

Waheed Ahmed Alhindi¹, Norkhairul Hafiz Bajuri², Saqib Muneer³

**TWIN DEFICIT AND FELDSTEIN-HORIOKA PUZZLE:
SOUTH ASIA (PAKISTAN, INDIA & SRI LANKA) PERSPECTIVE**

The primary objective of this study is identifying the role of twin deficit and Feldstein-Horioka puzzle in Pakistan, Sri Lanka and India. Moreover, this study explores the relationship between current account deficit (CAD) and budget deficit (BD) in Pakistan, Sri Lanka and India from 1980 to 2011. According to the twin deficit hypothesis, "a larger budget deficit leads to an expanded current account deficit". However, according to the Feldstein-Horioka puzzle, "there is a low correlation between national investment and national saving in the presence of accurate mobility of capital". Prior studies on twin deficit, conducted in South Asia, present the single country analysis, but this study is going to compare the twin deficit of 3 countries in South Asia. In order to achieve the objective and check that the data is either unit root or not one of 3 tests (Dickey-Fuller test, augmented Dickey-Fuller test, Dickey-Fuller generalized least square) can be applied. In addition, Granger causality tests, cointegration tests and error correction model can be used to examine the data.

Keywords: twin deficit, current account deficit, budget deficit, Feldstein-Horioka puzzle.

**Вахід Ахмед Альхінді, Норхайрул Хафіз Баюрай, Сакіб Мунір
ПОДВІЙНИЙ ДЕФІЦИТ І ПАРАДОКС ФЕЛЬДШТЕЙНА-
ХОРИОКИ: ДОСЛІДЖЕННЯ ЗА ДАНИМИ ПІВДЕННОЇ АЗІЇ
(ПАКИСТАН, ІНДІЯ І ШРІ-ЛАНКА)**

У статті визначено роль подвійного дефіциту і парадоксу Фельдштейна-Хоріоки в економіці Пакистану, Шрі-Ланки та Індії. Досліджено залежність між дефіцитом рахунку поточних операцій і бюджетним дефіцитом у Пакистані, Шрі-Ланці та Індії з 1980 по 2011 рік. Згідно з гіпотезою подвійного дефіциту, "збільшення бюджетного дефіциту призводить до зростання дефіциту поточного рахунку". Однак, відповідно до парадоксу Фельдштейна-Хоріоки, "існує невелика кореляція між національними інвестиціями та національними заощадженнями за умов певної мобільності капіталу". Попередні дослідження подвійного дефіциту, проведені в Південній Азії, були покrajнові, а в даній статті порівняно показники подвійного дефіциту в 3 країнах Південної Азії. Для аналізу використано тест Дікі-Фуллера, доповнений тест Дікі-Фуллера, метод найменших квадратів за Дікі-Фуллером, а також тест причинності за Грейнджером, тест на коінтеграцію і модель корекції похибок.

Ключові слова: подвійний дефіцит, дефіцит рахунку поточних операцій, дефіцит бюджету, парадокс Фельдштейна-Хоріоки.

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**Вахид Ахмед Альхинди, Норхайрул Хафиз Баюри, Сакиб Мунир
ДВОЙНОЙ ДЕФИЦИТ И ПАРАДОКС ФЕЛЬДШТЕЙНА-
ХОРИОКИ: ИССЛЕДОВАНИЕ ПО ДАННЫМ ЮЖНОЙ АЗИИ
(ПАКИСТАН, ИНДИЯ И ШРИ-ЛАНКА)**

¹ Professor, Department of Public Administration, College of Business Administration, King Saud University, Riyadh, Saudi Arabia.

² Dr., Faculty of Management and Human Resource Development, Universiti Teknologi Malaysia, Malaysia.

³ PhD Student, Department of Management, Faculty of Management and Human Resource Development, Universiti Teknologi Malaysia, Malaysia.

