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Fiscal Policies And Current Account Dynamics in OECD Countries.

Do Military Expenditures Matter?

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Abstract

This paper builds on the empirical studies that have investigated the relationship between fiscal policies and the current account balance. Fiscal balances have been the most notable proxies for fiscal policies in these studies but also the general public expenditure has been considered. Drawing on this inspiration, this paper analyses the empirical relationship between military expenditures and the current account balance. Panel data for 30 OECD economies covering the period 1995 – 2011 has been used to compare the estimates from OLS, fixed effects and GMM models. A conclusion has therefore been drawn that there is evidence that military expenditures matter for the current account dynamics of the OECD sample countries.

Key Words: Fiscal policies, Current account balance, Military Expenditures, Panel data.

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1. Introduction

Fiscal policies and monetary policies act as the main tools available to policy makers for regulating the economy. Fiscal policies, the attention of this paper relate to government policies such as public consumption behaviour and the use of the tax rate to influence the economy. These policy tools can be applied by the government depending on whether it wishes to pursue an expansionary approach such as when the economy is in a recession or to contract aggregate demand such as due to overheating in the economy. Apart from taking into consideration the bi-effects of expansionary policies on the economy, the impact on the economy's external balance also needs consideration. For instance, an expansionary policy aimed at bringing the economy out of a downturn could augment the price level. Such a policy however also risks deteriorating the country's external balance or the current account balance (Vinals, 1986).

More recently, the need to understand the empirical relationship between fiscal policies and the current account balance has been alike for scholars and for policymakers. This interest has been especially provoked by the twin deficit hypothesis which came to light following the simultaneous fiscal and current account deficits experienced by the United States during the 1980s. Consequently, most empirical research on the relationship between fiscal policies and the current account balance has used the fiscal balance as a proxy for fiscal policy with many of the studies finding a positive and significant relationship between these variables [for example Abbas et al. (2011), Gossé & Serranito (2014) & Kin & Roubini (2008)]. On the other hand, Bussière et al., (2004) is one of the notable studies which take into consideration the impact of the general public expenditure on the current account balance. The empirical evidence on the relation between fiscal policies and the current account balance is however believed to be inconclusive. One of the arguments for this inconclusiveness is that the relationship between fiscal policies and the current account balance depends on the assumptions imposed. It is therefore believed that the response of consumers to the higher income from expansionary fiscal policies depends on whether they are Ricardian or Keynesian (Bussière et al., 2004).

For an understanding of how fiscal policies influence the current account balance, it is crucial to emphasize that the current account balance is influenced by the saving and investment behaviour in the economy. This behaviour is highlighted through various economic variables incorporated into theoretical models of the current account balance such as the intergenerational current account models derived by Obstfeld & Rogoff (1996).

This paper therefore builds on the existing literature about fiscal policies and the determinants of the current account balance. The main contribution of this study is the consideration of the role of military expenditures henceforth interchanged with defense burdens, for the current account balance dynamics of OECD countries. Being a typical public good is one reason why military expenditures can act as a good proxy for fiscal policies since they can solely be met by the government in the interest of the country's population. The main challenge however is to clarify the theoretical channels through which military expenditures would be expected to influence the current account balance due to lack of existing studies. On the other hand, a form of Keynesianism popularly referred to as Military Keynesianism has been accepted as a theory to emphasize the use of military expenditures by the government in order to influence the business cycle (Custers, 2010). Various studies have therefore based on the theory of Military Keynesianism to empirically investigate the empirical relationship between military expenditures and growth and investments [for example Atesoglu (2004), Benoit (1978), Pieroni et al. (2008) and Smith & Dunne (2001)] are some of the studies that have covered the relationship between military expenditures and the performance of the economy. It is argued that a negative impact of the military expenditures on growth can be interpreted as evidence of crowding out effect or the depressing of private investments. Empirical evidence of the relationship between military expenditures and growth and investments variables therefore offers a basis for the contribution of this paper. This is because growth and investments are an integral part of the current account models derived for example in the theoretical work of Obstfeld & Rogoff (1996).

For policy relevancy, Abbas et al., (2011) for example argue that adjusting the fiscal balance could be helpful for countries with large current account imbalances to correct these imbalances. In relation to defense burdens, this argument can be expanded by relating to events following the recent global economic downturn. It is well documented that following the recent economic crisis, many Western governments adopted austerity measures. The growth of large budget deficits during the aftermath of the financial crisis induced cuts in public spending by many developed countries. Hence, due to the budget crises, many governments also cut down their defense budgets (SIPRI Year Book, 2012). Additionally, the analysis of the impact of defense burdens on the external balance comes at a time when there are differing views among NATO member countries on the commitment of a 2 percent GDP threshold towards their defense sectors. Very few NATO states except the United States fulfil the 2 percent GDP threshold (The Guardian, 16 March 2015). The US on average committed 3.8 percent of its

GDP[1] towards the defense sector between 1995 and 2011 which makes it the largest spender on the defense sector considering the size of its economy. Furthermore, in the wake of huge global imbalances during the recent years, understanding the impact of military expenditures on the current account balance could add to arguments in the debate on defense burdens.

This paper uses OLS, fixed effects and Generalized Method of Moments (GMM) estimation methods to highlight the empirical relationship between military expenditures and the current account balance in OECD countries while also controlling for other determinants of the current account balance. The data used is an unbalanced panel of 30 OECD economies covering the period 1995 - 2011. The results from estimating the baseline models indicate some empirical evidence that military expenditures deteriorate the current account balance. Ceteris paribus, it has been found that a 1 percentage point increase in military expenditures deteriorates the current account balance by between 0.3 and 0.9 percentage point. This impact is statistically significant in both cases at 5 percent significance level. Additionally, this finding only holds without controlling for the general public expenditure and the fiscal balance. Intuitively, these results translate into the interpretation that military expenditures matter for the current account dynamics of OECD countries.

The rest of the paper is organised as follows. Section 2 covers the theoretical framework. Section 3 reviews some of the studies on the relation between fiscal policies and the current account balance. Section 4 covers the econometric methodology. Section 5 reports the empirical results and the analysis. Section 6 provides some robustness considerations. Section 7 discusses the limitations of the paper whereas section 8 concludes.

2. Theoretical Framework.

The foundation of this paper rests on literature about fiscal policies and the determinants of the current account balance. This section therefore covers the theory of the current account determinants, the theory on fiscal policies in general and also the theory related to fiscal policies which directly refers to military expenditures.

[1] Average calculation using data from SIPRI for the period 1995 - 2011

2.1 A model for the current account balance.

An intertemporl approach can be used to analyse the theoretical determinants of the current account balance. By also taking into consideration the life cycle hypothesis, the basic current account model can be extended to arrive at an overlapping generations model of the current account balance (Rogoff & Obstfeld, 1996). Unless referenced otherwise; the main reference in this subsection is the work of Rogoff & Obstfeld (1996).

The theoretical application of the overlapping generations model imposes some assumptions which are crucial in an open macroeconomic context. This paper considers only the assumptions of a small open economy that exists in two periods, in line with the goal of the paper. This assumption has some implications for the economy. Firstly, being an open economy implies that the country can borrow and lend on the world capital markets so as to smooth consumption. Similarly, the country's investment demands do not necessarily have to be met by its national savings. Additionally, the assumption of a small yet open economy implies that the country takes the world market interest rate as given. Secondly, the assumption of a two period economy implies that the individuals in this economy maximize utility for the period when they are young and the period when they are old.

A country's current account balance on the other hand is defined as the difference between its total income and its consumption. In an open economy framework, the economy's consumption does not necessarily have to be equalized by its total income due to the availability of borrowing and lending opportunities on world capital markets.

Hence, defining the current account identity of a country as;

$$CA_t = Y_t + \beta_t - C_t - I_t - G_t \quad (1)$$

Identity 1 indicates a country's current account balance is positively influenced by its Gross National Product (Y_t) and its net foreign assets position (β_t). The net foreign assets position of the country at a given time could be positive or negative depending on whether the country recorded a surplus or a deficit during the previous period. Furthermore, the current account identity can also be seen to be negatively influenced by private consumption(C_t), aggregate investments (I_t) and public consumption (G_t).

One implication of the public expenditure variable in the current account balance identity is that the government attempts to balance its budget through imposing lump sum taxes on the private sector. Hence, the country's population which is made of the young and the old have to maximize their utility.

Hence, they maximize the following utility function;

$$U\left(C_t^y, C_{t+1}^o\right) = lnC_t^y + BlnC_{t+1}^o \qquad (2)$$

Subject to the following budget constraint,

$$C_t^y + \frac{C_{t+1}^o}{1+r} = \left(y_t^y - T_t^y\right) + \frac{y_{t+1}^o - T_{t+1}^o}{1+r}. \qquad (3)$$

Where y signifies the young and o the old.

