MPRA

Aid Financing of Global Public Goods: an Update

Cepparulo, Alessandra and Giuriato, Luisa

Dipartimento di Economia Pubblica, Sapienza University of Rome, Italy, University of Exeter, Business School, Xfi Centre for Finance and Investment

December 2009

Aid Financing of Global Public Goods: an Update

Alessandra Cepparulo[*] and Luisa Giuriato[**]

December 2009

Abstract

The paper compares different aggregates of aid financed global public goods and detects the presence, for the period 1995-2006, of the substitution effect between these aggregates and traditional aid that was found by former studies for earlier periods. A second focus of the paper is on the differences in the importance that donors attach to the various types of global public goods, trying to detect regular patterns in their choices of financing. Statistical regularities, representative of common historical, social, cultural factors, for groups of countries (Anglo-Saxon, Northern European and Central European) give rise to the existence of a certain clusterized homogeneity in global public goods financing. Potential explanatory variables are examined in a panel analysis, which reveals the dominance of the donors' wealth, preferences for public goods and public finance constraints in the decision of aid funding of global public goods. Finally, there is evidence that some global public goods with weakest-link technologies have become increasingly important at the global level. The increase in their financing through aid flows could be explained by the rich countries' fear of an insufficient provision by poor countries, which, increasingly, cannot afford to pay for them: rich countries are therefore stepping in to avoid sub-optimal levels of provision, as already foreseen by Sandler (1998).

Keywords: Foreign aid, Global public goods
JEL codes: H41, F35, H87

1

1. Introduction

The current financing of international public goods (IPGs) is almost totally entrusted to national governments and it is the joint product of domestic public expenditure decision concerning research, knowledge development, defense, and environment protection. Only a minor share of IPGs are financed at the international level (0.5 per cent according to Kaul and Le Goulven, 2005). However, tracing direct and explicit IPG financing in specific headings of the national budgets is very difficult, as no separate accounting is generally provided for international programs. As far as we know, only Canada has promoted a two-track budgeting system to ensure that every ministry pays for the international mechanisms it benefits from.

For OECD-DAC countries, indirect financing of IPGs can be detected through the Official Development Assistance (ODA) budgets, i.e. the aid and development funds to developing countries[1]. Since the 1980s, it has become a common practice to use aid funds for financing IPGs provision by developing countries[2]: te Velde et al.(2002) estimate the share of total aid spending allocated to IPGs to be nearly 5 per cent in 1980-82, 7 per cent in 1990-92, and close to 9 per cent in 1996.

The aid financing of IPGs is now recognized as one of the rationales behind development assistance, together with motivations of international solidarity and strategic, political, and economic self interest (Sagasti, 2005). However, the presence of lines of IPG financing inside aid funding have met both approval and criticism. On one hand, there is evidence of important relationships between cooperation for development and the provision of IPGs (Zedillo and Thiam, 2006) and each of them can be essential for the supply of the other. Limited development can hinder the provision of many IPGs that require sufficient capacity at national level as a pre-condition for an efficient delivery. IPG provision must sometimes 'wait' until this capacity has been built: for example, communicable disease control requires sufficiently developed national health sectors to deliver drugs, vaccines and the necessary health services in the whole countries, including the rural areas. Complementarity plays also in the opposite direction and some IPGs are critical for attracting private direct investment flows, for ensuring development financing and the effectiveness with which governments deliver national public goods.

On the other hand, global concerns can also have dubious impact on development and, in some cases, they can distort the whole structure of aid. For instance, this is the case for global security expenditures. "While domestic security in developing countries is a pre-requisite for development efforts, the current emphasis on global security could highjack aid as the Cold War did for decades. The pursuit of narrow geo-political and security interests distorts aid allocation patterns, reduces resources available for human development and reinforces pernicious practices such as the provision of tied aid" (Sagasti, 2005, p. 11).

Further criticisms to aid financing of IPGs have been advanced (Anand, 2004) on grounds of (i) ethics, as IPGs divert resources that should mainly directed to poverty reduction; (ii) efficiency, as institutions for development may not be the most appropriate for

---

[1] Net Official Development Assistance (ODA) comprises grants or loans to developing countries and territories on the OECD/DAC list of aid recipients that are undertaken by the official sector with promotion of economic development and welfare as the main objective and at concessional financial terms.

[2] The World Bank (2001) estimated that t5he share of IPGs on total ODA was about 1 per cent in the 1970s.

IPG delivery; (iii) accountability, as IPG funding seems to take place without prior assessment of needs.

Concerns for coherence in aid programs and the fear that IPGs displace aid devoted to human development and poverty reduction have been growing since the 1990s: "if IPGs are less beneficial to at least to some poor countries than traditional aid, earmarking aid to IPGs would reduce the utility that developing countries can derive from aid" (Reisen et al., 2004, p. 28). Crowding out of aid-financed national public goods and development by IPG financing is all the more harmful when there exist complementarities between international and national public goods and between international goods and development expenditure. Thus, if spending on IPGs were to displace aid spending on complementary national public goods, the effect would weaken developing countries' ability to provide IPGs (te Velde et al. 2002, p. 142). A number of studies have searched for the presence and the size of the crowding-out effect and evidence has been found both in a strong (te Velde et al., 2002) and in a soft version (Reisen et al., 2004) for the 1980s and 1990s.

Notwithstanding the concerns that surround aid financing of IPGs, these seem to have been integrated within the "grand purpose" currently assigned to international development assistance, namely the managing of global interdependencies in a globalized world (Severino and Ray, 2009). The expanding range of global concerns that the international community faces, calls for a better understanding of the motivations behind IPGs financing through aid funds. Do donor countries consciously pursue the altruistic aim of increasing the total provision of IPGs from which every country in the world would benefit? Or do they expect nation-specific returns from their expenditures on IPGs? Are donor countries aware of the new task of managing global interdependencies assigned to ODA? Or are they just disillusioned with aid, thus egoistically diverting funds from development to seize the world-wide benefits that IPGs provide? Why do donors not separate expenditures to development and poverty reduction from those to IPGs? Do donors keep IPGs financing together with development aid just to increase the ODA level and formally reach the Millennium targets on aid? Has the concern for some IPGs become so great that, fearing underprovision, developed countries are ready to finance the shares that less developed ones cannot afford to grant? Do donors take into account the provision technologies of IPGs and do they act cooperatively when required?

This paper tries to provide some tentative answers to these questions focusing on aid financing of those IPGs that can be termed global public goods (GPGs), i.e. that provide benefits that extend worldwide and that are globally non-rival and non-excludable. This excludes IPGs that are regional public goods and thus provide non-rival and non-excludable benefits only to a limited number of countries.

Two caveats must be made before presenting our answers to the above questions. First, IPGs are not solely responsible for the change in the patterns of aid that have been experienced since the 1990s. Other factors have played a relevant role as well: the major "identity crisis" experienced by official development assistance after the fall of the Berlin Wall (Severino and Ray, 2009), the changes in donors' ideologies (Hjertholm and White, 2000) and in the development paradigm, the acknowledgment of the limits in aid effectiveness, the combination of evolving strategic and trade interests, geo-political considerations, political alliances (Alesina and Dollar, 2000; Berthélemy and Tichit, 2004;

Canavire et al., 2005). A second caveat concerns a fundament limit of this research: the picture of GPGs financing would need to be completed with the consideration of explicit, non-ODA financing through the national budgets, which could complement or substitute for the share of GPGs that are funded through the ODA channels.

1.1. Outline of the paper

Estimates of aid financing of IPGs and GPGs vary a lot, ranging from 3.7 per cent (Anand, 2002) to 12.5 per cent (1994-98; World Bank, 2001), to 16 per cent (1997-99; Reisen et al., 2004) and to 25 per cent (Raffer, 1999). These differences are almost entirely attributable to differences in the definition of what "international/global" is[3]. In the line of Reisen et al. (2004), we construct our definitions of GPGs according to the spatial dimension of the aid financed activities and we include only those activities whose benefits spread worldwide. When possible, we also try to make reference to the third dimension of 'publicness' of GPGs, namely their 'aggregation technology', or the manner in which contributions determine the aggregate provision level.

Our estimates of GPGs financing include the update of Reisen et al. (2004) aggregate (from now on GPG_OECD) and the introduction of two new aggregates. The first is designed to capture the GPGs that should be financed to attain the Millennium Development Goals (GPG_MDG); the second aggregate (GPG_E) broadens the OECD definition by including new sectors. This second aggregate will be used as our benchmark.

The paper then develops along the following lines. First, we search for the presence of a substitution effect, where the financing of IPGs displaces other aid spending (te Welde, 2002; Reisen et al., 2004), for the period 1995-2006. With respect to previous studies, we compare the effect of the adoption of different definitions of GPGs on the substitution effect and we try to show the relevance of this effect for the single donor countries.

The second objective is to focus on differences in the importance that donors attach to the various types of GPGs (as it is done also by te Velde et al., 2002), trying to detect a regular pattern in their choices of financing. The paper adds to previous studies by extending the analysis to multilateral aid financing of GPGs. Multilateral financing, which implies common-pool funding, gives donors less control over their donations than bilateral aid[4]. It, thus, offers fewer occasions for strategic behavior. However, it is an increasingly important source of GPGs financing.

Then, the analysis focuses on a larger number of determinant variables for GPG financing, which are subsumed under two dominant types: preferences and constraints. We investigate whether preferences for redistribution and national public goods financing within the donor countries influence their choice of GPG financing and which role is played by donors' openness to the rest of the world and their altruistic concern for recipient countries.

---

[3] According to Birdsall (2006) and OECD (2004), regional public goods amounted to 23.9 per cent in 1997 and to 14.9 per cent in 2002. These data refer to a broad definition of regional public goods, which captures any support that might have spillover effects into neighbouring countries. When employing a stricter definition of a regional public good, including only projects with clear transborder properties (region-wide air transport, river development, rail transport, protection and pest control), the amount of development assistance for regional public goods is about 6 percent for 1997 and to less than 3 percent for 2002 (Birdsall,2006).

[4] There is, however, evidence that international agencies foster the interests of donors when disbursing funds (Neumayer, 2003). In particular, large donor countries seem to derive donor-specific benefits.

The state of donors' public finances acts as a constraint. However, even if aid could be one of the first budgetary items to be cut in case of budgetary strains, GPGs could move in different directions. When GPGs are of primary concern, such as health emergencies are, their financing through aid could be kept or even increased.

Using data from 1995 to 2006 for 22 countries, we first perform a statistical analysis of the correlations between ODA and GPG expenditures and their potential determinants. Then, through a panel analysis, we estimate the donors' committed expenditure to aid funded GPGs and we evaluate the relevance of different explanatory variables.

The outline of the paper is as follows. Section 2 presents the data and the definitions of GPGs adopted. Section 3 offers a description of the evolution of aid financed GPGs from 1995 to 2006 and Section 4 presents a more detailed analysis of bilateral and multilateral financing by donors and categories of intervention. Section 5 presents the analysis of the determinants of ODA and GPGs and Section 6 presents the results of the estimation of a GPG financing supply function through a panel analysis. Section 7 concludes.

2. Data and definitions of GPGs

The estimates of aid financing of GPGs provided in this paper are based on the Aid Activity database of the DAC-OECD, i.e. the Creditor Reporting system (CRS), which offers a sector allocation of aid based on common definitions agreed by all DAC countries. The CRS data refer to payments and commitments by DAC countries and multilateral organizations[5] and to total flows (grants and loans). The estimates of GPGs provided in this paper are given for bilateral and multilateral levels, by categories and by donors and they include both loans and grants, as, in general, the GPGs financing is not peculiarly skewed towards grant-financing as compared to ODA (Anand, 2004, p. 231)[6].

The CRS database records flows according to 194 <u>sectors of destination</u>, which are selected according to their local, regional or global dimension. This choice involves a degree of arbitrariness, as the distinction between global, regional, and national goods is not always uncontroversial. Table A.1 provides a summary of the different definitions adopted in some previous analyses of aid spending on international public goods (World Bank, 2001; te Velde et al., 2002; Reisen et al., 2004).

The main difference between this paper and previous studies by the World Bank (2001) and te Velde et al. (2002), is that the latter refer to IPGs (both global and regional public goods) and that they include in their definition only those CRS sectors that are related to "core" activities. For example, they completely exclude the sector 'Economic and financial governance', as the CRS data base does not provide separate statistics for the core and non-core activities included in it and does not distinguish the financing allocated to the support of global economic integration (non-core activity) or to the participation in global forums (core

---

[5] The time series for gross disbursements starts from 2002.

[6] On the contrary, Mascarenhas and Sandler (2004) argue that grants are the most appropriate form of aid for financing spillovers associated with IPG. They test the hypothesis that the share of grants in aid reflects the importance of spillover effects and find that the mean grant share is highest for knowledge IPG (95 per cent for bilateral donors and 82 per cent for multilateral donors) and health IPG (respectively 90 and 83 per cent) and lowest for governance (81 per cent for bilateral donors and 85 per cent for multilateral donors) and environment (83 per cent for bilateral donors and 81 per cent for multilateral donors).

activity): economic and financial governance is treated as a complementary activity that is national in range[7]. On the other hand, they include the expenditures for preventing or alleviating the effects of conflicts, as these provide regional security benefits. World Bank (2001) includes post-conflict reconstruction and mine clearing, while te Velde et al. (2002) treat them as national public goods. Te Velde et al. (2002) also exclude emergency relief and aid to refugees, which are instead core activities according to World Bank (2001).

As in Reisen et al. (2004), this study distinguishes CRS activities according to a spatial dimension and focuses on ODA flows with a global spatial dimension. This implies excluding some activities that are "core" according to the World Bank, but which have a limited spatial dimension, for example, "post-conflict peace building of the United Nations peace operations" or "land mine clearance", which have national/regional spatial dimension. On the contrary, the present study includes the expenditures for "narcotics control activities" that are functional to the provision of the global good 'Crime control', whose benefits have a global scale[8].

The activities included in the data set present different degrees of non-rivalry and non-exclusivity (Arce and Sandler, 2002) and they are produced through the contributions of donor countries, which are aggregated according to different technologies: summation, weighted sum, weakest link and best shot technologies (Arce and Sandler, 2002; Stansfield et al. 2002). Available data of CRS sectors are too aggregated to enable to fully take into account the aggregation technology of each GPG: nonetheless, some tentative general considerations are provided. From the CRS database, 59 CRS sectors[9] are aggregated into the following categories, which are standard in the literature (Zedillo and Thiam, 2006) and which will build the GPG aggregates:

Knowledge generation and dissemination. Knowledge can be generated by best-shot and/or summation technologies and this influences the direction of the financing flows. For example, vaccine development research has both summation and best-shot aggregation patterns (Stansfield et al., 2002). From the CRS database, we have chosen all sectors related to research, the building of statistical capacity and the financing to scientific institutions, excluding education provision, which is essentially a national good.

