation brings up the issue concerning whether certain monetary positions are feasible. Officially, a financial situation is practical if the current estimation of future economic excesses produced under imminent financial approaches is adequate to cover the current supply of net obligation (Lebow, 2004).

Maintainability suggests that the obligation will not rise as a portion of GDP uncertainly, but strategies that lead to steady obligation proportions are frequently considered reasonable. The monetary change that drives the current obligation/GDP proportion to be kept up at current levels is in no way, shape, or form the ideal change for a nation to pick at some random second. On the one hand, nations with high obligation proportions may accept that lower obligation levels would be valuable in advancing monetary development. Paying off the obligation proportions would require monetary changes in abundance of those shown by the maintainability lists. Then again, a nation in a downturn may wish to utilise simulative monetary strategies that are impractical over the long haul yet that are by and by alluring on a momentary premise. In this subsequent case, nonetheless, it is imperative to perceive that those financial changes should, in the end, be made and that the more extended change is postponed, the more prominent the changes that are at last needed to support the higher obligation levels will be. Obligation adjustment is another method of reviewing this issue. It alludes to the reception of strategy gauges that will keep a steady degree of obligation. Financially, strategies that lead to obligation adjustment are maintainable.

Most observational investigations zeroed in on the outside obligation issue in rising nations and nations with low pay because they relied on unfamiliar capital ventures (Nguyen et al., 2003). The exact proof shows that past a specific limit, higher public obligation brings down expected development that can demonstrate a non-straight and sunken (transformed U-shape) connection between the obligation of government and monetary development (Cecchetti et al., 2011; Kumar & Woo, 2010; Reinhart & Rogoff, 2010a; b). This implies that a low degree of public obligation improves and simultaneously increments financial development. When obligation arrives at a specific level, an extra expansion in its effect on monetary development may imply that it goes negative.

Nayab (2015) analyses the connection between spending shortage and Pakistan's monetary development. As a result of his demonstration, it can be seen that the cause of venture and speculation is GDP, which can later cause a shortfall. Nevertheless, spending deficiency does not cause the development of GDP. The main aftereffects of the indicated investigation likewise support the Keynesian view about spending deficiency. The detections additionally show that the shortfall in spending can positively impact development.

In their examination, Thuy et al. (2020) researched the impacts of public obligation and spending shortfalls on the maintainable monetary improvement of non-industrial nations, considering the job of control of defilement in 59 non-industrial nations from 2004 to 2015. They discovered that public obligation and the spending shortage affected reasonable turn of events, while the impact of defilement control was positive. Also, utilising connection terms between control of debasement and public obligation and spending shortfall, individually, experimental outcomes demonstrated that controlling defilement restricted these unfavourable impacts.

Furthermore, the research of Checherita and Rother (2010) and Cecchetti, Mohanty, and Zampolli (2011) is firmly identified with the examination by zeroing in on the effect of all-out open obligations on monetary development in cutting-edge nations. Like past investigations, the two examinations affirm a non-direct connection between open obligation and monetary development and discover an obligation-defining moment at about 85%–100% of GDP, past which the obligation deleteriously affects development. Kumar and Woo (2010) strain an assortment of stations over which extraordinary obligation will probably affect development, including higher long-haul loan fees, future distortionary tax collection, more swelling, more noteworthy vulnerability, and weakness to emergencies (Dobrescu, 2011).

Reinhart, Reinhart, and Rogoff (2012) request the decay of the budget because of an expansion in open obligations and a public obligation overhang. In financial aspects, writing like this identifies with the potential causality impact of a hefty public obligation trouble on development; the prevailing worldview is the obligation overhang theory. This hypothesis depends on the reason that if obligation exceeds the reimbursement of national capacity with some probability later on, predictable obligation administration will possibly be an expanding capacity of the yield of national level. Observationally, testing this speculation in an example of 26 countries (Reinhart et al.; 2012, and Reinhart and Rogoff, 2010) got some answers concerning the high aggregation of public obligation nations and revealed that in 23 of those cases, financial development stayed stale for over ten years. The eminent in their discoveries is a non-straight connection between open

obligations and monetary development. It was also demonstrated that when the proportion of public obligations to GDP is higher than 90%, the yearly financial development rate will be as much as 1.2% lower.