Alternatively, the current account balance can be defined as the difference between the country's aggregate domestic savings and aggregate level of investments. Consequently, the current account identity can be defined in terms of national savings and aggregate investments.

Defining national savings as;

$$S_t = Y_t + r\beta_t - C_t - G_t \qquad (4)$$

The current account identity can be re-written as;

$$CA_t = S_t - I_t, \qquad (5)$$

Thus, identity 5 indicates that a country's current account balance is the difference between its aggregate savings and aggregate level of investments. Given that the savings – investments current account identity is positive, the country runs a surplus and consequently becomes a net lender whereas if it is negative, the country runs a deficit and consequently becomes a net borrower.

Identity 5 can further be redefined by differentiating between private and public savings (Abbas et al., 2011). Hence, based on Abbas et al., the current account identity 5 can be re-written as;

$$CA_t = \left(S_{pr} - I_{pr}\right) + (S_g - I_g) \qquad (6)$$

Where $\left(S_{pr} - I_{pr}\right)$ is the difference between private savings and investments and $(S_g - I_g)$ the difference between public savings and investments which is also known as the fiscal balance.

2.3 General view on fiscal policies and the current account.

Fiscal policies refer to the government purchase of goods and services and tax policy, a policy tool widely believed in by the Keynesianism theory as a way to achieve full employment.

Related to fiscal policies and the current account balance is the twin deficit hypothesis. It was initially used to refer to the simultaneous fiscal and current account balance deficits experienced by the US during the 1980s (Gruber & Kamin, 2007). The twin deficit hypothesis can be explained by expansionary fiscal policies such as tax cuts or increased aggregate public consumption. Such policies result in increased aggregate demand and consumers respond by partially increasing consumption. Consequently, domestic savings and investments fall as well. However, if investments do not fall in the same proportion as the fall in national savings, the country would have to borrow from abroad or reduce its foreign assets position to be able to meet domestic investment demands. In other words, the twin deficit hypothesis predicts that growth in fiscal deficits deteriorates the current account balance if there is a positive relation between fiscal deficits and private consumption, in line with the Keynesian belief (Nicke & Vansteenkiste 2008).

However, contrary to Keynesian models, it is believed that the relationship between fiscal policies and private consumption depends on whether the Ricardian equivalence is assumed. According to the Ricardian equivalence, expansionary fiscal policies do not influence the consumption decisions of tax payers or the consumers. This is based on the idea that a rational individual realises that a fiscal deficit today will have to be met by future taxes (Rogoff & Obstfeld, 1996). Such consumer behaviour can be for example captured by overlapping generations models which predict that the young behave in accordance with the Ricardian equivalence unlike the old who prefer to consume all their wealth (Bussière et al, 2004). Additionally, the budget constraint faced by private consumers (3) gives some insights into how

public consumption could influence the current account balance. Assuming Ricardian equivalence for instance, a government budget deficit results in higher private savings as consumers anticipate higher taxes in the future which leaves the current account balance unaffected.

According to Custers (2010), a government budget deficit could be used to finance increased public consumption for civilian purposes or be allocated for military purposes. Consequently, a special form of Keynesianism which refers to the reliance on defense budgets to influence the business cycle has become widely recognised by scholars. Subsection 2.3 that follows therefore highlights this form of Keynesianism.

2.3 Military expenditures as a fiscal policy.

According to Dimitraki & Menla (2013), the macroeconomic impacts of military expenditures have been of considerable interest for both policy makers and scholars. However, despite that, military expenditures as a fiscal policy have no theory of their own but rather different theoretical views such as Keynesian, Neoclassical, Liberal and Marxist (Dunne & Nikolaidou, 2011). On the other hand, a special version of Keynesianism that relates to military expenditures as a fiscal policy has stood out as being hugely acknowledged by various literature whose attention has mostly focused on the impact of military expenditures on growth through the multiplier and also the impact on private investments through what is known as the crowding out effects.

The form of Keynesianism that widely refers to the use of military expenditures to regulate the business cycle has therefore been widely referred to as Military Keynesianism (Custers, 2010, Dakurah et al., 2001, Dunne & Nikolaidou (2012). Custers (2010) for instance defines Military Keynesianism as the commitment of huge monetary sums by the government towards the defense sector in order regulate the business cycle. This theory originated from John Keynes' view that in the worst case scenario, the government should spend on anything so as to stimulate growth. Gold (2005) argues that in this case military expenditures can act as a source of aggregate demand. The theory of Military Keynesianism however gained acceptance especially after the use of deficit spending by Germany for armament purposes during the 1930s and also the use of military expenditures by the United States before the Second World War. It is argued that in both cases, the respective economies managed to weather recession (Gold, 2005). During

the later years, this theory was however mostly been associated with the heavy reliance on military expenditures by the United States to influence its business cycle, but later on was extended to refer to the use of military expenditures by other countries as well as a fiscal policy tool (Custers, 2010).

Custers (2010) identifies various forms of Military Keynesianism. The first defined as pump priming refers to the short term use of Military Keynesianism through for instance the purchase of military hardware during a downturn with a goal to stimulate the economy. The other is the long term use of multiplier effects where by, the government may pass budgets for the purchase of military hardware spread over a certain period of the business cycle. In this case, the multiplier effects work through stimulating additional investments in the economy over a longer time period. Using an example of the US war against Iraq in 2003, Custers (2010) argues that the war was used to pull the American economy out of recession. It is emphasized that huge military expenditures during the late 2002 and early 2003, the period leading to the war enabled the economy to pick up during the first quarter of 2003. Hence, as much as 60 percent of the growth during this period is believed to have been a result of military expenditures during the period prior to the war.

Furthermore, Custers (2010) argues that there is a difference between the primary and secondary use of Military Keynesianism as a fiscal policy tool. These two phenomena are distinguished using the EU and the US. It is for instance argued that for the case of the US, Military Keynesianism has played a key role in influencing its business cycle. On the other hand, for the EU states, civilian Keynesianism has been the most influential. These differences can be supported by fact that although the EU and the US are very similar in terms of GDP, the military budgets of all EU states combined are less than a half of the US'.

Another important consideration regarding Military Keynesianism is the differentiation between the domestic and externalised form of Military Keynesianism. This differentiation is especially necessary in the context of an open economy. In this case, the exporting countries of military related hardware benefit from multiplier effects whereas the importing countries bear the costs. The US and some EU states such as the UK and France have for instance tried to achieve multiplier effects through an externalised form of Military Keynesianism (Custer, 2010). Other EU countries with developed military industries include Austria, Italy, Sweden, Germany and the Netherlands whereas for economies such as Greece and Portugal, their military industries remain weak (Dunne & Nikolaidou, 2011).

In scholarly circles, there exists a wide range of studies on the relationship between military expenditures and the performance of the economy especially the impact on growth and investments, which are also determinants of the current account balance. The evidence and arguments from the various studies however varies.

Contrary to the perceived crowding out argument, military expenditures are not always a burden to the economy. South Korea and Taiwan due to perceived threats from North Korea and China respectively have had large military burdens but still experienced impressive growth rates (Smith & Dunne, 2001). Hence, according to Dakurah (2001), a positive relation of military expenditures with growth is an indication of a stronger impact of military expenditures on aggregate demand whereas a negative impact is evidence of the crowding out effect. The positive shock on growth is believed to occur through a positive stimulation of the stock utilisation and hence by driving up profits, this process stimulates further investments. However, the positive shock on investments is believed to only occur in short run due to the crowding out effect (Pieroni et al., 2008). Chinn & Prasad (2003) on the other hand argue that the relationship between fiscal policies and investment is not clear. One argument is that private and public investments are complementary to each other which implies that private investments could be stimulated following fiscal policies. The other view supports the crowding out argument in that increased public borrowing due to a fall in public savings depresses private investments.

One of the earliest empirical studies to address the relationship between military expenditures and the performance of the economy is the paper by Benoit (1978). Benoit's study which focused on low developed countries finds a positive relation between defense expenditures and growth. It also finds that the countries with the largest military expenditures recorded faster growth rates than those with lower defense budgets. Other studies that also find evidence that military expenditures have result in positive growth shocks include; Pieroni et al., (2008) who find a positive and significant long run relationship between military spending and growth for the UK and the US. Similarly, Atesoglu (2002) also found that military spending has a positive and significant long run impact on growth for the case of the US.

Contrary to the studies that find a positive impact of military expenditures on growth, some studies have focused on the impact of military expenditures on investments. For instance,

Atesoglu (2004) looked at the impact of defense spending on investments in the US and found no evidence that defense spending crowds out investments.