Human rights. Reisen et al. (2004) treats the protection of human rights and the working for gender equality and women's empowerment as GPGs. On the contrary we deem that the benefits they generate are basically national, although their protection raises international concerns. Besides, we deem that treating human rights as GPGs is not appropriate, as they themselves are the reason for the provision of many GPGs (right to health, right to clean

---

[7] The argument is that establishing global institutions to coordinate the provision or to directly provide international public goods is a core activity. Providing financial stability in one country is not an international public good; however, it is considered a complementary activity as it contributes to the overall stability and to the governance in that country. Besides, building governance capacity, especially in the context of economic policy and management, confers public benefits only at national level and is a complementary activity (Morrissey, 2002).

[8] For a detailed description of the CRS sectors employed see Table A.1 in the Appendix.

[9] The list of the CRS sectors employed here and in OECD (2004) and their description are detailed in Table A.2 in the Annex.

water or air, right to education; Bizzarri, 2005). Thus, this category will be present only in the GPG_OECD aggregate.

Communicable disease control. Although the provision of health services is a national good, the expenditures for communicable disease control are global in their effects. From the CRS database, we choose two sectors: activities related to the prevention, control and combat of sexually transmitted (including HIV/AIDS[10]) and activities related to infectious diseases control (excluding tuberculosis and malaria, which have regional coverage). Available data cannot enable us to distinguish activities according to the proportion of benefits that can be ascribed to a local dimension and the one that has an international range. Besides, the two CRS sectors employed include activities that exhibit a mixture of aggregation technologies. For instance, finding a cure for AIDS or preventing the spread of a disease are best shot technologies. Disease prevention, elimination or eradication programs display weakest-link patterns of aggregation, because the smallest effort fixes the level of the global good provision. Controlling pest needs a weighted sum technology, as each country's contribution has different additive impact (Stansfield et al., 2002).

Global governance. As already mentioned, both the World Bank (2001) and te Velde et al. (2002) exclude economic governance. Following Reisen et al. (2004), we include those activities that support the governing of international economic relations (such as trade, investment) and the macroeconomic and financial stability of developing countries. These activities are generally provided by summation technologies.

Crime control and global peace. Differently from World Bank (2001) and te Velde et al. (2002), we exclude from 'Global Peace' the reintegration of demobilized military personnel or land mine clearance, as they have a national or regional spatial dimension. On the contrary, we include the narcotics control activities that are functional to 'Crime control' on a global scale: these activities are often provided by a weakest/weaker link technology.

Global commons and sustainability. Environmental goods have a global public nature: biosphere protection, biodiversity protection, environmental projects related to fishery, and forestry policy are of global importance. All kinds of production technologies are present in this category, with a dominance of the summation type. Following Barrett (2005), we deem that the absence of climate change is a GPG and that addressing it would require new technologies that produce energy without emitting greenhouse gases. Therefore, in our estimates we include all activities related to alternative energy sources, which are classified as national goods by te Velde et al. (2002).

Communications. This category includes the CRS activities named Communications policy (policy, planning and programs, including postal service development), Telecommunications (telephone networks, telecommunications satellites) and the Free flow of information, which

---

[10] It is debatable whether HIV control and combat is a regional or a global public goods. The fact that mutations in the HIV genes in less developed countries have deep repercussions on the treatment in developed countries, makes us inclined to register the related activities as global goods.

we deem to have global spillovers. Production technologies are of the summation and of the weakest-link types.

The above categories are employed to construct three aggregates of GPGs (Table 1). The first one is built according to Reisen et al. (2004) definition (GPG_OECD): it includes Knowledge, Human rights, Communicable disease control, Global governance, Crime control and global peace, Global commons and sustainability. Differently from Reisen et al. (2004), we include all types of financing (grants and loans). The second aggregate, named Millennium Global Goods, includes the key GPGs that are relevant for the Millennium Development Goals[11] (GPG_MDG), as indicated by the UK Department for International Development (Speight, 2002): Knowledge, Communicable disease control, Global commons and sustainability, Global Governance. The third aggregate, which will be the benchmark in the discussion, is the largest one (GPG_E), as it includes the GPG_MDG categories plus Communications and Crime control and global peace. Both the GPG_MDG and the GPG_E aggregates exclude the category Human rights, which is a permanent concern at international level, but whose benefits are basically national.

Table 1 – Definitions of GPGs

Categories included	GPG_OECD	GPG_MDG	GPG_E
Knowledge generation and dissemination	√	√	√
Human rights	√		
Communicable disease control	√	√	√
Global governance	√	√	√
Crime control and peace building	√		√
Global commons and sustainability	√	√	√
Communications			√

As Table A.2 in the Appendix shows, the categories of GPGs we employ in the MDG and E aggregates do not match perfectly those chosen by Reisen et al. (2004), as we have added or removed some sectors. These changes affect especially Global commons, Crime control and Global Governance. For example, differently from Reisen et al. (2004), we include Conflict prevention and Post-conflict peace building in the category Crime control and global peace, as contemporary conflicts have all global spillovers and exert their influence on the world balance of powers (wars in Iraq, Israel and Palestinian, Georgia are examples of this). Besides, differently from the choices made by Reisen et al. (2004) for the Global commons category, we exclude the activities related to Family planning (planning services, counseling,

---

[11] The Goals for the Millennium include: eradicate extreme poverty, achieve universal primary education, promote gender equality and empower women, reduce child mortality, improve maternal health, combat HIV/AIDS, malaria and other diseases, ensure environmental sustainability, develop a global partnership for development. In 2000 the additional amount of aid needed to finance these goals was estimated to be USD 50 billion per year, while the Zedillo Report (2001) estimated that an adequate financing of international public goods would require at least USD 20 billion per year in addition.
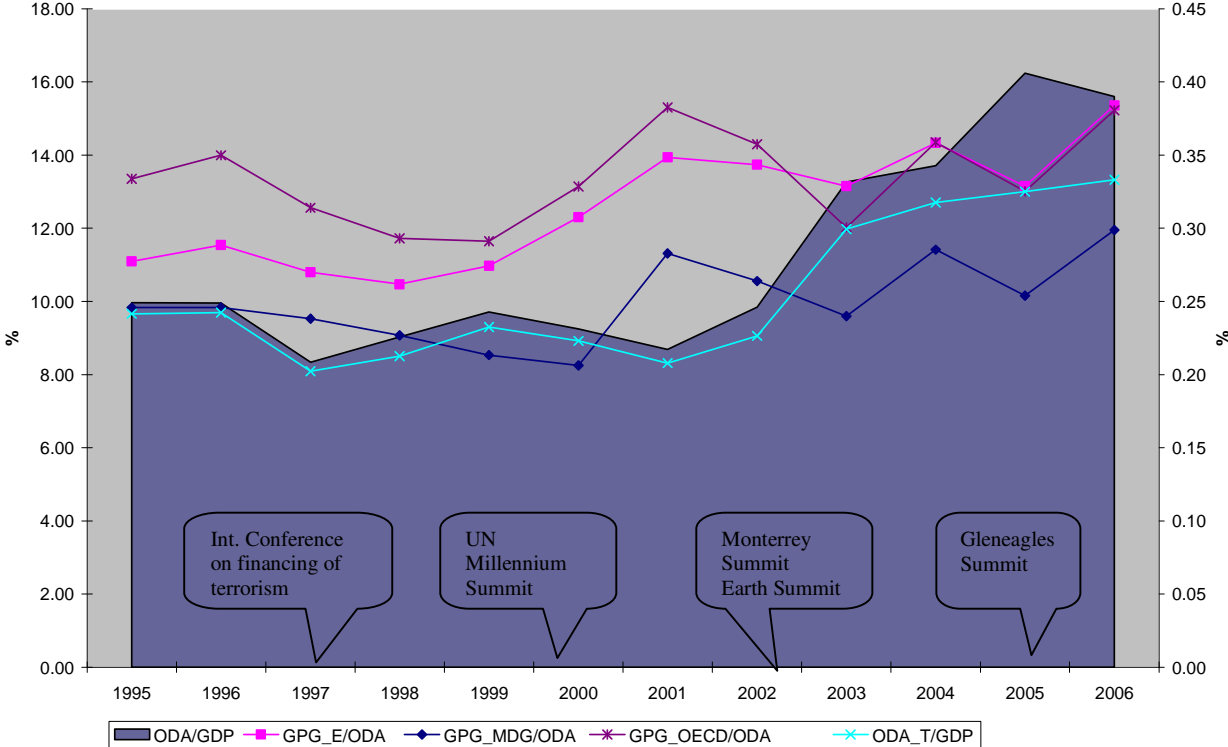
information, education, delivery of contraceptives), which, we deem, have a national/regional dimension, and those related to the hydro-electric power plants, as they are often an element of environment disruption rather than promotion.

GPG aggregates are given in 2000 constant USD and expressed as shares on GDP, on ODA and also on ODA as corrected for debt forgiveness (ODAT). Debt forgiveness is retroactively recognized by the DAC accounting system as ODA grants, but it does not correspond to actual financial flows. This correction allows a better assessment of the actual transfers and of the shares of GPGs, as these latter are financed only out of actual financial flows. The total period 1995-2006 is considered as a whole and in three sub-periods, which are determined according to significant trends in the financing of ODA and GPGs: 1995-1998, 1999-2002 and 2003-2006.

3. Trends in aid financing to GPGs: 1995-2006

While the 1990s were characterized by aid stagnation due to the re-thinking of development policies after the end of the Cold War, the subsequent years saw an encouraging rise in ODA, due to the impulse of the global debate on poverty reduction, that took place at the beginning of the new millennium (Millennium Summit, 2000), and of the pledges of aid scale-up, renewed at the Monterrey (2002) and Gleneagles (2005) summits (Graph 1).

Graph 1 – ODA financing of GPGs (%): 1995-2006

Source: authors' calculations based on OECD-CRS.
Notes: ODA transfers (ODAT) exclude debt forgiveness items from ODA. Right-hand scale is referred to total ODA to GDP and to ODA as corrected for debt forgiveness (ODAT) to GDP. Left-hand scale is referred to the shares of global goods to ODA and to ODA transfers for the three aggregates (%).

In the whole period 1995-2006, the volume of aid increased more than three times in current terms and by about 150 per cent in real terms: the evolution is less marked, when ODA is corrected for debt forgiveness. The UN target of aid to GDP (0.7 per cent by 2015) is still far from being honored, although the economic significance and the assumptions upon which it was determined have been seriously challenged (Clemens and Moss, 2007).

Out of the total aid financing, a share of 11 per cent was devoted to the largest aggregate of GPGs in 1995: twelve years later this share has grown to 15.3 per cent (Graph 1), which is not an impressive rise. On a still minor scale (+ 2.2 p.p.), a similar rise can be detected also for the OECD and the MDG aggregates. For both aid and GPGs financing, turning points in the period seem to be associated with world summits and international conferences. The largest part of aid is provided by bilateral financing (73 per cent on average; 70.7 per cent on average when corrected for debt forgiveness). Bilateral aid is also the largest source of GPGs financing (about 76 per cent on average for the E aggregate).

3.1 Searching for a crowding out effect in bilateral aid financing of GPGs

Depending on the definition adopted, GPGs represent a share of between 7 and 14 per cent of bilateral ODA. Table 2 shows the trend of these shares: a decline from 1995 to 1999, an upward surge from 2000 to 2002, some oscillations thereafter. The largest increase can be observed for the expanded definition: from 12.2 to 14 per cent. Higher shares of GPGs financing can be observed when ODA is corrected for debt forgiveness: the range of the ratios to ODAT goes then from 7.5 to 17.4 per cent.

As Reisen et al. (2004) analysis reports, "there is no straightforward way to test for crowding-out" (p. 28) associated to aid financed GPGs. The methodology adopted in the present study compares the growth rates of the ODA/GDP ratio and those of the GPG_i/ODA ratio (i represents one of the three possible aggregates adopted), as in te Velde et al. (2002) . The possible cases are:

1- absence of substitution effect: the share of resources devoted to ODA increases while the financing to GPG_i out of ODA keeps constant, diminishes or increases less;

2- substitution effect:
   - only on the incremental side: the ODA/GDP ratio and the GPG_i/ODA ratio increase at the same rate, meaning that every additional dollar spent in ODA is earmarked for GPGs;
   - complete: the GPG_i ratio on ODA increases more than ODA/GDP, implying that not only new resources are spent for GPGs but that the precedent allocation of ODA resources is now changed in favour of GPGs.

Table 2 - Bilateral aid and GPGs financing: 1995-2006 (%)

| | ODA/GDP | Shares on ODA | | | ODAT/GDP | Shares on ODAT | | |
		GPG_E	GPG_MDG	GPG_OECD		GPG_E	GPG_MDG	GPG_OECD
1995	0.176	12.20	10.60	14.84	0.168	12.76	11.09	15.53
1996	0.185	12.58	10.58	14.79	0.178	13.06	10.99	15.36
1997	0.162	11.40	9.76	13.52	0.155	11.92	10.20	14.14
1998	0.175	10.14	8.37	12.02	0.159	11.14	9.19	13.21
1999	0.199	9.74	7.08	10.94	0.186	10.40	7.56	11.68
2000	0.204	12.00	7.33	12.98	0.193	12.71	7.77	13.74
2001	0.196	13.44	10.54	14.92	0.182	14.40	11.29	15.99
2002	0.226	13.55	10.22	14.31	0.199	15.42	11.63	16.29
2003	0.280	11.69	8.09	10.85	0.245	13.40	9.26	12.43
2004	0.269	13.81	10.40	13.96	0.243	15.29	11.52	15.45
2005	0.345	12.66	9.63	12.77	0.257	16.98	12.92	17.14
2006	0.341	13.98	10.44	14.08	0.275	17.30	12.91	17.43

Source: elaborations on OECD-CRS.

Notes: ODA transfers (ODAT) exclude debt forgiveness items from ODA.

