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Trade Defence measures: the EU anti-dumping policy. Analysis of the biodiesel anti-dumping case-study in Argentina and Indonesia and its consequences on the world market

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**Trade Defence measures: the EU anti-dumping policy.
Analysis of the biodiesel anti-dumping case-study in Argentina and
Indonesia and its consequences on the world market**

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Outline

Introduction

The environment of anti-dumping (AD) policies has dramatically changed in the past decade. After the Uruguay Round (1986-1994), AD became a nice way to dampen the liberalization impacts and to justify trade openness. As new members, emerging markets started to use this tool very often (Niels, ten Kate, 2006). According to WTO statistics, the number of AD initiations rose from 150 cases in 1995 to more than 350 in 2002 and decreased to its initial level nowadays. Traditionally, developing countries have been the receivers of measures adopted by developed countries such as USA and the European Union (EU). However, India and Brazil were the two biggest initiators of AD in 2014 with more than 35 initiations while the EU did 14, the same level as Mexico (14) or Indonesia (12). Only 9 initiations have targeted the EU in 2014 while China has been targeted 63 times. Countries like Malaysia, Thailand or India are now targeted as much as the EU (WTO, 2017).

This paper focuses on a specific case initiated by the EU which has been already widely commented. It focuses mainly on EU arguments in order to show how the EU strategically used AD measure to protect its industry. In 2011, the European Commission investigated on biodiesel exports practices in Argentina and Indonesia. A final duty has been imposed in 2013 for 5 year duration (until 2018) but named countries appealed the decision to the EU Court of Justice in 2016 and obtained the suspension of the duty (Blenkinsop, 2016). The EU turned to the WTO in December 2016 (European Commission, 2016). The case is pending now and the duties are still applied. If the AD is supposed to be used in order to fight unfair trade practices, it appears that the EU could have use WTO rules for a strategic reason: the development of its green energy industry. A press conference of the European Commission suggests those motivations: *"The EU is open to Argentine and Indonesian exports but we should not stay idle and tolerate structural raw material distortions. We're glad the Council adopted the Commission proposal (...) Now we can be reassured that our green energy sector is not under threat and will continue developing to the benefit of all Europeans"* (European Commission, 2013).

Three main parts will structure the paper. First, a literature review will present the main concepts used to analyze our case study. The objective is to address two main questions: Why AD measures are widely used? And what are the potential effects on world trade? The second part will explain the context of the EU duty. The political and economic situation in the EU before the AD initiation will be described. Third, we will focus on the specific biodiesel case and will try to show some evidence about the effects of the duty. By showing how the EU and world markets reacted to the decision, this third part will study the EU28 internal market, its imports and exports to the world and the named countries and how related but untargeted goods reacted to the duty. Finally, the conclusion will go through the main results and make the link between our case and the theoretical framework to see whether or not the biodiesel case fits expectations or highlights surprising results.

I. A literature review on anti-dumping
A. Why AD measures?

Four reasons will be presented in this section to explain the proliferation of AD. First, trade linkages are important. Free trade agreements (FTA), the existence of high valued exports or the inflow of aid play a huge role in AD investigations. It limits the number of cases, reduces their effects and promotes more negotiations (Cheong, 2007). The fear of disturbing sound economic relations which are vital for weaker economies decreases the likelihood of retaliation when they are targeted (Niels, ten Kate, 2006). It means that the kind of economic relations is interesting to study in order to understand what duty will be decided and how it will be enforced. In general, developed economies are more targeted in absolute terms than developing countries. However, in relative terms, developing countries are more targeted. The proportion of products under an AD investigation is bigger. It can be due to less diversification and a reliance on specific and primary products. Their sectors of specialization are also under more competition, more risky and therefore more volatile (Cheong, 2007).

Second, AD is an easy tool for protecting the national assets because the looseness in WTO rules allows a wide room for discretion and leads to less transparency in their utilization (Niels, ten Kate, 2006). It means that for small economies, it is harder to understand the procedure, to get information and to argue. Poorer countries have not the financial capacity to hire high level lawyers to represent them. They have higher duties imposed on average, 35% for lower middle income countries and 26% for others (Cheong, 2007).

Third, most of AD measures are initiated based on retaliatory motivations and are not often designed to oppose unfair trade. Actions are regularly linked to internal macroeconomic (as oligopolistic pressures) or political factors (protectionism) (Niels, ten Kate, 2006). If there is a strong feeling of patriotism in the economy (buy local etc.), politicians are more open to protectionism in order to relief domestic industries. AD is also seen as a safety net to support new industries (capacity-creation hypothesis) (Aggarwal, 2004). Economically, it justifies predatory behavior. A government argues harmful dumping practices in order to impose duty and ensure a monopolistic or oligopolistic power on its territory for national industries and to rule out potential external competitors. This predation argument goes against economic theories and rationality. A social planner should try to maximize the welfare of its citizens by increasing purchasing power and promote competition (Aggarwal, 2004). AD measures are not always in the interest of the public and this argument is directly related to the last reason.

The complaining industry (its political links or employment possibilities) is important to determine, whether or not, an investigation will end up with an AD imposition. Consumers are more likely to suffer from an AD duty because they are often less organized than industrials to make their voice heard. Therefore, the political and economic side of investigation can end up with duties protecting well-organized industrial sector at the detriment of consumer because quantities are reduced and prices likely to increase (Niels, ten Kate, 2006). AD is often pushed by the industry which needs a large market share for economies of scale (Niels, 2003). In our case study, we can notice that the EU industry in the

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biodiesel sector is particularly well organized through the European Biodiesel Board (EBB) and has a strong lobbying power in Brussels. The board represents more than 50 firms from 15 member states active in the biodiesel sector and weights 220 000 jobs in 210 plants, mainly in Germany, Italy, Austria, France and Sweden which all have specific laws to promote green energies (European Biodiesel Board, 2017).

Bown (2007) noticed that industries soliciting AD measures are often suffering from a high import penetration of foreign exporters, high capital expenditures (higher average capital expenditure relative to value added, 31.23% versus 19.27% for industry not asking AD measures), they have a slow output growth (1.3% versus 5.4%) in the prior three years of investigation and they are in countries facing a money appreciation (face cheaper imports). The size of the industry is also important because it allows funding to support litigation costs and the administrative process.

B. What are the expected effects of AD?

Three main effects will be highlighted in the paper. First, AD can destroy economic exchange. The two partners stop the trade of targeted products (trade depression/destruction). Second, trade can be diverted. The named country will stop trade with the initiator of the measure but non-named countries will compensate and enlarge their exports to the initiator (Vandenbussche, Zanardi, 2010 and Niels, 2003). Third, all related goods and substitutes (non-targeted products) can be hit as well. It has been showed that AD measure has also an effect on the aggregate level of imports. It is called the chilling effect and can be considered as spillover effect. It can provoke losses at the aggregate level of trade between the two partners which will offset the potential benefits of having protecting a specific industry. The aggregate effect can be detrimental to global economy. The chilling effect is expected to decrease global trade by 5,9% between two partners (Vandenbussche, Zanardi, 2010). Broadly, an AD measure is expected to have effects on all traders of the targeted commodities and on all goods/sectors in the named country.

According to Niels, AD has a similar negative impact on imports for all types of economies. However, the diversion effect seems to be weaker when AD measure concerns a developing country because non-named countries competing are less able to replace the product due to less power on the market and the fear of retaliation compared to developed countries. Concerning specific sectors, the food, textile and rubber industries (characterizing developing economies) are more likely to have destruction effect while the steel, chemicals and plastics industries are more characterized by import diversion (Niels, 2003).

However, many surveys are contradictory and there is no golden rule on dumping. According to Staiger and Wolak, the negative effect on imports is expected to be similar to the positive effect on domestic production where producers will take over the decrease in imports of the named country. They suggest that trade diversion is limited (Niels, 2003). On the contrary, Prusa found strong destruction and diversion effects. An AD measure can have unintended consequences. The trade diversion can be so large that the imports reduction from the named

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country is more than compensated by the increase of imports from non-named countries. (Prusa, 2015). Volumes are widely restricted by duties and diversion is larger when the duty is greater. It means that the global trade volume is likely to keep increasing even with the duty (Prusa, 1996). Prusa concluded that an AD duty can lead to a reduction of 70% in volume each year and an increase of prices between 30 and 50% during the three years following the imposition. The magnitude of the duty seems to depend on the length of the post investigation period. After three years, it is estimated that the effect is lower because the named country recover or find a way to dampen its impact. According to him, AD means that the importer will have to pay more or to switch to another exporter, probably more expensive (because they have chosen the cheapest one previously). It means that the foreign exporter who is not targeted have new opportunities to enter a market.

In conclusion of this literature review, AD decisions are not always economically rational. The political side of the decision and the type of industry initiating the investigation are important. Three main effects (depression, diversion and chilling) are observable but the authors have difficulties to assess the expected magnitude of each of them. However, developing countries are more targeted and stronger hit than developed countries.

II. Presentation of the biodiesel case-study

This section will briefly present the decision of the European Council[1] and explain how and on which basis the Commission justifies its position. The regulation imposes a definitive quota on imports of biodiesel originating from Argentina and Indonesia. The complaint was initiated by EU producers through the EBB which represent 60% of the sector in Europe. The claim is based on soybean and palm derived products used for biodiesel. Biodiesel declared for non-fuel use is also considered because it has the same physical properties. European producers denounced the differential export tax system in both countries which distorts the raw material prices. The overregulation of the biodiesel market would make the market out of the ordinary course of trade.

The Commission investigation shows a level of export taxes on raw material around 35 % on soya beans and 32 % on soybean oil for Argentina over the investigation period (2011-2013). It was much higher that the duty imposed on manufactured products as biodiesel is imposed only at a 20% average level. A national system of tax rebate even lowered the duty to 14,58 % in some cases. The average difference between raw materials and biodiesel is around 20%. A similar strategy has been applied by Indonesia. The Commission observed that the price of crude palm oil (CPO) was very low on the domestic market due to the same type of fiscal export structure. Biodiesel export rate was between 2 and 5 % over the investigation period. The tax rate for CPO was around 15-20 % for the same period. If we consider the palm fruit, the tax rate can reach 40 %. The normal value of the goods doesn't reflect international prices for the Commission and Argentina and Indonesia intentionally distorts the market. The price

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[1] REGULATION (EU) No 1194/2013 of 19 November 2013 imposing a definitive anti-dumping duty and collecting definitively the provisional duty imposed on imports of biodiesel originating in Argentina and Indonesia

is much lower than the average international market price and allows a cheap domestic production of biodiesel due to the oversupply of non-exported oil in the domestic market.

The Commission justifies its will to impose a duty in order to correct this system which encourages overproduction of biodiesel at the detriment of the EU industry and through unfair practices. Both countries opposed the Commission argument by arguing EU internal market signals which have no links with their industry. The two countries arguments have been rejected. They refuse any causal link with the injury in the EU and are opposed to all the numbers presented in this section. The table A represents the EU consumption of biodiesel. The second represents the production capacities of the EU.

Union consumption	2009	2010	2011	IP
Tonnes	11 151 172	11 538 511	11 159 706	11 728 400
Index 2009 = 100	100	103	100	105

Source: Eurostat, data from the Union industry

Table A, source: REGULATION (EU) No 1194/2013 of 19 November 2013

	2009	2010	2011	IP
Production capacity (tonnes)	18 856 000	18 583 000	16 017 000	16 329 500
Index 2009 = 100	100	99	85	87
Production volume (tonnes)	8 729 493	9 367 183	8 536 884	9 052 871
Index 2009 = 100	100	107	98	104
Capacity utilisation	46 %	50 %	53 %	55 %
Index 2009 = 100	100	109	115	120

Table B, source: REGULATION (EU) No 1194/2013 of 19 November 2013

It shows that the EU industry has clearly the capacities to satisfy fully to the demand and does not need any import (the consumption is around 11 million tons while it can produce 18 and imports around 2,5 million from the world). The table B shows that biodiesel was less profitable in 2011 than in 2009. According to the Commission computations, the share of biodiesel imported in the EU had rose by 48% in volume and by 41% in share over the investigation period. The Commission created a table (see annex 1) with the targeted industries, the names of the companies and the dumping margin (between 9 and 50%) they have in order to set the level of the duty (between 9 and 25%) they will impose on all targeted products (see annex 2) according to the behavior of each firm. The AD measure will not only be imposed on pure biodiesel but also on blends in a proportional way of the total content.

It is interesting to go through a directive passed in 2009[2] which is quoted many times in the decision. It gives a clear idea of the EU motivations, political strategy and challenges

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[2] Directive 2009/28/EC of 23 April 2009 on the promotion of the use of energy from renewable sources

concerning the use of renewables. It exposes an ambitious framework going beyond the Kyoto protocol requirements for the use of renewable energies, the reduction of greenhouse gas and to encourage clean transportation. A first deadline was set for 2020 (and a another one for 2030) at the European level: minus 20% (40%) of greenhouse gas emission, 20% (27%) share of renewables in the energy mix and 20% (27%) less energetic consumption. As another intermediate objective, 10% of the energy used in transports should come from renewable resources. Enlarging the energetic independence of the EU is also a critical objective. The directive has been subject to a long discussion in the EU institutions because the effect of biofuel on the environment does not make consensus.

Biofuel uses cereals and oils that could be used to feed people, it has therefore been criticized because it could endanger food security. According to the World Bank, the increased demand for biofuel is responsible for 75% of the increase in food prices since 2002 (Chakrabortty, 2008). It will make impossible for the poorest to have access to food because developed countries will be able to buy it at a higher price to process fuel (Rossi, Lambrou, 2008). Moreover, well-known specialist as Jean Ziegler denounced a protectionist policy of the EU in the sector through subventions, impeding developing countries to benefit from a new economic opportunity in the agricultural sector (UN, 2007). The European Committee of Regions questioned the ecological footprint of the objective in its advice on the directive (Committee of the Regions, 2008). An increase demand of biofuel will lead to a degradation of the wildlife because it will necessitate new arable lands. If regulations on arable lands are strict in the EU, there are not all over the world. By increasing the demand, it encourages indirectly the destruction of the environment (Lechon et al., 2011). The sustainable origin of the biofuel is of crucial importance.

Taking all those arguments and the AD decision into account, the EU faces conflicting interests: the protection of wildlife and humankind (less greenhouse gas, more available resources and less toxic emission from non-renewables), the development of a new European industry (allowing indirectly energetic security) and international trade and development.

III. The biodiesel case-study analysis
A. Data description

Some preliminary remarks on data, methodology and constraints are necessary before starting to analyze the trade flows. Data have been gathered from 2007 to 2015 (there is no reliable data available for 2016 yet) and 2011 appears as the reference year because it is when the investigation started and it cuts the period in two similar sub-periods. 2013 is the year where the duty if officially introduced (a low and temporary duty was already in place over the investigation). In all tables, the period will be divided according to this reference year. In addition to the two named countries, two non-named countries (Brazil and Malaysia) are studied as well. The countries are direct neighbors but also competitors of the named countries in the sense that they produce the targeted products (palm oil for Malaysia, soya bean oil in Brazil). Those four countries are also in the top 10 largest producers of biodiesel and have close economic power and development level. All are members of a FTA:

MERCOSUR or ASEAN. It means that Argentina and Brazil face exactly the same condition to export to the EU. The same holds true for Indonesia and Malaysia in ASEAN[3]. It allows assessing the different effects of dumping with a certain level of similarity and homogeneity.

The Eurostat database (managed by the European Commission) has been used as the most accurate database. It is the only one providing the EU trade statistics from all products and all countries from the world each time with the same value (€) and quantity (by 100kg). The comparison between different EU partners and the internal market is eased. Eurostat is also more consistent because it uses the HS codes[4] for all its partners and provides the most precise information (8 digit-level). This paper focuses on the European market because it was interesting to compare the political strategy and the economic reality but also because it is the only institution providing accurate data concerning our case-study. Focusing on named countries was impossible because the data is poorer. National agencies of statistics of the four countries use different labels to name similar products and different measures of values and quantities. Data has been collected for the 13 targeted goods (see annex 2) concerning the EU internal market, EU imports and exports to/from the four countries and the world. The UN Comtrade database has been used when the requested data were not available on Eurostat. However, this database provides only 6 digit level codes. Other substitutes, complementary, products or intermediate inputs used to manufacture the 13 targeted products have also been considered but the data availability was not good for many of them. Therefore only a limited number of like-products have been taken into account in this section.

Annual average growth rates have been computed for all the data concerning the four countries and the world over the sub-periods to show how the investigation changed the trend existing before 2011. Moreover, the same exercise has been realized for the EU internal market. If Eurostat is the most precise database, there are still important constraints in the analysis due to data availability (with the exception of the EU internal market which is complete for all the targeted products).

First, the good 38249091 is not targeted but it covers the goods 38260010 and 38260090 that are created in 2012 by an international HS code reform (the two existed under the unique code 38249091 until 2011). The row "biodiesel sector" is the sum of the two goods after 2012 or represents 38249091 before. Second, the codes starting with 271020 do not exist before 2012 and are computed under the code 27101941. Unfortunately, this code covers also other goods that will have their own codes as well in 2012 but are not targeted by the measure. It is therefore impossible to use it. All the products marked with [0] are by default studied from 2012 for this reason. Third, 2013 is the reference in order to construct the "top 5" because it is the starting date of the duty imposition and the HS code reform has occurred.

Unfortunately, data on the products 2710 are very limited or even non-existing with the four countries while 3 out of the 5 most important products in the EU internal market were part of

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[3] An Interregional Framework Cooperation Agreement exists with MERCOSUR and negotiations are currently led to create an FTA. Beside bilateral agreements with member states, there is a biannual ASEAN-EU Trade and Investment Work Program and negotiations for a partnership are also ongoing (European Commission, 2017)
[4] Harmonized System Codes developed by the World Customs Organization

the group 2710. There is not enough data to run a consistent analysis of this sector. Taking into account this data availability, the relative importance of each good and the EU strategy focusing on biodiesel, most of the analysis will be focused on goods from the sector 38. Small conclusions at the end of each following sections will summarize the analysis.

B. A brief outlook of the biodiesel world production

Before starting to analyze specifically the EU market and its imports, it is interesting to have a look at the evolution of the biodiesel market over the last 10 years. The ten countries are ranked according to their industrial weight in 2015. In 2005, the EU had a monopolistic position on this market and was responsible for more than 90% of the world production (REN21, 2006). However, the quantities were small. In 2015, the top 10 producers accounted for 93% of the world production and the EU share decreased to 38% even if the quantities produced never stopped increasing. The EU faced new competitors which exploit the potential of the biodiesel sector and have huge possibilities of production. For instance, the USA quadrupled its own production over the last 5 years. Focusing on the four countries considered here, some of them were not producing any biodiesel at all in 2005 and Malaysia was not in the top ten in 2010 (REN 21, 2006-2011). Except Argentina, all increased their production at larger growth rate than the EU, automatically decreasing the EU world share in this industry. Following this trend, it is very likely that the EU loses its first place in the future.

| Table 1: Biodiesel production of the top 10 producers in the world in 2015 (source: REN 21)							Growth rate
	2005		2010		2015		Growth rate
	production*	world share	production*	world share	production*	world share	2010-2015
EU	3,6	92,3%	10	52,6%	**11,5**	**38,3%**	**15,0%**
USA	0,25	6,4%	1,2	6,3%	4,8	16,0%	300,0%
Brazil			2,3	12,1%	**3,9**	**13,0%**	**69,6%**
Argentina			2,1	11,1%	**2,1**	**7,0%**	**0,0%**
Indonesia			0,7	3,7%	**1,7**	**5,7%**	**142,9%**
Thailand	No data or production		0,6	3,2%	1,2	4,0%	100,0%
Singapore			out of top 10 in 2010		1	3,3%	/
Malaysia					**0,7**	**2,3%**	/
Colombia			0,3	1,6%	0,6	2,0%	100,0%
China			0,2	1,1%	0,4	1,3%	100,0%
Top 10 total	3,85	98,7%	17,4	91,6%	27,9	93,0%	60,3%
Top 10 without the EU	0,25	6,4%	7,4	38,9%	16,4	54,7%	/
World total	3,9	100,0%	19	100,0%	30,1	100,0%	58,4%
*Production in billion of tons oil equivalent (ranked according to the top 10 producers in 2015)							

C. The EU 28 internal market of biodiesel

The production and the utilization capacities will be presented followed by the trade growth rates of the targeted products inside the EU market. The primary production in the EU rose from 5 million tons equivalent oil in 2007 to more than 11 million in 2015 with an average growth rate of 10% each year. This average decline to 6,8% (even if it is still high) after 2011. A similar picture exists for the production capacities of biodiesel. It rose from 11 million tons equivalent oil in 2007 to more than 22 million in 2015. The annual average growth rate is around 8,5% but it has been thoroughly declining after 2011 (0,8%). There is a limited

increase in the use of capacities (only 1,3% on average each year) over the period but it increased to 6% annually after 2011.