On the other hand, the findings of some studies have been inconclusive. Dunne & Nikolaidou (2011), for example using data for the EU15 economies find that military expenditure either has a negative effect on growth or no significant impact at all. Additionally, Smith & Dunne (2001) using panel data for 28 countries find that military expenditure does not have a strong impact on either growth or investments. Whereas Dritsaki (2004) focusing on Greece and Turkey find that there is no long run relationship between military expenditures and growth in the respective countries.

Even if the evidence on the impact of Military Keynesianism on growth and investments is inconclusive, the possible channels through which military expenditures would be expected to influence the current account balance that have been highlighted include; the impact on public savings, an impact through shocks to growth and also through crowding out effects. Based on this summary, the literature on the current account can be used to understand how military expenditures could influence the current account balance.

Based on the arguments by Rogoff & Obstfeld (1996) about the impact of growth shocks on the current account balance, the following analysis is made. Assuming that military expenditures result in a positive shock on growth, the impact on the current account would depend on some conditions such as whether the shock is permanent or temporary. Based on these considerations and assuming a two period framework, a temporary positive shock that occurs in the current period world result in a current account surplus. This occurs because consumers save part of the higher income in order to smooth consumption given that income in the second period would be lower. On the other hand, given a temporary positive shock on growth which occurs in the second period, the country would run a current account deficit in the current period as it borrows against possible higher income in the future in order to be able to smooth consumption. On the contrary, a permanent positive shock on growth would leave the current account balance unchanged. Furthermore, the analysis could differ depending on whether the consumers are assumed to be Ricardian or Keynesian. Moreover, with reference to the primary form of Military Keynsesiasm, Custers (2010) argues that governments use deficit spending and state borrowing to stimulate aggregate demand. An example pointed out is the

case of the US during 1980s. Interestingly, this period coincides with the period when the twin deficit hypothesis gained momentum.

2.4 Summary of the theoretical determinants of the current account.

This paper aims to estimate the determinants of the current account balance with the main focus being the role of defense burdens for the current account position of a country. Hence, apart from fiscal policies, other factors also influence the current account balance. This subsection therefore discusses the factors which are relevant for the current account balance. Given that the current account is the difference between the savings and investments of a country, the variables outlined in this subsection have to do with the saving and investment behaviour of the economy.

Budget deficits influence the current account if Ricardian equivalence is not assumed. In this regard, contractionary fiscal policies improve the current account since increased public savings would improve national savings (Endegnanew et al., 2012) with the vice versa happening in the case of expansionary fiscal policies.

Net Foreign Assets are defined as an integral aspect of the current account balance through the theoretical work of Rogoff & Obstfeld (1996). According to Gruber & Kamin (2007), a country's current account balance is directly affected by its net foreign asset position through a direct impact on net investment. Other theoretical arguments indicate that a country with a positive net foreign assets position could benefit from net income and interest which would improve its current account. On the other hand, a high net foreign assets position could result in a deterioration of the current account balance though inducing a delay in the country's trade deficits (Endegnanew et al., 2012).

A country's terms of trade also influence its current account balance (Nickel & Vansteenkiste, 2008). It is argued that volatility in the terms of trade induces consumers to increase savings as a precautionary measure in order to be able to smooth consumption. Volatility in the terms of trade is also believed to have a negative impact on investments (Endegnanew et al., 2012). Additionally, high volatility in the terms of trade makes the country less attractive for international capital (Chinn & Prasad, 2003).

A country's demographic structure based on the life cycle theory also determines its current account by influencing the saving behaviour of the consumers (Gossé & Serranito, 2014). In an overlapping generations model of the current account balance, it is argued that the young borrow against potential higher income in the future so as to be able to smooth consumption whereas the old consume all their wealth. It is therefore predicted that countries with a large population of the young and the old in proportion to the population of the working age would run current account deficits (Gruber & Kamin, 2007).

Openness to international trade is also cited as a determinant of the current account balance. This is because the level of the country's trade openness could for instance influence its trade balance which could worsen or improve its current account balance depending on whether more openness results in more trade deficits or trade surpluses (Endegnanew et al., 2012). Additionally, trade openness could be an indicator for certain characteristics of the country such as the ability to generate foreign exchange from exports in order to be able to service external debt. Furthermore, Chinn & Prasad (2003) argue that capital flow to a country is influenced by its level of trade openness.

Similar to trade openness, a country's financial openness is believed to influence its current account balance (Chinn & Prasad, 2003). According to Makin & Narayan (2013), due to the financial liberalization, there has been an increase in international capital mobility. One consequence of increased capital mobility is that domestic investments do not necessarily have to be constrained by national savings. Consequently, increased international capital mobility has been pointed out to have played a major role in the current account imbalances of many advanced and emerging economies since the 1990s. Based on the savings glut, there has also been a debate on why the US has been able to run sustained current account deficits. One reason that has been highlighted in the literature is that the Asian economies that have run large surpluses have been attracted by the quality of US's financial institutions (Gossé & Serranito 2014). Gruber & Kamin (2007) for instance motivate that the financial institutions in the US are more liquid and also offer more security and diversification possibilities than many other economies.

Furthermore, it is also argued that country specific productivity shocks are some of the main determinants of the current account balance (Gossé & Serranito 2014). The impact of productivity shocks on the current account balance occurs through influencing the savings and

investment behaviour of the agents in the economy (Nickel & Vansteenkiste, 2008). According to (Gossé & Serranito 2014), given a temporary productivity shock, output increases which results in current account surpluses. However, if the productivity shock is permanent, it boosts investments due to higher returns on capital and also due to the prospect of higher earnings in the future. These events consequently result in a fall in the savings level of the country. Gruber & Kamin (2007) add that if a country experiences temporary productivity growth in relation to other countries, the increase in the marginal return on capital stimulates investments. Consequently, there is increased borrowing in the economy against potential higher income in the future so as to smooth consumption. Generally, a permanent productivity shock is believed to deteriorate the current account balance.

A country's level of economic development is also believed be a key determinant of its current account balance. From an economic theory perspective, developed countries should export capital whereas developing countries should be net importers of capital (Gruber & Kamin, 2007). According to Chinn & Prasad (2003), as low income countries grow towards an advanced stage of economic development, they have to run surpluses to be able meet their external liabilities and even act as capital exporters to other lowly developed countries. This theory has however been challenged by recent current account imbalances which have seen emerging Asian economies run large surpluses. These surpluses have resulted into capital exports to advanced countries such as the US which has run large deficits (Gruber & Kamin, 2007).

Economic growth is identified in the theoretical work of Rogoff & Obstfeld (1996) as a determinant of the current account, with its impact on the current account balance depending on the timing and lag of the growth shock. The timing of growth consequently influences the saving and borrowing behaviour of households in the economy in a bid to smooth consumption (Chinn & Prasad 2003). For instance, Bussière et al., (2004) argue that if a country's output is temporarily low, it would run a current account deficit.

Last but not least, the exchange rate through a temporary appreciation and depreciation can influence the current account. The role of the exchange rate for a country's current account balance is through influencing its trade balance (Chinn & Prasad, 2003).

2. Empirical studies on fiscal policy and the current account.

Existing studies that have looked at the relation between fiscal policies and the current account have considered various estimation techniques and sample data. Many of them are however similar in that they have estimated the twin deficit hypothesis - the belief that growth in fiscal deficits results in current account deficits. Hence, many of these studies have used the fiscal balance as a proxy for fiscal policies with the general evidence implying that tightening the fiscal balance improves the current account balance.

Among these studies include; the study by Chinn & Prasad (2003), one of the most cited papers in research about the determinants of the current account balance. Using annual data covering the period 1971 – 1995 for industrial and developing countries, they aim to determine the factors that influence the current account balance in the medium term. Their cross section estimations indicate that fiscal balances have a positive and significant impact on the current account balance for the various sub-groups of countries such as Africa, Industrial countries, and other developing countries except for Africa. Similarly, applying their data on panel regressions, they find a positive and significant relationship between the current account balance and the fiscal balance except for the industrial countries.

Mohammed (2004) also using panel data for industrial and developing countries covering the period 1975 – 1998 finds a positive and significant relationship between the fiscal balance and the current account balance. This finding holds for both developing and industrial countries. A notable contribution of this study is that financing expansionary fiscal policies through tax and bond financing worsens the current account. This finding is statistically significant and holds for both the developing and developed countries. However, bond financing of fiscal deficits has a more severe impact on the current account balance than fiscal deficits financed through taxation.

Nicke & Vansteenkiste (2008) also use the fiscal balance to look at the impact of fiscal policies on the current account balance. Their data considers only industrialised countries and covers the period 1981 – 2005 whereas the determinants of the current account are estimated by dynamic models. One notable contribution of their study is that they allow the relationship between the fiscal balance and the current account to vary with the debt level of the government for the purpose of highlighting the role of Ricardian equivalence in the current account – fiscal

policy relationship. Their findings indicate that for countries defined as low and medium debt economies, growth in the fiscal deficit has a positive and significant effect on the current account. The same conclusion holds for countries defined as medium to high debt economies. However, for countries with very high debt levels, growth in fiscal deficits has no significant effect on the current account which implies that the consumers in these countries are Ricardian.