The regression analysis proposed by te Velde et al. (2002) for the period 1980-98 is performed for sub periods from 1995 to 2006 and for all definitions,:

(1) $\Delta gpg^d{}_{it}/oda = \gamma + \beta \,\Delta oda_{it}/gdp + \gamma_1 TD_{95\text{-}98} + \gamma_2 TD_{99\text{-}02}$

where Δ is the first difference operator, necessary to eliminate the country-specific effect and to focus on the change between periods in each country; $gpg^d{}_{it}/oda$ is the share of GPGs financed by ODA for country i at time t for the three definitions (*d*) of GPGs considered; oda_{it}/gdp is the share of ODA spending on GDP and *TD* is a time dummy for the three sub-periods considered. The same regressions are performed then for aid transfers (ODAT). We expect that changes in the ODA/GDP ratio entail changes of the same sign in the GPG/ODA ratio

The results (Tables 3.a and 3.b) for the three definitions of GPGs show that β is positive, as expected, but not significant and that the changes in the share of GPGs are significantly determined only by the time dummies for all the sub-periods. This result confirms the findings obtained by te Velde et al.: the share of GPGs is explained by the erosion of other forms of aid spending. This result is even stronger when the ODA/GDP ratio is replaced with the ODA transfers ratio: in fact, the coefficients of the time dummies and the explanatory power of the regression are higher (Table 3.b). The choice of the aggregate of GPGs makes no dramatic difference in the statistical significance of the results. However, the coefficients of the time dummies and the explanatory power of the regression are higher for the extended aggregate (E).

Table 3 – Do aid financed GPGs crowd out other forms of aid expenditure?
a) GPG and total bilateral aid

$\Delta gpg_i/oda = \beta\ \Delta oda/gdp + \gamma_1 TD_{95\text{-}98} + \gamma_2 TD_{99\text{-}02} + \gamma TD_{03\text{-}06}$

gpg_e/oda	Coeff.	gpg_mdg/oda	Coeff.	gpg_oecd/oda	Coeff.
oda/gdp	.349786	oda/gdp	3.805355	oda/gdp	3.467516
$TD_{95\text{-}98}$	10.82204*	$TD_{95\text{-}98}$	7.819874*	$TD_{95\text{-}98}$	11.14259*
$TD_{99\text{-}02}$	12.01694*	$TD_{99\text{-}02}$	7.294383*	$TD_{99\text{-}02}$	10.46597*
$TD_{03\text{-}06}$	11.6144*	$TD_{03\text{-}06}$	7.112651*	$TD_{03\text{-}06}$	9.498748*
Num obs.	216	**Num obs.**	216	**Num obs.**	216
R-squared	0.7802	**R-squared**	0.7506	**R-squared**	0.7149

b) GPG and bilateral aid transfers

$\Delta gpg_i/odat = \beta\ \Delta odat/gdp + \gamma_1 TD_{95\text{-}98} + \gamma_2 TD_{99\text{-}02} + \gamma TD_{03\text{-}06}$

gpg_e/oda	Coeff.	gpg_mdg/oda	Coeff.	gpg_oecd/odat	Coeff.
odat/gdp	-.312754	odat/gdp	3.458632	odat/gdp	2.883462
$TD_{95\text{-}98}$	11.53154*	$TD_{95\text{-}98}$	8.418438*	$TD_{95\text{-}98}$	11.93041*
$TD_{99\text{-}02}$	13.4598*	$TD_{99\text{-}02}$	8.11459*	$TD_{99\text{-}02}$	11.51061*
$TD_{03\text{-}06}$	13.69216*	$TD_{03\text{-}06}$	8.893738*	$TD_{03\text{-}06}$	11.88989*
Num obs.	216	**Num obs.**	216	**Num obs.**	216
R-squared	0.8134	**R-squared**	0.7772	**R-squared**	0.7448

Note: subscript *i* is referred to one of the three definitions of global goods (E, MDG, OECD). Pooled ordinary least squares estimates. * significant at 5%.

Table 4 offers a crude measure of the displacement effect in the DAC country, by presenting the differences between the growth rate of the GPG_E/ODAT ratio and the growth rate of ODAT. Countries are ranked according to the relevance of the displacement effect, whose presence is implied by a positive value of that difference.

The results show, in general, great dynamism in donors' behavior. Some countries, like the US, Sweden, Norway, and Finland, which in the sub-period 1995-1999 displaced, on average, other forms of aid by GPG financing, have reversed this trend in more recent years. An opposite trend, from no displacement towards displacement, has been followed by Australia, France, and the UK, while the group of the Central European countries plus Italy continue to increase the presence of GPGs at the expenses of other forms of aid spending.

Explanations for the irregular patterns of the substitution effect can be found in the interplay of different factors: i) global emergencies that require the provision of GPGs (Barrett, 2007), such as global diseases, global environmental risks, international anti-terrorist or anti-drug campaigns; ii) a change in the donors' balance between the benefits from aid financed GPGs and the benefits that donors derive from development aid (strategic and trade interests, geo-political considerations, colonial ties); iii) the increasing awareness of the ineffectiveness of some forms of traditional aid and the so-called 'aid fatigue'; iv) the increasing world-wide inequality in income distribution (Sandler, 1998) and thus the rich

countries' awareness of the necessity of increasing their contributions to the financing of GPGs, especially those with weakest or weaker link technologies that poorest countries cannot afford to pay.

We leave open the question whether this erosion signifies a shift from generosity to greater selfishness by donor countries in times of declining prosperity and public finance difficulties. Alternatively, the displacement effect could signify a 'selfish' reassessment of the donor-specific gains from development aid compared with the world-wide benefits from GPGs. Sections 4 and 5 offer some tentative answers.

Table 4 - Ranking over the substitution effect of GPGs:
ODA transfers financing to GPG_E and to other forms of aid

	1995-98		1999-02		2003-06	
	Difference in average growth rates*	Rank based on difference	Difference in average growth rates*	Rank based on difference	Difference in average growth rates*	Rank based on difference
Italy	38.76	1	-8.85	12	10.92	4
Germany	33.37	2	-19.39	16	4.18	6
Switzerland	27.97	3	29.69	1	15.50	3
Denmark	23.11	4	-14.77	15	10.86	5
Belgium	21.38	5	19.08	2	28.74	2
Sweden	21.33	6	10.35	4	-12.19	15
Finland	12.40	7	-12.47	13	-5.51	10
United States	7.66	8	-104.31	18	-66.32	22
Norway	6.68	9	-13.93	14	-7.55	11
Netherlands	-2.07	10	1.91	9	-12.02	14
Canada	-3.77	11	-29.69	17	-54.18	21
United Kingdom	-11.51	12	7.54	6	1.51	7
Japan	-13.68	13	8.78	5	-21.74	19
Spain	-19.45	14	18.51	3	-13.03	18
France	-21.38	15	0.97	10	-1.02	9
Australia	-78.21	16	0.03	11	31.78	1
Austria	..	..	4.48	8	-12.39	16
Greece	..	..	5.73	7	0.002	8
Ireland	..	..	..	..	-11.73	13
Luxembourg	..	..	..	..	-12.91	17
New Zealand	..	..	..	..	-8.18	12
Portugal	..	..	..	..	-27.26	20

Source: Authors' calculations based on OECD-CRS. ODAT excludes debt forgiveness items from ODA. * Positive differences between the growth rate of the GPG_E/ODAT ratio and the growth rate of ODAT imply the presence of a substitution effect. When the difference is zero there is substitution effect only on the incremental side. A negative value for the difference implies no substitution effect.

3.2 An increasing trend in multilateral aid financing to GPGs

Multilateral aid contributes on average to 26.3 per cent of total ODA and to 29.2 per cent of total ODA transfers. If compared to bilateral aid, commitments on multilateral aid to GDP

grow more smoothly, probably due to the more stable financing that programs promoted by multilateral agencies enjoy (Graph 2). As debt forgiveness is almost irrelevant for multilateral aid, the trend of multilateral ODAT replicates that of multilateral ODA.

Graph 2 – Multilateral aid and aid transfers and shares of GPGs: 1995-2006
(constant USD, million and %)

Source: Author's calculations based on OECD-CRS. Notes: ODA transfers excludes debt forgiveness items from ODA. Left-hand scale is referred to total multilateral ODA and multilateral ODAT. Right-hand scale is referred to the shares of global goods to multilateral ODA for the three definitions.

The aggregate E of GPGs represents 8 per cent of multilateral ODA at the beginning of the period and reaches 16 per cent in 2006. GPGs compete with other aid spending in multilateral financing. Their average annual growth (Table 5) is about 7.8-8.4 per cent, while it is about 4.5 per cent for total multilateral ODA. In the sub-periods, the rates of growth for GPGs are always higher than those of multilateral aid for all aggregates[12]. This means that international financing has increasingly financed those multilateral agencies whose mission is the provision of GPGs, such as the Joint United Nations Program on HIV/AIDS (UNAIDS) or the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFTAM).

A crowding out effect can thus be detected also for multilateral aid, in the sense that multilateral programs have been increasingly directed towards global goods provision. As for bilateral aid, this change in the target of multilateral financing can be explained either because GPGs are in some cases a pre-requisite for the provision of development aid, or because

---

[12] Data for debt forgiveness are irrelevant for multilateral aid.

donors in international agencies have increasingly required the financing of goods with worldwide spillovers from which they would themselves benefit. When at international level the decision to contribute is a voluntary one and "[...] the arrangements are to raise the monies needed, they must somehow make it in the interests of the countries to contribute (Barrett, 2007, p. 105)".

Table 5 – Average rates of growth of multilateral aid financing to GPGs(1995-2006)

	Av. Annual Rate of growth 1995-2006	Av. Annual Rate of Growth 1995-1998	Av. Annual Rate of Growth 1999-2002	Av. Annual Rate of Growth 2003-2006
Multilateral ODA/GDP	**4.46**	**8.91**	**-0.62**	**6.19**
GPG_E/Multilateral ODA	7.89	9.55	2.75	11.78
GPG_MDG/Multilateral ODA	7.80	9.31	0.95	13.53
GPG_OECD/Multilateral ODA	8.45	11.28	3.16	11.61

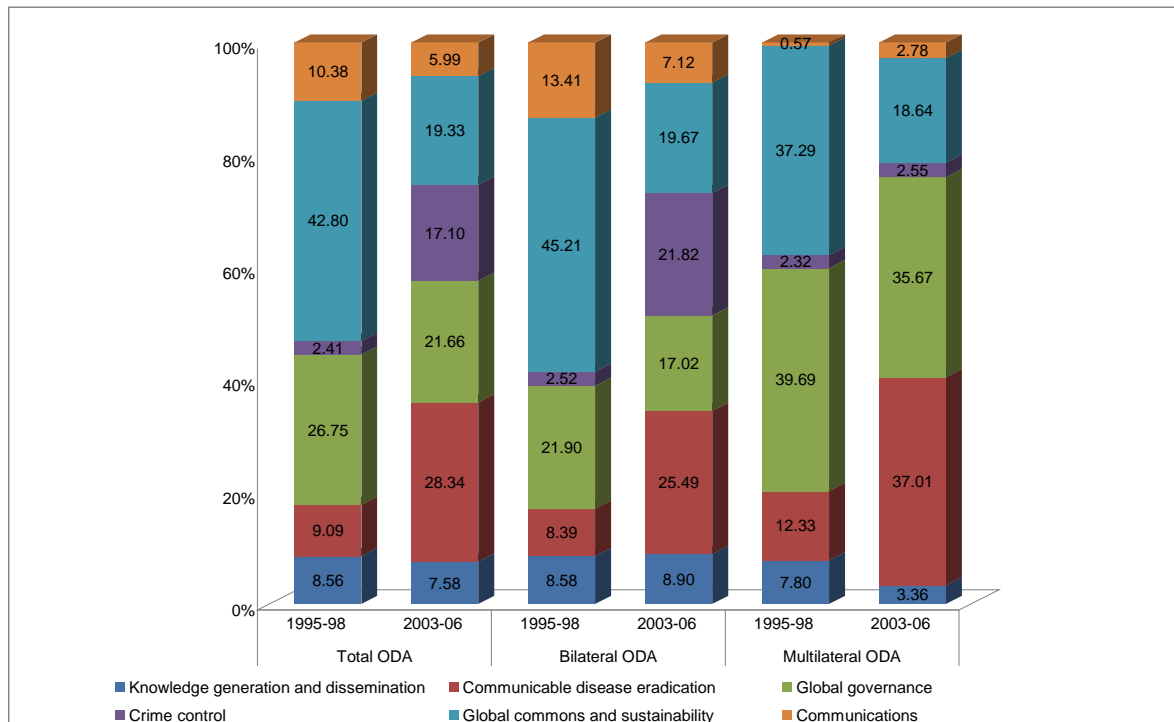Source: Author's calculations based on OECD-CRS.

4. The composition of aid financing to GPGs

This section gives insights into the composition of aid financing of GPGs according to the six categories into which they are grouped. When examining bilateral aid financing, the focus is first on the pattern of financing displayed by single donors and then on their composition.

The composition and the evolution of the aid financing to GPGs between 1995-1997 and 2004-2006 are summarized in Graph 3 for the E aggregate which is the only one we consider in this section[13]. Expenditures for the Global commons and sustainability, which represented the largest share of total financing in 1995-1997, have substantially decreased in time as a share on the total GPGs. A reduction is detected also for the expenditures on Communications. Both categories have been substituted by Communicable disease control, which covered only 9 per cent of the expenditures in 1995-1997 and reaches 28.3 per cent twelve years later. Expenditures on Crime control and Global peace also represent an increasing share of financing. Therefore, we observe both an increase in aid financed GPGs and a change in their composition.

---

[13] According to the World Bank (2001) most of the IPGs financing was devoted to health and knowledge (agricultural and other research) in the 1970s.

Graph 3 – The composition of total, bilateral and multilateral aid financing of GPGs (GPG_E)
(av. 1995-1998 and 2003-2006; %)

Source: Author's calculations based on OECD-CRS.

Higher growth rates are observable by the categories which include GPGs provided by weakest-link technologies: Crime control and Communicable disease control. GPGs provided mostly by summation or best-shot technologies (Communication, Knowledge generation and dissemination, Global governance) show lower and sometimes negative growth rates. Global commons, which includes GPGs with a dominance of summation technologies, presents the worst trend.

