

# A pipeline approach of foreign aid absorptive capacity: analyzing disbursement delays in Africa through an ARDL panel data model.

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**Abstract:** This paper analyzes the delays and therefore the unpredictability of foreign aid in Africa. As many African countries are dependant to foreign aid, it's important to understand to what extent aid delays matters for the absorptive capacity and therefore influences aid effectiveness. As the aid literature on absorptive capacity was mainly focused on dutch disease, decreasing returns and institutional weakness, we foster our interest on the disbursement constraints what we call *pipeline approach*. According to this approach, in short run, the disbursement constraints lead to huge delays of aid disbursements and weak rates of aid disbursement with regard to commitments. We explore the different factors likely to explain the aid delays, building a new analytical framework and using the concept of programmable aid. Some stylised facts on aid delays are presented for African recipients as well as for bilateral and multilateral donors, reflecting the existence of specificities for these actors. These findings are supported by the econometric estimations using a dynamic econometric model, an ARDL for a panel of 52 African countries during the period of 1975-2004. We find disbursement constraints mainly at short run level, while the main donor's specific factors seem to be the selectivity and the degree of aid fragmentation. Aid lags are also influenced by economic performance and governance quality of recipients and the share of grants in aid modalities. Bilateral donors are found to under-perform compared to multilateral donors in terms of the rhythm of aid disbursement.

**Key words:** Foreign aid, absorptive capacity, disbursement delays, panel ARDL model.

**JEL classification numbers:** F35; O16; O19

## 1. Introduction

During past decades, foreign aid effectiveness analysis was mainly focused on its ability to promote a sustainable growth. But recently, the aid literature debate tends to emphasize on its performances to alleviate a growing poverty in developing countries. Obviously this shift in the debate was influenced by the commitments made regarding to Millennium Development Goals (MDGs). Then the absorptive capacity issues come naturally on the front of debate because, even in the case of full respect of donor's commitment to provide more aid, the crucial question will remain

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on the ability of recipient countries to absorb more usefully these amounts of aid. Some authors such as Easterly (2006) are sceptical about the need to scaling up aid regarding to absorptive capacity problem, while others authors, like Sachs (2005), are keen proponents of a substantial increase of aid in order to reach MDGs. Poverty trap arguments are usually put ahead to claim the need to increase the amount of aid to poor countries, but these arguments are not sufficient to convince donors to make more commitments and to respect them by disbursing more effective aid. Some consensus seem to emerge from academic and practical fields that absorptive capacity issues are one of foreign aid effectiveness determinants. We focus our paper the aid disbursement delays which constitute one of four approaches to absorptive capacity literature.

Indeed, the third others approaches of absorptive capacity concern firstly the macroeconomic unrests- Dutch disease approach- resulting from aid increase and instability, so that leading to the lost of economic competitiveness in receiving countries. The second approach in academic works points out the problem of diminishing marginal returns of aid by using threshold principles, while the third approach pays attention on the effects of aid on recipient country's institutions weaknesses (Guillaumont & Guillaumont Jeanneney, 2007; Guillaumont, 1971). Yet, the disbursement delays approach was neglected by academic works, which is surprising regarding to interest made by aid practitioners on this issue. This research aims at remedying this weakness by proposing both theoretical and empirical framework to analyze aid delays. The disbursement delays approach is also called "pipeline approach" of absorptive capacity in reference to the stock of aid waiting to be disbursed, then lags between commitments and disbursements. We are then interested by the uncertainty associated to the rhythm of aid disbursements.

In our assumptions, the size of aid pipeline reflects the importance of bottlenecks affecting the adequate timing of disbursements, so that they provide useful indications on the absorptive capacity of a given receiving country. Uncertainties resulting from aid delays and unpredictability affect negatively economic performance of receiving countries by decreasing aid impact on growth and by affecting recipient government's incitements to undertake huge public investment in

order to reduce poverty (Lensink and Morrissey, 2000; Bulíř & Lane, 2002). However one might consider some mitigating effects while assuming that recipient governments are in the habit to face foreign aid unpredictability.

The small literature on aid delays does not present uniform view about the relevance and size of lags in disbursements as much as about the potential factors that could explain these delays (Odedokun, 2003 ; Leurs, 2005; Svenson, 2006 ; Kanbur, 2000; Deutscher and Fyson, 2008 ; Celasun and Walliser, 2008 ; OECD-DAC, 2008; Bulíř & Hamann, 2006; Bulíř & Lane, 2002). In a such context, we propose firstly in this paper a brief review of debate on the causes and size of aid delays by distinguishing multilateral and bilateral donors and by making difference between the causes coming from recipients and those attaching to donors behaviours, and without neglect the causes related to aid modalities. In a second step, we draw a theoretical framework for disbursement delays analysis, which leads us to build some stylized facts on bilateral and multilateral aid delays in African benefiting countries. The last part of this article try to shed light on some empirical determinant of aid delays in Africa by using an econometric approach through a dynamic panel data model (ARDL) which allows to make difference between short and long run effects of disbursement constraints.

## **2. Do aid delays really matter for absorptive capacity? Theoretical arguments about the origins of gap between commitments and disbursements.**

The interest to study the absorptive capacity through the pipeline approach is led by the fact that it allows us to understand and to pick up the short run constraints of absorptive capacity. Old approaches to absorptive capacity were unsatisfactory because they describe and capture essentially the long run constraints on aid disbursement. Aid pipeline represents the amount of aid pledged by donors but not yet disbursed. This waiting stock of aid are often postponed or simply cancelled according to situations. So, the level of the pipeline is influenced by the importance of bottlenecks and constraints that disbursement process has to support. Also the pipeline level might be a good indicator of the capacity of a given recipient country

to absorb usefully more important quantity of foreign aid flows. Yet, the magnitude of disbursement lags will depend on the frame adopted to notify the dates of new disbursements regarding to commitment dates. Because donors and recipients use sometimes different definitions of disbursement dates, they are some confusion on disbursement delays measures which make difficult temporal and cross countries comparisons.

The invisible bureaucratic pipeline of aid has a circuit which runs from donor side to recipient country. So that, the time gap between different levels of this pipeline might relatively be long according to the stage of aid cycle where there are bottlenecks. In this way, we can distinguish three stages on aid cycle: feasibility studies, negotiation and execution. Our analysis is focused on the later stage of aid cycle. Then, it is important for the receiving country to deal with a regular and predictable rhythm of disbursements, which is crucial for budget planning, credibility in terms of public investment and avoiding diminishing utility and time inconsistency problem in public resources allocations.

More importantly, there is a real need to identify and explain the factors that are at the origin of long disbursement delays. However, in the academic literature, there is no consensus about the nature and net consequences of constraints affecting aid disbursements. Indeed, some authors like Svensson (2006) and Kanbur (2000) support the idea that there are inadequate quick disbursements of aid because donors are under the spell of pressures or victim of Samaritan dilemma, while other authors (Odedokun, 2003 ; Leurs, 2005; Deutscher and Fyson, 2008 ; Celasun and Walliser, 2008 ; OECD-DAC, 2008; Bulíř & Hamann, 2006; Bulíř & Lane, 2002; Roodman, 2006) are denouncing the slow rhythm and long delays in aid disbursement. Before exposing the argumentations of each of these two groups, let us notify that in the two cases (quick and slow disbursement), it's the aid effectiveness which is threatened. Indeed, the risks associated to quick disbursements are strong and concern for instance the waste of aid and the promotion of bad governance. In other side, slow disbursements can have undesirables effects mentioned above by generating uncertainty on disbursement rhythm or by reducing in fine the global volume of aid available, due to potential cancellations resulting from long delays.

