

Fragmentation & Proliferation in the Delivery of Foreign Assistance to Pakistan

Discussion Paper

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Abstract

The high degree of aid fragmentation and proliferation undermines the value and effectiveness of foreign assistance in Pakistan, as it increases the transaction costs, as well as the coordination challenge and distorts sectoral allocations of domestic resources. This paper reviews methodologies commonly used to measure to what extent donors *proliferate* their aid and thereby contribute to *fragmented* assistance portfolios within a recipient country. It highlights that the most significant factors for fragmentation and proliferation are often neglected in global analyses and suggests an alternative measure. Based on data captured in Pakistan's Development Assistance Database, the degree of *sector fragmentation* and *aid proliferation* in Pakistan is calculated for the years 2006 and 2007. The analysis reveals that especially social sectors face a considerable coordination challenge due to the high degree of aid fragmentation. The paper intends to contribute to the ongoing discussion about improving aid effectiveness in Pakistan, by providing evidence for the need to rationalize sector support through the introduction of a division of labour among development partners based on their comparative advantage.

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“Today, more than 60,000 aid projects are being implemented in the developing world. 85% of these projects cost less than US\$ 1 million. Often different administrative procedures, in particular different financial, procurement and reporting rules and mechanisms, set up by development partners are applied. This places a heavy burden on poor countries that lack the administrative capacity to handle these demands, and does not help them building their own systems. Hence, when the project ends, the results are often not sustained.”²

1. Introduction

There is a lively debate about the changing global aid architecture, which is becoming increasingly complex, with a growing number and importance of non-DAC donors, as well as with a high degree of *aid proliferation and fragmentation*.³ The term *aid proliferation* is generally used to refer to the increasing number of donor channels providing ODA, while fragmentation refers to the increasing number of foreign-funded activities with decreasing financial size.

At country-level, fragmentation and proliferation of aid often result in considerable coordination challenges and reduces its effectiveness⁴ by (1) presenting additional challenges to harmonizing and aligning aid, which results in rising transaction costs for recipient countries and donors;⁵ (2) potentially creating wasteful duplication and overlap in the delivery of aid; (3) causing competition for scarce skills in recipient countries; and (4) distorting sectoral allocations of public spending by possibly reflecting global rather than recipients’ priorities, as aid flows become increasingly earmarked for specific purposes. In sectors where increasing fragmentation leads to growing competition between development partners, the effect can be that development partners, and the government ministry counterparts, become increasingly focused on the results of their own projects, losing sight of the broader and more strategic objectives of the national programme. A related problem identified in the literature relates to the stripping of local capacity, as each partner seeks to establish its own expertise in each sector, in which it has a presence.

This paper looks for signs of *aid fragmentation and proliferation* in Pakistan. The purpose of this paper is to contribute to evidence-based dialogue about the aid architecture in Pakistan and its implications for the effective delivery of foreign assistance, as well as the sustainability of related development efforts.

² Doing Aid Better – A comment piece by Donald J. Johnston Secretary-General of the OECD, and Richard Manning Chair of the OECD Development Assistance Committee, February/March 2005, Paris: OECD.

³ See the global aid effectiveness literature including, Acharya et al (2004), 'Aid proliferation: how responsible are the donors?'; Roodman (2006), 'Aid project proliferation and absorptive capacity'; Knack and Rahman (2004), 'Donor fragmentation and bureaucratic quality in aid recipients', and World Bank (2008), 'Global Monitoring Report 2008'.

⁴ See for example Easterly and Pfutze (2008) 'Where does the money go? Best and worst practices in foreign aid'.

⁵ For a detailed discussion on the contribution of fragmentation and proliferation to increasing transaction costs see Acharya et al. (2004, p. 7-8).

The paper is divided into four parts: the first section reviews different methodologies used in the literature to measure *fragmentation* and *proliferation* and explains the method used in this paper. The following two sections analyze the degree of *sector fragmentation* and *aid proliferation* in Pakistan. The final section attempts to draw conclusions from the analysis and tries to link them to ongoing country-level initiatives to improve aid effectiveness.

2. Measuring Fragmentation and Proliferation

There are a number of different understandings of what exactly constitutes *fragmentation* and *proliferation*, and consequently, there are different definitions of the two terms. Depending on the definition applied, researchers are using different methodologies to measure the phenomenon. A measure commonly used in various studies is the Hirschman-Herfindahl Index.

$$H = \sum_{i=1}^h P_i^2$$

The Hirschman-Herfindahl Index is generally used as a measure of the degree of concentration – in terms of the number and size of firms – in a given industry. In this case, the parameter P would be interpreted as the market share of each individual firm.

Applied to measure *aid fragmentation*, the index is calculated by summing the squares of each donor's percentage share (P) of the total aid disbursed (by h number of donors). The index reflects both the number of partners providing support as well as relative shares and distribution. The lower (higher) is the index, the more (less) '*fragmented*' is the aid environment of a particular country.

Knack and Rahman (2004, p.17) define *donor fragmentation* as a large number of donors each with a small share of the total aid provided to a given recipient country. Their definition is translated into a measure that equals one minus a Hirschman-Herfindahl Index, as follows:

$$1 - \sum s_d^2$$

S_d is the share of each donor in the total aid provided to a given recipient. In order to construct the index of *donor fragmentation*, the Hirschman-Herfindahl Index is first

calculated by summing the squared shares of aid over all donor agencies. The Herfindahl index, which ranges from 0 to 1, is then subtracted from 1 and multiplied by 100, to form a *fragmentation* index, with high values indicating greater fragmentation.

Acharya et al. (2004, p. 9) point out that “*from the perspective of the aid recipient, donors can be responsible for proliferation of two kinds. The first we label ‘source proliferation’: the provision of aid to a particular country from a wide variety of donors in relatively small amounts. The second, ‘use proliferation’, is the division of aid among a wide variety of end uses in-country.*” Following from this premise, Acharya et al. (2004, p.10, 15) define fragmentation as “*the extent of dispersion in the sources of aid received by an aid recipient*”⁶ and proliferation as “*the extent to which a donor disperses its aid budget among a portfolio of potential recipients*”.⁷ While Acharya et al. also use the Herfindahl Index to measure *fragmentation*, they use the Theil Index to measure what they refer to as *source proliferation*⁸.