These trends convey the idea that some GPGs, and in particular those with weakest-link technologies, have become increasingly important at the global level: health emergencies, such as SARS or avian flu, and crime control emergency, that spur aid to narcotics control to cut one of the main sources of financing to terrorist activities. At the same time, the contributions from poorer countries, which are usually also the weakest-link nations, have probably fallen behind the level desired by the richer donors. To avoid a suboptimal provision of weakest-link GPGs, richest nations have increased their participation in the financing of weakest-link GPGs. This observation supports Sandler's (1998) anticipation of the increase in the sub-optimality of provision levels of weakest-link GPGs, "unless the richest countries either subsidize the poorest countries' provision or else step in and provide the public goods for these poor countries" (Sandler, 1998, p. 235).
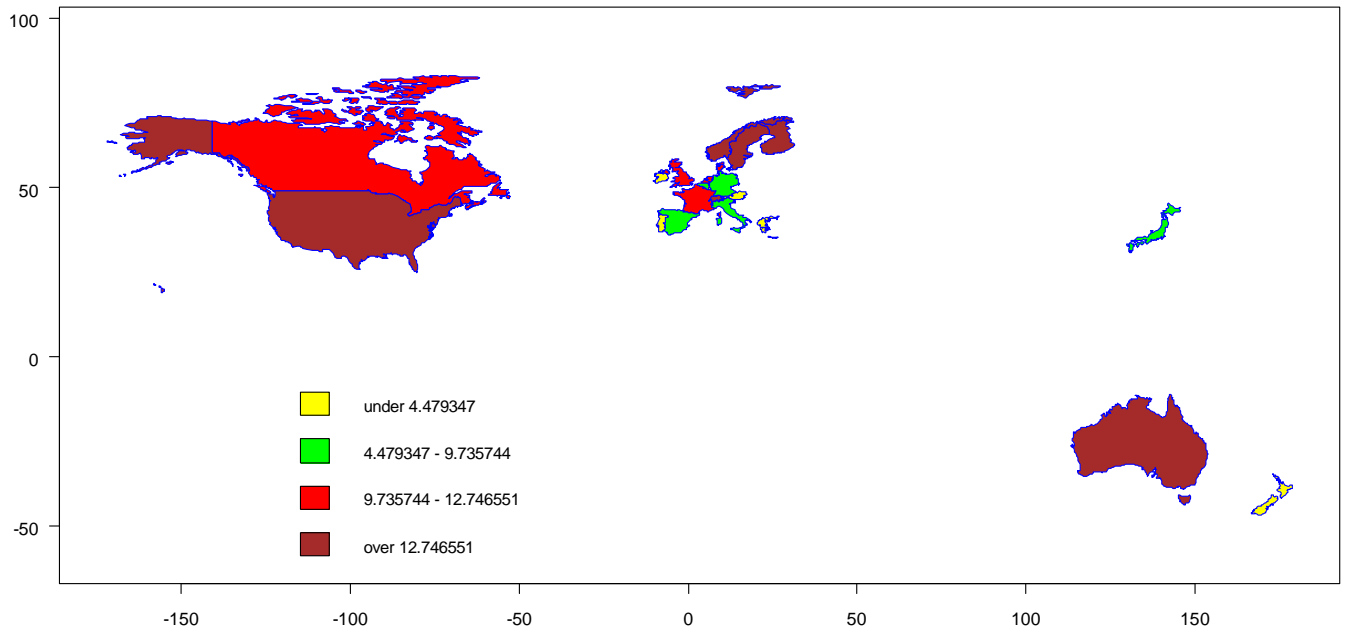
4.1 Ranking donors

Bilateral donors tend to finance four categories of GPGs (Graph 3): Crime control, Communicable disease control, Global governance and Global commons. The first three present a sustained growth in the period, while the expenditures for environment are declining in time. In 2003-2006, the largest share of financing is devoted to Communicable disease control (25.5 per cent), while twelve years before the expenditure for environmental global goods had the primacy (45.5 per cent).

Graph 4 and 5 shows the different role played by DAC countries in GPGs financing at the extremes of the period. On average, donors devoted 9 per cent of their ODA financing to GPGs in 1995-1998 (Graph 4). This share reached its lowest values in Austria (3.6 per cent) and Portugal (1.2 per cent). Some countries (Ireland, Greece, Luxembourg, and New Zealand) had no financing of GPGs at the time. Eleven donors had shares of GPGs to bilateral ODA larger than 9.7 per cent, reaching the maximum values for the Nordic countries, Australia and the US (22 per cent). Twelve years later (Graph 5), in 2003-2006, we observe a general increase in bilateral ODA financing of GPGs. All countries, without an exception, devote part of their bilateral aid to GPGs. Six of them have decreased their financing, Belgium and the US have kept their shares more or less constant and all the others have increased them[14].

The ratios of GPGs financing to ODA change, when we correct ODA for debt forgiveness. The relevance of debt forgiveness is very uneven among DAC counties in the period. It is null for Luxembourg, New Zealand, Ireland, and Greece and almost insignificant for Norway, Finland, Netherlands, Portugal, and Sweden, while it represents a significant share of aid for some countries: 55 per cent of aid in Austria and 50.6 per cent for Italy in the years 2003-06. When we apply this correction, the shares of global goods financing increase for the countries that have significant values of debt forgiveness. Then, in 2003-06, about 10 per cent of Austria aid financing results to be devoted to GPGs, and also Italy's tiny share on ODA increases from 4 to 6.3 per cent. Also UK, Belgium, France and Germany present increases in their shares of GPGs financing by 3-4 p.p.

---

[14] Our results are in line with those of te Velde et al. (2002). For the years 1996-98, they find that only Austria and Portugal allocated less than 5 per cent of aid to IPGs and seven countries allocated more than 10 per cent (in ascending order Norway, Denmark, Netherlands, Sweden, France, Finland, Australia with 19.1 per cent). However, they find that in the same period the US devoted only 8.5 per cent of ODA to IPGs.

Graph 4 – Bilateral aid financing of GPG_E (%, 1995-98)

(yellow)	under 4.479347
(green)	4.479347 - 9.735744
(red)	9.735744 - 12.746551
(brown)	over 12.746551

Graph 5 – Bilateral aid financing of GPG_E (%, 2003-06)

(yellow)	under 8.014076
(green)	8.014076 - 12.5373
(red)	12.5373 - 13.718688
(brown)	over 13.718688

Source: Author's calculations based on OECD-CRS data

In order to better assess the position of each donor country in GPGs financing, countries are first ordered in ascending order in terms of their average GNI[15], a proxy not only for ability-to-pay but also for benefits from GPG provision, as in Barrett (2007). This ranking is then compared to the ranking according to the donors' share of GPG_E on bilateral ODA (Table 6). An increasing gap between donors' potential appropriable benefits and their contribution to GPGs can be observed, as we move from Anglo-Saxon countries and Northern Europe to Southern Europe. The Northern European countries' contribution to GPGs exceeds their position as contributors and potential beneficiaries. Among the Anglo-Saxon countries, the US are characterized by a perfectly coherent relation of benefit-contribution, while Canada, Ireland and New Zealand tend to contribute more and the UK less than their rank in the GNI. Italy, instead, shows a downward trend in its share of global goods financing even if its average GNI would imply increasing benefits from GPGs.

Table 6 - Ranking over GNI vs ranking over the share of GPG_E on bilateral ODA

Rank based on GNI	1995-1998				1999-2002				2002-2006			
		GNI	Share of GPG_E (%)	Rank based on share		GNI	Share of GPG_E (%)	Rank based on share		GNI	Share of GPG_E (%)	Rank based on share
1	USA	8,542,457.87	22.18	1	USA	10,053,068.26	22.51	1	USA	11,105,166.47	22.45	1
2	JP	3,219,193.44	8.83	13	JP	3,280,263.48	5.81	15	JP	3,452,567.97	6.76	17
3	D	1,983,742.64	7.11	14	D	2,114,736.55	8.85	13	D	2,221,515.32	8.70	13
4	F	1,385,267.73	10.16	11	F	1,560,443.07	5.26	16	GB	1,745,752.97	13.63	7
5	I	1,351,770.65	7.07	15	GB	1,555,740.94	16.62	3	F	1,670,348.31	7.01	16
6	GB	1,344,035.21	10.29	10	I	1,457,033.30	4.19	17	I	1,520,511.22	4.10	19
7	CA	719,964.58	11.07	9	CA	851,973.56	12.07	8	CA	957,980.28	16.17	3
8	AU	442,669.28	18.69	2	AU	522,640.62	17.45	2	AU	616,908.32	13.19	10
9	NL	407,225.46	12.72	7	NL	475,080.37	9.30	12	NL	507,573.55	13.76	5
10	B	264,284.14	9.05	12	B	288,180.22	10.84	9	B	304,769.60	8.51	14
11	CH	218,287.84	13.30	5	SE	243,314.13	12.98	6	SE	269,575.19	13.75	6
12	SE	216,344.20	12.76	6	CH	239,272.65	16.26	4	CH	263,528.20	12.23	11
13	A	205,656.44	3.62	16	A	226,656.23	8.67	14	A	245,259.28	6.65	18
14	GR	181,056.43	0.00	17	GR	206,219.77	0.00	18	GR	242,223.09	21.04	2
15	NO	138,408.49	13.64	4	NO	162,292.01	13.86	5	NO	183,438.85	15.11	4
16	DK	136,707.64	11.90	8	DK	150,993.72	10.17	10	DK	166,429.73	13.35	9
17	FIN	112,514.69	15.03	3	FIN	133,761.44	12.32	7	FIN	147,107.31	13.62	8
18	IRE	71,438.05	0.00	17	IRE	95,617.00	9.80	11	IRE	119,149.75	11.75	12
19	NZ	67,932.74	0.00	17	NZ	772,73.31	0.00	18	NZ	902,26.27	7.85	15

Source: Author's calculations based on OECD-CRS data.

Note: Spain, Portugal and Luxembourg are excluded because of absence of GNI data. GNI data are averages in constant 2000 USD.

---

[15] "The benefits of supplying global public goods will not be proportional to this measure [GNI] (benefits may increase with income at a decreasing rate), but they will tend to be correlated with this measure. Bigger and richer countries usually benefit the most" (Barrett, 2007, p.113).

Even if Mascarenhas and Sandler (2006) suggest that donors' decisions on how much aid to allocate are generally independent of the actions of other donors, we can detect groups of donors that display more homogeneous patterns of global goods financing (Table 7). Anglo-Saxon countries have lower than average values of aid and global goods financing, in terms of GDP and population, but they have the highest shares of global goods on total bilateral ODA and bilateral ODA transfers. These countries display an increasing uniform pattern in ODA and GPG financing. Northern European countries have higher than average values for both ODA and GPGs and the lowest dispersion for the share of global goods on total bilateral ODA and ODA transfers. These countries also show an increasing uniformity. Central European and Southern European countries are less homogeneous groups with respect to both ODA and GPGs provision. Central European countries and Japan have ODA values that are about or above the average, but they have lower than average shares of global goods to ODA. Southern European countries have the lowest average values for all variables. These countries are also relatively less homogeneous, especially with respect to their share of global goods to GDP and ODA.

Table 8 adds the composition of the GPG_E spending for the same groups of countries in the three sub-periods. Anglo-Saxon countries, with their propensity to interventionist global policies, have experienced the most decisive shift from summation to weakest link GPGs: activities related to Crime control and Communicable disease control, which amounted to 17.5 per cent of total GPG_E in 1995-98, sum up to 66 per cent in 2003-2006. On the contrary, expenditures for environment and global stability have decreased from 71.8 to 26.8 per cent in the same period. In a less pronounced way, the same trend has been followed by the North European countries, which have doubled their financing to Crime control and Communicable disease control (from 12 to 27 per cent), but still keep 48 per cent of their GPG expenditures on environment and global stability in 2003-2006. The Central European countries only in the last sub-period tend to conform to the pattern of expenditures of the above countries, they reduce less the expenditures for environment while increasing the shares of Knowledge and Global stability. The same pattern is followed by the countries in Southern Europe. Japan presents an opposite trend with respect to Anglo-Saxon countries, increasing its financing to the summation technology GPGs, environment and global stability.

Tables 6 and 7 tend to suggest that no clear principle of burden sharing is respected in the financing of GPGs: neither the ability-to-pay principle, when ability is measured in terms of GNI, nor the equal sacrifice principle is respected, when sacrifice is measured in terms of the per capita amount spent on GPGs, as per capita expenditures show a pattern which is similar to the global goods ratios to GDP. Besides, we cannot demonstrate the presence of free-riding behavior either: Southern European countries could either be considered as free-riders, profiting from the other donors' higher contribution to GPGs, or be positively evaluated as they do not subtract funds from development aid and poverty reduction. Finally, Southern European countries could be simply less equipped than other DAC donors with the administrative capacity to run programs for proving GPGs and could therefore prefer to finance them through multilateral agencies.

A host of considerations involving perspective benefits and genuine altruism probably drives the donors' decision on how much aid to allocate to GPGs: donor-specific gains from other aid spending (geo-political considerations, trade and political ties), satisfaction from altruistic giving to alleviate poverty or to contribute to the solution of world-wide problems and non-rival/non-excludable benefits from GPGs. For example, Nordic countries, which seem to be less driven by the search for donor-specific gains from aid (Gates and Hoeffler, 2004), have kept a generous level of financing to poor countries over time, while not renouncing to redirect part of it to global issues: are they just becoming less generous or are they leaving behind the "old school" development assistance patterns (Severino and Ray, 2009) to search for greater coherence between aid and other dimensions of their international economic policies? The same caution is to applied to the Anglo-Saxon countries and to the US in particular. Their shift towards weakest-link GPG financing could be the attempt to grant stable financing against risky and disruptive events, even in the absence of cooperation from other countries. Alternatively, it could be the consequence of the strict pursuit of geopolitical and security interest, whose complementary with poor countries development is doubtful (Sagasti, 2005).

Table 7 - Bilateral aid financing of GPG_E by groups of donors (1995-2006)

	1995-1998				1999-2002				2003-2006			
	ODA/GDP (%)	GPG_E/GDP (%)	Share of GPG financing on bilateral aid (%)	GPG_E/bilateral ODAT (%)	ODA/GDP (%)	GPG_E/GDP (%)	Share of GPG financing on bilateral aid (%)	GPG_E/bilateral ODAT (%)	ODA/GDP (%)	GPG_E/GDP (%)	Share of GPG financing on bilateral aid (%)	GPG_E/bilateral ODAT (%)
All countries (22)												
Average	0.296	0.035	10.882	11.443	0.352	0.040	12.472	13.578	0.432	0.049	11.812	13.278
Rel. Std. Dev.	0.816	1.022	0.572	0.543	0.732	0.823	0.709	0.657	0.708	0.840	0.505	0.436
Anglo-Saxon countries (6)												
Average	0.164	0.025	15.089	16.121	0.202	0.031	15.611	16.256	0.273	0.038	14.173	15.575
Rel. Std. Dev.	0.550	1.202	0.545	0.495	0.361	0.482	0.385	0.391	0.368	0.432	0.365	0.389
Northern European countries (4)												
Average	0.581	0.073	13.332	13.775	0.634	0.078	12.335	12.489	0.778	0.108	13.954	14.370
Rel. Std. Dev.	0.500	0.477	0.268	0.272	0.445	0.541	0.288	0.276	0.375	0.435	0.218	0.214
Central European Countries (7)												
Average	0.296	0.030	9.175	9.835	0.413	0.039	9.426	11.162	0.533	0.049	9.161	11.548
Rel. Std. Dev.	0.554	0.854	0.501	0.465	0.574	0.723	0.523	0.452	0.552	0.670	0.523	0.452
Southern European countries (4)												
Average	0.081	0.005	5.754	6.124	0.143	0.021	15.718	17.763	0.151	0.014	12.030	12.975
Rel. Std. Dev.	0.483	1.056	0.771	0.735	0.455	0.882	1.133	1.002	0.772	0.731	0.819	0.716
Japan												
Average	0.360	0.032	8.829	9.013	0.274	0.016	5.813	6.044	0.415	0.028	6.765	8.456
Rel. Std. Dev.	0.030	0.000	0.205	0.200	0.142	0.221	0.246	0.240	0.135	0.168	0.131	0.184

Source: Author's calculations based on OECD-CRS data. Notes: ODA transfers excludes debt forgiveness items from ODA.

