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COMPETING MODELS OF INTERNATIONAL LENDING ACTIVITY

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Four competing models of the World Bank's lending to developing countries are constructed and econometrically estimated by pooled time series and cross-section data. The analysis suggests that a model combining economic and political determinants performs best. Besides per capita income, inflation, balance of payment and budget deficit, external debt and past growth, political determinants such as the 'capitalist' climate or political instability are also important, as well as a recipient country's former status as a colony or dominion. This politico-economic-model is successfully used to forecast the distribution of IBRD loans and IDA credits among the developing countries.

1. Introduction

The behaviour of international organizations has very often been *described* [see, for example, van Meerhaeghe (1971), Mason and Asher (1973), MacBean and Snowden (1981)], but there exists hardly any work *analyzing the behaviour* of international institutions which derives *theoretical propositions* and *tests* them *empirically*.[1] Yet it would be important to have a well tested theory of how international organizations behave, since they occupy a prominent place in international economic and political relations.

This paper analyzes and econometrically tests the lending behaviour of the World Bank. It thus aims to contribute to a better understanding of what determines the credits received by less developed countries (LDCs) from a

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[1]Exceptions are analyses of the voting shares in international organizations [Dreyer and Schotter (1980), Fratianni and Pattison (1982)], and an empirical study by Heller and Frenkel (1982) on the determinants of the indebtedness of developing countries.

major international financial institution. The paper is part of an emerging public choice approach to international political economics.[2]

Four models of World Bank behaviour are constructed on the basis of the descriptive literature available [see, e.g., the criteria for IBRD and IDA credits listed in van de Laar (1980, pp. 31–50, 79–82)] and of theoretical a priori knowledge (based on public choice ideas), and compared with each other: (1) credits are extended to those countries which 'need' them most ('needs-model'), (2) credits are given to those countries which 'deserve' them most because they promise most development potential ('deserts-model'), (3) the World Bank is run by beneficent officials acting in accordance with the officially stated goals ('benevolence-model'), (4) the World Bank is a bureaucracy which furthers the utility of its (top) members, subject to economic and political constraints ('politico-economic-model'). These models are tested by using international cross-section data for developing countries over the period 1972–81 and by applying a combined time series/cross-section analysis over the period 1977–80. The results show that the politico-economic-model is best suited to explain World Bank behaviour. This suggests that the behaviour of this international organization has to be explained by *both* economic and political (and cultural) factors.

Section 2 presents the four competing models, section 3 discusses the econometric tests and presents forecasts, and section 4 offers concluding remarks.

2. Four competing models

The 'World Bank', composed of the International Bank for Reconstruction and Development (IBRD) and the International Development Association (IDA) has been described, and may be looked at, according to four different, and partly contradictory points of view.

2.1. The needs-model

This approach stipulates that the World Bank extends most of its credits to those countries which are in greatest need of such financial aid. This applies in particular to the period since 1970 (here considered) which has witnessed a major emphasis on assistance to the poorest countries [see, e.g., McNamara (1973), ul Haq (1978), van de Laar (1980)]. It is expected that credits will be higher, the lower income per capita is (which is, of course, highly correlated with indicators of poverty such as food or calories intake).

[2]A survey is given in Frey (1984). Most work has been addressed to the study of protectionism [see in particular Baldwin (1976, 1982), Caves (1976), Magee (1980), Finger, Hall and Nelson (1982), Findlay and Wellisz (1982), Lavergne (1983)], but other problem areas are also dealt with [e.g., Tollison and Willett (1976)].

The need for financial support is further reflected in other indicators, in particular the rate of inflation (showing the internal strain of demand on real resources), and the accumulated external debt (showing the strain of demand on foreign resources). On the other hand, surpluses in the balance of payments and/or in the government's budget would be held as an indication that World Bank credits are needed less than in other countries.

Column (2) of table 1 shows the expected signs of the parameters of the five causal variables just discussed on the per capita amount of credits received. It may be expected that the needs-model performs better for IDA credits than for IBRD credits, because the International Development Agency was founded for the explicit purpose of providing more generous assistance to the most needy countries (an upper eligibility limit has been formally established).

