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Twin Deficits Hypothesis and Feldstein-Horioka Puzzle in Vietnam

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Abstract

This paper examines the validity of the twin deficits hypothesis and the presence of the Feldstein-Horioka puzzle in the case of a small developing country, Vietnam. We investigate the long-run relationship and causality between current account balance, budget deficit and investment for the period 1990 – 2011. The analysis is conducted within the framework of cointegrating technique, error correction modeling and Granger non-causality test. The empirical results show that the twin deficits hypothesis under Keynesian proposition holds for Vietnam in both the short and long runs. The empirical results also point to the presence of the Feldstein-Horioka puzzle, indicating that Vietnam was not fully integrated into the international financial markets. Yet it is found that the investment has a significant contribution to the current account deficit.

Keywords: twin deficits, Feldstein-Horioka puzzle, capital mobility, Vietnam
JEL Classification: F32, F36, E62

1. Introduction

The emergence of the current account deficit and the budget deficit phenomena in many countries in the last three decades has triggered a long debate on the problem of twin deficits. Growing budget and current account imbalances experienced by developed countries have been considered to be the cause of macroeconomic imbalances and are important to the long-term economic progress of a country (see e.g. Edwards, 2001; Megarbane, 2002). It is not only developed countries however that appear to suffer from the twin deficits since many developing countries have also encountered similar problems. Due furthermore to the differences in the structure of the economy, developing countries are more likely to experience the same expansion of budget and current account deficits (Laney, 1984; Khalid and Teo, 1999; Edwards, 2001; Megarbane, 2002; Kouassi *et al*., 2004). Accordingly, authors like Laney (1984) or Khalid and Teo (1999) argued that the relationship between these two deficits is even much stronger in developing economies. As budget and current account imbalances have a negative impact on economic growth (see e.g. Edwards, 2001), this is a particularly relevant topic for developing countries.

The debate on the problem of twin deficits has followed a new vein related to the degree of financial openness and integration in the context of globalization wave since the leading work of Fidrmuc (2003). This vein is very much in the spirit of the original argument by Feldstein and Horioka (1980) that a correlation between the domestic savings and investment in an economy reflects the degree of international capital mobility. A missing variable like the investment, which

may plausibly drive the current account (see e.g. Sachs, 1981; Obstfeld and Rogoff, 1995, 1996), can therefore be used to shed additional light on the issue of financial integration. In this vein, the twin deficits problem can also be linked to the degree of capital mobility across borders (see e.g. Fountas and Tsoukis, 2000; Bagnai, 2006). As a consequence, the persistence of the budget and current account imbalances, capital inflows and the degree of financial markets integration in many developing economies have motivated increasing research on these issues (see e.g. Baharumshah *et al.*, 2005; Marinheiro, 2006; Altintas and Taban, 2011; Bagheri *et al.*, 2012; among other).

As a developing country, Vietnam is no exception. Vietnam has also experienced the problem with a continuous sequence of large budget deficits since the early 1990s and was accompanied by a frequent sequence of significant current account deficits for most of the period. Recently, the persist existence of the twin deficits, as witnessed in many past years, in the context of Vietnam has raised much attention among academic economists and policymakers alike but remaining a gap in the economic literature. Moreover, financial market liberalisation and financial openness in Vietnam have made capital more increasingly mobile across border in the last 20 years but the degree of its integration with international capital markets is still in the question. Vietnam's twin deficits too have again become a matter of concern in the aftermath of the 2007-08 financial crisis which disrupted global trade and capital flows as also Vietnam's progress towards fiscal consolidation.

In this paper, we investigate the long-run relationship and causality between current account balance, budget deficit and investment in Vietnam. The main objective of the investigation is to examine the validity of the twin deficits hypothesis and the presence of the Feldstein-Horioka puzzle in the case of a small developing country. The paper contributes to the existing literature in three significant aspects. First, to the best of our knowledge, it is the first attempt to tackle the twin deficits problem and the degree of capital mobility simultaneously for the case of Vietnam, while the bulk of previous empirical studies address either one of these two issues. Second, no previous work has attempted to include both budget deficit and investment as the determinants of the long-run current account in Vietnam. Third, our contribution is to offer evidence on the degree of integration of the domestic economy into the international financial markets.