The Theil Index has two components. Acharya et al. define the portion of a donor’s total aid going to recipient *i* as x_i , and construct the first component as follows:

$$H(x) = \sum_{i=1}^n x_i \log \left(\frac{1}{x_i} \right)$$

The maximum value H is reached when an equal amount of aid is given to all n countries, each receiving $\frac{1}{n}$ with $H(x) = \log n$. The Theil Index is the difference between the maximum value and the actual $H(x)$, after some simplification:

$$T = \log n - H(x) = \sum_{i=1}^n x_i \log n x_i$$

The number n in this case is all potential recipients of aid. If there were only one possible recipient then this value is 0. The value T reaches 0 when all potential aid recipients receive an equal amount of assistance.⁹ Applied at country level, the Theil Index can be used to measure to what extent a donor distributes its funds evenly across the sectors it supports.

⁶ According to Acharya et al., *fragmentation* has two dimensions: (a) the number of sources from which a recipient obtains aid; (b) the extent to which each donor contributes an equal share.

⁷ According to Acharya et al., *proliferation* has two dimensions: (a) the proportion of the total number of potential recipients who actually receive any share of the aid budget of a particular donor; and (b) the extent to which that total budget is shared equally among all the recipients.

⁸ Acharya et al. argue that the Herfindahl Index is not useful in measuring proliferation, because this measure does not take into account ‘zero observations’: i.e.: the number of potential aid recipients to whom a donor gives no aid.

⁹ As opposed to the Herfindahl Index, the Theil Index is not a measure with a closed scale between 0 and 1, as the scale is relative to the dataset under analysis.

Looking from the recipient's perspective (or donor's perspective), all indices used in recent studies basically consider only two factors: (1) the number of donors that provide aid to a country (or number of recipient countries that each donor aids) and (2) the donor share of the total aid received by the country (or the country share of the total aid budget provided by the donor).

However, many studies acknowledge that a critical factor to assess the real degree of *fragmentation and proliferation* is what constitutes the aid shares, i.e. the question of how far a given volume of aid is divided into many small packets ("projects") or few large packets ("programmes"). Using the Development Gateway's AiDA database, Knack and Rahman (2004, p. 20) construct an alternative fragmentation index only on the basis of project counts and highlight that "*project counts and aid volumes provide somewhat different pictures of fragmentation*".

Indices based on the number of projects reflect actual problems associated with lack of donor coordination better than indices based on aid volumes. Similarly, taking the project size into account reflects more accurately another implication of high fragmentation, i.e. increasing transaction costs.¹⁰ In line with empirical evidence, it can be argued that the lower the average financial project size, the higher weigh the transaction costs associated with the assistance. This should not be misunderstood as an argument against small projects per se, but rather as a call for a more integrated and programme-based approach to development. It is well-known in the aid business that however successful a project appears on its own terms, it will have little or no sustained impact in a poor sector-policy environment, and where it is not integrated into other donor-funded or government programmes.

The concentration indices commonly used do not take the number and size of the packages through which assistance is delivered sufficiently into consideration, which can lead to skewed results regarding the actual degree of fragmentation. For example, a country might receive aid from only 2 donors that provide 50% of the total aid volume each. Using the Hirschman-Herfindahl Index, one would come to the conclusion that the 'aid market' is rather *concentrated*, i.e. not *fragmented*. However, while one of the two donors might provide its assistance through 50 individual projects in 10 different sectors, the other might have only 5 projects in 2 sectors. By using the Hirschman-Herfindahl Index or the Theil Index, one would

¹⁰ While different factors contribute to transaction costs, the financial size of a project can have a mitigating effect on the transaction costs caused by the project.

neither correctly show that the total assistance portfolio is rather *fragmented* nor that one of the two donors acts more as a *proliferator* than the other.¹¹

The main reason why most studies use measures that focus on total aid shares and neglect to analyze what these consist of seems to be the lack of data, especially across a larger number of countries, as most studies attempt to assess the global scale of the problem. Consequently, most researchers use either disbursement data available from the Development Assistance Committee of the OECD or project data available from the Development Gateway's AiDA (Accessible Information on Development Activities) database. While the OECD DAC data lacks information on projects, the AiDA data is generally sketchy and doesn't allow to draw conclusions on the total number of projects of a given donor (or in a given sector) together with the matching total disbursed amount.

In countries where a national aid information management system exists, data on the different dimensions of fragmentation and proliferation is more easily accessible, which allows to use different measures that take other factors than only total aid shares into account. The authors of the 'Cambodia Aid Effectiveness Report 2007', for example, construct a 'composite index' to measure *donor proliferation*.¹² This index takes not only the aid shares, but also the number and size of projects constituting these shares into consideration. The index is based on the average size of project disbursements in 2005 and 2006 and a Herfindahl Index that takes account of the number of sectors and the amount of support associated with each development partner. The composite index assigns a 70:30 weighting between average project size and sector concentration, assuming that what constitutes the aid share is more important than the distribution of total aid shares if one wants to measure fragmentation and proliferation. While such kind of composite index comes closer to reflecting the real degree of fragmentation, the allocation of weights is arbitrary - both conceptually and statistically.

In this paper, we focus on aid fragmentation and proliferation in Pakistan. Consequently, we are not only looking at total aid volumes provided to the country as a whole, but analyze the degree of fragmentation of assistance provided to individual sectors, as well as the extent to which individual donors contribute to this fragmentation.

¹¹ A comparison of findings if both, Herfindahl Index as well as Theil Index on the one hand and the alternative indices suggested in this paper on the other hand, are applied on the same dataset is presented in sections 3 and 4.

