

Ashoff, Guido; Weiss, Dieter

**Article — Digitized Version**

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Intereconomics

*Suggested Citation:* Ashoff, Guido; Weiss, Dieter (1979) : Effects of German development aid on the internal economy, Intereconomics, ISSN 0020-5346, Verlag Weltarchiv, Hamburg, Vol. 14, Iss. 5, pp. 215-220,  
<https://doi.org/10.1007/BF02924563>

This Version is available at:

<https://hdl.handle.net/10419/139630>

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# Effects of German Development Aid on the Internal Economy

by Guido Ashoff, Dieter Weiss, Berlin\*

**The importance of economic cooperation with the Third World for the internal economy is attracting increasing attention in the discussion of development aid topics in the Federal Republic of Germany<sup>1</sup>. In this context it is of interest how the German development aid bears on the internal economy of the Federal Republic through feedbacks (in the form of contracts for German firms) from its bilateral and multilateral development aid payments. The following article presents the results of a relevant inquiry for the year 1976<sup>2</sup>.**

The methodical instrument used in this inquiry to ascertain the effects on the internal economy of German development aid-financed supplies and services is the input-output tabulation for the Federal Republic of Germany the latest available edition of which relates to the year 1972<sup>3</sup>. It can be used to compute both the effects of a given change of demand on the economy as a whole and on various sectors, taking into account not only the effects felt in the immediately concerned supplying industries (direct effects) but also the indirect effects on other industries at previous stages in the production chain. The total of the direct and indirect effects on production can be determined with the help of the inverse of the input-output matrix.

These production effects are attended by income effects which trigger a demand for consumer goods and give thereby rise to further production and employment effects stemming from the production of such consumer goods and requisite inputs. These

"multiplier-induced" effects, as they are called, can be ascertained by means of an input-output model augmented by the Keynesian multiplier<sup>4</sup>. The consumption ratio and the sectoral distribution of the induced consumer expenditure provided, together with the input-output table, the empirical basis for the inquiry<sup>5</sup>.

The inquiry into the effects of development aid-financed supplies and services on the part of the German industry dealt with several macroeconomic aggregates, namely gross production, imports and gross domestic product (GDP), and with the GDP components gross income in the form of wages and salaries, gross income from entrepreneurial activity and property, depreciation, and indirect taxes less subsidies. The effects on the direct taxes were

<sup>2</sup> Cf. also H. E. Grundmann: The Effects of Development Aid on Exports, in: *INTERECONOMICS*, No. 9/10 (1978), p.242ff.

<sup>3</sup> R. Pischner, R. Stäglin, H. Wessels: Input-Output-Rechnung für die Bundesrepublik Deutschland 1972 (Input-Output Account for the Federal Republic of Germany 1972), in: *DIW-Beiträge zur Strukturforchung*, No. 38 (1975).

<sup>4</sup> R. Pischner, R. Stäglin: Darstellung des um den Keynes'schen Multiplikator erweiterten offenen statischen Input-Output-Modells (Presentation of the open static input-output model augmented by the Keynesian multiplier), in: *Mitteilungen aus der Arbeitsmarkt- und Berufsforschung*, No. 3 (1976), p.345.

<sup>5</sup> The assumptions in regard to the distribution of the additional consumption over various goods are based on work by Rheinisch-Westfälisches Institut für Wirtschaftsforschung (RWI); cf. R. Rau: Die Struktur des privaten Verbrauchs 1980 und 1985 (The pattern of private consumption in 1980 and 1985), in: *Mitteilungen des RWI*, Vol. 25 (1974), p.237-250; by the same author: Die Struktur des privaten Verbrauchs 1985 (The pattern of private consumption in 1985), in: *Mitteilungen des RWI*, Vol.27 (1976), p.249-264. The ratio of consumption to gross incomes from employment and from entrepreneurial activities and property was assumed to be 50 %; cf. R. Stäglin and others: Multiplikatorwirkungen des Konjunkturprogramms von 1975. Anwendung des um den Keynes'schen Multiplikator erweiterten Input-Output-Modells (Multiplier effects of the economic programme of 1975. Application of the input-output model augmented by the Keynesian multiplier), in: *DIW-Beiträge zur Strukturforchung*, No.45 (1976), p.8-10.