The remainder of the paper falls in five sections. Section 2 briefly reviews the existing theoretical and empirical literature in the research area. Section 3 presents analytical framework for our empirical work. Section 4 gives data description and econometric methodology. The empirical results of our analysis are discussed in Section 5. Finally, Section 6 provides concluding remarks and some policy implications.

2. Literature review

This section reviews the existing theoretical as well as some empirical literature related to the twin deficits hypothesis (hereafter TDH) and the Feldstein-Horioka puzzle (hereafter F-H). There are two main theoretical explanations, namely the Keynesian proposition and the Ricardian equivalence, for the relationship between the current account and budget deficits. According to the traditional Keynesian proposition, these deficits are closely linked, and the budget deficit causes the current account deficit due to two main mechanisms. First, an increase in the budget deficit induces domestic absorption, which results in an import expansion and thus worsens the external deficit. Second, and according to the Mundell-Fleming framework, an increase in the budget deficit leads to higher domestic interest rates, to foreign capital inflow, and subsequently to the appreciation of the exchange rate, which then deteriorates the current account balance (see Kouassi *et al.*, 2004). The traditional proposition is however challenged by proponents of the Ricardian equivalence (see Barro 1974, 1989) which claims the absence of any relationship between the current account and budget deficits. This view argues that an increase in the budget deficit due to tax cut is matched by an equal increase in the private savings because people have rational expectations that tax cut today will have to be paid for in the future, so that the current account balance remains unaffected.

In a seminal work, Feldstein and Horioka (1980) asserted that investment-savings correlation measures the degree of capital mobility. If there is no international capital mobility, domestic investment is financed by the domestic savings. Thus, under conditions of capital immobility savings and investment should be highly correlated. On the other hand, if capital mobility exists, domestic investment will be financed by foreign savings. In a world of perfect capital mobility, the financing of domestic investment is not constrained by the amount of domestic savings, but only by the accessibility of funds in the international fully integrated capital market. Domestic savings should respond to the worldwide opportunities for investment while domestic investment should be financed by the international pool of funds. Therefore, under conditions of capital mobility savings and investment should be uncorrelated. Empirically, Feldstein-Horioka findings of a high correlation between the investments and savings suggest that capital is not mobile in the OECD countries. Such a conclusion is in contrast with the liberalisation and integration of financial markets among these countries however (see e.g. Grilli and Milesi-Ferretti, 1995; Mathieson and Rojas-Suarez, 1994). This situation gives rise to the so-called F-H puzzle.

The TDH has a clear linkage with the F-H puzzle since the latter is concerned with the source of financing the external deficit. Given the fact that savings and investment are not highly correlated, reflecting free capital mobility, the budget deficit and the current account deficit can be expected to move together. Let us consider the case of an increase in the budget deficit. If Ricardian equivalence does not hold, this decrease in the public savings is not compensated for by an increase in the private savings, leading to a decrease in the domestic savings. For a given amount of investment, this decrease in the domestic savings leads in turn to an increase in the current account deficit. Hence, perfect capital mobility results into twin deficits in a non-Ricardian world. In other words, if the F-H puzzle exists there is no twin deficits.

Many researches tackle both the TDH and the F-H puzzle simultaneously in the empirical investigations. Fidrmuc (2003) examined evidence of the twin deficits and the F-H puzzle in OECD countries and found a positive long-run relationship between the twin deficits in several countries. Investment in some EU countries was financed to a relatively high degree by the international financial markets, implying that the F-H puzzle is less significant in the EU countries. Similarly, Aristovnik and Djurić (2010) investigated the empirical link between the fiscal balance and the current account in EU. Additionally, the importance of the F-H puzzle in the considered countries is examined. The empirical results mainly rejected the validity of the TDH but provided evidence of a relatively higher level of capital mobility, especially in new EU member states and candidate countries. Marinheiro (2006) concluded for the presence of a (weak) long-run relationship between the twin deficits and found evidence in favor of a reverse causality running from the external deficit to the budget deficit in Egypt. Furthermore, there was evidence in favor of a high degree of capital mobility (or financial integration).