¹² Council for the Development of Cambodia (2007), 'The Cambodia Aid Effectiveness Report 2007', <http://www.phnompenh.um.dk/NR/rdonlyres/FECB6484-6392-4F1F-9C62F4A5A2DB0B6F/0/AidEffectivenessReportMay2007.pdf>

Definition of Terms Used in this Analysis

Some studies use the terms *fragmentation*, *proliferation*, *concentration*, *dispersion* synonymously, which cannot only lead to confusion, but possibly to misguided policy decisions regarding the potentially necessary rationalization of assistance portfolios. Against the background of the preceding methodology discussion, we understand the terms as follows:

- *Concentration* refers to the number and distribution of aid shares in the assistance portfolio of a sector or of a donor. *Dispersion* is the antonym of concentration.¹³ We use the Herfindahl Index to measure the degree of concentration within a sector assistance portfolio, i.e. the extent to which a sector receives aid from few (or many) donors with aid shares of similar (dissimilar) size. We use the Theil Index to measure the degree of concentration within a donor assistance portfolio, i.e. the extent to which a donor distributes its total aid budget across few (or many) sectors and the extent to which its aid shares are of similar (dissimilar) size.
- *Fragmentation* refers to the number of donors, as well as the number and financial size of projects within a sector assistance portfolio. We consider a sector to be highly *fragmented* if it receives assistance from of a large number of donors with a large number of projects of comparably small financial size.¹⁴
- *Proliferation* refers to the number of sectors, as well as the number and financial size of projects within a donor's country assistance portfolio. A donor is considered to be a '*proliferator*' if its portfolio consists of a large number of financially small projects that are spread across a comparably large number of sectors. Conceptually, *proliferation* parallels *fragmentation*.

Subsequently, we will outline the steps taken to construct alternative indices to measure sector fragmentation and aid proliferation in line with the above definitions.

Sector Fragmentation Index

According to the above definition, three factors have to be taken into consideration to calculate the degree of fragmentation of a sector: (1) the number of donors that are active in the sector, (2) the number of projects in the sector and (3) the average financial size of these projects. On this basis, we construct three separate indices as follows: First, we construct a *Donor Number Index (D)* by dividing the number of

¹³ It should be noted that many studies use the term 'fragmentation' for what we call 'concentration'.

¹⁴ The term 'project' is used in a wider sense and refers to what development partners have entered in DAD as a 'project'. It can be a project or a programme, a cash transfer, delivery of goods or a contribution to a non-governmental organization, i.e. project is used in the same way as the term 'aid activity' is used by the OECD in the Creditor Reporting System.

donors in each sector by the median.¹⁵ Second, we construct a *Project Number Index (P)* by dividing the number of projects in each sector by the median. Third, we construct an *Average Project Size Index (A)* by establishing the total amount disbursed to each sector in the year of observation and divide it by the number of projects in the corresponding sector, in order to calculate the average project size. Then, we construct the index by dividing the sector-related average project size by the median. We use yearly project-related disbursements as a proxy for the average project size, which allows comparing changes in the degree of fragmentation over a period of time.¹⁶

Assuming that the average project size, due to its affect on transaction costs, is a more significant indicator of fragmentation than the number of donors, we choose the average project size index (A) as numerator and the other two indices as denominator and construct the fragmentation index 'F' as follows:

$$F = A / (P * D)$$

The lower the index value, the higher is the degree of sector fragmentation.

Aid Proliferation Index

In line with the above definition, three factors have to be taken into consideration to calculate the level of proliferating behaviour of a donor: (1) the number of sectors a donor is active in, (2) the number of projects in the donor portfolio and (3) the average financial size of these projects. On this basis, we construct three separate indices as follows: First, we construct a *Sector Share Index (S)* by establishing the number of sectors in a donor portfolio and divide it by the total number of sectors in the country, in order to calculate the sector share. Taking the sector *share* takes account of 'zero observations', i.e. the number of potential sectors to which the donor gave no aid. Thereby, the index takes the active choice of a donor to support only its selected sectors and not the remaining ones into account. We construct the index by dividing the individual sector shares by the median. Second, we construct a *Project Number Index (P)* by dividing the number of projects of each donor by the median. Third, we construct an *Average Project Size Index (A)* by calculating the total amount disbursed by the donor in the year of observation and divide it be the number of projects in its portfolio, in order to calculate the average project size. Then, we construct the index by dividing the donor-specific average project size by the median.

¹⁵ By taking the median, the calculation takes the specific country context into account. A downside of this approach is that the measure is not suitable for cross-country analysis.

¹⁶ Due to using medians, the index does not allow to calculate a percentage change in the degree of fragmentation within a certain sector from year to year. However, the index allows assessing the relative change in the degree of fragmentation between the different sectors from year to year.

Again, we use project-related disbursements as proxy for the average project size, in order to be able to compare changes over time.

Assuming that the average project size is a more significant indicator of donor proliferation than the number of sectors, we choose the average project size index (A) as numerator and the other two indices as denominator and construct the proliferation index 'X' as follows:

$$X = A / (P*S)$$

The lower the index value, the higher is the degree of proliferating behaviour of a donor.

Pros and Cons of Alternative Indices

The suggested alternative indices reflect the actual problems associated with lack of donor coordination and decreasing financial size of assistance packages better than indices based on aid volumes. However, while using medians to construct both alternative indices has the advantage of taking the specific country context into consideration, the disadvantage is that the indices do not have a definite universal scale. Therefore, they are not suitable to indicate a high or low degree of fragmentation per se, but they reflect more accurately the relative degree of fragmentation (proliferation) among sectors (donors). In case all sectors (donors) have a similarly fragmented assistance portfolio, which is rather unlikely, the suggested alternative indices would show an even degree of fragmentation (proliferation).

The vast majority of studies use the Herfindahl and the Theil Index as measures for 'fragmentation'. According to our understanding, these measures do not accurately reflect all factors that constitute fragmentation, if the main elements that are responsible for the negative implications of this phenomenon on aid effectiveness are to be taken into account. Using the same dataset, we will subsequently compare the results of both, the Herfindahl and the Theil Index on the one hand and the alternative indices suggested in this paper on the other hand, in order to look at the situation in Pakistan from different angles. For the sake of clarity, we will talk about *concentration (dispersion)* if we use the Herfindahl Index or the Theil Index. Table 1 (below) summarizes the indices used in the following analysis.

Table 1: Indices Used in this Analysis

Index	What it measures	Variables taken into account
Hirschman-Herfindahl Index	Concentration (dispersion) (The lower the index value the lower the degree of concentration)	The number and distribution of donors' aid shares within a sector
Theil Index	Concentration (dispersion) (The lower the index value the lower the degree of concentration)	The number of shares within a donor's aid budget and their distribution across sectors
Fragmentation Index	Fragmentation (The lower the index value the higher the degree of fragmentation)	The number of donors, as well as the number and financial size of projects within a sector
Proliferation Index	Proliferation (The lower the index value the higher the degree of proliferation)	The number of sectors, as well as the number and financial size of projects within a donor's aid portfolio

Data Used for this Analysis

For this analysis, we use data extracted from the Development Assistance Database (DAD) Pakistan (www.dadpak.org). DAD is a web-based application that provides easy access to real-time project-level information on aid flows to Pakistan, including commitments, disbursements and expenditures by development partner, sector and geographic location, as well as on progress towards results. The system was established with UNDP support against the background of the 2005 earthquake and is now used to track all foreign assistance provided to Pakistan. While DAD is maintained by the Economic Affairs Division, the data captured in the system is entered online by development partners of the Government of Pakistan, who are the custodians of the data.

