The Effects of Membership of Currency Unions on Foreign Direct Investment (FDI) Movement

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Abstract

In the recent years, there has been a rise in regional integration activities such as membership of currency unions and regional agreements. Therefore, it becomes an important issue to find out how the membership in Currency Unions (CUs) could affect inward and outward investments. This paper aims to examine the effects of currency unions on inflows, outflows and net FDI of different countries. For this purpose, I undertake an empirical investigation of the relevant factors that determine the effects of the membership of CUs on FDI and use pooled OLS estimation method for 180 countries over the period 1970-2007. My sample consists of 5 currency unions. The empirical findings indicate East Caribbean Currency Area (ECCA) and Economic and Monetary Community of Central Africa (CEMAC) membership increases net FDI of countries. The membership in Eurozone increases both FDI inflows and outflows, with the raise being more significant for the latter.

1.1 Introduction

There has been a growth in regional integration activities worldwide in the recent years. Nowadays, increasing number of countries are inclined towards the use of a single currency due to international economic integration. For instance, Gulf Cooperation Council (GCC) countries are still in the process of assessing the feasibility of a single currency for the Gulf region. The number of countries which use Euro has increased from 11 in 1999 to 18 in 2014out of 28members of the European Union. Other currency unions namely Economic and Monetary Community of Central Africa (CEMAC), West African Economic and Monetary Union (WAEMU) and East Caribbean Currency Area (ECCA) are also examples of countries from the same region using the same currency for economic reasons. Dollarization has been a much discussed issue, as some countries use dollar as their currency, irrespective of what region they belong to (e.g. Panama).

It seems that more countries are assessing or measuring the positive impact of Currency Union (CU) membership to avail the benefits of CU. This study has the potential to provide answers to the countries that seek to obtain maximum advantages from the membership of a CU and illustrates how joining a currency union may influence their inflows, outflows and net FDI. The paper is organised as follows. Section 1.2 reviews the proposed theoretical framework of currency unions and their impact on FDI. Section 1.3 describes the explanatory variables used in this study. Methodology and data for the study are explained in section 1.4. In section 1.5 I present results. Finally, section 1.6 offers some concluding remarks. Section 1.7 gives limitations and directions for future research.

1.2 Currency Unions (CU)

Currency union (also called monetary union) is a union where one or more countries decide to adopt the currency of another country as their own legal tender (e.g. dollar) or countries decide to use a single currency mutually for some political and economic reasons (e.g. Euro). It is observed that countries join a currency union or adopt other country's currency for the benefit and stability of their country. One of the fundamental reasons to join currency unions includes the need or motivation to keep inflation under control (Silva and Tenreyro 2010; Frankel and Rose 2002; Agenor 1994), which is a burning issue for many nations. The use of

common currency gives stability to the currency of a country, as the union then takes the responsibility for the monetary policy and stability of a country in terms of inflationary control. Another important motive is to avail the benefits of economic integration. It facilitates transfer of factors of production and helps in elimination of trade barriers, which in turn makes trade attractive for the member countries. Further, common currency helps to eliminate the problems of exchange rate fluctuations and different currency rates, which promotes trade and investment within currency union (Silva and Tenreyro 2010; Alesina and Barro 2002; Ng 2002; Fielding and Shields 2003).

Countries have a tendency to be more inclined towards joining currency unions, as one of the benefits of currency unions is that the membership assists to shrink or eliminate transaction costs of trade, which supports openness and increases trade and investment among the member countries of the currency union (Ng 2002). Frankel and Rose (2002) find evidence that a country's income increases due to raise in trade caused by membership of currency union and that otherwise there is no direct relationship between currency union and income. However, Dwane *et al.* (2010) find contrasting results with no direct relationship between trade and European Monetary Union (EMU), although a very strong impact of UK-Ireland currency union on the trade of Ireland was observed.

In the process of switching from a country's individual independent currency to a mutually agreed currency, a country has to sacrifice her control over monetary policy through which it could take necessary measures to improve its economic conditions (Silva and Tenreyro 2010; Ng 2002). Member countries then become dependent and compelled to follow the policies issued by currency board or central banks of currency union for their monetary policy, irrespective of their dissimilar economic opportunities and threats (Alesina and Barro 2002; Ng 2002). The situation becomes worse in a case when the currency union countries face unrelated economic shocks (Frankel and Rose 2002). There are some members of European Community, that is the United Kingdom, Latvia, Denmark, Lithuania, Hungary, Poland, Romania, Czech Republic and Sweden which still use their own currency in order to retain the freedom regarding monetary policy matters and are in the process of assessing the pros and cons of using the Euro.

1.2.1   Optim-um Currency Area (OCA) Theory

In his seminal work, Robert Mundell (1961) presented a path-breaking theory about currency unions and currency areas and discussed the criteria for a feasible working system of currency areas and unions. These criteria were labor mobility, the degree of wage flexibility and free capital movement. When discussing the adjustment mechanism of macroeconomic asymmetric shocks among currency union countries, Mundell (1961) had given more emphasis on the factor (labor and capital) mobility in comparison to real exchange rate flexibility. In a situation of insufficient real exchange rate flexibility and factor of production mobility, countries face the problems of increased unemployment. According to Mundell's theory (1961), states can acquire the benefits of membership of currency union through the elimination of exchange rate variability and lower transaction costs. The suitability of membership of currency union is evident from the degree of losses which are contingent on the nature of macroeconomic symmetric or asymmetric shocks and the speed of adjustment of nations.