Using data from five Asean countries, Baharumshah *et al.* (2005) examined the causal relation between current account deficits, budget deficits and investments. The empirical results supported the TDH in three countries (Malaysia, Thailand and the Philippines). They also concluded that a high proportion of domestic investment was financed from international sources, which suggest that the F-H puzzle was less important in these emerging economies. Additionally, Baharumshah and Lau (2009) examined the relevance of the TDH for selected seven East Asian countries that comprise two Newly Industrialized Countries, four the Newly Industrialized Economies, and one industrialized economy. They found support of the TDH in four out of seven Asian countries: Indonesia, Korea, the Philippines and Thailand. The study, however, presented a feedback relation between the budget deficit and current account deficit for Malaysia. For the perspective on Singapore and Japan, they discovered the TDH is less likely to be evident in countries with highly developed financial systems.

More recently, Altintas and Taban (2011) found the presence of twin deficits in Turkey and derived that the F-H puzzle holds, with the model revealing that one fifth of the investments were financed through foreign savings. On the other hand, Saeed and Khan (2012) tried to find any

evidence of the F-H puzzle in the presence of twin deficits for Pakistan. The estimated empirical results showed evidence in favor of a high degree of capital mobility by rejecting the F-H puzzle in case of Pakistan. They concluded that the F-H puzzle not exists although Pakistan was not perfectly integrated into the world economy. The TDH and the F-H puzzle were revisited by Bagheri *et al.* (2012) for the case of Iran. The results indicated that there exists a long-run equilibrium link between budget deficit and current account deficit. Testing the validity of the F-H puzzle displayed a low level of international capital mobility for the Iranian economy. In sum, on the whole, the empirical evidence on the TDH is inconclusive and that on the F-H puzzle provides mixed results.

3. Analytical framework

The national account identity provides the basis of the link between twin deficits and degree of financial integration. The model starts with the national income identity in an open economy that can be written as

$$Y = C + I + G + NX + NFI \tag{1}$$

where Y stands for gross national product, C private consumption, I investment, G government spending, NX net export, and NFI net factors incomes from abroad. The sum of the last two items defines the current account balance $CA = NX + NFI$. Taking it to the left hand side of equation (1) and recalling the definition of domestic savings, we have

$$CA = Y - C - G - I = S - I \tag{2}$$

The current account balance is therefore equal to the difference between domestic savings and investment: when a country's investment exceeds its savings, the shortage must be financed from abroad.

A more detailed expression of the sources of domestic savings is obtained by broking down domestic savings into private savings (S^P) and public savings (S^G). So, equation (2) now becomes

$$CA = S^P + S^G - I \tag{3}$$

Note that public savings equal tax revenue (T) minus government spending (G), or ($T - G$) is budget deficit (BD). Upon substituting this in equation (3), we get

$$CA = S^P + S^G - I = S^P + (T - G) - I$$

or

$$CA = S^P + BD - I \tag{4}$$

Equation (4) provides a convenient framework to investigate the relationship between the current account and budget deficit. It shows that if the difference between private savings and domestic investment is stable over time, then the current account and budget deficit must move together by arithmetic (i.e. they are "twin").

Moreover, Obstfeld and Rogoff (1995, 1996) discussed the intertemporal approach to the current account, where levels of domestic savings and investment need not to be correlated. Under the assumption of consumption smoothing, the economy can finance large private investment and budgetary needs or equalize negative income shocks by external deficits and, by definition, surpluses on the capital account. It follows that a relatively high correlation between the current account and the investment implies evidence of high capital mobility. Taking into consideration the significant role of private investment in the context of intertemporal approach to the current account, the long-run relationship between the CA, BD and I in equation (4) can be represented as

$$CA_t = \beta_1 + \beta_2 BD_t - \beta_3 I_t \tag{5}$$

The equation (5) has the advantage of encompassing both the TDH and the F-H puzzle. We expect a positive coefficient for the budget deficit ($\beta_2 > 0$) and a negative coefficient for the investment ($\beta_3 > 0$). Thus, both budget deficit and high investment are expected to worsen the current account balance. Moreover, the β_3 coefficient should equal the unity if country is perfectly integrated into the world economy. In this case, the domestic investment is totally financed from the international financial markets. However, if the β_3 coefficient is significantly lower than unity, then

this indicates the presence of the F-H puzzle. Likewise, a negative β_2 coefficient leads to the rejection of the TDH.