2.2. The deserts-model

This approach starts from the premise that those countries get most credits from the World Bank which deserve them most, because they exhibit the strongest potential for development. Countries which are expected to put the credits to the most effective use are expected to get most financial aid. According to Mason and Asher's (1973) authoritative study of the World Bank, 'The IBRD lends for viable projects in creditworthy countries whose overall performance suggests that they will continue to be creditworthy' (p. 227). On the other hand, 'the Bank has rather frequently curtailed its project lending – or even stopped lending altogether – to a country whose fiscal, monetary, and foreign exchange policies adversely affect domestic savings and foreign exchange earnings' (p. 290). This means that economically and financially 'responsible' (past) policies are rewarded by the Bank. Creditworthiness is reflected in a low rate of inflation (indicating that the government is determined not to resort to financially unsound policies), a budget surplus (implying that the government is thrifty), a surplus in the balance of payments (demonstrating a prudent import policy and/or successful export policy),[3] and a low external debt (showing that the country makes its development effort on its own.[4] A country also deserves credits if its growth in the past has been high (proving that it is capable of development). Indeed, an operational memorandum of IBRD (No. 4.01 of April 14, 1965)

[3]According to van de Laar (1980, pp. 52–53): 'The application of the creditworthiness criterion as a pre-condition for Bank lending leads . . . to countries which have weak balance-of-payments prospects being excluded altogether from receiving Bank loans'.

[4]There is only a low correlation between the state of the balance of payments (a flow) and the (accumulated) stock of foreign debt, '. . . the Bank's studies of creditworthiness distinguish the short-run external liquidity problem from the long-term debt source problem'. According to the deserts-model, the balance of payments may be hypothesized to play a weaker role than external debt.

states that 'Bank and IDA lending . . . involves an examination of past performance in borrowing countries'. Finally, a 'responsible' policy also entails that the government has been successful in maintaining social peace and political stability, which can be measured by a low number of politically caused strikes and riots. An examination of creditworthiness and expected future performance applies to credits both from the IBRD and from the IDA, but it seems reasonable to assume that the deserts-model applies relatively better to loans by the IBRD because this institution is required to finance itself on the open capital market where risk ratings play an important role for investors.[5]

Column (3) of table 1 lists the expected parameter signs for the effect of these causal variables on World Bank credits.

2.3. The benevolence-model

According to this view, the officials of the World Bank are 'benevolent bureaucrats' fulfilling their task according to the officially declared goals contained in the organization's charter. As has been contended, the World Bank 'has proved to be a multilateral, technical, professionally efficient and above all *non-political* organization of the world economic system' [Hürni (1984, p. 136), our translation]. IBRD and IDA have the same basic objectives [see, e.g., MacBean and Snowden (1981, ch. 11)]. Article 1 of the Articles of Agreement of IDA, effective since September 24, 1960, states the following purposes:

> 'The purposes of the Association are to promote economic development, increase productivity and thus raise standards of living in the less-developed areas . . . in particular by providing finance to meet their important developmental requirements on terms which are more flexible and bear less heavily on the balance of payments than those of conventional loans thereby furthering the developmental objectives of the International Bank for Reconstruction and Development and supplementing its activities.'

The charter may be interpreted to mean that developing countries running a structural balance of payments deficit and thus having a high external debt would cet. par. receive more credits than countries which are in a more fortunate situation. The goal of promoting economic development means that countries which have a low per capita income have more credits extended to them by the Bank. According to article 1, III of the charter, the

[5]The contrary view is advanced by Mason and Asher (1973) who argue that performance and creditworthiness are even more important for IDA credits because 'the difference between good and bad performance is of greater significance to the well-being of the population' (p. 429). See also van de Laar (1980), who states: 'Poor countries have to "deserve" IDA assistance' (p. 81).

Bank's goal is to promote the expansion of international trade and to encourage international investment. In the absence of reliable data on the great many forms of import restrictions, a country's willingness to benefit from the advantages of international trade and investment, an indicator for the 'capitalist climate' [see Gastil (1979)], may be taken. It is expected that more credits will be forthcoming the better the 'capitalist climate' (standing for the openness toward international trade and investment) is. The 'capitalist climate' also indicates the World Bankers' ideological aversion against nationalizations. 'Normal practice is for the Bank to inform governments who are involved in nationalization disputes that it will not assist them unless and until they make appropriate effort to reach fair and equitable settlements' [van de Laar (1980, p. 33)].

Column (4) of table 1 shows the parameter signs expected on the basis of the benevolence-model.