Abbas et.al., (2011) also look at the relationship between a cyclically adjusted fiscal balance and the current account balance. Their empirical estimations use data for advanced and emerging and low income countries covering the period 1970 – 2007 and apply both panel estimations and Vector Auto regression (VAR) models. In line with the other studies their fixed effects estimations indicate that there is a positive and significant impact of fiscal policies on the current account balance. Additionally, they also find that the magnitude of the impact depends on a number of country specific characteristics such as the level of trade openness, the exchange rate regime, level of initial public debt and the output gap.

The contribution of Endegnanew et al., (2012) is the attention of their study on Microstates defined as countries with a population of less than 2 million people. Their sample data covers the period 1973 – 2004 and they apply both panel and VAR models. Their panel estimations which consider OLS, fixed effects and GMM estimations indicate that there is a positive and significant relation between a cyclically adjusted fiscal balance and the current account balance. Additionally, their VAR approach indicates that the impact of a fiscal policy shock on the current account balance of the sample countries is slow in the long term.

Gossé & Serranito (2014) base their study on panel data for OECD countries covering the period 1974 – 2009. Their study differs in they are interested in determining the long run determinants of the current account balance based on the argument that the current account balance is affected differently by its long run and short run determinants. Using vector error correction models (VECM), they find that the fiscal balance is one of the long run determinants of the current account balance due to evidence of a cointegration relationship between the two variables.

Whereas many studies rely on annual panel data, Kim & Roubini (2008) use only quarterly time series data for the US covering the period 1973 – 2004. Through VAR estimation, the authors find significant evidence that expansionary fiscal policies result in an improvement of the US

current account balance. They argue that this is occurs through a Ricardian response of consumers to a growth in the budget deficit and also through crowding out private investments.

The study by Bussière et al. (2004) differs from other studies in many aspects. Their main contribution is the deriving of a theoretical current account model that incorporates a dynamic variable and the fiscal balance. They do this based on the fact that various empirical estimations of the current account models find that the current account is influenced by its lag and the fiscal balance but without a theoretical motivation. Another significant difference of this study is that it considers the general public consumption while controlling for the fiscal balance in their regressions. Their estimation methodology uses fixed effects, Instrumental Variables (IV) and GMM using sample data for OECD countries and EU accession countries. Two important empirical findings from their study are that public consumption worsens the current account although only under fixed effects estimation. Additionally, fiscal surplus has a significant and positive impact on the current account balance under IV and fixed effects estimation but not under GMM estimation.

Last but not least, Monacelli & Perotti (2007) used VAR estimation techniques on data for Australia, Canada, the UK and the US to estimate the impact of aggregate government spending on the real exchange rate, and the trade balance. Their estimations indicate that a rise in public consumption has a negative impact on the current account balance for all the countries. Additionally, they find that the impact of fiscal expansion on the US external balance is small and also carries weak statistical evidence.

3. Econometric Methodology.

Following the theoretical arguments touching upon the determinants of the current account balance, this paper aims to estimate the following baseline models. Section 4 hence discusses the methodology applied and also introduces the data used.

4.1 The baseline models.

$$CA_{it} = \beta_1 mex_{it} + \beta_2 X_{it} + \varepsilon_{it} \qquad (1)$$

$$CA_{it} = \beta_1 CA_{it-1} + \beta_2 mex_{it} + \beta_3 X_{it} + \varepsilon_{it} \qquad (2)$$

where the dependent variable is the current account balance for country i during time period t expressed as a ratio of GDP. The explanatory variable of main interest is mex_{it} (military expenditures as a ratio of GDP) while X_{it} is a vector of control variables highlighting other potential determinants of the current account balance that have been identified in various studies. CA_{it-1} , in baseline model 2 is the dynamic variable which measures the speed of adjustment. Furthermore, ε_{it} is the white noise error term that captures the unobserved determinants of the current account balance. The goal is therefore to estimate the unknown β coefficients.

4.2 Data.

The econometric estimations rely on annual unbalanced panel data for 30 OECD economies [see appendix A for the group of countries considered]. The panel time series data therefore covers the period 1995 – 2011 and it has been collected from various sources. The choice of the time period can be motivated by the political events of the early 1990s which among other outcomes resulted in the reunification of Germany and also the emergence of other independent states in Europe that are today OECD members. Hence, to take into consideration the transition period of these countries (Bussière et al, 2004) and also to avoid many missing variables, it has been deemed best to consider the data from 1995 onwards. Additionally, even if this study uses an unbalanced panel data set, it does not suffer from serious missing observations as data availability for most of the variables from 1995 is good. The choice of OECD countries on the other hand can be motivated by Abbas et al. (2011) who argue that due to country-specific characteristics, it could be helpful to base the empirical analysis on countries with similar characteristics such as a similar level of economic development.

The dependent variable for the baseline models is defined as the current account balance as a ratio of GDP. The data for this variable is extracted from the International Monetary Fund World Economic Outlook (IMF WEO). On the other hand, the explanatory variable of major interest is the military expenditure variable which is defined as the share of GDP for each country devoted towards the defense sector of each country. Data for this variable has been extracted from the Stockholm International Peace Research Institute (SIPRI).

Moreover, other theoretical determinants of the current account that have been highlighted are also controlled for. These include net foreign assets considered for example in the empirical

work of (Gruber & Kamin, 2007). This paper takes into consideration the recommendation by Gruber & Kamin (2007) that since net foreign assets are an accumulation of previous current accounts, this variable should enter the current account regression in lag form so as to avoid possible correlation with the dependent variable. Data for this variable defined as net foreign assets as a ratio of GDP has been extracted from the External Wealth of Nations by Lane & Milesi-Ferretti (2007).

Although military expenditures fall under fiscal policies, general public spending has been included in the model. This could provoke an argument that military expenditures are correlated with the general public expenditures. Military expenditures however constitute only a small share of the general public consumption. Indeed, the correlation matrix indicates that these two variables are weakly correlated given a correlation of only 5 percent. Moreover, even if most of the reviewed studies use the fiscal balance as a proxy for fiscal policy while ignoring public expenditure, Bussière et al. (2004) consider both public expenditure and the fiscal balance simultaneously in their current account models. Furthermore, Custers (2010) adds that it is possible for the government to combine both Military Keynesianism and civilian Keynesianism. Data for public consumption and the fiscal balance defined as ratios of GDP has been extracted from the WEO.

Growth in the terms of trade considered by for example Nickel & Vansteenkiste (2008) is used to control for the impact of volatility in export and import price movements on the current account balance. The data for this variable is from the World Bank Development Indicators (WDI).

Productivity shocks considered by example Nickel & Vansteenkiste (2008) are also controlled for. This paper uses Total Factor Productivity (TFP) as a proxy for productivity and data for this variable is from the Penn World Table 8.1 (PWT). This variable differs from the one used by Nickel & Vansteenkiste (2008) who used growth in per capita GDP. Moreover, the correlation matrix indicates that TFP and per capita GDP growth are highly correlated which implies that either of them could be used. Additionally, using TFP instead of per capita GDP growth enables to control for GDP growth which is highly correlated with per capita GDP growth. Thus, data for GDP growth is from the WDI.

A country's level of economic development is captured by Per capita income in terms of Purchasing power parity such as in Nickel & Vansteenkiste (2008**)** using data from the WDI. This variable however enters the regression in log form due to its large magnitude.

A country's demographic structure considered by studies such as (Chinn &Prasad, 2003, Bussière et al, 2004 and Nickel & Vansteenkiste, 2008) in their current account models is also controlled for. This variable is defined as the dependency ratio, the population under the age of 15 and that above the age of 65 as a ratio of the population between the age of 15 and 64. The data for this variable is from the OECD.

The real effective exchange rate though its influence on the country's trade balance considered by for example Nickel & Vansteenkiste (2008) is also controlled for. Data for the real effective exchange rate is from the WDI.

Trade openness defined as the sum of imports and exports as a ratio of GDP considered for example in (Chinn & Prasad, 2003) is also controlled for. Its data has been extracted from the WDI. Similarly, a country's financial openness is also been controlled for. This paper uses M2 as a ratio of GDP considered by Chinn & Prasad (2003) as a proxy for financial openness and the data for this variable is form the WDI.

Given that a country's current account balance is the difference between its savings and investments, investments are a key determinant of the current account balance. Bussière et al. (2004) and Nickel & Vansteenkiste (2008) are among the studies that have controlled for investments in their current account regressions. Bussière et al. (2004) for instance argue that a temporary high spike in investments worsens the current account balance. Defined as a ratio of GDP, the data for this variable is from the WEO.