Table 8 - The composition of GPG_E spending by groups of donors and sectors: 1995-2006 (%)

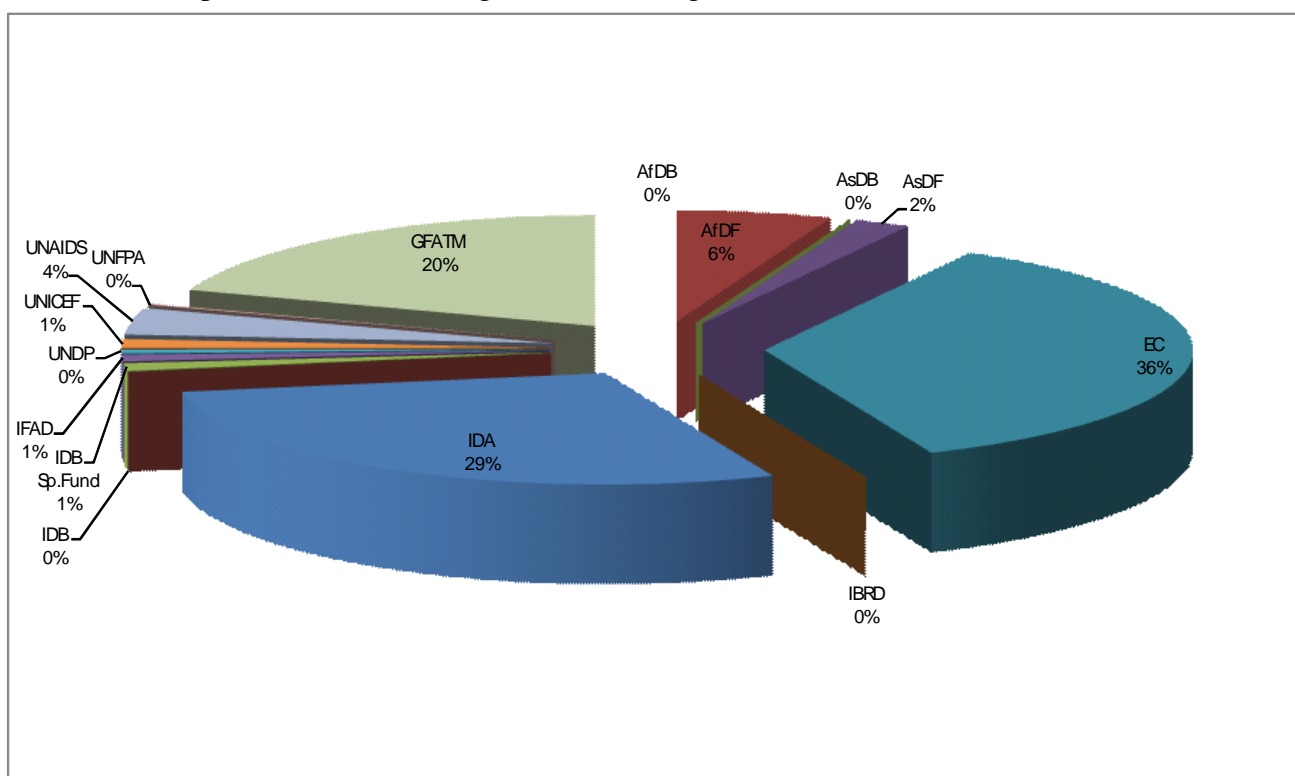|	Knowledge generation and dissemination			Communicable disease eradication			Global governance			Crime control and peace building			Global commons and sustainability			Communications		
	1995-1998	*1999-2002*	*2003-2006*	*1995-1998*	*1999-2002*	*2003-2006*	*1995-1998*	*1999-2002*	*2003-2006*	*1995-1998*	*1999-2002*	*2003-2006*	*1995-1998*	*1999-2002*	*2003-2006*	*1995-1998*	*1999-2002*	*2003-2006*
Anglo-saxon countries	5.33	4.28	4.00	14.10	24.68	36.42	36.96	18.41	18.85	3.47	34.54	29.62	34.90	16.77	7.99	5.24	1.31	3.12
Nordic countries	12.53	21.59	22.13	6.95	14.48	16.41	13.20	12.29	10.21	5.18	7.13	10.92	51.33	38.15	34.46	10.80	6.37	5.87
Central European countries	22.36	9.53	25.84	8.93	11.70	12.53	9.00	15.16	16.01	1.73	8.88	10.83	46.49	49.83	31.83	11.48	4.91	2.97
Southern European countries	11.53	6.77	11.81	5.14	4.87	11.00	2.31	7.82	10.62	7.48	46.95	27.71	38.96	27.15	33.17	34.58	6.44	5.69
Japan	1.09	2.53	4.10	1.34	4.53	3.86	15.36	2.50	16.05	0.00	0.56	0.59	57.64	79.22	63.98	24.58	10.65	11.42

Source: Author's calculations based on OECD-CRS data. Notes: data for lines sum up to 100.00 for the different sub-periods.

4.2 The international agencies financing of GPGs

Multilateral aid finances about 23 per cent of total global goods (definitions E) in 2003-2006, with a preference for Global governance (35.6 per cent), Communicable disease eradication (37 per cent) and, on a lesser scale, for Global commons (18.6 per cent) (Graph 3): these categories absorb 91.2 per cent of the total financing. The same categories, but with higher shares for the Global commons (39.7 per cent), were financed also in 1995-98. As the DAC countries in general, also international agencies have increasingly financed weakest-link GPGs (especially in the health sector), but they have not stepped from summations GPGs, like Communications and Global governance.

As Graph 6 shows, multilateral aid financing to GPGs comes primarily from the European Commission (35.8 per cent) and the International Development Association (IDA) of the World Bank (28.8 per cent), which confirms the relevant position in the financing that was observed by te Velde et al.(2002). The Global Fund to Fight AIDS, Tuberculosis, and Malaria (GFATM) has also a relevant share of 19.8 per cent on the total financing.

Graph 6 - International agencies financing of GPGs (E) (av. 2003-06, %)

Source: Author's calculations based on OECD-CRS data.

Legenda. AfDB: African Development Bank; AfDF: African Development fund; AsDB: Asian Development Bank; AsDF: Asian Development Fund; EC: European Commission; IBRD: International Bank for Reconstruction and development; IDA: International Development Association; IDB: Inter-American Development Bank; IDB Sp. Fund: Inter-American Development Bank Special Fund; IFAD: International Fund for Agricultural Development; UNDP: United Nation Development Program; UNICEF: United Nations Children's Fund; UNAIDS: Joint United Nations Programme on HIV/AIDS; UNFPA: United Nations Populations Fund GFATM: Global Fund to Fight AIDS, Tuberculosis, and Malaria.

GPGs financing seen as a share of each organization's total aid commitments amounts to about 12 per cent for the European Commission, IDA and the IDB special operations fund. The Joint United Nations Program on HIV/AIDS (UNAIDS) devotes almost its whole aid budget to Global disease control and GFATM a share of 56 per cent.

There are generally one or two leader donors in the provision of the different global goods (Graph 7): the EC for Knowledge and Crime control, GFATM for Communicable disease eradication, EC and IDA for the other goods. The European Commission has a much more diversified allocation of its funds to GPGs. It finances all categories, with a preference for Global governance and for Environmental goods. IDA finances the same global goods with a preference for Global governance.

Graph 7 - The contribution of multilateral agencies to different categories of GPGs (GPG_E, average 2003-06, %)
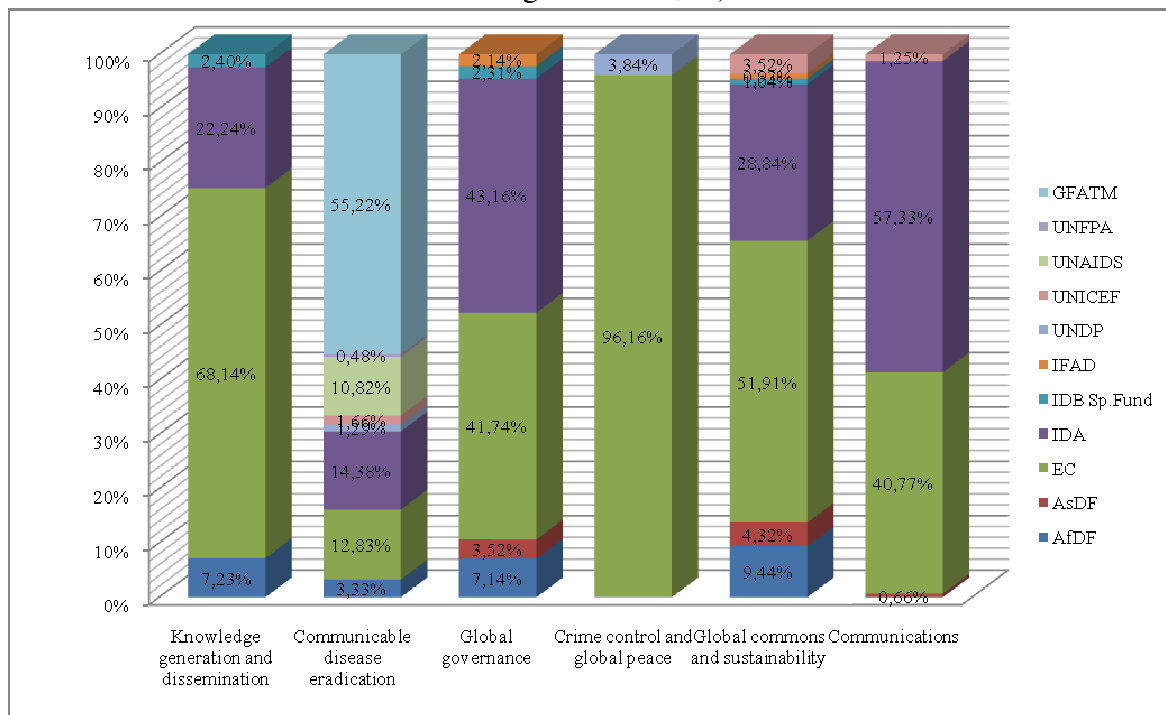

Source: Author's calculations based on OECD-CRS data.
Legenda. AfDB: African Development Bank; AfDF: African Development fund; AsDB: Asian Development Bank; AsDF: Asian Development Fund; EC: European Commission; IBRD: International Bank for Reconstruction and development; IDA: International Development Association; IDB: Inter-American Development Bank; IDB Sp. Fund: Inter-American Development Bank Special Fund; IFAD: International Fund for Agricultural Development; UNDP: United Nation Development Program; UNICEF: United Nations Children's Fund; UNAIDS: Joint United Nations Programme on HIV/AIDS; UNFPA: United Nations Populations Fund GFATM: Global Fund to Fight AIDS, Tuberculosis, and Malaria.

In comparison to bilateral aid financing of GPGs, multilateral agencies have more concentrated financial flows and higher specialization, which do not prevent some overlapping in GPG provision. The framework is still far from the organisational structure that a number of scholars have suggested. Lodefalk and Whalley (2002) propose the creation of global agencies,

each focused on one specific category. Kanbur et al. (1999) and Rajaraman and Kanbur (1999) suggest that aid should be channeled through a common pool mechanism. Kanbur (2001) favors a single global organization with several sector specialist sub-agencies.

5. Determinants of bilateral financing of aid and GPGs

This section focuses on the bilateral aid, trying to disentangle the factors that determine the donors' decision of GPG financing. The empirical literature on the factors influencing aid allocation[16] provides two patterns of modeling: i) *hybrid models* and ii) *donor interest/ recipient needs models.* In hybrid models the aid flows are explained by a combination of variables representing political, commercial, and humanitarian motives. In donor interest models and in recipient needs models, the egoistic and altruistic side of the action of the donor are separated[17]. We adapt the hybrid model, focusing on the donor, separating the two stages, *how much to give* and *how to allocate*, and concentrating on the first one. The determinants of the financing flows are then to be found not just in the conditions of the recipient and among the hidden interests of donors, but also in the preferences and conditions of the donors[18]. The result is that recipients are considered as a *unicum*, which is consistent with our interest in global goods financing, where benefits of GPGs are potentially equal for all countries and the relevant role is that of the financer/producer.

5.1 Determinants of bilateral ODA

As in Reisen et al. (2004), we first analyze the source of GPGs financing, namely bilateral ODA, in total and as corrected by debt forgiveness. The variables considered can be roughly divided into two groups, *i)* indicators of *preferences* for bilateral aid and GPGs, and *ii)* indicators of *constraints*. The first group includes variables that summarizes the country's position with respect to: (a) the financing of public expenditure; (b) the degree of openness to the rest of the world; (c) the preference for redistribution both within the country and (d) between countries; (e) the importance given to country-specific gains from aid. The second group includes variables related to the state of the donor's public finances. We expect that when the budgetary situation is under strain, less effort can be devoted to financing development abroad: ODA becomes one of the first items to be cut under a budget tightening, like public investment, and it is resumed when the state of public finances improves.

Table 9 presents the correlations between determinant variables, and the ratios ODA/GDP and ODA transfers/GDP, in the three sub-periods. There are other country-specific factors impact on the level of bilateral aid that we do not explicitly take into account. For example, some countries like Italy prefer to contribute to multilateral agencies rather than to bilateral aid, given the fact that multilateral programs are less labor-intensive and the structural

---

[16] For a survey see McGillivray and White (1993).