Graph 1: Utilization of the EU 28 biodiesel production capacities in % (source: Eusrostat)
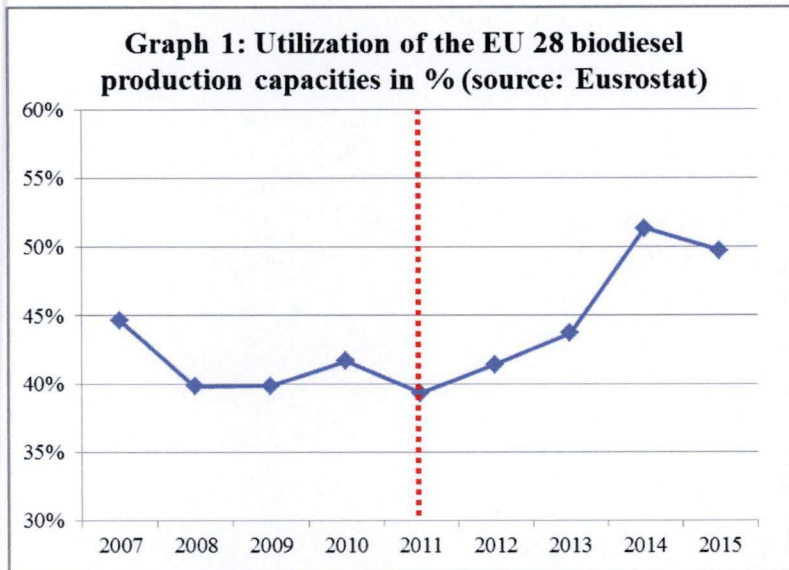
Top 5 products in the EU market in 2013 (source: Eurostat)		
Imports	share in value*	share in quantities*
1 27101943	48,07%	50,03%
2 27102011	16,95%	17,17%
3 27101947	14,67%	16,77%
4 38249097	9,16%	5,84%
5 biodiesel sector	6,26%	5,23%
Sum	95,11%	95,04%
*considering all goods under AD measure		

Considering the targeted products, the top 5 good within the internal market accounts for more than 95% of the EU trade while the 8 others account for less than 5%. For all goods concerned by the AD measure, imports within the EU market corresponds to more than €62 billion in 2013 and more than 80 million of tons.

The table 2 shows imports within the EU28 market with the annual average growth rate of the products in value, quantities and value by kg over the period. Negative growth rates are in red. In general terms, the quantities are increasing except for one product from the top 5 (27101947) which has a negative average growth rate of -3,3%. Except the biodiesel sector, all goods have their global value decreasing after 2011. The specific biodiesel sector is positive in any case (in value and quantities). However, quantities rise faster than price so the value of each kg produced decreases. If the global value is decreasing for all the products except biodiesel, all the quantities (except 27101947) are rising and biodiesel is rising at a much higher pace.

Graph 2 shows the imports of biodiesel and 38249097 over the whole period (there are the two where data is available). It confirms that those two industries are on an increasing trend since 2007. However, it seems that they were reaching a ceiling around 2011 with a stable but non increasing period. It corresponds to the high penetration of Indonesian and Argentine
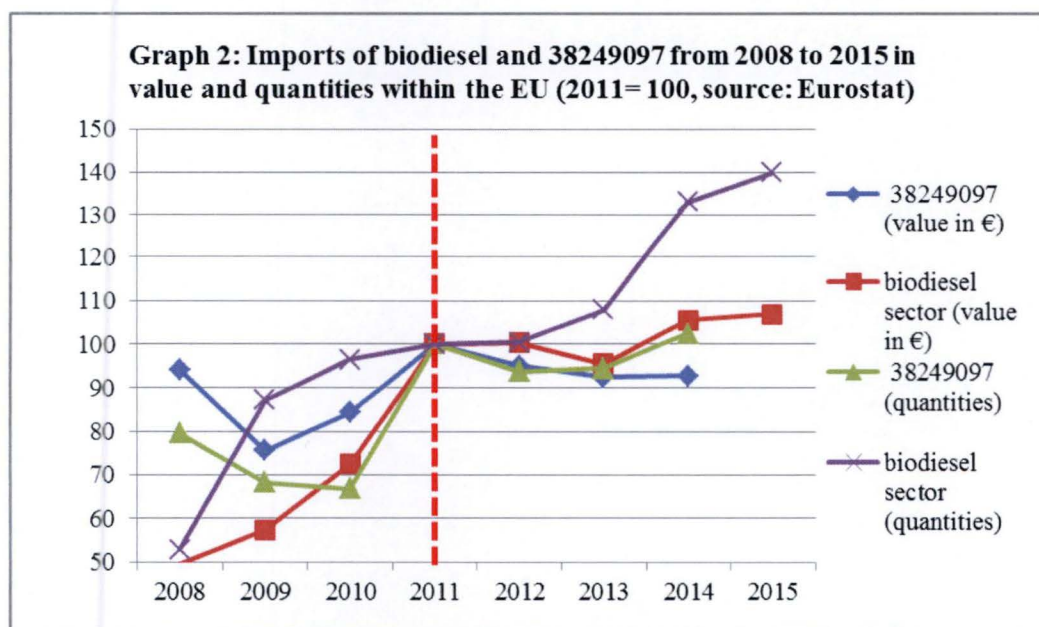
biodiesel. The end of the investigation and the implementation of the AD measure in 2013 boosted again the sector, especially the quantities of biodiesel.

Table 2: top 5 imported goods within the EU 28 market in average annual growth rates (source: Eurostat)	Value in €		Quantities (100kg)		Value/kg in €	
	all the period	from 2011	all the period	from 2011	all the period	from 2011
15162098	1,2%	-3,4%	-3,3%	-1,5%	4,7%	-1,9%
15180091	4,5%	-2,3%	4,9%	2,3%	-0,3%	-4,5%
15180095	7,5%	-4,8%	4,8%	5,3%	2,6%	-9,6%
15180099	5,1%	-13,8%	3,9%	-12,3%	1,2%	-1,7%
27101943[0]		-12,9%		2,0%		-14,6%
27101946[0]		-19,7%		-3,9%		-16,4%
27101947[0]		-18,7%		-3,3%		-15,9%
27102011[0]		-13,9%		1,8%		-15,4%
27102015[0]		0,0%		21,6%		-17,8%
27102017[0]		-21,5%		-8,2%		-14,5%
38249097	-0,2%	-2,5%	4,3%	0,8%	-4,3%	-100,0%
38249091	26,5%		23,7%		2,3%	-100,0%
38260010[0]		1,4%		10,7%		-8,4%
38260090[0]		19,2%		33,7%		-10,8%
biodiesel sector*	10,1%	1,7%	12,9%	8,8%	-2,5%	-6,5%
Total of products[0]		-15,0%		-1,0%		-15,0%

* sum of the three last rows above

[0] data available only from 2012 and growth rate computed from 2012 and not 2011

Graph 2: Imports of biodiesel and 38249097 from 2008 to 2015 in value and quantities within the EU (2011= 100, source: Eurostat)

In general, the biodiesel sector is booming over the period and the EU AD measure could have helped to fully exploit the existing capacities and therefore decrease the cost of production, take benefits from economies of scale and limit the competition of other

producers. The utilization of capacities is rising after 2011 and is reflected in positive rates of the biodiesel sector.

D. EU imports from the named countries (Argentina and Indonesia), Brazil and Malaysia

The effect of the AD measure on the two named countries and the two non-named which are Brazil and Malaysia will be analyze here. Unfortunately, products 2710 are not considered because of the data unavailability. It is however hard to do a ranking with shares as previously because the value and quantities vary a lot from one year to the other (due to the AD measure) but the top 5 is stable.

Top 5 imported products into the EU internal market in 2013 from the four countries (source: Eurostat)			
	Argentina	Brazil	Indonesia	Malaysia
1	15180091	15180091	15162098	15162098
2	15180095	15180095	15180095	15180095
3	38249097	15180099	15180099	15180099
4	38260010	38249097	38249097	38249097
5	38260090	38260010	38260010	38260010

Argentina and Brazil have the same top 5 goods they export to the EU except one. Indonesia and Malaysia have exactly the same top 5. Considering the four countries, they share at least 3 products. Firstly, we can highlight that 38249097 and 38260010 are all in the top 5. For the two named countries, biodiesel is by far the most important goods, representing in some years ten times the sum of the four other goods. It represents a large share of EU imports compared to the trade of biodiesel within the EU internal market (see Graph 3). In 2011, the two named countries export biodiesel to the EU for a value corresponding to 60% of the total biodiesel trade within the EU market and more than two thirds of the quantities. None of the other targeted products has a share over 1% or 2%. It shows the power of penetration of the biodiesel industry inside the EU market.

Graph 3: share of the EU 28 imports of biodesel from Argentina and Indonesia relative to imports within the EU market for biodiesel in quantities (source: Eurostat)

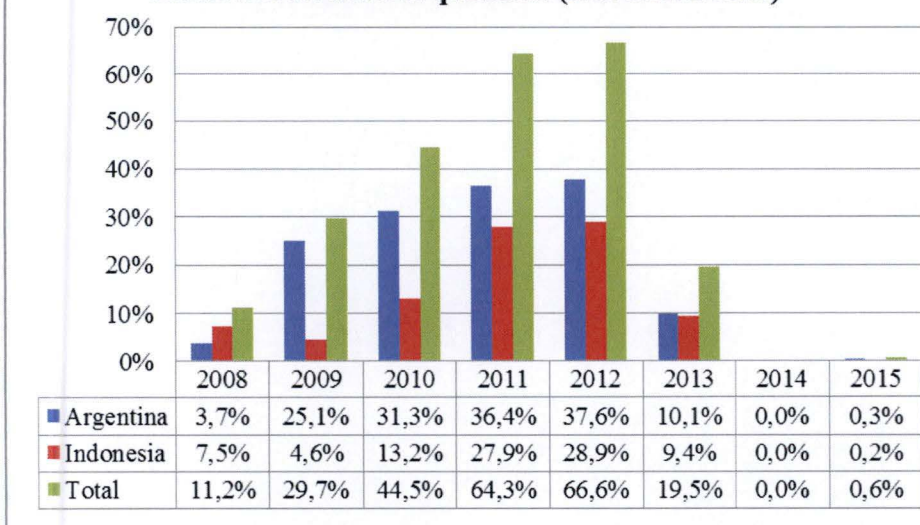|	2008	2009	2010	2011	2012	2013	2014	2015
Argentina	3,7%	25,1%	31,3%	36,4%	37,6%	10,1%	0,0%	0,3%
Indonesia	7,5%	4,6%	13,2%	27,9%	28,9%	9,4%	0,0%	0,2%
Total	11,2%	29,7%	44,5%	64,3%	66,6%	19,5%	0,0%	0,6%

Table 3 covers 6 different goods if we take into account the top 5 of each country at the same time. Concerning 15162098, the product is subject to a decrease both in Indonesia and Malaysia at the same time while the effect on 15180091 is strongly negative on Argentina. However it is hard to conclude due to the general lack of data in the sector 15 which does not always allow for systematic comparisons. Moreover, those products account for a small share of the trade in the targeted goods and are not strategic as biodiesel.

Unsurprisingly, the most interesting products to focus on are 38249097 and the biodiesel. For Argentina and Indonesia the AD imposition worsened the situation as illustrated by the declining annual growth rates after 2011, showing a net stop in the EU imports while they were soaring before. In the meantime, Malaysia and Brazil are taking a full advantage of the situation while their exports of biodiesel to the EU are booming. The quantities are limited for both Brazil and Malaysia but it is still represents a huge increase according to the growth rates. The value never went over €26 million for Brazil and nearly €4 million in Malaysia in 2014. By comparison, Argentina was exporting for more than €1,37 billion and Indonesia around €1 billion in 2011 to the EU. Therefore, the diversion towards the two non-named countries is not very alarming for the EU market because it does not compensate the loss of the two named countries (Table 4). In general, 38249097 is decreasing after 2011.

Table 3: annual average growth rates of the 5 most important targeted goods imported to the EU (source: Eurostat)

	Argentine		Brazil		Indonesia		Malaysia	
Value in €	annual average growth rates							
	2007-2010	2011-2015	2007-2010	2011-2015	2007-2010	2011-2015	2007-2010	2011-2015
15162098			-39,65%	204,81%	37,61%	-1,43%	6,84%	-2,53%
15180091		-24,78%	-20,77%	-32,31%				
15180095		182,89%	742,82%	-83,34%		11,21%		33,27%
15180099			-22,81%	-36,81%		35,49%	632,51%	-0,83%
38249097	-50,16%	-56,79%	38,13%	-45,78%	32,59%	-56,00%	47,05%	-10,00%
biodiesel	263,77%	-69,66%	-100,00%	2316,56%	75,96%	-66,90%	50,05%	108,62%
Quantities (100kg)	annual average growth rates							
	2007-2010	2011-2015	2007-2010	2011-2015	2007-2010	2011-2015	2007-2010	2011-2015
15162098			-39,52%	159,96%	11,33%	-2,29%	2,26%	-4,10%
15180091		-29,02%	-32,75%	-28,58%				
15180095		123,90%	2421,10%	33,35%		11,21%		41,40%
15180099			-33,20%	-37,38%		35,49%	728,11%	0,64%
38249097	-48,05%	-71,38%	29,44%	-44,93%	35,16%	-64,92%	31,38%	-38,69%
Biodiesel	292,62%	-66,09%	-100,00%	5505,50%	78,65%	-67,19%	48,10%	114,29%

Table 4: annual average growth rates of the biodiesel imports to the EU internal market from the four countries (source: Eurostat)

	2008	2009	2010	2011	2012	2013	2014	2015
Quantities (tons)	269.665	1.135.004	1.757.811	2.526.281	2.648.782	1.063.557	377.086	381.923
Annual growth rate	/	320,9%	54,9%	43,7%	4,8%	-59,8%	-64,5%	1,3%

Focusing on the two named countries, we could ask ourselves what have been the consequences for them at a worldwide scale and regarding two major economies: The USA and China. UN Comtrade database provides data and the 6 digit-level is not an issue because

382600 is composed by only two codes which are both falling under the AD duty (38260010 and 38260090). Biodiesel Argentine exports are only available for the world and they decreased with a negative annual growth rate of 31% in value and 20% in quantities since 2012. Indonesian exports have a negative annual growth rate of 45% for the world and 33% for China in value, 40% and 17% for quantities starting from 2012. There is no data availability for the USA. Both countries exported almost exclusively to the EU so that the decreasing rates at the world level only replicate the effect of the change in the EU. China absorbed a large part of the Indonesian biodiesel by importing more than €530 million in 2013 and compensated around half of the losses of Indonesia. However, all the other years are far below €100 million. This phenomenon can be very problematic because the export of biodiesel weighted more than €1 billion in 2012 for a GDP around €714 billion in Indonesia and €1,7 billion for a GDP around €425 billion in Argentina.

In conclusion, the AD measure seems to be detrimental to exports from Argentina and Indonesia. Some goods are still flooding to the EU market but represent small values and are not threatening the EU industry. Concerning biodiesel, diversion has occurred in Brazil and Malaysia but the quantities are too tiny to compensate the depression. It could indicate that the EU biodiesel industry is under less international pressure.

E. Worldwide EU imports

Top 5 products imported to the EU market from the world in 2013 (source: Eurostat)			
	Imports	share in value*	share in quantities*
1	27101943	65,27%	66,23%
2	27101947	26,40%	27,68%
3	38249097	3,11%	0,98%
4	biodiesel sector	2,65%	2,48%
5	27102011	0,70%	0,68%
	Sum	98,12%	98,05%
*considering all goods under AD measure			

The same exercise as section D is realized at the world level. The top 5 is similar to the internal market. Taking into account quantities, the 5th place can be shared between 27102011, 27101946 and 15180095 which all display very similar quantities. Table 5 will present a table considering this top 5 and the goods 15180095 and 15180099 which were important for Argentina and Indonesia to allow comparison.