Table 1 on the following page contains the summary statistics. From this table, based on the standard deviation, it can be observed that military expenditures are less volatile than the current account balance. This could be an indicator that defense budgets react less to shocks in the economy than the current account balance does.

Additionally, it can be inferred that among the considered countries, the current account imbalances as a ratio of GDP range from a deficit of 15 percent to a surplus of 16 per cent. But on average all the sample countries recorded a deficit of 0.6 percent of GDP between 1995 and

2011. According to Makin & Narayan (2013), the most significant external imbalances since the beginning of the century have taken place in the Asia-Pacific economies such as Japan which has recorded large surpluses whereas others such as Australia, New Zealand and the US have for long recorded external deficits. However, the data set indicates that Norway has run the largest surpluses which on average have been 11.2 of GDP whereas Portugal has run the largest deficits on average at 8.3 of GDP.

Table 1**:** Summary statistics.

Variable	Mean	Min	Max	Std. Dev
Current Account/GDP	-0.613	-15.022	16.443	5.311
Military Expenditures/GDP	1.875	0.400	9.600	1.357
Fiscal Balance/GDP	-1.798	-29.337	18.786	4.500
Public Expenditure/GDP	41.822	14.162	64.949	9.806
Investments/GDP	23.133	14.071	39.8	4.111
Net Foreign Assets/GDP	-0.165	-1.655	1.566	0.481
ΔTFP	0.977	0.666	1.152	0.062
ΔReal Effective Exch. Rate	0.008	-0.328	0.232	0.053
ΔTerms of Trade	-0.009	-0.268	0.161	0.048
Trade Openness	85.501	16.749	349.849	49.581
Financial Openness	107.313	16.254	683.088	92.982
GDP Growth	2.805	-14.738	21.829	3.093
GDP per capita	33815.555	10462.475	96245.4917	14153.785
Dependence ratio	49.293	37.301	67.871	5.038
Per capita GDP Growth	2.188	-14.573	18.621	3.075

Regarding military expenditures, the highest share of GDP committed towards the defense sector is 9.6 percent and although one would suspect this to be from the US, it is actually by Israel. Although Israel does not have the highest GDP among the OECD economies, the high share of GDP committed to the defense sector reflects the security situation in its geographical location.

Israel has on average spent 8.106 of its GDP on the defense sector during the sample period, which is unmatched by any country in the sample. However, although the average of the US is

3.8 percent of GDP, it remains the largest spender on the military due to the size of its economy. On the other hand, it can also be observed that the lowest military expenditures are only 0.4 percent of GDP. Furthermore, on average only 1.9 percent of GDP was committed towards the defense sectors, a percentage which is very close to the 2 per cent threshold recommended by NATO.

4.3 Econometric issues.

The econometric results are derived from static and dynamic model estimations. Consequently, pooled OLS models, fixed effects (LSDV) models and dynamic Generalized Method of Moments (GMM) estimations by Arellano and Bond (1991) are estimated.

All these approaches have been considered in various empirical work about the determinants of the current account balance. Some arguments for considering these estimation techniques include Nickel & Vansteenkiste (2008), who motivate that estimating panel data by OLS yet ignoring possible country specific effects would result in biased estimations. Additionally, Veerbek (2012) argues that most economic models based on panel data are estimated with random effects or fixed effects. It is also argued that estimating panel data while controlling for fixed effects results in better estimates since it filters out possible endogeneity problems related to the standard errors. Chinn & Prasad (2003) however share the view that controlling for fixed effects while estimating models of the current account eliminates a meaningful analysis of the estimates based on economic theory since it does not take into consideration the individual country variation in the current account. This paper takes into consideration the various views and thus estimates both OLS and fixed effects models. Fixed effects estimation has however been preferred to random effects after performing the Hausman test recommended by (Veerbek, 2012) which rejects the null of a Random effects model [see Appendix C for the Hausman test].

In addition to OLS and fixed effects estimation, the current account balance is also estimated with GMM. One reason for GMM estimation is due to its ability to estimate dynamic models, which is also necessary when estimating the determinants of the current account balance. This is based on the argument that the current account balance is influenced by its lag due to partial adjustment effects (Nickel & Vansteenkiste, 2008). According to Moral-Benito & Roehn (2014), neglecting the impact of partial adjustments in the current account would result in biased estimates. Furthermore, the closer the coefficient of the dynamic variable to unit (1), the

slower the current account balance adjusts in response to shocks or in other words, the more persistent is the current account (Ghosh et al., 2008).

Another reason for considering OLS and GMM estimation centres around the arguments on the influence the lag of the current account and net foreign assets have on the current account balance. One reason for this debate is because a country's net foreign assets are defined as the accumulation of previous net foreign assets. Additionally, net foreign assets could reflect the past current account records of the country according to Gruber & Kamin (2007).

Some papers such as Endegnanew et al., (2013) have simultaneously considered both net foreign assets and the dynamic current account variable in their regressions. Others such as Bussière et al. (2004), consider only the lag of the current account. Gruber & Kamin, (2007) for their part, consider only net foreign assets in their baseline models and as a robustness check also consider the lag of the current account while excluding net foreign assets from their regressions. On the other hand, Chinn & Prasad (2003) consider only net foreign assets in their regressions.

This paper therefore addresses the debate between the dynamic variable and the net foreign assets variable by estimating OLS and fixed effects models that consider net foreign assets and GMM models that consider the dynamic variable. Additionally, net foreign assets enter the OLS and fixed effects models in lag form so as to avoid potential correlation with the dependent variable (Gruber & Kamin, 2007).

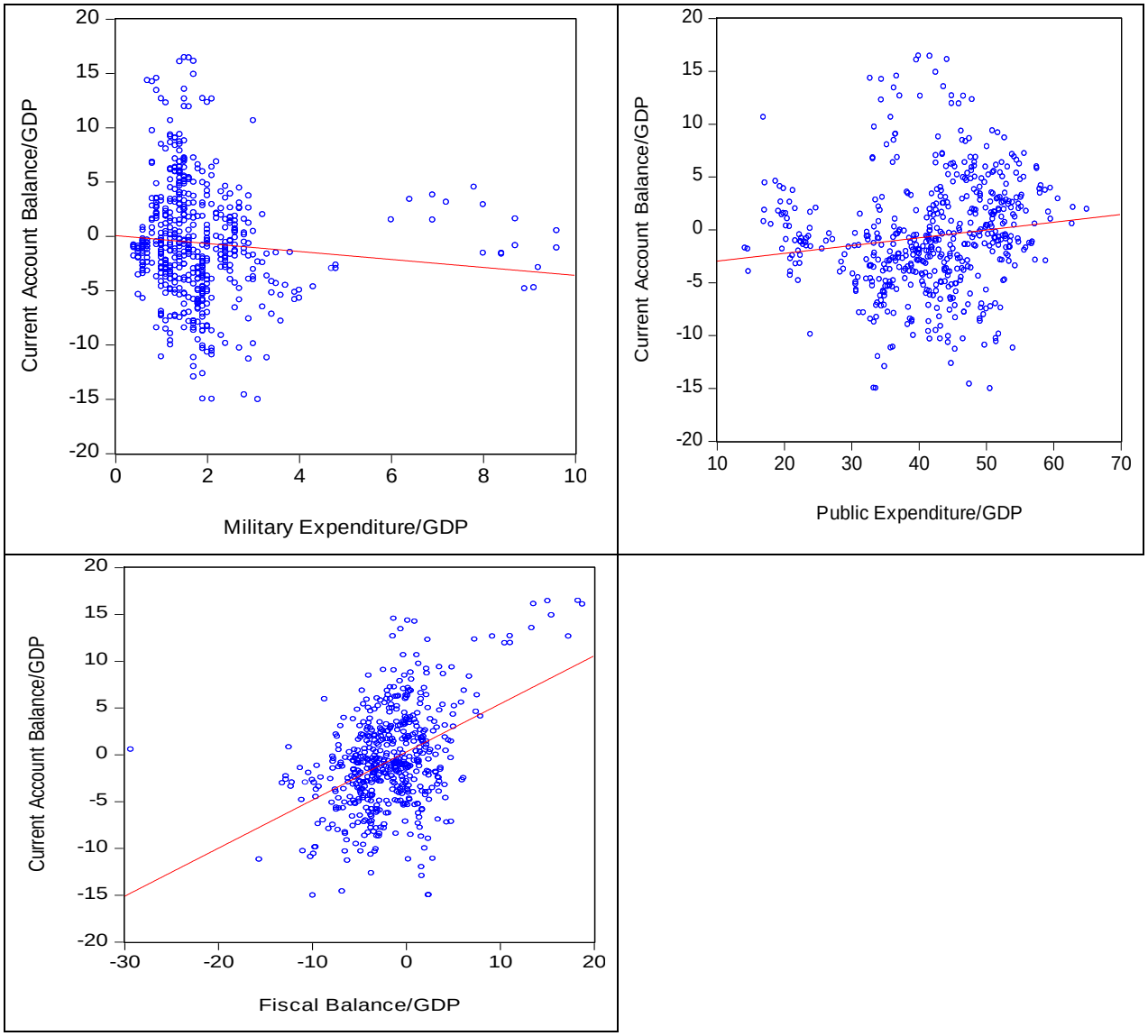
There are other differences between OLS and GMM approaches. GMM models for instance make use of instrumental variables unlike OLS estimation. For GMM estimation in this paper, the lags of the explanatory variables have been used as the instruments. Additionally, the dynamic variable considered under GMM estimation helps to control for serial correlation. Besides these arguments, GMM estimation also relaxes the distributional assumptions such as the normality condition which is crucial in OLS estimation. Morover, GMM models tolerate heteroskedasticity of some form (Verbeek, 2012).