### *Arguments supporting the existence of excesses in the rhythm of disbursements*

A part of aid literature postulate that the current rhythm of aid disbursement is excessively high contrary to that we can imagine. For authors defending this fact, aid agencies are facing to pressures in different kinds, in order to disburse quickly aid even if the conditionalities associated to it are not satisfied. The nature of pressures for disbursements depends on the type of aid agency - multilateral or bilateral- and on the modalities of aid - loan or grant. For multilateral agencies, the pressures could come from the main principal -shareholders- of these agencies, namely the rich developed countries. Indeed, multilateral agencies aid allocation is often influenced by political factors coming from developed countries, so that the disbursements could also be influenced by these same factors. Bureaucratic considerations and interest in aid agencies are also likely to lead to quick disbursements because it is usual to determine the size of new commitments in accordance to aid agencies performance in terms of past disbursements (Svensson, 2006; Kanbur, 2000). On the other hand, bilateral aid agencies are not far from some pressures. As multilateral donors, bilateral agencies could also be confronted to bureaucratic interests and constraints (bounds of fiscal year) which could encourage quick disbursements. In addition, bilateral donors pursue generally multiple objectives among which political and trade considerations (tying aid) that tend to contribute for an acceleration in the rhythm of disbursements (Celasun and Walliser, 2008 ; Villanger, 2006 ; Amegashie and al, 2007).

Nonetheless, both bilateral and multilateral aid agencies are affected by Samaritan dilemma which refers to their incapacity to have credible commitment aiming to punish bad performances of receiving countries. There is asymmetric information in the relation between receiving countries, donors and developed countries citizens contributing to aid. This classical agency problem contributes to quick and inefficient disbursements of aid in a system of ex-ante conditionality (Svensson, 2000; Easterly, 2000; Miquel-Florensa, 2007; Leandro and al, 1999; Svensson, 2003; Adam and al, 2004; Pedersen, 2001; Hagen, 2006).

### *Arguments aiming to explain the existence of long disbursement delays*

The potential explanatory factors of long delays can be classified in three groups: the factors specific to donors, those coming from recipient characteristics and finally the factors in relation with aid modalities.

#### *Donors specific factors*

*Donor's fragmentation and the slowness related to multiple procedures:* aid fragmentation concerns the number of donors in a recipient country as well as the proliferation of activities financed by donors (Knack and Rahman, 2004 ; Roodman, 2006, Deutscher and Fyson, 2008 ; Celasun and Walliser ; 2008 ; OECD-DAC, 2008). As matter of fact, the transaction cost become more and more substantial for recipient country and the problem of "non objection opinion" is reinforced. Also, bureaucratic slowness in donor's country and calendar or priorities discrepancies leads to long delays in aid disbursement. Otherwise, *Paris declaration* in 2005 recognized that donor's coordination is one of key issues of aid effectiveness.

*Aid allocation is often made on political basis:* as commitments are influenced by political factors, it is not surprising that disbursements also be under these factors. Bilateral aid seem to be more concerned by this issue than multilateral aid (Alesina and Dollar, 2000; Collier and Dollar, 2002 ; McGillivray, 2003 ; Berthelemy and Tichit, 2004 ; Isopi and Mavrotas, 2006).

*Aid conditionality problem:* conditionality is a technology seeking to solve the problem of asymmetric information and time inconsistency in the relation between donors and recipients. Recipient could be tempted by some opportunism behavior, as it knows that aid flows can be fungible and donor is likely to be under Samaritan dilemma (Azam and Laffont, 2003; Devarajan and Swaroop, 1998; Svensson, 2000; Pedersen, 2001; Hagen, 2006). Thus, the non fulfillment of political and economic conditionalities by recipient leads to long delays and cancellation in disbursements. However, it can occur that recipient satisfied all conditionality's rules while the donor refused to disburse the amount of aid pledged. Yet, the new tendency is to move from input conditionality towards outcome/performance conditionality.

### *Recipient specific factors*

At receiving country level, some factors can be identified as sources of long delays of disbursements. Among these factors we have the bureaucratic slowness which, combined with multiple procedure for financing agreement and non fulfillment of conditionalities contribute to deepen disbursement delays. In many recipient countries, public administration is not able to follow accurately all procedures requested by donors and this situation has for consequence to lag aid disbursements. Delays are also important because recipient financial compensation in aid disbursement schemes is sometimes overestimated and it remains some problem of public procurement and contractual enterprise failures in the execution stage of aid activities. Yet, some political and institutional characteristics of recipient could matter for disbursement rhythm. Indeed, during political events and instability, donors are generally more suspicious about the use of their financings, so that they use to slow down or stop disbursement.

### *Aid modalities matter*

As aid flows are not homogeneous we might have some discrepancies of disbursement constraints following aid modalities. Aid financial modalities –loan or grant- are not expected to have similar disbursement constraints. Loans disbursements should have relatively long delays above all in cases of high indebted recipients, but in the other hand we can imagine that delays in loan disbursements are low in comparison with delays in grant disbursements because grants can be assimilate to free resources by recipient, so donor pays more attention in disbursement process. These theoretical contradictions can be elucidate by the fact that the comparison between aid financial modalities will depend on what aid is assumed to finance (Fielding and Mavrotas, 2005). For example, when grants are provided through emergency aid, their delays might be weak comparatively to loans which finance generally strong projects. Indeed, delays in infrastructure projects must naturally be high relatively to delays in social projects. In the same way, disbursement delays will depend on channels through which aid flows are provided. Budget and program aid flows are not constrained in the same way as project aid

flows. Consequently, differences in bilateral and multilateral donors' behaviors in terms of disbursement delays could be explained by their discrepancies in adopting aid modalities, their differences in activities financed by aid and differences in their aid recipients.

### *Some empirical case studies on the causes and magnitudes of disbursement delays*

In 2005, the SPA - Strategic Partnership with Africa - has published a report (SPA, 2005) to present the results of its surveys undertaken in 15 African states during 2003 and 2004. They have found that on average 81% of aid commitments made in 2003 was disbursed in the same year, while 10% was disbursed in 2004 and 9% was cancelled. In 2004, only 73% of commitments were disbursed and 22% was cancelled. This study has also shown some discrepancies between countries, for example, while in Senegal only 25% of commitments were disbursed in the same year, Niger and Ethiopia present 100% of disbursement. Concerning the causes of delays and cancellations, the report of SPA has noted that donors estimate to 40% the proportion of cases due to the non fulfillment of conditionalities, 29% was related to administrative issues on donor side, while 25% concerned slowness in procedural conditions respect by recipient. Only 4% of cases were due to political problem at donor side. Bilateral and multilateral donors differ once again because 60% of delays for multilateral aid are due to conditionality non satisfaction while this cause represents only 35% for bilateral aid. Indeed, the report has found that the first cause of delays in bilateral aid (40% of cases) is the administrative problems in donor country and recipient non fulfillment of procedural conditions is the second cause of multilateral aid delays (25% of cases).

In the same vein, Bulir and Hamann (2001; 2003) and more recently Celasun and Walliser (2008) have found that the predictive power of IMF's aid commitment in terms of disbursement is on average between 70% and 80% in Africa. Finally, Odedokun (2003) has shown that the rate of disbursement (disbursement compared to commitment) of the aid provided by DAC bilateral donors is influenced by donor economic and political characteristics (growth, budget, political polarization...) and by aid modalities such the tying degree, the proportion of grant.

### 3. Analytical framework and some stylized facts on disbursement delays

In this part, we seek to establish some stylized facts on disbursement delays. Then, we'll have an idea on their magnitude and evolution by checking for eventual difference between bilateral and multilateral donors while these stylized facts might shed light on the existence of recipient specific factors as well as donors' specific factors in delays occurrence. Before we analyze these stylized facts, it is necessary to present the analytical setting used to draw them.

#### 3.1. Analytical framework for disbursement delays indicators

Two types of indicators are developed and will serve to capture delays magnitudes: simple indicators and weighted indicators. Simple indicators are defined to measure the disbursement delays for given recipients or donors, without taking into account the weight of different sources or destinations of aid.

