

The effect of budget deficit on current account deficit: Evidence from Iran

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Abstract

The main objective of this paper is to present the theoretical argument of twin deficit hypothesis. In this study we evaluate the effect of budget deficit on current account deficit in Iran in the period of 1981-2012. For this purpose, we use the generalized method of moments (GMM) approach. In this paper we use Keynesian and Ricardian Theory about budget deficit. We find that the coefficient of budget deficit, equal 0.09 which shows that a unit of increase in budget deficit leads to 0.09 unit decrease in current account balance, indeed one unit increase in budget deficit leads to increase in current account deficit. Also, the results show that there is positive and significant relationship between the oil revenue and current account balance. But the results show that real exchange rate does not have significant effect on current account balance.

Keywords: Budget deficit, Current account deficit, Keynesian approach, GMM model.

Introduction

Economists are concerned about public budget, current account and balance of payments deficit since they became ingrained at the most of economies structure. The deficit effects appeared negatively on economy such as inflation, deterioration of the purchasing power, deterioration in living standards, growth of internal and external debt, increase of the burden of debts services, which cause a strain and drain of reserves and foreign assets. This adversely affects the balance of payments and causes pressure on the international reserves.

In the economic literature, two main approaches are known to explore the relationship between current account and budget deficit; the Ricardian Equivalence and the Keynesian conventional proposition.

The first approach (The Ricardian Equivalence) denies any relationship between the budget deficit and the current account deficit. Since people are rational, then they know that the reduction in taxes is temporal and so they will save the extra money to pay for the future higher taxes. The national savings will not be affected. Therefore, the budget deficit has no effect on the current account deficit. In contrast to the first approach, the Keynesian Proposition confirms the existence of positive relationship between budget deficit and current account deficit. Particularly, the twin deficits hypothesis states that a budget deficit leads to a current account deficit. And obviously a budget surplus will improve the current account deficit, while a budget deficit makes the government as a net borrower (Alkswani, 2000).

The economic implications of this paper are very important. The increase in current account position encourages the government to spend more causing the budget deficit to increase.

This study is guided by the following research questions: What is the relationship between budget deficit and current account deficit in Iran? Does budget deficit have significant effect on Iran's current account deficit?

Since government of Iran has consistently run its economy with a budget deficit and current account deficit, this paper re-investigates the effect of budget deficit on current account deficit and current account balance in the Iranian economy by using annual data for the period of 1981- 2012.

This paper consists of three sections. Section 1, covers the review of literature, the relationship between budget deficit and current account balance. Section 2, covers the details of the data and research methodology employed in this study and reports the findings and discussions. The final section contains the Empirical Result.

1. Literature review

The relationship between fiscal policy and the current account has attracted interest among economists and policymakers alike. For many countries where current account imbalances are especially large, a relevant question has been raised, i.e. to what extent fiscal adjustment can contribute to resolving external imbalances? In order to study and analyze this phenomenon in the Iran, identify the effect of budget deficit on current account deficit, and analyze the economic impact of these deficits, it was necessary to provide a literature review for this study, which shows various important thoughts related to budget and current account deficits. While the results have varied among different countries, it may get different results depending on types of econometric techniques used, or depending on the period taken in the same country.

Vamvoukas (1999) analyzed the relationship between the two deficits by co-integration analysis for Greece using 1948-1994 annual data and found a positive relationship.

Mohammad (2000), took the sample of 67 countries and used the cross-sectional data. His study period was from 1975-1995. His study was important to show the significant relationship between the trade deficits and budget deficits. He concludes that there is positive relationship between the budget surplus and the trade balance.

Piersanti (2000) analyzed the relationship between the budget and current account deficits for almost all OECD countries excluding Turkey, Switzerland, Portugal, Iceland, Belgium, New Zealand and the last entering countries using causality tests. The econometric results signaled a strong positive effect of expected future budget deficits on trade deficits for OECD countries.

Funke and Nickel (2006) using 1970-2002 panel data of G7 countries' fiscal policy and trade balance showed statistically that an increase in government expenditure had a significantly positive effect on goods and services import. In the second group, when applied to budget deficits to test this hypothesis, Barro (1989) argues that movement between taxes and budget deficits have no effect on the real interest rates or the current account balance. In other words, there is no relationship between the two deficits.

Bilgili and Bilgili (1998) employing USA, Singapore and Turkish data for 1975-1993 period showed that for each country budget deficit had no causal effect on current account deficit.