Another important consideration when dealing with panel time series data is the risk of the presence of trends in the data which would result in spurious estimates. Hence, to control for this, all the variables have been tested for unit root using the Levin. Lin and Chu unit root tests for panel data. Based on very low p-values, all the variables have been found to be stationary. Additionally, the residuals also appear to be stationary [see appendix D for unit-root tests].

Furthermore, to address possible problems of multicollinearity, a correlation matrix has been constructed. Among the variables considered in the baseline model, there are no major concerns for multicollinearity except for the economic growth and Total Factor Productivity variables that have 70 percent autocorrelation [see Appendix B for the Correlation Matrix].

Another need for clarification is the simultaneous inclusion of the fiscal balance, military expenditures and the general public consumption variables which all relate to fiscal policies in the baseline models. The correlation matrix helps to address this argument from a statistical point of view as it indicates that these variables have very low levels of autocorrelation. The scatterplots in Figure 1 also indicate that the relationship between these variables and the current account balance of the sample countries varies.

Figure 1. The relationship between military expenditures, public consumption and the fiscal balance.



4. Empirical Results and Analysis

The results from OLS, fixed effects, and GMM estimation of the determinants of the current account balance for the sample data are obtained using Eviews software and are reported in Table 2. An analysis for all the estimated coefficients has been conducted but the coefficient of main interest is that of the military expenditure variable.

Generally, all the model specifications indicate that there is a negative relation between military expenditures and the current account balance. However, except for the GMM estimation, the other estimations indicate that military expenditures only have a significant impact on the

current account balance without controlling for the general public expenditure and the fiscal balance. Consequently, the OLS and fixed effects estimates indicate that ceteris paribus, a 1 percentage point increase in military expenditures deteriorates the current account balance by between 0.3 and 0.9 percentage point. This impact is statistically significant in both cases at 5 percent significance level. An economic interpretation of this finding is that increasing military budgets deteriorates a country's external balance. Consequently, one policy implication of this finding is that for countries with large military budgets and large external imbalances adjusting their military budgets could play a role in a bid to improve their external positions.

Possible explanations for the negative relationship between the two variables could be that military expenditures result in output shocks or do not result in crowding out effects. Hence, in this case, stimulating investments as a result of military expenditures worsens the current account balance. Additionally, since the models capture short run dynamics, the shocks of military expenditures on the growth should be considered to occur in the short run. And hence, the savings behaviour as a result of the short term shocks to growth influences the current account balance.

4.1 Analysis of the control variables.

Dynamic estimation using GMM confirms the evidence in other studies such as in Nickel & Vansteenkiste (2008) of a positive and significant relationship between the current account balance and its lag. This finding can be interpreted as evidence of persistence in the current account dynamics of the sample countries. Additionally, this finding translates into the argument that the current account does not instantly respond to changes in its fundamentals (Bussière, et al. 2004). Moreover, the fact that the coefficients of the dynamic variables are significantly less 1, it can be inferred that the GMM models do not suffer from unit root. This paper however finds that persistence in the current account balance is weak given a speed of adjustment of almost 90 percent.

Net foreign assets in line with other studies such as Gruber & Kamin (2007) also have a strong and positive relationship with the current account balance. This result is robust for all the OLS and fixed effects estimations. According to Endegnanew et al., (2012), such a finding is an indicator that these countries have a strong net foreign assets position. As a result, they benefit from net income flow for instance through interest earnings from their net foreign assets.

Table 2. Estimation results of OECD current account balance determinants 1995 -2011.

Variable	OLS	OLS	LSDV	LSDV	GMM	GMM
CA(-1)					0.193**	0.169**
					(0.064)	(0.057)
NFA(-1)	2.461***	2.824**	0.999**	1.492***		
	(0.730)	(0.975)	(0.353)	(0.560)		
Military Expenditures	0.080	-0.328***	-0.069	-0.982***	-1.261	-1.608
	(0.098)	(0.079)	(0.342)	(0.289)	(1.024)	(0.825)
Investment	-0.513***	-0.381***	-0.809***	-0.703***	-0.545***	-0.501***
	(0.044)	(0.058)	(0.032)	(0.030)	(0.121)	(0.110)
GDP growth	-0.367**	0.189	0.111	0.339***	-0.008	-0.046
	(0.121)	(0.099)	(0.085)	(0.067)	(0.279)	(0.266)
Dependency ratio	-0.057**	0.019	-0.246***	-0.289***	0.053	0.038
	(0.020)	(0.024)	(0.053)	(0.049)	(0.413)	(0.403)
ΔTFP	37.186***	-13.657	-8.506	-28.178***	0.461	-1.188
	(9.896)	(8.966)	(7.619)	(6.014)	(22.647)	(32.069)
ΔExchange rate	-7.351**	-8.325*	-2.442	-2.279	-0.188	-0.618
	(3.243)	(3.421)	(1.541)	(1.725)	(3.697)	(3.107)
ΔTOT	-6.42E-07***	-5.93E-07***	-3.25E-07*	-3.08E-07	0.020	0.015
	(1.37E-07)	(1.65E-07)	(1.26E-07)	(1.13E-07)	(0.026)	(0.018)
Trade Openness	-0.006	-0.003	0.004	0.015	-0.036	-0.011
	(0.005)	(0.005)	(0.010)	(0.009)	(0.029)	(0.029)
Financial openness	-0.005	-0.014**	0.004	0.004	-0.0004	0.0000
	(0.004)	(0.005)	(0.002)	(0.002)	(0.009)	(0.009)
Log per capita GDP	1.671*	4.427***	-3.347*	-4.429**	1.664	1.119
	(0.726)	(0.482)	(1.302)	(1.497)	(8.772)	(9.048)
Public Expenditure	-0.011		-0.177**		0.046	
	(0.017)		(0.045)		(0.130)	
Fiscal balance	0.583***		0.193**		0.165	
	(0.076)		(0.069)		(0.097)	
Constant	0.411	-36.267***	71.833***	75.325***		
	(8.221)	(6.678)	(15.115)	(17.294)		
Country Fixed Effects	No	No	Yes	Yes	Yes	Yes
Adj. R-squared	0.544	0.395	0.872	0.846		
AIC	5.415	5.694	4.208	4.385		
BIC	5.536	5.798	4.598	4.749		
Obs.	483	483	483	483	425	425

Note: White noise standard errors in the parentheses, significance levels, * at 10%, ** at 5% and *** at 1%

Investments also have a negative and significant relation with the current account balance under all model specifications. This providess strong evidence that investments worsen the current account which is in line with economic theory since a country's current account balance is the

difference between its savings and investments. Additionally, the magnitude of the coefficients appear to be in line with the estimates of Bussière et al. (2004) who also find a negative and significant relationship between investments and the current account balance for OECD countries.

The impact of GDP growth on the current account balance appears to be ambiguous. The negative and significant coefficient under OLS estimation and the positive and highly significant coefficient under fixed effects estimation makes the analysis difficult. However, evidence of a significant impact of growth on the current account balance would be expected in short run dynamic models in line with the theory of the current account since consumers react to temporary shocks on growth by saving and borrowing in order to smooth consumption.

There also appears be evidence that a country's demographic structure matters for its current account balance. The evidence from OLS and fixed effects estimations indicates that an increase in the dependence ratio deteriorates the current account balance. This is line with economic theory that countries with predominantly young and old populations would run deficits as the young borrow to smooth consumption whereas the old consume all their wealth. Nickel & Vansteenkiste (2008) also confirm evidence of a negative relationship between a country's demographic structure and the current account balance using data for industrialised countries.

