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**Does it Take Two to Tango? Improving Cooperation between the IMF and the
World Bank: Theory and Empirical Evidence**

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Does it take two to tango? Improving cooperation between the IMF and the World Bank: theory and empirical evidence

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Abstract

This paper analyzes the impact of different governance structures on the degree of Bank-Fund cooperation, focusing on the quality of their information transmission. It compares the performance of a decentralized governance with that of a centralized one. A centralized structure better addresses the necessity of coordinating policy actions, but greater consistency in policy actions will be achieved at the expenses of a less satisfactory adaptation to "local conditions." It is shown that when the need for coordination is relevant, a centralized governance allows to achieve a greater level of overall payoffs. In the real world the governance structure of the two institutions is certainly decentralized. A testable implication of the model would then be to see whether Bank-Fund's coordination is really important for their impact on recipient countries. The empirical evidence shows that a Bank-Fund simultaneous intervention is beneficial to growth and that such beneficial effect is increasing with the willingness to coordinate of the two organizations. This evidence would then be in favor of a (more) centralized governance.

Keywords: IMF and WB conditionality, coordination, communication

JEL Classification: D83, F33, N2.

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“While everyone agrees that coordination is necessary, nobody wants to be the one that is coordinated,” Joachim Koops (director of the Global Governance Institute, a Brussels-based think-tank, The Economist June 1st 2013)

1 Introduction

The International Monetary Fund (IMF) and the World Bank (WB) were originally created as two distinct and independent institutions with complementary tasks and different methods of intervention, within the framework of the Bretton Woods agreement (1944). Over the years, however, their mandates have expanded in response to the changing realities of the global economy and the degree of overlap between the two has increased, leading to more room for both conflict and cooperation. The importance of close collaboration between the Bank and the Fund is now a well recognized fact, which has also periodically been emphasized in a number of official documents.¹ However, despite a series of official declarations and agreements aimed at strengthening Bank-Fund collaboration, it is widely believed that coordination still falls short of what could be rationally expected (Truman 2006).

More specifically, "information sharing" between the IMF and the WB is what still needs to be greatly improved.² This comes as no surprise since successful cooperation requires effective transmission of information (communication) whenever information asymmetries exist.³ Thus, investigating what factors influence the quality and the extent of communication between the Bank and the Fund has now become particularly relevant. Little theoretical and empirical analyses exist, however, about what circumstances may inhibit or encourage Bank-Fund communications. In this paper we contribute to fill this gap by focusing on the factors that might inhibit (or enhance) the quality of information transmission between these two institutions and in turn their cooperation.

This choice is justified by the fact that, as the reform agenda has deepened to include institutional and social reforms, the collection of specialized information by the two institutions

¹As Krueger (1997) puts it: “a strong case can be made that the functions of lending policy advice, training, research and provision of information of both the Bank and the Fund are mutually complementary and that the spillovers from each of the functions to the others are large.”

²See the Malan Report (2006) and the Joint Management Action Plan on Bank-Fund Collaboration (JMAP) Report (2010).

³Although the extent of overlap between the operations of the two organizations have increased over time, they still maintain a strongly specialized expertise in their core areas of intervention: monetary, fiscal, and exchange rate policies for the Fund and policy areas related to development for the Bank. Therefore, each institution bases its decision on specialized information that is only partially overlapping.

has increasingly consisted in acquiring country-specific inputs.⁴ "Local knowledge" is certainly crucial to the definition of economic problems and to their solutions, but it is often too messy, political intractable, and very difficult to make judgments about (Wood 2006). In other words, it mainly consists of unverifiable information ("soft" information). This paper explores the interaction between the incentives of IMF and WB to communicate information which is useful for the design of policy choices when there is misalignment of interests. The analysis is conducted within a two-sided incomplete information framework in which the transmission of information—assumed to be costless—between the IMF and the WB is soft and cannot be verified. Whenever the interests of the two organizations differ, however, the quality of their reports will depend on such conflict of interests, with each of them expecting the information transmitted by the other to be distorted (*cheap talk game*).

Our key hypothesis is that such misalignment of interests arises whenever decision making involves a trade off between the need of coordinating policy decisions and the need of adapting to "local conditions". A greater pressure for conformity, required by the need of coordination, may contrast with the objective of enhancing policy adaptation to the specific conditions revealed by each institution's specialized expertise. Within this broad perspective, this paper focuses on the comparison of two types of governance structures, relative to the quality of the transmitted information: "centralization" and "decentralization." We define as "centralized" a governance structure in which the Fund and the Bank are not independent institutions but they both respond to an "headquarter" which centrally decides policies after receiving both the Fund and the Bank suggestions relative to their respective core area of expertise (vertical communication). Under decentralization, instead, control rights over policies are retained by the two institutions (as in the current structure), and coordination between them is left to the discretion of their executive boards (horizontal communication).

The headquarter maximizes overall "payoffs" (given by the sum of the Bank and the Fund objective functions), while under decentralization each executive board maximizes its own objective function. Contrary to the headquarter, the executive board of each institution does not fully internalize the benefits of coordination, since it does not internalize how its actions affect the other institution. Therefore, a centralized structure better addresses the necessity of coordinating policy actions. This intuition, however, overlooks the fact that the headquarter is uninformed and must rely on the "specialized information" transmitted by the Bank and the Fund to take decisions. Differently from a decentralized structure, where communication is crucial to improve coordination, in a centralized structure, communication

⁴For more details on the importance of context-specific knowledge for reforms design see, among others, Dixit (2009), Easterly (2006, 2008), Rajan (2008) and Marchesi *et al.* (2011).

is fundamental to improve adaptation. However, the misalignment of interests between the headquarter and the single institutions prevents vertical communication to be truthful. Thus, adaptation losses are always higher in a centralized governance than in a decentralized one. On the other hand, the decisions taken by the headquarter are not biased by the selfishness of the two institutions, as it happens instead in a decentralized structure. Therefore, the coordination losses are always lower under centralization. Thus, in a centralized governance, a greater consistency between the Bank and the Fund policy actions will be achieved at the expenses of a less satisfactory adaptation to local conditions. However, when the need for coordination is relevant, as it should be the case for the IMF and the WB given their strong complementarities, we find that a centralized governance allows to achieve a level of overall payoffs greater than those of a decentralized one. In conclusion, which governance structure is socially preferable critically depends on the relevance of the coordination needs.

In the real world the governance structure of the two institutions is certainly decentralized and, according to our model, in this case (horizontal) communication is jeopardized by the “selfishness” of the two institutions which does not allow them to fully internalize the benefit of coordination. Thus, improving communication would become fundamental to improve coordination. A testable implication of the model would then be to see whether variables measuring the IMF and the WB willingness (or ability) to coordinate may actually improve their impact on recipient countries. This circumstance could then represent (indirect) evidence in favor of the importance of their greater coordination. The empirical results show that a Bank-Fund simultaneous intervention is beneficial to growth and that such beneficial effect is increasing with the willingness (or ability) to coordinate of the two organizations. Namely, the beneficial effect is increasing with the availability of the country’s specific information (which decreases the asymmetry of information between the two institutions), with the importance of the multilaterals’ specific knowledge (which increases the importance of Bank-Fund coordination) and with the “scope” of IMF’s conditionality (which makes communication easier for the two institutions).⁵

The paper is organized as follows. Section 2 contains some institutional information regarding the overlapping responsibilities of the IMF and the WB while Section 3 briefly describes the related literature. Section 4 presents the theoretical model. Section 5 describes the empirical model and Section 6 describes the data while the results are presented in Section 7. Finally, Section 8 summarizes and concludes.

⁵Scope of IMF conditionality measures the number of areas covered by an IMF program. Higher scope should increase the probability of letting channels of communication open between the two institutions, as there is more room for identifying different area of specialized competence.

2 IMF and the World Bank: synergies and conflict

The World Bank and the IMF were created as two distinct and independent institutions with different tasks and methods of intervention, within the framework of the Bretton Woods agreement (1944). Up to the 1980s, the division of labor between the Fund and the Bank had been relatively straightforward. While the Fund's orientation was towards short-run macroeconomic stability, the Bank was oriented towards long-run development programs. At the same time the existence of synergies between the two institutions had also been recognized. Such synergies, however, became more important during the 70's and the 80's when, on the one hand, the IMF started to complement demand management policies by supply side policies and, on the other, the World Bank changed its policy towards a more explicit recognition of the importance of macroeconomic policies besides the traditional project and sector lending.⁶ Moreover, during the 1980s, the Fund's lending became more concessional and related to structural matters and increasingly focused on lower income countries, those typically "served" by the Bank.

The first step toward a formal recognition of the importance of cooperation between the IMF and the World Bank was already made in 1966 with an agreement which explicitly laid out the primary responsibilities of each organizations and the procedures for the two to work together (Boughton 2001).⁷ Then, in 1974, a joint ministerial committee of the Boards of Governors of the Bank and the Fund - the Development Committee (DC)- was established, in charge of assuring high-level coordination and facilitating intergovernmental consensus-building on development issues.