Kuştepelı (2001) using VAR type co-integration and causality analysis for 1975-1995 data period for Turkey found no causal relationship from budget to current account deficits.

Kim and Roubini (2008) address the issue of endogenous movements of the fiscal and the current account deficits and argue that a "twin divergence" is more probable; the current account deficit can improve when the fiscal deficit worsens. These findings are attributed to two factors; first, a partial Ricardian movement of private saving (private saving increases) and second, an investment crowding out effect (investment declines) caused by an increase in the real interest rate. Second, when the two balances are affected by an output and/or a productivity shock, "twin divergence" also seems to be more likely.

Boileau and Normandin (2009) conducted research on the effect of tax shocks on budget deficit and foreign deficit by using data from 16 countries and for post 1975 era. The results Show that tax shocks lead budget deficit and foreign deficit to move in a positive way.

Baharumshah, İsmail and Lau (2009), used data from five Association of Southeast Asian Nations (ASEAN) countries and tested the validity of twin deficit hypothesis. According to the results, in Malaysia, Thailand and Philippines, budget deficit plays an important role for determining current account deficit. According to the results, there is one way causality from current account balance towards budget balance. There is no data related to a causality from budget balance towards current account balance.

Holmes (2011), used data from 1947 – 2009 period of USA and analyzed the relation between current balance and budget balance with threshold cointegration view. Results support the Keynesian view.

Omoniyi and et al (2012) used data from 1970 – 2008 period and conducted research on twin deficit effects of Nigeria. Results Show that there is dual relation between budget deficit and foreign trade deficit.

Kalou and Paleologou (2012) used 1960 – 2007 period data in order to explain the casual effect between budget deficit and current account deficit. In the study, the results show that there is a positive relation between tow deficits and the direction of the causality is from current account towards budget deficit.

2. Theoretical basis and Econometric' model

From the national income identity:

$$Y = C + I + G + (X - M) \quad (1)$$

Here the national income, Y, equals consumption C, investment I, government expenditures G plus the net exports (X – M). On the other hand, individuals dispose of income Y, either as consumption C, savings S, and taxes T:

$$Y = C + S + T \quad (2)$$

When combining two equations, it is:

$$C + S + T = C + I + G + (X - M) \quad (3)$$

After substituting, equation (3) yields:

$$(X - M) = (T - G) + (S - I) \quad (4)$$

Equation (4) states that the trade or current account deficit, (X – M), is equal to budget deficit, (T – G), plus the saving – investment gap, (S – I). If the savings – investment gap remains the same or stable, changes in policies that worsen the budget deficit will widen the trade or current account deficit and vice versa, an increase in trade or current account deficit will worsen budget deficit. This is the traditional twin deficit relationship. This model shows there is a bi-direction relationship between the budget deficit and trade deficit. They move together and in the same direction. However, in the context of an open economy where international financial markets are available for investment, the relationship may not necessarily exist, even if it exists, they may not move together and in the same direction. This model is the basis for attempting to understand the relationship between these twin deficits and how they may affect each other.

In the economic literature, two approaches are known to explore the relationship between current account deficit and budget deficit, the Ricardian Equivalence and the Keynesian conventional proposition, which are explained briefly below.

2.1. The Ricardian equivalence

The Ricardian equivalence claims the absence of any relationship between the current trade deficit and the budget deficit. This approach reveals that the budget deficit is a result of a tax cut which will have no effect on the national savings. Tax cut reduces public revenues and public saving. The decrease of the public saving enlarges the budget deficit. But, the decrease of the public saving will be matched by an equal increase in the private savings. So, the domestic savings will not be affected. That is because people will rationally presume that decreased tax (the budget deficit) will have to be paid for in the future. So, they will increase savings to pay for future increased burden. People know that taxes will go again to pay for the budget deficit so they save the extra money and they use it to pay for the future tax increases. The tax has simply been delayed, not actually taken away. If this were perfectly true, then the budget deficit would have no impact on anything because it would not change national savings. The Ricardian equivalence, reveals that the tax cut is a temporary procedure. The decrease of the public savings will be compensated for by an equal increase of private savings. The national saving will not be affected. Therefore, the budget deficit has no effect on the current trade deficit.