Table 5 has very similar trend compared to the goods studied for the two named countries. When looking to product 2710, all growth rates are negative after 2011 except 27101943 while in the EU internal market, all are positive or close to 0% (see table 2). It seems to indicate that the EU industry is slowly getting a larger share of the production of those goods, considering quantities. Graph 4 studies the relation between imports from the two named countries relative to global imports for biodiesel. It shows that the EU imports from Argentina and Indonesia account for 95% of all EU biodiesel imports from the world in 2011. Naturally, the two named countries drive the world trend.
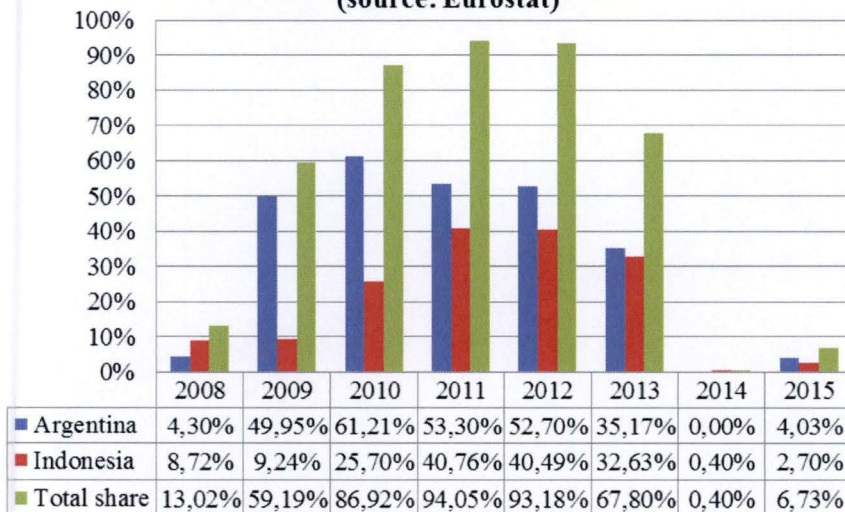
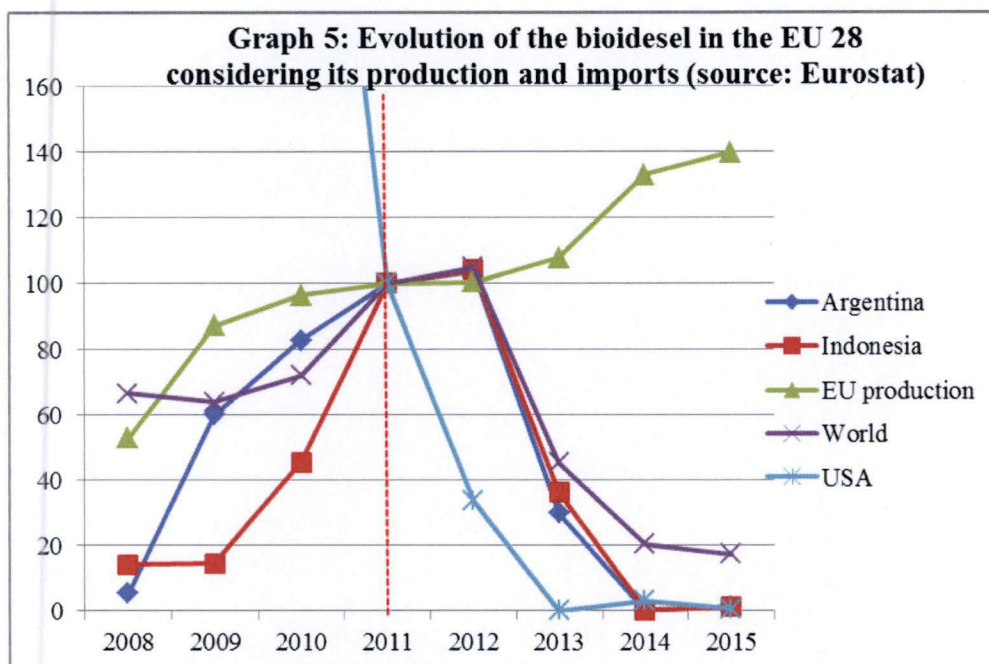| Table 5: annual growth rates of the most imported goods from the world to the EU (source: Eurostat)					
	Value in €		Quantities (100kg)		Value/kg in €	
	2007-2010	2011-2015	2007-2010	2011-2015	2007-2010	2011-2015
15180095	76,3%	8,8%	64,7%	16,1%	7,0%	-6,3%
15180099	49,2%	27,3%	60,8%	35,6%	-7,2%	-6,1%
27101943⁰		0,0%		18,0%		-14,7%
27101947⁰		-29,0%		-16,0%		-15,1%
27102011⁰		-61,3%		-56,0%		-12,9%
38249097	-2,5%	-11,7%	-9,6%	-28,5%	7,8%	-100,0%
38249091	2,6%		4,1%		-1,4%	
38260010⁰		-46,5%		-44,9%		-3,0%
38260090⁰		-56,7%		-63,9%		20,0%
biodiesel sector*	2,6%	-36,7%	4,1%	-35,3%	-1,4%	-2,1%
Total of products⁰		-11,0%		-1,0%		-15,3%

* sum of the three last rows above

⁰ data available only from 2012 and growth rate computed from 2012 and not 2011

Graph 4: share of the biodiesel from Argentina and Indonesia relative to the global imports of the EU 28 (source: Eurostat)

	2008	2009	2010	2011	2012	2013	2014	2015
■ Argentina	4,30%	49,95%	61,21%	53,30%	52,70%	35,17%	0,00%	4,03%
■ Indonesia	8,72%	9,24%	25,70%	40,76%	40,49%	32,63%	0,40%	2,70%
■ Total share	13,02%	59,19%	86,92%	94,05%	93,18%	67,80%	0,40%	6,73%

Graph 5 will provide a first intermediary conclusion of the EU imports and production analysis. It shows that Argentina and Indonesia started with a low level of exports to the EU in 2008 (start of the data availability) but quickly increased it to reach a top in 2011 and 2012. The AD measure seems to have decreased a lot world exports to the EU while the phenomenon is slightly lowered by the increasing exports coming from Brazil and Malaysia. The start of the AD duty coincides with a boom in the EU market that was stagnating from 2010 to 2012. There is no diversion from the named countries to the USA even if table 1 showed a huge production increase because the EU imposed another AD measure on US biodiesel applied from 2009 to 2014 (European Commission, 2008). It attests of the sensitivity of the sector and the efficient lobbying power of the EU industry (Bloomberg, 2013).

Graph 5: Evolution of the bioidesel in the EU 28 considering its production and imports (source: Eurostat)

F. EU exports towards the named countries

Top 4 exported products from the EU market to the four countries (source: Eurostat)			
	Argentina	Brazil	Indonesia	Malaysia
1	27101947	38249097	38249097	38249097
2	27102943	27101947	27101947	27102943
3	38249097	27102943	27102943	27101947
4	15162098	15162098	15162098	15180091

Keeping the same logic, this section analyses the evolution of the EU exports to the four countries. 4 goods are considered (quantities are close to 0 for all others). All but one (in Malaysia) are common to four countries. The value and quantities are lower than imports. As an example, no exported goods from the EU to Argentina or Indonesia exceed a value of €40 million over the studied period (Argentina is an exception with €317 million for 27101947 in 2013 and €131 million for 27101943 in 2015 but there are the only years and products concerned).

Table 6: annual average growth rate of the most exported goods from the EU internal market to the four countries (source: Eurostat)								
	Argentine		Brazil		Indonesia		Malaysia	
Value in €	annual average growth rate							
	2007-2010	2011-2015	2007-2010	2011-2015	2007-2010	2011-2015	2007-2010	2011-2015
15162098	36,33%	-39,01%	5,73%	-1,89%	2,23%	6,76%	-51,81%	-0,84%
27101943		55,00%		56,25%		-10,66%		-41,60%
27101947		-18,00%		-48,23%		-46,85%		-12,65%
38249097	6,38%	0,48%	29,44%	-1,98%	-1,75%	15,66%	9,73%	-0,31%
Quantities (100kg)	annual average growth rate							
	2007-2010	2011-2015	2007-2010	2011-2015	2007-2010	2011-2015	2007-2010	2011-2015
15162098	23,66%	-29,96%	33,85%	-14,90%	2,02%	-3,75%	-72,11%	15,83%
27101943		83,86%		122,95%		3,81%		-35,91%
27101947		-7,22%		-45,72%		-40,13%		-8,99%
38249097	-3,51%	-6,54%	-4,89%	-15,03%	-26,46%	12,86%	2,76%	-6,66%

Table 6 demonstrates that the EU exports to four countries are decreasing a lot after 2011. Only the good 27101943 grows tremendously in all countries, except in Malaysia. The EU

exports of the good 38249097 are nearly stopped except for Indonesia. It seems to indicate that the trade between the EU and those countries are less and less important. Malaysia is one exception with the good 15162098 and Indonesia another with 38249097. Lastly, biodiesel is not exported to those countries, suggesting that all the EU production is supplied on the domestic market.

G. EU exports worldwide

Top 5 exported products frmo the EU market to the world in 2013 (source: Eurostat)			
	Exports	share in value*	share in quantities*
1	27101943	46,12%	52,25%
2	27101947	34,61%	40,31%
3	38249097	16,28%	4,97%
4	biodiesel sector	1,7%	1,37%
5	27102011	0,76%	0,80%
	Sum	99,42%	99,70%
*considering all goods under AD measure			

Surprisingly, it appears that the top 5 of EU exports to the world is exactly the same as EU imports, even in proportions. Table 7 summarizes the rates of this top 5 and 15162098 because it is part of the biggest EU exports to Argentina and Indonesia. Biodiesel was not exported at all to the four countries but has a positive growth at the world level.

Table 7: annual average growths rates of EU exports to the world (source: Eurostat)						
	Value in €		Quantities (100kg)		Value/kg in €	
	2007-2010	2011-2015	2007-2010	2011-2015	2007-2010	2011-2015
15162098	3,0%	-2,0%	-1,7%	-2,8%	4,8%	0,8%
27101943[0]		-10,9%		4,2%		-14,4%
27101947[0]		-14,4%		-0,2%		-14,2%
27102011[0]		-28,7%		-14,1%		-16,9%
38249097	3,5%	4,0%	-3,0%	1,8%	6,7%	-100,0%
38249091	14,2%		31,5%		-13,2%	
38260010[0]		28,1%		35,2%		-5,2%
38260090[0]		38,5%		34,4%		3,1%
biodiesel sector*	14,2%	14,7%	31,5%	24,1%	-13,2%	-7,5%
Total of products[0]		0,0%		0,6%		-0,6%

* sum of the three last rows above
[0] data available only from 2012 and growth rate computed from 2012 and not 2011

What conclusions can be drawn from the analysis of exports? The table 7 suggests that if the EU is expanding its exports of the most valuable products to the world, it is not the case towards the four countries studied under scrutiny where the trade is nearly stopped (table 6).

H. Controls

It is necessary to introduce some indicators in order to prove that the variation of the trade relationships between the EU and the named countries is due to the AD measure and not to another phenomenon as national or world shock. The section will analyze the role and the

share of biodiesel in the global trade between the two countries and the EU. Next, the national energetic market will be studied. The GDP growth rates of the two named countries are positive: Argentina has 10% annual growth rate and Indonesia 11% according to the data of the World Bank. The rate is still at 8 and 5% after 2011. The decreasing trend is not due to a global national recession.

Table 8: annual average growth rates of the global external trade of the EU with the four countries and the world, regardless of the AD measure (source: Eurostat)				
Total trade (€)	EU Imports		EU Exports	
	2007-2010	2011-2015	2007-2010	2011-2015
Argentina	3%	-7%	7%	2%
Brazil	0%	-6%	14%	-1%
Indonesia	3%	-2%	6%	8%
Malaysia	5%	4%	0%	3%
World	2%	0%	3%	4%

Table 8 illustrates how the global imports and exports evolved between the four countries, the world, and the EU. We notice as well a general drop of the growth rates after 2011 in all cases.

The table 9 shows the importance of biodiesel in EU imports in 2011 in 2015. In a € 2,57 billion global decrease of Argentine exports to the EU, €1,36 billion accounts only for the biodiesel industry (more than half of the global decrease). In Indonesia, €928 million out of the €1 billion decrease is due to the biodiesel industry. The AD duty on biodiesel seems not to have had large effect on other industries and sectors and could explain most of the decrease presented in table 8. In both countries, the value of biodiesel is close to 0€ in 2015 and all have decreased their exports to the EU. However, it should be better to control all the goods imported into the EU from all the sectors to see whether or not biodiesel is the true cause of the decrease.

Table 9: Importance of the biodiesel trade for the two named countries relative to their global exports to the EU							
		value in € (billions)			quantities (oil tons equivalent)		
		2011	2015	Difference	2011	2015	Difference
Argentina	biodiesel	1,37	0,011	1,359	1,42	0,019	1,401
	global	10,7	8,13	2,57	19,13	14,52	4,61
	ratio	12,8%	0,14%	52,88%	7,42%	0,13%	30,39%
Indonesia	biodiesel	0,94	0,011	0,929	1,88	0,012	1,868
	global	16,32	15,32	1	19,2	17,05	2,15
	ratio	5,8%	0,07%	92,90%	9,8%	0,07%	86,88%

A ratio between 2 and the 8 digit level products has been done to control the evolution of the sector 38 (it gathers more than 200 8 digit level products). If the share of the 8 digit level decreases, it will mean that only the specific product faces a crisis. If the share is constant, the sector and the product are moving on the same proportion. Graph 6 shows that the sector 38 is mostly composed of biodiesel sector because it accounts for more than 95% in 2011 in Argentina and 75% in Indonesia. The definitive introduction of the duty in 2013 put a clear end to the EU imports of biodiesel as the share in the global sector is converging to 0%. In Argentina, the sector 38 collapsed by an annual average growth rate of -50% for values and quantities. It is about -25% in Indonesia.

Graph 6: share of the biodiesel in the specific sector 38 concerning EU imports (source: Eurostat)
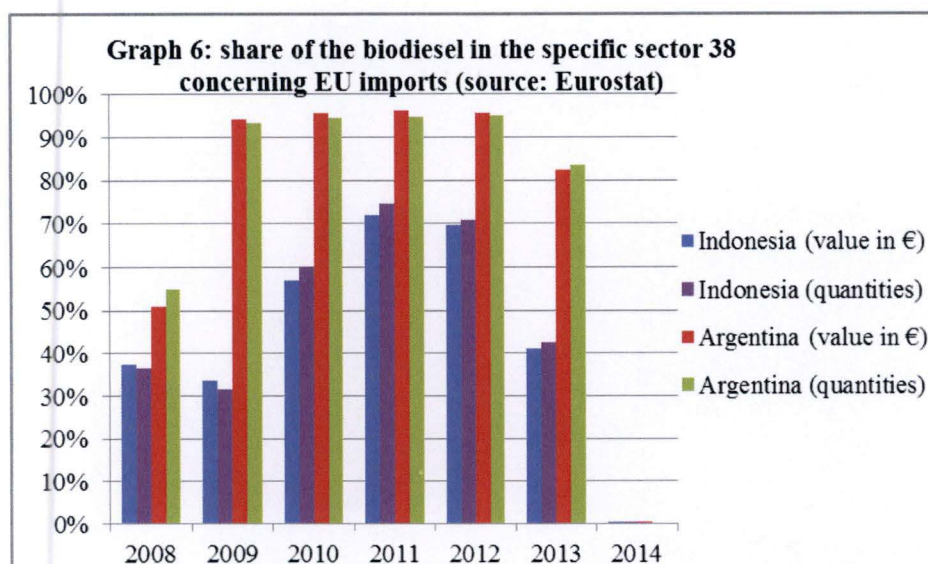
Over the period, there is no crisis in the biodiesel sector. All countries (except Argentina) have increased their production, with a majority of them over 100% (see table 1). A national crisis in the energy sector is hard to believe as well. The data from the International Energy Agency are not giving accurate number about the biodiesel production as such but gives enough indicators to estimate whether or not the energy sector was evolving well. From 2011 to 2014, all indicators show a positive trend (with one exception for Argentina). The AD duty is likely to be the driving force in the variation of the trade between the two named countries and the EU because no other negative variation occurs over the same period. Moreover, the biofuels exported has a positive growth rates.

Average annual growth rate (2011-2014)	total energy	renewables and waste energy	liquid biofeuls	biofuels exported
Argentina	-1,13%	6,72%	7,83%	2,91%
Indonesia	2,74%	3,31%	22,40%	5,68%

Table 10: Evolution of the energy sector in Argentina and Indonesia (source: International Energy Agency statistics)

Share of biofuels exported	2011	2012	2013	2014
Argentina	63,52%	39,93%	50,80%	55,22%
Indonesia	80,01%	68,88%	64,27%	51,50%

To sum up, the energetic sector of both countries is not at all under pressure because all rates are positive and the economy is behaving well. It could mean that the AD measure is the source of all the variations described before. Moreover, a large part of the aggregate decrease (chilling effect) seems to be due only to biodiesel sector because the global growth rates are not affected a lot if biodiesel is not considered.

I. Related goods imported to the EU

It is interesting to know if the two named countries had strategies to counteract the AD measure, as Prusa suggested it. Given the analysis done so far, we should expect a limited reaction. However, some non-targeted from the same sectors (15 and 38) will be studied. In fact, other basic goods used in the biodiesel industry such as palm oil for technical use (15111010) and soybean oil for industrial use (15071010) are surprisingly not part of the AD measure. The first good concerns Indonesia and the second Argentina. The duty imposed by the EU fights the system of exports in both countries to reduce exports of refined products. We expect therefore that Argentina and Indonesia export less refined products and more raw materials (it allows the EU industry to keep handling the refining process).

Table 11: average annual growth rates of related goods imported to the EU 28 from Argentina (source: Eurostat)				
	Value in €		Quantities (100kg)	
	2007-2010	2011-2015	2007-2010	2011-2015
15071010	35,46%	-96,03%	22,96%	-91,82%
22071000	15,09%	-0,27%	20,43%	4,17%
38231990	72,58%	-2,07%	53,25%	3,12%

Focusing on Argentina, the country has been unable to react to the AD duty. With the collapse of the biodiesel exports, the exports of the primary products of soybean oil for technical uses collapsed as well. The oil reached a peak of exports in 2010 and accounted for 75% of value (€230 millions) and quantity of sector 15 exported to the EU. However, the share felt to 0% in 2014, for a value of only 15 000€. This good can explain a large share of the collapse of sector 15 in Argentina. The sector weights in 2015 a third of its 2011 value. After 2011, Argentina exported more ethanol[5] (22071000) and fatty acids but it brings no additional benefits because of their decreased value.

The good 38231990 increased tremendously from 5 in 2007 to €34 million in 2015 (with a peak in 2012 with 43 €million) but does not compensate the €1,35 billion loss (see table 9). However, this good is now the most important in EU imports from Argentina because it accounted for 85% of the sector 38 in quantitative terms in 2014. It was below 10% between 2009 and 2013. It is also the year where 38 is the lowest with less than 1 billion ton (it reached 15 billion in 2011).

Table 12: annual average growth rate of related goods imported to the EU 28 from Indonesia (source: Eurostat)				
	Value in €		Quantities (100kg)	
	2007-2010	2011-2015	2007-2010	2011-2015
15111010	63,71%	10,77%	53,23%	16,67%
38231930	35,69%	27,87%	0,30%	31,35%
All*	21,36%	7,46%	11,34%	12,27%
* fatty acid derived from palm or similar fruits				

The case of Indonesia is quite different. On the contrary of Argentina, Indonesia managed to enlarge the exports of primary goods to dampen the

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[5] Ethanol is the first substitute to biodiesel. Both are biofuels, biodiesel uses oil while bioethanol uses alcohol derived from the maceration of plant and animal wastes (no data is available for Indonesia).

effect of the AD measure. All potential substitutes display positive annual growth rates, especially the good 38231930. Sector 15 increases in Indonesia (from €1,2 billion in 2007 to €2,6 billion in 2015) and the exports of CPO to the EU is driving this trend. Crude palm oil for technical use rose from €150 million to more than a billion after 2011. It represents 61% of the sectoral increase over the period but its value by kg has a decreasing annual growth rate of 5% after 2011. The CPO accounts now for more than 40% of the sector in quantities and values after 2012. The country managed also to increase its exports of certain fatty acids derived from palm to the EU, especially the fatty distillate acid[6]. It accounts now for more than 55% in value and around 70% in quantities in the years 2014-2015 in the sector 38. It is not enough to compensate the ban because it rose only from €75 million in 2011 (5% share in 38) to 275 €millions in 2015 while biodiesel exports decreased by €1 billion. To be complete, it is necessary to add that another AD measure has been taken in 2011 by the Commission against Indonesia (Malaysia and India). An ad valorem duty was imposed on fatty alcohol and their blends until 2016. None of the goods studied here were targeted by this measure (Council of the EU, 2011).

Indonesia diversifies its exports with many types of acids and managed to redirect its exports with CPO. If all of them are more exported to the EU (but do not compensate the loss from biodiesel), it is still a success for the EU which aimed to decrease its imports of biodiesel as a "finished" product. Indonesia has been more successful than Argentina in protecting its industry of oil and in finding solutions to dampen the side effects of the duty.