2.4. The politico-economic model

This view posits that the World Bank must be regarded as a bureaucracy in which the individual members [especially the top officials including the (Vice-)President(s), Directors, Assistant and Deputy Director(s)] further their own utility, subject to various economic and political constraints.[6] One of the main purposes of this paper is to show the usefulness of this approach. The top bureaucrats' utility is composed of the prestige enjoyed within the banking community[7] and the discretionary power exerted vis-à-vis donor and recipient governments.

Prestige can be gained within the banking community by 'performance excellence', i.e., by showing that the organization's tasks are competently handled. The top bureaucrats share their interests with the staff which is 'unique among the international agencies in terms of its professional competence' [Mason and Asher (1973, p. 71)]. This means in particular that those countries receive more credits which have a low per capita income and have shown themselves to be worthy of assistance by having grown rapidly in the past. Prestige in the international banking community can also be gained by keeping to the commonly observed conservative standards for lending [this is stressed, for example, by Oliver (1975, ch. X, esp. p. 253)]. This means that developing countries with low inflation and government deficits, as well as those with a 'capitalist climate' are favoured. *Discretionary power* can be ensured and increased by minimizing the probability and intensity of intervention especially by donor countries. Governments have, in

[6]Such models have been constructed by Tullock (1965), Downs (1967), Niskanen (1971) and Breton and Wintrobe (1982).

[7]With the exception of McNamara, World Bank presidents have all been close to the Wall Street banking fraternity prior to entering the Bank.

fact, few incentives to directly interfere with the Bank's daily business because such action is likely to provoke conflicts with other nations, except when the Bank can be accused of having made serious errors. The officials of the World Bank are therefore strongly interested in avoiding major blunders, inducing them to avoid risks and to pursue conservative lending policies. Countries with high external debts and unstable political conditions [measured by the number of politically induced strikes and riots; see Jodice and Taylor (1981)] are accordingly given less credit, since both features make future defaults more likely. Similarly, the larger a government's balance of payments deficit, the less willing are the directors to extend credits, since this makes the repayment of the loans harder to achieve.

The most important constraint imposed on the behaviour of the World Bank top officials is the interference of the donor countries exerted through their voting rights in the governing bodies, or by more informal channels.[8] The donor countries tend to intervene in favour of those developing countries which *depend* on them. 'Dependence' may take two forms:[9]

(a) Metropolitan countries support the interests of their former colonies or countries they dominated in cultural, political and economic ways. This applies in particular to the former large colonial powers, the United Kingdom and France, as well as to the LDCs dominated by the United States. It is thus expected that former colonies or dominations of these three countries cet. par. get more credits than the other countries.

(b) Donor countries have an interest that the developing countries to which they export are able to pay the concomitant bills. This task is eased when the World Bank extends credits to them. It is therefore expected that those developing countries to which the main donor countries (U.S., U.K., France, Federal Republic of Germany, Japan, Italy and Benelux; Saudi Arabia and Kuwait are important donors only since about 1976 and will therefore not be included in the econometric tests hereafter) export a particularly high share of goods cet. par. receive more credits from the World Bank.[10]

The World Bank officials are, of course, also subject to financial constraints: the IBRD has to finance itself on the open capital market, the IDA has to get support from its (industrialized) member countries. However, this constraint has already been taken care of in the case of the IBRD by the risk averse behaviour reducing the chance of default, and in the case of the IDA by the willingness of the Bank's bureaucrats to yield to the pressure of donor countries, thereby securing the future flow of contributions to the funds.

Column (5) of table 1 lists the signs expected for the parameters on the basis of the politico-economic-model.

[8]This aspect has been discussed by van der Laar (1980) and by Krasner (1981) for regional development banks. An important channel of country influence is the distribution of top bureaucrats according to nationality: in 1978, the US nationals held 31%, UK nationals 12%, and German (F.R.) and French nationals 9% each of the 115 'management positions' (Vice-Presidents, Directors, Assistant and Deputy Directors). (Administrative Budget 1979).

[9]Still another possibility would be to define dependence by the share of exports from a less developed country to the individual donor countries. This measure is discussed in Richardson and Kegley (1980). As the resulting empirical estimates are quite similar to those of the more simple approaches used here, it is not reproduced.

[10]The two concepts are not independent of each other because, as has been shown by Kleiman (1976, 1977), trade is more intensive between countries related by former colonialism.

2.5. Summary of the models

Columns (2)–(5) of table 1 give a general survey of, and allow a comparison between, the theoretically expected effects of the causal variables [column (1)] on the size of the World Bank per capita credits, according to the four models discussed.