The analysis takes into consideration disbursements made in 2006 and 2007 related to regular development assistance, as well as the corresponding number of projects and sectors supported during this time period.¹⁷ Disbursements related to earthquake assistance have been excluded from this analysis. The data used for this analysis refers to *gross foreign assistance*, i.e. figures presented include repayments to be made by the Government of Pakistan.¹⁸

¹⁷ We use disbursements instead of commitments, as the former better reflect the actual implications for recipient governments in terms of coordination effort and transaction costs. The analysis takes all recorded projects into account, regardless how small they are. It can be argued that many partners define a 'project' rather differently, aggregating or clustering a number of activities under a single programmatic heading while others may more narrowly define their activities and consequently be identified as having more projects. The fact that what donors record in DAD as 'projects' might therefore reflect a diverse range of aid activities can be neglected in this analysis. In DAD, a project is supposed to be recorded as the actual package that was negotiated with the Government and through which assistance is actually delivered by a donor for a particular purpose.

¹⁸ Data on gross aid disbursements is best suited to our purpose, as it gives a better indication of the number of aid transactions between donors and recipient.

Some of the following analysis must be underwritten with a caveat. First, not all donors that provide assistance to Pakistan have recorded their disbursements in 2006 and 2007 in DAD. Second, the usual note of caution must be observed regarding data quality. In this case not all partners have provided sufficiently disaggregated information in DAD and sectoral aid allocations recorded in the system might not accurately reflect reality.

3. Sector Fragmentation in Pakistan

Table 2 (below) shows the total amount of regular development assistance disbursed to each sector in 2006 and 2007, according to DAD data records.¹⁹ On average, the largest volumes of assistance were allocated to 'Balance of Payment Support/Budget Support', 'Education', 'Health & Nutrition' and 'Agriculture & Livestock'. It can be noticed that 'Balance of Payment Support/Budget Support' has increased from 2006 to 2007, while especially 'Banking, Finance and Insurance', 'Water and Sanitation' and 'Transport' received less assistance in 2007 than in the previous year.

Table 2: 2006-07 Disbursements by Sector

Sector	Disbursed (USD)	
	2006	2007
Grand Total	3,313,912,463	3,125,590,990
Agriculture and Livestock	263,475,634	304,436,092
Balance of Payments / Budgetary Support	327,980,601	979,037,837
Banking, Finance and Insurance	321,280,136	165,778,296
Crisis Prevention and Disaster Reduction	68,608,046	28,756,771
Education	282,315,935	372,544,228
Energy Generation	299,525,158	113,669,491
Environment and Natural Resources	24,357,519	1,602,505
Gender and Women Development	15,002,917	27,203,232
Governance	256,790,408	137,080,299
Health and Nutrition	378,430,604	224,085,425
Housing and Construction	4,422,656	12,265,326
Industrial Development	16,153,062	6,023,214
Information Technology and Telecommunication	3,600,000	0
Oil and Gas	0	50,000,000
Population Welfare	6,875,481	6,784,383
Rural Development	276,770,038	204,958,456
Social Welfare	82,621,881	181,885,352
Tourism, Culture and Youth Affairs	262,900	0
Trade	1,562,241	665,000
Transport	317,301,871	172,749,453
Urban Development	0	23,780,910
Water and Sanitation	366,575,376	112,284,719

Source: Development Assistance Database Pakistan. Data status: April 24, 2008

¹⁹ Funds that have not been allocated to a specific sector have been excluded from the analysis.

First, we use the Hirschman-Herfindahl Index to measure the degree of concentration (dispersion) of foreign assistance provided to individual sectors in 2006 and 2007.

Table 3: Degree of Concentration (Dispersion) of Sector Support in 2006 & 2007

Sector	Hirschman-Herfindahl Index	
	2006	2007
Grand Total	0.24	0.30
Education	0.27	0.39
Health and Nutrition	0.28	0.29
Environment and Natural Resources	0.35	0.54
Transport	0.38	0.53
Water and Sanitation	0.39	0.38
Agriculture and Livestock	0.41	0.70
Rural Development	0.46	0.54
Balance of Payments / Budgetary Support	0.46	0.46
Energy Generation	0.47	0.89
Gender and Women Development	0.48	0.58
Banking, Finance and Insurance	0.49	0.69
Industrial Development	0.5	0.81
Crisis Prevention and Disaster Reduction	0.52	0.44
Governance	0.57	0.42
Social Welfare	0.57	0.77
Tourism, Culture and Youth Affairs	0.58	-
Trade	0.92	1
Population Welfare	0.92	0.70
Housing and Construction	0.95	0.99
Information Technology and Telecommunication	1.00	-
Oil and Gas	-	1.00
Urban Development	-	1.00

Source: Development Assistance Database Pakistan. Data status: April 24, 2008

The analysis reveals a comparably high degree of aid *dispersion* in the sectors 'Education', 'Health & Nutrition' and 'Water & Sanitation' in both years under observation. However, the degree of dispersion has decreased from 2006 to 2007 in the 'Education' sector, as well as in the sectors 'Transport' and 'Environment & Natural Resources', among others. The results of the analysis show an increase in the degree of aid dispersion from 2006 to 2007 in 'Governance' and 'Population Welfare', among others.

Following, we review the findings by using the fragmentation index suggested in this paper. According to our definition, a sector is considered to be highly *fragmented* if it consists of a large number of donors with a large number of projects of comparably small financial size. Table 4 and 5 (below) shows the results of this analysis.