Lately, in 1989, a Concordat was signed by the IMF and the World Bank in which a vast area of overlapping responsibilities was explicitly identified. In this common area, cooperation should have been pursued and strengthened: to this scope the Concordat did define guidelines and terms of the World Bank-Fund interaction, and the mechanisms for resolving potential conflicts between the sister organizations. Both institutions committed themselves to systematically exchange information concerning low and middle-income countries. Moreover, the Concordat encouraged them to exchange this information not only within their

⁶Between 1980 and 1984 energy prices were addressed in 46% of Fund supported programs, the mobilization of domestic savings in 54% investment planning and execution in 37%. These were areas of primary responsibility of the Bank. Similarly the Bank was increasingly concerned with many variables central to Fund stabilization program (Feinberg 1988)

⁷According to the Dual memoranda of December 1966, the need for collaboration is made explicit by giving numerous examples of overlapping responsibilities: the structure and functioning of financial institutions, the adequacy of money and capital markets, the actual and potential capacity of a country to generate domestic savings, the implications of development programs for the internal and external financial position of a country (Gold 1982).

decision bodies, but also at the level of the operative staff. We should emphasize that the Concordat was motivated by the public nature of the disagreement between the Fund and the Bank about Argentina, in 1988. At that time, the rules on collaboration broke down when the World Bank announced a new loan to the country, before the IMF mission had completed its negotiations with the Argentinian authorities. This circumstance forced the two organizations to come up with a new agreement to guide collaboration (Wood, 2006).

Later on, in 1998, during the Asian Crisis, a new episode of disagreement promoted the issuing of a joint statement by the Bank president and the Fund managing director on Bank-Fund collaboration (e.g., see Mallaby 2004). In light of the greater overlap in operations, the leaders of the two organizations reaffirmed that a better collaboration was needed.

Despite all these official documents aimed at strengthening Bank-Fund cooperation, operations in middle-income countries are not yet guided by any formal collaborative vehicle. As a result, the Bank and the Fund cooperation hinges critically on discretionary communication at the staff level. The case is different for low income countries. With the creation of the Structural Adjustment Facility (SAF) and the Enhanced Structural Adjustment Facility (ESAF), later substituted by the Poverty Reduction and Growth Facility (PRGF), structural adjustment has served to create an important area of overlap between the Bank and the Fund.⁸ To access this program the country has to elaborate a policy framework paper, that is the Poverty Reduction Strategy Paper (PRSPs), jointly with the staff of the Fund and the Bank. The process of drafting the PRSPs was designed to ensure the consistency of the Bank's and the Fund's stances, by forcing them to develop a common view on the appropriate policy advice for the country.⁹

Despite good intentions PRSPs revealed some weaknesses such as the asymmetry in the documents' operational importance in each organization, the lack of specificity in outlining policy targets, and the failure to effectively engage the borrowing government in the process. Most notably, this latter weakness with the PFP process underscored the need for more substantial country involvement and pushed the Bank and the Fund to acknowledge country ownership as an emerging priority of development cooperation. By many standards, country

⁸In January 2010, three types of loans were created under the new Poverty Reduction and Growth Trust (PRGT) as part of a broader reform: the Extended Credit Facility (ECF), the Rapid Credit Facility (RCF) and the Standby Credit Facility (SCF). In particular, the ECF succeeds the PRGF as the Fund's main tool for providing medium-term support.

⁹In the same year, the Heavily Indebted Poor Countries (HIPC) initiative was enhanced as a direct outcome of a comprehensive review carried out by the International Development Association (IDA) and the IMF. The initiative entails a coordinated commitment to reduce and forgive large volumes of debt to the poorest and most indebted countries.

ownership had come to be considered an important component of successful poverty reduction and development (IMF and World Bank 2001).

More recently, in 2007 the World Bank and the Fund signed a Joint Management Action Plan, which sets concrete steps to improve the culture of cooperation between the two institutions, emphasizing, on the one hand, that duplicate functions represent a waste of resources for both institutions and, on the other, that uncoordinated policy prescriptions can make it harder for recipients dealing with adjustment programs. The Plan calls for an improvement of coordination and communication and it also recommends to translate identified good-practices concerning interaction into standard practices.

The issue of Fund Bank coordination is still debated nowadays and far from being settled. For example, the forthcoming IMF review on conditionality is expected to contain a fair amount of discussion about coordination with the World Bank. This is going to be crucial especially for middle income countries whose operations are not guided by any formal process, like the PRSP or the related facilities in the two organizations.

3 Related literature

This paper is related to three strands of literature. The first is the cheap talk literature building on Crawford and Sobel (1982, hereafter CS).¹⁰ More specifically, we are related to the literature on coordination in organizations under distributed information (Alonso, Dessein and Matouschek 2008, hereafter ADM; Rantakari 2008). These authors address the problem of an organization in which two operating divisions (managers) should adapt to local conditions but also coordinate with each other and their results confirm the general wisdom that when coordination needs are relevant, a centralized structure in which decision rights are allocated to an headquarter, should be preferred, although adaptation to local conditions will be always less satisfactory than in a decentralized structure.

The second stream of literature which we relate to is primarily concerned with the governance of the IFIs. While there are many papers dealing with both the IMF and the WB individually, to our knowledge, there are very few papers analyzing what governance structure may inhibit or encourage cooperation between the IMF and the WB. More specifically, there is

¹⁰See, among others, Dessein (2002), Harris and Raviv (2005, 2008), Marchesi *et al.* (2011). For an empirical application of two-sided incomplete information—using the International Monetary Fund’s structural programs—also see Marchesi *et al.* (2011).

no contribution addressing this problem theoretically.¹¹ Fabricius (2007), drawing on field research conducted in Ghana, Pakistan, Peru, and Vietnam, over the period 1980-96, has tried to identify empirically the conditions that determine whether or not these organizations are actually collaborating, addressing as well whether such collaboration is necessarily a good thing. According to Fabricius' results, Bank-Fund cooperation (or consistency) depends critically on the level of communication between the two organizations, where such exchange of information is not generally institutionalized but it has been left to the discretion of individuals (i.e., the staff members).¹²

Whether or not the Bank and the Fund cooperate has been found to depend on two conditions, which are highly correlated. Namely, similarity in the Bank's and the Fund's organizational structures (which facilitates communication) and the so called "domain consensus" (i.e. the degree to which they consent to the domain of their respective activities in the division of labor).¹³ Finally, an important implication emerging from this study is that Bank-Fund consistency may not always be desirable. According to Fabricius, pressures for conformity might jeopardize "ownership" of lending conditions and thus he suggests that the Bank and the Fund should pursue a case-specific approach in deciding whether or not to coordinate.

A similar problem is also addressed by Hagen (2010), who (theoretically) investigates how "ownership" could be affected by introducing more or less donors' coordination.¹⁴ Indeed in the case of multiple (uncoordinated) donors greater coordination (especially in the case of a "lead lender" and of a silent partner) could generate some pressure for conformity, which may contrast with the objective of enhancing recipients' ownership. In both papers a trade off between responding to local conditions (i.e., improving "ownership") and coordination among donors, clearly emerges. However, the problem of what governance structure may better respond to such trade off is not addressed. In this paper we propose to fill the gap by applying the analysis of ADM and Rantakari (2008) to analyze the impact of different governance structures on the degree of Bank-Fund cooperation.

¹¹Some political scientists have addressed the issue of the efficiency of the separation between the Fund and the Bank, arguing that these two institutions, while created for very different purposes, are nowadays indistinguishable and thus their artificial separation is inefficient (e.g., Clark 1990; Crook 1991; Shultz 1998; Burnham 1999 and Fischer 2004).

¹²The main exception being the PRSPs which are prepared by the countries themselves together with the World Bank and the IMF. However, this only applies to low-income countries.

¹³The evidence collected at the country level suggests that the most difficult factor that both Bank and Fund staff must overcome to ensure domain consensus is the difference between the two organizations' operational styles (the Fund remains a highly centralized organization while the Bank has gradually decentralized its operations to the borrowing countries).

¹⁴Öhler (2012), for example, finds evidence of a limited coordination effort across regions and sectors among bilateral donors within a recipient country (Cambodia).

The third and final strand of literature we look at is empirical. Despite a vast literature considering the individual impact of the IMF and the WB on recipient countries' economic growth and development, little is known about the effects of the simultaneous presence of both institutions in a single country. Moreover, little empirical evidence exists about how and under what circumstances these two organizations work actually together. It is therefore difficult to distinguish the effect of their interaction from that of their simultaneous action, which may in itself have an effect. Marchesi and Sirtori (2011) have estimated the impact on economic growth of the joint participation in both IMF and WB programs. As a proxy of Bank-Fund interaction they used the simultaneous presence of a Bank and Fund program in the same country and at the same time. Using panel data for 128 developing countries over the period 1982-2005, Marchesi and Sirtori find that the interaction between these two organizations has a positive and significant impact on growth. More specifically, the coefficient of IMF programs is negative and significant, the coefficient of World Bank programs is not significant while the coefficient of their interaction term is positive and significant at conventional levels. The results suggest that the WB can have a stronger impact on growth when the IMF is simultaneously involved as compared to when it is acting individually.

We then contribute to this literature both theoretically and empirically. Regarding theory, we analyze the importance of information transmission for the cooperation between the IMF and the WB and, to our knowledge, it is the first time that communication is explicitly introduced to the context of Bank-Fund interaction. With respect to our empirical models, even though some papers have considered the impact of IMF (and WB) programs on growth individually, we are the first to test the impact of a "joint" IMF-WB loan and to investigate if greater Bank-Fund cooperation may be more effective in terms of growth.