As may be seen, the models' predictions differ significantly from each other both with respect to the causal variables included and with respect to the expected signs of the parameters. The needs-model is restricted to purely economic explanatory variables; the finance 'required' for development is independent of political conditions. The deserts-model incorporates one political variable (political instability), as does the benevolence-model ('capitalist climate'). The politico-economic-model takes into account both political and two sets of dependency variables.

3. Econometric tests

3.1. Cross-section analysis

The four models are econometrically tested with data for 60 less developed countries receiving credits, applying a cross-section analysis. The dependent variables are IBRD loans and IDA commitments in US$ per capita, averaged over the period 1972–81.[11] These, as well as the explanatory variables are fully described in the appendix.

Two equations have been estimated with the ordinary least squares method for IBRD loans and for IDA credits each, one taking the set of explanatory variables (1)–(8) and (9a)–(11a), the other taking the set (1)–(8) and (9b)–(15b). The regression results are presented in table 2.

The four equations are statistically satisfactory. They account for 54–68 percent of the variance, and the $\hat{F}$-test indicates that the set of explanatory variables has a significant influence on World Bank credits (99% level of security). A large number of the parameters is significantly different from zero at the 90%, 95% and 99% levels of security.

In general, the estimates indicate that World Bank credits are not only

[11]Averages instead of individual years are taken in order to eliminate short-term variations.

Table 1
World Bank credits: Causal variables, theoretically expected parameter signs for the four models, and econometrically measured parameter signs.[a]

	Parameter signs					
	Theoretically expected for the models				Econometrically estimated for the dependent variables:	
Casual variables (1)	Needs (2)	Deserts (3)	Benevolence (4)	Politico-economic (5)	IBRD loans (6)	IDA credits (7)
ECONOMIC VARIABLES						
(1) Per capita income	−	n.s.	−	−	−	−
(2) Rate of inflation	+	−	n.s.	−	−	−
(3) Government budget (surplus)	−	+	n.s.	+	+	n.s.
(4) Balance of payments (surplus)	−	+	−	+	+	n.s.
(5) External debt	+	−	+	−	+	+
(6) Past growth	n.s.	+	n.s.	+	+	+
POLITICAL VARIABLES						
(7) Political instability	n.s.	−	n.s.	−	−	n.s.
(8) 'Capitalist climate'	n.s.	n.s.	+	+	+	n.s.
DEPENDENCY VARIABLES						
(a) *Former colonies and dominations*						
(9a) United Kingdom	n.s.	n.s.	n.s.	+	+	n.s.
(10a) France				+	+	+
(11a) United States				+	+	+
(b) *Share of exports from donor country*						
(9b) United Kingdom	n.s.	n.s.	n.s.	+	+	+
(10b) France				+	+	+
(11b) United States				+	+	+
(12b) Fed. Rep. of Germany				+	n.s.	n.s.
(13b) Japan				+	n.s.	n.s.
(14b) Italy				+	n.s.	n.s.
(15b) Benelux				+	+	+

[a] + means that the parameter sign is positive, − that it is negative, n.s. implies that the corresponding parameter is not significant. The exact definition and measurement of the variables is given in the appendix.

Cross-section analysis of World Bank credits. IBRD loans to 60 developing countries, average over the period 1972–81; and IDA credits (commitments) to 48 developing countries, average over the period 1972–81.[a]

Dependent variable		Constant term	Economic variables: Income per cap. (t−2) (1)	Inflation rate (t−2) (2)	Govt. budget (surplus, share of GNP) (t−2) (3)	Balance of paym. (surplus per cap.) (t−2) (4)	External debt per capita (t−2) (5)	Growth of GNP (t−2) (6)	Political variables[b]: Political instabil. (t−2) (7)	'Capitalist climate' (t−2) (8)
IBRD loans (per capita)	(a)	5.04	−0.57**	−0.22*	0.12(*)	0.23*	0.15**	0.64**	−0.21(*)	3.54*
		(1.31)	(−2.87)	(−2.43)	(1.72)	(2.62)	(2.93)	(3.47)	(−1.79)	(2.16)
			−0.28	−0.08	0.08	0.32	0.29	0.26	−0.09	0.21
	(b)	4.19	−0.52**	−0.24*	0.09(*)	0.24*	0.16**	0.65**	−0.19(*)	2.86*
		(1.47)	(−2.91)	(−2.53)	(1.69)	(2.67)	(2.96)	(3.55)	(−1.69)	(2.02)
			−0.28	−0.09	0.07	0.33	0.31	0.23	−0.08	0.17
IDA credits (comm. per capita)	(a)	5.98	−0.39**	−0.11*	0.01	0.04	0.05*	1.16**	−0.46	1.85
		(1.59)	(−3.12)	(−2.04)	(0.94)	(0.69)	(2.17)	(2.83)	(−1.61)	(0.89)
			−0.65	−0.12	0.02	0.01	0.39	0.31	−0.17	0.06
	(b)	4.43	−0.40**	−0.09*	0.01	0.03	0.05*	1.10**	−0.36	1.74
		(1.41)	(−3.15)	(−2.04)	(0.90)	(0.81)	(2.29)	(2.77)	(−1.27)	(0.99)
			−0.66	−0.11	0.03	0.01	0.40	0.32	−0.10	0.07