IV. Conclusion

The EU is the major producer of biodiesel in the world. As we have seen, the AD duties are often used for protectionary purposes, mainly to allow industrial development. Using its market power and its position of first world producers of those fuels, the EU managed to impose AD duties to Argentina and Indonesia. However, there are few reasons to believe that the investigation was initiated to oppose unfair practices because the EU was already investigating other products and countries in the same industrial sector (fatty alcohol in Indonesia and Malaysia, biodiesel and bioethanol in the USA). All those indicators show that AD is likely to be strategically used by the EU for protectionist purposes and that the weight of the domestic industry (the EBB) is a determinant of AD investigations. Our case-study fits with the theoretical framework. The directive 2009/28 seems to be the starting point of this strategy. AD is therefore an instrument to reach all those objectives fixed in the directive even when it goes against world trade rules and objectives (as the EU Court of Justice ruled for US bioethanol and our present case-study).

Our analysis allowed showing a huge decrease of EU biodiesel imports from the targeted countries but also from the USA and the world in general while Brazil and Malaysia benefited

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[6] Industrial saturated fatty acid (38231100), oleic acid (38231200), fatty distilled acids (38231910), fatty distillate acid (38231930), and 38231990. All of those acids are derivatives from palm or similar fruits used to produce biodiesel. To make it easier, all those acids will be summed to see their share in the sector 38.

from trade diversion for biodiesel but in a limited way. The increase in values and quantities of some targeted products (especially the sector 15) is not questioning the measure efficacy as they are not important relative to the quantities and values of biodiesel. All the indicators studied tend to show that the EU is the only beneficiary of the measure and that its biodiesel industry in Europe faces much less competition than before 2011. The review of all the effects explained in the literature review will assess more precisely the transformation of the biodiesel sector in Europe.

The depression effect is clear. Except for some goods that accounts for a very small proportion of the targeted products, all have decreasing growth rate after 2011 in Argentina and Indonesia. A similar trend is observed for the world imports. The specific sector 38 experienced a harsh decrease of imports. It is consistent with the EU will to stop biodiesel imports. EU exports are limited in values and quantities and no significant change happened. The diversion effect is existing but at a small scale. Brazil and Malaysia take advantage of the AD measure by increasing tremendously their biodiesel exports to the EU. However, the values and quantities are so small for the EU that it is absolutely not alarming for it. If the chilling effect is difficult to properly assess given the data availability, little effect is detectable with the present results. Most of the AD effects are limited to the sector targeted and the aggregate level of trade between the EU and Argentina and Indonesia is not very affected. The decrease at the aggregate level corresponds, especially in Indonesia, to the decrease in the biodiesel sector.

However, we noticed that the EU imports of primary goods that can be used to produce biodiesel increased in Indonesia (such as, in the sector 15, CPO). This increase could called an "opportunity effect" suggesting that the country has been able to modify its export scheme in order to compensate the loss in biodiesel exports by exporting other products used for refining fuel. This increase isn't enough to compensate the loss due to the depression effect. It could explain why the Indonesian Government initiated a new strategy because *"ineffective policies and insufficient supply chain infrastructure have caused biodiesel use to fall (...) and the nascent fuel ethanol market to completely disappear"*. This economic adaptation following the duty imposition was predicted by Prusa and is verified in Indonesia. A new support scheme was introduced in 2016 for the sector to recover and for the weak world demand for biodiesel to be replaced by domestic demand (USDA, 2015). According to our results, it could be that there is a win-win situation where the EU refining industry is protected while Indonesia adapted its export scheme.

Argentina undertook no major reforms but remains confident in its ability to enter the US market given its potential in renewables consumption to compensate the non-access to the EU market before 2017. Domestic consumption is constantly increasing but the capacity utilization of the 38 biodiesel plants is only at 45% and exports were the lowest in 2015 and 2016 since 2009 (USDA, 2015).

The AD duty provides the effects expected by the EU: an increase in the EU industrial production, an enlarged utilization of all the production capacities and therefore a reinforced

energetic independence. The unintended consequences suggested by Prusa do not happened in this case. To conclude, however, two questions should be addressed. First, are the trade policies consistent with environmental issues? The enlarged EU imports of CPO are potentially appalling for the environment even if it is highly profitable for trade. The EU has enough resources to produce all materials necessary refine biodiesel in its own market and CPO is known as an unfriendly crop for the environment. Second, how the EU can be credible in its promotion of sound trade rules and relationships while it uses all the weaknesses of the WTO system in order to strategically achieve protectionism at the detriment of weaker economies development?

V. Annexes

Annex 1: EU Commission table presenting the companies under AD duty with their dumping margin, injury margin and dumping duty.

Country	Company	Dumping margin	Injury margin	Anti-dumping duty rate
Argentina	Aceitera General Deheza S.A., General Deheza, Rosario; Bunge Argentina S.A., Buenos Aires	41,9 %	22,0 %	22,0 % (EUR 216,64)
	Louis Dreyfus Commodities S.A., Buenos Aires	46,7 %	24,9 %	24,9 % (EUR 239,35)
	Molinos Río de la Plata S.A., Buenos Aires; Oleaginosa MoreNo Hermanos S.A.F.I.C.I. y A., Bahia Blanca; Vicentin S.A.I.C., Avellaneda	49,2 %	25,7 %	25,7 % (EUR 245,67)
	Other cooperating companies	46,8 %	24,6 %	24,6 % (EUR 237,05)
	All other companies	49,2 %	25,7 %	25,7 % (EUR 245,67)
Indonesia	PT. Ciliandra Perkasa, Jakarta	8,8 %	19,7 %	8,8 % (EUR 76,94)
	PT. Musim Mas, Medan	18,3 %	16,9 %	16,9 % (EUR 151,32)
	PT. Pelita Agung Agrindustri, Medan	16,8 %	20,5 %	16,8 % (EUR 145,14)
	PT Wilmar Bioenergi Indonesia, Medan; PT Wilmar Nabati Indonesia, Medan	23,3 %	20,0 %	20,0 % (EUR 174,91)
	Other cooperating companies	20,1 %	18,9 %	18,9 % (EUR 166,95)
	All other companies	23,3 %	20,5 %	20,5 % (EUR 178,85)

source: REGULATION (EU) No 1194/2013 of 19 November 2013

Annex 2: Table presenting the thirteen products under duty according to the 8 digit-level

15162098	Vegetable fats and oils and their fractions, partly or wholly hydrogenated, inter-esterified, re-esterified or elaidinised, whether or not refined, in immediate packings of > 1 kg or in another form (excl. fats and oils and their fractions, further prepared, hydrogenated castor oil and subheading 15162095 and 15162096)
15180091	Animal or vegetable fats and oils and their fractions, boiled, oxidised, dehydrated, sulphurised, blown, polymerised by heat in vacuum or in inert gas or otherwise chemically modified (excl. those of heading 1516 and linoxyn [oxidised linseed oil])
15180095	Inedible mixtures or preparations `yellow grease` of animal or of animal and vegetable fats and oils and their fractions
15180099	Mixtures and preparations of animal or vegetable fats and oils and of fractions of various fats and oils, inedible
27101943	Gas oils of petroleum or bituminous minerals, with a sulphur content of <= 0,001% by weight (excl. containing biodiesel, and for undergoing chemical transformation)
27101946	Gas oils of petroleum or bituminous minerals, with a sulphur content of > 0,001% but <= 0,002% by weight (excl. containing biodiesel, and for undergoing chemical transformation)
27101947	Gas oils of petroleum or bituminous minerals, with a sulphur content of > 0,002% but <= 0,1% by weight (excl. containing biodiesel, and for undergoing chemical transformation
27102011*	Gas oils of >= 70% of petroleum or bituminous minerals, with a sulphur content of <= 0,001% by weight, containing biodiesel
27102015*	Gas oils of >= 70% of petroleum or bituminous minerals, with a sulphur content of > 0,001% but <= 0,002% by weight, containing biodiesel
27102017*	Gas oils of >= 70% of petroleum or bituminous minerals, with a sulphur content of > 0,002% but <= 0,1% by weight, containing biodiesel
38249097	Chemical products and preparations of the chemical or allied industries, incl. those consisting of mixtures of natural products
38260010 (38249091 until 2011)	Fatty acid mono-alkyl esters, containing by volume 96,5 % or more of esters (FAMAE)
38260090	Biodiesel and mixtures thereof, not containing or containing < 70 % by weight of petroleum oils or oils obtained from bituminous minerals (excl. fatty-acid mono-alkyl esters containing by volume >= 96,5 % of esters `FAMAE`)

*the three are created in 2012 and were denoted under the same code 27101941.

Source: TABLE I – CORRELATING THE 2012 VERSION TO THE 2007 VERSION OF THE HARMONIZED SYSTEM World Customs Organization. Including the corrigenda No. 1 (March 2011) and No. 2 (July 2011).

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Monetary policy in developing context: new challenges

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SUMMARY

The monetary policy in Developing Countries is evolving in under developed financial institutions and financial markets and often weak central bank. In general, monetary policy effectiveness is weaker in most developing countries compared to the developed countries. However, irrespective of country and monetary regime, all central banks in developing environment share the objectives of price stability, economic growth and financial stability. Focusing on the main weaknesses in Ghana, Tanzania and Ethiopia we find that pursuit of multiple objectives, fiscal dominance, weak financial sector, bank excess liquidity, choice of monetary policy instrument used to hamper the efficacity of the monetary policy. Therefore, the challenges are located in the policy design and implementation, and macroeconomic and financial aspects.

To assess the effectiveness of the monetary policy, we use a narrative approach, following Romer and Romer (1989), and focus on some significant changes of monetary policy in each of the three countries of our case studies: Ghana, Tanzania and Ethiopia. We don't find a very clear evidence of the transmission mechanism. So, the main instruments which have been used are market-based instruments specifically open market operations and reserve requirement which got some limitations in developing economies.

INTRODUCTION

Achieving long-term economic growth and development is the aspiration of all economic policy makers namely the public authorities. The economic objectives pursued by the monetary authorities in general are to control inflation by maintaining stable prices, low unemployment, stable currency and economic growth (Alan Greenspan,1996).

Monetary association of inflation was central in early classical economics; of which the Quantity Theory of Money (QTM) is primarily mentioning. Via Fisher's quantity equation, the QTM reveals for the existence of equi-proportional link between money supply and price (Dornbusch and Fischer, 1970). Therein, most economists would agree that in the long run, output is fixed, so any changes in the money supply only cause prices to change. But in the short run, because prices and wages usually do not adjust immediately, changes in the money supply can affect the actual production of goods and services. So monetary policy is one of the most powerful policy tools for monetary authorities to influence such important macroeconomic variables as output and inflation. Monetary policies can be implemented as "policy mix" with fiscal policy. Nevertheless, for multiple reasons, the link between monetary policy instruments and aggregate demand may be significantly weaker in developing countries than it is in emerging and advanced economies (Mishra et al., 2010). This might be due to the fact that developing context is marked by under developed financial institutions sector and often non-credible central banks. Particularly, the financial structure of such countries implies that the bank lending channel is likely to be the dominant channel of monetary transmission. However, its effectiveness, which depends on the domestic institutional context, the structure of the banking system, and the intrinsic stability of the domestic macroeconomic environment, is problematic ((IMF, working paper, Prachi Mishra and Peter Montiel, 2012).

Although many developing countries have made substantial progress in achieving price (to a single digit) and macroeconomic stability (IMF, 2015), growing exposure to international financial markets require to develop more refined instruments and policy frameworks. They are experiencing difficulties from monetary policies implementing. The monetary environment presents some weaknesses rendering the effectiveness of the monetary instruments very low. In this context how far, those weaknesses affect the system of monetary policy and its instruments and how the central banks manage to overcome such limitations.

The purpose of this study is to present the different instruments used by the monetary system in a developing context and explore its effectiveness. The study will focus on three sub-Saharan African countries namely Ghana, Tanzania, and Ethiopia. The choice of those countries is that have different monetary policy regime and with some degree of exchange rate flexibility. Also, each of them differs from the monetary framework and the number of objectives pursued by their central bank. The study also seeks to determine the weaknesses of monetary policy in developing economies and its challenges.

The remaining part of the paper is structured as follows. Section 1 presents the literature review and some empirical evidences concerning the monetary policy in developing countries. Section 2 explains the methodology of the work and the section 3 exposes the analysis of the three countries with respect to their monetary policy framework particularly, the underlying weaknesses, and the effectiveness of the monetary system.

I.   LITERATURE REVIEW AND EMPIRICAL EVIDENCE

This section is intended to present the literature review and some empirical evidences concerning the weaknesses of the monetary policy and the different challenges faced by developing countries. So, the main hypothesis related to the monetary framework and some information acquired by observation and experimentation on the limitations of monetary policy will be reviewed.

I.1. Weaknesses and their impacts on monetary policy effectiveness

The effective transmission of monetary policy requires several conditions. Indeed, in 2015, the International Monetary Fund (IMF) has pointed out a general consensus on the set of principles that characterize effective monetary policy. Among them appear a clear mandate in terms of goals and operational independence of the central banks to pursue these goals; the price stability as a primary objective of monetary policy over the medium term; a clear and effective operational framework and a transparent and timely communications of the Central Banks. Empirically, some researchers have studied the effectiveness of monetary policy. Overall, the studies provide a very weak evidence at best for the effectiveness of monetary transmission in sub-Saharan Africa countries, whether an interest rate or the monetary base is considered to be the policy variable and whether identification of the monetary policy shock is achieved through recursive or structural means (Prachi Mishra and al. 2012). The situation of weak transmission

of the monetary policy in developing economies can be attributed by a set of reasons as the macroeconomic conditions, the limitations of market participation, and the institutional shortcomings. As mentioned by the IMF (2004) those limitations could affect the development of a strong operational framework for monetary policy implementation. So, how these limitations may hamper the effectiveness of the monetary policy?

I.1.a. Macroeconomic conditions

In general, monetary policy effectiveness is weaker in most developing countries compared to the developed countries (Mishra et al., 2010; Mishra and Montiel, 2012). This may be due in part to the poor macroeconomic conditions in developing environment.

Indeed, fiscal dominance has often hampered the effectiveness of money market operations (IMF, 2014). Fiscal dominance refers to a regime where monetary policy ensures the solvency of the government. Indeed, in this situation monetary policy no longer follows the objective of price stability but rather the concerns of fiscal policy by accommodating high levels of public debt. As a result, high and volatile inflation occurs and monetary longer able to control it. Definitely, in some developing countries, a lack of fiscal discipline has undermined investor confidence, making it difficult for a government securities market to emerge. Therein, Government borrowing from the central bank tends to be associated with excess liquidity and demand in the economy, putting upward pressure on inflation and undermining the exchange rate. Furthermore, in case of fiscal dominance, central bank could be forced to lend to the public sector at large or to prioritize sectors at below-market rates. So, liquidity provided at low cost would have to be withdrawn at market rates, therefore resulting in losses for the central bank. Some consequences of fiscal dominance on monetary policy has been pointed out by Carlos Montoro and al. (2011). Indeed, they showed that fiscal deficits and outstanding debt stocks might affect the real interest rate and the inflation. Fiscal policy might have substantial effects on monetary conditions, and thus on monetary policy, beyond its direct countercyclical effects. In particular, sustainability concerns due to large deficits or high debt levels might put upward pressure on long-term interest rates. AKPAN H and al. (2001) have found some fiscal dominance evidence in Ghana, and this suggests a problem of coordination between monetary authorities and government and a need for the central bank to adhere to legal limits on central bank financing of government deficits. In doing so curtailing fiscal dominance is key to achieve and maintain long-term price stability and then effective monetary policy.

Another issue of macroeconomic conditions is the failure of developing countries to develop a government securities market. Consequently, this failure has prevented the establishment of a clear separation between money creation and government funding needs, therefore complicating the management of the balance sheet of the central bank (Laurens, 2015). The failure to establish a government securities market may also complicate the conduct of monetary policy since government securities are typically used as underlying assets for open market operations. This failure has also delayed financial market development in general as the government securities market usually sets a benchmark for the money and bond markets (IMF, 2014). In some cases, the government's reliance on central bank credit, either to finance the budget deficit or to support state-owned entities, has made it difficult for the central bank to retain control over the size and composition of its balance sheet, in turn resulting in difficulties to influence effectively overall liquidity conditions. In extreme circumstances of low financial intermediation, monetary policy may not even be effective in containing the macroeconomic effects of temporary fiscal imbalances. This has happened in instances where, due to the absence of a functioning banking system, the central bank is unable to withdraw excess liquidity created by fiscal imbalances because of the absence of counterparties to conduct monetary operations.

The situations of structural liquidity surplus also complicate the transmission in countries with shallow markets such in developing countries. In these particular contexts, the central bank needs to withdraw liquidity from the system in a systematic and structural way have complicated monetary policy or interfered with its transmission. In particular, when the volume of transactions in the markets is not proportionate with the size of the central bank's operations, liquidity absorbing money market operations have led to overshooting and volatility of interest rates. At times, the incapacity of the central bank to undertake effective monetary policy actions to deal with excess liquidity has resulted in excessive domestic lending or pressures on the exchange rate. More broadly, excess liquidity has blunted the impact of changes in monetary policy on interest rates and bank lending, and liquidity-absorbing monetary operations have had little impact on interest rates, credit conditions, or bank lending (IMF, 2014). Empirically, Saxegaard (2006) examines the pattern of excess liquidity in sub-Saharan Africa and its consequences for the effectiveness of monetary policy. His paper proposes a methodology for measuring this quantity and uses it to estimate a nonlinear structural VAR model for the Economic and Monetary Community of Central Africa region, Nigeria and Uganda. The study

suggests that excess liquidity weakens the monetary policy transmission mechanism and thus the ability of monetary authorities to influence demand conditions in the economy.

I.1.b. Market participation limitations

The first weakness of the market participations is related to the weakness of financial system in developing context. So, in many developing countries, the monetary transmission mechanism differs significantly from that in advanced and emerging economies. This is due to the fact that developing countries are characterized by the absence of well-functioning markets for fixed-income securities, equities, and real estate, by very imperfect links with private international capital markets, and by heavy central bank intervention in foreign exchange markets (Prachi Mishra and Peter Montiel, 2012). Their banking systems are less competitive with a large interest margins and higher concentration ratios of banks. Those banks operate in a much less favourable institutional environment. With regards to these characteristics, several authors have claimed that the importance of the bank lending channel in many sub-Saharan African countries is limited by the small size of and imperfections in the financial sector. Sacerdoti (2005), for example, noted that banks in Africa tend to extend limited amounts of credit to the private sector, as the result of underdeveloped institutional means to cope with credit market frictions that increase the cost of financial intermediation. Instead, these banks have tended to hold 30-50 percent of their deposits as reserves at the central bank and in the form of short-term foreign assets (Prachi Mishra and Peter Montiel, 2012). In the same sense, Karam Pal and Al., (2009) show that monetary policy does not work effectively in underdeveloped countries because the money market in those countries is highly under-developed. Due to the unorganized nature of the money market and lack of its integration with the central bank, the traditional methods of credit control like bank rate policy, open market operations and variations in the reserve ratio have got limited effect. In doing so the central bank extends its control only to the organised sector and not to the unorganized one. This creates several complicated problems for the central bank when it tries to control the money market of the country. The latter is also conspicuous by the absence of a well-developed bill market.