4 The model

The model is that of ADM, appropriately modified to deal with the issues at hand. More specifically, differently from them, we assume that the two divisions (the Fund and the Bank in our context) are fully selfish.¹⁵ We believe that this scenario better describes a situation in which the public evaluation of the two institutions' operations responds exclusively to their own performance.

¹⁵The selfishness of the two institutions might be explained by the circumstance that the career of both the Fund and the Bank staff members depend on skills and efforts which are exclusively related to the performance of each institution.

4.1 Objective functions

The trade off between coordination and adaptation can be formalized by assuming that the Fund and the Bank have to minimize the following quadratic loss functions, respectively

$$L^F = (d_1 - \theta_1)^2 + \delta (d_1 - d_2)^2, \quad (1)$$

and

$$L^B = (d_2 - \theta_2)^2 + \delta (d_2 - d_1)^2, \quad (2)$$

where d_1 represents the Fund's decision about an adjustment program, d_2 , represent the Bank's decision and $\theta_i \in R$, $i \in \{1, 2\}$, represents the "specialized information" of each institutions. The Fund observes its local conditions θ_1 without knowing the Bank's local conditions (i.e., the realization of θ_2) and vice versa. It is common knowledge that θ_1 and θ_2 are uniformly distributed on $[-\bar{\theta}_i, \bar{\theta}_i]$, and the draws of θ_1 and θ_2 are independent. The first term of the loss function represents the loss due to a not satisfactory adaptation to local conditions, that is $d_i \neq \theta_i$, while the second term represents the coordination loss that the Fund (and the Bank) incurs when their actions are not perfectly coordinated, that is $d_1 \neq d_2$.

The parameter $\delta \in [0, \infty)$ measures the relative weight of coordination losses with respect to adaptation losses. If the degree of competition between these two institutions is high, δ will be low, namely the two institutions overlook the need to coordinate their action in order to improve the adaptation to local conditions. On the contrary, if the gain from exploiting synergies is high, δ will be high. The degree of the "environmental volatility" which is faced by the IMF is given by the variance of θ_1 (i.e., σ_1^2), while that of the Bank is given by the variance of θ_2 (i.e., σ_2^2).

4.2 Delegation versus centralization

Under a *decentralized governance structure*, control rights over d_1 and d_2 are allocated to the IMF and the WB, respectively. Each of them will take decisions to minimize its own loss function, overlooking the effect which its own action has on the other institution. Thus, we assume that the Fund and the Bank first observe their local conditions, then they send each other messages m_1 and m_2 about the realization of their own state of nature, and finally they take their decisions to minimize respectively $E[L^F | \theta_1, m_2]$ and $E[L^B | \theta_2, m_1]$.

Under a *centralized governance structure*, control rights over d_1 and d_2 are retained by a central authority, the Headquarter (HQ), that is not informed about the local conditions.

The HQ acts in behalf of global taxpayers and therefore takes decisions d_1 and d_2 to minimize the following loss function

$$L^{HQ} = L^F + L^B. \quad (3)$$

Before taking decisions the HQ receives messages m_1 and m_2 about the realization of the two states on nature from the Fund and the Bank, respectively, and then it takes decisions d_1 and d_2 to minimize $E[L^{HQ} | m_1, m_2]$.

4.3 Decision making

We analyze decision making by assuming both a centralized and a decentralized governance structure. Under centralization, the HQ receives messages by the Fund and the Bank and then chooses (d_1, d_2) to minimize $E(L^{HQ} | m = (m_1, m_2))$. Taking the first order conditions of the expected value of (3) with respect to d_1 and d_2 , and solving for the equilibrium decisions, it is possible to show that

$$d_1^C = \gamma E(\theta_1 | m) + (1 - \gamma)E(\theta_2 | m), \quad (4)$$

and

$$d_2^C = (1 - \gamma)E(\theta_1 | m) + \gamma E(\theta_2 | m), \quad (5)$$

where:

$$\gamma = \frac{1 + 2\delta}{1 + 4\delta}. \quad (1)$$

The equilibrium decisions are convex combination of the HQ's posterior beliefs about the states of the fundamentals θ_1 and θ_2 , conditional on the vector m . When the importance of coordination increases and eventually when $\delta \rightarrow \infty$ the HQ sets

$$d_1^C = d_2^C = \frac{1}{2} [E(\theta_1 | m) + E(\theta_2 | m)].$$

Under decentralization, taking the first order conditions of the expected value of (1) and (2) with respect to d_1 and d_2 , deriving the reaction functions and solving them for the equilibrium decisions, yields

$$d_1^D = a\theta_1 + (1 - a)(bE(\theta_1 | \theta_2, m) + (1 - b)E(\theta_2 | \theta_1, m)), \quad (6)$$

and

$$d_2^D = a\theta_2 + (1 - a)(bE(\theta_2 | \theta_1, m) + (1 - b)E(\theta_1 | \theta_2, m)), \quad (7)$$

where $a = \frac{1}{1+\delta}$ and $b = \frac{\delta}{1+2\delta}$.

The Fund decision is a convex combination of θ_1 and its posterior beliefs about θ_2 (i.e., $E(\theta_2 | \theta_1, m)$), and the Bank posterior belief about θ_1 , (i.e., $E(\theta_1 | \theta_2, m)$). Similarly, the Bank decision is a convex combination of θ_2 and its posterior beliefs about θ_1 , (i.e., $E(\theta_1 | \theta_2, m)$), and the Fund posterior belief about θ_2 , (i.e., $E(\theta_2 | \theta_1, m)$). As $\delta \rightarrow \infty$, for given posterior beliefs, the decentralized decisions converge to that of the HQ, that is

$$d_1^D = d_2^D = \frac{1}{2} [E(\theta_1 | m) + E(\theta_2 | m)], \quad (8)$$

in other words, as the need of coordination increases, the misalignment between the objectives of the HQ and those of both the Fund and the Bank disappears.

4.4 Strategic Communication

To improve coordination between their own specialized decisions, the Fund and the Bank can communicate the realization of their observed state of nature before taking action. However, the non-verifiability of information (i.e., soft information) creates communication problems. Under both organizational structures the information transmitted will never be truthful: indeed, there will always be an incentive for either the Fund or the Bank to exaggerate the realization of the state of nature with a positive bias if $\theta_i > 0$ and with a negative bias if $\theta_i < 0$, with $i = 1, 2$.¹⁶

Let us consider first the case of a decentralized structure. Let us suppose that the Fund sends message m_1 to the Bank. The Bank's expected response to message m_1 is given by $(1 - a)(1 - b)E(\theta_1 | \theta_2, m)$, with $(1 - a)(1 - b) < 1$. In this case, the Fund, anticipating Bank's behavior, will try to induce a higher "reaction" by the Bank, by exaggerating the value of the report about the realized θ_1 . It is straightforward to show that only when $\theta_1 = 0$ communication will be truthful. The same argument applies to the Bank.

The incentives to misrepresent information exists also in a centralized governance structure. Indeed, the HQ puts more weight on minimizing the coordination losses than the Fund or the Bank would like it to do. If for example the Fund truthfully communicate $\theta_1 \neq 0$ to the HQ, it would expects that the latter would take decision $d_1^C = \gamma E(\theta_1 | m)$, which, from its point

¹⁶This is the typical setting of a cheap talk models where agency problems prevents communication from being sincere (CS). Each agent introduces a distortion in its message in order to manipulate the choice of the other.

of view, would not be “extreme” enough, given that $E(\theta_2) = 0$ and $\gamma < a + (1 - a)b$. As a consequence, the Fund will exaggerate the realization of θ_1 by reporting $m_1 > \theta_1$ (if $\theta_1 > 0$) or $m_1 < \theta_1$ (if $\theta_1 < 0$). It is straightforward to show that only when $\theta_1 = 0$ communication will be truthful. The same argument applies to the Bank.

The incentives to mis-report information are qualitatively the same in both governance structure, but it is possible to show that as the need for coordination increases (that is, as δ increases) the quality of information (horizontal communication) transmitted under a decentralized governance structure increases, while it worsens in a centralized governance structure (vertical communication). Intuitively, in a decentralized structure an increase in the need of coordination makes both agents more responsive to the communicated information, since they put less weight on adapting decisions to their own local conditions. This circumstance reduces the incentives to exaggerate information. In contrast, in a centralized structure, as the need for coordination increases, the HQ becomes less and less responsive to communicated information. This explains why the Fund’s (or Bank’s) incentive to exaggerate information increases.

Moreover, when $\delta = 0$, the need to balance conflicting needs for adaptation disappears in both types of governance structure. In the case of centralization, vertical communication will be fully truthful, that is: $m = \theta$, $d_1^C = \theta_1$ and $d_2^C = \theta_2$; while in the case of decentralization, communication becomes totally uninfluential, since both institutions will only put weight on the adaptation to their respective local conditions, namely: $d_1^D = \theta_1$ and $d_2^D = \theta_2$. Therefore, the two governance structure will produce the same results. Finally, as $\delta \rightarrow \infty$, for given posterior beliefs, the decentralized decisions converge to that of the HQ, as in equation (8) above.