4. Data and Methodology

4.1. Data

In this section, we describe the data and econometrics methodology used in the analysis with reference to Vietnam. One major obstacle in the study is the lack of a reliable and long dataset for Vietnam. Availability of adequate and reliable data is very important for consequential analysis. The validity of results depends on sufficient and consistent data. We have done our utmost effort for the collection of reliable and consistent data set for our research. The data employed in this paper are annual time-series of Vietnam over the period 1990 – 2011, retrieved from various data sources. The main data source is the Key Indicators for Asia and the Pacific published by the Asian Development Bank, complemented with other sources taken from several publications of World Bank, Ministry of Planning and Investment, and General Statistic Office of Vietnam. These data include the current account balance (*CA*), budget deficit (*BD*), and investment (*I*). All the *CA*, *BD* and *I* are expressed in terms of shares of GDP.

4.2. Methodology

Dual main objectives of the paper are to examine the validity of the TDH and the presence of the F-H puzzle for the case of Vietnam. In this paper, we employ the Unit root tests, the Johansen cointegration technique, the Vector Error Correction Model, and the Granger-causality-Wald test to attain the objectives.

Unit root testing

According to the time series econometric literatures, the regression analysis carried out in the usual manner may produce spurious results if the time-series variables at hand are non-stationary (Granger and Newbold, 1974). Therefore, it is essential to firstly check each time-series for stationarity to avoid the spurious correlation problem. To do this, the standard unit root tests are used: the Augmented Dickey-Fuller (ADF) and Phillips and Perron (PP) tests. The null hypothesis for an ADF test and a PP test is that a certain series has a unit root. The optimal lag length for ADF test is chosen based on Schwarz information criterion (SIC), while the bandwidths for the PP test are determined by the Newey-West method. As the standard unit root tests are already well known by now, a further description is not presented here.

Cointegration

Cointegration analysis permits to test and estimate the long-run equilibrium relationship between stationary time series integrated of the same order. If the relevant variables are stationary, the system can be tested for cointegration. The multivariate cointegration tests are used to verify the existence of possible long-run relationship between the set of variables considered in the study. To determine the number of cointegrating vectors, Johansen (1988) and Johansen and Juselius (1990) suggested two test statistics: the trace test and the maximum eigenvalue test. The first one tests the null hypothesis, says that the number of cointegrating vectors equals at most to (*r*). This test is calculated as follow:

$$\lambda_{trace}(r) = -T \sum_{i=r+1}^{p} ln\left(1 - \hat{\lambda}_i\right)$$

where $\lambda_{r+1},\ldots, \lambda_n$ are the smallest value eigenvectors ($p - r$). The null hypothesis states that the number of distinct cointegrating vectors is less than or equal to (*r*), against a general unrestricted alternative being more than (*r*).

The second statistical test is calculated according to the following formula:

$$\lambda_{max}(r, r+1) = -T\, ln\left(1 - \hat{\lambda}_{r+1}\right)$$

This test statistic is based on the maximum eigenvalue. It concerns a test of the null hypothesis that there is (r) of cointegrating vectors against the alternative that ($r + 1$) cointegrating vectors.

The importance of applying a correction factor for the Johansen technique in small samples is now well known. As there is a tendency of the test to falsely reject the null hypothesis of nocointegration in a relatively short span of data (known as size distortion), a correction factor is necessary. In this paper, we apply the correction factor suggested by Reinsel and Ahn (1992) to the estimated maximum eigenvalue and trace statistics. The correction factor suggested is the multiplication of the original test statistic by $(T - pk)/T$, where T is the sample size, p is the number of variables, and k is the lag length for the VAR model.