\*German Institute for Development Policy. — The article is based on an inquiry which was carried out last year. The information on return flows of German bilateral capital aid has been extracted from „Sonderuntersuchung über die Verwendung der Kapitalhilfeauszahlungen nach Lieferländern, Lieferbranchen und Warengruppen" (Special inquiry into the application of capital aid disbursements, by supplying countries, supplying industries and commodity groups) by the Reconstruction Loan Corporation (Kreditanstalt für Wiederaufbau), Frankfurt. This kind of inquiry was first undertaken for 1976 and corresponding data have in the meantime been made available also for 1977.

<sup>1</sup> The Federal Republic of Germany is by no means the only country in which this point has been discussed. Cf., amongst others, R. Gerster: Schweizerisches Volkseinkommen und Dritte Welt (Swiss national income and the Third World), in: *Aussenwirtschaft*, Vol. 31 (1976), No. 1, p.33ff; P. V. Saladin: Bedeutung der multilateralen Entwicklungsfinanzierungsinstitute für die schweizerische Wirtschaft (Importance of the multilateral development finance institutions for the Swiss economy), in: *Aussenwirtschaft*, Vol. 31 (1976), No. 4, p.301ff.

computed by regression analysis on the basis of the calculated income changes<sup>6</sup>.

The effects on employment in the Federal Republic were calculated by reference to average sector-by-sector labour-input coefficients (working time or manpower requirements per output unit in individual industries) for which estimates by the Institute for Labour Market and Vocational Research were available for 1976<sup>7</sup>.

The input-output calculations of the return flows from German bilateral aid into the Federal Republic were subdivided into project-tied capital aid plus deliveries in kind in the framework of technical assistance and untied capital aid. The effects of the German exports of goods to developing countries as a whole<sup>8</sup> – whether financed by aid funds or not – were calculated at the same time and in the same accounting operation.

As regards the effects of the multilateral aid contracts to German firms on the internal economy of the Federal Republic, the available data were insufficient to do more than roughly estimate approximate figures for the various economic aggregates; figures for individual sectors cannot be provided. It was assumed that the multilateral aid contracts are spread over individual industries in the same way as the return flows from bilateral aid, which seems plausible as the use of multilateral aid funds by the international organizations for which figures were available does not differ fundamentally from the application of bilateral aid to specific types of development projects.

### Return Flows from German Aid

The Federal Republic of Germany provides capital aid to developing countries without tying it to particular deliveries. Only shipbuilding orders and supplies and services by other "sensitive industries" (railway engines, nuclear energy industry, engineering consultancy) are excepted from this rule. Tied contracts are as a matter of fact of little importance only: no more than 1 % of the capital aid commitments

<sup>6</sup> Cf. D. Teichmann: Bestimmungsgründe der direkten Steuern. Ergebnisse einer multiplen Regressionsanalyse der direkten Steuern der Arbeitgeber und der Arbeitnehmer (Determinants of direct taxes. Results of a multiple regression analysis of the direct taxes of employers and employees), in: Vierteljahreshefte zur Wirtschaftsforschung des DIW, No.3 (1976). The regression equations have been brought up to date for the present model calculations.

<sup>7</sup> Cf. E. Spitznagel: Anwendung des erweiterten Input-Output-Modells auf das „Programm zur Stärkung der Bau- und anderen Investitionen“ (Application of the extended input-output model to the "Programme for the boosting of building and other investments"), in: Mitteilungen aus der Arbeitsmarkt- und Berufsforschung, No.3 (1976), p.350-362.

<sup>8</sup> Statistisches Bundesamt, Fachserie 7, Außenhandel, Reihe 7, Außenhandel nach Ländern und Waren der Industriestatistik (Spezialhandel), 1976.

in 1976 was tied to specific contracts. Since the eastern bloc clause has been gradually removed all states may act as supplying countries.

The recipient countries conclude delivery contracts with domestic or foreign suppliers. The invoices are presented for payment to the Reconstruction Loan Corporation (RLC). By reference to the thus documented transactions it can be established in which supplying countries and industries the committed resources were spent. Detailed computations of this kind were undertaken by the RLC for the first time for 1976.

**Table 1**  
**Bilateral Capital Aid Disbursements of the Federal Republic of Germany for Supplies and Services from the Major Supplying Countries and Groups of Countries in 1976**

Supplying Countries	Total	
	in DM mn	in %
Industrialized Countries	1,349.3	73.4
Federal Republic of Germany	950.7	51.7
France	111.2	6.1
USA	95.5	5.2
Switzerland	40.5	2.2
Japan	39.7	2.2
Great Britain and Northern Ireland	35.1	1.9
Other Industrialized Countries	76.8	4.1
State-Trading Countries	5.0	0.3
Developing Countries	114.6	6.2
Unattributable	368.4	20.1
Total <sup>a</sup>	1,837.3	100

<sup>a</sup>Differences between totals and individual items are due to rounding.  
Source: Kreditanstalt für Wiederaufbau.