Table 4: Degree of Sector Fragmentation in 2006

Sector	Donor Count	Donor Number Index (D)	Project Count	Project Number Index (P)	Average Project Size (USD)	Average Project Size Index (A)	Fragmentation Index (F)
Governance	11	1.69	82	4.82	3,131,590	0.57	0.07
Gender and Women Development	8	1.23	23	1.35	652,300	0.12	0.07
Education	13	2.00	62	3.65	4,553,482	0.83	0.11
Environment and Natural Resources	7	1.08	18	1.06	1,353,195	0.25	0.22
Health and Nutrition	12	1.85	46	2.71	8,226,752	1.51	0.30
Tourism, Culture and Youth Affairs	2	0.31	2	0.12	131,450	0.02	0.67
Trade	4	0.62	3	0.18	520,747	0.10	0.88
Agriculture and Livestock	10	1.54	24	1.41	10,978,151	2.01	0.93
Population Welfare	2	0.31	8	0.47	859,435	0.16	1.09
Transport	9	1.38	25	1.47	12,692,074	2.33	1.14
Industrial Development	4	0.62	8	0.47	2,019,132	0.37	1.28
Rural Development	6	0.92	27	1.59	10,250,742	1.88	1.28
Social Welfare	6	0.92	13	0.76	6,355,529	1.17	1.65
Water and Sanitation	8	1.23	23	1.35	15,938,059	2.92	1.75
Energy Generation	9	1.38	17	1.00	17,619,126	3.23	2.33
Banking, Finance and Insurance	7	1.08	17	1.00	18,898,831	3.46	3.22
Crisis Prevention and Disaster Reduction	4	0.62	8	0.47	8,576,005	1.57	5.43
Housing and Construction	2	0.31	2	0.12	2,211,327	0.41	11.20
Balance of Payments / Budgetary Support	4	0.62	7	0.41	46,854,371	8.59	33.90
Information Technology and Telecommunication	1	0.15	1	0.06	3,600,000	0.66	72.93

Source: Development Assistance Database Pakistan. Data status: April 24, 2008

Taking the project number and size into account, a different picture emerges. The fragmentation analysis reveals that especially social sectors, such as ‘Governance’, ‘Gender and Women Development’, ‘Education’, as well as ‘Health and Nutrition’, face a considerable coordination challenge. While the previous analysis showed that the assistance portfolio in ‘Governance’ is fairly *concentrated*, the sector appears as having a rather *fragmented* assistance portfolio according to this analysis. In 2006, 11 donors provided funding to 82 individual governance projects, while 13 donors provided funding to 62 projects in the ‘Education’ sector. Each of these projects involves at least one, but often numerous, implementing partners.

Table 5: Degree of Sector Fragmentation in 2007

Sector	Donor Count	Donor Number Index (D)	Project Count	Project Number Index (P)	Average Project Size (USD)	Average Project Size Index (P)	Fragmentation Index (F)
Governance	11	2.20	77	5.50	1,780,264	0.24	0.02
Environment and Natural Resources	3	0.60	11	0.79	145,682	0.02	0.04
Gender and Women Development	7	1.40	26	1.86	1,046,278	0.14	0.05
Health and Nutrition	11	2.20	54	3.86	4,149,730	0.56	0.07
Crisis Prevention and Disaster Reduction	5	1.00	23	1.64	1,250,294	0.17	0.10
Education	11	2.20	54	3.86	6,898,967	0.93	0.11
Industrial Development	5	1.00	6	0.43	1,003,869	0.14	0.32
Population Welfare	3	0.60	6	0.43	1,130,731	0.15	0.59
Rural Development	6	1.20	21	1.50	9,759,926	1.32	0.73
Water and Sanitation	7	1.40	14	1.00	8,020,337	1.08	0.77
Energy Generation	7	1.40	14	1.00	8,119,249	1.10	0.78
Agriculture and Livestock	8	1.60	19	1.36	16,022,952	2.16	1.00
Social Welfare	7	1.40	15	1.07	12,125,690	1.64	1.09
Banking, Finance and Insurance	5	1.00	16	1.14	10,361,143	1.40	1.22
Transport	5	1.00	12	0.86	14,395,788	1.94	2.27
Trade	1	0.20	1	0.07	665,000	0.09	6.28
Housing and Construction	2	0.40	2	0.14	6,132,663	0.83	14.48
Urban Development	1	0.20	3	0.21	7,926,970	1.07	24.95
Balance of Payments / Budgetary Support	3	0.60	7	0.50	139,862,548	18.87	62.89
Oil and Gas	1	0.20	1	0.07	50,000,000	6.74	472.15

Source: Development Assistance Database Pakistan. Data status: April 24, 2008

The analysis for 2007 reveals that the degree of *fragmentation* in the 'Education' sector has decreased, due to a reduced number of projects and a higher average project size. A similar pattern can be observed for 'Agriculture & Livestock'. While the Herfindahl Index indicated a decrease in the degree of dispersion from 2006 to 2007 in the sectors 'Environment & Natural Resources' as well as 'Gender & Women Development', the fragmentation index suggested in this paper reveals an increase in the degree of fragmentation, which is mainly caused by a decrease in the average project size.

Findings of Sector Fragmentation Analysis

While the assistance portfolios in the sectors ‘Gender & Women Development’ and ‘Governance’ appear to be rather *concentrated* according to the Herfindahl Index, the fragmentation index shows that both sectors are in fact rather *fragmented*, due the high number of financially small projects, which contribute to high transaction costs and coordination challenge. Both measures, the Herfindahl Index as well as the fragmentation index, reveal a high degree of dispersion/fragmentation of assistance provided to social sectors, in particular ‘Health & Nutrition’ and ‘Education’. It is evident that development partners need to integrate their support better in sector-wide programmes and work more effectively to lower transaction costs if the Government is to exercise effective leadership over these sectors.

4. Aid Proliferation in Pakistan

The next analysis takes a donor perspective and considers the degree of dispersion/proliferation in their support to Pakistan. Table 6 (below) shows the total amount of regular development assistance disbursed by donor in 2006 and 2007, according to DAD data records.²⁰

Table 6: 2006-07 Disbursements by Funding Source

Funding Source	Disbursed (USD)	
	2006	2007
Grand Total	3,313,912,463	3,125,590,990
ADB (Asian Development Bank)	1,286,077,738	1,389,822,782
Australia	0	7,395,828
Canada	32,371,697	18,228,519
China	195,319,420	0
EC (European Commission)	40,030,753	58,059,150
GEF (Global Environment Facility)	3,322,248	1,705,746
Germany	123,583,929	156,727,157
IDB (Islamic Development Bank)	11,230,000	0
IFAD (International Fund for Agricultural Development)	14,373,057	0
Japan	428,055,832	17,834,044
Nordic Development Fund	0	980,000
Norway	5,067,305	8,859,810
OPEC Fund (Organization of Petroleum Exporting Countries Fund)	11,612,315	0
Oman	3,600,000	1,500,000
Saudi Arabia	0	13,210,000
Switzerland	267,560	0
United Kingdom	69,973,645	117,540,743
UN (United Nations)	4,593,302	79,493,340
USA	260,621,630	320,623,758
WB (World Bank)	823,812,032	933,610,114

Source: Development Assistance Database Pakistan. Data status: April 24, 2008

²⁰ Funds that have not been allocated to a specific sector have been excluded from the analysis.