Empirically, Berg and others (2013) use the narrative approach to identify the effects of monetary tightening in selected developing economies. The focus is on the large and arguably unexpected tightening of monetary policy by four members of the East African Community (Kenya, Rwanda, Tanzania, and Uganda) in 2011. They find a well-functioning transmission mechanism; especially in countries where the stance of monetary policy was communicated

clearly. The depth of financial markets is a less clear indicator of the strength of transmission than the clarity of the regime. As a result, the transmission was clearest in Kenya and Uganda, and while Kenya was a standout in terms of financial depth Uganda was not. Furthermore, in his study, Benedicte Vibe ChristensenIn (2005), argued that low-income countries, by contrast, one would expect the lack of developed financial markets to weaken the interest rate channel, and the lack of a secondary market for equities and real estate to weaken the asset channel. The exchange rate channel would depend on the actual flexibility of the exchange rate. According to Enock T and al. (2014), the strength of monetary transmission mechanisms depends on the nation's financial landscape including the financial linkages with international financial markets. However, developing economies have small and illiquid financial markets with limited integration with external markets. The financial sector is often small and dominated by less competitive banking sector. These factors arguably tend to weaken the monetary transmission mechanisms in developing countries (Mishra et al., 2010; Montiel et al., 2012). Broadly, some of the major limitations of monetary policy in under developed countries are as follows: (i) under-developed financial institutions; (ii) non-monetized sector; (iii) lack of integrated interest rate structure; (iv) lack of banking facilities; (v) non-banking financial institutions; (vi) limited application of weapons of credit control (Karam Pal and Al., 2009).

The predominance of informal urban economy in developing environment complicates the transmission of monetary policy. Arguably, due to the existence of an extensive non-monetized sector, changes in the money supply of the country or the changes in the interest rates do not have any effect on the level of economic activity. It is because money does not enter into this sector and all the transactions conducted therein are merely barter exchanges. Therefore, non-monetized sector creates many problems in the smooth working of the monetary policy (Karam Pal and Al., 2009). Indeed, Agenór and Montiel (1999) indicate that in sub-Saharan African region, the informal urban sector can account for up to 60 per cent of total employment and economic activity, compared to its virtual non-existence in industrialised countries. The informal sector plays a significant role in employment and economic activity in sub-Saharan African (Agenór and Montiel, 1999; Plenderleith, 2003). In addition, countries in sub Saharan African continue to depend on the agricultural sector for growth and employment.

I.1.c. Institutional Shortcomings

Regarding the institutional limitations, the lack of central bank autonomy and lack of operational autonomy may hamper the effectiveness of monetary policy. Despite increased emphasis given to central bank autonomy in recognition of its benefits in boosting credibility

and monetary policy effectiveness, some developing countries still exhibit significant weaknesses in this regard. Several of the case studies illustrate the implications of weak central bank institutional frameworks on the effectiveness of monetary policy in general, and money market operations in particular. Most notably, *de facto or de jure* absence of a single objective assigned to monetary policy has undermined the ability of the central bank to maintain monetary stability in the event of a conflict between the objectives pursued. For instance, some central bank law sets out several principal objectives of the central bank, but there is no established priority among the objectives. So, for success in conducting monetary policy, a sound institutional framework is a necessary condition. Although the law may define a clear primary objective for the central bank, the lack of operational autonomy may undermine policy effectiveness. Specifically, in developing context where macroeconomic weaknesses or shallow financial markets limit the range of policy instruments available to the central bank.

Another institutional limitation is the weak liquidity forecasting frameworks which have complicated monetary policy implementation. Limited progress in this area was for the most part the consequence of a poor flow of information between the units within the central bank responsible for financial operations (currency, reserve management and foreign exchange operations, refinancing operations, operations with the government) and between the central bank and the Treasury (Laurens, 2005). At times, weak liquidity forecasting capacity has also reflected a policy decision to rely on administrative measures for monetary policy implementation, allowing the central bank to adopt a passive attitude in conducting monetary policy, which does not require developing a liquidity forecasting capacity. In turn, the absence of a liquidity forecasting capacity has delayed reliance on money market operations or has created difficulties for reliance on such instruments.

Finally, the weak liquidity payment systems also impede an efficient liquidity management implementation, thus obstructing the development of money markets. Most notably, the difficulties encountered by the banks in tracking their position at the central bank has encouraged maintenance of large excess reserves to meet settlement contingencies, and it has discouraged interbank trading (IMF, 2014). Therefore, short-term rates have been slow to respond well to changes in liquidity conditions resulting from the central bank's monetary operations, and the central bank has encountered difficulties in managing liquidity in the system. Also, the absence of efficient and cost-effective systems for transferring ownership of the securities traded in the secondary market, or the funds to pay for them has obstructed market development or repurchase transactions. In turn, the lack of a repurchase framework has delayed the introduction of collateralized lending in the interbank market, therefore helping back interbank trading, particularly when there has been limited trust between participants.

I.2. Challenges in policy design and implementation

The performance of monetary policy in any country remains unnerving, given that monetary policy is a short-term stabilization mechanism against domestic and external shocks (Enock Nyorekwa and al. (2014)). Particularly, in developing context, the stabilization challenge is needed, combined with the means of enhancing the effectiveness of monetary policy in such countries. The challenges can be classified in two categories: technical, linked to the policy designing and implementing and structural, related to macroeconomic and financial challenges.

I.2.a. Challenges in policy design and implementation

Although the primary role of the central banks is price stability, this should be attained while boosting economic growth and ensuring financial stability (Berg et al., 2013). Indeed, albeit many developing economies succeed in reducing inflation to a single digit, most low-income countries' central banks do not have an effective framework for formulating and implementing policy. According to the IMF (2014), the frameworks lack several critical elements as a clear inflation objective, and a coherent strategy that maps objectives to operations. Thereby the absence of a clear policy framework is an important factor behind policymakers' dissatisfaction and the motivation for the ongoing modernization efforts. The limitations of existing developing countries' frameworks reflect a number of challenges.

First of all, the partial data availability and central bank analytical capacity hinder policy formulation. Many developing countries face severe statistical constraints and large uncertainty regarding the state of the economy, for instance, as illustrated by very large revisions to national accounts data in recent years IMF (2014). In addition, many central banks lack the capacity to analyse the drivers of inflation and derive implications for policy, and in most cases, efforts to correct this shortcoming are in their infancy.

Secondly, developing countries face an ineffective governance and inappropriate organizational structures. So, the poor internal organization and the absence of cohesion between different divisions can hamper the formulation and implementation of policy.

Finally, developing countries have a limited central bank transparency and accountability. In particular, a clear communication strategy centred on the inflation outlook is generally missing. The pursuit of multiple objectives is another challenge. Indeed, it complicates policy design. As mentioned, the Bank of Tanzania and the National Bank of Ethiopia continue to play a significant role in determining the path and stability of the exchange rate in addition to price

stability. In doing so, at times, concerns over the exchange rate or the level of credit take precedence over price stability considerations. As a result, monetary policy in many developing countries can go through periods of excessive accommodation or tightening and contribute to inflation and output volatility. Although these challenges are present for all central banks, they are more pronounced in some developing countries, given the absence of clear frameworks.

Policy effectiveness in many developing countries is hampered by the existing operational arrangements (IMF, 2014). No developing countries conduct pure floats[1]; All use interventions at least from time to time, for various purposes. The IMF country desk survey[2] on monetary policy frameworks, covering de jure and de facto frameworks in 2005, objectives, targets, instruments, transparency and accountability covering 61 low and lower middle-income countries (LLMICs) show that most developing countries with independent monetary policy have exchange rate-related issues as one of their objectives.

I.2.b. Macroeconomic and financial challenges

It is also worth noting that financial sector in developing economies is still relatively small and is dominated by the banking industry. For instance, in Tanzania, the domestic debt market is dominated by commercial banks, accounting for 48%, followed by the Bank of Tanzania at 28%, and pension funds at 16% (IMF, 2013). In addition, the liberalization of the banking sector has not led to a reduction in the interest rates. To some extent, this could be attributed to the low levels of bank competition (Mlachila et al., 2013). Limited bank competition weakens the bank interest rate channel; and any policy changes may not be transmitted to the lending and deposit rates. The perseverance of high intermediation costs is partly due to the institutional and regulatory weakness, which inexorably heightens the financial intermediation costs and limits the transmission of monetary policy actions (Monteil et al., 2012). According to Finscope (2013), developing economies still has more than a third of its population excluded from financial access, with even a higher proportion in the rural areas at 83%. It also has a high proportion of the population who use non-bank financial services. The latter is consistent with

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[1] In the IMF classification of foreign exchange regimes, a floating regime involves a largely market-determined exchange rate where the authorities may intervene to moderate the rate of change or to prevent undue volatility. This type of arrangement is often referred to as a managed float.

[2] Some results of the IMF desk survey are presented in the appendices 1 and 2.

the rapid growth in mobile money over the years, to over 50% of the population using mobile money by 2013.

The rise and size of capital flows complicates monetary policy and macroeconomic stabilization more generally. Indeed, some developing countries continues to receive significant levels of aid flows (IMF, 2014). These arguably lead to changes in reserve money being erratic (Batini et al., 2005). These inflows may result in a higher risk to reduce the autonomy of the monetary policy, as they often increase foreign exchange reserves, which could be used for domestic financing. The associated fiscal expansion often leads to inflation and increased sterilization challenges, thereby leading to the crowding out of the private sector (Berg et al., 2010). Aid flows also lead to short-run real movements in the exchange rate, and a shift of resources from the traded to the non-traded goods sector (Fielding and Gibson, 2012).

Figure 1: Capital Flows to LLMICs and Emerging Markets and, 1990–2013
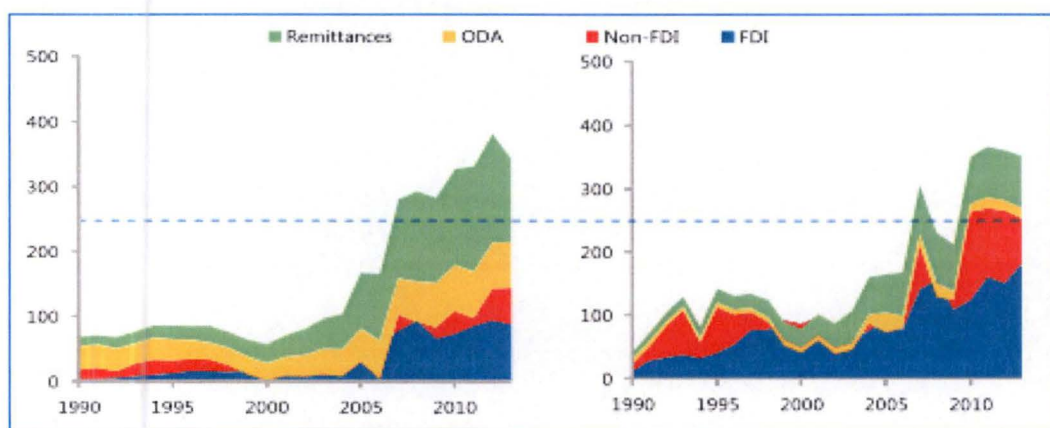
Sources: IMF World Economic Outlook; and World Development Indicators.

In order to improve the efficiency of the monetary policy, it is necessary to improve the financial market infrastructure. Another important mechanism in achieving an effective monetary policy is the development of the securities market. This development should intensify investment processes in the country and improve the effectiveness of the interest rate channel and the efficiency of the state monetary policy. Yet, it is necessary to reinforce the role of the financial market in the redistribution of financial resources, their accumulation for the purpose of solving priority problems of socioeconomic development, and minimization of risks in the banking sector.

In addition, dollarization is one of challenges in some economies. Highly dollarized economies face unique challenges that add another layer of complication for monetary policy, and for the coordination of monetary and fiscal policy (IMF, 2014). For instance, Tanzania 's economy is

highly dollarized, with foreign deposits accounting for 33% of the total deposits, and net foreign assets accounting for 45% of M3, as of March 2012 (Bank of Tanzania, 2013). Consequently, high dollarization weakens the monetary autonomy, especially when the monetary target is that of M2, as it is in Tanzania. The foreign deposits and the excess reserves tend to be invested in government securities, as opposed to the private sector, ultimately weakening the bank credit-lending channel (Saxegaard, 2006).

The global environment in the recent past has made monetary policy in developing countries more complex. These economies, have been susceptible to recent shocks: the food and fuel price shocks of 2007/08; the financial crisis of 2007/09; and the recent food and fuel price shocks of 2011/12 (Berg et al., 2013). The global shocks seem to have overlapped with the rising inflation in developing economies (IMF, 2014).

Besides, developing economies remains largely rural, and it is likely to encounter dominant supply shocks over the demand shocks. The supply shocks tend to increase the probable conflict between output and inflation (Adam et al., 2010). Monetary targeting is tailored to control core inflation; but this may be flawed, given that the weight of food prices in the consumer price index accounts for 47 % (Berg et al., 2010). The targeting of core inflation, when food and fuel are dominant drivers of headline inflation, so often leads to unpredictable inflationary outcomes (Hammond et al., 2009).

II.   METHODOLOGICAL APPROACH

The study will focus on three sub-Saharan African countries namely Ghana, Tanzania and Ethiopia. Those three reference countries have been chosen because they are some degree of exchange rate flexibility with different monetary policy regime (Appendix1). Their implicit monetary regimes specifically, inflation targeting, money aggregate targeting and exchange rate anchor are the principal monetary regimes applied by the vast majority of countries. Indeed, a majority of surveyed countries (90 percent) evolve in those three monetary regimes. Also, each of them differs from the monetary framework and the number of objectives pursued by their central bank. This paper uses some changes in monetary policy to understand some of the basic facts of the transmission mechanism in developing countries.

The source the data is from International Financial Statistics (IFS) and the World Development Indicators. The methodology consists of making descriptive analysis of monetary policy landscape (weaknesses) and the effectiveness of the monetary policy indicators. Specifically,

to assess the effectiveness of monetary policy transmission, we apply what Romer and Romer (1989) call the "narrative approach" to identifying the effects of monetary policy. Indeed, "The central element of this approach is the identification of monetary shocks through non-statistical procedure..."[3]. We adopt this method because anywhere, policy is endogenous to events in the economy and the structure of the economy itself is evolving, for example as the financial system develops. Meanwhile, the transmission of policy itself depends on the policy framework, which is sometimes both obscure and changing. We then identify the monetary policy in each country and trace out the effects of these policies on the main macroeconomic variables such the gross domestic product, the money aggregate, and the inflation. More specifically, the main characteristics of monetary policies in the three countries will be analysed with the implicit weaknesses.

Besides, given the general weaknesses of the monetary policy in developing context, we were willing to analyse how the central banks manage to overcome those limitations through a questionnaire[4] via "Google forms" addressed to our sample of countries. The questionnaire is made up of three parts: the first part of addresses some general characteristics of the monetary regime and the main weaknesses faced by the central banks. The second part is about the different strategies adopted by the monetary authorities to overcome eventual weaknesses. The last part deals with the monetary policy transmission channels. To achieve this objective, the central banks, responsible institutions of the monetary system, were targeted. In doing so, we got in touch some officials in each institution to inform us. Unfortunately, the questionnaire has not been fulfilled. Given that, we were unable to address this issue of coping the weakness by the central banks. Nevertheless, the final task of our paper is to analyse the degree of effectiveness of the different instruments used.

So, before analysing the different instruments employed by each of our countries, let us review the main questions and issues addressed by their central banks.

In 2007 Ghana modernized its monetary policy framework transiting from traditional money targeting to inflation targeting. So, by adopting this "new" regime, Ghana became the second country in Sub-Saharan Africa to transition to inflation targeting after South Africa. Yet the Bank of Ghana's primary objective is "to pursue sound monetary and financial policies aimed

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[3] Romer and Romer (1989), pp. 1.
[4] Questionnaire is presented in the appendix 3 and available on the website through this following link:
https://docs.google.com/forms/d/1ILb7IBx_SpOwd8gE7-vISEgz0Mb6YKOW1xR8BRRkKeU/prefill

at price stability so as to create an enabling macroeconomic environment for the promotion of sustainable economic growth" (Bank of Ghana, annual report 2015). Price stability in this context is defined as a medium-term inflation target of 8 percent with a symmetric band of ±2 percent at which the economy is expected to grow at full potential without excessive inflation pressures. The particular monetary aggregate used varies from country to country, and in Ghana has evolved over the years. Indeed, M1 (also called narrow money, include coins and notes in circulation and other money equivalents that are easily convertible into cash) was used as the intermediate target for the greater part of the period prior to 1983 (E.K.Y. Addison, 2001). However, as quasi money grew and became increasingly a near-perfect substitute for demand deposits, Bank of Ghana switched to using M2 (M1 plus short-term time deposits in banks and 24-hour money market funds) as the intermediate target. Finally, since 1997, the central bank started using the broader target of M2+, defined as the sum of M2 and foreign currency deposits (Bank of Ghana, Monetary Policy summary, 2017). This was in response to the rapid growth of foreign currency deposits on the balance sheets of commercial banks and the need to monitor them as a potential source of demand and therefore inflation.

In Tanzania, the current system of formulation and implementation of monetary policy which aims at price stabilization was adopted as the primary role of the central bank in 1995 through Bank of Tanzania act (Victoria Said Ayubu, 2013). Indeed, controlling inflation within acceptable rates is one of the major macroeconomic policies in Tanzania. To secure macroeconomic stability, in 1990s the country implemented several institutional liberalizations (Laryea & Sumaila 2001). These reforms include the approval of the Bank of Tanzania Act of 1995. The act was designed to strengthen the capacity of the central bank in fighting inflation. The new Bank of Tanzania act directed the obligation of formulating and implementing monetary policy with the purpose of pursuing price stability as the primary objective of the central bank (Masawe, 2001). Specifically, in 2016/17 the Bank of Tanzania aimed at achieving the following monetary policy targets: i. Annual growth of average reserve money of not more than 12 percent; ii. annual growth of broad money (M3) of not more than 12.3 percent; iii. annual growth of private sector credit of not more than 12.5 percent; and iv. maintaining gross official reserves at levels adequate to cover at least 4 months of projected imports of goods and services, excluding foreign direct investment related imports (Bank of Tanzania, 2017). The implementation of monetary policy in Tanzania involves the setting of targets, followed by the choice of instruments. There are basically thee levels of targets: Operating target; intermediate target; final target (Joseph L. Masawe, 2001). The Bank of Tanzania sets annual monetary

policy targets in its Monetary Policy Statement at the beginning of every fiscal year. The targets are reviewed at mid-year. The Bank of Tanzania uses reserve money as the operating target. The money supply (M2) is the intermediate target, given that it is a money-based stabilisation system.

In Ethiopia, the principal objective of the monetary policy is to maintain price and exchange rate stability and support sustainable economic growth of Ethiopia (National Bank of Ethiopia, 2009). Indeed, maintaining exchange rate stability on the other hand is considered as the principal policy objective of the National Bank of Ethiopia so as to be competitive in the international trade and to use exchange rate intervention as policy tools for monetary policy to affect National Bank of Ethiopia foreign reserves position and domestic money supply. As Ghana and Tanzania, the monetary management framework of Ethiopia contains basically three targets: the ultimate or final target, the intermediate target and the operating target. As mentioned there are three objectives of monetary policy in Ethiopia. In achieving these objectives, the National Bank of Ethiopia sets money supply as an intermediate target. Then, the growth of base money (reserve money) is being used as operational target of the National Bank of Ethiopia. The practice of targeting reserve money is based on the assumption that there will be a stable money demand function in the economy. If the money demand happens to be unstable over the medium to long term, then the National Bank of Ethiopia will shift its targeting in to another workable framework such as interest rate targeting or multiple indicator approach. In addition, the Bank shall maintain the international reserves at a level which, in its opinion, is adequate for Ethiopia's international transactions. In this regard, a minimum threshold at which foreign reserves are considered adequate is set at three months of imports of goods and services.

III.   CASE STUDIES ANALYSIS

The purpose of this section is to review the main instruments of monetary policies in Ghana, Tanzania, and Ethiopia and analyse the underlying weaknesses. The highlights of the effectiveness of the different instruments used will be reviewed also.