Table 1 shows the capital aid disbursements of the Federal Republic of Germany for supplies and services of the major supplying countries and groups of countries for 1976. It will be seen that about half the capital aid resources found their way back into the Federal Republic, and if the distribution by countries of the disbursements which cannot be divided by supplying countries is assumed to have been similar, the Federal Republic may be estimated to have shared with about 60 % in the return flows. The most important supplying countries beside the Federal Republic (albeit with much smaller individual shares) were France, the United States, Switzerland and Japan.

The distribution by industries of the return flows from German capital aid and technical assistance deliveries in kind to the Federal Republic in 1976 (see Table 2) indicates a marked concentration on mechanical engineering, (almost half of all deliveries), electro-technical industry, road vehicle building and chemical

**Table 2**  
**Bilateral Capital Aid Disbursements for Supplies**  
**from the Federal Republic of Germany and for**  
**Technical Assistance Deliveries in Kind by**  
**Supplying Industries in 1976**

Supplying Industries	in DM mn	in %
Mechanical engineering	534	47.9
Electro-technical industry	210	18.8
Road vehicle building	107	9.5
Chemical Industry	45	4.1
Others	219	19.6
<b>Total</b>	<b>1,115</b>	<b>100</b>

Sources: Kreditanstalt für Wiederaufbau; Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ).

industry. These industries are also the leaders in the German export trade with developing countries as a whole, a fact which suggests a correlation between return flow ratio and competitiveness of the German export industry.

In an assessment of the return flow ratio of the Federal Republic for 1976 it has to be borne in mind that the ratio had been higher in previous years and has tended to decline, especially since 1973 when the tying of aid in the form of goods to German deliveries ceased. For a proper assessment of the factual circumstances and an appreciation of the points raised during the discussion about a possible return to tied aid the dimensions of the theoretically achievable return flows and of the resultant effects on the internal economy under full aid tying have to be kept in sight. Contracts worth DM 886.6 mn<sup>9</sup> would have accrued to German firms in 1976 in addition to the actual verifiable return flows into the Federal Republic of DM 950.7 mn if all German development aid had been tied.

The exports financed by bilateral development aid necessitated an additional intermediate production of DM 727 mn<sup>10</sup>, bringing their gross production value to DM 1,567 mn. If allowance is made for the income multiplier, the value of the intermediate production rises to DM 1,469 mn and the gross production value to DM 2,308 mn.

This additional production volume for 1976 corresponds to a direct and indirect employment effect of altogether about 19,000 jobs – about 6,100 in the mechanical engineering industry, 3,100 in the electro-

technical industry, 940 in road vehicle building, 580 in the chemical industry and 1,400 in miscellaneous services. Allowing for the income multiplier effects the employment effect mounts up to about 29,400 jobs (6,200 in mechanical engineering, 3,300 in the electro-technical industry, 1,100 in road vehicle building, 800 in the chemical industry and 2,700 in miscellaneous services).

The income effect works out at DM 598 mn for wages and salaries and about DM 257 mn for entrepreneurial and property income; both these figures include the income multiplier effects (see Table 3).

**Table 3**  
**Internal Effects of the Return Flows from**  
**German Bilateral Development Aid into the Federal**  
**Republic of Germany in 1976**

(in numbers of employed persons and in DM mn at 1972 prices)

	Direct and Indirect Effects	Direct and Indirect Effects plus Income Multiplier Effects
Number of employed persons	19,034	29,370
Gross production	1,567	2,308
Imports	115	162
Gross domestic product	724	1,105
Gross income in wages and salaries	424	598
Gross income from business and property	149	257
Depreciation	72	114
Indirect taxes less subsidies	79	136
Direct taxes	181	229
Total taxes	261	365

Source: G. Ashoff, D. Weiss: Binnenwirtschaftliche Wirkungen der deutschen Entwicklungspolitik - Tabellenanhang, Berlin 1978, Tables 10, 11, 13.

The additional tax revenue (direct plus indirect taxes minus subsidies) amounts to DM 261 mn excluding the income multiplier and DM 365 mn including the income multiplier. The tax revenue amounts to 31 and 44 % respectively (excluding or including the income multiplier) of the German bilateral development aid expended in the Federal Republic<sup>11</sup>.