В статті определена роль двойного дефицита и парадокса Фельдштейна-Хориоки в экономике Пакистана, Шри-Ланки и Индии. Исследована зависимость между дефицитом счета текущих операций и бюджетным дефицитом в Пакистане, Шри-Ланке и Индии с 1980 по 2011 год. В соответствии с гипотезой двойного дефицита, "увеличение бюджетного дефицита приводит к росту дефицита текущего счета". Однако, в соответствии с парадоксом Фельдштейна-Хориоки, "существует небольшая корреляция между национальными инвестициями и национальными сбережениями при условии определенной мобильности капитала". Предыдущие исследования двойного дефицита, проведенные в Южной Азии, были пострановыми, а в данной статье сравнены показатели двойного дефицита в 3 странах Южной Азии. Для анализа использованы тест Дики-Фуллера, дополненный тест Дики-Фуллера, метод наименьших квадратов по Дики-Фуллеру, а также тест причинности по Грейнджеру, тест на коинтеграцию и модель коррекции погрешностей.

Ключевые слова: двойной дефицит, дефицит счета текущих операций, дефицит бюджета, парадокс Фельдштейна-Хориоки.

1. Introduction. Twin deficit (also called "double deficit") is the short form of 2 related economic variables: government budget deficit and current account deficit. Both deficits occur when a country spends more than earns. If a country spends more than earns it must borrow money or sell its assets. The effects of a twin deficit can be harmful, as each deficit can feed off the other, causing a country's economic decline. Budget deficit is not usually considered prolific as it impacts availability of funds for private borrowers negatively which further raises private loans' interest rates. In the field of international finance and macroeconomics, the Feldstein-Horioka puzzle (Martin Feldstein and Charles Horioka, 1980) has widely been discussed. As economics assumes; if investors are capable to invest in any country of the world, they will first choose to invest in a country that offers highest per unit return on investment that will raise the price of per unit investment until per unit price of investment becomes the same. If the theory is accepted, then statistically it will not be possible to determine the relationship between investment and savings within a single country. However, the data provide the opposite results. According to Feldstein-Horioka puzzle (FHP) if perfect capital (K) mobility is considered, then there would be lesser correlation between savings (S) and domestic investment (I). Investors can borrow funds at world rates from international markets and they don't need to finance themselves from domestic savers. In the same way, savers can lend their entire savings to foreign investors. Yasutomi & Horioka (2011) explained the views of Adam Smith in the Feldstein-Horioka puzzle that this is about investor's own security. Making investments in other countries is riskier than investing in own country. That simply shows that investors are more interested in a source of capital than in that of gaining profit. Governmental provision of economic assistance for the masses is the predominant effort for budget deficit.

External balance or current account deficit (CAD) is the sum of public and private sector gaps of investments and savings. In short, this statement summarizes financial dealings internationally, in terms of goods or services exchange of one country with other countries in the world. According to Roubini and Setser (2005), large and never-ceasing current account deficit of the US will in the end bring global financial imbalance. Their study proved to be true and the world started facing financial

problems in 2008, whereas the aftershocks of financial crisis that occurred in 2008 are still being experienced internationally. Freund & Warnock (2007) observed that the United States' CAD in 2004 was \$668 bln, which was 5.7% of its GDP. By using Turkish data, Ekinci & Erturk (2007) also pointed towards this imbalance during the crisis of 2000. CAD for the US is created by surplus CAD of China (Cordon, 2009). Summers (1986) documented 5% CAD of GDP highly risky and "danger point" which creates many problems and inescapable adjustments can be experienced which will raise interest rate and slow down the growth that would further depreciate the currency. International finance and financial economics have always centered twin deficit (CAD and BD relationship). This relationship's significance rises when such financial imbalance issues are faced by a country. That's why researchers from both developed and developing countries have been testing twin deficit. CAD is the sum of public and private sector deficits (investment-saving gaps), so in the absence of a private sector deficits adjustment, an increase in BD may enforce CAD move in the same direction. However, this simple accounting ignores some important adjustment mechanisms like interest rates and exchange rates. It also ignores their respective importance in establishing relationship between CAD and BD and capital mobility explained through the Feldstein-Horioka puzzle.

Twin Deficit in Subcontinent.