4.5 Communication Equilibria

We model the coordination game of an organization with two divisions where decisions must both be adapted to local conditions and coordinated with each other. Information about local conditions is private, soft and communicated by cheap talk. ADM show that all communication equilibria are interval equilibria in which the state space, $[-\bar{\theta}_i, \bar{\theta}_i]$, $i = 1, 2$, are partitioned in intervals, and each division reveals only which interval its local conditions θ_i belong to. The equilibrium concept used is Perfect Bayesian Equilibrium (PBE). A PBE equilibrium consists of a reporting strategy $\mu_1(m_1 | \theta_1)$ for the Fund and a reporting strategy $\mu_2(m_2 | \theta_2)$ for the Bank, given a probability distribution over reports m_i conditional on the

value of θ_i observed, and a posterior belief functions $g_i(\theta_i | m_i)$, satisfying $\frac{\mu_i(m_i|\theta_i)}{\int_P \mu_i(m_i|\theta_i)d\theta_i}$ for $i = 1, 2$, given the posterior probability of θ_i conditional on each possible report m_i .

The decision rule, under decentralization, is given by the functions $d_1^C(m_1, m_2), d_2^C(m_1, m_2)$ reported in (4) and (5)); while, under centralization, the decision rule is given by the functions $d_1^D(\theta_1, m_2), d_2^D(m_1, \theta_2)$, reported in (6) and (7)).

For an interval equilibrium to be incentive compatible, it is necessary that ,when the realized state falls on the boundary of two intervals of the partition, the sender must be indifferent between saying that the state belongs to either one of the intervals. This condition translates in a differential equation whose solution defines the following family of incentive-compatible partitions

$$a_{i,j+1} - a_{i,j} = a_{i,j} - a_{i,j-1} + 4b_h a_{i,j}, \quad (9)$$

and

$$a_{i,-(j+1)} - a_{i,-j} = a_{i,-j} - a_{i,-(j-1)} + 4b_h a_{i,-j}, \quad (10)$$

for $j = 1, 2, \dots, N_i - 1$, where N_i is the number of intervals.

Conditions (9) and (10) say that the size of the interval $(a_{i,j+1} - a_{i,j})$ is equal to the size of the preceding interval $(a_{i,j} - a_{i,j-1})$ plus $4b_h a_{i,j}$. Symmetrically, in the negative semiaxis, the size of the interval $(a_{i,-(j+1)} - a_{i,-j})$ is equal to that of the preceding interval plus $4b_h a_{i,-j}$. It is possible to show that $b_h = b_C = \frac{\delta}{1+\delta}$ under centralization and $b_h = b_D = \frac{1+\delta}{\delta}$ under decentralization.

The quality of communication deteriorates as θ_i moves further away from its mean value, that is $\theta_i = 0$. This result is intuitive since the incentives to misrepresent information increase with the module of θ_i . Furthermore, we can see that b_C increases with δ , while b_D decreases with δ . Consistently with what intuitively explained in the previous subsection, this means that in a centralized governance, communication becomes noisier when the need of coordination (i.e., δ) increases, while in a decentralized governance, communication becomes more precise. However, it is possible to check that $b_C \leq b_D, \forall \delta$. This implies that in a centralized structure the quality of communication is always higher than in a decentralized organization, although this difference is decreasing with the importance of coordination. This result is easily explained by noting that the misalignment of interests between the Bank and the Fund is always greater than the misalignment between the HQ and each single institution.

ADM prove that the limit of strategy profiles and beliefs as the number of partitions $N_i \rightarrow \infty$ is a PBE, and it is the most efficient equilibrium, that is $EL^{HQ} = E(L^F + L^B)$ is lower than in any other equilibrium. In such an equilibrium the size of the intervals is infinitesimally small for θ_i close to 0 and increases at a growing rate as the module of θ_i increases.

4.6 The choice of governance

In this section we compare the expected losses for each governance structure. Under centralization, the HQ has got control over both the Fund and the Bank operations. Since its objective is to minimize overall losses, the decisions it takes are always first best, conditional on the information available. The amount of adaptation achieved depends on the importance of adaptation for the two institutions, which in turn depends on the quality of the information released. Instead, the amount of coordination depends on the overall value of coordination.

Let AL_C denote the adaptation losses, that is

$$AL_C = E [E(\theta_2 - d_2^C)^2 + (\theta_1 - d_1^C)^2],$$

and let CL_C denote the coordination losses, that is

$$CL_C = E(d_1^C - d_2^C)^2.$$

Expected losses under centralization are thus given by

$$EL_C = AL_C + 2\delta CL_C.$$

Under decentralization, the Fund and the Bank take decisions overlooking the effects of their actions on the other's payoff. Equilibrium decisions are thus biased with respect to the first best even under perfect information. Moreover, strategic communication leads to coordination failures over and above any inherent biases in equilibrium decisions. Let AL_D denote the adaptation losses, that is

$$AL_D = E((d_1^D - \theta_1)^2 + E(d_2^D - \theta_2)^2),$$

and let CL_D denote the coordination losses, that is

$$CL_D = E(d_1^D - d_2^D)^2.$$

Expected losses under decentralization are thus given by

$$EL_D = AL_D + 2\delta CL_D.$$

ADM prove that the adaptation losses (AL) are always higher in a centralized governance structure, while the coordination losses (CL) are always higher in a decentralized governance structure, that is

$$AL_C - AL_D = \Delta AL \geq 0 \forall \delta \in [0, \infty),$$

and

$$CL_D - CL_C = \Delta CL \geq 0 \forall \delta \in [0, \infty).$$

Differently from a decentralized structure, where communication is fundamental to improve coordination, in a centralized structure communication is fundamental to improve adaptation. But the misalignment of interests between the headquarter and the single institution prevents vertical communication to be truthful. This explains why adaptation losses are always higher in a centralized governance structure than in a decentralized one. On the other hand, in a decentralized structure, decisions are biased by the selfishness of the two institutions, and strategic communication leads to further coordination failures. Therefore, the coordination losses are always higher in a decentralized structure.

As the need for coordination increases, the worse performance of the centralized governance structure in terms of adaptation to local conditions is fully offset by the better results that it can achieve under coordination. This is proved in the following proposition.

Proposition 1 *Centralization dominates decentralization for all $\delta \geq 0.19$. Moreover, $EL_C - EL_D = 0$ when $\delta = 0$; $EL_C - EL_D \rightarrow 0$ when $\delta \rightarrow \infty$.*

Proof. It is possible to show that by substituting, a, b, γ, S_C, S_D for their expressions that

$$EL_C - EL_D = \Delta AL + \Delta CL = 2\delta(\sigma_1^2 + \sigma_2^2) \frac{33\delta^3 + 32\delta^2 + 3\delta - 2}{392\delta^5 + 1078\delta^4 + 1125\delta^3 + 560\delta^2 + 133\delta + 12}$$

Let $f = 33\delta^3 + 32\delta^2 + 3\delta - 2$

since the denominator of $EL_C - EL_D$ is always positive, it is easy to check that :

$$\text{sign}(EL_C - EL_D) = \text{sign}f; \quad f \geq 0 \quad \forall \delta \in [0.19, \infty).$$

■

The proposition shows that a decentralized authority represents the preferred governance structure only when the need of coordination is very low. In this case, the advantages of a decentralized structure in achieving a better adaptation are greater than the disadvantages of a biased decision.

In contrast, a centralized governance structure should be preferred when the coordination need is above a given threshold level. The HQ is able to eliminate the bias arising in decentralized equilibrium, although the quality of adaptation remains always below of what can be achieved under a decentralized structure. This disadvantage, however, is fully offset by the better coordination results that a centralized structure can guarantee. As the need of coordination increases further, each institution becomes more willing to coordinate with the other. Thus, the dominant position of a centralized structure is “eroded” by the circumstance that even in a decentralized structure the decisions become less and less biased. To the limit (as δ tends to infinity) the outcomes of the two governance structures converge to the same value. The same result is obtained when $\delta = 0$: in this case there is no need to balance competing adaptation needs: the absence of conflicting preferences allows then to achieve the first best in both types of governance structures.

The theoretical model provides normative indications regarding the optimal governance structure of the IMF and the WB. The theoretical prediction of the model is that when the need for coordination is relevant, as it is generally the case for the Bank and the Fund operations, a centralized governance structure allows to achieve a level of overall payoff greater than those of a decentralized one. In the real world the governance structure of the two institutions is certainly decentralized, nevertheless, the model allows us to derive some implications regarding the importance of greater cooperation between the IMF and the WB. An immediate testable implication of the model would then be to see whether variables measuring the IMF and the WB willingness (or ability) to coordinate may improve their impact on recipient countries. This circumstance could then represent (indirect) evidence in favor of the relevance of the coordination needs. We turn to the empirics next.

5 Empirical Model

In this section, first of all, we plan to analyze the effects of a loan which is granted simultaneously by the IMF and the WB on growth we want to test whether this impact is in turn

influenced by some variables which we take as proxy of the IMF and WB willingness (or ability) to coordinate.

We consider only the cases in which the IMF and the WB are lending *simultaneously* to a recipient country. We are well aware that being involved simultaneously with the same country does not necessarily mean that these two organizations are actually working together. The Bank and Fund could lend simultaneously to the same country without any exchange of information as well as exchanging information also at a distance. However, *ceteris paribus*, it is plausible to believe that these institutions will be more likely to interact when simultaneously “involved” with the same country as compared to the case in which they are acting on their own.