The imports required for the additional production amount to DM 115 mn and DM 162 mn respectively, i. e. 14 or 19 % of the exports, excluding or including the income multiplier.

Table 3 shows all the effects of German bilateral development aid on the internal economy of the Federal Republic.

The Federal Government provided in 1976 DM 634 mn for multilateral development cooperation. This was

<sup>9</sup> This is the difference between the total bilateral capital aid disbursements by the Federal Republic of Germany in 1976 which amounted to DM 1,837.3 mn and the verifiable return flows to the Federal Republic of DM 950.7 mn; cf. Table 1.

<sup>10</sup> All the following figures are at 1972 prices.

<sup>11</sup> DM 839.2 mn at 1972 prices.

# DEVELOPMENT ASSISTANCE

**Table 4**  
**Return Flows from Multilateral Development Aid into the Federal Republic of Germany:**  
**1976 and Cumulative Figures**

Institution	Return Flows into the Federal Republic of Germany Amount (in US\$ mn)		Share of Total Disburse- ments (in %)	Share of the Federal Republic of Germany of the Contributions or Subscribed Capital (in %)
1976				
United Nations Development Programme (UNDP)	4.9	11.6	6.5	-
International Bank for Reconstruction and Development (World Bank)	282.3 <sup>a</sup> 277.9 <sup>b</sup>	16.5 <sup>a</sup> 15.7 <sup>b</sup>	5.3 (on June 30, '76) 5.3 (on June 30, '77)	
International Development Association (IDA)	140.3 <sup>a</sup> 148.9 <sup>b</sup>	15.5 <sup>a</sup> 17.0 <sup>b</sup>	10.0 (on June 30, '76) 10.2 (on June 30, '77)	
Asian Development Bank (ADB)	34.6	n.a.	5.2 (on Dec. 31, '76)	
European Development Fund (EDF)	3.5 <sup>c</sup>	4.8	d	
Cumulative				
United Nations Development Programme (UNDP) 1972-1976	23.8	10.7	6.7	
International Bank for Reconstruction and Development (World Bank) up to June 30, 1977	2,195.8	13.9	5.3 (on June 30, '77)	
International Development Association (IDA) up to June 30, 1977	779.5	14.5	10.2 (on June 30, '77)	
International Finance Corporation (IFC) 1966 - June 15, 1977	113.1	14.3	3.4 (on June 30, '76)	
Asian Development Bank (ADB) up to June 30, 1977	160.4	9.6	5.2 (on Dec. 31, '76)	
European Development Fund (EDF) 1959 - Dec. 31, 1976	192.3 <sup>c</sup>	12.5	d	
Inter-American Development Bank (IDB) up to June 30, 1976	178.1	n.a.	n.a.	

<sup>a</sup>Financial Year 1976 (July 1, 1975 - June 30, 1976); <sup>b</sup>Financial Year 1977 (July 1, 1976 - June 30, 1977); <sup>c</sup>in million units of account (EUA), <sup>d</sup>in the average for the year 1976: DM 2.815; <sup>e</sup>share of the Federal Republic of Germany in the raising of funds for the EDF: First EDF 34.4%, Second EDF 33.8%, Third EDF 33.2%, Fourth EDF 26%.

Source: Compiled from data of the various institutions.

equal to 19 % of the total public development aid of the Federal Republic.

Tenders for projects which are financed by multilateral aid are normally open to international competition but bids are in principle only accepted from firms which are domiciled in member countries of the international development aid institutions involved. German firms are free to submit tenders in response to the bid invitations of all important international development aid organizations because the Federal Republic is a member of and provides capital for all these agencies<sup>12</sup>.

Comprehensive statistics for the multilateral aid contracts placed with German firms do not exist. The UN Development Programme (UNDP), the World Bank group (World Bank, IDA, IFC), the Asian Development Bank (ADB), the Inter-American Development Bank (IDB) and the European Development Fund (EDF) alone publish information on their expenses for goods and services classified by supplying countries (see Table 4), and the amounts shown are cumulative and not all separately available for individual years so that any figures for 1976 have to be qualified. They contain

no detailed sector-by-sector distribution of the placed contracts according to supplying countries such as would have allowed a computation of the direct and indirect effects on the internal economy of the Federal Republic by reference to the input-output table as for the German bilateral aid.