Dependent variable		Dependency variables: Colonies and dominations: U.K. (9a)	F. (10a)	U.S. (11a)	Share of exports to recipient countries from: U.K. (t−2) (9b)	F. (t−2) (10b)	U.S. (t−2) (11b)	F.R.G. (t−2) (12b)	Jap. (t−2) (13b)	Italy (t−2) (14b)	Benel. (t−2) (15b)	Test-statistics: $\bar{R}^2$	F_{all}	F_{dy}	d.f.
IBRD loans (per capita)	(a)	1.84(*)	4.99*	1.94*	—	—	—	—	—	—	—	0.64	7.09	4.64	47
		(1.89)	(2.61)	(2.12)											
		0.18	0.43	0.28											
	(b)	—	—	—	1.50(*)	3.47**	2.74*	−0.36	−0.41	1.06	2.49*	0.68	14.12	5.01	43
					(1.75)	(2.77)	(2.23)	(−1.07)	(−0.98)	(1.41)	(2.11)				
					0.11	0.20	0.16	−0.07	−0.08	0.10	0.14				
IDA credits (comm. per capita)	(a)	1.06	3.86**	1.46*	—	—	—	—	—	—	—	0.54	6.53	4.21	35
		(1.27)	(2.89)	(2.13)											
		0.10	(0.44	0.20											
	(b)	—	—	—	1.47(*)	5.98**	3.47*	1.56	1.74	1.84	2.06*	0.62	9.46	4.98	31
					(1.71)	(3.03)	(2.46)	(0.99)	(1.43)	(1.19)	(2.12)				
					0.11	0.27	0.19	0.06	0.09	0.11	0.19				

[a]The independent economic, political, and dependency variables are averaged over the period 1970–79; i.e., a two years' lag is chosen, as it is assumed that the World Bank officials need two years' time to react and change policies to developing countries; OLS- regressions; the figures in parentheses below the estimated coefficients are the t-values; underneath the t-values are the β-coefficients; an asterisk in parentheses means that the variable has a significant influence at the 90% level of confidence; one asterisk indicates that the variable has a significant influence at the 95% level, and two asterisks at the 99% level of confidence (all three: two-tailed tests); $\bar{R}^2$ is the coefficient of determination corrected for degrees of freedom; F_{all} (F_{dy}) indicates whether in total the independent (all dummy) variables have a significant impact on the dependent variable.

[b]The political variable 'political instability' is averaged only over the period 1970–77, after 1977 no data was available.

influenced by economic variables (1)–(6), but that the political variables (7) and (8) and the dependency variables (9a)–(11a) or (9b)–(15b) which reflect a mixture of cultural, political and economic factors are also important. An application of the $\hat{F}$-test for the set of variables (9a)–(11a) and (9b)–(15b), respectively, indicates that dependency has a statistically significant influence on World Bank credits at the 99% level of security.[12]

The qualitative results of the econometric estimates are tabulated in columns (6) and (7) of table 1 for IBRD loans, allowing a direct comparison with the signs theoretically expected on the basis of the four models. The *needs-model* correctly forecasts the direction of influence of income (negative) and of external debt (positive) on credits, while it incorrectly predicts that cet. par. a higher rate of inflation, a balance of payments deficit and a budget deficit (at least for IBRD loans) help to secure more credits, whereas the econometric estimates suggest the contrary. The needs-model does not make any prediction about the influence of past growth whereas the empirical estimates find that it contributes to more credits. Concerning the political and dependency variables, the model again suggests that they do not have any influence; the empirical results indicate that both the 'capitalist climate' and political instability (for IBRD loans), as well as being a British or French ex-colony or a United States ex-dependency help to obtain more credits. The needs-model correctly predicts that having been a colony of the United Kingdom does not affect the credits granted by the IDA from the World Bank. The upper part of table 3, column (2) summarizes these results for the needs-model for the case of IBRD loans and the first dependence definition: two parameter signs are correctly predicted, in six cases a statistically significant influence was not predicted, three parameters have the wrong sign compared to the estimates.