##### *Simple indicator of absorptive capacity*

This indicator measures the average delay, in terms of a time unit, for the aid received by a recipient from a specific or a set of donors. The starting point of our model of simple delays indicator comes from those developed by Guillaumont (1967) to which we added some changes.

The Pipeline « **PL** » at the beginning of period  $t$  is defined as follow:

$$P L_t = \sum_{-\infty}^{t-1} (C 1_t - C 2_t) - \sum_{-\infty}^{t-1} D_t \text{ with } P L \geq 0 \quad (1)$$

**C1** denotes the sum of new commitments of the period  $t$  with additional commitments coming from changes in earlier or current commitments while **C2** represents commitments lost by cancellations. **D** designs current disbursements

Then, the pipeline PL measures the stock of aid committed but in waiting for disbursement at each beginning of period. In the case of a yearly commitment system, the pipeline captures the weakness of absorptive capacity in the receiving country. This relative weakness is due both to recipient and to donor. However, in the case of multi-yearly commitment system, the pipeline does not represent systematically a problem because it is normal that disbursements, associated to multi-yearly commitments become spread out the time. But in this case, what's important is the rhythm of disbursements which might be predictable.

Then, at each beginning of period, the capacity to disburse "CD" is obtained by adding to the pipeline, the new commitments. It represents the potential disbursements available at each beginning of period.

$$CD_t = PL_t + C1_t - C2_t \quad \text{with } CD \geq 0 \quad (2)$$

From the identity (2), we derive the simple indicator of average disbursement delays "d" which measures the average waiting time for one unit of commitment before it disbursement when we consider the pipeline.

$$d_t = \frac{CD_t}{D_t} \quad \text{where } d \geq 1 \quad \forall D \neq 0 \quad (3)$$

The inverse of the average delay represents the average speed of disbursement which characterizes the disbursement rhythm. Yet, the simple indicator of delay can be criticized because it doesn't take into account the heterogeneity of donors and recipients weights. For this reason we develop average weighted indicators for recipients' absorptive capacity and for donors' performance in aid disbursement.

### *Average weighted indicators of absorptive capacity*

The idea that motivates our choice to develop weighted indicators of delays is guided by a straightforward assumption that the capacity of a recipient to absorb

usefully more aid depends naturally on its own characteristics, but also depends on donors' characteristics such their importance for this recipient comparatively to others recipients. Then, disbursement delay of aid from a donor  $j$  to a recipient  $i$  is influenced in one hand by the weight of the aid of  $j$  among the global aid received by  $i$  during a given period, and in other hand by the weight of  $i$  among all recipients of  $j$ . However, the net effect of these influences is not theoretically established. For example if the aid of a donor  $j$  represents a big part of the total aid received by a recipient  $i$ , we could wait both for a long and short delay. The argument of short delays can be explain by the fact that the recipient in this case will pay more attention to disbursement conditionalities to be respected if it wants to receive this important amount of aid. For instance, we can also assume that the confidence between donor and recipient will be better in the case of high weight, so that facilitate the rhythm of disbursement and the predictability of aid (OECD-DAC, 2008). In other hand, the argument of long delays can be support by the fact that in the case of a high weight, big amount of aid are generally addressed to the financing of big activities such as infrastructures, which by essence, need objective long delays, necessary to deal with technical aspects.

Concerning the weight of a given recipient among all others recipients for a given donor, the influence could be explain in one hand by the importance of political and strategic considerations on behalf of the donor, or in other hand by the sensibility of donor face to some socio-economic characteristics of a recipient, notably the structural vulnerability profile of recipient. For these reasons we can't derive the direction of influence because if we have to assume that political and strategic considerations allow delays fall, we could reasonably postulate that the structural characteristics of recipients lead to rising delays.

*Average weighted delay of recipient*

Now, let us consider the following identity:

$$dr_{i,t} = \sum_{j=1}^p \alpha_{ij,t} d_{ij,t} \tag{4}$$


  
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$$dr_{i,t} = \sum_{j=1}^p \alpha_{ij,t} (d_{ij,t} - \bar{d}_{j,t}) + \sum_{j=1}^p \alpha_{ij,t} \bar{d}_{j,t} \quad (5)$$

$$dr_{i,t} = \sum_{j=1}^p \alpha_{ij,t} (d_{ij,t} - \bar{d}_{j,t}) + \sum_{j=1}^p (\alpha_{ij,t} - \alpha_{j,t}) \bar{d}_{j,t} + \sum_{j=1}^p \alpha_{j,t} \bar{d}_{j,t} \quad (6)$$

Where we assume that:

$$\alpha_{ij,t} = D_{ij,t} / \sum_{j=1}^p D_{ij,t} ; \quad \alpha_{j,t} = D_{j,t} / \sum_{j=1}^p D_{j,t} ; \quad d_{ij,t} = CD_{ij,t} / D_{ij,t} ; \quad \bar{d}_{j,t} = \frac{1}{n} \sum_{i=1}^n d_{ij,t} ;$$

$$D_{j,t} = \sum_{i=1}^n D_{ij,t}$$

$\alpha_{ij,t}$  measures the relative weight of a donor  $j$  in a recipient  $i$  country.

$\alpha_{j,t}$  measures the relative weight of a donor  $j$  regarding to all donors who intervene in  $n$  receiving countries.

$\bar{d}_{j,t}$  is the average disbursement delay of a donor  $j$  in all receiving countries during period  $t$ .

$d_{ij,t}$  is the simple average delay of the aid of donor  $j$  in recipient  $i$  country and is obtained from (3).

$CD_{ij,t}$  represents the capacity to disburse (as define previously in equation (2))

$D_{ij,t}$  is gross disbursement of aid

$X$ = average weighted delay of recipient  $i$  with  $X= A+B$

$A$ = part of delay due to the specificity of a recipient  $i$  and is assumed to represent the endogenous component

$B$ = part of delay due to the characteristics of aid providers (donors) to a recipient  $i$ . and is assumed to represent the exogenous component of the weighted delay index.

Then we note that  $B= C+D$  while  $C$  is the part of delay related to the structure of specific origin of aid provided to recipient  $i$  while  $D$  represents the average delay of all donors to all  $n$  recipient countries.

$dr_{i,t}$  is then an average weighted indicator of disbursement delay. It can capture the capacity of a recipient to absorb more aid after taking into account donors and recipients characteristics.

**Proposition 1:** a high value of delay indicator “X” attested the presence of a weak capacity of recipient to absorb usefully large amount of aid.

**Proposition 2:**

A positive value of “A” shows the weak performance of a recipient  $i$  in terms of disbursement delays and absorptive capacity. Recipient  $i$  deepen delays through its behavior and own characteristics. By symmetry, a negative value of “A” denotes a better performance of a recipient  $i$  regarding to the average recipient. It contributes to reduce average delays.

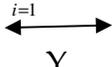
**Proposition 3:**

- a) a recipient  $i$ , instead of getting the value  $X$  as average weighted delay, should have the value  $B$  if it behaves normally as the others recipients, given donors behaviors and the structure of origin of the aid received.
- b) A negative value of “C” denotes a better performance of the recipient  $i$  due to the specificity of its aid origin structure. This means that it used to receive aid from a set of donors which perform better than the average donor in terms of aid disbursement rhythm.