Mundell's work is divided into two different models. In his earlier work, Mundell (1961) suggested that smaller currency areas should be formed instead of making a large common monetary/ currency area to effectively deal with the problems of individual country disturbances. On the other hand, in a later model of Mundell, he supported the common currency union among the diverse nations facing different economic disturbances.

When we discuss the effects of fixed exchange rates, inflexible prices and wages negatively affect the terms of trade from performing their crucial part in the adjustment process. Episodic balance-of-payments crises play and will keep playing a very crucial role in international economic systems. Common currency areas of Eurozone are affected by balance of payments crisis and it is said to have started around 2007 (Sinn 2012).

McKinnon (1963) on the other hand, associate the advantages of membership of currency union with trade liberalization due to decrease in transaction cost resulting in an increase in trade among members. Kenen (1969) suggested that the economic diversification should be used as an important indicator of the suitability of currency areas as the countries with low degree of economic diversification are prone to encounter/ suffer asymmetric shocks for which the independent exchange rates are preferred. The countries which face asymmetric shocks and have poor factor mobility (i.e. labor and capital) are not suitable candidates for the membership in currency unions (Bayoumi and Eichengreen 1994). The similar situation takes place in the case of highly diversified economies which face symmetric economic nature of disturbances. These countries have the advantages of following uniform policies with the countries facing similar problems. The economic condition of countries facing high inflation (asymmetrically distributed aggregate demand shocks) may be related to their domestic policy.

Bayoumi and Eichengreen (1994) have analysed the countries experiencing similar economic disturbances by looking at their demand and supply shocks incidents and concluded that high degree of specialization is likely to be associated with asymmetric shocks and with floating exchange rates between separate currencies.

In 1960s, floating exchange rate or external exchange rate flexibility was considered to have an independent monetary policy in terms of the adjustment of macroeconomic shocks in individual countries by (McKinnon 2002). However, there is a change of direction in 1970s Mundell's later work, where he support the concept of membership of currency unions by looking at the impact of future exchange rate uncertainty on capital markets (keeping in view the international portfolio diversification and risk sharing). The later study of Mundell suggests that countries can better cope with asymmetric shocks by having better reserve pooling and portfolio diversification (McKinnon 2002).

1.2.2 Economic Effects of Currency Union

Most of the earlier literature is available on the relationship between trade and currency unions (Brouwer et al. 2008; Rose and Van Wincoop 2001; Rose and Engel 2002; Frankel and Rose 2002; Tenreyro and Barro 2003; Rose 2000; Nitsch 2002;Micco et al. 2003; Dwane et al. 2010; Bun and Klaassen 2007). However, only limited literature describing the effects of currency unions onFDI is available**.** There are the studies which examine the effects of EMU on the member countries (Aristotelous 2005;Schiavo 2007; Foad 2006; Brouwer et al. 2008; De Sousa and Lochard 2006; Petroulas 2007). Edwards and Magendzo (2003) draw a distinction between the economic performance of currency union countries with the countries having own currencies and classify currency union countries into independent currency union and dollarized countries. Edwards and Magendzo (2003) found that membership in currency unions is beneficial for a country's economic growth and monetary policy. Both independent currency union and dollarized countries have higher growth volatility and lower rate of inflation than countries with their own currencies.

Rose and Engel (2002) found membership in currency union allows countries to reap the benefits of higher international integration (more trade), lower rate of inflation and highly synchronized business cycles compared to countries with their own currencies. They find that member countries are smaller in size, more open to international trade and capital

investments. However, Rose and Engel (2002) data does not include European Economic and Monetary Union (EMU). Glick and Rose (2002) examine the time series effect of joining or leaving a currency union on international (bilateral) trade using panel data set for over 200 countries from 1948 to 1997. Glick and Rose (2002) found that bilateral trade nearly doubled when countries joined currency union and halved when they left currency union. Their study does not include the European Economic and Monetary Union (EMU).

Rose (2000) uses gravity model and panel data set to analyse the impact of common currency and exchange rate volatility on international trade for 186 countries from 1970-1990. He finds that joining common currency union increases international trade three times among the member countries and the volatility of exchange rate has small negative effect on international trade. Frankel and Rose (2002) investigate the effects of membership of currency unions on income and trade of a country and suggest that joining currency union increases bilateral trade within member countries and does not have any diversion effect on trade of non-member countries. However, membership has indirect positive effect on income of a currency union country.

This study includes four monetary unions (which have a common central bank) i.e. Economic and Monetary Community of Central Africa (CEMAC), East Caribbean Currency Area (ECCA), West African Economic and Monetary Union (WAEMU), European Monetary Union (EMU) and Dollarized countries (with no common monetary institution controlling monetary policy of dollar using countries). The important question is whether membership of currency unions is beneficial for countries? Which of the currency unions are most efficient in achieving the desired effects?

1.3 The Description of Explanatory Variables
The brief description of macroeconomic variables used in this study is given below:

1.3.1   Market Growth
The growth in the market size gives a significant idea of the expected demand and profits for investors. The rise in GDP triggers investments, which results in increased production, employment, consumption, product demand and revenues for investors. This helps organizations to gain more profits and benefits from economies of scale and scope and suggests that the annual change or increase in economic growth will attract market-oriented foreign investment into the country (Buckley et al. 2007). Market growth is measured in terms of rate of annual percentage change of GDP at market prices based on constant local currency. GDP growth is reported to have positive and significant impact on the FDI inflows in investment literature studies. The GDP growth rate is selected as a variable for the study for the reason that FDI is a long term investment and GDP growth rate gives a good estimate of countries' economic condition in the long run (Jaumotte 2004).