Vector Error Correction Model

The Vector Error Correction Model (VECM) incorporates both the short-run and long-run relationships among the variables in the system. According to Engle and Granger (1987), if the variables are cointegrated, there must also be a VECM representation. The VECM is a simultaneous system of equations, one for each variable describing the short-run dynamics or adjustment of that variable towards the long-run equilibrium. Such a model consists of the lagged first differences of the endogenous variables and the one-period lagged cointegrating equation. The VECM system takes the following form

$$\Delta CA_t = \alpha_0 + \sum_{i=1}^{p} \alpha_{1,i}\, \Delta CA_{t-i} + \sum_{i=1}^{p} \alpha_{2,i}\, \Delta BD_{t-i} + \sum_{i=1}^{p} \alpha_{3,i}\, \Delta I_{t-i} + \beta_1 ECM_{t-1} + u_{1t}$$

$$\Delta BD_t = \gamma_0 + \sum_{i=1}^{p} \gamma_{1,i}\, \Delta CA_{t-i} + \sum_{i=1}^{p} \gamma_{2,i}\, \Delta BD_{t-i} + \sum_{i=1}^{p} \gamma_{3,i}\, \Delta I_{t-i} + \beta_2 ECM_{t-1} + u_{2t}$$

and

$$\Delta I_t = \delta_0 + \sum_{i=1}^{p} \delta_{1,i}\, \Delta CA_{t-i} + \sum_{i=1}^{p} \delta_{2,i}\, \Delta BD_{t-i} + \sum_{i=1}^{p} \delta_{3,i}\, \Delta I_{t-i} + \beta_3 ECM_{t-1} + u_{3t}$$

where Δ is the first difference, α_i, γ_i and δ_i are the short-term time invariant coefficients, β_i are the long-run coefficients of the lagged error-correction terms (ECM_{t-1}) derived from the long-run equation.

The VECM has cointegration relations built into the specification so that it restricts the long-run behaviour of the endogenous variables to converge to their cointegrating relationships while allowing for short-run adjustment dynamics. Using the Vector Autoregression (VAR) method, we can estimate the VECM. The coefficients α_i, γ_i and δ_I can be linked to the short-run causal (i.e. Granger causality) relation of the variables with respect to dependent variable. The coefficient of the ECM_{t-1} is expected to be negative and it shows the eliminating of speed of disequilibrium.

Granger Causality Testing

If a VAR system is cointegrated, the Granger causality test may be conducted in the environment of VECM. The Granger-causality-Wald test, which looks at whether the lags of any variables Granger-cause any other variable in the VAR system, helps to verify the existence of causality among variables and determine their directions. It determines bilaterally whether the lags of the excluded variable affect the endogenous variable by testing the null hypotheses that the lagged coefficients are significantly different from zero, and, the joint significance of all other lagged endogenous variables in the equation.

5. Empirical results

The preliminary step of the analysis is to examine the stationnarity and order of integration of the time series used in the analysis. Table 1 reports the results of the ADF and PP tests for the series in levels and in first differences. Both the tests fail to reject the null hypothesis of a unit root for all the variables in their first difference at conventional significance levels. Hence, it can be safely concluded that the variables *CA*, *BD*, and *I* contain the unit root or they are integrated of order one, I(1). This may validate our proposition that the variables concerned are cointegrated and a long-run relationship holds among them.

Table 1: The unit root test

Variable	ADF		Phillips-Perron	
	Levels	First Difference	Levels	First Difference
CA	-2.972129	-3.417518**	-2.349699	-3.291080**
BD	-2.689848	-7.223263***	-2.573908	-12.28380***
I	-1.879974	-3.200644**	-1.619238	-3.278019**

Notes: 1) We assume that the data have only an intercept and no trend.
2) The superscripts ***, ** denote significance at the levels of 1% and 5%, respectively.

Given the common integrational properties of all the series, the next step is to test for the presence of the long-run cointegration for the three-dimensional vector. Results of the Johansen cointegration technique (with and without the adjustment factor) are presented in Table 2. The hypothesis of non-cointegrating vector ($r = 0$) is soundly rejected at the 5% significance level. Both the trace and the maximum eigenvalue test statistics point indeed to the presence of a single cointegration vector. On the basis of these test results, we conclude that all the variables enter in the long-run equilibrium relationship. With this information at hand, we proceed further to investigate the nature of long-run and short-run relationships among the variables.