III.1. Instruments of monetary policies

The implementation of monetary policy involves the use of direct regulatory administrative measures and indirect instruments to influence the supply and demand for money. In this sense, the formulation of monetary policy operations that is, the adoption of specific policy instruments and targets aiming at dealing with liquidity issues is highly diverse among countries (Inese Buzeneca and Rodolfo Maino, 2007). During the last two decades, the IMF has explicitly advocated the use of market-based instruments to implement monetary policy, that is, to try to steer liquidity by influencing money markets through open market operations and auctions instead of relying on direct controls on credit and interest rates. Direct instruments comprise measures that establish limits on interest rates (price restrictions), credit or lending ceilings (quantity restrictions), while indirect instruments include setting the required levels of reserve requirements or altering liquidity conditions through money market operations. For the analysis of the different instruments used by the sample of countries specified, we have grouped instruments of monetary policy in six major categories as did by Buzeneca I. and Maino R. in 2017. Consequently, we have direct instruments, reserve requirements, statutory liquidity requirements, central bank standing facilities, discretionary monetary instruments, and market information (money market and secondary market for government securities). An overview of the information contained in each category is as follows: (i) Direct instruments focus on interest rate controls and limits on bank lending; (ii) reserve requirements[5] section provides information on required reserve ratios, eligible assets, the practice of averaging reserve holdings over the maintenance period, penalty for reserve deficiency, and remuneration of required reserves among others; (iii) the statutory liquidity requirements section lists liquid assets ratios imposed by central banks; (iv) the central bank standing facilities section describes the details (collateral, maturity, interest rates, and penalty rates) of short-term credit to banks, rediscount credits, deposit facilities, and interest rate arrangements; (v) the discretionary monetary instruments cover primary and secondary market operations (Open market operations, repurchase

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[5] Reserve requirements are defined as a percentage of commercial banks liabilities required to be maintained as reserves at the central bank.

agreements, outright transactions), as well as other instruments such as foreign exchange swaps, credit auctions, deposit facility, etc.; (vi) the market information section covers mostly interbank operations (market structure).

Most countries have completely abandoned the use of direct instruments of monetary policy, either interest rate controls or other direct instruments as advocated by the IMF including Ghana, Tanzania and Ethiopia.

III.1.a. Monetary policy instruments in Ghana

Regarding the instruments, the Bank of Ghana has several it uses to achieve its monetary policy objectives. These include open market operations, repurchase agreements, foreign exchange operations, reserve requirements, and interest rates (Table 1).

As in developing economies in general, in Ghana, open market operations are the main instruments used to steer interest rates and manage liquidity. Open market operations can be performed either in primary markets by issuing short-term central bank or government bills, or in secondary markets. In implementing monetary policy, Bank of Ghana intervenes mainly through the primary auction of Treasury bills and Bank of Ghana bills. The weekly auctions were initially open to banks and to the non-bank public, although the non-bank public had to submit their bids through their bankers. Pricing at the auction is based on the multiple price auction system, where bids are arranged in descending order and the higher prices are allotted first until the offer is exhausted. Investors could also purchase on tap directly from Bank of Ghana between tenders (auctions) at the weighted average price declared at the preceding auction.

Repurchase agreements are also used as an essentially instrument to enable the Bank of Ghana to fine-tune the level of reserves in the banking system between the weekly auctions (Ivy Aryee, 2001). This tool consists for the Bank of Ghana to buy Treasury-bills from the deposit money banks and they, in turn, are contractually obligated to buy these bills back (repurchase them), within a short period of time, typically one day but within three days. The interest rate on these is fixed at between 0.5 to 1.75 percentage points above the 91-day Treasury-bill rate established at the most recent auction. The purchase of Treasury-bills from the deposit money banks by the Bank of Ghana injects reserves into the banking system thus increasing the stock of Reserve Money. When the deposit money banks close out the repo by repurchasing the Treasury-bills, their deposit holdings at the Bank of Ghana are debited, reducing domestic money banks reserves and hence the stock of reserve money.

Foreign exchange operations are used for monetary policy purposes in terms of outright sales or purchases or swaps. Ordinarily, Bank of Ghana's exchange rate policy is based on reserve targeting. On occasions where reserves were higher than targeted, Bank of Ghana has used outright foreign sales as a tool of monetary policy. In doing so, forex sales were used as a supplement to Treasury-bill auctions to mop up excess liquidity in the system.

Another tool used is reserve requirement defined as the ratio of cash to total deposits that a bank must keep. This is used for Bank of Ghana prudential and monetary management purposes. Reserve requirements are set by the Bank of Ghana as a fixed percentage of banks' deposit liabilities, including foreign currency accounts. The reserve requirement ratio has evolved from its highest of 27 percent in 1990 to 10 percent in 1996 and its current level of 8 percent since 1997. There are two sets of reserve requirements. Primary or cash reserves are currently 8 percent of deposit liabilities. Primary reserves consist only of deposits of banking institutions at the Bank of Ghana. Secondary reserves must be held in the form of approved government paper, primarily Treasury bills, and are currently set at 35 percent of deposit liabilities.

The interest rate is also considered to be a monetary policy tool. The Government's Budget Statements reflect this belief. For example, the 1999 Budget Statement asserted that "The Bank of Ghana will use interest rate policy to reinforce its monetary policy objectives" (E.K.Y. Addison, 2001). It is stated that the Bank of Ghana had raised interest rates to counter the depreciation of the credit. The interest rate is changed only when reserve money targets cannot be consistently met through the use of alternative monetary policy instruments or when extraordinary circumstances compel a change.

III.1.b. Monetary policy instruments in Tanzania

Regarding the instruments, in 1995, the Bank of Tanzania moved from implementing direct to indirect monetary policy instruments to ensure maximum efficiency in the regulation of money supply. The indirect monetary policy used in Tanzania includes foreign exchange market operation, discount policy, reserve requirements, repurchase agreements, gentlemen's agreement, moral suasion and open market operations (Bank of Tanzania, 2012).

Indeed, open market operations are the principal instrument for monetary policy, as the active approach is taken. It consists of the Bank of Tanzania to sell or buy Government securities as Treasury-bills, in open market in order to influence the monetary base. The Treasury-bills market is dominated by commercial banks and participation is limited to residents. The tenure

of Treasury-bills is 35, 91, 182, and 364 days, which are issued in the primary market once fortnightly and settlement is done on the next day, and secondary market trading is done over the counter.

Concerning the repurchase agreements (repos), they involve the sale of securities with an agreement to repurchase the securities at a future date, and at an agreed price. They were introduced to manage intra-auction liquidity variations. At the moment, repo transactions are conducted between the Bank of Tanzania and commercial banks. Tenure for repos ranges between 2 days maturity to 14 days maturity.

With regard to foreign exchange market operations, those ones are conducted through the Inter-bank foreign exchange market, where the central bank buys and sells foreign exchange to commercial banks. However, the exchange rate is freely determined by the market, with the central bank intervening only to smooth short fluctuations and build external reserves, without prejudice to the primary objective of price stability.

Another instrument used is Reserve requirements which are traditionally used by the Central banks as an instrument for monetary control. These requirements work by affecting the proportion of assets that banks are required to hold, and hence their ability to expand liquidity. However, the Bank of Tanzania does not use this instrument frequently because it is considered to be more direct than indirect. Its frequent variation causes considerable uncertainty for commercial banks and may have negative implications for the cost of funds, since it is not remunerated in Tanzania (Joseph L. Masawe, 2001).

For the discount rate, given that open market operations are the principal tool for monetary policy implementation, the discount rate is highly restrictive so as to discourage borrowers from resorting to the discount window. A penal rate is currently used and is 5 percentage points above the weighted average yield for all Treasury-bills maturities.

The moral suasion, a dissuasive instrument, is sometimes applied in Tanzania, especially in persuading commercial banks to be prudent in setting their deposit and lending rates. However, moral suasion is always used in conjunction with other instruments.

The Gentlemen's agreements as an instrument, are voluntary agreements between the central bank and banks, aimed at improving monetary conditions in the economy. In Tanzania such agreements have been used between the central bank and the largest commercial bank in an effort to lower the spread on interest rates.

III.1.c. Monetary Policy instruments in Ethiopia

The introduction of a wide range of monetary instruments by central banks engenders competition, efficiency and transparency and broadens financial intermediation in the banking system. It also promotes liquidity management of commercial banks and gradually leads to the development of well-functioning money and financial markets which could serve as catalysts for economic growth and development. So far, the use of such instruments has been extremely limited in Ethiopia due to the underdevelopment of the money market and the virtual non-existence of a financial market. Thus, it is envisaged to use a mix of diversified monetary policy instruments so as to effectively carry out the monetary management function of the National Bank of Ethiopia. The National Bank uses a mix of diversified monetary policy instruments so as to effectively carry out the monetary management function. Those instruments include open market operations, standing central bank credit facility, reserve requirement, direct borrowing/lending in the inter-bank money market and introducing repurchase agreement (Table 1).

The open market operations used by the National Bank of Ethiopia include sale and purchase of bonds or securities issued by government (Treasury-bills). In the absence of its own securities, certain amount of government treasury bills needs to be allocated to National Bank of Ethiopia by the government for its monetary policy purpose. To prepare the ground for enhanced open market operations, the yield on government securities should be at least close to the minimum interest rate.

Reserve requirement in Ethiopia is computed by netting out uncleared checks paid and uncleared effect foreign from the total deposits. The requirement is currently 5 percent of the net deposit and failing to comply with this requirement will be penalized. The National Bank of Ethiopia uses this instrument to control the liquidity of banks by varying the rate according with the targeted level. The higher reserve requirement contracts the liquidity as well as credit expansion power of commercial banks and the opposite will increase liquidity and credit expansion power of banks.

The standing central bank credit facility gives banks the assurance that, when confronted with problems of shortfall in the clearing and a lack of alternatives for raising immediate funds in the inter-bank market, they can settle the clearing with the central bank's funds.

In conjunction with the major monetary policies instruments or separately, the National Bank of Ethiopia may use moral suasion to persuade commercial banks to act in a manner consistent with the dictates of the macro-economic situations.

Table 1: Monetary policy mandates and instruments

Country	Nominal anchor	Mandate	Instruments
Ghana	Inflation targeting	1.Price stability	Open market operations Repurchase agreements Foreign exchange operations Reserve requirements Interest rates
Tanzania	Monetary targeting	1.Price stability 2.Financial stability Support of Government policy	Open market operations Repo operations Rediscount policy Policy rate Foreign exchange intervention Moral suasion
Ethiopia	Exchange rate targeting	1.Price stability 2.Economic growth 3.Exchange rate stability	Open Market Operation Standing facility Reserve requirements Floor deposit interest rate Direct borrowing/lending in the inter-bank money market and re-purchase agreement Moral Suasion

Source: own computation

To sum up, several general trends can be observed regarding the evolution of the instrument mix used in developing countries. (i) Direct instruments of monetary policy are no longer used in the majority of countries. (ii) The diversity of the instrument mix in developing economies has not kept up with the increased diversity in the more advanced group of economies and there is a tendency for developing economies to use rules-based instruments more intensively relative to more advanced economies. This phenomenon could be due to the presence of excess liquidity and the early stage of market development in developing economies. (iii) Developing economies tend to use rules-based instruments more intensively relative to more advanced economies, which could hamper market development and hold back the transition to market-based monetary operations. On the other hand, greater reliance on rules-based instruments is a reflection of shallow markets. In this regard, the challenge for central banks is to strike an appropriate balance and make sure that their reliance on rules-based instruments is also mindful of the need to develop markets. Adopting indirect monetary policy instruments requires a

certain level of financial market development. Specially to use open market operation as a main monetary policy instrument, well-developed secondary market is necessary to transmit the desired effect into the economy. For instance, central bank discount rate changes are transmitted easily and fast into other interest rate as long as well-developed secondary market exists. Therefore, the efficiency of indirect monetary policy is largely dependent on the development of secondary market.

In many respects, the above results in many aspects support the agenda for action to enhance monetary policy effectiveness in developing countries as outlined in IMF Occasional Paper 244. Laurens et al. (2005) have argued that to enhance the effectiveness of monetary policy in countries with less developed financial markets, the following headings, in order of priority, should set the Fund's work agenda so as to cooperate technically with those countries to: (a) curtail fiscal dominance, (b) deal with structural liquidity surplus, (c) establish efficient money markets, and (d) strengthen financial market infrastructure.

III.2. Monetary policy weaknesses

The purpose of this section is to analyse some weaknesses associated to the monetary policy by choosing some specific indicators. More specifically those indicators will be related to the multiplicity of monetary objectives, the degree of dependency of the central banks, the monetary policy instruments, and the degree of development of the financial system.

III.2.a. Multiple objectives pursuing

Although in most developing countries central banks place price stability as the primary objective of monetary policy, its role in the policy framework varies widely. According to the IMF desk survey, developing countries central banks often follow other objectives in addition to price stability. For instance, the IMF desk survey reveals that two thirds of the survey respondents had two or more objectives.

Indeed, with respect to our sample of countries, apart Ghana who pursue a single objective[6] as monetary policy, it's not the case for Tanzania and Ethiopia. For the case of Tanzania, in addition to price stability the Bank of Tanzania follows also a financial stability as a second objective. For Ethiopia, three objectives are pursued namely price stability, economic growth,

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[6] Appendix 1 presents the different objectives pursued by each of the countries.

and exchange rate stability. In doing so the multiple objectives pursuit often complicates policy design and may be the source of policy slippages.

However, the primacy of the inflation objective is generally not well established. Most central banks in non-inflation targeting countries do not have an explicit numerical inflation objective. This is the case of Tanzania and Ethiopia. In contrast Ghana has a medium-term inflation target of 8 percent with an acceptable band of 6 to 10 percent.

III.2.b. Central bank independency and fiscal dominance

To assess the fiscal dominance, we use the indicator of central bank credit to the government materialized by the annual growth of claims as % of broad money on central government. Note that according to IMF, the monetary policy in many African countries has suffered from fiscal dominance. Fiscal dominance implies that expectations about inflation are intrinsically linked to fiscal performance. Under fiscal dominance, the monetary policy might be ineffective for several reasons insomuch as a monetary tightening can have a perverse effect on the economy (Benedicte Vibe Christensen). So, instead of leading to an increase in real interest rate, appreciation of the currency, and reduction in aggregate demand and inflation, such tightening might fuel expectations of default on government debt and thereby lead to a depreciation of the currency and increase in inflation. A lack of fiscal discipline has undermined investors' confidence, making it difficult for a government securities market to emerge. Also, under fiscal dominance, inflation expectations react to fiscal events and reflect lack of a credible anchor. Fiscal dominance can also compromise central bank independence if the government openly resists moves by the central bank to raise interest rates. More importantly, fiscal dominance generally crowds out private sector credit.

The figure 2 shows that the growth of central bank claims on central government is relatively erratic before the global financial crisis in 2008 in our sample of countries. However, since 2008, in absolute term the central bank's net claims remained to high but the annual growth rate tends to be stabilized in Ghana and Tanzania. For the case of Ethiopia, the fact that a lot of data are missing renders the analysis quite difficult.

Figure 2: Claims on central government (annual growth as % of broad money)
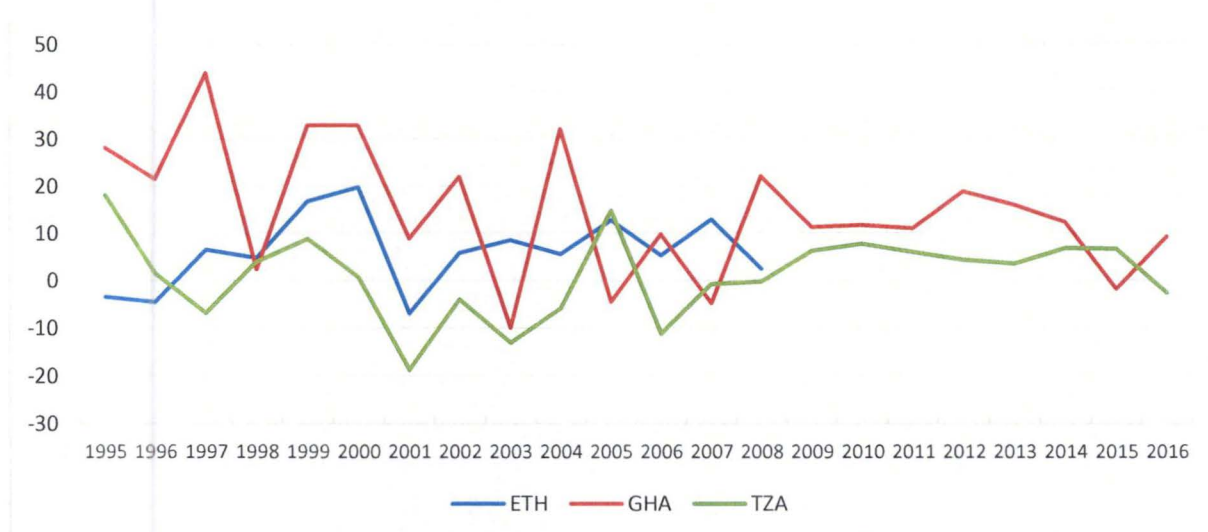
III.2.c. Weak financial system

Developing economies' financial systems are smaller, less complex, less interdependent than in advanced economies, as well as less exposed to financial derivatives. For instance, gross asset position in financial derivatives, relative to capital, is evaluated, by end 2009, at 33 % for emerging market and developing economies and at 222 % for advanced economies – with similar figures for the liability side (Financial Stability Board, 2011, p. 45). According to Benedicte Vibe Christensen, Africa has trailed the rest of the world in terms of financial development. Apart from a few countries, most notably South Africa, the continent has been characterised by less developed financial markets, limited competition in the banking sector and few non-bank financial institutions. The financial sector in developing countries is still relatively small and is dominated by the banking industry. To analyse the patterns of financial deepening, we use some indicators namely domestic credit to private sector, bank accounts per 1,000 adults and more broadly the financial development index developed by the IMF.

Domestic credit to private sector refers to financial resources provided to the private sector, such as through loans, purchases of non-equity securities, and trade credits and other accounts receivable, that establish a claim for repayment. The domestic credit to private sector remains relatively low although it has grown rapidly in all the three countries from 1995 to 2016. Also, the number of bank accounts per 1,000 adults has encountered an important growth from 2006 to 2015. This growth was more sizeable in Ghana and Tanzania where it reached respectively

600 and 265 in 2015. Compared to High Income Countries, the domestic credit to private sector and the banks accounts per 1,000 adults have reached respectively 87 and 1200 in 2015 (WDI). Thereby, the financial deepening is improving but remained still low compared to emerging markets and developed economies.