[17] The types of models appeared in literature are more than just the two types considered here: there are also bias models, stressing certain phenomena like the small-country effect or medium-income effect; developmental models, which, in a certain way, are similar to recipient needs model but with more stress on the role of developmental variables representing the ability to absorb aid; limited dependent variable models including the eligibility for aid choice.

[18] Reisen et al. (2004) adopt this interpretation, when correlating GPG/ODA and ODA/GDP with variables representative of the donor's preference for altruism and for public goods

and operational deficiencies of the departments in charge of bilateral flows (Maurini and Settimo, 2009).

We don't find any remarkable difference in the correlation strength for the two definitions of aid (ODA and ODAT), probably because the reasons for the expenditure are very similar. The three sub-periods present a certain stability in the significant variables, as if the variability of the composition of the aid could be explained by a constant set of reasons. In particular, among the variables related to openness, a large outward direct investment position (as in Reisen et al., 2004) and foreign direct investment outflow are significant and positively correlated with aid for all the sub- periods.

Table 9 - Correlation coefficients for the ODA to GDP ratio

		1995-1998°		1999-2002		2003-2006	
		ODA/GDP	ODA transfers/GDP	ODA/GDP	ODA transfers/GDP	ODA/GDP	ODA transfers/GDP
Openness to rest of the world	Outward direct investment position /GDP	0.6029* (0.0104)	0.5907* (0.0125)	0.7098* (0.0002)	0.7346* (0.0001)	0.6985* (0.003)	0.6793* (0.0005)
	FDI outflow %GDP- 2006	0.4265** (0.0878)	0.4706** (0.0566)	0.6680* (0.0007)	0.6770* (0.0005)	0.5438* (0.0089)	0.4726* (0.0263)
Altruism within the country	Gini index	-0.7133* (0.0092)	-0.8322* (0.0008)	-0.6000 * (0.0181)	-0.5092** (0.0813)	-0. 5845* (0.0174)	-0.5476* (0.0281)
	Social expenditure %GDP	0.2425 (0.3322)	0.3230 (0.1911)	0.3461 (0.1146)	0.1959 (0.3822)	0.4297* (0.0459)	0.2840 (0.2002)
Altruism between countries	CDI index av. - 2004-06	no data	no data	no data	no data	0.5662* (0.0075)	0.5558* (0.0089)
	Tied aid (%)	-0.2941 (0.2361)	-0.2755 (0.2684)	-0.2286 (0.3324)	-0.1774 (0.4542)	-0.3865** (0.0923)	-0.4737* (0.0349)
	Effectiveness perceived of national aid (Eurobarometer) (a)					0.7255* (0.0033)	0.7630* (0.0015)
Preference for public goods	Public expenditure on Health	0.0052 (0.9838)	0.0010 (0.9968)	-0.0474 (0.8339)	-0.2016 (0.3682)	-0.0689 (0.7605)	-0.2181 (0.3296)
	Public expenditure on Education	0.5209** (0.0562)	0.5033** (0.0666)	0.5421* (0.0165)	0.4158** (0.0766)	0.5860* (0.0084)	0.5509* (0.0145)
	General government final consumption expenditure (%GNI)	0.8132* (0.0007)	0.8077* (0.0008)	0.6667* (0.0048)	0.5092* (0.0440)	0.5971* (0.0146)	0.5294 * (0.0350)
	Gross domestic expenditure on R&D	0.3583 (0.1443)	0.4812* (0.0432)	0.3970** (0.0674)	0.3936** (0.0700)	0.4320* (0.0447)	0.3811** (0.0801)
Economic liabilities	General Government financial balance (% GDP)	0.4964* (0.0361)	0.4716* (0.0482)	0.4128** (0.0562)	0.4952* (0.0191)	0.3710** (0.0892)	0.4387* (0.0411)
	General government gross financial liabilities	-0.0857 (0.7354)	0.0031 (0.9903)	-0.2840 (0.2002)	-0.2942 (0.1839)	-0.2422 (0.2774)	-0.3303 (0.1332)
	Maastricht debt/GDP (a)	0.2238 (0.4845)	0.2937 (0.3541)	-0.4676 ** (0.0678)	-0.6059* (0.0129)	-0.4059 (0.1188)	-0.5529* (0.0263)
	Interest expenditure/GDP (a)	-0.0364 (0.9155)	0.0727 (0.8317)	-0.2622 (0.3267)	-0.3358 (0.2035)	-0.4061 (0.1331)	-0.5868* (0.0215)

Source: Author's calculations based on OECD-CRS data.

Notes: As in Reisen et al. (2004) we report the Spearman correlation coefficients for period averages. * Correlation is significant at a 5 per cent level ** Correlation is significant at a 10 per cent level. ° Luxembourg, New Zealand, Ireland, Greece are not considered because of insufficient data for that period. °° Greece and New Zealand are not considered because of insufficient data. (a) EU countries only; (c) When GPGs are correlated with ODA transfers/GDP, data are expressed as ratios to ODA transfers

The preference for *domestic inequality*, as summarized by the Gini index, is negatively related to aid financing, meaning that countries that do not allow for much domestic redistribution are less involved in international redistribution. With regard to *altruism in international relationships*, a larger share of tied aid[19] is negatively and significantly correlated with aid giving in the last interval, 2003-2006. It could be that conditionality on aid is associated with weaker altruism and smaller aid flows. Alternatively. the explicit decision to finance more extensively international programs possibly goes hand in hand with the lower necessity to buy internal consensus by imposing conditionality on aid. Moreover, the concern for development and for better quality in the relationships with other countries, as captured by the Commitment to Development Index[20], is significantly associated with larger aid giving. Another variable related to altruism in international relationships, Effectiveness of national aid, expressing a great support to aid by the vast majority of the EU citizens (above 70% on average since 1990s), is significantly and positively correlated with ODA[21].

Out of the indicators of *preferences for public goods*, all variables, except expenditure on health, are significantly related to aid. As in Reisen et al. (2004), this supports the hypothesis that a larger government is associated with higher spending also on international programs.

Among the indicators for the *state of public finances,* the general government financial balance, the Maastricht debt (last two periods), and the interest expenditure (last period and only for ODA transfers) are significant[22]. This supports the hypothesis that part of the generosity in aid financing is explained by the availability of public saving: countries undergoing a period of public finance distress or reform tend to cut all more flexible budget items, including the support to international programs. This conclusion is shared also by te Velde et al. (2002).

5.2 Determinants of GPGs

The analysis above is performed for the three aggregates of GPGs, adding two variables, population and gross national income pro capita[23], as representatives of the *potential direct benefits* from GPG provision. As in Barrett (2007), we expect that a larger income and a larger

---

[19] Tied aid is defined as loans and grants which are tied to procurement of goods and services from the donor country and from a restricted number of countries. The literature estimates that tying raises the cost of aid projects a typical 15–30 percent and reduces the *value* of aid by 13–23 percent.

[20] There are no data of the CDI for the first two sub-periods.

[21] Hudson and Van Heerde (2009), over the period 1990-2007, consider both a strict (including only questions on development aid) and a relaxed (including even questions on poverty in general) measure of public support: they find non-significant relations (respectively a negative and a positive one) with ODA. The authors stress how, even if there is a sort of unanimous consent to public intervention, which is confirmed for national policies, it is less evident for foreign policies. Their finding suggests us to take both results with caution, considering the low level of information of the public and the vagueness and not explicitness of the surveys.

[22] General government gross financial liabilities are not significantly correlated with aid, probably because gross debt data are not always comparable across countries due to different definitions or treatment of debt components. In particular, debt data include the funded portion of government employee pension liabilities in some OECD countries, including Australia and the United States. The debt position of these countries is thus overstated relative to countries that have large unfunded liabilities for such pensions, which according to ESA95 are not counted in the debt figures.

[23] "This is because people benefit from the supply of global public goods, and their willingness to pay for provision—a measure of their benefit—while not determined by their income, will almost certainly increase in the level of their income" (Barrett, 2007), p. 113).

number of potential beneficiaries increase the willingness to take part in GPG financing (Table 10).

Table 10 - Correlation coefficients for the GPG ratios

		Spearman correlation								
		GPG_E/ GDP	GPG_M DG/GDP	GPG_O ECD/GD P	GPG_E/ GDP	GPG_MD G/GDP	GPG_OE CD/GDP	GPG_E /GDP	GPG_M DG/GDP	GPG_OE CD/GDP
		1995-1998°			1999-2002°°			2003-2006		
Openness to the rest of the world	Outward direct investment position /GDP	0.4412** (0.0763)	0.4877* (0.0470)	0.3725 (0.1408)	0.5489* (0.0122)	0.5955* (0.0056)	0.3579 (0.1213)	0.6894* (0.0004)	0.7019* (0.0003)	0.5663* (0.0060)
	FDI outflow as a % GDP	0.4828* (0.0496)	0.5686* (0.0138)	0.6078* (0.0075)	0.5053* (0.0231)	0.4797* (0.0323)	0.2436 (0.3007)	0.3981** (0.0665)	0.4545* (0.0336)	0.3811** (0.0801)
Altruism between countries	Tied aid to LDC (%)	-0.2219 (0.3762)	-0.2611 (0.2953)	-0.2157 (0.3900)	-0.5026* (0.0335)	-0.2466 (0.3238)	-0.2178 (0.3854)	-0.2932 (0.2096)	-0.2872 (0.2195)	-0.1985 (0.4015)
	CDI index av 2004-06	No data						0.6208* (0.0027)	0.6312* (0.0022)	0.5325* (0.0130)
Preference for public goods	Public expenditure on Health	-0.0155 (0.9513)	-0.1334 (0.5977)	-0.1086 (0.6680)	-0.0030 (0.99)	0.0271 (0.9098)	0.0647 (0.7865)	-0.0328 (0.8849)	-0.1175 (0.6025)	-0.1695 (0.4508)
	Public expenditure on Education	0.4813** (0.0814)	0.2282 (0.3624)	0.3268 (0.1857)	0.5604* (0.0156)	0.5294* (0.0239)	0.4778* (0.0449)	0.6035* (0.0062)	0.5825* (0.0089)	0.5035 (0.0280)*
	General government final consumption expenditure (%GDP)	0.7582* (0.0027)	0.3639 (0.1376)	0.4682* (0.0500)	0.5201* (0.0469)	0.5112** (0.0515)	0.5273* (0.0434)	0.5353* (0.0326)	0.5324* (0.0338)	0.4735** (0.0639)
	Gross domestic expenditure on R&D	0.4047** (0.0957)	0.3841 (0.1156)	0.5307* (0.0235)	0.0331 (0.8899)	0.2947 (0.2071)	0.3098 (0.1838)	0.4410* (0.0399)	0.3360 (0.1263)	0.3552 (0.1048)
Economic performance	GDP per capita	0.5150 * (0.0287)	0.4923 * (0.0380)	0.3973 (0.1025)	0.4917* (0.0277)	0.4992* (0.0250)	0.4977* (0.0255)	0.6849* (0.0004)	0.6036* (0.0029)	0.6443* (0.0012)
Potential benefits	GNI per capita°°°	0.3176 (0.2306)	0.4029 (0.1217)	0.3176 (0.2306)	0.5907* (0.0125)	0.4461** (0.0727)	0.4167** (0.0962)	0.6965* (0.0009)	0.5333* (0.0187)	0.5509* (0.0145)
	Population	-0.432** (0.0731)	-0.5129* (0.0295)	-0.4056** (0.0950)	-0.5263* (0.0171)	-0.3609 (0.1180)	-0.2857 (0.2220)	-0.2942 (0.1839)	-0.3123 (0.1571)	-0.2422 (0.2774)
Economic liabilities	General Government financial balance (% GDP)	0.6677* (0.0025)	0.6429* (0.0040)	0.4675** (0.0504)	0.5699* (0.0087)	0.6647* (0.0014)	0.5835* (0.0069)	0.4568* (0.0326)	0.5155* (0.0141)	0.4195** (0.0519)
	General government gross financial liabilities	-0.2033 (0.4184)	-0.1579 (0.5315)	-0.2466 (0.3238)	-0.5128* (0.0208)	-0.3895** (0.0896)	-0.4737* (0.0349)	-0.3890** (0.0735)	-0.4489* (0.0361)	-0.3845** (0.0772)
	Maastricht debt/GDP (a)	0.0839 (0.7954)	0.1538 (0.6331)	0.0979 (0.7621)	- 0.4637** (0.0949)	-0.4418 (0.1138)	-0.4110 (0.1443)	-0.4821* (0.0687)	-0.3893 (0.1515)	-0.4071 (0.1320)
	Interest expenditure/GDP (a)	-0.0273 (0.9366)	0.1455 (0.6696)	-0.0455 (0.8944)	0.0352 (0.9049)	-0.0880 (0.7648)	-0.0550 (0.8518)	-0.5492* (0.0340)	-0.4884** (0.0647)	-0.5063** (0.0541)

Source: Author's calculations based on OECD-CRS data.

Notes. ° Luxembourg, New Zeland, Ireland, Greece are not considered because of insufficient data for that period. °° Greece and New Zeland are not considered because of insufficient data. °°° Spain, Portugal are not considered because of insuficient data. (a) EU countries only; * significant at 5% ** significant at 10%

Table 10 shows that the strategic interest component continues to be supported by the statistical significance of the variables included under the heading *Openness to the rest of the world*. The significance of the Commitment to Development Index confirms the idea that not only selfish interests move developed countries. *Preference for national public goods* continues to be significantly and positively correlated with GPGs (E aggregate), supporting the hypothesis that countries interested in national public goods are more in favor of GPG financing. This result is different from that found by Reisen et al. (2004, p. 25), where these variables are significantly correlated only with ODA/GDP. Our finding could be due to the overlapping role of GPGs and ODA in certain sectors.

The variables related to *potential benefits* from GPG financing, are significant but in different sub-periods: population is significant in the first period and per capita GNI in the following two periods.

The *state of the public finances* continues to be significantly related to GPGs financing. As expected, the relationship is positive for the budget balance, as in Reisen et al. (2004), and negative for the General government gross financial liabilities, the share of Maastricht debt and interest expenditure on GDP for the EU countries.

In conclusion, the comparison among the three aggregates of GPGs adopted shows the light superiority of the enlarged definition in better catching the different motives behind the choice of GPGs financing.