In this paper, we consider the amount of IMF and WB disbursements rather than taking the number of projects, as in Marchesi and Sirtori (2011). Since the effects of a loan can be evaluated only after a few years from the disbursement, all our variables are averaged over three years. We then use data only restricted to countries which have received a loan simultaneously by the IMF and the WB, that is a maximum of 90 developing countries over the 1982-2008 period.¹⁷ We then test

$$G_{it} = \alpha + \beta L_{it} + \gamma X_{it} + \delta X_{it} * L_{it} + \zeta Z_{it} + \eta_i + \tau_t + u_{it}, \quad (2)$$

where G_{it} represents per capita growth in country i at period t , L_{it} denotes the sum of IMF and WB loans received by country i at period t , X is a vector containing our variables of interest, $X * L$ denote the effect that our variables of interest have on the simultaneous impact of an IMF-WB loan and Z is a vector containing a set of control variables. Finally, η_i and τ_t denote country and time dummies, respectively, which allow us to control for both countries unobservables and common macroeconomic factors.

To test the robustness of our results, we also estimate an alternative specification using the full sample of countries, that is a maximum of 128 developing countries over the 1982-2008 period. Specifically, we test the following equation

$$G_{it} = \theta + \vartheta L_{it} + \lambda X_{it} + \mu dIW + \nu L_{it} * dIW + \xi L_{it} * X_{it} + \rho L_{it} * dIW * X_{it} + \varphi Z_{it} + \psi_i + \tau_t + \varepsilon_{it} \quad (3)$$

where L_{it} denotes the sum of IMF and WB loans received by country i at period t , dIW is a dummy variable which is equal to one when a country receive a loan simultaneously by the IMF and the WB, $L * dIW$ denotes the impact on growth of an IMF-WB loan and

¹⁷In a similar setup Burnside and Dollar (2000) and Collier and Dollar (2001) use averages over four years, while Barro and Lee (2005) or Dreher (2006a) use five-year averages.

$X * L * dIW$ denotes the effect that our variables of interest have on the simultaneous impact of an IMF-WB loan.¹⁸ As above, X is a vector containing our variables of interest, Z is a vector containing a set of control variables and ψ_i and τ_t denote country and time dummies, respectively.

We use a OLS fixed-effect estimator with robust standard errors in order to correct for heteroskedasticity across countries. When estimating the growth regression by OLS there may be the problem with the endogeneity of both the IMF and the WB variables as adjustment programs are usually concluded in periods of economic crisis. For this reason, the coefficient measuring the effect, of the program’s adoption on growth can be downward biased as there may be a selection bias and obviously selection problems may also be related to the interaction term between IMF and World Bank programs.

Nevertheless we decided to use OLS to estimate both equation (2) and (3) since we believe (as for example do Dreher *et al.* 2013 and Clemens *et al.* 2011) that OLS regressions are superior to 2SLS with questionable instruments.¹⁹ Moreover, our estimate of whether IMF-WB loans affects growth is likely to be the lower bound of the true effect, and we avoid to interpreting it in a causal way. We have, however, no reason to expect a systematic bias for the interaction terms with our variables of interest. Since we take disbursed loans (and not committed ones) we take contemporaneous (but three years averages) values of growth and disbursements (see Dreher *et al.* 2013b).

6 Data

6.1 Control Variables

Our choice of control variables follows the specification of Marchesi and Sirtori (2011), which is quite common in the literature analyzing the effects of both IMF and WB programs (and foreign aid).²⁰ Our selection then includes economic, institutional, and social variables. More specifically, we control for the log of GDP per capita at the start of each period, measures for human resources (life expectancy and fertility rate), investments as a percentage of GDP, a measure of openness (exports and imports over GDP), an index of democracy as defined in the Polity IV dataset (ranging from -10 to 10) and the CPIA index of the World Bank which

¹⁸Since $X * L * dIW$ is a triple interaction we need to control for each possible combination of the three variables. X , L and dIW .

¹⁹Dreher *et al.* (2013a) and (2013b) and Kilby (2012) have all shown how that politically driven aid (and WB projects) have negative outcomes. For this reason political variables cannot be (anymore) valid instruments in aid (and loans) effectiveness regressions.

²⁰Among others, see Barro and Lee (2005), Dreher (2006a) and Rajan and Subramanian (2008).

measures the quality of policies and institutions (reflecting the Bank’s internal evaluation of country performance and institutions).²¹

6.2 Variables of interest

Since we assume that the quality of communication varies according to the relative importance of each organization’s specialized information with respect to their degree of competition, our variables of interest should include the factors that may affect the willingness of the two institutions to interact and coordinate. This set of variables is made of four main types of indicators. First of all, we include variables which are meant to capture the importance of the country’s and the multilateral’s specific information. Then, following Fabricius (2007), we consider the role of the “domain consensus” in explaining Bank-Fund cooperation.²² Finally, we control for the possible role of political factors in inducing more or less cooperation between the two institutions.

Importance of the local knowledge. The quality and the extent of horizontal communication is jeopardized by the relative weight given to adaptation to local conditions as revealed by each institution specialized information. However, if local knowledge is easily accessible and no specialized expertise is needed to acquire it, distorted communication does not represent a problem anymore. To this respect, we use the quality of *information transmission* as a proxy of the asymmetry of information between the two organizations. With a higher quality of information transmission it is easier to verify information and, therefore, to assess its relevance and importance for decisions and outcomes. As a consequence, as information asymmetry decreases, the cooperation between the Bank and the Fund should improve. We use the number of telephone lines per 100 inhabitants (World Telecommunications/ICT Indicators Database 2011) as a proxy for the quality of information transmission.²³ Higher values indicate higher quality, and thus less importance of differences in knowledge endowment.²⁴

²¹We also tried to include some measures for "education" and some of the ICRG indicators but missing data reduced the sample substantially, so we do not report the results below. We have also included the KOF Index of Globalization and its subcomponent on economic restrictions (Dreher, 2006b) and our results are unchanged. Different specifications are available upon request.

²²Fabricius (2007) empirically shows that whenever the Bank and the Fund agree on the boundaries of each other’s operations (the so called domain consensus), they tend to speak with one voice. However, the increasing overlap of the mandates of the two organizations over time has amplified the areas of potential conflict, since each institutions tends to exaggerate the importance of their own opinions overlooking the importance of compromise.

²³For more recent years, the availability of internet access might be a better proxy, but the use of this variable would substantially restrict our sample. The number of telephone lines correlates highly with this and other potential measures for the intensity of communication.

²⁴Following Marchesi *et al.* (2011) we have also considered an alternative measure for the importance of

Importance of the multilateral knowledge. Following Marchesi *et al.* (2011), the greater the importance of the multilateral general knowledge (with respect to local knowledge) in designing adjustment programs, the stronger the impact on growth of the Bank-Fund simultaneous involvement in a recipient country.²⁵ In particular, the IMF and the WB's informational advantage will be more relevant for more open countries since multilateral institutions could be an ideal place to internalize spillovers (Rajan, 2008). We employ the indicators of openness introduced above to test this hypothesis.

Competition or lack of domain consensus. We measure the potential for domain dissent considering the "scope" of IMF conditionality, namely the number of areas covered by an IMF program. Greater scope means greater room for overlap (i.e., the IMF is more likely to interfere with the WB's actions) which in principle would imply greater potential disagreement as to "who gets what for what purpose." Such disagreement might trigger two different responses: either expressing disagreement (voice) or withholding information (exit) (see Hirshman 1970). If "channels of negotiation" remain open, disagreement does not necessarily lead to distorted communication and lack of cooperation. Shortfall in cooperation is rather observed in a situation in which withholding of information would be perceived more effective than negotiating in order to claim leadership on given areas. Therefore, ex ante, it is not easy to define the expected outcome of an increase in the "scope" of IMF conditionality. According to Fabricious (2007), disagreements are more likely to be observed in macroeconomic policy, fiscal policy, and financial sector reform, while other policy areas (i.e., privatization, agricultural policy, trade policy, and aid coordination) would show a substantial domain consensus. As a consequence, contrary to intuition, it could happen that increasing the scope of IMF conditionality actually improves the probability of letting channels of communication open between the two institutions, as there is more room for identifying different area of specialized competence.

To capture the scope of IMF conditionality we follow Marchesi *et al.* (2011) and build 20 categories, allocating all conditions to one of them, with the 20th category containing the residual. These categories refer to: Arrears, Balance of Payments/Reserves, the Capital Account, Central Bank Reform, Credit to Government, Debt, Exchange system, Financial sector, Governance, Government Budget, Monetary Ceiling, Pricing, Private Sector Reforms,

the country's information, namely a transparency indicator showing the share of series for which there are no data available in a given country and year (out of the 250 series classified as "economics" in the World Bank's World Development Indicators, 2008). However, while neither this variables nor its interaction are significant at conventional levels, the results for the remaining variables are unchanged.

²⁵The informational advantage of a multilateral institution derives from cross-country knowledge it accumulates during its activities.

Privatization, Public Sector, Social, Systemic, Trade and Wages & Pensions. Clearly, these categories are to some extent arbitrary and some of them represent sub-categories of others.²⁶

Political factors. The role of political factors in explaining the preferential treatment to allies of major shareholders of International Financial Institutions (IFI) is well known.²⁷ In our analysis we are interested to test how political aspects may affect Bank-Fund cooperation. On the one hand, if political interferences are “symmetric,” it is reasonable to expect that they make the two institutions more willing to find an agreement. On the other hand, asymmetric political pressure could jeopardize the cooperation between the IMF and the WB.