1.3.2   Inflation
Inflation is an important economic factor. High inflation is considered as an indicator of macroeconomic instability, as it might lead to devaluation of currency, which reduces the value of real earnings and purchasing power within the host country for investors and makes (market-seeking and export oriented) investments unattractive in the host country. It affects the interest rates and makes borrowing of funds costly (Daniels et al. 2009). Unstable inflation rates reduce the faith of investors and market-seeking FDI, as it becomes tricky to make long-term goals and policy decisions regarding pricing strategies and operating profits. Therefore, for FDI inflows, the coefficient on inflation is assumed to be negative (Buckley et al. 2007; Dhakal et. al 2007; Schneider and Frey 1985).

1.3.3 Openness

FDI and trade have a much debated relationship, whether they complement or substitute each other. In any way, trade liberalization is considered to have a significant impact on FDI, as government trade liberalization policies make business environment conducive to foreign investments and foreign investors are more attracted towards a host country which has minimum or no capital control and investment-friendly procedures (Taylor 2000). The more open an economy is, the more one would expect export-oriented FDI to increase. However, tariff-jumping FDI will increase, if more trade restrictions (less trade liberalization) are imposed (Asiedu 2002). Openness is extremely significant factor in terms of RTAs. The same applies to home country investors; as such conducive investment climate and policies create more competition within the home country and are supposed to stimulate FDI outflows from a country to challenge the rivals in their markets. Therefore, openness is supposed to increase both FDI inflows and outflows.

1.3.4 Real Interest Rate

Interest rate is the monetary policy instrument which is used to control money supply in a country. Higher interest rate implies the scarcity of capital, increasing the opportunity cost of capital, making direct investment in and out of country costly. On the other hand, lower interest rate, demonstrates the availability of ample capital for investment purposes, may increase the FDI outflows from the country (Kyrkilis and Pantelidis 2003; Tolentino 2008). Interest rate is expected to have a negative relationship with FDI.

1.3.5 Current Account

Current account is the measure of strength and stability of a country's currency. Current account deficit is believed to depreciate the currency of a country which increases inflation and causes exchange rate fluctuations. This situation might affect the capital flows as foreign investors lose their confidence to make a long term investment in the country (Dhakal et. al 2007). This in turn may reduce the value of the assets and discourage the prospective investors from the country. On the other hand, current account surplus stimulate outward investment. The current account as a percentage of GDP is selected to examine the impact of current account on inflows, outflows and net FDI of countries. Schneider and Frey (1985) in their study, found a highly significant impact of current account deficit on FDI inflows showing that lower current account deficits increase FDI inflows.

1.3.6 Real GDP per Worker

Real GDP per worker is the inflation-adjusted GDP per worker of a country. The variable is an indicator of the potential productivity increases or decreases per worker in an economy. This variable is used to find the relationship between the labour productivity and FDI of a country. Real GDP per worker is assumed to have positive impact on inflows, outflows and net FDI of a country and measures the ability of countries to produce the outputs.

1.3.7 European Monetary Union (EMU)

The currency of Euro was officially introduced on 1st January 1999. The membership of EMU expanded from 11 to 17 EU member countries within twelve years. Euro was expected to increase trade and investment within the region with a common currency to support the further economic and political integration of the region. Aristotelous (2005) examine 15 European Union countries from 1966-2003 and find positive and significant impact of EMU on US FDI flows into Euro zone. Foad (2006) argue that due to creation of Euro, US FDI decreased in United Kingdom, Sweden and Denmark and increased in Euro countries.

De Sousa and Lochard (2006) used gravity model and report an increase of FDI inflows within the Euro-member countries. Petroulas (2007) document statistically significant and positive effects of EMU on FDI inflows into Euro zone with 16% increase in FDI among euro countries, 11% increase in FDI outflows and 8% increase in FDI inflows in Euro countries from non-member countries. Schiavo (2007) examines the data for 25 countries from 1980-2001 and reports that euro increases FDI flows by approximately 100% between member and non-member countries and above 200% between member countries. Schiavo (2007) studied the impact of Euro on member countries' FDI and report positive impact of membership. Brouwer et al. (2008) study the impact of membership on FDI inflows of Eurozone countries and find 21% increase among euro countries, 129% between existing and new member countries. Bergsten (2010) calls EMU a work in progress, which needs to develop in order to fulfil the expectations.

1.3.8 Central African Economic and Monetary Community (CEMAC) and West African Economic and Monetary Union (WAEMU)

CEMAC and WAEMU are considered a unique kind of monetary unions, because although they have different central banks with distinct currencies, they also have certain similarities, such as pegging their currencies with French Franc earlier and now with Euro. Both are collectively called CFA Franc Zone, both have convertibility of currency guaranteed by France and are associated with successful systems/supranational central banks established in 1948 with stable peg levels due to "stronger institutions and more policy transparency" (Gulde 2008:3; Boughton 1991). The CFA Franc Zone has the advantage of private funds moving freely in the entire zone (Boughton 1991), especially due to the fact that there are no restrictions on investments in WAEMU (Guilde 2008).

CFA Franc Zone came into existence when West and Central African member countries were French colonies. France established two banks to manage monetary system in all African colonies, which now called as Banque Centrale des Etats de l'Afrique de l'Ouest (BCEAO) for WAEMU and Banque Centrale des Etats de l'Afrique Centrale (BEAC) for CEMAC. Same currency unions operated under the supervision of France after independence, however, in the late 1970s the power was transferred to African Banks. WAEMU was established in 1994 and consists of eight members: Benin, Burkina Faso, Cote d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo. CEMAC has six members: Cameroon, The Central African Republic, Chad, The Republic of Congo, Equatorial Guinea and Gabon (United Nations 1999; Gulde 2008; Gurtner 1999). The interesting fact is that both the currencies of WAEMU and CEMAC are convertible to Euro, but not to each other. Only central banks are allowed to exchange one CFA Franc into other CFA Franc with some tax rate (Fielding and Shields 2005). CFA Franc zone consists of both developing and under-developed countries (Gulde 2008).