Figure 3: Domestic credit to private sector and bank accounts per 1,000 adults
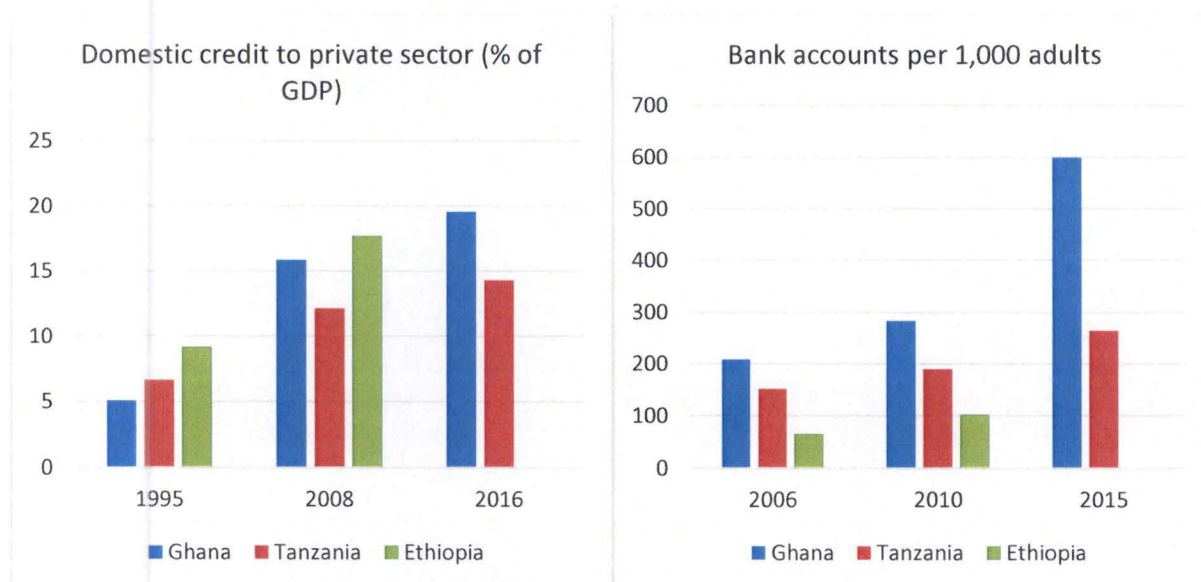
Source: own computation using World Bank Global Financial Development Data base

More broadly, to assess the financial deepening we use the financial development index (FDI) developed by the IMF. It is constructed using a standard three-step approach on reducing multidimensional data into one summary index: normalization of variables; aggregation of normalized variables into the sub-indices representing a particular functional dimension; and aggregation of the sub-indices into the final index. The more the index tends to 1, the more the financial sector is developed. The three countries present a very low index across time which remained below 15%. More alarming the indicator has encountered a negative trend since 1980 in Tanzania and Ethiopia. For Ghana the trend is positive with a very flat slope. In emerging market, the index remains higher compared to the three countries where the average difference in 2014 was almost 20%. Compared to United Kingdom in which the financial development index reached 88%, the index is almost 6 times larger.
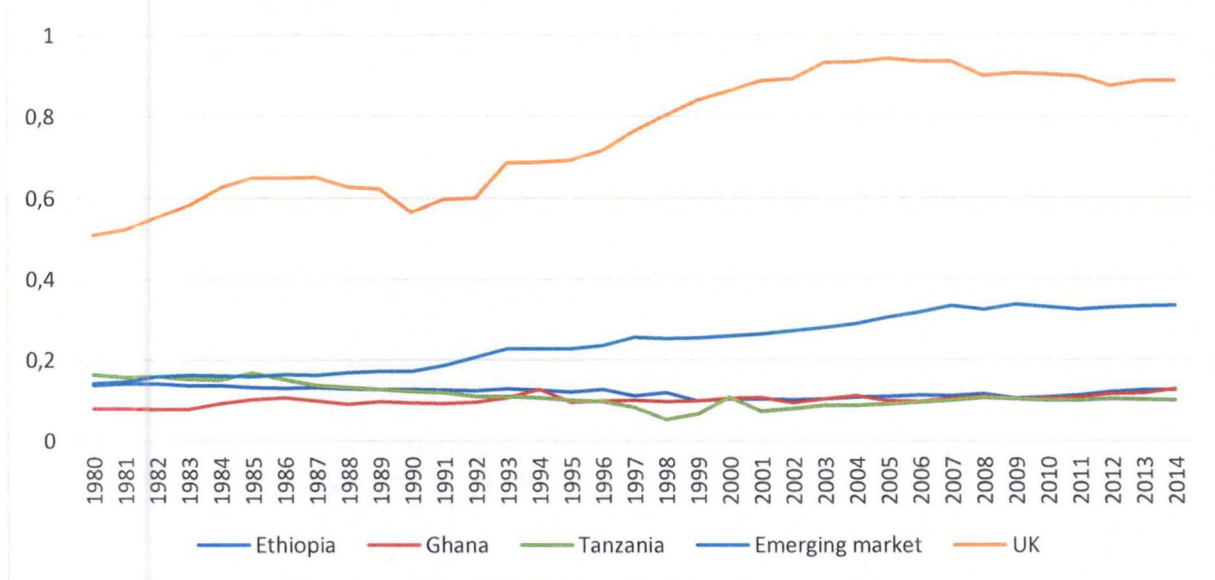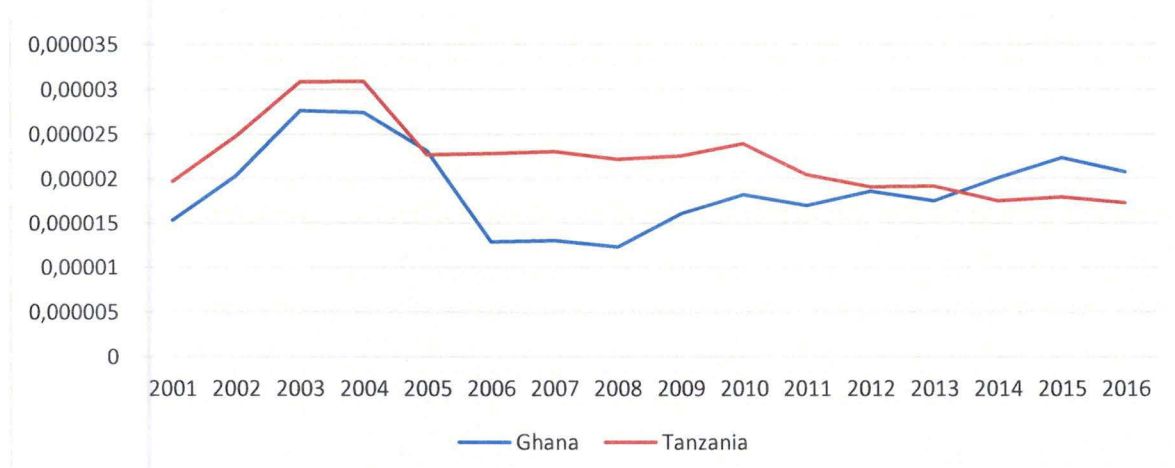
Source: own computation using World Bank Global Financial Development Data base

The international financial integration (IFI) is an indicator of financial globalization, expressed as the sum of foreign assets and foreign liabilities as percentage of GDP.

Indeed, developing countries are characterized by low degrees of international financial integration. According to Prachi Mishra and Peter Montiel (2012), on average the low-income countries in sub-Saharan Africa are substantially less integrated with international financial markets and are more likely to intervene in foreign exchange markets than is the typical advanced country. Consequently, those characteristics tend to impair the exchange rate channel. The following figure show the aggregate IFI ratios for Ghana and Tanzania. The IFI ratio is extremely low, indicating the weak financial globalization. In developed countries, the IFI ratio rose from 68.4 percent in 1980 to a peak of 438.2 percent in 2007. In emerging market, the IFI ratio doubled from 34.9 percent in 1980 to 73.3 percent in 2007. Therein, the low level of IFI ratio contribute to hamper the exchange rate channel in developing economies. In addition, this leaves little scope for the functioning of the conventional interest rate channel, the asset channel, or the exchange rate channel.
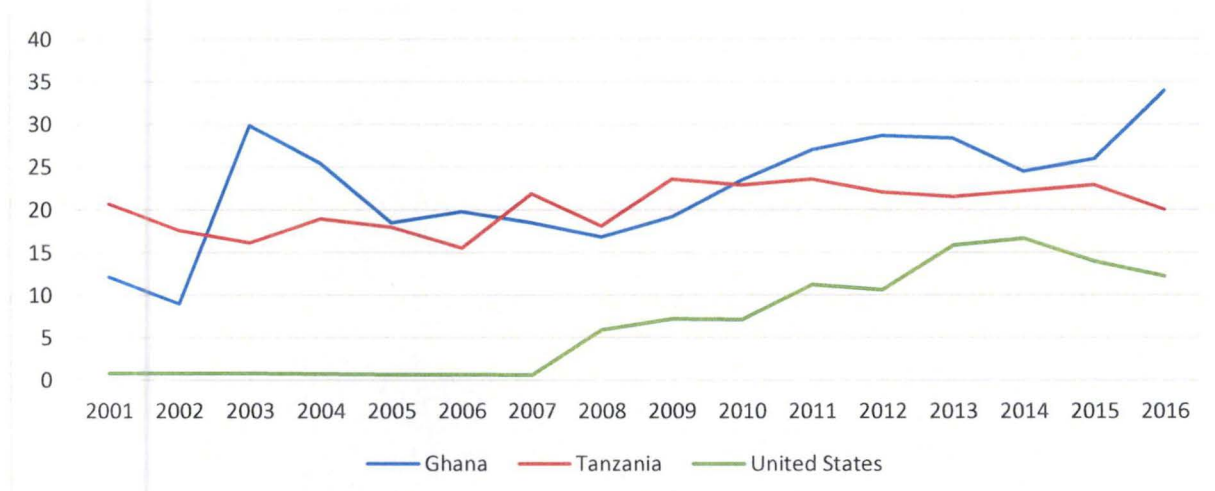
Source: own computation using World Bank Global Financial Development Data base

III.2.d. Excess liquidity in banking sector reserves

Banks' liquidity management is central to the transmission and implementation of monetary policy. In developing countries there is an excess liquid reserve on commercial bank balance sheets[7]. One reason is the lack of money market instruments in which banks can invest. A higher level of precautionary reserves might also reflect the fact that there is no effective interbank market in which banks can borrow if their reserve positions fall below the minimum. Indeed, the larger the liquid reserves, the less sensitive the interest rate or reserve ratio are and the stronger any central bank tightening measure must be to have the desired effect. The following figure depicts the ratio of bank liquid reserves to bank assets. Since 2001, free reserves of the banking system are increasing, thereby potentially making monetary policy less effective. Compared to the United States, where the reserves ratios were almost 0 percent till 2007 before reaching 12 percent in 2016, Ghana and Tanzania present high ratio level. This high level could deteriorate the prospects that changes in policy rates or in reserve money of the central banks get passed through to private sector saving and lending, thereby possibly slowing down real activity in the economy.

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[7] Have monetary transmission mechanisms in Africa changed? Benedicte Vibe Christensen

Figure 6: Bank liquid reserves to bank assets ratio (%)

Source: own computation using World Bank Global Financial Development Data base

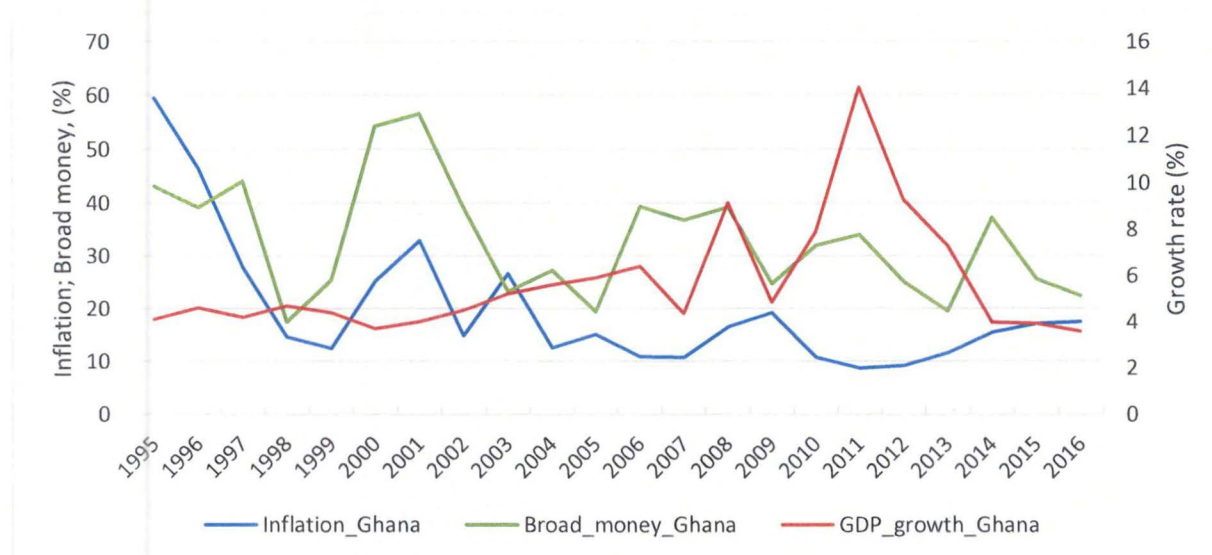## III.3. Effectiveness of monetary policy

III.3.a. Effectiveness of monetary policy in Ghana

The figure 6 depicts the selected macroeconomic variables for Ghana. As a reminder, the main decision of Bank of Ghana in terms of monetary policy since the adoption of inflation targeting regime is defined as a medium-term inflation target of 8 percent which allowed to fluctuate between 6 to 10 percent at which the economy is expected to grow at full potential without excessive inflation pressures. In doing so, the consequent results were far from the objective at the beginning of the new monetary regime. After 2011, this regime is getting more effective.

To support these theses, on the one hand, the rate of inflation during the period under review shows the effectiveness of the inflation targeting framework adopted in 2007 by the Bank of Ghana insomuch as the target rate matches with the actual rate achieved for the respective year. In early of the implementation of the inflation targeting, there was a substantial difference between the target and actual rates particularly from 2007 to 2010. Therein, the inflation targeting framework was not very effective in its early days of implementation. However, since 2011 it can be considered as very effective. It is worth noting that between 2011 and 2012, the inflation rates, 8.7 and 9.16 percent respectively, were in the "band zone" (6% to 10 %). After 2012, the increase of inflation was driven by electoral cycle, oil price and devaluation (Oppong et al,2015). On the whole, it looks like the economy is better off with this new framework regarding the inflation rate. On the other hand, the GDP has encountered an increase in 2007 and specially in 2011 with the discovery of oil reserves. Since 2011, the GDP growth rate

decreased dramatically reaching its low level in 2016. In general, Ghana has experienced robust growth since the early 2000s, mainly supported by a favourable external environment and some large investment inflows, principally in the extractive industries. Consequently, it will be difficult to disentangle economic performance due to the adoption of the inflation targeting.

Figure 7: Selected macroeconomic variables of Ghana

Source: own computation using World Bank Global Financial Development Data base

III.3.b. Effectiveness of Monetary Policy in Tanzania

The main issues of Tanzania's monetary policies are to control inflation within acceptable rates and to secure macroeconomic stability. In 2011, in the four East African Countries, Kenya, Tanzania, Uganda, and Rwanda (The EAC4), inflation accelerated on the strength of higher food and oil inflation, strong demand, weakening exchange rates, and still-negative interest rates (Rwanda is an exception). In the face of these situations, the governors of the EAC4 central banks agreed at the October 2011 meeting that policy needed to be tightened significantly in order to bring inflation under control. The EAC4 came to the realization that more significant and clear action was needed to stabilize the situation. In the case of Tanzania, the central bank undertook policies in different angles in 2011. It increased its policy rate by 440 basis points to 12 percent, augmented the minimum reserve requirements on government deposits held by banks from 20 percent to 30 percent, reduced commercial banks' limit on foreign currency net open positions from 20 percent to 10 percent of core capital, tightened capital controls and increased sales of foreign exchange in the interbank market[8]. An important contraction in the

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[8] "In an environment of rising inflation, the Bank took measures to stem inflation expectations and exchange Rate volatility" (Bank of Tanzania, 2012).

real growth rate of broad money in late 2010 has caused an increase in the interbank rate, with a bit of pass-through to Treasury-bill rates, but this proved short-lived even as the growth rate of money continued to fall.

With respect to those monetary policy measures, what were their impacts on the monetary policy effectiveness in Tanzania?

Before these events happened in 2011, the growth rate of the broad money and the inflation were high and more volatile. For instance, from 2001 to 2011, the growth rate of the broad money fluctuated between 5 to 30 %. In the case of inflation, from 2001 to 2005, the inflation rate was stable, around 5%. However, it started to increase since 2006 with a sudden raise in 2011 reaching 16%. Thanks to the reforms operated in 2011, the inflation rate went down since 2012 and remained more or less constant around 5 % from 2013 to 2016. Overall, after the underlying reforms, the monetary policy was a success to keep stable the level of the inflation rate. Otherwise, the real GDP growth rate increased till 2005 where it reached 8.17 % before getting down its though in 2006 during that period. According to Andrew Berg and al. 2013, there was no discernible effect on lending rates, the exchange rate, or credit aggregates of these actions, except for a small down-blip in credit growth in mid-2011. The economy registered strong growth in 2016 with real GDP growing by 6.8 percent compared to 6.95 percent recorded in 2015.

Figure 8: Selected macroeconomic variables of Tanzania
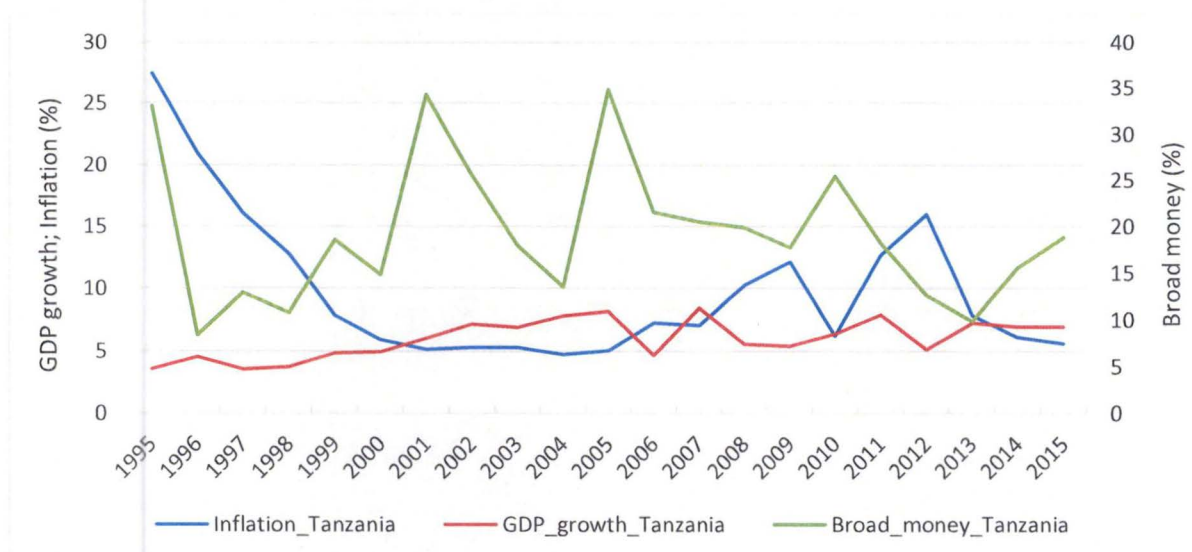
Source: own computation using World Bank Global Financial Development Data base

III.3.c. Effectiveness of Monetary Policy in Ethiopia

As mentioned previously, the mandates pursued by the National Bank of Ethiopia are to maintain price and exchange rate stability and promote economic growth. Accordingly, monetary policy continued to be geared towards maintaining inflation rate at single digit. In 2002/03, attention was focused on sterilising excess liquidity and moving towards allowing greater market determination of the exchange rate of the birr (ETB). A tighter monetary policy stance reduced the growth of broad money supply (M2) to 11.3 per cent from 12.3 per cent in the preceding year. Reflecting the weak economic activity in 2002/03 and the decision of the commercial bank of Ethiopia, the leading bank in the country has decided to stop lending to all institutions with non-performing loans. The total credit to the private sector increased by only 4.8 per cent in 2002/03, compared with 7.1 per cent in 2001/02. Increased credit to the government was maintained at 3.1 per cent in 2002/03.