Table 2: The Johansen cointegration test

Eigenvalue	Null	Alternative	Unadjusted	Adjusted	5% Critical Value
		Trace			
0.728074	$r = 0$	$r > 0$	34.97682	30.20725	29.79707
0.245655	$r \leq 1$	$r > 1$	7.932327	6.850646	15.49471
		λ_{max}			
0.728074	$r = 0$	$r = 1$	26.04450	22.49298	21.13162
0.245655	$r = 1$	$r = 2$	5.638096	4.869265	14.26460

Notes: 1) *r* represents the number of cointegration vectors and tests' critical values are at the 5% significance level.
2) The estimations were obtained assuming only an intercept and no trend in the cointegration equation.

Normalising on *CA*, the Johansen technique provides the long-run (cointegrating) equation for the *CA* in Table 3. The normalized cointegrating equation shows that the coefficient of the investment (*I*) is significantly negative as expected, with one third of the domestic investment being financed by foreign savings. There is thus evidence to indicate that the investment contributes significantly to the current account deficit. On the other hand, the low negative investment coefficient reveals a relatively

low proportion of the domestic investment is financed from external sources, which provide a partial basis for confirmation of the F-H puzzle.

Table 3: Long run (cointegrating) equation and the restriction test

Cointegrating equation [*t*-value]				LR-test $\chi 2$-statistic (*p*-value)
CA	*BD*	*I*	*C*	H_0: $\beta_3 = 1$
1.00000	1.654594	-0.328775	8.562829	8.935746
	[4.77137]**	[2.04679]**		(0.002796)

Note: The superscript ** denotes significance at the level of 5%.

At this point it is important to formally test the null hypothesis that the coefficient of the *I* is unity. The test statistic of the LR test is asymptotically distributed as Chi-square with one degree of freedom. The result of an LR test is reported in the last column of Table 3. The test result shows that the null can be rejected at the 1% significance level. The coefficient of the *I* therefore is significantly different from unity. This evidence points indeed to the presence of the F-H puzzle in an emerging Vietnamese economy, supporting the view that Vietnam was not fully integrated into the international financial markets in the examined period. This result is contrary to those of some previous studies conducted for several emerging economies and cited in our review of the literature (e.g. Baharumshah *et al*., 2005). Vietnam still relies strongly on domestic sources (savings) to finance its investment despite the increasing role of international financial markets.

The normalized cointegrating equation also shows that the coefficient of budget deficit (*BD*) is significantly positive, which lead to acceptance of the TDH. The magnitude of the coefficient is unexpectedly high (1.65). It is noteworthy that the relatively high coefficients were also found by Fidrmuc (2003) in some European countries (e.g for France where it is 16.71) and Baharumshah *et al*. (2005) in an Asean country (for Singapore 3.04). Note however, that the finding of a positive correlation does not indicate where the causality runs from: it could be the budget deficit that causes the external deficit, or the other way round. In order to determine the direction of the (possible) causality relationship, it is necessary to estimate the VECM.

Finally, the VECM is employed to see the causality among the variables in the system. The second column of Table 4 shows the coefficients of the ECM_{t-1} derived from the long-run equation. As expected, the sign of the ECM_{t-1} in the ΔCA equation is negative at the 1% significance level. The significance of the ECM_{t-1} indicates that *CA* is endogenous in Vietnam, as it is *CA* that adjusts its path to the long-run equilibrium. The VECM estimation reveals about 90.9% of the disequilibrium in *CA* would be corrected over the following year. This means that the adjustment takes place very quickly.

The evidence indicates that *BD* and *I* Granger-cause *CA* in the long run. In addition, since the negative coefficient in the ΔBD equation of the ECM_{t-1} is not significant even at the 10% level, there is a one-way causality running from the *BD* to the *CA*. Hence, these evidences coupled with the existence of a long-run equilibrium relationship between *CA* and *BD* does confirm the Keynesian proposition in the Vietnamese economy. This result in favour of the Keynesian TDH corroborates results of some previous studies conducted for developing countries in general and emerging economies in particular in the cited review of the literature (e.g Marinheiro, 2006; Baharumshah and Lau, 2009; Bagheri *et al*., 2012; among others). A key reason of the budget deficit in Vietnam during the sample period is seen through the policy of 'progressive' public investment. The view on the decisive role of state economic sector that forced the Vietnamese government to pursue large investment both directly and through state-owned enterprises for many years has led to a rapid

increase in the share of public investment in GDP and, consequently, widening the budget deficit along with the current account deficit.