The *deserts-model* has a superior overall performance [compare columns (3) and (2) in table 3], and it differs in several respects from the needs-model; in particular, the sole erroneously predicted parameter sign is that an increasing external debt would cet. par. reduce credits, while the econometric estimates suggest that it contributes to receiving higher credits.

The *benevolence-model* is able to predict three parameters correctly and one incorrectly [column (4) of table 3]. Again the pattern of 'hits' and 'misses' is different from the other two models just discussed. Among the political variables, the predicted insignificant effect of political instability on credits is only correct for IDA credits.

The *politico-economic-model* makes the largest number of predictions about whether an influence should run in the positive or negative direction. The model predicts incorrectly that increasing external debt makes it difficult to get more credits, but it correctly predicts the direction of influence with

[12]The corresponding $\hat{F}$-values are shown in table 2.

Table 3
The performance of the four competing models: Comparison of the theoretically expected and the empirically estimated parameters, for IBRD loans.[a]

Dependency definition (1)	Theoretical model: Needs (2)	Deserts (3)	Benevolence (4)	Politico-economic (5)
(*a*) *Former colonies and dominations*				
– Correct sign	2	5	3	10
– No influence expected while there is an empirically significant sign, or the reverse	6	5	7	0
– Wrong sign	3	1	1	1
(*b*) *Share of exports from donor country*				
– Correct sign	2	5	3	11
– No influence expected while there is an empirically significant sign, or the reverse	7	6	8	3
– Wrong sign	3	1	1	1

[a]The table is derived from table 1, and is explained in the text.

respect to ten causal variables, including many of the political and dependency effects.

The lower part of table 3 lists the 'hits' and 'misses' for IBRD loans and the second definition of dependence. A pattern comes about which is similar to the one in the upper part of the table.[13]

A comparison of the performance of the four models with respect to IBRD loans as compiled in table 3 suggests that the politico-economic-model is superior to the others, having a significantly higher number of correct predictions and a lower number of incorrect ones. The politico-economic-model thus provides us with the greatest amount of useful information about the World Bank's lending activity, and less often leads us into a wrong direction than the other models.[14] The deserts-model seems to perform a little better than the needs- and benevolence-models, but the difference may be attributable to chance.

Using the same type of comparison (not shown for reasons of space) for the case of IDA credits, it turns out that the politico-economic-model still performs best. As hypothesized, the needs-model performs better than the deserts-model in this case.

[13]Again about the same qualitative results hold for 'hits' and 'misses' pattern for the explanation of IDA credits; we therefore dispense with reproducing the corresponding table.

[14]It may, of course, be that an observer's crucial interest is in only one particular relationship, say the influence of the size of the external debt on credits. If this is so, both the deserts and the politico-economic-models convey mistaken information.

3.2. Combined cross-section/time series analysis

The estimates so far made are based on the average values of per capita credits received by an LDC over the period 1972–81. This procedure has been used in order to even out the large variations in credit received per year. For example, in the four years from 1977 to 1980, Argentina has received IBRD loans of US$ 12, 6, 4, 9, respectively, per capita, and Ecuador of US$ 7, 1, 7, 13, respectively, per capita. The variation is also large for IDA credits. Over the same period, for example, Bermuda has received US$ 2, 4, 2, 7, respectively, per capita, and Sudan US$1, 4, 3, 9, respectively, per capita.

In order to check whether the amalgamation of the yearly loans into a long-term average has not led to spurious results, the politico-economic-model of World Bank behaviour has been re-estimated using a combined cross-section/time series analysis for *yearly* IBRD loans and IDA credits covering the period 1977–80. The estimates are then used to make (true) ex post forecasts one year ahead (1982). The sample of countries shrinks somewhat (for IBRD loans to 40, and for IDA credits to 32 LDCs) because some of the countries included in the earlier sample no longer count among the credit recipients of the World Bank.[15] 'Political instability' could no longer be included among the determinants, because the data are available only up to 1977.

The results of the econometric estimates are shown in table 4.