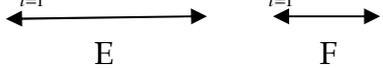
### Donor performance indicator

Symmetrically to the weighted index made for recipient, we develop here the average weighted delay indicator for a donor. Let’s start by the following identities:

$$dd_{j,t} = \sum_{i=1}^n \beta_{ij,t} d_{ij,t} \quad (7)$$



$$dd_{j,t} = \sum_{i=1}^n \beta_{ij,t} (d_{ij,t} - \bar{d}_{i,t}) + \sum_{i=1}^n \beta_{ij,t} \bar{d}_{i,t} \quad (8)$$



$$dd_{j,t} = \sum_{i=1}^n \beta_{ij,t} (d_{ij,t} - \bar{d}_{i,t}) + \sum_{i=1}^n (\beta_{ij,t} - \beta_{i,t}) \bar{d}_{i,t} + \sum_{i=1}^n \beta_{i,t} \bar{d}_{i,t} \quad (9)$$



$$\text{with } \beta_{ij,t} = D_{ij,t} / \sum_{i=1}^n D_{ij,t} ; \beta_{i,t} = D_{i,t} / \sum_{i=1}^n D_{i,t} ; \bar{d}_{i,t} = \frac{1}{p} \sum_{j=1}^p d_{ij,t} \quad D_{i,t} = \sum_{j=1}^p D_{ij,t}$$

$\beta_{ij,t}$  denotes the weight of recipient i among all the recipients of donor j.

$\beta_{i,t}$  denotes the weight of recipient i among all the recipients of aid from all donors.

$\bar{d}_{i,t}$  measures the average delay of aid received by the recipient i.

E= the part of delay due to a donor j and represents the endogenous component of weighted index; F= average delay of all the recipients of donor j and represents the exogenous component of weighted index; G= part of delay relate to the structure of specific destination of donor j aid; H= average delay of all aid recipients from all donors.

$dd_{j,t}$  (part Y) is then the average weighted delay of donor j aid disbursement.

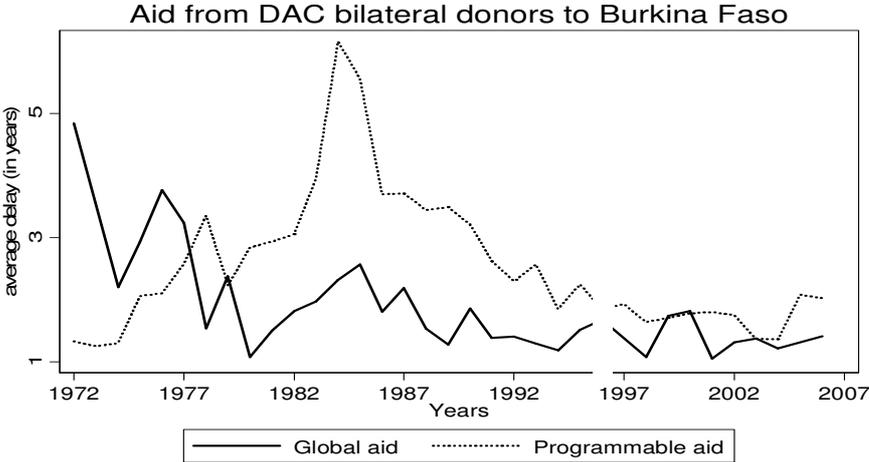
**Proposition 4:** Donor j, instead of getting Y as average delay, should have the value F if it behaves normally as others donors, given the structure of specific destination of it aid and given behaviors of all recipients of aid from all donors.

### 3.2. Some stylized facts of disbursement delays

In this part, we draw some stylized facts on disbursement delays by using the simple and weighted delay indicators that we have just presented in the previous section. Data used to perform stylized facts come from DAC international development statistics. Twenty two DAC bilateral donors and three multilateral donors (World Bank, African Development Bank and European Commission) are concerned by the study. 52 African states during the period 1972 and 2006 form our panel of aid recipients. For the sake of relevance, we develop and use the concept of programmable aid which presents the advantage to capture, with more accuracy, the real amount of aid flow arriving effectively in recipient country (OECD-DAC, 2008). For this purpose, we subtract to global ODA commitment and disbursement, the elements having by essence speedy disbursement or negligible delays. This concerns emergency aid, food aid, debt forgiveness and technical assistance. If these elements are not subtracted, the average delay will be underestimated. For us, it's only the

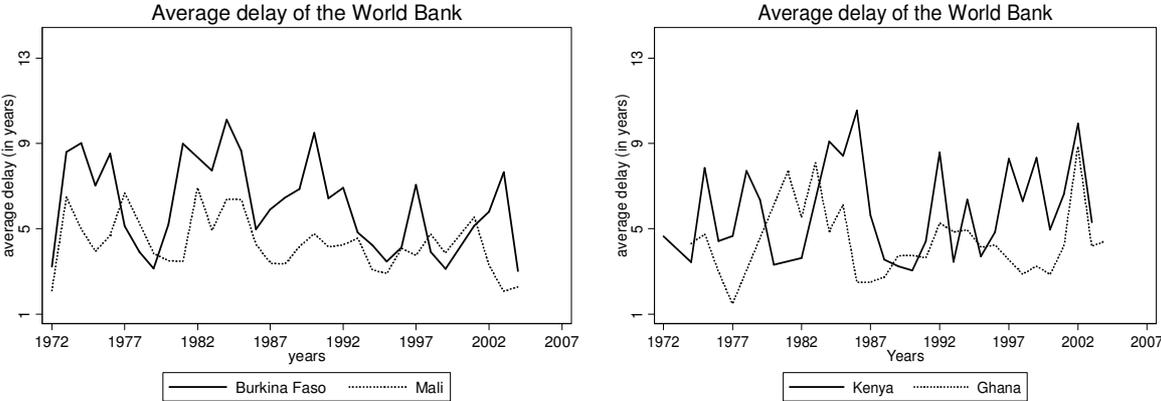
programmable aid concept which is relevant while measuring disbursement delay because it's this kind of aid which has commitment and disbursement to be spread out of time.

**Figure 1** : Comparison between global aid and programmable aid delays



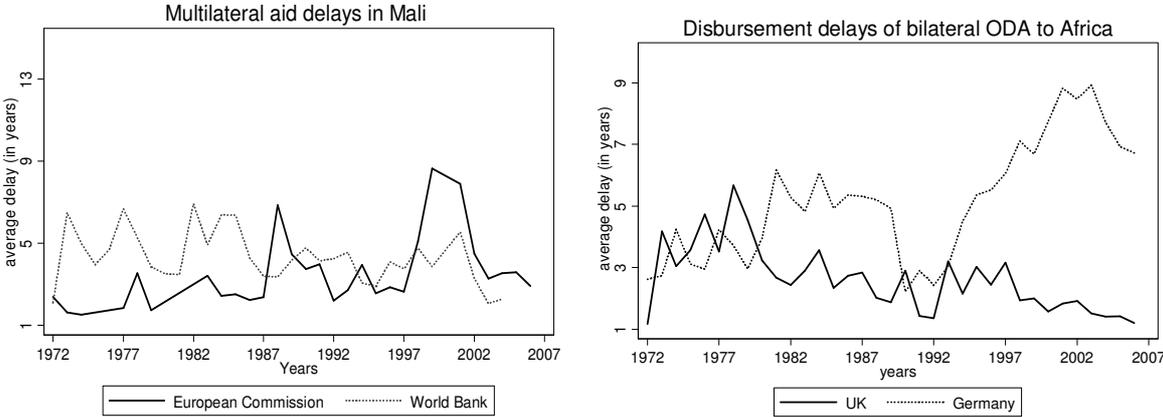
This chart supports our assumption according to which programmable aid has high delays regarding to global aid. This tendency is also true for the other African countries. For this reason, we'll use only the programmable aid in the rest of this paper. Otherwise, this chart shows some swings in the evolution of disbursement delays with some decreases from a decade of 1990. On average, disbursement delays in Burkina Faso are under three years.