The evidence of the impact of productivity shocks on the current account balance appears to be inconclusive. Whereas OLS estimation indicates that productivity shocks improve the current account balance, fixed effects estimation indicates the opposite. Similarly, GMM coefficients are both negative and positive although insignificant. These estimates contradict the findings by Nickel & Vansteenkiste (2008) which indicate a negative but not significant relationship between productivity shocks and the current account balance using data for industrialised economies.

OLS estimations indicate that an appreciation of the exchange rate worsens the current account balance. However, this contradicts the findings of studies such as Endegnanew et al. (2012), Nickel & Vansteenkiste, (2008), who find no significant effect of the real exchange rate.

Volatility in the terms of trade appears to have a negative and relatively significant impact on the current account balance under OLS and fixed effects estimation. This finding partly reflects the estimates by Chinn & Prasad (2003) for industrial countries although Nickel & Vansteenkiste, (2008) find a positive and significant relationship. Additionally, the negative

and significant evidence from OLS and fixed effects estimation contradicts economic theory that volatile terms of trade should be associated with an improvement in the current account balance through precautionary saving of the consumers and less investment activities in the economy.

Trade openness does not appear to be relevant for the current account balance under any of the estimation methods. This appears to be in line with the finding by Chinn & Prasad (2003) who find no significant relationship for industrial countries although Nickel & Vansteenkiste, (2008) who use data for industrialised countries find that trade openness has a positive and significant coefficient.

The evidence on the relationship between financial openness and the current account balance also appears to be inconclusive. This is due to inconsistent coefficient signs under all the estimations and also some evidence of a significant relation. The findings however generally appear to confirm the evidence of a no significant relation found by Chinn & Prasad (2003) for industrial countries.

Furthermore, there is no clear evidence on the relationship between a country's per capita income as a proxy for the level of economic development and the current account balance. Although dynamic estimation indicates that there is no significant relationship, OLS and fixed effects estimations provide mixed evidence due to inconsistent coefficient signs. The inconsistence of the signs and level of significance for the coefficients appears to be similar to the findings of Endegnanew et al. (2013) who also use OLS, fixed effects, and GMM estimation. However, according to Nickel & Vansteenkiste (2008), economically meaningful coefficients should have been insignificant given that the sample data is for mostly industrialised countries. Hence, since they are not in a growing phase, they should not run deficits based on hope of major growth prospects.

General public expenditure appears to worsen the current account balance under fixed effects estimation although there is no significant relation under OLS and GMM estimation. Additionally, the negative coefficient from fixed effects estimation and positive coefficient from GMM estimation are in line with the findings of Bussière et al. (2004) although they do not find any significant evidence.

Last but not least, consistent with many studies such as Abbas et al. (2011), Bussière et al. (2004) and Nickel & Vansteenkiste (2008), OLS and fixed effects estimations indicate a

positive and statistically significant relation between the fiscal balance and the current account balance. According to Nickel & Vansteenkiste (2008), this is also evidence of the twin deficit hypothesis, which implies that growth in the fiscal deficit deteriorates the current account balance. Furthermore, the insignificant yet positive coefficient from GMM estimation appears to be in line with Bussière et al. (2004). An economic interpretation of this result is that the consumers in these countries are Ricardian which implies that an increase in the fiscal deficit leaves the current account balance unaffected. The reason for this outcome is that ceteris paribus, growth in fiscal deficits induces a fall in private consumption which increases national savings hence leaving the current account balance unaffected.

Overall, OLS and fixed effects estimations result in the best prediction of the determinants of the current account balance for the sample data. Apart from the dynamic variable, GMM estimation indicates that only investments matter for the current account balance of the sample countries. Furthermore, GMM estimation indicates that military expenditures worsen the current account balance although this impact is not significant.

Based on goodness of fit, the adjusted R-squared indicates that the fixed effects models appear to be superior to OLS models in estimating the determinants of the current account balance for the sample countries. This observation is also confirmed by the Akaike information criterion (AIC) and Bayesian information criterion (BIC) statistics. According to Verbeek (2012), the rule of thumb for model selection should be based on low AIC and BIC values. This argument hence motivates the inclusion of the AIC and BIC statistics in Table 2. Together with the adjusted R-Squared, these statistics confirm that the fixed effects models are better at predicting the determinants of the current account balance of OECD countries compared to the OLS and the GMM models. Hence, in part 6, some robustness tests are considered but estimated with only fixed effects.

5. Further Robustness considerations

This section considers various estimation alternatives for the determinants of the current account balance for the sample countries and also to emphasize the robustness of the explanatory variable of main interest.

The first robustness consideration is the re-estimation of the baseline models using different variable definitions for some of the explanatory variables. Firstly, due to the ambiguous significance evidence and coefficient sign for productivity shock, captured by the total factor productivity in the baseline models, an alternative proxy for productivity is considered. Thus, growth in GDP per capita is considered as a proxy for productivity. This variable is also used by for example Gruber & Kamin (2007) and Nickel & Vansteenkiste (2008). The correlation matrix also confirms that total factor productivity and growth in GDP per capita are highly correlated given a correlation of 80 percent. However, one impact for this consideration is that GDP growth will be eliminated from the regression since the two variables almost have 100 percent correlation. Another robustness consideration is separating the dependency ratio into the young dependency ratio defined as the ratio of the population under 15 years to the working age population and the old dependency ratio defined as the ratio of the population above 65 to the working age population. This approach has been preferred by some studies such as Chinn & Prasad (2003) but also Gruber & Kamin (2007). Per capita GDP as a proxy for level of development is also excluded from the model since it almost has 60 percent correlation with net foreign assets and financial openness. The estimations are repeated for the static baseline models using fixed effects and are reported in Table 3.

The new proxy for productivity shock indicates a positive relation with the current account balance although Gruber & Kamin (2007) and Nickel & Vansteenkiste (2008) find a negative and insignificant relation. Furthermore, the youth and the old dependency ratios confirm the main findings that the demographic structure matters for its current account balance of the sample countries. Similarly, the relation between military expenditures and the current account balance remains the same as the fixed effects estimations in the Table 2.

Table 3. Estimating the determinants of the current account using only fixed effects.

Variable	LSDV	LSDV
NFA(-1)	1.212***	1.759***
	(0.388)	(0.585)
Military Expenditures	-0.048	-0.999***
	(0.324)	(0.295)
Investments	-0.852***	-0.699***
	(0.034)	(0.031)
GDP per capita growth	**0.058**	**0.137*** **
	(0.039)	(0.035)
ΔExchange rate	-2.011	-1.613
	(1.383)	(1.646)
ΔTOT	-4.78E-07***	-2.45E-07**
	(1.16E-07)	(8.63E-08)
Trade Openness	0.003	0.019*
	(0.008)	(0.007)
Financial openness	0.003	0.002
	(0.002)	(0.002)
Youth dependency ratio	**-0.151****	**-0.142*****
	(0.049)	(0.033)
Old dependency ratio	**-0.442*****	**-0.509*****
	(0.081)	(0.086)
Public Expenditures	-0.150**	
	(0.046)	
Fiscal balance	0.226***	
	(0.068)	
Constant	39.053***	30.494***
	(2.922)	(2.269)
Observations	483	483
Adj. R2	0.876	0.851

Note: White noise standard errors in the parentheses,
significance levels, * at 10%, ** at 5% and *** at 1%

Additionally, since the main contribution of this paper is the impact of military expenditures on the current account balance, another robustness check has been considered for NATO countries in the sample data since NATO as an alliance spends the most on military related activities globally. The sample data has therefore been sorted to include only NATO member states. Furthermore, using data for NATO countries, a dummy variable for the US, the country with the largest military expenditures in monetary terms has been also considered. The dummy

variable takes the value of 1 for the US and a value of 0 for the rest of NATO countries. The estimations using data for only NATO member countries are therefore reported in Table 4.

Table 4. Estimating the determinants of the current account using data for NATO countries.