We control for whether a country votes (more or less) in line with the United States in the United Nations General Assembly (UNGA) (or with other “key” shareholders of the IMF and the WB) as proxy of the importance that political factors may have for both IMF and WB intervention, and we interact this variable with a loan granted simultaneously by the IMF and the WB.²⁸ We also emphasize that politically motivated aid (and WB’s projects) have recently been shown to have a negative outcome *per se* (see Dreher *et al.* 2013a; Dreher *et al.* 2013b and Kilby 2012) and we expect a similar results for Bank_Fund’ loans. Therefore, in the simple analysis of the interaction term we are not actually able to disentangle the effects due to the Bank-Fund interaction from the effects of politically driven loans.

Table A in the appendix presents the list of countries, Table B contains details of the definitions and sources of the variables included in the regressions while the descriptive statistics is provided in Table C.

7 Empirical results

This section presents two sets of regression results. Table 1 presents the results of the “restricted” specification in equation (2). First of all we do detect a positive effect on growth of a joint Bank-Fund loan. The disbursement of a simultaneous IMF-WB loan is significant

²⁶We find similar results controlling for the number of conditions in IMF programs.

²⁷There is substantial empirical evidence linking a country’s geopolitical proximity to the Fund’s major shareholders with a variety of types of preferential treatment (e.g., Thacker 1999; Barro and Lee 2005; Dreher and Jensen 2007; Dreher *et al.* 2008a; Dreher *et al.* 2008b, Stone 2008; Moser and Sturm 2011). The influence of political aspects on the World Bank has been less investigated, still there is some evidence documenting their impact in programs’ participation and credit allocation (e.g., Dreher, Sturm and Vreeland 2009; Kaja and Werker 2010; Kilby 2009).

²⁸Dreher *et al.* (2008b) and (2009) find evidence of a preferential treatment by both the IMF and the WB (respectively) for countries serving on the United Nations Security Council (UNSC). More recently, Dreher *et al.* (2013b) show that the effect of aid on economic growth is reduced by the share of years a country has served on the UNSC in the period the aid has been committed.

at the ten percent level and substantively important: its increase by one standard deviation increases per capita growth by almost two percent. The finding of a positive coefficient is reassuring with respect to the (plausible) consequences of the endogeneity of an IMF and WB's program adoption as in this case a downward bias in the estimate of such coefficient is expected.

As far as our variables of interest are concerned, we observe that the coefficient of the interaction between a joint IMF and WB loan with the variable information transmission is positive and significant almost at the 10% level of significance (i.e., 10.5%), which suggests that the positive impact of growth of a joint Bank Fund interaction is increasing with the degree of information transmission. In order to look at the specific effect (on growth) of the IMF-WB loan at different levels of information transmission, we calculated the marginal effects of the interaction (as displayed in Figure 1).

The results show that the critical amount of info transmission above which the marginal effect of Bank-Fund loans on growth is positive and significant is about 2.5, which is actually below the sample average value of 5. Therefore, the impact of a joint loan on growth is not significant only for very low values (below 2.5) of info transmission and positive and increasing with information transmission thereafter. This evidence seems to suggest that the more easily the two institutions can gather country-specific information, the more beneficial their joint intervention in a country can become, which is consistent with the theory.

The coefficient of the interaction with openness is positive and significant at the 5% level of significance, suggesting that the positive impact of growth of simultaneous Bank-Fund loans increases the more open a country is, that is the more important the Bank-Fund's general knowledge is with respect with the "local information". When we graph the marginal effect of Bank-Fund simultaneous intervention for different levels of openness, the results show that the critical amount of openness above which the marginal effect of Bank-Fund loans on growth is positive and significant is about 30, which is definitely below the sample average value of about 70. Therefore, we can conclude that the impact of a joint loan on growth is always positive and increasing with the importance of the multilaterals' general information, which is consistent with the theory.

The coefficient of the interaction with scope is positive and significant at the 5% level of significance, suggesting that the positive impact of growth of joint Bank Fund loans increases the broader IMF's conditionality is. When we graph the marginal effect of Bank-Fund simultaneous loans for different levels of scope, the results show that the critical amount of scope above which the marginal effect of Bank-Fund loans on growth is positive and

significant is about 0.7, which is below the sample average value of about 1.7. Thus, the impact of a joint loan on growth is always positive and increasing with the number of areas covered by an IMF program. This result may seem at odds with intuition, however, as discussed by Fabricious (2007) it is plausible to believe that communication between the two institutions becomes easier when there are more intervention areas (i.e., greater scope) as compared to the case in which those areas are restricted to the three many policy areas where domain dissent is concentrated.

Finally, the interaction with voting in line with the US in the UNGA is negative and significant at the 5% level meaning that the effect of Bank-Fund loans on growth is significantly lower when such loans have been disbursed for political reasons. This result is consistent both with previous results of the related literature showing the negative effects of politically motivated aid (Dreher *et al.* 2013) and also with the possible adverse consequences of politically motivated loan disbursements on the Bank-Fund willingness to cooperate.²⁹

Finally, as can be seen most explanatory variables have the expected impact on growth. Growth rates significantly increases with lower initial GDP and with lower fertility rates. While GDP growth increase with higher investments, and higher scores of the CPIA index, as expected. The coefficients of both life expectancy and democracy are not significant.

TABLE 1 HERE

FIGURE 1-3 HERE

Table 2 presents the results of the “full” specification in equation (3). We can observe that while the effects on growth of the adoption of *either* an IMF or a WB loan has a negative impact on growth, the coefficient of the variable denoting their simultaneous presence is positive and larger than the first one, which is consistent with our previous results. We then find similar results both considering the variables of interests and the explanatory variables. As the variables of interest are concerned, the main difference is related to the sign of the interaction of the bank-Fund loan with information transmission, which is now significantly negative rather than positive. However, calculating the marginal effects of both interactions (disbursements of either an IMF or WB loan and disbursement of both types of loans) with info transmission we find that neither of them is significant for “reasonable” values of the variable info transmission (see figure 4 and 5).

TABLE 2 HERE

FIGURE 4-5 HERE

²⁹We have also included the interaction of a joint Fund-Bank’s loan with the dummy for temporary UNSC membership. While neither the dummy nor the interaction are significant at conventional levels, the results for the remaining variables are unchanged.

8 Conclusions

Despite a series of official agreements aimed at strengthening Bank-Fund cooperation, it is widely believed that coordination between the two organizations often falls short of what should be rationally expected. However, a greater pressure for conformity, required by the need of coordination, may contrast with the objective of enhancing policy adaptation to the specific conditions revealed by each institution's specialized expertise.

In this paper we present a theoretical model which, focusing on the quality of information transmission between the IMF and the WB, analyzes the impact of different governance structures on the trade off between responding to local conditions (i.e., improving adaptation) and the need of enhancing consistency of policy actions (i.e., improving coordination). We compare the performance of a decentralized governance structure with that of a centralized one. A centralized structure better addresses the necessity of coordinating decisions, but a greater consistency between the Bank and the Fund policy actions will be achieved at the expenses of a less satisfactory adaptation to local conditions. We find that a decentralized structure is to be preferred only when the need for coordination is very low. On the contrary, when the need for coordination is relevant, a centralized governance allows to achieve a level of overall payoffs greater than those of a decentralized one.

In the real world the governance structure of the two institutions is definitely decentralized. A testable implication of the model would then be to see whether Bank-Fund's coordination is really important for their impact on recipient countries. Consistently with Marchesi and Sirtori (2011), we find that Bank-Fund joint intervention is beneficial to growth and, more importantly, such beneficial effect is increasing with the availability of the country's specific information (which decreases the asymmetry of information between the two institutions), with the importance of the multilaterals' knowledge (which increases the importance of Bank-Fund's coordination) and with the scope of IMF's conditionality (which makes communication easier for the two institutions). This evidence would then be in favor of a (more) centralized governance. Our results are in line with the general wisdom that centralization must be preferred when the need for coordination is relevant, and it supports the reform proposals which have favorably looked at a possible merger between the two institutions.³⁰

Finally, the paper could be extended in three directions. First of all, we emphasize that the better performance of the centralized governance is mainly due to our assumption of "fully selfish" institutions, which systematically overlook the impact of their actions on the other

³⁰See for example, Clark (1990); Crook (1991); Shultz (1998); Burnham (1999) and Fischer (2004).

organization's payoff. As a consequence, their policy choices will result always "too distant" with respect to the first best and this circumstance more than offsets the better adaptation to local conditions that a decentralized structure could in principle achieve. Therefore, we plan to extend our model analyzing what happens when this assumption is (at least slightly) relaxed (as it is in ADM). More specifically, we expect to find that the introduction of some incentive alignments between the two organizations would ameliorate the performance of a decentralized governance making it a more desirable option.³¹

A further extension of our basic framework is related to the issue of the acquisition of costly information. In the framework of coordination games based on cheap talk communication, the specialized information privately owned by agents is generally assumed to have been costlessly collected. However, when the acquisition of specialized information is costly, agents must balance the cost of information acquisition against its benefits. In our framework the benefits are only related to the improved adaptation to local conditions. Thus, it would be interesting to analyze the impact that different governance may have on the agents' incentive to invest in acquiring informative signals.