Twin Deficit in Pakistan: After the partition in 1947, the country lacked many resources (personnel, institutions, funds) to help country develop and sustain in the region. Pakistan's government decided to raise growth rate to lessen the poverty level, deficit stroke 7% of GDP during the 1980s, which was largely financed by financial markets. Growth rate was 6% a year during 1980. In the fourth quarter of 2011 CAD was reported almost 815 mln USD. Pakistan reported budget surplus roundabout 8.8% to 8.1% of the GDP from 1990 to 1993. From 2006 it was again raised to 7.6% in 2009. After the currency crises in all over the world Pakistan budget surplus dropped and Pakistan reported 5.2% deficit in 2005. Budget deficit equivalent to 6.3% of GDP was reported in 2010.

Twin deficit of India: India is one of the few countries with both fiscal deficit and current account deficit. However, the extent of deterioration in both is a matter of deep concern. India has been running persistent twin deficits since 1980-81. Small vicissitudes occurred in India's current account from 2000 to 2006. Things went wrong and India's current account deficit reached 12.6 mln USD in the first quarter of 2009. From 2009 to 2011 things became worse and India reported 16.9 mln USD in the second quarter of 2011. The data from Reserve Bank of India on balance of payments (BOP) showed the rise in CAD that was 4.3% of GDP during the last quarter of 2011, higher than in the same period of 2010 which was 2.3%. 19.6 bln USD current account deficit was reported by India in the fourth quarter of 2011. Budget deficit of 3.5% was reported by India in 1990 and it decreased to 2.3% in 1993. During the worldwide financial crises the deficit of India suddenly increased to 7.5% in 2009. In 2010 deficit decreased to 6.9% of its GDP. In 2011, at the end of the fiscal year budget deficit equivalent to 5.10% of GDP was reported by India.

Twin Deficit in Sri Lanka: Since the independence of Sri Lanka from Britain in 1948, country's economy has always been affected by catastrophes like Indian Ocean

earthquake in 2004 and several insurrections like in 1971, 1987-89 and civil war during 1983-2009. In 2001 the debt reached 101% of GDP and Sri Lanka faced bankruptcy. Political and economic challenges slowed down the economic growth. During 1991-2000, the average annual growth rate of GDP was 5.2%. Country's CAD was around \$1.4 bln USD when trade deficit reached \$5.2 bln USD in 2010. In the second quarter of 2011 CAS equivalent to \$1064 mln was reported by Sri Lanka. Budget deficit decreased to 7.2% in 2007 from 8.1% in 2006. Total revenue-to-GDP ratio increased in the 3rd consecutive year in 2007. In 2008, government's target was to lessen the budget deficit to 7%. In 2010, 8% of GDP was reported as budget deficit.

2. Literature Review. In the theoretical perspective, there may be at least 4 different relationships between external deficit (CAD) and internal deficit (BD). The traditional Mundell-Flemming model, which itself bases on the orthodox Keynesian framework, describes that budget deficits (BD) generate current account deficits (CAD) (Mundell, 1963; Fleming, 1967). In this kind of framework of twin deficit, a raise in budget deficit in the open economy tends to increase the domestic interest rate. High rates of interest further induce capital inflow and thus cause a real exchange rate appreciation. In this capital inflow known as the Feldstein-Horioka puzzle, domestic currency appreciation deteriorates the current account deficits (CAD), and consequently BD causes CAD. The main assumption is that capital flow (inflow or outflow) moves faster than trade flow (imports and exports). The reason behind this faster capital flow is that international investors draw advantage from arbitrage, interest rate differences among countries, to attain profit prospects. Bellongia & Stone (1985) studied budget deficit and current account deficit by analyzing intertemporal model of taxation smoothing and consumption (that is to resolve the Feldstein-Horioka puzzle). They further explained that the incorporation of international capital markets is in such a manner that the significance of fiscal deficits to determine saving behavior and current account may explain the Feldstein-Horioka puzzle. Dewald & Ulan (1990) explained that theoretically, fundamentally non-monetized high budget deficit would influence in the following ways. It will pressurize interest rate upward. High interest rates would increase the value of rupee (in terms of foreign exchange). Stronger rupee will consequently shed net exports. Normandin (1994) studies the relationship between budget deficit and external deficit, where the overlapping generation model of Blanchard was used. According to him, from Canadian perspective, there is a significant relationship between budget and external deficit. In the case of USA, budget deficit has not been extracted as an important determinant between 2 deficits, therefore the usefulness of Richardian equivalence has been estimated for the US economy.