On an international scale the Federal Republic of Germany is, together with the USA, Japan and Great Britain, one of the most important multilateral aid contract operators<sup>13</sup>. This observation applies equally to the disbursements from World Bank loans and IDA credits and to the return flows under UNDP and ADB contracts. Only in regard to the European Development Fund does the Federal Republic emerge with a relatively low share of aid deliveries (12.5 % of its contributions to the EDF's resources). The bulk of the EDF-financed contracts went to France and to the countries associated with the European Community. The close economic relations between France and its former colonies and the ramifications between enterprises in these countries and France are playing here an important role.

<sup>12</sup> In addition to the contributions by their member countries (subscriptions to the basic capital and periodic capital increases) the international development banks are issuing loans in the international capital markets to finance their operations.

<sup>13</sup> For detailed information cf. G. Ashoff, D. Weiss: Binnenwirtschaftliche Wirkungen der deutschen Entwicklungspolitik - Tabellenanhang (Effects of the German development policy on the internal economy - Statistical appendix), Berlin 1978. Great Britain records a relatively high share only for the contracts placed with UNDP funds.

The flow of orders from international organizations – other than the EDF – to German firms has reached a substantial volume, not only by international comparison but in relation to the German contributions to the international development aid institutions. In 1976 as in previous years the German share of deliveries for the World Bank group, the Asian Development Bank and the UNDP exceeded the financial contribution or capital subscription of the Federal Republic, partly by a considerable margin. As a member of these organizations the Federal Republic enabled German firms to secure order books far in excess of the German financial contributions.

### Internal Effects

The verifiable return flows from multilateral development aid payments by the Federal Republic in 1976 amounted to about DM 1 bn (see Table 4). The distribution of the orders in question over the various sectors of the German economy is, as stated earlier, unknown, and this makes a detailed computation of their effects on the internal economy of the Federal Republic as undertaken for the German bilateral aid impossible.

However, assuming that the sector-by-sector distribution of these orders is similar to the feedbacks from the bilateral development aid, their effect on the internal economy can be estimated by reference to the figures for the bilateral aid. The results of such an estimate are shown in Table 5.

**Table 5**  
**Internal Effects of Delivery Contracts to German Firms from Multilateral Development Aid in 1976<sup>a</sup>**  
(in numbers of employed persons and in DM mn at 1972 prices)

	Direct and Indirect Effects	Direct and Indirect Effects plus Income Multiplier Effects
Number of employed persons	17,070	26,350
Gross production	1,405	2,070
Imports	103	145
Gross domestic product	650	991
Gross income in wages and salaries	380	536
Gross income from business and property	134	230
Depreciation	64	102
Indirect taxes less subsidies	71	122
Direct taxes	163	205
Total taxes	234	327

<sup>a</sup>Estimates based on verifiable purchase orders to German firms from multilateral development aid in 1976 to the value of about DM 1 bn.

On this assumption the employment effects of DM 1 bn worth of additional orders in 1976 corresponded to about 17,100 jobs excluding and 26,400 jobs including

the income multiplier. Their sectoral distribution was probably similar to that of the bilateral aid effects.

The income effects – including the income multiplier effects – may be estimated at DM 536 mn<sup>14</sup> for wages and salaries and DM 230 mn for entrepreneurial and property income.

The additional tax revenue – again including income multiplier effects – totalled DM 327 mn while the imports needed for the extra production amounted to DM 103 mn excluding and DM 145 mn including the income multiplier effects.

A brief summary of the effects of the German exports to developing countries as a whole – whether financed with development aid funds or not – is offered in conclusion as they were ascertained in the same computation: The German exports of goods to developing countries amounted in 1976 to DM 41.8 bn, i. e. 16 % of all German exports. The leaders by volume of exports to developing countries were mechanical engineering, road vehicles, electro-technical products and chemicals.

**Table 6**  
**Internal Effects of the German Goods Exports to Developing Countries in 1976**  
(in numbers of employed persons and in DM mn at 1972 prices)

	Direct and Indirect Effects	Direct and Indirect Effects plus Income Multiplier Effects
Number of employed persons	682,620	1,053,590
Gross production	59,559	86,175
Imports	4,738	6,419
Gross domestic product	26,541	40,203
Gross income in wages and salaries	15,517	21,760
Gross income from business and property	5,062	8,925
Depreciation	3,049	4,568
Indirect taxes less subsidies	2,913	4,950
Direct taxes	6,029	8,649
Total taxes	8,942	13,599

Source: G. Ashoff, D. Weiss: Binnenwirtschaftliche Wirkungen der deutschen Entwicklungspolitik - Tabellenanhang, Berlin 1978, Tables 10, 11, 13.