6. Committing aid funds to GPGs

The function describing aid funded commitments to GPGs employs one variable for each group of determinants reported in Table 10[24], using the three definitions of GPGs. The first estimate refers to an unbalanced dataset of 18[25] countries observed for 12 years (1995-2006):

$$(2) \quad GPGF^{j}_{it} = \beta_1 \, \mathrm{FL}_{it} + \beta_2 \, \mathrm{GDP}_{it} + \beta_3 \mathrm{TA}_{it} + \beta_4 \, \mathrm{R\&D}_{it} + \beta_5 \, \mathrm{GNIpro}_{it} + \beta_6 \, \mathrm{OUTW}_{it} + \varepsilon_{it}$$

where the up script j denotes the three definitions of GPGs, the subscript i denotes the ith state and the subscript t denotes the tth year.

The factors of influence considered are: *openness to the rest of the world*, as measured by the outward direct investment position as a percentage of GDP (*OUTW*); *economic liabilities,* as measured by the General government gross financial liabilities as a percentage of GDP (*FL*); the *wealth of the country*, as measured by GDP (*GDP)*; *the preference for public goods,* as measured by research and development expenditure as a percentage of GDP (*R&D*); *between altruism*, as measured by tied aid (*TA*) and the *potential benefits* as measured by per capita GNI (*GNIpro*). The disturbance term is specified as a two-way error component model: $\varepsilon_{it} = \alpha_i + \gamma_t + u_{it}$ with α_i representing the country effect, which we assume a fixed effect, so to include cultural,

---

[24] Effectiveness of national aid will not be considered as there are not sufficient data.
[25] Ireland, Luxembourg , Greece and New Zealand are omitted because of missing values.

religious and historic aspects, and γt - the time dummies, fixed for each year, in order to catch the influence of peculiar policies or events which can influence countries' behavior.

Because of an incomplete dataset for some countries in the whole period, the equation (2) is calculated first on a reduced number of variables and then on a larger number of variables, but for a reduced panel. At the end, the operation of including new variables and of dropping some countries brings to a panel composed of 15 countries.

The results (Table 11) confirm the great importance of wealth and of potential benefits in the donor's decision of GPG financing: in fact *GDP* is significant for all the three aggregates of GPGs, while per capita GNI is significant for the OECD and the E aggregates. The signs are also, as expected, positive for both the variables.

The role of the financial variables is more uncertain. Financial liabilities (*FL*) are significant (and with the expected sign) only for GPG_OECD. The preference for public goods and the openness to the rest of the world, even if with the right sign, are not significant.

The country specific effects play an important role: in fact more than 96 per cent of the variance is explained by them for the three aggregates of GPGs considered. A comparison among aggregates of GPGs shows that the GPG_OECD aggregate is explained by more heterogeneous factors.

Trying to find new determinants, the analysis is repeated for the EU countries only, by enlarging the set of variables: education expenditure (*EDU*) and final consumption expenditures (*FCE*) as a share of GDP, to represent the *preference for public goods*; the shares of interest expenditure (*IE*) and of Maastricht debt (*MAA*) on GDP, to represent the *financial liabilities*. Even in this case missing data brings to a reduction in the dimensions of the panel.

$$(3) \quad GPGF^j_{it} = \beta_1 \text{FCE} + \beta_2 \text{E}DU + \beta_3 \text{GDP} + \beta_4 \text{MAA} + \beta_5 \text{IE} + \beta_6 \text{TA} + \beta_7 OUTW + \beta_8 GNIpro + \varepsilon_{it}$$

with $\varepsilon_{it} = \alpha_{it} + u_{it}$

The results are summarized in Table 12 and show, for all aggregates, the primary role of *wealth* (*GDP*). The three aggregates seem to depend also on other aspects. In fact, by including new variables, we find a significant effect of the *preference for public goods* (OECD and MDG definitions), of *openness to rest of the world* (OECD definition) and of the *financial liabilities*. Among the financial liabilities, the interest expenditure, (*IE*, not significant) and the Maastricht debt (*MAA*, significant for GPG_E) have positive signs. This could be interpreted that, when public finances are under strain and interest expenditure and public debt grow, the government has less room for direct financing of GPGs and resorts to their financing through aid expenditure, even at the cost of some displacement of other forms of aid. When public finance conditions improve, there is, in principle, larger room for more explicit financing of global goods, unless bureaucratic, political or donor-specific benefit considerations lead to prefer the less explicit financing through aid to development.

Table 11 - Determinants of GPGs financing

Variables	GPG_MDG	GPG_E	GPG_OECD	GPG_MDG	GPG_E	GPG_OECD	GPG_MDG	GPG_E	GPG_OECD
GDP	0.000831***	0.00163***	0.00149***	0.00117**	0.00109**	0.00119**	0.00141***	0.00138***	0.00150***
	(2.67e-05)	(3.29e-05)	(2.72e-05)	(0.000449)	(0.000498)	(0.000488)	(0.000429)	(0.000446)	(0.000448)
OUTW	1.363	1.825	1.584	1.398	1.311	1.173	1.739	1.832	1.671
	(1.435)	(1.780)	(1.684)	(1.174)	(1.370)	(1.381)	(1.226)	(1.392)	(1.375)
R&D	4.989	12.71	18.19	12.61	6.805	11.68	12.47	5.882	11.49
	(12.28)	(12.09)	(19.64)	(9.748)	(10.87)	(20.11)	(11.13)	(12.17)	(21.68)
FL	0.147	-1.400	-3.012	-0.532	-1.359	-3.063	-0.437	-0.990	-2.801*
	(1.956)	(2.904)	(2.860)	(1.134)	(1.516)	(1.857)	(0.912)	(1.054)	(1.333)
TA				-0.100	-0.142	-0.124	-0.0905	-0.133	-0.113
				(0.0724)	(0.0955)	(0.0772)	(0.0705)	(0.0885)	(0.0688)
GNIpro							23.87	35.77**	34.30*
							(13.58)	(15.35)	(17.32)
Obs.	216	216	216	204	204	204	180	180	180
R-squared	0.606	0.809	0.797	0.456	0.440	0.379	0.506	0.512	0.433
Number of id	18	18	18	17	17	17	15	15	15

Source: Author's calculations based on OECD-CRS data.

Notes. Fixed effects estimator.

Variables: GDP: gross domestic product; OUTW: outward direct investment position; R&D: research and development expenditures; FL: financial liabilities; TA: tied aid; GNIpro: per capita gross national.

USA is removed for missing data for TA, Spain and Portugal are removed for missing data for GNIpro

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 12 - Determinants of GPGs financing for EU countries (1995-2006)

VARIABLES	GPG_E	GPG_OECD	GPG_MDG	GPG_E	GPG_OECD	GPG_MDG	GPG_E	GPG_OECD	GPG_MDG
GDP	0.00131***	0.00118***	0.00127***	0.00179***	0.00154***	0.00172***	0.00128**	0.00106*	0.00135**
	(0.000384)	(0.000349)	(0.000360)	(0.000302)	(0.000304)	(0.000267)	(0.000522)	(0.000499)	(0.000482)
TA	0.0830	0.0713	0.0698	0.175*	0.142	0.159	0.153	0.116	0.140
	(0.0934)	(0.0879)	(0.0841)	(0.0947)	(0.0999)	(0.0884)	(0.0985)	(0.103)	(0.0934)
OUTW	0.784	0.927	0.569	0.879	1.085*	0.703	-0.0233	0.542	0.246
	(0.794)	(0.581)	(0.632)	(0.778)	(0.591)	(0.602)	(0.431)	(0.408)	(0.415)
MAA	2.509*	1.761	2.016	1.017	0.638	0.592	3.077	3.062	2.445
	(1.156)	(1.127)	(1.148)	(0.691)	(0.615)	(0.688)	(2.609)	(2.203)	(2.416)
IE				23.42	17.00	22.15	26.88	19.54	23.81
				(15.08)	(13.45)	(13.96)	(15.51)	(12.70)	(13.88)
FCE	14.20	20.72	15.19	14.84	24.65*	16.65	33.39	42.35***	29.89*
	(16.86)	(12.85)	(14.95)	(17.43)	(11.25)	(13.13)	(18.98)	(12.26)	(13.76)
EDU	6.381	-7.804	2.308	4.464	-11.09	-0.107	15.31	-2.774	6.624
	(10.34)	(7.446)	(9.261)	(11.86)	(8.541)	(10.35)	(10.29)	(7.124)	(9.898)
GNIpro							27.16*	23.60	18.50
							(14.75)	(14.29)	(13.60)
Constant	-1250**	-1160**	-1208**	-1648***	-1529***	-1603***	-2664***	-2452***	-2342***
	(475.1)	(409.8)	(442.4)	(409.3)	(346.6)	(355.8)	(486.1)	(391.4)	(375.8)
Observations	156	156	156	132	132	132	120	120	120
R-squared	0.516	0.470	0.530	0.588	0.525	0.607	0.617	0.554	0.624
Number of id	13	13	13	11	11	11	10	10	10

Source: Author's calculations based on OECD-CRS data.

Notes. Fixed effects estimator.

Variables: GDP: gross domestic product; TA: tied aid; OUTW: outward direct investment position; MAA: Maastricht debt; IE: interest expenditure; FCE: final consumption expenditures ; EDU: education expenditure; GNIpro: per capita gross national.

Spain and Portugal are removed for missing data for GNIpro and Norway for IE. Robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

7. Concluding remarks

Some patterns of behavior by donor countries seem to dominate aid financing of GPGs through the crowding out effect and the selection of the items of expenditure. Our results show that, regardless of the definition of GPGs adopted, an increasing share of aid, both bilateral and multilateral, has been devoted to GPGs financing in the period 1995-2006. This increase has, however, been lower than in the 1980s and 1990s, when, according to te Velde et al. (2002), the share of IPGs nearly doubled.

From 1995 to 2006, the growth of GPGs has taken place, partly, at the expenses of other aid spending. Time series analysis confirms the presence of this substitution effect, showing a higher explanatory power of the regressions for the extended definition (GPG_E) and for aid transfer financing of GPGs. The displacement effect in bilateral aid is not uniform among donor countries and along the period analyzed. In fact, it is more relevant for the sub-period 1999-2002 and for some European countries (France, Germany, Italy). Nordic countries, the US and Canada are the "best practicing" among donors, with small or no displacement.

The increase in GPG financing has been accompanied by a process of goods' selection by donors, who thus express their changes in priorities (as in te Velde et al., 2002). In many instances, these changes have been uncoordinated and abrupt, thus conveying the impression that "global actions and funding have tended to occur on an *ad hoc* basis, in response to highly visible emergencies (such as HIV) or as a result of catalytic actions by philanthropic organizations" (Reisen et al., 2004, p. 8).

Among the categories of GPGs, some of those with weakest-link technologies have become increasingly important at the global level: Crime control/peace building and Communicable disease control. The increase in their financing through aid flows could be explained by the rich countries' fear of an insufficient provision by poor countries, which, increasingly, cannot afford to pay for them. Rich countries are therefore stepping in to avoid sub-optimal levels of provision, as foreseen by Sandler (1998), and to provide for a sort of "insurance" against risky and disruptive events.

In aid financing of GPGs, we find some statistical regularities among countries, representative of common historical, social, and cultural factors. First, we observe a sort of free riding phenomenon, as we move from Anglo-Saxon countries and from Northern Europe to Southern Europe. Moreover, Anglo-Saxon and Northern European countries tend to display more homogeneous patterns of global goods financing, giving rise to a certain clusterized homogeneity. Anglo-Saxon countries have lower than average values of aid and global goods financing, in terms of GDP and population, but contribute relatively more to global goods. In the composition of their expenditures, Anglo-Saxon countries have decisively shifted from summation to weakest link technology GPGs, thus conforming to their interventionist role at the global level. Northern European countries have higher than average values for both ODA and GPGs and, to a smaller extent, they follow the Anglo-Saxon countries' pattern of expenditure. Central European and Southern European countries are less homogeneous groups and they tend to preserve their share of summation technology GPGs, as Japan also does. Further research needs to be conducted on these aspects, trying to include, when possible, the role of spatial correlation as an additional explanatory variable.

Looking for the reasons for cooperation *versus* free-riding in donor countries' behavior, we identify potential determinants of the aid financed expenditure commitment to GPGs. A significant role is played by variables related both to constraint (variables related to the state of the donor's public finances) and to preferences (openness to the rest of the world; collective altruism both within the country and between countries; preference for public goods; conditionality imposed on aid by government), even if missing data impede to find definite conclusions. Our results for all donors confirm the importance of the donor's wealth and of its potential benefits from GPGs provision. The role of the financial variables is more uncertain. A comparison among different definitions of GPGs shows that the expanded GPG_OECD definition is explained by a larger number of heterogeneous factors.

When the financing supply function is estimated for European countries only, the significance of the aforementioned variables is confirmed. Besides, variables related to the state of the donor's public finances are also significant with positive signs. This could be interpreted as the fact that, when public finances are under strain, the government has less room for direct financing of GPGs and resorts to their financing through aid expenditure, even at the cost of some displacement of other forms of aid. When public finance conditions improve, there is, in principle, larger room for more explicit financing of global goods, unless bureaucratic, political or donor-specific benefit considerations lead to prefer the hidden financing through aid to development.

Our first result, i.e. the presence of a crowding out effect between GPGs and other aid spending, should suggest to separate national budgeting systems for financing GPGs and development and to guarantee that funding for GPGs be a complement and not a substitute to development aid, as advocated by many scholars. As suggested in Zedillo and Thiam (2006), the OECD statistics should also track expenditure on global goods by introducing a line item for them, including contributions that are not considered ODA. These statistics should also include a larger number of countries than the traditional DAC donors, as contributions to GPGs come also from the major developing economies. As a consequence, the international goals should be separated: the famous UN 0.7 % should be applied only to expenditures related to the promotion of human welfare and the reduction of poverty, while another target should be set for GPGs (Severino and Ray, 2009).

The second result, the process of GPG selection, shows that, when the financing is voluntary, the strategic use of GPGs can be a strong impulse to participate in its financing. Traditionally, the history of aid to development has been characterized by the strategic and political motives of donors. This situation seems to have ended in the 1990s, according to many observers, but not to others, like Burnell (2004) and Mavrotas and Villanger (2006). GPGs represent a similar case: for instance, the choice of GPG financing can privilege those activities whose benefits are greater for the donors, or difficulties in coordination can give raise to free-riding behaviors. However, strategic and opportunistic approaches to GPGs are increasingly inadequate, as both the global problems have increased in size and the necessary solutions have increased in cost (Stansfiled et al., 2002, p. 5). There is a strong need to implement effective international mechanisms to prioritize GPGs, to agree upon arrangements for shared financing and to coordinate the necessary collective action. The international public goods agenda opens up new and heretofore little explored dimensions of aid coordination that relate to issues of timing, balance, and synergy (World Bank, May 2001a).