**Figure 2** : Comparisons of recipients according to simple average delay indicator

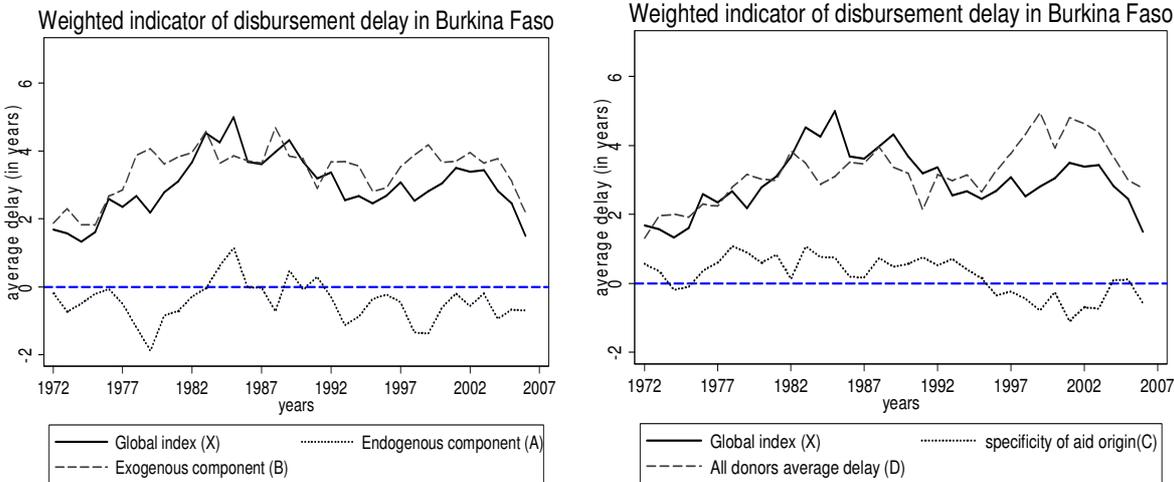


The figure n°2 shows a relative heterogeneity of recipients in terms of delay magnitude but some homogeneity in the evolution of delays. This fact can indicate the existence of factors, independent to recipients, which can influence the evolution of delays. We can notably think about donor's specific factors influencing the size and evolution of delays in recipient's countries. About this assumption, we can clearly see, in the figure 3, that for the same recipient, donors present differences in delays magnitude and evolution. So that, we are able to affirm that disbursement delays are influenced both by recipient's characteristics and by donor's characteristics. Yet, aid modalities should also matter but we haven't adequate data to prove it in this paper.

**Figure 3:** Comparison of donors in the same recipient country (simple average indicator)

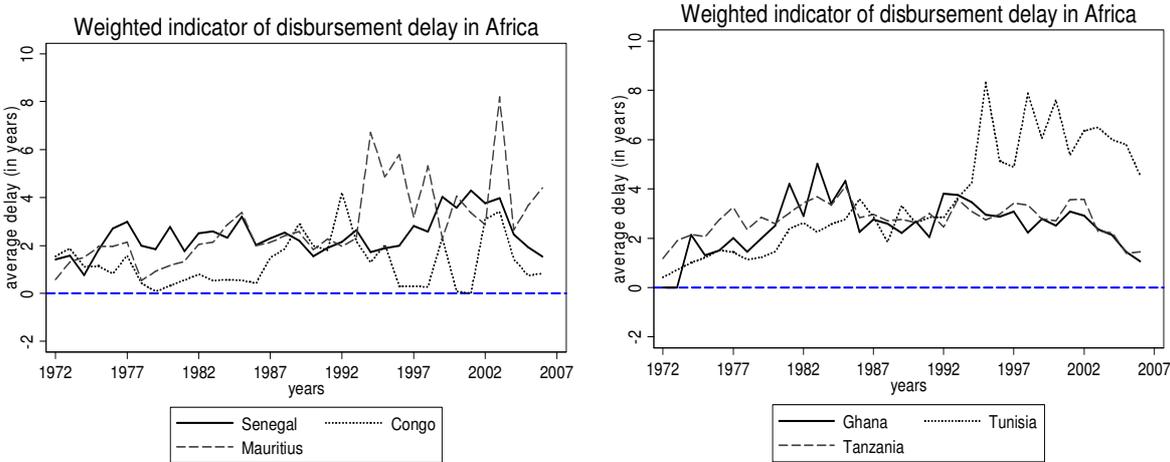


**Figure 4:** Evolution of different components of the weighted indicator of disbursement delays in Burkina Faso.



The Figures 4 and 5 show in some high swings in weighted delays of recipients, so they attest in some extent the unpredictability of aid disbursements. We remark some tendency in weighted delays to increase overtime contrary to the decrease of delays measure by the simple indicator. This situation could be explained by the increase in absorptive capacity constraints, notably aid conditionalities which become more rigorous after the cold war. Recipient heterogeneity persists forever with the weighted indicator as shown in the Figure 5 and Annex 1.

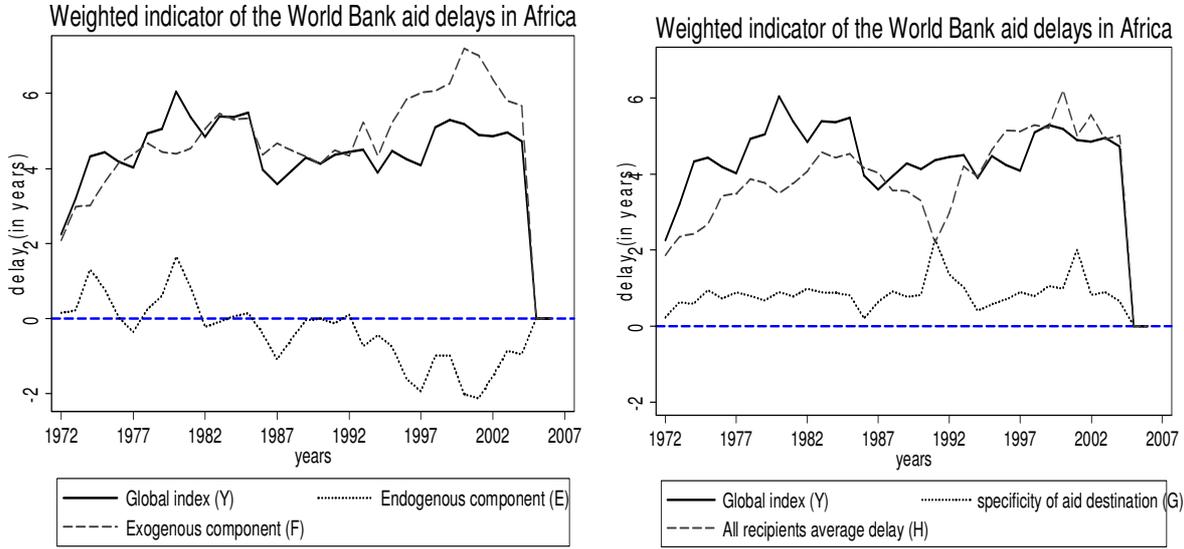
**Figures 5** : Comparison of recipients according to the average weighted delay indicator