2.2. The Keynesian proposition

The strongest argument against the Ricardian equivalence is the Keynesian proposition. This proposition argues that there is a positive relationship between trade and budget deficits. The twin deficits hypothesis states that a budget deficit will lead to a current account deficit. And obviously a budget surplus will improve the current account deficit. If the budget is in deficit then the government is a net borrower. Total national savings are equal to the private plus the public savings. If the public is negatively saving, then the national savings will decrease. With a lower level of national savings, the interest rates should increase, which will lead to an increase in the exchange rate. An increasing interest rate will make exports less attractive, and increase the attractiveness of imports, subsequently worsening the trade balance which is the major factor in the current deficit account variability. So, the budget deficit leads to increase in the current accounts deficits.

The dynamic panel GMM estimation uses the appropriate lags of the instrumented variables to generate internal instruments and employs the pooled dimension of the panel data. So it does not put restrictions on the length of each individual time dimension in the panel. This enables use of suitable lag structure to exploit the dynamic specification of the data. However, this approach still has some important shortcomings (Anshasy, 2012). First, it only allows the intercepts – not slopes – to vary across groups. Pesaran et al. (1997, 1999) argued that the assumption of homogeneity of slope parameters may not be proper when the time dimension of the panel is short. Second, cross-sectional dependence is not addressed. Therefore, this paper follows Pooled Mean Group (PMG) estimation. Pesaran et al. (1997, 1999) proposed the PMG estimator that allows the short-term parameters to be heterogeneous between groups while imposing homogeneity of the long-term coefficients between countries. It is one advantage of PMG estimator. Furthermore, the PMG estimator highlights the adjustment dynamic between the short-run and the long-run. The heterogeneity of short-run slope coefficients allows the dynamic specification to differ across countries. The PMG estimation – based error correction model requires an existence of co-integration between dependent variable and explanatory variables. So, the study first tests the stationarity of the variables by using the Fisher tests, developed by Maddala & Wu (1999) and then applies the co-integration test of Westerlund (2007).

The panel differenced GMM Arellano-Bond estimation

$$Y_{it} = \alpha Y_{it-1} + \beta X_{it} + \eta_i + \xi_{it}; 1 = 1,2,3, \dots, N; t = 2,3, \dots, T. \quad (5)$$

Where Y is the share of current account deficits to GDP; X is a vector including variables such as share of fiscal deficits to GDP, inflations, interest rates, exchange rates and trade openness (sum of shares of exports and imports to GDP); η_i is an unobserved time-invariant, country specific effect and ξ_{it} is an observation-specific error term. The dynamic characteristics in (5) show that the country-specific fixed effects can be correlated with the lagged dependent variable and some explanatory variables may be endogenous. It can make OLS inconsistency and estimates bias. However the panel differenced Generalized Method of Moments (GMM) estimator, developed by Arellano & Bover (1995), and Blundell & Bond (1998), tackles these problems. It utilizes the lagged differences of the predetermined variable as instruments for their levels and the differences of the strictly exogenous variables (as in the standard IV procedure).

The PMG estimation – based error correction model

$$\Delta Y_{it} = \phi S_{it-1} + \sum_{j=1}^p \delta_{ij} \Delta X_{it-j} + \eta_i + \xi_{it}; \text{ where } S_{it-1} = Y_{it-1} - \theta X_{it-1} \quad (6)$$

Where Y is the share of current account deficits to GDP; S_{it-1} is the deviation from long-run equilibrium at any period for group i, and ϕ is the error-correction (speed of adjustment) coefficient. The vector θ captures the long-run coefficients which do not vary across groups; these coefficients represent the long-run elasticity of current account deficits with respect to each variable in X_{it-1} . The short-run responses of the X variables are captured by the vector δ . η_i is an unobserved time-invariant, country-specific effect and ξ_{it} is an observation-specific error term. In addition, based on the information criterions BIC and AIC, the study uses lag orders $K = 2$ identical for all cross-units, respecting the condition $T > 5 + 2K$, which is important to guarantee the validity of the proposed tests, even with short T samples.

3. Empirical Result

3.1. ADF Unit Root Test

Nelson and Plosser (1982) argue that almost all macroeconomic time series typically have a unit root. Thus, by taking first differences the null hypothesis of nonstationarity is rejected for most of the variables. Unit root tests

are important in examining the stationarity of a time series because nonstationary regressors invalidates many standard empirical results and thus requires special treatment. Granger and Newbold (1974) have found by simulation that the F-statistic calculated from the regression involving the nonstationary time-series data does not follow the Standard distribution. This nonstandard distribution has a substantial rightward shift under the null hypothesis of no causality.