Ricardian proportionality suggests that obligation does not influence or is not identified with monetary development (Barro, 1989). The speculation suggests that when financial improvement happens, spending deficiency develops. Government obligation is quickening, and market players prepare for a future time when grim measures and assessment rise; therefore, they move their concentration from utilisation and venture to investment funds, killing the effect of the interest-animating monetary arrangement.

In light of past writing, the connection between open obligation and monetary development is not one route as it becomes conceivable that spending shortages and obligations could encourage development. This development could prompt the amassing of more obligations to keep up and the other way around. Thus, another point of this work is to check this causal connection between spending shortage, public commitments, and financial development in Singapore. Generally, the 'weight of obligation' has been examined in a medium-to-long haul structure previously developed by (Domar, 1944). It provides a foundation for investigating the relationship, which is the centre of our work. The work dissects the Republic of Singapore as a solitary substance utilising time arrangement information despite most jobs that have received a board information system joining nations comparable in obligations.

The remarkable resurgence of monetary progressivism during the 1970s, through the delegates of the neoliberal tenet, denoted another difference in context restoring, as indicated by the statutes of the "great" traditional liberal teaching, the dissatisfaction about the state's obligation. As they display, "whatever the general situation of the nation being referred to, expanding deficiencies (A/N and public obligation) express the guarantee of future monetary challenges and decreased government assistance" (Landais, 1998). The principal contention to legitimise the dissatisfaction with regards to the state's obligation emerges from the rise, when public specialists go to general advances to fund spending shortages, of a negative impact called the "swarming out impact. This like this diminishes private speculation (delicate to loan fee changes). Thus, private capital assets "escape" towards the public area to serve public use financing.

After a comprehensive perusing of past writing, we saw that most works have treated public obligations and financial development or spending shortages and monetary development. However, only a few works have investigated their joint consequences for economic growth. Our work, hence, fills this gap.

## 2. Methodology

We use the time series econometrics framework to examine the relationship between Singapore's public deficit, public debt, and economic growth. The study was carried out from 1980 to 2015.

The generalised growth model of the theoretical economy with features of the debt and deficit variables has been used in this work to explain the effects of the debt ratio on GDP. Thus, the linear equation with the debt-to-GDP ratio and the budget balance has been used to capture debts and deficits. Most works have disaggregated public debts into external and internal debts, but our work does not. We use a methodology based on a multiple regression model to test how economic

growth is affected by budget deficits and the different debt categories combined. The equations of the model can be written as follows;

$$RGDP_t=F\ (SB_tDP_tTrade_tFDI_t, RER_t, RIR_tNX_t, DS_t, INFL_t)\ldots\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

Equation (1) measures the effects of the budget deficit and public debt on economic growth while including other possible control variables that could influence growth.

RGDP is the actual growth rate, SB is the budget balance, DP is the public debt, FDI is foreign direct investment, RER is accurate exchange rates, RIR is the real interest rate, DS is domestic savings, and INFL is the inflation rate. We empirically examined the effects of debts and deficits on economic growth from this generalized equation.

The equation will be estimated from the generalized model we have to get the empirical effect of public debts and deficit on economic growth in Singapore between1980 between and 2015. The major innovation here is that the index is disaggregated to show the specific effect of the chosen variables on economic growth.