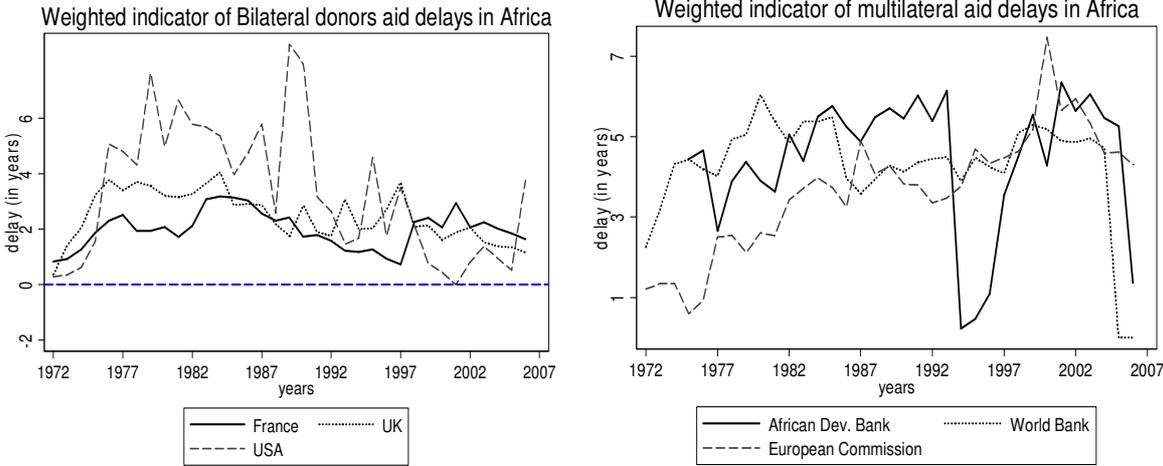
While considering the different components of the weighted indicator of disbursement delays, we could note that the global score of many recipients is mostly driven by exogenous factors. Indeed, in the Figure 4, the curve representing the component B (as defined in the equation (5)) is over that of the global index (X) which means that Burkina Faso performs better than the average recipient in terms of aid absorption. As the curve representing the endogenous component C is under the line  $y=0$ , one might assume that some endogenous characteristics of Burkina Faso contribute to dampen the negative effects of absorptive capacity constraints. However the effect the structure of specific origin of ODA given to Burkina Faso has shifted overtime, passing from a negative effect to a positive effect since the middle of the decade 1990s. This fact supports the assumption of changes in the way that donors behave. It's what we examine in the following charts. In this connection, the Figure 6 presents some interesting stylized facts for the World Bank ODA in Africa. Indeed, the left part of the Figure 6 shows that the World Bank began to perform

better than the average donor since the beginning of the decade 1990s because the global index (Y) curve is under the exogenous component (F) curve (see equation (8) for the construction of the index). This period coincides with the end of the cold war and the launch of good governance paradigm by the World Bank. As shown by the curve representing the endogenous component (E), the new World Bank's aid policies taken since 1990 allow it to improve its performances in terms of aid disbursement rhythm up to the dawn of the new millennium when the advent of aid selectivity seems to reduce this performance (see Annex 2 for stylized facts concerning others donors). However, the right part of the Figure 6 shows some performance gain due to the World Bank's aid targeting system since the beginning of the millennium in a context of good governance based- selectivity. Indeed, the curve representing the component (G) is decreasing during the decade 2000s which attests some improvement in the effect related to the specificity of structure of World Bank's aid destination.

**Figure 6:** Evolution of different components of the weighted indicator of the World Bank ODA disbursement delays



**Figures 7 :** Comparison of donors according to the average weighted delay indicator



The Figure 7 witnesses the presence of heterogeneities in donor performances in terms of aid disbursement rhythms as previously shown with simple delay indicator. Yet, we note a decrease in donors’ delays from a decade 2000, which could be due to MDGs advent. Finally, stylized facts support most theoretical assumptions about disbursement delays, notably heterogeneity in recipients and donors behaviors and high unpredictability of aid disbursements. These assumptions will also be checked in the econometric section.

**4. Econometric analysis of disbursement delays: ARDL error correction model.**

**4.1. Motives for using an ARDL model**

In this part, we are seeking to to check empirically the existence of limits to absorptive capacity according to the pipeline approach and to pick up the dynamism accompanying the influences of potential factors affecting the absorptive capacity. These identifications are made through a dynamic panel model, namely ARDL - *Auto Regressive Distributed Lags* - which allows dealing simultaneously with short and long terms dynamism of absorptive capacity. As it’s recognized that absorptive capacity is essentially a dynamic phenomenon, it appears relevant for us to use an ARDL model contrary to some authors who use a classical panel model (Ododekun, 2003) or AR model (Bulir and Hamann, 2001 ; 2003). Indeed, the temporal lags

between commitment and disbursement lead likely to a co-integration system which need an error correction model. This is necessary to capture the magnitude of short run disequilibrium between commitments and disbursements and finally to pick up the size of the adjustment' speed of disbursements towards their long run equilibrium conditioned by the pipeline. In practice, it's consist to explain disbursement variations by current and passed commitments, passed disbursements, recipients and donors characteristics and aid modalities. The AR dimension of our model is supported by the assumption that passed disbursements can affect current disbursements. This assumption result from the principle of commitments' continuity which means that in the case of multiyear commitment system the amounts of passed disbursements associated to these commitments will determine the amount of current disbursements. The DL dimension of the model is guided by the assumption that passed commitments influence current disbursements. This assumption is based on the principle of continuity for commitments which are generally distributed over time due to donor's willingness or due to absorptive capacity constraints. Therefore the combination of these two dimension deals explicitly with the pipeline generated by the lag between commitments and disbursements while correcting for uncertainty magnitude on disbursements.

#### 4.2. *Econometric specification and estimation techniques*

The ARDL model specification is:

$$D_{i,t} = \sum_{j=1}^p \alpha_{ij} D_{i,t-j} + \sum_{l=0}^q \beta_{il} X_{i,t-l} + \mu_i + \varepsilon_{i,t} \quad (10)$$

where  $D_{i,t}$  denotes gross disbursements of ODA received by a recipient  $i$  ( $1, \dots, 52$ ) during the period  $t$  ( $1, \dots, 32$ ).  $X$  is the explanatory variables vector. The equation (10) leads to an error correction model used for the estimations.

$$\Delta D_{i,t} = \phi_i (D_{i,t-1} - \theta_i' X_{i,t}) + \sum_{j=1}^{p-1} \alpha_{ij}^* \Delta D_{i,t-j} + \sum_{l=0}^{q-1} \beta_{il}^* \Delta X_{i,t-l} + \mu_i + \varepsilon_{i,t} \quad (11)$$

where  $\theta_i = -\phi_i^{-1}\varphi_i$  is the long run elasticity vector.  $\alpha_{ij}^*$  and  $\beta_{il}^*$  are the short run elasticity coefficients.  $\phi_i$  is the error correction coefficient, then it measures the adjustment speed of disbursements converging toward their long run equilibrium when it happens some variations in commitments or other factors influencing absorptive capacity. It captures the effect of the pipeline on disbursements after controlling for the other factors. The model is relevant if the estimated coefficient  $\hat{\phi}_i$  is significant and negative. More the absolute value of this coefficient is near to zero, less there is adjustment, so weak convergence of disbursements. These two parameters are very important for our analysis because the design and adoption of policy, against the harmful effects of aid instability and unpredictability, will depend on temporal or permanent nature of aid flow variations. Thus, our error correction model is estimated with the Mean Group (MG) and Pool Mean Group (PMG) method, developed by Pesaran and al (1999). MG allows individual heterogeneity both at short and long run, while PMG accepts heterogeneity at short run but homogeneity of behaviors at long run. For the authors, these estimators are better than other estimators such dynamic fixed effects estimator. In other hand, these estimators are robust to endogeneity and to the presence of unit roots.

### 4.3. *Data and variables*

Our sample is composed by 52 African countries observed during the period 1975 to 2006. Data come from DAC statistics, but we have apply the principle of programmable aid in order to be near to the effective aid flow going really to recipient country. The dependant variable is the annual disbursement of ODA coming from bilateral and multilateral donors. The explanatory variables are past and current commitment of ODA, past disbursements. These variables are in log format. Others variables such the share of grants in total ODA, the share of commitment going to African LDCs -Least Developed Countries- (selectivity issues), aid fragmentation index (number of donors having a weight inferior to 5%). In order to control for the recipient governance quality we introduce the dummy Election (if the recipient country is in pré-electoral or electoral period, see Keefer and al, 2002).

Recipient socio-economic characteristics are controlled by GDP per capita, while we use the rate of FDI (inflows) to capture the trade pressures on aid absorptive capacity.

#### *4.4. Results and implications for aid policy issues*

Three main findings are to be mentioned with the econometric estimation. First, we have found that absorptive capacity constraints matter essentially at short run. The second important result is that recipients and donors characteristics also affect disbursement delays and finally, the third result is that aid modalities influence disbursement delays too.