Thus the significance of the test is overstated and a spurious result is obtained. The presence of a stochastic trend is determined by testing the presence of unit roots in time series data. Non-stationarity or the presence of a unit root can be tested using the Dickey and Fuller (1981) tests.

The test is the t statistic on ϕ in the following regression:

$$\Delta Y_t = \beta_0 + \beta_1 \cdot trend + \rho Y_{t-1} + \sum_{i=0}^{\infty} \phi_i \Delta y_{t-i} + \varepsilon_t \quad (7)$$

Where Δ is the first-difference operator, ε_t is a stationary random error.

The data are extracted from Iran central bank database quarterly data in the period of 1981 - 2012. The secondary data include budget deficits (BD), current account balance (CA), oil revenue (OIL) and real exchange rate (RER).

The results of the unit root tests for the series of variables are shown in Table 1. The ADF test provides the formal test for unit roots in this study.

Table 1. Results of unit root test

Variable	ADF Test			
	Level		1 st difference	
	ADF t-statistic	Prob	ADF t-statistic	Prob
Budget deficits	-1.95	0.30	-6.67	0.00
Current account balance	-0.09	0.94	-7.04	0.00
Oil revenue	6.40	1.00	-4.95	0.00
Real exchange rate	-2.27	0.18	-5.26	0.00

Note: The optimal lags for the ADF tests were selected based on optimising Akaike's information Criteria AIC, using a range of lags. We use the Eviews software to estimate this value.

Table (1) shows that with ADF, All variables has a unit root at level, and it is stationary at first differences.

3.2. Differenced GMM Arellano-Bond estimation results

The results of the differenced GMM Arellano-Bond estimation in Table 2 show that all variables except for real exchange rate have statistically significant effects on the current account balance. Accordingly, the impact of the budget deficits on the current account is negative while that of oil revenue is positive.

Table 2 – Table 2 Differenced GMM Arellano-Bond estimations

Variable	Coefficient	t-statistic	Prob
Budget deficits	-0.098	-2.44	0.022
Oil revenue	0.065	5.11	0.000
Real exchange rate	-0.173	-0.44	0.662
INTERCEPT	-1231.74	-0.45	0.65

The coefficient of the budget deficit is negative and significant at 5 per cent level which implies that twin deficit works in Iran in the long run. one unit increase in the budget deficit decrease current account balance by 0.098 percentage points in the long run, holding the effects of all other variables constant in other word one unit increase in budget deficit lead to increase in current account deficit.

The coefficient of oil revenue is positive and significant at 5 percent level. The study finds that if oil revenue increases by 1 percent then current account increase by 0.065 percentage points approximately in the long run.

The coefficient of real exchange rate is negative but insignificant at 5 percent level.

Conclusion

This paper applied the GMM Arellano-Bond to empirically investigate the relationship between current account deficits or current account balance and budget deficits with controlling variables such as real exchange rate and oil revenue for Iran between 1981 and 2012.

Results show that financing of the budget during the last decade through borrowing from the Central Bank lead to increased liquidity and increasing demand has been increasing imports and ultimately has led to the deficit on the current account balance that it has negative impact and lead to an increase in current account deficit, and in fact, Keynes's theory regarding to the positive impact of the budget deficit on the account deficit are accepted and the theory of Ricardian approach has been rejected.

Results show that all variables except for real exchange rate have statistically significant effects on the current account deficits. Accordingly, the impact of the budget deficits is positive while that of oil revenue is negative.

Due to the this fact that the real exchange rate during the period studied in most years has been decreasing in the real exchange rate by increasing the price of export goods in foreign markets and falling prices of imported goods in the domestic market, total demand for goods and services the economy towards external demand will lead. In fact, the decline in the exchange rate, the demand for domestic manufactured goods in the domestic market what the foreign market reduced demand for domestic production would not reduce the full use of existing production capacity and domestic production negative impact on trade balance this negative effect.

The empirical results suggest some policy implications as follows: (i) An increase of the domestic currency under survey can make the current account deficits worse. (ii) An increase in the budget deficits in Iran due to increasing public expenditure to foster the economic growth and reduce the rate of unemployment , worsen the current account deficits. However, the main driver of the two balances is an output shock which depends on the situation of the economy.

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