To estimate the effect of public debts and budget deficit on economic growth, we specify the following model, including the parameters to be estimated:

$$RGDP_t= \alpha_0+\alpha_1SB_t+\alpha_2lnDP_t+\alpha_3Trade_t+\alpha_4RIR_t+\alpha_5RER_t+\alpha_6INFL_t+\alpha_7DS_t+\alpha_8NX_t+\alpha_9FDI_t+\varepsilon_t\ldots\ldots\ldots\ldots(2)$$

Where RGDP is the Logarithm of absolute growth rate, SB is the Logarithm of budget balance, LnDP is the logarithm of public debt, Trade is the degree of openness, RER is the breathel exchange rate, RIR is of real interest rate, DS is the of domestic savings, NX is the net export, FDI is foreign direct investment, INFL is the of inflation, $\alpha_{0,}\alpha_{1,}\alpha_{2,}\alpha_{3,}\alpha_{4,}\alpha_{5,}\alpha_6$ and $\alpha_7$ are parameters of the independent variables and, $\varepsilon_t$ = stochastic error term, t = period which varies from 1980 to 2015.

Before completing the relapse methodology, significant tests will be done on our information, which are the model detail and unit root tests. The reason for these tests is to ensure that the information is substantial for the following examination. The model determination test is a test to identify the presence or the nonattendance of superfluous or significant factors in the information arrangement. The unit root test is a test to decide the presence of unit root a in the information and explain the fixed status of the information. One of the approaches to recognizing determination mistakes is utilizing the excess variable test or the Ramsey test to exclude factors. This test is like this to test when at least one significant important factor is mistakenly prohibited in the model. If a pertinent variable is precluded from the model, the outcome will be that the regular fluctuation they share with other comprehensive factors might be inaccurately credited to those variables. Regarding the unit root test, Granger and New striking (1974) and increased Dickey-Fuller tests are utilized.

**3. Results and Discussions**

As mentioned above, the preliminary tests are to make sure that the modification is valid. The stationary test results are summarized in the table below:

At the level, we notice that inflation (INFL), real growth rate (RGDP), and real interest rate (RIR) are stationary at 1%; therefore, we reject the null hypothesis and conclude that RGDP, R, IR, and IFL do not have a unit root and as such, they are integrated at order zero I(0). All other variables are not stationary at the level because their p-values are more significant than the test critical values of the ADF test. We fail to reject the null hypothesis and conclude they have a unit root.

Still from the above table, after testing for unit root at the first difference, we discover that the other variables DP, SB, DIN DS, FDI, NX, RER, and TRADE, we discover that all the p-values are less than 1%, as such, we reject the null hypothesis of unit root for variables and conclude that DP, SB, DIN DS, FDI, NX, RER, TRADE, and UEMP are not having a unit root at first difference. The variables are stationary and integrated at their first differentials.

**Table 1:** *Results of ADF test for unit root on RGDP, DP, SB, DS, FDI, NX, RER, DIN, RIR, TRADE, UNEMP, and INFL for the period 1980 to 2015*

| **Variables** | **Unit root test at level** | | **Unit root test at first difference** | | **Level of integration** |
|---|---|---|---|---|---|
| | t –statistics | P-values | t – statistics | p-values | I(d) |
| RGDP | -3.695443 | 0.0085*** | - | - | I(0) |
| lnDP | -1.036210 | 0.7293 | -5.597049 | 0.0000*** | I(1) |
| SB | -2.098273 | 0.1285 | -4.215720 | 0.0024 *** | I(1) |
| DS | -2.519987 | 0.1342 | -6.845098 | 0.0000*** | I(1) |
| FDI | -0.875392 | 0.7842 | -0.875392 | 0.7842 | I(1) |
| INFO | -4.275585 | 0.0019*** | - | - | I(0) |
| NX | -2.566433 | 0.1094 | -6.477029 | 0.0000*** | I(1) |
| RER | -0.401188 | 0.8982 | -5.138363 | 0.0002*** | I(1) |
| Din | 0.7201 | 0.1485 | -6.243601 | 0.0000*** | I(1) |
| RIR | -3.695443 | 0.0085*** | - | - | I(0) |
| Trade | -1.302275 | 0.6175 | -5.436642 | 0.0001*** | I(1) |

**Note:** All critical values are at either 1%, 5%, or 10% significance level based on the Mackinnon critical values with ***, **, and * indicating significance at 1%, 5%, and 10%, respectively.