Coakley et al. (1998) from this perspective explained the importance of the Feldstein-Horioka puzzle that how economists respond to it that the association of high investment-saving among the OECD countries entailed dispirited capital mobility. According to them, in the OECD, FH result pertaining to high saving investment has played a vital role. For policy matters, FH regression may be questionable because of the origin of both investment and saving. Regarding capital mobility, mere FH result may not be enlightening. The FH puzzle shows that analytically the belief of capital mobility is not straightforward. Vyshnyak (2000) worked on twin deficit

hypothesis in case of Ukraine. He further documented that Ukrainian data supported it. Exchange rate between 2 deficits is the diffusion system. Amornthum (2003) worked on the Feldstein Horioka puzzle and endeavor to find if the puzzle is solved or not yet solved. Recent explanations related to current account solvency seem to be a key respondent of puzzle, yet it has not been accepted widely. The puzzle still goes on and experimental support has not been found yet. According to Ozmen (2004), the FH puzzle on investment and domestic saving connection is backed by the data of Middle East and North American countries. Furthermore, he determined that both ARDL limits panel measures and cointegration test. Hericourt & Maurel (2005) examined the extent of financial integration in the European Union through the Feldstein-Horioka puzzle. They explained that the Feldstein-Hoioka criterion keeps emphasizing the differences between small and large countries. Bartolini & Lahiri (2006) worked on the importance of the twin deficit hypothesis and its effect after 20 years. According to them, larger fiscal deficit by affecting national savings prolongs current account deficit. They affirm the hypothesis of twin deficit, whereas they do not back the idea that a significant role can be played by decline in future deficit to get rid of current account imbalance. Short-term and long-term relationships between 2 deficits were analyzed by Samadi (2006) in MENA countries. No cointegration was found by them between 2 deficits in Jordan, Morocco, Iran, Oman, Kuwait and Tunisia whereas they found the integration in Turkey and Egypt. 2 deficits move along in the same direction in Bahrain, Egypt, Turkey and Oman.

Freund and Warnock (2007) on CAD documented that these deficits are hard to abolish in industrial countries. Katsimi and Moutos (2007) by examining the FH found a connection limited international capital and human mobility. Baharumshah et al (2009) investigated the significance of the twin deficit in ASEAN. They found that the important role is played in budget deficit to strengthen the current account deficit in Malaysia, Thailand and the Philippines. Casual relationship was examined by Chang and Hsu (2009) between the two deficits of some countries of Northern Europe, the US and Asia. They used Wald test practice in a multivariant structure. They explained that the twin deficit hypothesis diverges in different countries, Ricardian equivalence hypothesis is valid in these countries, and there is a structural disparity of economic studies. Lau et al. (2010) examined the twin deficit argument in the countries affected by Asian crisis. According to them, for Malaysia, Thailand and the Philippines the causality runs to current account deficit from budget deficit. For Korea and Indonesia, a reverse trend is seen in causality run, while in the Philippines a bidirectional causality was seen in the post-crisis period. Efremidze and Tomohara (2010) documented how both deficits during 1970-2000 changed in anticipating sudden stops. They explained that over the decades, twin deficit's descriptive power declined but both deficits still play an important role. Huge CAD is a problem even when budget deficit does not escort it. Zamanzadeh & Mehrara (2011) applied the hypothesis of twin deficit to the economic data on Iran. They explained the acceptance of twin deficit hypothesis compared to the hypothesis of Ricardian equivalence that explains that economic variables are not affected by governmental spending and taxes. Jun (2011) analyzed the relationship between investments and savings. He examined that investment and saving rates are unit roots and

cointegrated. The level of the predictable saving-retention coefficients is greatly minor than those accounted by Feldstein-Horioka.