First, we use the Theil Index as indicator of concentration (dispersion). The Theil Index indicates to what extent a donor is spreading its assistance evenly or unevenly across a small or large number of sectors. The findings of this analysis are shown in table 7 (below).

Table 7: Degree of Concentration (Dispersion) of Donors' Assistance Portfolios in 2006 & 2007

Funding Source	Theil index	
	2006	2007
Grand Total	0.22	0.30
ADB (Asian Development Bank)	0.32	0.42
WB (World Bank)	0.38	0.70
USA	0.58	0.60
Germany	0.63	0.99
Japan	0.7	0.81
Norway	0.72	0.73
United Kingdom	0.83	0.50
Canada	0.84	0.64
UN (United Nations)	0.85	0.52
EC (European Commission)	0.91	1.05
Switzerland	1.07	-
China	1.1	-
IDB (Islamic Development Bank)	1.22	
GEF (Global Environment Facility)	1.3	1.01
IFAD (International Fund for Agricultural Development)	1.3	-
OPEC Fund (Organization of Petroleum Exporting Countries Fund)	1.3	-
Oman	1.3	1.30
Australia	-	1.08
Nordic Development Fund	-	1.30
Saudi Arabia	-	1.30

Source: Development Assistance Database Pakistan. Data status: April 24, 2008

The analysis reveals that the Asian Development Bank is spreading its assistance across more sectors and more unevenly than other donors in both years under observation. The degree of dispersion in the assistance portfolios of the World Bank and Germany has noticeably decreased from 2006 to 2007, while it has increased in the assistance portfolios of the United Kingdom and Canada.

Following, we review the findings of this analysis by using the proliferation index suggested in this paper to measure the degree of *proliferating behaviour* of individual donors. In this regard, a donor is considered to be a '*proliferator*' if its portfolio consists of a large number of financially small projects that are spread across a comparably large number of sectors. The higher the degree of *proliferating behaviour*, the more a donor is contributing to sector fragmentation, as well as the associated coordination challenge.

Taking the number and financial size of the assistance packages in each donor's portfolio into account provides a different picture regarding the spreading of funding by individual donors. The results of this analysis are presented in tables 8 and 9 (below).

Table 8: Degree of Aid Proliferation in 2006

Donor	Number of Sectors	Sector Share Index (S)	Number of Projects	Project Number Index (P)	Average Project Size (USD)	Average Project Size Index (A)	Proliferation Index (X)
UN (United Nations)	11	0.55	48	3.43	95,693	0.03	0.01
Switzerland	8	0.40	11	0.79	24,323	0.01	0.02
Canada	10	0.50	79	5.64	409,768	0.11	0.04
EC (European Commission)	8	0.40	31	2.21	1,291,314	0.34	0.39
Oman	5	0.25	11	0.79	327,272	0.09	0.45
USA	11	0.55	54	3.86	4,826,326	1.29	0.61
GEF (Global Environment Facility)	2	0.10	10	0.71	332,224	0.09	1.24
Norway	5	0.25	6	0.43	844,550	0.23	2.11
United Kingdom	8	0.40	16	1.14	4,373,352	1.17	2.56
ADB (Asian Development Bank)	15	0.75	48	3.43	26,793,286	7.16	2.78
Germany	6	0.30	14	1.00	8,827,423	2.36	7.86
Japan	9	0.45	21	1.50	20,383,611	5.45	8.07
WB (World Bank)	13	0.65	21	1.50	39,229,144	10.48	10.75
IFAD (International Fund for Agricultural Development)	2	0.10	6	0.43	2,395,509	0.64	14.93
IDB (Islamic Development Bank)	3	0.15	3	0.21	3,743,333	1.00	31.11
China	2	0.10	8	0.57	24,414,927	6.52	114.14
OPEC Fund (Organization of Petroleum Exporting Countries Fund)	1	0.05	2	0.14	5,806,157	1.55	217.15

Source: Development Assistance Database Pakistan. Data status: April 24, 2008

Using the proliferation index suggested in this paper reveals that the *proliferating behaviour* of the Asian Development Bank, the World Bank, as well as of Germany needs to be reconsidered in light of the comparably high average financial size of their assistance packages. Instead, Switzerland, Canada and the European Commission turn out to be the largest '*proliferators*' in 2006. While Canada remained under the top '*proliferators*' in 2007 due to an increasing number of projects with decreasing financial size, the degree of fragmentation in the assistance portfolio of European Commission decreased slightly. The analysis reveals that while Canada distributed its total assistance rather evenly across the sectors it supported, it provided assistance to a comparably high number of sectors through a comparable large number of financially small packages. Hence, in light of the earlier discussion about the implications of *proliferating behaviour* and which factors need to be taken

into consideration to assess it, the proliferation index suggested in this paper shows the real degree of *proliferating behaviour* better than the Theil Index.

Table 9: Degree of Aid Proliferation in 2007

Donor	Number of Sectors	Sector Share Index (S)	Number of Projects	Project Number Index (P)	Average Project Size (USD)	Average Project Size Index (A)	Proliferation Index (X)
Canada	7	0.35	83	7.55	219,621	0.14	0.05
UN (United Nations)	13	0.65	50	4.55	1,589,867	0.98	0.33
GEF (Global Environment Facility)	2	0.10	9	0.82	189,527	0.12	1.43
USA	12	0.60	48	4.36	6,679,662	4.12	1.57
EC (European Commission)	8	0.40	24	2.18	2,419,131	1.49	1.71
United Kingdom	11	0.55	24	2.18	4,897,531	3.02	2.52
Japan	7	0.35	11	1.00	1,621,277	1.00	2.86
Australia Gov	3	0.15	10	0.91	739,583	0.46	3.35
ADB (Asian Development Bank)	15	0.75	54	4.91	25,737,459	15.87	4.31
Norway	4	0.20	8	0.73	1,107,476	0.68	4.70
WB (World Bank)	11	0.55	22	2.00	42,436,823	26.17	23.80
Oman	2	0.10	2	0.18	750,000	0.46	25.44
Germany	4	0.20	8	0.73	19,590,895	12.08	83.07
Nordic Development Fund	1	0.05	1	0.09	980,000	0.60	132.98
Saudi Arabia	2	0.10	2	0.18	6,605,000	4.07	224.07

Source: Development Assistance Database Pakistan. Data status: April 24, 2008

It should be noted that this analysis takes no account of the funding modality or of the mode of delivery, which may be through the non-Government sector or by acting as a silent partner in a co-financing arrangement.