Yet, from 1995 to 2003, the inflation rate has been kept at single digit but, this rate has encountered a severe fluctuation, varying between almost -8.5 to 19.3%. The inflationary episodes of Ethiopia started in the 2003 and marked the beginning of sustainable mounts in the growth rate of inflation. A grouping of inflationary episodes in Ethiopia by National Bank of Ethiopia (2012) reveals that, prior to 2002/03, the issue of inflation was not considerable thereby exhibiting the average annual rate of less than 5%. However, things changed and the rate has mounted to 17.77% in 2003. From the period 2003 to 2013, the general consumer price index inflation continued to register at annual average double-digit growth rate. The consequent fluctuations were more erratic. In doing so, the inflation reached its peak (44.4 %) in 2008. Overall, these huge volatilities can be a good synonym of monetary policy failure to keep the inflation rate stable. As for the GDP growth, during the period 1995 to 2004, it fluctuated also reaching its peak (13.57 %) in 2004 and a through (-3.45%) in 1998. From 2004, the GDP growth rate is almost 10%.

Regarding the growth rate of broad money, before 2004, the average annual growth rate was only 9.7%. Unfortunately, its growth rate reached the annual average of 18.47% between 2005 and 2007 years period. According to IMF (2009), this event was mainly due to increasing volume of monetized budget deficits. The share of quasi-money has shown considerable improvements following the government's higher involvement in selling more bonds. This according to IMF (2014) was due to the expansion of domestic credits and increasing transactions money demand following some economic advancement.

Figure 9: Selected macroeconomic variables of Ethiopia
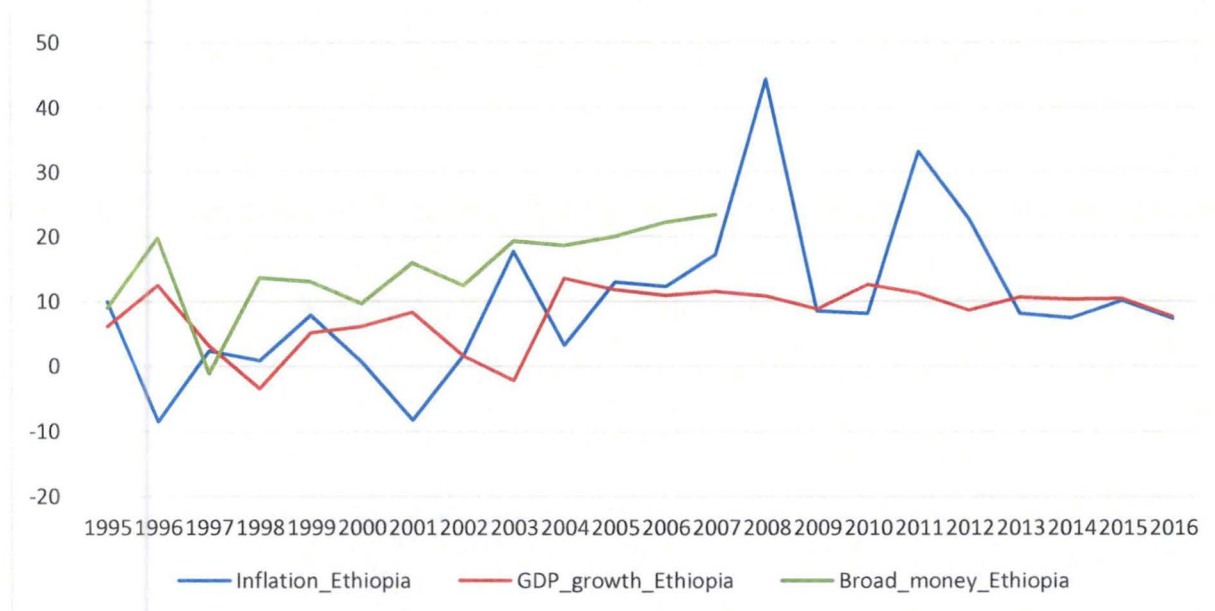
Source: own computation using World Bank Global Financial Development Data base

So, regarding those performance above-mentioned in terms of maintaining stable inflation rate and high GDP growth rate, what could be the effectiveness of the main instruments used in Ghana, Tanzania, and Ethiopia.

Arguably, the poor performance in terms of monetary control may have acted as the contributing factor behind the abandonment of direct instruments in many countries. Alexander et al. (1995) depicted many problems that have often been identified when direct instruments are used, including: (a) decreasing effectiveness of the instruments arising from evasion as the financial market develops and economic agents learn how to circumvent them; (b) increasing inefficiency in resource allocation; (c) potential inequity during implementation; and (d) lack of credible enforcement. Also, direct control induces disintermediation, distortion in the allocation of bank resources, and loss of effectiveness. However, directed credits as well as specific lending requirements are still being used by developing countries.

Reserve requirements remain a highly used instrument of monetary policy in developing countries, while its role in policy design in developed countries has been decreasing over time. The overall design and operations of reserve requirements involve the type, definition and monitoring of the requirement base, the eligibility of assets, and averaging rules and the rate of remuneration. Particularly, the role of reserve requirements has changed in countries that still make use of them. It has to be noted that as instruments for monetary policy, reserve

requirements lack flexibility. Moreover, Alexander et al (1995) emphasized that frequent changes in reserve requirements might become disruptive and generate additional costs for banks.

The imposition of statutory liquidity requirements, which obliges financial institutions to hold a certain percentage of their liabilities in the form of government securities, may also create market distortions, such as (a) constraining commercial banks' asset management, (b) distorting the pricing of government securities in the financial markets, (c) causing disintermediation and generating a loss of effectiveness to control monetary aggregates, and (d) suppressing secondary markets. Hence, the heavy use of the above two rules-based instruments in some developing countries could slow down market development considerably, which is a key institutional constraint for market-based monetary policy operations. In addition, the heavy use of the two rules-based instruments may have also affected the design of the lending facility in the developing countries, causing these countries to differ from the best practices in the more advanced economies. For instance, compared to developed economies, lending facilities in some developing economies are often not collateralized and tend to be of longer maturity.

There is a tendency for developing economies to use rules-based instruments more intensively relative to more advanced economies. This is perhaps due to the presence of excess liquidity and the early stage of market development in developing economies.

Open market operations are flexible instruments to conduct monetary policy because they can be deployed frequently and, in the amount, necessary to stabilize money markets. Open market operations can be performed either in primary markets by issuing short-term central bank or government bills, or in secondary markets. The latter offer even more flexibility for policymakers by including collateralized lending, repurchase agreements (repos) of securities (using short-term securities, in general), outright transactions (usually involving longer-dated securities or foreign exchange), and foreign exchange swaps. Primary market operations involve (i) primary market issuance of central bank securities or government securities for monetary policy purposes, and (ii) acceptance of fixed-term deposits and credits. the use of primary market operations in government securities has decreased in developing economies. The practical arrangement for the issuance of government securities is, generally, similar to the issuance of central bank bills. Treasury bill issuance may need to exceed fiscal funding requirements. It encourages fiscal discipline on the part of government if direct central bank financing is discontinued. For instance, regarding open market-type operations in Ethiopia, it

can be argued that it is ineffective and always aimed at tightening the grip on money supply growth through the only open market instrument operational in Ethiopia- treasury bills. On the Treasury-bills market National Bank of Ethiopia has limited power to affect the volume of sale since it is totally dependent on the level of government deficit. T-bills auction is continuing for fiscal rather than monetary reasons. Thus, National Bank of Ethiopia, as a monetary policy maker, has limited area to influence and use it as a monetary instrument. Therefore, open market operations in Ethiopia are at rudimentary level (even by the standards of the sighted two developing nations) and there is a lot of task ahead of policy makers to develop them.

With the aim of developing secondary markets, some economies have introduced operations in government securities. It was the case for all the sample of our three countries. Secondary market operations involve also outright purchases and sales or repo and reverse repo operations. They can be undertaken on a continuous basis and thereby provide even greater flexibility and transparency. Although open market operations in the secondary market for government securities may enhance market development, their final impact on liquidity depends on the depth of the secondary market. Secondary market operations induce an immediacy of response in the money market and they have the advantage of being automatically reversible, which is especially well suited for offsetting seasonal fluctuations (IMF, 2014). However, a successful and smooth operation requires a liquid and deep secondary market. In addition, central banks must have an adequate stock of marketable assets to undertake these operations.

CONCLUSION

This study has outlined the monetary policies pursued since in the past decade up to now as well as the trends in key monetary indicators. The objective being to ascertain the monetary policy effectiveness and draw from this some challenges. Monetary policies have been pursued in developing economies to reorient the economy towards the path of growth. Consequently, the conduct of monetary policy has moved away from the use of direct control measures to indirect, market-oriented tools. It is very hard to come away from this review of the evidence with much confidence in the strength of monetary transmission in low-income countries.

It appears that the main objective of monetary policy has been to stabilize prices and subsequently create an enabling environment for Bank of Tanzania h foreign and domestic investors. However, in addition to price stability, the vast majority of low income countries pursue others objectives. In this regard, combined with their weak financial system, and the lack of dependency of the central bank, the monetary policy is in general ineffective. The study therefore looked at the various monetary policy strategies and trends in key indicators and made interesting findings. First, given that any effective monetary policy should be accompanied by fiscal discipline, fiscal policies in the period were also designed to ease those monetary difficulties associated with huge budget deficits that compel governments to resort to large-scale borrowing at high interest rates, which crowds out the private sector.

In terms of challenges, developing countries face in one hand policy design and implementation, and in other hand, macroeconomic and financial challenges. Policy design and implementation challenges encompass the pursuit of multiple objectives complicates policy design that is often the source of policy slippages, the lack of an effective framework for formulating and implementing policy of central banks, the existing operational arrangements. Regarding the macroeconomic and financial challenges, we have the weak credit culture and financial development, the complex interaction between monetary and fiscal policy means that pressures arising from the fiscal authority can substantially complicate the task of monetary policy, the rise and size of capital flows complicates monetary policy and macroeconomic stabilization more generally, the dollarization of certain economies.

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APPENDICES

Appendix 1: IMF desk survey results: primary Objectives of Monetary Policy

		Exchange rate anchor	Money aggregate targeting	Inflation targeting	Other
Single objective	**Price stability**	Burundi Morocco São Tomé and Principe	Congo Mozambique Sierra Leone Sri Lanka Sudan Ukraine Uzbekistan	Armenia Georgia Ghana Guatemala Kenya Moldova	Egypt
	XR	Cape Verde			
Dual objective	**Price and XR**	Liberia Tajikistan	Afghanistan Madagascar	Indonesia	Kyrgyz Republic
	Price and growth	Cambodia	Guinea	India Philippines	
	XR and other	Nicaragua			
	Price and other	Bolivia Guyana Honduras Timor Leste	Tanzania	Paraguay Romania Uganda	Vanuatu
3 or more objectives	**Price, growth, XR**	Ethiopia	Bangladesh		
	Price, growth, other	Vietnam	Malawi Myanmar		Mongolia Papua New Guinea
	Price, XR, other		Nigeria Yemen, Rep. of		
	Price, other	Solomon Islands			Pakistan Zambia
	Price, growth, XR, other		Gambia Rwanda		

Source: IMF desk survey.

Note: "Other" refers to one or more of the following objectives: stability of the financial sector, promoting macro-economic development, maintaining external reserves, and supporting government policies. XR refers to exchange rate stability. The regime classification is based on responses by IMF country desks.

Appendix 2: IMF desk survey results: de Jure Monetary Policy Regimes in LLMICs

Source: IMF country desk survey.
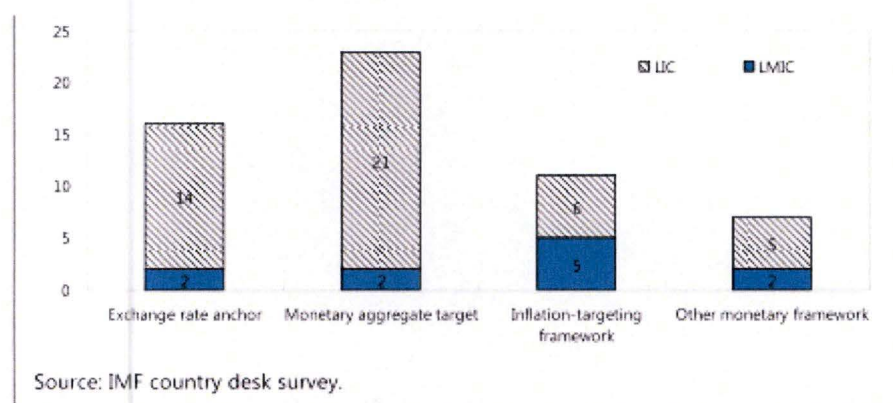
Appendix 3 : Questionnaire
MONETARY POLICY IN DEVELOPING COUNTRY

Survey/interview for personal project: Advanced Master in International and Development Economics/University of Namur
Topic: Monetary policy in developing countries: new challenges
Focusing on three countries: Ghana, Tanzania and Ethiopia

*Obligatoire

1. Q1. COUNTRY *
Une seule réponse possible.

- ( ) Ghana
- ( ) Tanzania
- ( ) Ethiopia

2. Q2. What kind of monetary regime has been selected? *
Une seule réponse possible.

- ( ) Inflation targeting
- ( ) Money aggregate targeting
- ( ) Exchange rate anchor
- ( ) Other

3. Q3. What is the primary objective of your country's Monetary Policy?
Une seule réponse possible.

- ( ) Price stability
- ( ) Exchange rate stability
- ( ) Economic growth

4. Q4. Is this primary objective well known by the agents?
Une seule réponse possible.

- ( ) Yes
- ( ) No

5. Q5. Has the primary objective been selected by the :
Plusieurs réponses possibles.

- [ ] Central Bank
- [ ] Government
- [ ] Law
- [ ] Other

6   **6. Does the Central Bank achieve its primary objective over the 5 last years?**
Une seule réponse possible.

	0	1	2	3	4	
Not achieved	◯	◯	◯	◯	◯	Fully achieved

7. Q7. What are the main constraints?
Plusieurs réponses possibles.

- [ ] Ineffecient instruments
- [ ] Weak financial system
- [ ] External shocks
- [ ] Political dominance
- [ ] Domestic shock
- [ ] Significant levels of aid flows
- [ ] Other

8. Q8. What is the degree of dependency of the Central Bank?
Une seule réponse possible.

	0	1	2	3	4	5	
Low dependency	◯	◯	◯	◯	◯	◯	High dependency

9. Q9. In case of fiscal dominance, how the central bank manage?
Plusieurs réponses possibles.

- [ ] Efforts to separate monetary from fiscal policy
- [ ] Better fiscal discipline
- [ ] Insulate against political pressures
- [ ] Separate policy formulation from implementation
- [ ] Curtailing fiscal dominance
- [ ] Develop a government securities market
- [ ] Other

10. Q10. In case of weak financial sector how the Central Bank manage to overcome this weak?
Plusieurs réponses possibles.

- [ ] Promoting the financial institutions
- [ ] Strengthen monetary policy transmission
- [ ] Combining different instruments
- [ ] Enhance the competitiveness of commercial banks
- [ ] Establishing efficient Money Markets
- [ ] Strengthening Financial Market Infrastructure
- [ ] Other

vii

11 11 H w the Central Bank manage to develop the Banking Sector?
Plusieurs réponses possibles.

☐ Continuation of reforms in banking business

☐ Efficient management of assets and obligations in all credit organizations;

☐ Extension of loans to the main economic branches;

☐ Implementation of a unified information security policy;

☐ Delivery of bank services to the residents

☐ Development of the interbank credit market;

☐ Assurance of transparency of credit organizations,

☐ Improvement of regulatory legal acts, with a view to enhancing banking supervision,

☐ Extension of the scope of cashless

12. **Q12. Is the the lack of Macroeconomic data a constraint for Monetary policy?**
Une seule réponse possible.

◯ Yes

◯ No

13. **Q13. If "yes" in Q12 how the Central Bank manage to cope this limitation?**
Plusieurs réponses possibles.

☐ IMF technical assistance and training

☐ developing or upgrading the forecasting and policy analysis systems (FPAS)

☐ developing a core medium-term forecasting model

☐ other satellite models

☐ conducting model-based policy analysis and communicating

☐ improving internal data collection and data management procedures

☐ Other

14. **Q14. Is the lack of suitable tools and capacity for medium-term policy analysis constitute a constraint for Monetary Policy transmission?**
Une seule réponse possible.

◯ Yes

◯ No

15. **Q15. Do the weak credit culture impair policy transmission?**
Une seule réponse possible.

◯ Yes

◯ No

16. **Q16. If yes how the Central Bank manage to solve the problem?**
Plusieurs réponses possibles.

☐ Improving the communication strategies

☐ Facilitating the procedures to obtain credit

☐ Developing the role of commercial banks in the payments systems

☐ Other

17 **17 D␣es the Central Bank possess a forecasting system?**
Une seule réponse possible.

○ Yes

○ No

18. **Q18. What is the degree of dollarization of the economy?**
Une seule réponse possible.

	0	1	2	3	4	
Low dollarized	○	○	○	○	○	Highly dollarized

19. **Q19. In case of dollarization, what strategy is adopted to face the problem?**
Une seule réponse possible.

○ Accentuate the exchange rate operations

○ Greater exchange rate flexibility

○ Intervention strategies

○ Other

Instruments of monetary policy

20. **Q20. During the last 5 years how far the different monetary instruments reached the underlying expected objectives?**
Une seule réponse possible.

	0	1	2	3	4	
No achieved	○	○	○	○	○	Fully

21. **Q21. What reasons can explain this weak performance?**
Plusieurs réponses possibles.

☐ Inappropriate instrument

☐ External shock

☐ Wrong expectations of the economic agents

☐ Domestic shock

☐ Other

22. **Q22. In the case of inefficient of the different instruments to achieve a given objective, how the Central Bank deal with to improve the effectiveness this instrument?**
Plusieurs réponses possibles.

☐ Combining two instruments

☐ Increase the degree of its transparency

☐ forward guidance: Communication methods

☐ Reduction in reserve requirements

☐ Standing lending facility

☐ Other

23   **23 D   the Central Bank use unconventional monetary policy instruments?**
Une seule réponse possible.

◯ Yes

◯ No

24. **Q24. If unconventional monetary policy instruments are used, what are those instruments?**

_____

_____

_____

_____

_____

Monetary policy transmission channels

25. **Q25. Interest rate channel**
Une seule réponse possible.

	0	1	2	3	4	
Inefficient	◯	◯	◯	◯	◯	Fully efficient

26. **Q26. The asset price channel**
Une seule réponse possible.

	0	1	2	3	4	
Inefficient	◯	◯	◯	◯	◯	Fully efficient

27. **Q27. The credit channel**
Une seule réponse possible.

	0	1	2	3	4	
Inefficient	◯	◯	◯	◯	◯	Fully efficient

28. **Q28. The monetary aggregate channel**
Une seule réponse possible.

	0	1	2	3	4	
Inefficient	◯	◯	◯	◯	◯	Fully efficient

29. **Q29. The expectation channel**
Une seule réponse possible.

	0	1	2	3	4	
Inefficient	◯	◯	◯	◯	◯	Fully efficient