1.3.9 Dollarization

It is generally known that countries adopt dollar to cope with the problem of inflation. However, Duffy et al. (2006:2074) associate dollarization of countries with "underdevelopment of financial systems", which causes inflation and faces countries to dollarize. In this study, I have taken those countries where official or full dollarization took place (i.e. when the government replaces their national currency with a hard foreign currency for instance dollar as a legal tender). Dollarized countries have a diverse position in the world as where they all use dollar in isolation and it does not make them connected or integrated with other dollarized economies. They have a different reason for dollarization and they all are small countries by population size (Fabris 2009).

Dollarization is not strictly considered a monetary union, because dollarized countries do not have a common central bank controlling the monetary policy for dollarized countries since a country adopts the currency of other country (Fabris 2009; Gulde 2008). Bahamas and Panama are the best examples of fully dollarized countries, which do not have their discrete national currencies (Fielding and Shields 2005). However, dollarized countries lose the seigniorage gain, which remains in the US. Hanke and Schuler (1999) advocate dollarization for countries and reason that a country can non-dollarize without much problem when adopted unilaterally in comparison to other currency unions. However, dollarization in a way may be beneficial for the countries, as the economic conditions of the nation become stable (stable exchange rate, lower interest rates and lower inflation) and it becomes more acceptable in the world (Hanke and Schuler 1999; Kim and Mah 2007; for detailed advantages and disadvantages of Dollarization see Fabris 2009). Kim and Mah (2007) examine the economic condition of Ecuador and El Salvador after dollarization and conclude that the effects of dollarization differ between countries depending on their objectives. They find that Ecuador dollarized for economic development, its FDI inflows increased; however, El Salvador's objective for dollarization was political, and hence no significant effect on FDI was observed[1].

1.3.10 Eastern Caribbean Currency Union (ECCU)

The Eastern Caribbean Currency Union (ECCU) comprises of eight island countries: Anguilla, Antigua and Barbuda, Dominica, Grenada, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent and Grenadines. Eastern Caribbean Central Bank controls the monetary policy of ECCU and issue the ECCU Dollar which is pegged to the US Dollar at a fixed rate[2]. US Dollar is also accepted and used for transactions within the ECCU countries due to the proximity and considerable tourism, however, the main currency used is ECCU Dollar (Fielding and Shields 2005). The association of Caribbean countries with the US Dollar dates back to 1960s and 1970s, when most of these British colonies got independence and their currencies were pegged to US dollar, due to devaluation of sterling against dollar (Worrell 2003).

1.4 Empirical Model Specification and Data Description

In this chapter, I aim to assess the effects of currency unions and trade agreements on FDI of a country. I analyse inward, outward and net foreign direct investment (inflow-outflow) as a percentage of GDP. The reason why the dependent variables and some of the control variables are expressed as a percentage of GDP is the need to deflate and detrend the variables. I focus on the sample of panel data on 180 countries and a long time-span from 1970 to 2007. I attempted to incorporate as many countries as possible including both developing, developed and transition countries. Sample size fluctuates between the different specifications because of data availability. I estimate a pooled OLS model (1) using dummy variables for currency unions.

To compute the effects of currency unions on foreign direct investment, pooled OLS regression is used.

$$
\begin{aligned}
(FDI\ /\ GDP)_{it} &= C + \beta_1 \text{GDPGROWTH}_{it} + \beta_2 \text{INFLATION}_{it} + \beta_3 \text{OPENNESS}_{it} \\
&+ \beta_4 \text{CURRENTACC}_{it} + \beta_5 \text{RGDPWORK}_{it} + \beta_6 \text{EUROZONE}_{it} + \beta_7 \text{CEMAC}_{it} \\
&+ \beta_8 \text{WAEMU}_{it} + \beta_9 \text{DOLLAR\_LTENDER}_{it} + \beta_{10} \text{ECCA}_{it} + \epsilon_{it}
\end{aligned}
$$

1   Palau, Marshall Islands and Fed. States of Micronesia, were not included in the sample.
2   Anguilla and Montserrat are not included in the sample because of the unavailability of FDI data.

Where the subscript i denotes countries and t denotes time. The dependent variable FDI/GDP$_{it}$ denotes FDI (inflows, outflows and net FDI) as a percentage of Gross Domestic Product (GDP) of a country i at time t. Same control variables are used in the second model except interest rate variable. EUROZONE, CEMAC, WAEMU, DOLLAR_LTENDER and ECCA are binary variables which take the value of 1 if a country i is a member of a given currency union.

The annual data for variables, net inflows of foreign direct investment as a percentage of GDP (inflows), net outflows of foreign direct investment as a percentage of GDP (outflows), GDP growth rate, inflation, openness and current account is collected from World Bank's World Development Indicators (WDI). The real GDP per worker variable data is sourced from Penn World Table 6.3. The data for currency unions is gathered from World Trade Organisation, Eastern Caribbean Central Bank, European Central Bank, Wei and Choi (2002), and the CIA World Factbook. Table 1 presents list of countries for the analysis of the effects of membership of currency unions on FDI. Table 2 shows the exact definitions of variables used in this study with data sources.