*Absorptive capacity constraints matter at short run: conditional convergence of disbursements*

The row (1) and (2) of the Table n°1 suggest two findings. The first finding is that there are disbursements constraints essentially at short run because we can remark that short run elasticities are negative, which means that marginal variations in commitments are not followed by marginal variations in disbursements. However, the long run elasticities show that the problem of absorptive capacity disappears with time and disbursements respond positively to commitments variations (96% for Mean Group estimator and 106% for Pool Mean Group estimator). This result supports the idea that absorptive capacity is fundamentally a short run problem, so disbursement delays approach remains more relevant than other absorptive capacity approach based on long run assumptions. The second important finding concerns the speed of disbursements. The adjustment coefficient is not enough high both for MG (56% per year) and PMG (46% per year). This coefficient characterizes the conditional evolution of the pipeline, so that, the disbursement delays properties are defined. Moreover, the Hausman test for the choice between MG and PMG estimators concludes to the relevance of PMG estimator, which is used in the rest of estimations.

*Some characteristics of recipients and aid modalities influence disbursement delays*

Socio-economic characteristics of recipients play some role in delays occurrence only at long run. Indeed, the effect of FDI rate is positive (Table n°1), this result could be supported by the fact that private interests of foreign investors are likely to generate pressures for disbursements in the case of tied aid. Recipients' institutional quality matters for delays as the dummy "Election" (Table n°1) has a negative effect at long run, which should denote the distrust of donors at the pre-electoral period, but at short run, the effect could be neglected. Aid selectivity also matters for disbursement delays (Guillaumont & Lajaaj, 2006; Chauvet & Guillaumont, 2006; Guillaumont, 2007). For instance, the aid targeting to LDCs countries in Africa leads to negative effects on disbursements at short run but the effects become positive at long run with a weak speed of adjustment (Table 2 and Table 3). We could explain this result by the fact that LDCs, with their structural vulnerability, meet some constraints to absorb more aid at short run, but this handicap disappears at long run. This result suggests to donors more attention while financing LDCs, and call for adapting aid to factors that can improve absorptive capacity. Concerning the aid fragmentation, it influences negatively disbursements (Table n°2) but with some threshold's effects. This negative effect is due to the increase of transaction costs induced by aid fragmentation. It will be better if donors accept more coordination and task division in aid system. In other hand, aid modalities are not to be neglected in disbursement delays analysis, because aid flows are not homogeneous. For example, aid financial modalities such the share of grants in aid commitments affects positively disbursements at long run and improve disbursement speed (see Table n°2). This result calls for more attention to aid modalities while making policies to improve absorptive capacity.

**Table n°1** : Determinants of ODA disbursement delays in African countries from all donors (1975-2006). Dependant variable: first difference of disbursements.

	(1)	(2)	(3)	(4)	(5)	(6)
	MG	PMG	PMG	PMG	PMG	PMG
<i>Long run</i>						
Commitment	0.956 (10.11)***	1.062 (42.78)***	0.976 (36.28)***	1.002 (42.09)***	1.016 (35.60)***	1.017 (46.90)***
GDP per capita			-0.329 (6.16)***	-0.327 (6.31)***		-0.340 (7.01)***
FDI rate				0.841 (3.25)***		0.633 (3.09)***
Election					-0.193 (4.98)***	-0.134 (4.34)***
<b>Speed of adjustment</b>	<b>-0.566</b> (16.44)***	<b>-0.461</b> (15.41)***	<b>-0.452</b> (9.17)***	<b>-0.490</b> (10.75)***	<b>-0.447</b> (16.20)***	<b>-0.476</b> (9.75)***
<i>Short run</i>						
Commitment	-0.097 (2.51)**	-0.073 (2.25)**	-0.112 (2.32)**	-0.093 (2.32)**	-0.054 (1.63)	-0.095 (2.12)**
Disbursement lag1	-0.048 (1.77)*	-0.084 (2.69)***	-0.103 (2.99)***	-0.068 (1.86)*	-0.100 (2.98)***	-0.085 (2.20)**
Commitment lag1	-0.030 (0.99)	-0.022 (0.94)	-0.015 (0.56)	-0.047 (1.78)*	-0.005 (0.21)	-0.039 (1.39)
GDP per capita			0.441 (0.91)	0.282 (0.61)		0.347 (0.75)
FDI rate				2.046 (2.10)**		2.341 (2.42)**
Election					0.060 (3.35)***	0.070 (3.22)***
Observations	1201	1201	1120	1101	1201	1101

Z- Statistics absolute values are in brackets. \* Significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. MG is the mean group estimator and PMG is the pool mean group estimator of Pesaran and al (1999).

#### *Heterogeneity in donors' behaviors: differences in multilateral and bilateral aid delays*

As revealed by stylized facts, the econometric estimations also find some differences between donors in terms of disbursement delays. The Table n°3 presents some comparisons between bilateral and multilateral donors. We note that the disbursement speeds for bilateral donors are inferior to those of multilateral donors (52% per year against 56%). This result is the opposite of those obtained through global ODA instead of programmable ODA (66% per year for bilateral against 55% per year for multilateral). What can explain this result?

**Table n°2:** Aid characteristics effects on ODA disbursement delays in African countries from all donors (1975-2006). Dependant variable: first difference of disbursements

	(1)	(2)	(3)	(4)	(5)
<b>Long run</b>					
Commitments	1.046 (54.96)***	1.089 (43.57)***	0.828 (39.76)***	0.818 (42.65)***	0.957 (54.74)***
Grants share	2.014 (13.97)***				1.508 (10.92)***
LDCs selectivity		1.099 (3.33)***			0.295 (1.51)
Aid fragmentation			0.900 (11.44)***	-4.726 (5.75)***	-3.435 (5.13)***
Aid fragmentation^2				1.096 (6.83)***	0.771 (5.84)***
<i>Speed of adjustment</i>	<b>-0.569</b> (15.27)***	<b>-0.431</b> (15.92)***	<b>-0.555</b> (14.70)***	<b>-0.563</b> (13.76)***	<b>-0.579</b> (9.93)***
<b>Short run</b>					
commitment	-0.130 (3.17)***	-0.057 (1.69)*	-0.083 (2.33)**	-0.091 (2.33)**	-0.066 (0.76)
Disbursement lag1	-0.024 (0.64)	-0.090 (3.02)***	0.007 (0.19)	0.022 (0.54)	0.026 (0.59)
Commitment lag1	-0.043 (1.71)*	-0.024 (1.01)	-0.055 (2.00)**	-0.063 (2.25)**	-0.090 (2.52)**
Grants share	-0.255 (1.95)*				0.673 (0.81)
LDCs selectivity		-0.834 (2.87)***			1.730 (0.61)
Aid fragmentation			0.007 (0.08)	0.027 (0.36)	-0.014 (0.13)
Observations	1201	1201	1081	1081	1081

Z- Statistics absolute values are in brackets. \* Significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. MG is the mean group estimator and PMG is the pool mean group estimator of Pesaran and al (1999).

The row (1) and (2) of table n°3 confirm the findings of stylized facts which show that global ODA data underestimates the importance of delays, by overestimating disbursement adjustment speed. The first explanation for this fact is trivial: bilateral donors provide an important part of their assistance in form of a non programmable aid (food aid, emergency aid, debt forgiveness, technical assistance). In this case, bilateral aid delays appear relatively low by spurious mechanism. But, when we apply the principle of programmable aid, bilateral aid's delays become higher regarding to multilateral delays. Yet, taken individually, some bilateral donors have low delays comparatively to some multilateral donors, as it is the case for France compared to the World Bank. Multilateral donors are not homogeneous in terms of delays, as we can see the comparison between European Commission and the World

Bank (Table n°3). Differences between bilateral and multilateral donors for disbursement delays could ultimately be explained by differences in their aid activities or sectoral affectation as we have mentioned in previous sections.