After verifying the model's validity, let's focus on the regression results. The table below summarises these results.

The probability of the F-statistics is significant at 1%, indicating that the model is globally good. Also, looking at the R-square values (63%) and the value of the adjusted R-square (52%), we can conclude that the variance of the independent variables has successfully explained the variance of the dependent variable. Some control variables are significant at various levels (1%, 5%, and 10%), while others are insignificant. Budget balance positively affects growth at a significant level of 1%, while public debt has an insignificant effect on growth. Carrying out economic interpretations on our model will enable us to check if our result ties in with the economic theory. This will confirm the result of our estimates and present the economic significance of the estimate.

As mentioned above, a budget deficit affects growth positively at a 1% significance level. Therefore, we reject our null hypothesis, which implies that a unit increase in the budget deficit of Congo leads to a 0.969710-unit increase in economic growth. This can be explained by the fact that an increase in government expenditure over the years in Singapore has increased government investment, especially in the oil sector, contributing close to 60% of state revenue. This explanation conforms with the Keynesian ideas in the budget deficit, which contributes to an increase in national income, thereby bringing the next part of the effect, which is called the Keynesian multiplier, on the condition that the resources were at first insufficient. This can be because the deficit can stimulate

consumption, national income, savings, and capital. This also confirms the empirical works of Bose et Al. (2007), who established that the budget deficit could help the growth of the economy if the productive expenditures were the reason of deficits, such as education, health, and capital expenditures, and stipulations of (A.L. et al., 2016; G Fatima et al., 2016)

**Table 2:** *Long run relation with t-statistic in () and p= probability of the variable.*

| **Dépendent Variable : RGDP** | | | | |
|---|---|---|---|---|
| Variables | Coefficients | T cal | P-value | Signifiance |
| SB | 0.969710 | 85.51724 | 0.0000 | 1% |
| LnDP | -1.782835 | -0.917477 | 0,3670 | Ns |
| TRADE | 0.100062 | 2522707 | 0.0178 | 5% |
| RIR | -0.044464 | 0.907207 | 0.3723 | Ns |
| NX | -0.153875 | -1.772368 | 0.0876 | 10% |
| RER | 0.072611 | 0.530882 | 0.5998 | Ns |
| INFL | -0.325203 | -3.227245 | 0.0033 | 1% |
| FDI | -6.179121 | -2.328735 | 0.0276 | 5% |
| DS | 0.315092 | 2.757168 | 0.0103 | 5% |
| C | -15.47644 | 0.765627 | 0.4505 | |
| Prob(F-statistic) | 0.000254 | | | |
| R-squared | 0.63065 | | | |
| Adjusted R-squared | 0.521224 | | | |
| Durbin-Watson stat | 1.674144 | | | |
| Number of observation | 36 | | | |

On the other hand, public debts have an insignificant effect on the economic growth of Congo. This can be explained by the fact that such debts entail the cost of servicing and refunding the principal. This ties in with the Ricardian equivalence proposition, which highlighted that economic growth has not been related to or affected by indebtedness (Barro, 1989) since debts can change their focus from paying and investing to increase in savings, which counteracts the impact of the request stimulating fiscal policy.

Other control variables like openness (trade) have a positive and vital impact on the economy's growth as a 1% rise in the degree of openness growth by 0.009320%. Inflation also hurts the economy's growth as it carries an undesirable sign. This negative sign of inflation can be due to the generally high level of prices of commodities within the period of our study.

From the co-integration test of Granger or the long-run stationary test of residue, we observe the presence of co-integration. To resolve this problem, which could bring spurious results, we use the

error correction model with the error correction term (ECT) to neutralize the co-integration effects. The results of the long-run stationarity test can be seen below.