Finally, we plan to analyze the case of asymmetric interdependency. Indeed, as many authors have emphasized, the Fund seems to be less inclined to coordination than the Bank. For example, Fabricious (2007) has argued that while the WB' structural adjustment loans (SALs) and project lending may await the borrower's agreement with the Fund, the IMF's stand by negotiations have generally been independent from the Bank' opinion³² Moreover, the WB has often argued that a structural adjustment program would fail without consistent macroeconomic policies designed to correct external equilibrium misadjustments. Therefore, an asymmetric setting will be more useful in order to investigate the different (relative) importance of adaptation and coordination for the two institutions. We leave these questions for future research.

³¹For example, the ability to work in team with the other organization's staff members could become a criterion to employ new people for both institutions.

³²The withholding of Fund's credit may affect a member's budget enough to disrupt financing for a Bank's supported project, but not vice versa.

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Table 1: Growth in the restricted sample, 1982-2008, OLS

IMF & WB loans	2.971*
	(1.887)
Information transmission	0.044
	(0.442)
IMF & WB loans x Info transmission	0.089
	(1.639)
Openness	0.003
	(0.260)
IMF & WB loans x Openness	0.006**
	(2.142)
Scope	-0.328**
	(-2.534)
IMF & WB loans x Scope	0.469**
	(2.191)
UNGA voting	6.442
	(0.843)
IMF & WB loans x UNGA voting	-11.135**
	(-2.048)
Initial per cap. GDP (log)	-4.735***
	(-4.189)
Investment	0.148***
	(4.675)
CPIA	1.976***
	(5.912)
Life expectancy (log)	-5.242**
	(-2.582)
Life fertility (log)	1.842
	(0.457)
Democracy	-0.000
	(-0.012)
Constant	20.873
	(1.112)
<hr/>	
Observations	544
Number of id	90
R-squared	0.327

Notes: t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Table 1: Growth in the full sample, 1982-2008, OLS

IMF + WB loans	-23.006** (-2.363)
IMF & WB loans	23.871** (2.592)
dIMF&WB	1.698** (2.448)
Information transmission	0.026 (0.472)
(IMF + WB loans) x Information transmission	2.929*** (3.084)
(IMF & WB loans) x Info transmission	-2.864*** (-2.980)
Openness	0.019* (1.810)
(IMF + WB loans) x Openness	-0.027 (-0.984)
(IMF & WB loans) x Openness	0.033 (1.232)
Scope	-0.394*** (-2.649)
(IMF + WB loans) x Scope	-1.341** (-2.445)
(IMF & WB loans) x Scope	1.814*** (3.709)
UNGA voting	-2.955 (-0.395)
(IMF + WB loans) x UNGA voting	99.371*** (2.867)
(IMF & WB loans) x UNGA voting	-103.698*** (-3.190)
Initial per cap. GDP (log)	-5.383*** (-5.487)
Investment	0.142*** (4.224)
CPIA	1.981*** (6.394)
Life expectancy (log)	-2.258 (-1.495)
Life fertility (log)	1.764 (0.501)
Democracy	-0.016 (-0.411)
Constant	20.001 (1.193)
Observations	700
R-squared	0.336
Number of id	103

Notes: t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

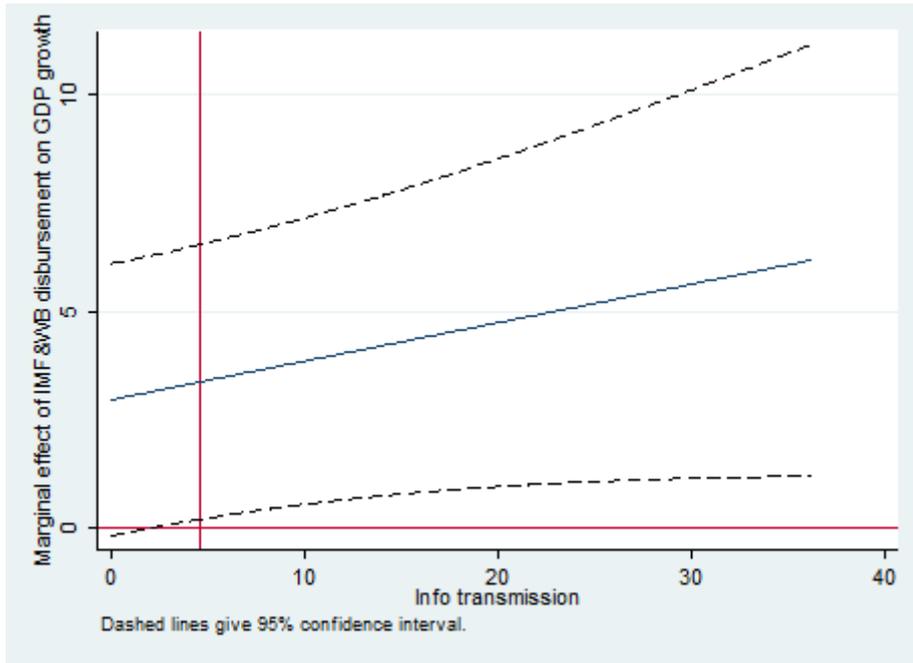


Figure 1: Marginal effect of IMF and WB loans on growth for different levels of Information Transmission (Table 1). The dashed line shows the 95%-confidence interval.

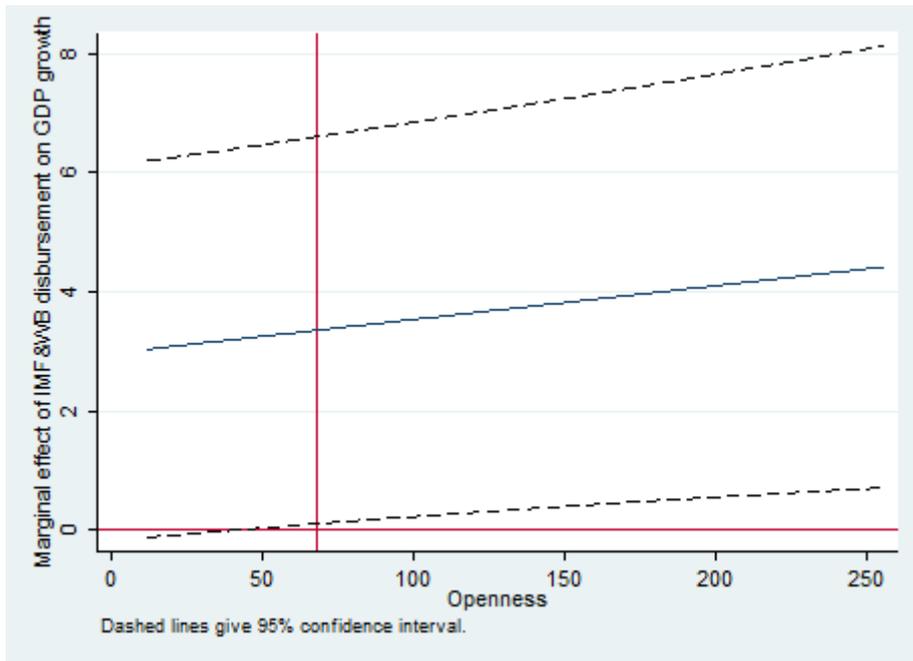


Figure 2: Marginal effect of IMF and WB loans on growth for different levels of Openness (Table 1). The dashed line shows the 95%-confidence interval.

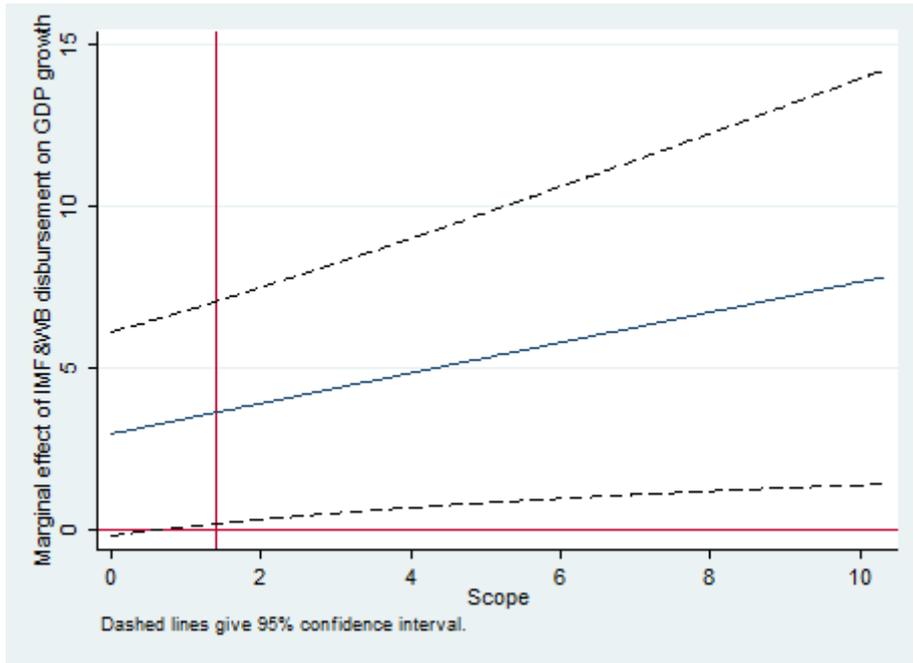


Figure 3: Marginal effect of IMF and WB loans on growth for different levels of Scope (Table 1). The dashed line shows the 95%-confidence interval.