A comparison of the signs and the *t*-values of the estimated parameters with those based on averaging (shown in table 2) reveals that there are only very few differences. *All* the parameters have the same sign. In the case of IBRD loans, the government budget surplus no longer has a statistically significant influence (at the 90% level) on the distribution between countries. In one case the significance level rises, in another it falls, compared to the pure cross-section estimate. In the case of IDA credits, the coefficient of the inflation rate is no longer statistically significant, and that of the external debt is significant only at the 90% level (previously at the 95% level).

It may be concluded that the estimates based on a cross-section of credit averages, and on a pooled cross-section/yearly time series of credits, yield very similar results.[16]

3.3. Forecasts of World Bank lending

A severe test of the performance of a model is its forecasting capacity. The

[15]As has been made clear, the models here discussed aim to study the differences in credits received by LDCs, not whether a country qualifies in principle as a credit recipient.

[16]The estimates are not imcompatible with the results reached by Heller and Frenkel (1982) who study the *stock of external indebtedness* of 43 developing countries. They find that total external debt of an LDC is significantly higher, the higher its *total* GDP and the lower its liquid international reserves are, but that country risk is not statistically significant (at the 90% level). Country risk is found to have, however, a significantly negative effect on the stock of debt owed to commercial banks.

Table 4

Combined cross-section/time series analysis of World Bank credits, years 1977 to 1980. IBRD loans to 40 developing countries in each year; and IDA credits (commitments) to 32 developing countries in each year.[a]

Independent variables	Dependent variables: IBRD loans (per capita)	Dependent variables: IDA credits (per capita)
Constant term	5.24 (1.69)	2.03 (1.71)
Shift variable (dummy) 1978	0.68* (2.11)	1.09* (2.34)
Shift variable (dummy) 1979	2.58** (2.90)	1.63* (2.49)
Shift variable (dummy) 1980	2.64** (2.78)	2.36* (2.22)
Income per capita	−0.46** (−2.95)	−0.32** (−3.10)
$(t-2)$	−0.31	−0.58
Inflation rate	−0.29* (−2.06)	−0.04 (−1.52)
$(t-2)$	−0.09	−0.06
Government Budget (surplus share of GDP)	0.09 (1.54)	0.07 (1.27)
$(t-2)$	0.06	0.08
Balance of payments surplus per capita	0.34** (2.78)	0.06 (1.41)
$(t-2)$	0.31	0.04
External debt per capita	0.27** (3.01)	0.12(*) (1.94)
$(t-2)$	0.27	0.21
Growth of GNP	0.81** (3.96)	0.96** (3.11)
$(t-2)$	0.28	0.41
Capitalist climate (dummy)	1.74(*) (1.72)	1.32 (1.44)
$(t-2)$	0.09	0.06
Share of Exports to recipient countries from:		
United Kingdom	0.89(*) (1.96)	0.91(*) (1.90)
$(t-2)$	0.10	0.12
France	2.39* (2.66)	3.02** (2.79)
$(t-2)$	0.19	0.30
United States	1.63* (2.27)	1.75* (2.36)
$(t-2)$	0.14	0.18
West Germany	0.41 (1.36)	0.96 (1.42)
$(t-2)$	0.10	0.11
Japan	0.21 (1.30)	0.58 (1.03)
$(t-2)$	0.03	0.07
Italy	0.08 (0.46)	0.68 (0.96)
$(t-2)$	0.03	0.11
Benelux	1.41* (2.23)	1.30* (2.06)
$(t-2)$	0.13	0.16
Test statistics:		
$\bar{R}^2$	0.78	0.71
F_{all}	16.41	13.57
F_{dy}	7.42	6.54
F_{stc}	1.43	1.55
d.f.	142	120

[a]F_{stc} is the *F*-test for structural changes over the four different years; the low *F*-values indicate no structural changes after adding the three shift variables for the years 1978, 1979 and 1980. Further explanations, see table 2.

pooled cross-section/time series estimates on the basis of data over the period 1977–80 of the 'best', i.e., the politico-economic-model (shown in table 4) are used to make a (true) ex post forecast of the distribution of World Bank credits among developing countries for the years 1981 and 1982. Table 5 lists the actual *IBRD loans* per capita, the predicted values and the absolute percentage deviation for the two years.