**Table 3:** *Stationarity test of residue on the budget deficit and public debt*

| | | t-Statistic | Prob.* |
|---|---|---|---|
| AugmentedDickey-Fuller test statistic | | -2.952459 | 0.0452 |
| Test critical values: | 1% level | -3.632900 | |
| | 5% level | -2.948404 | |
| | 10% level | -2.612874 | |

The ECM is used to address this since stationarity is not at the same level and does not exist here. Once the philosophy of the relation of the long-term is also justified and brought to attention, one can then derive the error correction model, z(ECM), which captures the rate of return to long-term parity after a small short-run shock. The error correction specification is with Engel and Granger (1987); if the variables are I (1), a group of co-integrated variables can be expressed as an error correction model. These results can be summarised in the table below.

The table above suggests that the budget deficit can have a positive effect on economic growth in the long run. However, we fail to accept our null hypothesis, as a 1% increase in the budget deficit leads to a 1.000667% increase in economic growth in the short run. This is still in line with the Keynesian economic theory and the empirical works of Bose et al. (2007) and in contradiction with the classical theory on the budget deficit and the empirical work of Hameed, Ashraf, and Chaudhary (2008).

On the other hand, we observe a negative effect of public debt on economic growth. We, therefore, validate our null hypothesis as a 1% increase in public debt reduces economic growth by -6.223443%. This can be explained by the fact that these public debts usually come with strings attached: tax increase, which reduces the amount of private investment, and an outflow of government funds in repayment of the principal and interest rates at maturity. This is similar to the work of Hameed, Ashraf, and Chaudhary (2008), which also is in line with the study carried out by Krugman (1988) and Sachs (1989), indicating that the negative effect of growth increases. Therefore, we accept our null hypothesis that public debt negatively affects economic growth in Singapore.

Looking at the other control variables, especially in our openness (trade) variables, real exchange rates and domestic savings positively affect economic growth at a significant level of 10%. This is because the greater the degree of openness, the greater the international commercialisation and revenue from trade. Domestic savings increases economic growth when these amounts are involved in investment projects.

Inflation negatively affects economic growth as it carries a negative sign. This negative sign of inflation can be due to the generally high level of prices of commodities within the period of our study.

**Table 4:** *Short-term analysis of the relationship between public deficit, public debt, and economic growth in Singapore*

| **Dependent Variable: RGDP** | | | | |
|---|---|---|---|---|
| Variables | Coefficients | Tcal | P-value | Significance level |
| D(SB) | 1.000667 | (2.77081) | 0.0000 | 1% |
| D(TRADE) | 0.174505 | (2.884930 | 0.0079 | 1% |
| D(LNDP) | -6.223443 | (-2.447838) | 0.0217 | 5% |
| D(RIR) | -0.001091 | (-0.036463) | 0.9712 | Ns |
| D(RER) | 0.171551 | (0.976881) | 0.3380 | Ns |
| D(NX) | -0.245656 | (-2.556845) | 0.0170 | 5% |
| D(INFL) | -0.388764 | (-4.852486) | 0.001 | 1% |
| D(FDI) | -4.324302 | (-0.851013) | 0.4020 | Ns |
| D(DS) | 0.480764 | (4.479322) | 0.0000 | 1% |
| ECT (-1) | -0.961586 | -5.377399 | 0.0000 | |
| C | -0.496606 | (-0.759240) | 0.4548 | |
| Prob(F-statistic) | 0.000079 | | | |
| R-squared | 0.705939 | | | |
| Adjusted R-squared | 0.60007 | | | |
| Durbin-Watson stat | 1.839449 | | | |
| Number of observation | 36 | | | |

## 4. Conclusion

This paper aims to confirm the connection between open shortages, public obligation, and financial development in the Republic of Singapore. We received numerous relapse methods to check our theory and deciphered the experimental outcomes utilising e-sees. Quite a while ago, the run and the short run tests were led because of co-reconciliation.