Table 1: Sample of countries for the analysis of the effects of currency unions on FDI

Afghanistan	Comoros	Iceland	Montenegro
Albania	Congo Dem Rep	India	Morocco
Algeria	Congo Rep	Indonesia	Mozambique
Angola	Costa Rica	Iran	Namibia
Antigua and Barbuda	Cote d'Ivoire	Ireland	Nepal
Argentina	Croatia	Israel	Netherlands Antilles
Armenia	Cyprus	Italy	Netherlands
Aruba	Czech Republic	Jamaica	New Zealand
Australia	Denmark	Japan	Nicaragua
Austria	Djibouti	Jordon	Niger
Azerbaijan	Dominica	Kazakhstan	Nigeria
Bahamas	Dominican Republic	Kenya	Norway
Bahrain	Ecuador	Kiribati	Oman
Bangladesh	Egypt	Korea Rep	Pakistan
Barbados	El Salvador	Kuwait	Panama
Belarus	Equatorial Guinea	Kyrgyz Republic	Papua New Guinea
Belgium	Eritrea	Lao People's Dem. Rep	Paraguay
Belize	Estonia	Latvia	Peru
Benin	Ethiopia	Lebanon	Philippines
Bhutan	Fiji	Lesotho	Poland
Bolivia	Finland	Liberia	Portugal
Bosnia & Herzegovina	France	Libya	Romania
Botswana	Gabon	Lithuania	Russia
Brazil	Gambia	Luxembourg	Rwanda
Brunei Darussalam	Georgia	Macao, China	Samoa
Bulgaria	Germany	Macedonia	Saudi Arabia
Burkina Faso	Ghana	Madagascar	Senegal
Burundi	Greece	Malawi	Serbia
Cambodia	Grenada	Malaysia	Seychelles
Cameroon	Guatemala	Maldives	Sierra Leone
Canada	Guinea-Bissau	Mali	Singapore
Cape Verde	Guinea	Malta	Slovak Republic
Central African Republic	Guyana	Mauritania	Slovenia
Chad	Haiti	Mauritius	Solomon Islands
Chile	Honduras	Mexico	Somalia
China	Hong Kong China	Moldova	South Africa
Colombia	Hungary	Mongolia	Spain

Sri Lanka	Switzerland	Trinidad and Tobago	Uruguay
St. Kitts and Nevis	Syrian Arab Republic	Tunisia	Uzbekistan
St. Lucia	Sao Tome & Principe	Turkey	Vanuatu
St. Vincent & Grenadines	Tajikistan	Turkmenistan	Venezuela
Sudan	Tanzania	Uganda	Vietnam
Suriname	Thailand	Ukraine	Yemen Arab Rep
Swaziland	Togo	United Kingdom	Zambia
Sweden	Tonga	United States	Zimbabwe

Table 2: Variables with definitions and sources

Variable	Definition	Sources
INFLOW	Net inflows of foreign direct Investment as a percentage of GDP	World Bank's World Development Indicators, The World Bank
OUTFLOW	Net outflows of foreign direct investment as a percentage of GDP	World Bank's World Development Indicators, The World Bank
WTO	WTO membership (153 members on 23 July 2008 (with dates of membership)	World Trade Organization
ECCA	East Caribbean Currency Area	Eastern Caribbean Central Bank
CEMAC	Economic and Monetary Community of Central Africa	International relations and cooperation Website, World Trade Organization
WAEMU	The West African Economic and Monetary Union	World Trade Organization and individual RTAs
GDPGROWTH	Annual percentage growth rate of GDP at market prices based on constant local currency	World Bank World Development Indicators, The World Bank
RINTEREST	Real interest rate	World Bank World Development Indicators, The World Bank
EURO	Member Countries of EMU	European Central Bank
OPENNESS	Sum of exports and imports of goods and services measured as a share of gross domestic product.	World Bank World Development Indicators, The World Bank
CURRENTACC	The sum of net exports of goods, services, net income, and net current transfers as a percentage of GDP	World Bank World Development Indicators, The World Bank
RGDPWORK	The real GDP per worker (in thousands of dollars per worker (in 2005 Constant Prices US$)	Penn World Tables PWT 6.3
DOLLAR	Countries using dollars as legal tender	Wei and Choi (2002), CIA the World FactBook

The data for currency unions is selected on the basis of the year of entry into the currency unions. The main economic variables have been selected on theoretical grounds.

1.5 Results
Descriptive statistics for the selected variables of currency unions are given in table 3. Correlation matrix for Currency Unions is presented in table 4. The results for currency unions are presented in tables 5, 6 and 7. The estimation method used is pooled OLS and expected signs for each variable are reported.

Table 3: Descriptive statistics for the effects of Currency Unions

Variables	Mean	Median	Std. Dev.
INFLOW	3.3042	1.2000	14.3548
OUTFLOW	1.6476	0.0900	17.3884
INFLOW-OUTFLOW	1.9147	0.8700	5.9656
GDP_GROWTH	3.9492	4.0800	6.3040
RINTEREST	5.9172	5.7800	19.2214
INFLATION	36.7872	6.3500	507.7638
OPENNESS	75.1272	64.7750	46.1430
CURRENTACC	-3.4922	-2.9600	10.5470
RGDPWORK	20.4552	12.6891	24.4904
EUROZONE	0.0138	0.0000	0.1168
CEMAC	0.0068	0.0000	0.0822
WAEMU	0.0071	0.0000	0.0842
DOLLARS_LEGALTENDER	0.0075	0.0000	0.0862
ECCA	0.0307	0.0000	0.1726

Table 3 shows the descriptive statistics for the effects of CUs on FDI over the period of 1970-2007. Table 3 reports that the average rate of economic growth is 3.95% per annum for the entire sample. On average, the real interest rate is 5.9 percent. The Inflation rate of 36% seems high and it is mainly due to developing countries. Openness is 75%, which shows that most of the countries have trade encouraging policies. Since productive workforce encourages FDI, I also examine the real GDP per worker, which averages 20.4552 thousands of international dollars. Among the CUs, around 3% of countries are members in ECCA. Eurozone members comprise of about 1.4% of the data sample. African currency unions (CEMAC and WAEMU) have approximately 0.68% and 0.71% members in the sample. Officially dollarized countries are about 0.75% of the entire sample.