It is also worth pointing out here that the non-significance in the ΔBD equation of the ECM_{t-1} suggests *BD* plays a weakly exogenous role in the ΔCA equation. Such a finding in the case of Vietnam tallies with those found in Baharumshah *et al*. (2005) for other Asean countries – Malaysia, Thailand and Philippine. It is an important finding, implying that the fiscal policy would be an effective measure to correct the current account imbalance directly in Vietnam as well as in these Asean countries.

In the ΔI equation, the coefficient of the ECM_{t-1} is positive at the 10% significance level, suggesting that *BD* has a negative effect on *I* in the long run. This finding supports the neoclassical view that government spending crowds out private investment, which holds widely in a closed economy. This result could be justified in Vietnamese case in two different ways. On the one hand, the crowding out effect may be signs of a small and more financially closed rather than open economy, which adds further weight to the evidence of presence of the F-H puzzle presented above. More importantly and as argued earlier, it implies that the relationship between the two deficits is direct rather than indirect. On the other hand and unlike other open economies, capital inflows may have not acted as a force to mitigate the problem of crowding out for the Vietnamese economy.

Table 4: The VECM and Granger causality

Dep. Variable	ECT_{t-1}	ΔCA	ΔBD	ΔI
	[*t*-value]	Wald-test $\chi 2$-statistic (*p*-value)		
ΔCA	-0.908901	-	1.165762	0.353278
	[-4.68480]**		(0.0008)	(0.4350)
ΔBD	-0.069767	-0.034876	-	-0.067595
	[-0.53303]	(0.7792)		(0.8248)
ΔI	0.248383	-0.106743	-0.390975	-
	[2.05976] **	(0.3517)	(0.0718)	

Note: The superscript ** denotes significance at the level of 5%.

The VECM provides some additional information on the short-run causality among the variables. Table 4 also reports the results of the Granger-causality-Wald test. It is evident that the null hypothesis of non-Granger causality between ΔBD and ΔCA is easily rejected at the 1% significance level. The test results indicate that ΔBD does Granger-cause ΔCA, but not the reversal causality. Hence, the TDH under the Keynesian proposition also receives strong support in the short run.

6. Conclusion

This paper investigates the long-run relationship and causality between current account balance, budget deficit and investment in Vietnam. The main objective of the investigation is to examine the validity of the TDH and the presence of the F-H puzzle in the case of a small developing country. Using time series data over the period 1990 – 2011, we conduct the analysis within the framework of cointegrating technique, error correction modeling and Granger non-causality test. The empirical results show that the TDH holds for Vietnam. Moreover, we do find strong support for the Keynesian proposition, with causality running from the budget deficit to the current account deficit, in both the short and long runs. The empirical results also point the presence of the F-H puzzle, indicating that Vietnam was not fully integrated into the international financial markets. Despite the increasing role

of international financial markets, Vietnam still finances its investment mainly from domestic savings. Yet it is found that the investment has a significant contribution to the external deficit.

From a policy perspective, the validity of the TDH has strong policy implications, and is closely linked to the F-H measure of low capital mobility in the Vietnamese economy. These findings, taken together, suggest that the budget deficit has still been the prime cause of foreign capital inflows in a small and more financially closed economy like Vietnam. Additionally, the weakly exogenous role of budget deficit implies that fiscal policy would be an effective measure to correct the current account imbalance. Since the Keynesian TDH is correct, the appropriate policy prescription would be a reduction in the budget deficit via a fiscal consolidation. This therefore calls for the government to launch further measures in order to curtail its non-productive spending, particularly in the public investment, and to raise its budgetary revenue. As such the government might effectively make the twin deficits under control and keep economic growth sustainable.

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