Over the long haul, it can be seen that the spending deficiency decidedly influenced financial development while public obligation affects development, which drove us to dismiss our invalid theory. In the short run, where we examined varieties, we see that spending shortages positively affected financial growth, which contradicts our invalid speculation. At the same time, public obligation hurts development in this way, confirming our invalid theory from 1980 to 2015. The acquired outcomes of this work are on open obligation attached with new influential research done by Reinhart and Rogoff (2010a), who looked at the effects of the dissimilar levels of the obligation by the government on the correct rate of the GDP, taking into consideration 20 developed nations and 24 developing nations over a time of almost 200 years (1790–2009). The results were comprehensive and directly related to the previous estimations and their measurements, particularly that a limit of 90% of GDP obligation positively affects the long-term GDP development rate. However, the impact of obligation above 90% is negative and huge in the short run.

The determinations of the relationship between debt, budget deficit, and economic growth, the outcome of this study, will go a long way in answering some of the problems that will show up most of the time when this research topic is considered. Out of that, those in charge of the policies will

understand better the issues that could be related to the study and will help them handle problems of increasing levels of debt and broadening budget deficit. Many related studies have been carried out on topics close to this, but putting together these three variables has not been very well elaborated on; as such, it was tough to establish a good relationship and work on. Due to the outbreak of Covid-19, studies on their own have not been easy. Concerning this work, getting the data was complex, and the time frame for a good project was not allocated.

The negative capital outflow, which could be seen as the payment of interest and the principal of debt from either a bilateral or multilateral creditor, can be avoided in the long run by the government limiting the amount of borrowing. Since Singapore faces slow risk in the short run due to its debt, putting more interest in policies to build up public debt and manage the institution of its assets can intensify the authorities' debt management capacity and fiscal policies. The findings of this study stated that implementing public debt into external and internal components offers a broader view of debt's impact. However, it also presents a limitation that could be addressed in future research.

Another issues that can be considered is the relatuonship between debt, budget deficit, and economic growth. It is suggested to investigate these relationships particularly in the context of emerging market economies where such dynamics are more noticable. In this type of economies, high levels of public debt and large budget deficits can create important influences on fiscal stability. This can limits governments' ability to respond to future economic shocks and evets. Aditionally, an increase in debt levels can lead to higher interest rates, decreasing the private investment and potentially hindering economic growth. The relationship between these variables can also vary depending on a country's economic structure, institutional quality, and level of financial market development, underscoring the need for tailored policy measures.

**Author Contributions (Yazar Katkı Oranı):** Halkawt Ismail Mohammed Amin (%50), Kemal ÇEK (%50)
**Ethical Responsibilities of Authors (Yazarın Etik Sorumlulukları):** This study was prepared in accordance with the rules of the required ethical approval
**Conflicts of Interest (Çıkar Çatışması):** There is no conflict of interest with any institution related to the study.
**Plagiarism Checking (İntihal Denetimi):** This study has been checked for plagiarism using a plagiarism scanning programme.

**References**

Aslam, A. M. (2016). "Budget Deficit and Economic Growth in Sri Lanka: An econometric Dynamic Analysis". *World Scientific News*, (46): 176–188.

Barro, R. J. (1989). "The Ricardian Approach to Budget Deficits". *The Journal of Economic Perspectives*, 3(2): 37–54.

Bose, N., Haque, M. E., & Osborn, D. R. (2007). "Public Expenditure and Economic Growth: A Disaggregated Analysis for Developing Countries". *The Manchester School*, 75(5): 533-556.

Cecchetti, S. G., Mohanty, M. S. and Zampolli, F. (2011). "The Real Effects of Debt", BIS Working Papers No. 352, Basel: Bank for International Settlements.

Cecchetti, S. G., Mohanty, M. S., & Zampolli, F. (2010). "The Future of Public Debt: Prospects and Implications". BIS Working Papers No. 300, Basel: Bank for International Settlements.