Table 4: Correlation matrix for Currency Unions

	INFLOW	OUTFLOW	INFLOW-OUTFLOW	GDP_GROWTH	INFLATION	OPEN-NESS	CURREN-TACC	RGDP-WORK	EURO-ZONE	CEMAC	WAEMU	DOLLARS_LEGAL-TENDER	ECCA
INFLOW	1.0000												
OUTFLOW	0.9498	1.0000											
INFLOW-OUTFLOW	-0.0792	-0.3871	1.0000										
GDP_GROWTH	0.0560	0.0076	0.1406	1.0000									
INFLATION	-0.0210	-0.0143	-0.0165	-0.1022	1.0000								
OPENNESS	0.3154	0.2387	0.1690	0.1327	-0.0812	1.0000							
CURREN-TACC	-0.0497	0.0815	-0.4062	-0.0140	0.0149	0.0446	1.0000						
RGDP-WORK	0.1465	0.1994	-0.2036	-0.0264	-0.0566	0.1802	0.4248	1.0000					
EUROZONE	0.2537	0.2804	-0.1456	-0.0363	-0.0310	0.0971	0.0557	0.2833	1.0000				

	INFLOW	OUTFLOW	INFLOW-OUTFLOW	GDP_GROWTH	INFLATION	OPENNESS	CURRENTACC	RGDPWORK	EUROZONE	CEMAC	WAEMU	DOLLARS_LEGALTENDER	ECCA
CEMAC	-0.0021	-0.0083	0.0202	-0.0312	-0.0149	0.0082	0.0689	-0.0587	-0.0177	1.0000			
WAEMU	-0.0096	-0.0111	0.0074	0.0019	-0.0179	-0.0441	-0.0792	-0.1099	-0.0224	-0.0102	1.0000		
DOL-LARS_LEGAL TENDER	0.0001	-0.0122	0.0392	0.0007	-0.0155	0.1236	-0.0005	-0.1008	-0.0248	-0.0113	-0.0143	1.0000	
ECCA	0.0370	-0.0169	0.1630	0.0335	-0.0229	0.1866	-0.2178	-0.0675	-0.0343	-0.0156	-0.0198	-0.0219	1.0000

Table 4 reports the correlation coefficient matrix of currency unions. GDP growth has negative correlation with Eurozone and CEMAC and positive correlation with WEAMU, dollar and ECCA. Inflation has negative correlation with all currency unions which indicate the decrease in inflation rate in economies joining CUs. Openness has negative correlation with WAEMU and positive with other unions. This may point to the liberalization policies of the unions. Current account is negative with WAEMU, dollar and ECCA and positive with the remaining.

Table 5: OLS Regression showing the impact of Currency Unions on Foreign Direct Investment inflows

Variable	Coefficient	Expected signs
Intercept	-6.7169*** (0.5425)	
GDP_GROWTH	0.0996** (0.0475)	+
INFLATION	0.0005 (0.0008)	–
OPENNESS	0.0923*** (0.0053)	+
CURRENTACC	-0.2043*** (0.0284)	–
RGDPWORK	0.0535*** (0.0118)	+
EUROZONE	19.7576*** (1.4345)	+
CEMAC	6.1140** (2.7741)	+
WAEMU	0.8445 (2.0731)	+
DOLLARS_LEGALTENDER	-2.4325 (2.1362)	+
ECCA	-0.8391 (1.4822)	+
Number of Countries	180	
Observations	3804	
R2	0.1574	
F-statistic	39.4786*** (5, 3793)	
Chi-square	197.3932*** (5)	

Above table presents results of OLS regression relating Foreign Direct Investment (FDI) net inflows as a percentage of Gross Domestic Product (GDP) to regional trade agreements. The dependent variable is FDI net inflows as a percentage of Gross Domestic Product (GDP), defined as net inflows (investment inflows minus disinvestment) in the countries from foreign investors, divided by country GDP. The data set consists of Foreign Direct Investment (FDI) net inflows as a percentage of Gross Domestic Product (GDP) of 180 countries from 1970-2007 for customs unions. GDPGROWTH is annual percentage growth rate of GDP at market prices based on constant local currency. RINTEREST is the lending interest rate adjusted for inflation as measured by the GDP deflator. INFLATION is the inflation measured by the consumer price index. OPENNESS is the sum of exports and imports of goods and services measured as a share of gross domestic product. CURRENTACC Current account balance is the sum of net exports of goods, services, net income, and net current transfers. RGDPWORK is the real GDP per worker (I$ 1000 per worker (in 2005 Constant Prices US$). EUROZONE is a binary variable which is 1 if country i is member to Economic and Monetary Union (EMU) of European Union in time t. CEMAC is a binary variable which is 1 if country i is member to Economic and Monetary Community of Central Africa in time t. WAEMU is a binary variable which is 1 if country i is member to West African Economic and Monetary Union (WAEMU) in time t. DOLLAR_LTENDER is a binary variable which is 1 if country i is using dollar as legal tender. *, **, and *** represents statistical significance of 10 percent, 5 percent, and 1 percent, respectively. Degrees of freedom are included in parentheses for F-stat and Chi-square.