References

Alesina, A. and D. Dollar, 2000, "Who Gives foreign Aid to Whom and Why?", *Journal of Economic Growth,* 5(1) pp. 33-63.

Anand, P., 2002, "Financing the Provision of Global Public Goods", UN University Discussion Paper n. 2002/110.

Anand, P., 2004, "Financing the provision of global public goods", *World Economy*, 27(2), pp. 215-237.

Arce, D.G. and T. Sandler, 2002, *Regional Public Goods: Typologies, Provision, Financing and development Assistance,* Stockholm, Almqvist & Wiksell International.

Barrett, S., 2005, "Managing the Global Commons", available at:
    http://www.gpgtaskforce.org/uploads/files/56.doc

Barrett S., 2007, *Why cooperate? The Incentive to Supply Global Public Goods*, New York, Oxford University Press.

Berthélemy J.C. and A. Tichit, 2004, "Bilateral Donors' Aid Allocation Decisions: a Three Dimensional Panel Analysis", *International Review of Economics and Finance*, 13 (3), pp.253-274.

Binger A., 2003, "Global Public Goods and Potential Mechanisms for Financing Availability", Background paper prepared for the Fifth Session of the Committee for Development Policy meeting, April 7-11.

Birdsall, N., 2006, "Overcoming Smallness. Meeting the Challenge of Underfunded Regionalism", in I. Kaul and P. Conceicao (eds.), *The New Public Finance*. Oxford, Oxford University Press, pp. 391-410.

Bizzarri, K., 2005, *Beni pubblici globali. Come gestire la globalizzazione nel 21° secolo*, Fondazione Culturale Responsabilità Etica.

Burnell P., 2004, "Foreign Aid Resurgent: New spirit or Old Hangover", WIDER Research Paper No. 2004/44.Helsinki:UNU-WIDER.

Canavire, G., P. Nunnenkamo, R. Thiele and L. Triveň, 2005, "Assessing the Allocation of Aid: Developmental Concerns and the Self-Interest of Donors", Kiel Working Paper no. 1253.

Cepparulo, A. and L.Giuriato, 2009, "Constraints and Preferences in Aid Financing of Global Public Goods", mimeo.

Clemens, M.A. and T. J. Moss, 2007 "The ghost of 0.7%: Origins and relevance of the international aid target", *International Jounral od development Issues,* 6(1), pp.3-25.

Cooper, Richard N., 2001, "Financing International Public Goods: A Historical Overview and New Challenges", in C.D. Gerrard, M. Ferroni, and A.Mody, (eds.), *Global Public Policies and Programs: Implications for Financing and Evaluation. Proceeding from a World Bank Workshop*. Washington, DC: The World Bank.

European Commission, 2005, *Attitudes towards Development aid*, Special Eurobarometer 222.

Gates, S. and Hoeffler, A., 2004, "Global aid allocation: Are Nordic donors different?", Centre for the Study of African Economies, Working Paper No. 2004-34, Oxford University.

Hjertholm, P. and H. White, 2000, "Survey of foreign aid: history, trends and allocation", Department of Economics, University of Copenhagen, Discussion Paper 00/04.

Hudson D. and J. van Heerde, 2009, "A mile wide and an inch deep: A review and critique of existing surveys on public opinion and development", available at:

http://davidhudson.files.wordpress.com/2009/03/hudson-van-heerde-a-mile-wide-and-an-inch-deep-1103092.pdf

Kanbur R., 2001, "Cross-Border Externalities, International Public Goods and Their Implications for Aid Agencies", Working Paper, available at:
http://www.people.cornell.edu/pages/sk145/papers/IPGWB.pdf

Kanbur R., T. Sandler and K. Morrison, 1999, "The Future of Development Assistance: Common Pools and International Public Goods", ODC Policy Essay b.25, Washington (DC): Overseas Development Council.

Kaul, I. and K. Le Goulven, 2003, "Financing Global public goods: a new frontier of public finance", in I. Kaul, P. Conceicao, K. Le Goulven and R.U. Mendoza (eds.) *Global Public Goods: Managing Globalization.* Oxford, Oxford University Press.

Kaul, I., 2004,. "Financing Global Public Goods: Trends and Challenges", paper presented at the Fiscal Policy Conference, Washington DC, 20-22 February.

Jacquet P. and Marniesse S., 2006, "Financing Global Public Goods: Issues and Prospects", Secretariat of the International Task Force on Global Public Goods 2006, Expert Paper Series Seven: Cross-Cutting Issues, Chapter 2, Stockholm Sweden.

Lodefalk M. and J. Whalley, 2002, "Reviewing proposals for a world environmental organisation", *The World economy*, 25 (5), 601-617.

McGillivray, M. and H. White, 1993, "Explanatory Studies of Aid Allocation Among Developing Countries: A Critical Survey", ISS Working Paper no. 148. The Hague: Institute of Social Studies

Mascarenhas, R. and T. Sandler, 2004, "Donors' Mechanisms for Financing International and National Public Goods: Loans or Grants?", *The World Economy*, 28 n.8 pp.1095-1117.

Mascarenhas, R. and T. Sandler, 2006, "Do Donors Cooperatively Fund Foreign Aid?", *Revue of International Organisation,* 1, pp. 337-357

Maurini, C. and R. Settimo, 2009, "Assessing the allocation of Italian foreign aid", *Occasional Papers*, Banca d'Italia, n.43.

Mavrotas, G. and E. Villanger, 2006, "Multilateral Aid Agencies and Strategic Donor Behaviour", WIDER Research Paper No. 2004/44. Helsinki:UNU-WIDER.

Morrissey, O., D.W. te Velde and A. Hewitt, 2002, "Defining international public goods: conceptual issues", in M.Ferroni and A. Mody (eds.) *International Public Goods. Incentives, Measurement and Financing*. Oxford, Oxford University Press, pp.31-46.

Neumayer, E., 2003, The determinants of aid allocation by regional multilateral development banks and United Nations agencies, *International Studies Quarterly,* 47(1), pp.101-122.

OECD, 2007, *Reporting directives for the CRS*, DCD/DAC(2007) 39/FINAL, Paris

OECD, 2008, *Guidelines for reporting in CRS++ format*, DCD/DAC/STAT(2008)17/REV1.

Raffer, K., 1999, "ODA and Global Public Goods: a Trend Analysis of Past and Present Spending Patterns", ODS Background Papers, UN, New York.

Rajaraman, J. and R. Kanbur, 1999, "International Public Goods and the Case for Foreign Aid", in I.Kaul, I Grunberg and M.Stern (eds.) *Global Public Goods: International Cooperation in the 21st Century*, New York: Oxford University Press.

Reisen, H., M.Soto and T.Weithöner, 2004, "Financing Global and Regional Public Goods Through ODA: Analysis and Evidence from the OECD Creditor Reporting System," OECD Development Centre Working Papers 232, OECD, Development Centre.

Roodman, D., 2007, "An Index of Donor Performance", Center for Global Development, WP n. 67.

Sagasti, F. 2005, "Official Development Assistance: background, context, issues and prospects, paper prepared for the G-20 Meeting "What do we want from ODA?" (Petra, Jordan).

Sandler, T., 1998, "Global and Regional Public Goods: A Prognosis for collective Action", *Fiscal Studies*, 19/3, pp.221-247.

Severino, J.M. and O. Ray, 2009, "The End of ODA: Death and Rebirth of a Global Public Policy", Center for Global Development, Working Paper, n. 167.

Speight, M. 2002, "How Much Should DFID Allocate to Global Action and Funding?", Department for International Development, London.

Stansfield, S.K., M.Harper, G. Lamb and J. Lob-Levyt, 2002, "Innovative financing of global public goods for health", CHM Working Paper Series, WG2:21.

te Velde, D.W., 2002, "Aid financing for international public goods", ODI Opinion 5.

te Velde, D.W., O. Morrissey and A. Hewitt, 2002, "Allocating Aid to International Public Goods", in M.Ferroni and A. Mody (eds.) *International Public Goods. Incentives, Measurement and Financing*, pp.81-118.

World Bank, 2001, *Global Development Finance 2001*, World Bank, Washington, D.C..

World Bank, 2001a, "Effective Use of Development Finance for International Public Goods", in World Bank, *Global Development Finance: Building Coalitions for Effective Development Finance*, ch. 5. World Bank, Washington, DC. May.

Zedillo, E. and T. Thiam, 2006, *Meeting Global Challenges: International Cooperation in the National Interest,* Report of the International Task Force on Global Public Goods, Sweden, 2006.

Appendix

Table A.1 – CRS sectors of destination and GPG provision

GPG	CRS code	Sectors	Description
Human rights	15162 15164	Human rights	Monitoring of human rights performance; support for national and regional human rights bodies; protection of ethnic, religious and cultural minorities
		Women's equality organisations and institutions	Support for institutions and organizations (governmental and non-governmental) working for gender equality and women's empowerment.
Communicable disease control	12250	Infectious disease control	Immunisation; prevention and control of infectious and parasite diseases.
	13040	STD control including HIV/AIDS	All activities related to sexually transmitted diseases and HIV/AIDS control
Global commons and sustainability	13010	Population policy and administrative management	Population/development policy; census work, vital registration; migration data
	13030	Family planning	
	23030	Power generation/renewable sources	Including policy, planning, development programmes, surveys and incentives
	23065	Hydro-electric power plants	
	23066	Geothermal energy	
	23067	Solar energy	
	23068	Wind power	
	23069	Ocean power	
	23070	Biomass	Densification technologies and use of biomass for direct power generation
	31210	Forestry policy and administrative management	
	31220	Forestry development	Afforestation for industrial and rural consumption; exploitation and utilization; erosion control, desertification control
	31261	Fuelwood/charcoal	Forestry development whose primary purpose is production of fuel wood and charcoal
	31310	Fishing policy and administrative management	
	31320	Fishery development	
	41010	Environmental policy and administrative management	
	41020	Biosphere protection	
	41030	Bio-diversity	
	41040	Site preservation	Applies to unique cultural landscape; including sites/objects of historical, archeological, aesthetic, scientific or educational value

Global governance	15110	Economic and development policy/planning	Macro-economic, fiscal and monetary policy and planning; social planning; economic and social analysis and forecasting; development planning and preparation of structural reforms; organizational development; support to ministries involved in aid co-ordination
	24010	Financial policy and administrative management	Finance sector policy, planning and programs; institution capacity building and advice; financial markets and systems
	24020	Monetary institutions	Central banks.
	33110	Trade policy and administrative management	Trade policy and planning; support to ministries and departments responsible for trade policy; trade-related legislation and regulatory reforms; policy analysis and implementation of multilateral trade agreements
	33140	Multilateral trade negotiations	Support developing countries' effective participation in multilateral trade negotiations
Knowledge generation and dissemination	11182	Educational research	
	12182	Medical research	
	16062	Statistical capacity building	
	23082	Energy research	
	31182	Agricultural research	
	31282	Forestry research	
	31382	Fishery research	
	32182	Technological research and development	
	41082	Environmental research	
	43082	Research/scientific institutions	
Communications	22010	Communications policy and administrative management	Communications sector policy, planning and programs; institution capacity building and advice; including postal services development;
	22020	Telecommunications	Telephone networks, telecommunication satellites, earth stations
	15163	Free flow of information	Uncensored flow of information on public issues
Crime control and global peace	16063	Narcotics control	In-country and customs controls including training of the police; educational programs and awareness campaigns to restrict narcotics traffic and in-country distribution.
	31165	Agricultural alternative development	Projects to reduce illicit drug cultivation through other agricultural marketing and production opportunities
	43050	Non-agricultural alternative developm.	Projects to reduce illicit drug cultivation through, for example, non-agricultural income opportunities
	15220	Civilian peace-building, conflict prevention and resolution	Support for civilian activities related to peace building, conflict prevention/resolution, including capacity building, monitoring, dialogue.
	15230	Post-conflict peace-building (UN)	Participation in the post-conflict peace-building phase of United Nations peace operations.

Table A.2 – Definitions of global public goods (CRS sectors)

	World Bank (2001)	te Velde et al. (2002)	REISEN ET AL. (2004)	GPG_MDG	GPG_E
Knowledge generation and dissemination					
11182:edu resources	√		√	√	√
31182: agri resources	√	√	√	√	√
23082: energy resources		√	√	√	√
41082: environmental reearch.	√	√	√	√	√
12182: medical resources	√		√	√	√
31282: forestry resources			√	√	√
43082: research and scientific instititutions	√	√	√	√	√
16062: statistical capacity	√	√	√	√	√
31382: fishery resources			√	√	√
32182: technological resources	√	√	√	√	√
16061: culture and recreation		√			
Human rights					
15162: human rights			√		
15164: women's equality			√		
Communicable disease eradication					
12250: infectious diseases control	√	√	√	√	√
13040: STD control	√	√	√	√	√
Global governance					
15110: economic policy			√	√	√
24010: financial policy			√	√	√
24020: monetary institutions			√	√	√
33110: trade policy			√	√	√
33140: multilateral trade negotiations				√	√
Crime control/peace building					
31165: agri alternative			√		√
16063: narcotics control		√	√		√
43050: no-agri alternative			√		√
15230: post-conflict peace building	√	√			√
15240: reintegration and SALW control	√	√			
72010: emergency assistance	√				
15250: land mine clearance	√				
73010: reconstruction relief	√				
43040: rural development	√				
72030: aid to refugees	√				
15220: civilian peace-building, conflict prevention and resolution					√
Global commons and					

	1	2	3	4	5
sustainability					
41031: bio diversity	√	√	√	√	√
23070: biomass	√		√	√	√
41020: bio spere	√	√	√	√	√
41010: environmental policy		√	√	√	√
31310: fishing policy	√	√	√	√	√
31320: fishery development	√	√	√	√	√
31220: forestery development	√	√	√	√	√
31210: forestry policy	√	√	√	√	√
13010: population policy			√	√	√
23030: power generation			√	√	√
23066: geothermal energy	√		√	√	√
41040: site preservation		√	√	√	√
23068: wind power	√		√	√	√
23067: solar energy	√		√	√	√
23069: ocean power			√	√	√
14040: river development	√	√			
14050: waste management		√			
23081: energy education		√			
41050: flood prevention		√			
41081: environmental education		√			
14010: water resources policy	√	√			
14015: water res. protection	√	√			
13030: family planning			√		
23065: hydro plants			√		
31261: fuel wood/charcoal			√		
Communications					
22010: communication policy					√
22020: telecommunications					√
15163: free flow of information		√		√	√