Checherita, C. & Rother P., (2010). "The Impact of High and Growing Government Debt on Economic Growth: An Empirical Investigation for the Euro Area". ECB Working Paper Series No. 1237, Frankfurt: ECB.

Checherita-Westphal, C., & Rother, P. (2012). "The Impact of High Government Debt on Economic Growth and Its Channels: An Empirical Investigation for the Euro Area". European Economic Review, 56(7): 1392-1405.

Dobrescu, E. (2011). "Some Issues Involved by the Policies Concerning Exchange Rate and Inflation: Quantitative Approach". *Amfiteatru Economic*, 13(29): 250-257.

Engle, R. F. & Granger, C. W. J. (1987). "Cointegration and Error Correction: Representation and Testing". *Econometrica*, 55: 251-276.

Hameed, A., H. Ashraf & M.A. Chaudhary. (2008). "External debt and its impact on economic and business growth in Pakistan". *International Research Journal of Finance and Economics*, 20: 132-140.

Krugman, P. R. (1988). "Financing vs. Forgiving a Debt Overhang: Some Analytical Issues", NBER Working Paper (No. 2486), Cambridge, MA: National Bureau of Economic Research.

Kumar, M.S. & Woo, J. (2010). "Public Debt and Growth". IMF Working Paper 10/174, Washington, DC: IMF.

Landais, B. (1998). "Lecons de Politique Budgetaire/ Budgetary Policy Lessons". Bruxelles: De Boeck Universite.

Lebow D.E. (2004). "Recent Fiscal Policy in Selected Industrial Countries," BIS Working Papers, September.

Nayab, H. (2015). "The relationship between Budget Deficit and Economic Growth of Pakistan". *Journal of Economics and Sustainable Development*, 6(11): 85–90.

Nguyen, T. Q., Clements, M. B. J., & Bhattacharya, M. R. (2003). "External Debt, Public Investment, and Growth in Low-Income Countries (No. 3-249)". International Monetary Fund.

Reinhart, C. M., Reinhart, V. R., & Rogoff, K. S. (2012). "Public Debt Overhangs: Advanced-Economy Episodes since 1800". *Journal of Economic Perspectives*, 26(3): 69-86.

Reinhart, C.M. & Rogoff, K.S. (2010a). "Growth in a Time of Debt, American Economic Review". 100(2): 573–578.

Reinhart, C.M. & Rogoff, K.S., (2010b). "Debt and Growth Revisited". (MPRA Paper No. 24376). Munich: Munich University Library.

Sachs, R. (1989). Developing Country Debt and Economic Performance, Volume 1: The International Financial System, National Bureau of Economic Research, Inc

Sen, S., Kasibhatla, K. M., & Stewart, D. B. (2007). "Debt overhang and economic growth–the Asian and the Latin American experiences. Economic Systems, 31(1): 3-11.

Toda, H. Y., & Yamamoto, T. (1995). Statistical inference in vector autoregressions with possibly integrated processes. Journal of Econometrics, 66(1-2): 225-250.

Van, V. T. T., Ha, N. T. T., & Quyen, P. G. (2020). "The Relationship Between Public Debt, Budget Deficit, and Sustainable Economic Development in Developing Countries: The Role of Corruption Control". Journal Ekonomi & Studi Pembangunan, 21(1): 84-104.

**Extended Summary**

Deficits and debts occupy an essential place in the country's fiscal policy and have great consequences for development. Deficit financing through borrowings increases public debt and government borrowing, which impacts an economy's short-run and long-run performance. Singapore, which has maintained very low fiscal deficits and has excellent public finance management, makes it suitable to examine the connections between budget deficits and public debt on economic growth. In the past, the city-state has sustained very low public debts to GDP. However, the changing global financial conditions and the COVID-19 pandemic have led to the rethinking of fiscal policies.