Table 5 reports the pooled OLS regression results on the impact of the CU membership on FDI inflows for 180 countries over the period of 1970-2007. Eurozone is positive and highly significant showing FDI inflows will increase by around 20% of GDP for new members of EMU. This may be due to the fixed value of the currency relative to other members. Additionally, controlled monetary policy, established political and economic conditions may promote further stability. Foreign investors are attracted towards the countries with stable exchange rates to avoid the higher costs of doing business (Mohan and Watson 2010).

CEMAC exerts a strong and positive influence on the inward FDI. The relationship between CEMAC and WAEMU is a curious one. The two currency unions are prominent groups of Africa. Even though, the members of both currency unions rank low in terms of human development, infrastructure and ease of doing business index, the substantial impact of the membership of CEMAC shows its advantageous position in comparison to WAEMU. CEMAC has the natural advantage in terms of FDI inflows, due to the existence of oil resources, which is also the reason for increased its exports[3]. This suggests that CEMAC attracts more export-oriented FDI. Further, economic growth was stable in CEMAC due to oil production. On the other hand, WAEMU had a relatively unsteady growth rate. WAEMU consist of agricultural countries with commodity exports and increased population growth rate (Ramirez and Tsangarides 2007; Alby 2007). The performance of CEMAC countries, as measured by the human development index and in terms of productivity, is much better than WAEMU members (Ramirez and Tsangarides 2007). However, they both have strict investment policies in terms of labor regulations, start-up capital requirements, and costly property registration processes, when compared to Sub-Saharan Africa.

Dollar and ECCA appear both negative and insignificant in the regressions. Joining ECCA may decrease the FDI inflows by 0.83% of GDP. Although, ECCA members grant a large number of tax concessions to foreign investors for instance tax holidays, these tax incentives have moderate effects on FDI to the members and even lower their revenues (Chai and Goyal 2008). Further, more than half of FDI inflows in ECCA are in tourism industry (Cubeddu et al. 2008), in which these countries have a comparative advantage.

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3   All the countries of CEMAC are oil producing countries except Central African Republic.

The coefficient on dollarization is inversely related to the inflows of FDIs. This suggests that dollarization of countries may not prove beneficial to the dollarized countries, which may be due to inability of dollarized countries to handle the external shocks resulting in reduced investments.

Table 6: OLS Regression showing the impact of Currency Unions on Foreign Direct Investment outflows

Variable	Coefficient	Expected signs
Intercept	-7.2852*** (0.8088)	
GDP_GROWTH	-0.0265 (0.0731)	-
INFLATION	0.0025 (0.0034)	+
OPENNESS	0.0860*** (0.0076)	+
CURRENTACC	0.0314 (0.0427)	
RGDPWORK	0.0682*** (0.0168)	+
EUROZONE	23.0326*** (1.8245)	+
CEMAC	-0.5987 (3.7431)	+
WAEMU	2.1403 (2.9727)	+
DOLLARS_LEGALTENDER	-3.7267 (2.7162)	+
ECCA	-4.3532** (2.0034)	+
Number of Countries	180	
Observations	2799	
R2	0.1348	
F-statistic	33.81653*** (5, 2788)	
Chi-square	169.0827*** (5)	

This table presents results of OLS regression relating Foreign Direct Investment (FDI) net outflows as a percentage of Gross Domestic Product (GDP) to regional trade agreements. The dependent variable is FDI net inflows as a percentage of Gross Domestic Product (GDP), defined as net inflows (investment inflows minus disinvestment) in the countries from foreign investors, divided by country GDP. The data set consists of Foreign Direct Investment (FDI) net inflows as a percentage of Gross Domestic Product (GDP) of 180 countries from 1970-2007 for customs unions. GDPGROWTH is annual percentage growth rate of GDP at market prices based on constant local currency. RINTEREST is the lending interest rate adjusted for inflation as measured by the GDP deflator. INFLATION is the inflation measured by the consumer price index. OPENNESS is the sum of exports and imports of goods and services measured as a share of gross domestic product. CURRENTACC Current account balance is the sum of net exports of goods, services, net income, and net current transfers. RGDPWORK is the real GDP per worker (I$ 1000 per worker (in 2005 Constant Prices US$). EUROZONE is a binary variable which is 1 if country i is member to Economic and Monetary Union (EMU) of European Union in time t. CEMAC is a binary variable which is 1 if country i is member to Economic and Monetary Community of Central Africa in time t. WAEMU is a binary variable which is 1 if country i is member to West African Economic and Monetary

Union (WAEMU) in time t. DOLLAR_LTENDER is a binary variable which is 1 if country i is using dollar as legal tender. *, **, and *** represents statistical significance of 10 percent, 5 percent, and 1 percent, respectively. Standard error is given in parentheses. Degrees of freedom are included in parentheses for F-stat and Chi-square.

In table 6, I analyse the relationship between CUs and FDI outflow for the period of 1970-2007. The membership to EUROZONE is expected to bring 23% increase in FDI outflows. The result complements the increase in recent FDI outflows from euro countries. The membership of euro may affect the diversification opportunities for home businesses resulting in an increase in outflows in non-member countries (Haselmann and Herwartz 2010; Eurostat 2008). The regression results show that joining ECCA will decrease 4.35% of the FDI outflows of member states. This might be due to capital controls, political and economic conditions in ECCA members.