Table 6 shows that including the requisite intermediate productions a gross output of DM 59.6 bn or DM 86.2 bn (at 1972 prices) – including or excluding the income multiplier – was needed to satisfy the demands from the developing countries which were put at DM 41.8 bn and at 1972 prices amounted to DM 31.3 bn.

<sup>14</sup> All the following value figures are based on 1972 prices.

A total of 683,000 jobs – 1,050,000 including the income multiplier – derived in 1976 directly or indirectly from exports to developing countries<sup>15</sup>; 149,000 accrued to the mechanical engineering industry, 89,000 to the electro-technical industry, 71,000 to the road vehicles industry and 58,000 to the chemical industry. Structural links caused major employment effects outside the supplying industries – 83,000 jobs in miscellaneous services, 44,000 in the wholesale trade, 68,000 in retailing and 56,000 in artisan trades.

The tax revenue (direct plus indirect taxes minus subsidies) attributable to exports to developing

<sup>15</sup> If approximate figures for invisibles (especially building and transport services) are taken into account, the number of jobs is about 100,000 higher; cf. D. S c h u m a c h e r : 800 000 Erwerbstätige für den Export in Entwicklungsländer beschäftigt (800,000 workers employed on exports to developing countries), in: DIW-Wochenbericht No.5 (1978), p.58.

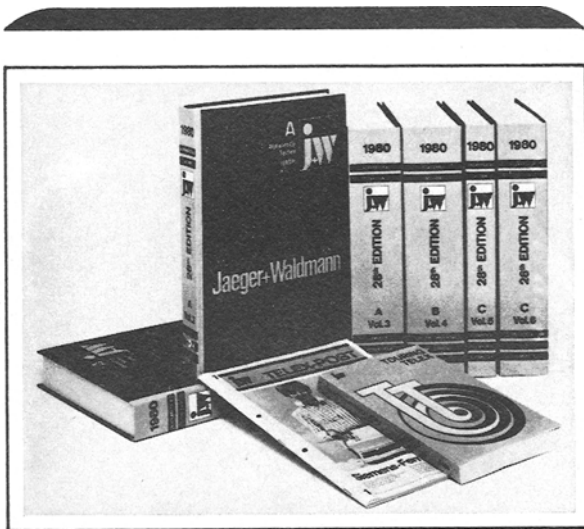
countries amounted (at 1972 prices) to DM 8.9 bn excluding and DM 13.6 bn including the income multiplier effects.

The German deliveries to developing countries which were financed by bilateral development aid of the Federal Republic in 1976 were valued at DM 1.1 bn and thus accounted for no more than 2.6 % of all German exports to these countries. Addition of about DM 1 bn worth of orders to German firms which can be shown to have been financed with multilateral aid funds raises the relevant figure to about 5 %.

The ratio of development aid-financed deliveries to the total exports of the Federal Republic to developing countries would not have been raised significantly if all aid commitments had been tied: in 1976 German firms would have obtained DM 886.6 mn of additional orders, and assuming that these would have been divided between the various industries in the same proportions as the actual return flows in the same year, the direct and indirect employment effects would have been of the order of 15,100 jobs. Addition of the multiplier effect brings the total employment effect in this case to about 23,300 jobs.

It has to be borne in mind however that the working-time and manpower requirements as calculated in the light of the technical interrelationships between different industries do not allow direct inferences in regard to the actual attitude of employers (to recruitment, redundancy and short-time working) in the cyclical and structural situation facing them in 1976. A canvass among trade associations and several large firms in the mechanical engineering, electro-technical, road vehicles, and chemical industries with the biggest share of development aid-financed orders for developing countries in 1976 which formed part of the inquiry revealed that the contracts financed with German development aid funds were insignificant in relation to the total sales in foreign or developing countries and did not give rise to specific decisions on employment policy. Similar conclusions would presumably apply to additional contracts of the order of DM 886 mn referred to above.

It would therefore be unrealistic to expect development aid to have major employment effects. Tied aid would be of limited effectiveness as an instrument of employment policy, and it is doubtful whether any resulting gains would make up for the negative effects in the sphere of development and trade policy and on the position of the Federal Republic in the North-South dialogue.



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**TELEX-VERLAG JAEGER + WALDMANN**  
Holzhofallee 38 · 6100 Darmstadt  
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