This work aims to establish the interaction between budget deficits, public debt, and economic growth in Singapore between 1980 and 2015. The study's methodology analyses how these variables relate to and drive each other and give details and reasoning for the causality of the variables. The conclusion drawn from this research goes a long way in addressing the current confusion about how best to manage fiscal policy to attain sustainable economic growth.

Therefore, the primary purpose of this research study is to establish the effect of budget deficits and public debt or government borrowing on the economic growth of Singapore. More precisely, it aims to examine whether budget deficits positively or otherwise impact the rate of economic growth in the short and long run and the impact of public debt on economic performance. Also, the research seeks to establish the direction of causality between these variables to enhance the understanding of the two causations: fiscal policy causes economic growth, or is it the other way round? The study also seeks to provide policy prescriptions concerning deficits and public debt to support long-run economic growth.

This research uses a time series econometric model to examine budget deficits, public debts and economic growth in Singapore from 1980 to 2015. This paper employs information regarding Singapore's GDP, public debt, budget deficits, FDI, inflation rate, real interest rate, and trade openness to give a complete picture of the economy. The extension of the growth model used in the study is a generalised growth model used to show the impacts of the cross-sectional correlation of budget deficits and public debt on economic growth, netting other variables that might affect the development.

This is done by performing what is referred to as unit root tests, which include the Augmented Dickey-Fuller (ADF) test. Long-term relationships are confirmed by Co-integration analysis, and the ECM Error correction model identifies Short-term dynamics of the variables. Consequently, this approach enables the analysis of the influence of budget deficits and public debt on the growth of an economy in the short and long run. The nature of the causality between the variables is investigated using the Granger causality test.

Thus, the empirical analysis outcomes support the hypothesis that budget deficits positively affect short-term and long-term economic growth. By increasing government spending, the country will likely realise a 97% increase in economic growth, supporting the view that spending propels economic activities and fosters growth. These long-term impacts of budget deficits also suggest continued positive economic gain, as such government expenditures in infrastructure, education, and health affect Singapore’s economy in the long run.

On the other hand, public debt has a mixed effect on economic growth, which is explained as follows: Unlike foreign debt, its correlation is complex, and its effects are unclear. Consistent with this, it is determined that an increase of 1 per cent in public debt in the short run negatively affects the GDP growth rate by 6 per cent. Twenty-two per cent indicates that large amounts of public debt limit the ability of private investments to grow and thus make borrowing expensive. However, the long-run relationship between public debt and economic growth is not statistically significant, as confirmed by the estimation; this means that Singapore, which is experiencing high levels of public debt, has not been affected by the ill effects of excessive public debt in the long run.

Through the causality analysis, this study establishes a positive and one-way causality between budget deficits and economic growth, affirming the importance of fiscal policy in Singapore's economic performance. On the other hand, public debt does not seem to have a direct causal relation with growth, adding to the argument that prudent management of public debts in Singapore has not hindered economic growth.

From this context, therefore, this study offers significant insights into the effect of budget deficits and debt on the economic growth of Singapore. The results indicate that deficits help in the economy's growth in the short and long run, specifically where public expenditure is aimed at productive expenditures such as development expenditure on social sectors, including transport, health, and education. Nevertheless, the computerised public debt has a less cheering narrative, as it is a curse for the economy in the short run, mainly when debt accumulates to a dangerous level. Singapore has been cautious in managing its fiscal policies and debt; hence, this has helped manage the risks that the public debt may pose lest it affect the country's growth.

As is evident in the study, some significant policy implications come with it. On the one hand, budget deficits can quickly become one of the most efficient tools for growth stimulation, especially in crises; however, on the other hand, governments must not let their debts get out of hand as it can lead to specific detrimental effects. Sound fiscal policy management that balances fiscal deficits and the sustainability of public debts is essential for Singapore's long-term prosperity. As with any research, there could be areas for further investigation into the effects of global and regional trade and other factors that may be tested regarding fiscal policy and economic growth in Singapore.