The membership of CEMAC have a negative and insignificant impact on members, indicating lower domestic investments presumably due to "macroeconomic and institutional environment" for businesses in the region (Ndiaye 2010:19). Dollarization may not positively affect the FDI outflows of countries. The reason for negative and insignificant impact of dollarization might be due to small economies. The coefficient on WAEMU for FDI outflows appears insignificant with the expected sign. The result indicates the need of economic freedom in the region in the areas of trade and direct investments (Vamvakidis 1998).

Table 7: OLS Regression showing the impact of Currency Unions on net Foreign Direct Investment

Variable	Coefficient	Expected signs
Intercept	-0.9736*** (0.2422)	
GDP_GROWTH	0.1381*** (0.0219)	+
INFLATION	0.0007 (0.0010)	−
OPENNESS	0.0231*** (0.0023)	+
CURRENTACC	-0.2626*** (0.0128)	−
RGDPWORK	-0.0065 (0.0050)	+
EUROZONE	-3.9648*** (0.5427)	+
CEMAC	3.0377*** (1.1130)	+
WAEMU	-1.0541 (0.8840)	+
DOLLARS_LEGALTENDER	0.5659 (0.8077)	+
ECCA	1.2190** (0.6097)	+
Number of Countries	180	
Observations	2754	
R2	0.2356	
F-statistic	13.61564*** (5, 2743)	
Chi-square	68.07822*** (5)	

Above table presents results of OLS regression relating Foreign Direct Investment (FDI) net flows (Inflows-Outflows) as a percentage of Gross Domestic Product (GDP) to regional trade agreements. The dependent variable is FDI net inflows as a percentage of Gross Domestic Product (GDP), defined as net inflows (investment inflows minus disinvestment) in the countries from foreign investors, divided by country GDP. The data set consists of Foreign Direct Investment (FDI) net inflows as a percentage of Gross Domestic Product (GDP) of 180 countries from 1970-2007 for customs unions. GDPGROWTH is annual percentage growth rate of GDP at market prices based on constant local currency. RINTEREST is the lending interest rate adjusted for inflation as measured by the GDP deflator. INFLATION is the inflation measured by the consumer price index. OPENNESS is the sum of exports and imports of goods and services measured as a share of gross domestic product. CURRENTACC Current account balance is the sum of net exports of goods, services, net income, and net current transfers. RGDPWORK is the real GDP per worker (I$ 1000 per worker (in 2005 Constant Prices US$). EUROZONE is a binary variable which is 1 if country i is member to Economic and Monetary Union (EMU) of European Union in time t. CEMAC is a binary variable which is 1 if country i is member to Economic and Monetary Community of Central Africa in time t. WAEMU is a binary variable which is 1 if country i is member to West African Economic and Monetary Union (WAEMU) in time t. DOLLAR_LTENDER is a binary variable which is 1 if country i is using dollar as legal tender. *, **, and *** represents statistical significance of 10 percent, 5 percent, and 1 percent, respectively. Standard error is given in parentheses. Degrees of freedom are included in parentheses for F-stat and Chi-square.

Table 7 reports the results on the impact of membership of CUs on net FDI (inflows-outflows) of countries. The coefficient on Eurozone is -3.96, which point to increased FDI outflows in comparison to FDI inflows in the region. The regression results for net FDI of CEMAC are robust, representing large investments in member countries in natural resources.

The membership in WAEMU may negatively affect the net FDI. The reason for this might be dependence on agriculture sector, lack of economic freedom and industrialization policies in these countries. Dollar is positive and insignificant. ECCA have significant and positive impact on the net FDIs of member countries, mainly due to tax incentives offered by these countries and opportunities in tourism sector.

1.6 Conclusions

In this chapter, I attempted to investigate the impact of currency unions on inflows, outflows and net FDI flows to 180 countries from 1970-2007. The most remarkable result to emerge from the data is that the membership in EUROZONE results in around 20 percent of GDP increase in FDI inflows and 23 percent of GDP increase in FDI outflows. These results suggest that joining EUROZONE improves the image of the country for international businesses mostly due to fixed value of currency, relatively stable monetary policy and economic conditions. Further, increase in FDI inflows may enhance competition, saturate domestic market and which motivates domestic businesses to invest in competitors' markets in retaliation.

Among the currency unions, CEMAC has a robust positive effect on inflows and net FDI. The rationale for this phenomenon is that CEMAC countries are rich in oil resources and by looking at their higher exports and stable economic growth compared to WAEMU, it becomes obvious that most of the FDI inflows are channelled towards oil production. On the other hand, strict policy regulations for investments seem to affect the growth of domestic investments. Joining ECCA appears to decrease FDI outflows, as their outward FDIs are concentrated around the same region and if a neighbour country joins the currency union, it is the trade that might get a boost. Dollarization and WAEMU membership appear to have no significant effects on FDIs of member countries. Among the control variables, GDP growth, openness, real interest rate, current account and real GDP per worker have robust effects on

the FDIs (inflows, outflows and net FDI). On the other hand, the variable of inflation did not appear to have a major impact on FDIs.

1.7 Limitations and Directions for Future Research
Finally, a number of potential limitations need to be considered. Nevertheless, I believe this work could be the basis for future research on the impact of currency unions on FDI.

First, an important limitation is the unavailability of data for some countries. The study on the effects of currency unions was limited by the unavailability of FDI data for Qatar and United Arab Emirates and the unavailability of the two members of GCC countries may have some role in making the coefficient on GCC dummy insignificant. Similarly, Palau, Marshall Islands and Federal States of Micronesia were not included in the sample of dollar using countries and the same is the case with ECCU members of Anguilla and Montserrat. Therefore, future research can be carried with the availability of FDI data for these countries.

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