While a high degree of fragmentation almost always contributes to the overall coordination challenge and is likely to have a negative effect on sustainable development, the associated high transaction costs for Government counterparts depend on the mode of delivery. In order to re-assess the contribution of donors to high transaction costs through a fragmented assistance portfolio, the following analysis of aid proliferation only considers disbursements made to government agencies. The proliferation index suggested in this paper is used for this analysis.

Table 10: Degree of Aid Proliferation in 2006 in Support to Government Sector

Donor	Number of Sectors	Sector Share Index (S)	Number of Projects	Project Number Index (P)	Average Project Size (USD)	Average Project Size Index (A)	Proliferation Index (X)
UN (United Nations)	5	0.25	22	3.38	123,239	0.02	0.02
Canada	3	0.15	8	1.23	27,140	0.00	0.02
GEF (Global Environment Facility)	2	0.10	8	1.23	322,301	0.04	0.35
ADB (Asian Development Bank)	15	0.75	45	6.92	27,849,194	3.72	0.72
Switzerland	1	0.05	1	0.15	58,461	0.01	1.01
Germany	5	0.25	13	2.00	9,169,757	1.22	2.45
WB (World Bank)	13	0.65	21	3.23	39,229,144	5.24	2.49
Japan	8	0.40	18	2.77	22,940,546	3.06	2.77
United Kingdom	5	0.25	7	1.08	9,739,176	1.30	4.83
IDB (Islamic Development Bank)	3	0.15	3	0.46	3,743,333	0.50	7.22
Norway	1	0.05	2	0.31	837,228	0.11	7.27
IFAD (International Fund for Agricultural Development)	1	0.05	4	0.62	3,315,514	0.44	14.39
USA	7	0.35	5	0.77	40,599,997	5.42	20.14
China	2	0.10	6	0.92	20,904,050	2.79	30.24
OPEC Fund (Organization of Petroleum Exporting Countries Fund)	1	0.05	2	0.31	5,806,157	0.78	50.40
EC (European Commission)	1	0.05	1	0.15	29,069,683	3.88	504.68

Source: Development Assistance Database Pakistan. Data status: April 24, 2008

Taking into account only disbursements made to government agencies, leads to noticeable changes in the proliferation index value for some donors. It reveals that a number of donors provide bigger parts of their assistance portfolio to Pakistan through non-governmental channels, such as the European Commission, whose assistance portfolio to the government sector turns out to be the least fragmented. While providing assistance through non-governmental channels is likely to reduce the transaction costs for the Government, it may increase the coordination challenge and might have limited sustained impact, as well as distortionary effects on public spending, if assistance channelled through non-government actors is not integral part of a wider programmatic approach including several donors, and if the corresponding financial support is not recorded in the national budget.

Table 11: Degree of Aid Proliferation in 2007 in Support to Government Sector

Donor	Number of Sectors	Sector Share Index (S)	Number of Projects	Project Number Index (P)	Average Project Size (USD)	Average Project Size Index (A)	Proliferation Index (X)
UN (United Nations)	5	0.25	21	3.50	444,164	0.07	0.08
Canada	1	0.05	5	0.83	36,433	0.01	0.13
GEF (Global Environment Facility)	2	0.10	7	1.17	243,678	0.04	0.32
ADB (Asian Development Bank)	15	0.75	51	8.50	25,806,251	3.96	0.62
Australia	2	0.10	6	1.00	985,174	0.15	1.51
United Kingdom	6	0.30	7	1.17	6,523,511	1.00	2.86
WB (World Bank)	11	0.55	22	3.67	42,436,823	6.51	3.23
Japan	3	0.15	3	0.50	2,251,433	0.35	4.60
Norway	1	0.05	2	0.33	608,276	0.09	5.59
Germany	4	0.20	8	1.33	19,590,895	3.00	11.26
Saudi Arabia	2	0.10	2	0.33	6,605,000	1.01	30.37
USA	7	0.35	4	0.67	50,117,033	7.68	32.93
EC (European Commission)	1	0.05	1	0.17	50,000,000	7.66	919.75

Source: Development Assistance Database Pakistan. Data status: April 24, 2008

Both, transaction costs and coordination challenges for the government can be considerably reduced through programme-based approaches and other forms of co-financing arrangements. In order to re-assess the degree to which donors contribute to both problems by maintaining a fragmented assistance portfolio, a further analysis of aid proliferation should be performed, which takes into account the share of the total aid budget of a donor, which is channelled through co-funded projects. In order to give extra credit to donors, who channel their assistance through co-funded projects, instead of implementing similar projects on their own, we suggest altering the formula to calculate aid proliferation by adding a further index that measures the percentage share of each donor's contribution to the total amount disbursed through co-funded projects. In this regard a *Co-Funding Index (C)* can be constructed by first calculating the percentage share of total annual disbursements of each donor that was channelled through co-funded projects. The actual *Co-Funding Index* is constructed by dividing the individual shares through the median. Consequently, the alternative proliferation index ' X_{alt} ' is constructed as follows:

$$X_{alt} = (A * C) / (P * S)$$

The lower the index value, the higher is the degree of proliferating behaviour of a donor.

Attempting to assess the degree of aid proliferation by donor while taking funds channelled through co-funded projects explicitly into account, we realized that only

very few co-funded projects are currently recorded in the Development Assistance Database. To the extent projects are co-funded, the few donors that seem to provide co-funding have entered their respective contribution as separate projects. Therefore, the available dataset on co-funding arrangements in DAD is currently too small to calculate the *Co-Funding Index* value by donor. Looking at the raw data, it seems that co-financing arrangements are not common in Pakistan. A more accurate entry of co-funded projects in DAD is required to verify this assumption.