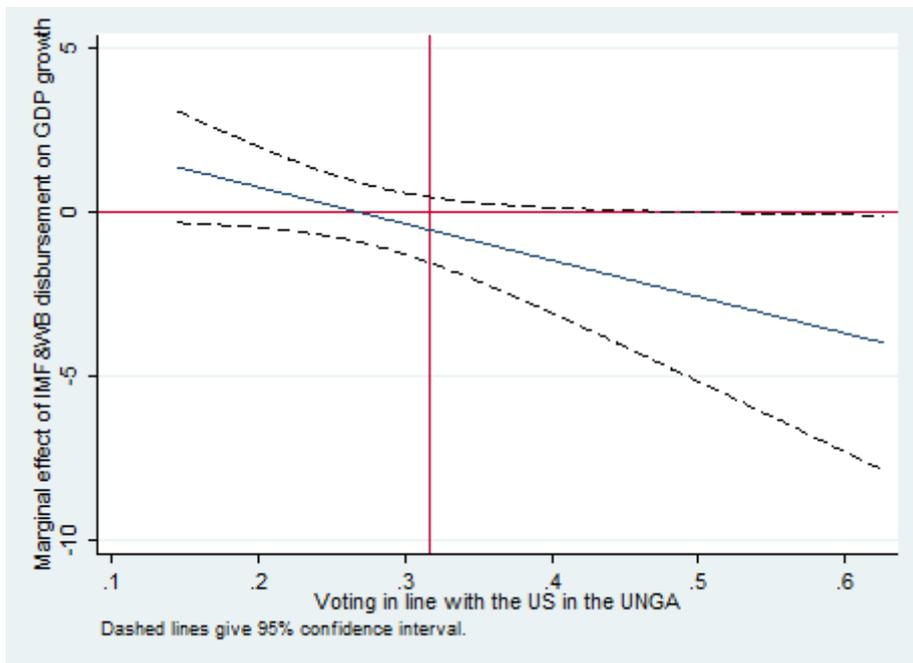


Figure 4: : Marginal effect of IMF and WB loans on growth for different levels of Voting in line with the U.S. in the U.N.G.A. (Table 1). The dashed line shows the 95%-confidence interval.

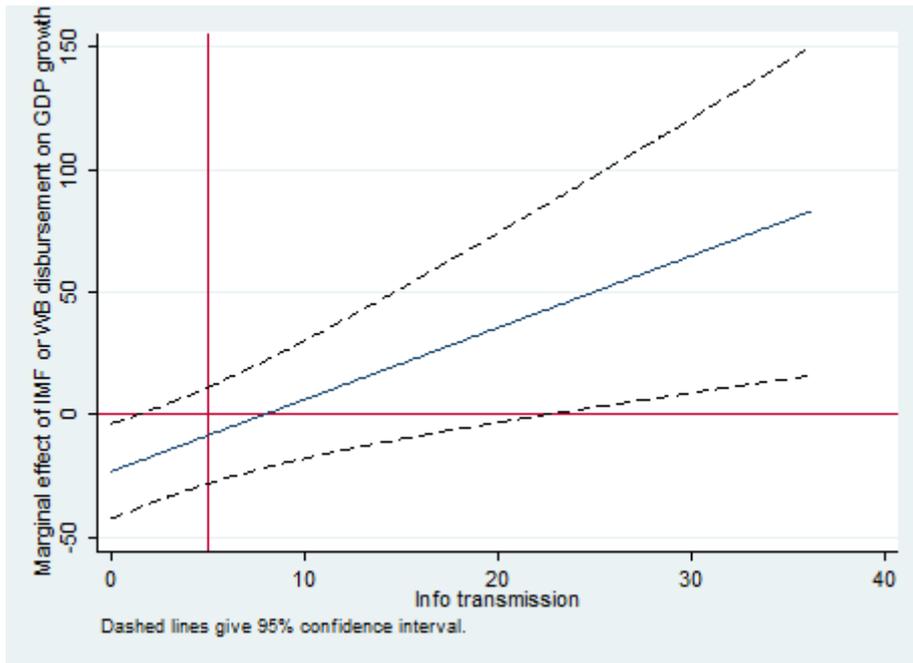


Figure 5: Marginal effect of either an IMF or a WB loans on growth for different levels of Information Transmission (Table 2). The dashed line shows the 95%-confidence interval.

Table A: List of countries included in the sample

Sub-Saharan Africa	Maldives	Bulgaria
Angola	Nepal	Croatia
Benin	Pakistan	Georgia
Botswana	Sri Lanka	Hungary
Burkina Faso	Middle East and North Africa	Kazakhstan
Burundi	Algeria	Kyrgyz Republic
Cameroon	Djibouti	Latvia
Cape Verde	Egypt, Arab Rep.	Lithuania
Central African Republic	Iran, Islamic Rep.	Macedonia, FYR
Chad	Jordan	Moldova
Comoros	Lebanon	Poland
Congo, Dem. Rep.	Morocco	Romania
Congo, Rep.	Oman	Russian Federation
Cote d'Ivoire	Syrian Arab Republic	Serbia
Equatorial Guinea	Tunisia	Slovak Republic
Eritrea	Yemen, Rep.	Tajikistan
Ethiopia	Latina America and Caribbean	Turkey
Gabon	Argentina	Ukraine
Gambia, The	Belize	East Asia and Pacific
Ghana	Bolivia	Cambodia
Guinea	Brazil	China
Guinea-Bissau	Chile	Fiji
Kenya	Colombia	Indonesia
Lesotho	Costa Rica	Lao PDR
Liberia	Dominica	Malaysia
Madagascar	Dominican Republic	Mongolia
Malawi	Ecuador	Papua New Guinea
Mali	El Salvador	Philippines
Mauritania	Grenada	Samoa
Mauritius	Guatemala	Solomon Islands
Mozambique	Guyana	Thailand
Niger	Haiti	Tonga
Nigeria	Honduras	Vanuatu
Rwanda	Jamaica	Vietnam
Sao Tome and Principe	Mexico	
Senegal	Nicaragua	
Seychelles	Panama	
Sierra Leone	Paraguay	
South Africa	Peru	
Sudan	St. Kitts and Nevis	
Swaziland	St. Lucia	
Tanzania	St. Vincent and the Grenadines	
Togo	Uruguay	
Uganda	Venezuela, RB	
Zambia	Europe and Central Asia	
Zimbabwe	Albania	
South Asia	Armenia	
Bangladesh	Azerbaijan	
Bhutan	Belarus	
India	Bosnia and Herzegovina	

Table B: Sources and definition of selected variables

Variable	Definition	Source
DEPENDENT VARIABLE		
GDP growth	Per capita GDP (constant 2000 US\$)	WDI (2008)
VARIABLES OF INTEREST		
IMF + WB loans	Sum of IMF and WB loans (ratio to GDP)	WDI (2008)
dIMF&WB	dummy=1 in case of IMF-WB joint participation	Built by authors
IMF & WB loans	Sum of IMF and WB loans interacted with dIMF&WB	Built by authors
IMF & WB loans x Info transmission	IMF & WB loans interacted with Info transmission	Built by authors
IMF & WB loans x Openness	IMF & WB loans interacted with Openness	Built by authors
IMF & WB loans x Scope	IMF & WB loans interacted with Scope	Built by authors
IMF & WB loans x UNGA voting	IMF & WB loans interacted with voting with US in UNGA	Built by authors
CONTROL VARIABLES		
Initial per cap. GDP (log)	Log of per capita GDP at the beginning of the period	WDI (2008)
Investment	Gross fixed capital formation (ratio to GDP)	WDI (2008)
Openness	Export + Import of goods and services	WDI (2008)
CPIA	Country Policy and Institutional Assessment	World Bank
Life fertility (log)	Fertility rate (birth per woman)	WDI (2008)
Life exp. (log)	Log of life expectancy	WDI (2008)
Democracy	Polity2 score taken from the Polity IV dataset	Marshall and Jaggers (2009)
Info transmission	Fixed telephone lines per 100 inhabitants	World Telecommunication database
Scope	Areas covered by Conditions	IMF's MONA database (2008)
UNGA voting	Percentage of votes within a year inline with the US in the UNGA	Dreher <i>et al.</i> (2009)

Table C: Descriptive statistics (Estimation sample of Table 1)

Variable	Mean	SD	Min	Max
Per capita growth	1.14	3.8	-14.42	14.84
IMF & WB loans	0.62	0.63	0.01	5.29
Information transmission	4.53	6.94	0.02	36.24
IMF & WB loans x Info transmission	2.28	5.57	0.01	65.29
Openness	67.9	36.25	12.23	256.3
IMF & WB loans x Openness	46.73	84.19	0.25	1356.11
Scope	1.38	2.17	0	10.33
IMF & WB loans x Scope	0.92	2.13	0	17.27
UNGA voting	0.32	0.09	0.15	0.63
IMF & WB loans x UNGA voting	0.19	0.21	0	1.54
Initial per cap. GDP (log)	6.45	1.04	4.43	8.99
Investment	20.44	7.43	2.56	62.02
CPIA	3.1	0.64	1	4.9
Life expectancy (log)	1.44	0.46	0.09	2.11
Life fertility (log)	4.06	0.18	3.33	4.34
Democracy	0.89	6.32	-10	10