**Table n°3** : Sensitivity analysis of disbursements conditional convergence through different samples (1975 – 2006).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	programmable aid	globale aid	LDCs	Multilateral aid	Bilateral aid	European Commission	World Bank	France
<b>Long run</b>								
Commitment	1.062 (42.78)***	1.055 (61.27)***	1.156 (45.33)***	0.965 (35.36)***	1.120 (50.87)***	0.882 (33.64)***	0.920 (15.23)***	1.030 (34.17)***
<i>Adjustment speed</i>	-0.461 (15.41)***	-0.521 (16.88)***	-0.437 (10.94)***	-0.557 (12.23)***	-0.516 (12.34)***	-0.646 (14.21)***	-0.519 (13.28)***	-0.562 (8.55)***
<b>Short run</b>								
Commitment	-0.073 (2.25)**	-0.093 (2.91)***	-0.083 (1.98)**	-0.272 (7.06)***	-0.060 (1.10)	-0.383 (10.67)***	-0.310 (7.36)***	-0.220 (3.65)***
Disbursement lag1	-0.084 (2.69)***	-0.051 (1.61)	-0.088 (2.14)**	-0.071 (2.16)**	-0.121 (3.87)***	-0.057 (1.56)	-0.086 (1.29)	-0.024 (0.45)
Commitment lag1	-0.022 (0.94)	-0.032 (1.23)	-0.029 (0.88)	-0.205 (4.98)***	0.004 (0.12)	-0.234 (8.97)***	-0.183 (3.59)***	-0.129 (2.81)***
Observations	1201	1228	814	1152	1118	1053	292	783

Z- Statistics absolute values are in brackets. \* Significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.  
MG is the mean group estimator and PMG is the pool mean group estimator of Pesaran and al (1999).

## Conclusion

The identification of the most problematic factors influencing disbursement delays is important in the process of improving aid effectiveness and the adoption of strategies for coping with harmful effects of foreign financing uncertainty. This uncertainty is updated with the current financial crisis affecting seriously donor's countries. This paper has dressed a review of theoretical arguments explaining disbursement delays. It appears that the causes of delays are to be found both in recipients and donors characteristics notably their politico-economic characteristics, while aid modalities, such it selectivity in favor to vulnerable recipient countries and it financial composition in terms of loans or grants, are not to be neglected. The analytical framework that we developed allows the design of some stylized facts which support theoretical assumptions by showing broad swings in delay trends as well some heterogeneity among recipients. Bilateral and multilateral donors differ in

theirs delays through stylized facts as well through the econometric estimations which shed light on the existence of constraints to absorptive capacity essentially at short run. Among the explanations to give for these discrepancies, we have differences in aid modalities and motivations for each of these two kinds of donors. The results of this paper call for changes in donor's practices, notably in aid allocation process which should take into account recipients structural characteristics notably vulnerabilities issues and increase the share of grants in aid budget. Ultimately, dealing with aid delays and uncertainty needs some changes in recipient's behaviors for better governance policies and sound aid management.

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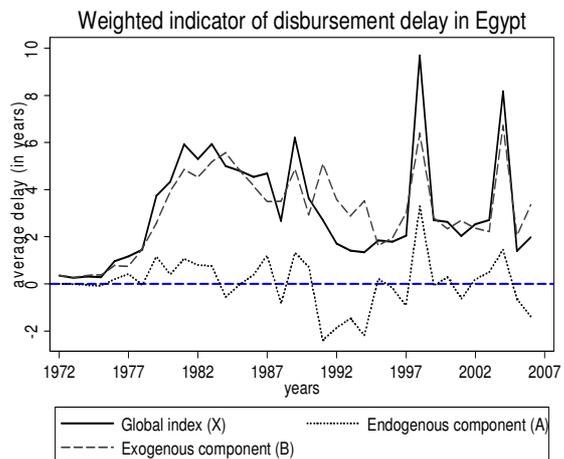
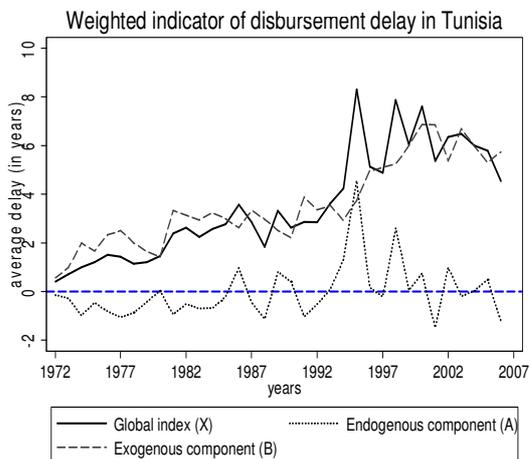
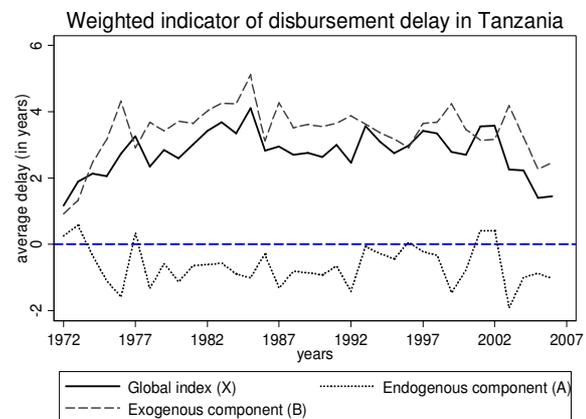
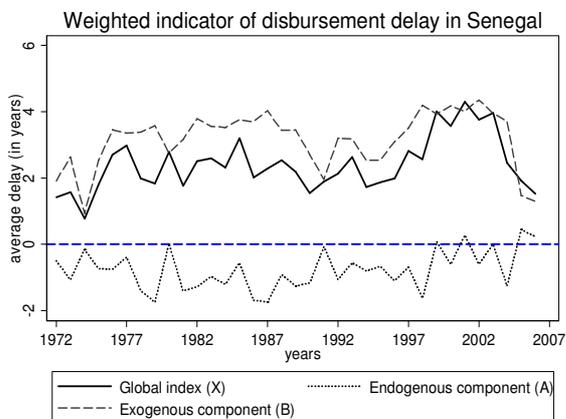
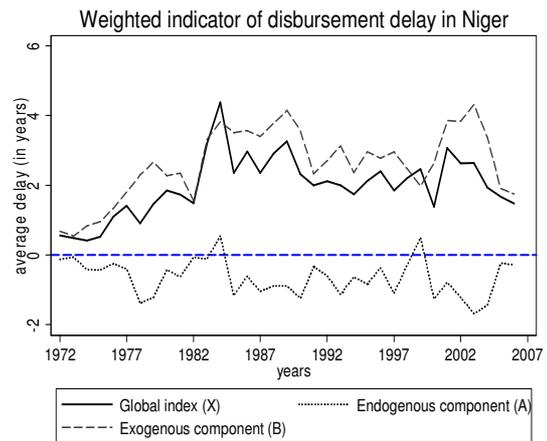
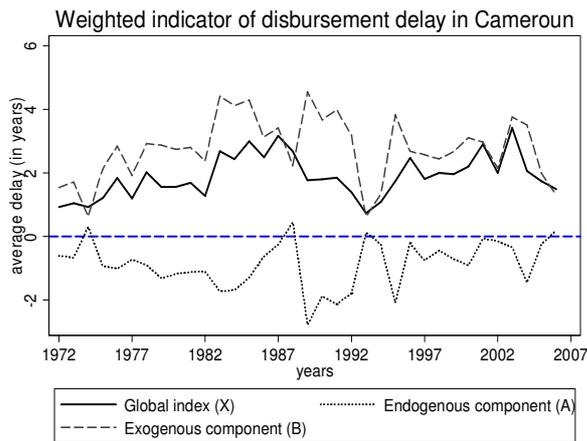
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## Annex 1: Weighted index of disbursement delays in African countries.



## Annex 2: Weighted index of disbursement delays of donors in Africa