In the Ricardian equivalence hypothesis (REH) framework, which is based on the hypothesis of permanent-income-life cycle, on the contrary, lies indeed no relationship between BD and CAD (Seater, 1993). The fiscal deficit increment would not affect real wealth of the consumer and budget constraint of private sector lifetime. Consequently, the changes in budget deficits will not have an effect on the equilibrium levels of CA balance, investment, consumption and interest rates. Barro (1989) suggests that budget deficit increment can be balanced by increasing private saving with no fall in aggregate national saving. The theory assumes that budget deficit gives an idea about future taxes, so people will save today to pay tax in future. The same phenomenon had taken place in the late 1970s in the USA. Accordingly, there need to be no crowding out of either the current account balance or investment (Frankel, 2004). As compared to the studies undertaken for industrial countries, the number of empirical studies which test the twin deficits hypothesis is rather limited for developing countries. Many studies were conducted in developing countries like Akbostanci and Tunc (2001), Islam (1998), Kim and Kim (2006), Hakro (2009) for Pakistan, and Lau et al. (2009) for Cambodia. Authenticity and viability of the twin deficit phenomenon was doubted by Bernheim (1988) and Islam (1998) from the underdeveloped countries' perspective. For instance, in under-developed countries, Lany (1986) determined empirical relationship and strong impact of internal deficit (BD) on external deficit (CAD). Akbostanci and Tunc (2001) in Turkey determined the long-run linkage between budget and trade deficits. Thus, Ricardian equivalence hypothesis (REH) is not supported by Turkish data. Lau et al. (2009) investigated Cambodian data and documented the existence of twin deficit in both short and long run. The study affirmed the existence of current account deficit (CAD) by budget deficit (BD).

In the resolution of 2 deficits exchange rates and interest rates plays a critical role. A number of researchers from many different countries have analyzed the two channels, interest rates and exchange rates. Feldstein (1982), Kvasnicka (1985) and Bahmani-Oskooee (1995) documented the relation between budget and external deficits by taking into account interest rates and exchange rates. The pertinence of short-run twin deficit in the case of the US has been rejected by Holmes (2010), but to have power over CAD the study sturdily suggested fiscal policy control. It is visibly noticeable that there is a connection between twin deficit and financing sources which sustain external deficit, so this creates an apparent relation between twin deficit with the professed Feldstein-Horioka puzzle. Feldstein and Horioka (1980) and Feldstein (1982) state that home (domestic investment) cannot be restricted by domestic savings in the world where capital is completely transportable. This has given every country's saving opportunities en route to act in response to global investments. As a result, countries through their investments can be capable of enjoying collection of savings of all the countries of the world. A numerous problems, like models chosen for an exploration are under- or overidentified, have affected these studies. Lag lengths are imperfectly selected. The study furthermore aims to make use of other time-series measures to discover the power of the twin deficits proposition

and the Feldstein-Horioka puzzle for the statistics of India, Pakistan and Sri Lanka. 4 variables are altered from yearly to quarterly level. The nature of the study is novel itself as it will undertake the study of twin deficit discretely and after that with the Feldstein-Horioka theory underneath vibrant analysis.

3. Conclusion. This paper reviewed the relationship between CAD and BD as well as analyzed the Feldstein-Horioka puzzle for Pakistan, Sri Lanka and India. Regarding twin deficit, 2 propositions (Ricardian equivalence, and the Keynesian proposition) exist in literature. Ricardian equivalence argues there is no correlation between CAD and BD while Keynesian proposition documents a positive relationship between twin deficits. If the twin deficits hypothesis was valid, "the appropriate policy prescription to correct a current account deficit would be a tax increase. However, such a policy prescription would be completely ineffective if Ricardian equivalence was a valid description of reality". In order to accomplish our objective, Granger causality tests, cointegration tests and error correction model can be used. In the light of prior studies it is clear that twin deficits exist in Pakistan, Sri Lanka and India while the Feldstein-Horioka puzzle keeps stressing the differences between small and large countries. Developing and testing the hypotheses of twin deficits and Feldstein-Horioka puzzle will be our next work.

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