Variable	NATO		USA Dummy	
	LSDV	LSDV	LSDV	LSDV
NFA(-1)	2.248***	2.655***		2.737***
	(0.571)	(0.709)		(0.731)
Military Expenditures	**0.866**	**-0.381**		
	(0.543)	(0.467)		
US dummy*Military Ex			**0.365**	**-1.5197*** **
			(0.383)	(0.269)
Investment	-0.909***	-0.789***	-0.899***	-0.801***
	(0.046)	(0.038)	(0.048)	(0.039)
GDP growth	0.129	0.363***	0.145	0.355***
	(0.092)	(0.077)	(0.099)	(0.076)
Dependency ratio	0.060	-0.016	0.058	-0.031
	(0.069)	(0.066)	(0.064)	(0.071)
ΔTFP	-12.807	-30.488***	-14.642	-29.259***
	(8.588)	(7.623)	(8.749)	(7.568)
ΔExchange rate	0.580	1.986	-0.119	1.841
	(1.573)	(1.627)	(1.345)	(1.669)
ΔTOT	-8.73E-05	-0.001	-5.02E-05	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Trade Openness	0.005	0.015	0.003	0.016
	(0.010)	(0.010)	(0.009)	(0.010)
Financial openness	0.005*	0.004	0.004*	0.005
	(0.002)	(0.003)	(0.002)	(0.003)
Log per capita GDP	0.078	-1.141	-0.161	-0.986
	(1.478)	(1.387)	(1.512)	(1.419)
Public Expenditures	-0.180**		-0.191***	
	(0.064)		(0.069)	
Fiscal balance	0.301***		0.268***	
	(0.080)		(0.069)	
Constant	21.754	27.521	26.214	
	(15.917)	(16.188)		
Country Fixed Effects	Yes	Yes	Yes	Yes
Adj. R-squared	0.898	0.867	0.896	0.869
Obs.	299	299	299	299

Note: White noise standard errors in the parentheses, significance levels, * at 10%, ** at 5% and *** at 1%

For all the NATO countries and the dummy for the US, the coefficients for military expenditures are negative without controlling for the fiscal balance and the general public

consumption. This confirms the main findings in Table 1 except that although the dummy coefficient for the US is significant, the coefficient for all NATO countries is not significant.

6. Limitations of the study.

Veerbek (2012) points out that one of the challenges of applying GMM models is that of identifying the right instruments. It is argued that identifying weak instruments would result in low information about the parameters of interest. Moral-Benito & Roehn (2014) add that it is challenging to identify instrumental variables related to the determinants of the current account balance that are not directly related to the current account. They also argue that the using lagged values of the explanatory variables as instruments results in weak instruments due to persistence in most aggregate variables. Consequently, a possible explanation for the poor results from GMM estimation could be failure to identify the right instruments

Another limitation concerns the quality of data especially for the main variable of interest – military expenditures. For instance, Custers (2010) argues that European Union countries do not fully reveal the true size of their military budgets to the public. It is believed that the real figures allocated to the military are often much bigger than those revealed to the general public. This argument could therefore weaken the empirical findings of this study.

Lastly, an improvement to this paper should have been an understanding of the long term relationship between military expenditures and the current account balance for instance by performing Vector Error Correction Model (VECM) analysis. This could however be a consideration for future studies.

7. Conclusions.

This paper has contributed to the vast interest in the empirical relationship between fiscal policies and the current account balance through using military expenditures as a proxy for fiscal policies. This consideration has been provoked by the theory of Military Keynesianism which implies that spending on the defense sector is used by governments as fiscal policy tool. This theory has stimulated vast research on the impact of military expenditures on growth and investments yet studies related to the impact on the external balance is lacking. This paper therefore empirically addresses this gap in literature by using annual panel data for 30 OECD economies covering the period 1995 – 2011. The estimation techniques have involved using OLS, fixed effects and GMM models for comparison. The key finding and main contribution

of this paper is some empirical evidence that military expenditures matter for the current account dynamics of OECD countries. Ceteris paribus, it has been found that a 1 percentage point increase in military expenditures deteriorates the current account balance by between 0.3 and 0.9 percentage points. This evidence is best captured by OLS and fixed effects estimation and is sensitive to controlling for the general public expenditure and the fiscal balance.

A possible policy implication of the conclusion drawn by this paper is that adjusting military budgets could play a role in correcting the global external imbalances. For instance the US the largest spender on the military related activities has appeared among the economies with the largest external imbalances. Secondly, the findings in this paper could also support the arguments by some of the NATO countries reluctant to commit a 2 percent GDP threshold towards their defense sectors.

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9. Appendices.

Appendix A: Countries in the study
Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Israel, Italy, Japan, South Korea, Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, UK, US

Appendix B: Correlation Matrix

Variable	ΔTFP	ΔExchange rate	ΔTOT	Current Account	Military Expenditure	NFA	GDP Per Capita growth	GDP growth	Fiscal Surplus	Public Expenditure	Investment	Dependency Ratio	Trade Openness	Financial Openness	GDP per capita
ΔTFP	1														
ΔExchange rate	0.148	1													
ΔTOT	0.148	0.076	1												
Current Account	-0.080	-0.147	-0.017	1											
Military Expenditure	0.021	-0.054	0.014	-0.094	1										
NFA	-0.055	-0.068	0.008	0.497	-0.133	1									
GDP Per capita growth	**0.801**	0.178	0.109	-0.136	0.059	-0.055	1								
GDP Growth	0.748	0.167	0.101	-0.117	0.122	-0.022	**0.977**	1							
Fiscal Balance	0.025	0.010	0.036	0.435	-0.181	0.261	0.222	0.262	1						
Public Expenditure	-0.040	-0.046	0.092	0.136	**0.049**	-0.029	-0.197	-0.257	**-0.224**	1					
Investment	0.214	0.163	0.033	-0.396	-0.052	-0.145	0.405	0.387	0.177	-0.432	1				
Dependency Ratio	-0.096	-0.082	-0.015	0.166	0.315	0.059	-0.107	-0.026	0.021	0.130	-0.462	1			
Trade Openness	0.045	0.037	0.028	0.037	-0.281	0.318	0.111	0.120	0.160	0.063	0.076	-0.221	1		
Financial Openness	-0.207	-0.053	0.027	0.047	-0.171	0.318	-0.172	-0.127	-0.005	-0.063	-0.117	-0.039	0.510	1	
GDP per capita	-0.204	-0.096	0.070	0.419	-0.197	**0.583**	-0.202	-0.139	0.339	0.215	-0.282	0.028	0.454	**0.611**	1

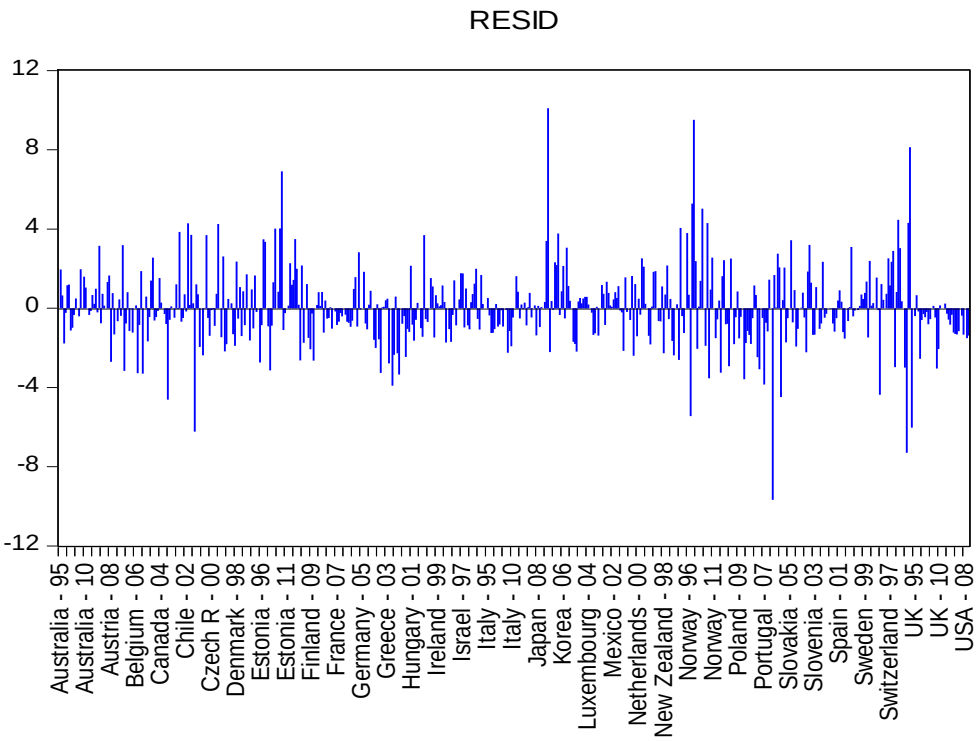
Appendix C: Hausman Test

Chi-sqaure statistic	p-value
61.5254	0.000

Ho: Randon effects model
H1: Fixed effects model
Null of a Random effects model is rejected.

Appendix D: Unit root testing

Variable	Levin. Lin and Chu unit root tests	P-value
Current Account/GDP	-2.867	0.000
Military Expenditure/GDP	-4.961	0.000
Fiscal Balance/GDP	-4.34154	0.000
Investments/GDP	-5.627	0.000
Net Foreign Assets/GDP	-2.61757	0.004
Public Expenditure/GDP	-4.355	0.000
ΔTerms of Trade	-9.049	0.000
Δ Productivity	-6.449	0.000
Δ Exchange rate	-9.371	0.000
Trade Openness	-2.959	0.000
Financial Openness	-14.9061	0.000
GDP growh	-6.810	0.000
GDP per capita	-5.154	0.000
Dependence Ratio	-19.701	0.000



Dieu Merci !