Findings of Aid Proliferation Analysis

The Theil Index and the proliferation index suggested in this paper come to different results regarding the extent to which individual donor's spread their funding across various sectors. Concentration indices that only take the aid volume and distribution into consideration, such as the Theil Index, don't show the full picture. In order to inform policy decisions regarding the potentially necessary rationalization of donors' assistance portfolios, it is important to assess proliferating behaviour and its implications on aid effectiveness with a view to the number and average financial size of the assistance packages, as well as the way through which these are delivered.

Overall, the proliferation analysis shows that there are significant variations in the degree to which individual donors spread their assistance to Pakistan thinly across a large number of sectors and projects.

Looking at individual donor portfolios, it is noticeable that the biggest '*proliferators*' provide support to a number of projects in the most fragmented sectors.

It should be noted that some development partners, such as the UN, have a mandated role in providing specialized packages of technical support across a broad range of topics. Similarly, the development banks, which are equipped with significant expertise in many areas, are sometimes expected to act like a 'family doctor', which provides help for numerous problems.

5. Conclusions and Recommendations

Concentration indices that only measure the distribution of aid shares don't accurately reflect the real degree of aid fragmentation and proliferation in a country, whose main effects, increasing coordination challenge and transaction costs, are largely caused by what constitutes the aid shares, i.e. the number and financial size of the aid packages. Despite some limitations, the alternative indices suggested in this paper to measure the two phenomena can give a better indication of the real degree of aid fragmentation at country level.

In spite of the necessary cautions to be applied in light of the described data quality issues, this analysis of aid fragmentation and proliferation can make a useful contribution to the aid effectiveness discussion in Pakistan. The analysis underlines the added value that an aid information management system like DAD can contribute to tracking, analyzing and managing foreign assistance. In order to capitalize on these benefits, it seems critical to firmly integrate DAD in the aid coordination architecture and use data captured in the system to inform collective dialogue and decision making on future aid allocations.

Furthermore, the analysis highlights that - *regardless of which measure is applied* - in particular social sectors experience a considerable coordination challenge due to their rather fragmented foreign assistance portfolio, which has direct implications on the effectiveness and sustainability of related development interventions. It further indicates that some donors are largely contributing to sector fragmentation through their proliferating behaviour regarding the provision of development assistance.

In order to achieve more development impact and reduce transaction costs, the Government of Pakistan and its development partners should work together to rationalize support to sectors and thematic areas, as well as to limit the number of development partners that are 'active' in a sector or thematic area to an appropriate level, depending on the needs and capacity of the sector/ thematic area, as well as the comparative advantages of individual development partners.

Development partners outside of a particular sector/ thematic area could be represented by those partners that are 'active' in the area of concern and should assume a role of 'delegating agencies'. They could nevertheless provide financial assistance to any sector/ thematic area within a framework of delegated cooperation, as division of labour does not concern the amount or distribution of development partner funding.

A 'coordinating agency' concept could be applied, whereby one agency would be appointed in each sector, thematic area and, where necessary, sub-sector to coordinate other partners that are active in that area in all matters. Depending on the case, the role of 'coordinating agency' may be rotated among different partners that engage in a particular sector/ thematic area. In addition, responsibility could be delegated to different partners for administering or carrying out specific activities (e.g. analytic work, monitoring and evaluation) or guiding specific aspects of dialogue within the area of concern. Dialogue mechanisms, especially at sector level, should be further institutionalized. The coordinating agency should co-chair the corresponding sector/ thematic working group together with the concerned line ministry and coordinate liaison with the Government.

The selection of the areas of focus for individual development partners and their roles as coordinating or delegating agency could be based on their comparative and, where applicable, competitive advantage. This should be determined by a development partner's established international and field office expertise, based on past successful experience, in a particular sector, thematic area or sub-sector. It should also include in-depth knowledge of local conditions at mission level. However, it should neither only depend on a development partner's funding capacity nor on its geographical area of interest.

Other selection criteria that could be taken into account when deciding who should engage in which sectors or thematic areas are:

- Organisational capacity, including thematic experts in-country;
- The appropriate total number of development partners in a sector or thematic area, taking into account the size, nature, needs in line with Government of Pakistan's policies, and capacity of the sector or thematic area of concern;
- Development partners' willingness to cooperate with each other in a particular sector or thematic area;
- Development partner's headquarter mandate;
- The extent of decentralised authority enabling field offices to make decisions; and
- Willingness to sustain support and invest in the agency's competencies in the long-term.

With regards to taking on a coordinating role, factors that could be considered in addition to the above are:

- Organisational capacity to assume leadership;
- Other development partners' willingness to recognise and trust a development partner as leader; and

- The distribution of lead responsibilities among development partners so as to facilitate equitable sharing of work.

An important element for rationalizing sector support and implementing a division of labour, but not necessarily a prerequisite for starting related work, is the formulation of operational sector development plans, which provide the strategic framework within which development partners provide their support. For division of labour to effectively support Governments' policy priorities, development partners have to be prepared to "let go" and disengage from sectors. Sector focus is expected to increase the development impact of the assistance portfolios of individual donors and would thereby contribute to increasing donors' visibility.

The Delegation of the European Commission in Pakistan has taken initial steps to implement the European Union's '*Code of Conduct on Complementarity and Division of Labour*' by developing a country-specific roadmap. The Code proposes broad guidelines which establish the principles of complementarity in development aid. In particular, the Code consists of eleven guiding principles, including '*sector focus*', '*lead donor concept*', and '*delegated cooperation*'. Given that the European Union is the largest donor group in Pakistan by number, the successful implementation of the Code of Conduct could have a significant mitigating effect on aid fragmentation and proliferation in Pakistan. As several donors, including non-European ones, are contributing to aid fragmentation, it should be explored if this initiative could be extended to include other like-minded donors outside of the European Union.

It is important to add, however, that simply addressing the symptoms may not be sufficient. In addition to developing a more rational 'division of labour' it is perhaps more critical that efficient programme-based approaches are developed that build national capacity to manage aid and utilize Government systems. The preparatory work that has been started to establish a sector-wide approach in the education sector is a first, but important step, and it should be explored to what extent similar work could be started in other highly fragmented sectors as well.

Aid fragmentation – and its negative effects on development – is not a natural consequence or by-product of foreign assistance, but a result of bad choices.

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