The forecasts turn out to be reasonably good in view of the fact that (1) it is much more difficult to make cross-section than time series predictions (where inertia 'explains' a lot), and (2) there may be very large yearly variations in the variable to be forecasted. In the one year prediction for 1981, the percentage deviation of the forecasted from the actual loans per capita is smaller than 20% in 30 out of the 40 LDCs included in the sample. There are two outlyers: the predicted value for Ecuador differed by 196% from the actual value ($2.5 instead ot $7.4) and with the care of Cameroon the predicted value was 54% too high ($4.8 instead of $7.4). On the other hand, for some countries the forecasts are extremely close to the actual per capita credits granted. For example, for Botswana, Nicaragua and Tunisia the deviation is less than 4%. For obvious reasons the forecasting performance worsens when the prediction is made two years in advance (1982). For 19 out of the 40 LDCs in the sample the forecasting error is below 20%. There are again two outlyers who received less loans per capita than predicted: Papua New Guinea (93% less) and Nicaragua (69% less). The forecast is, on the other hand, very close to the actual per capita loans for Botswana, Cyprus and Honduras (less than 7% deviation).

Table 6 lists the ex post forecasts of IDA credits for the 32 LDCs included in the sample.

The predictions are again quite satisfactory but the forecasting errors are somewhat larger than for IBRD loans. In the one year forecast (1981), the deviation from the actual values is less than 20% in 17, and in the two year forecast (1982) in 10, out of the 32 countries included.

4. Concluding remarks

Four models have been constructed with the intention of explaining the lending behaviour of the World Bank. Four models showing the influence of various factors on the amount of credits extended to developing countries have been compared. Econometric estimates suggest that the politico-economic-model performs best. Besides economic determinants such as per capita income, inflation, balance of payments deficit, budget deficit, external debt and past growth, it is necessary to include political determinants such as the 'capitalist' climate or the political instability due to strikes and riots. The results also suggest that the economic, cultural and political influences due to a former status of the recipient country as a colony or dominion are

Table 5
Ex post forecasts of IBRD loans (per capita) for 1981 and 1982.[a]

Nr. Country	Actual value 1981	Predicted value 1981	Absol. perc. deviation	Actual value 1982	Predicted value 1982	Absol. perc. deviation
01 Argentina	2.46	3.02	22.8%	14.44	7.84	54.2%
02 Bahamas	35.00	33.21	5.1%	29.00	31.41	8.3%
03 Barbados	20.00	16.41	18.0%	9.00	11.36	26.2%
04 Botswana	24.29	25.21	3.8%	28.57	26.43	7.0%
05 Brazil	4.29	5.46	27.3%	6.08	7.39	21.5%
06 Cameroon	4.80	7.43	54.8%	17.30	11.26	34.9%
07 Columbia	20.60	16.41	20.3%	10.91	14.32	31.3%
08 Cyprus	23.33	21.41	8.2%	20.33	18.94	6.8%
09 Dominican Republic	4.44	5.01	12.8%	4.70	5.23	11.3%
10 Ecuador	2.50	7.41	196.4%	28.59	14.46	50.6%
11 Egypt	2.24	3.36	5.0%	11.68	5.21	44.6%
12 Honduras	7.57	8.03	6.4%	8.11	7.51	7.4%
13 India	0.64	0.86	34.4%	1.88	1.41	24.5%
14 Indonesia	4.59	4.03	12.2%	6.32	7.08	12.0%
15 Ivory Coast	16.02	13.82	13.7%	12.23	14.12	15.5%
16 Jamaica	65.68	55.31	15.8%	60.50	49.37	18.4%
17 Jordan	14.38	15.41	7.2%	50.00	22.34	44.7%
18 Kenya	5.22	6.03	15.5%	4.42	5.03	13.8%
19 Korean Republic	10.21	9.34	8.5%	12.31	13.37	8.6%
20 Liberia	2.63	3.67	39.5%	10.53	7.32	30.5%
21 Malaysia	13.09	11.37	13.1%	10.96	12.01	8.7%
22 Mauritius	202.22	160.41	20.8%	169.22	122.31	27.8%
23 Mexico	15.49	13.37	13.7%	9.42	10.86	12.6%
24 Morocco	11.04	12.47	12.9%	13.66	16.42	20.2%
25 Nicaragua	12.96	13.49	4.1%	6.15	10.41	69.3%
26 Nigeria	3.79	3.22	15.0%	3.71	3.41	8.1%
27 Panama	30.83	19.98	35.2%	13.56	18.47	35.3%
28 Papua New Guinea	2.00	3.01	50.5%	2.00	3.86	93.0%
29 Paraguay	18.38	21.41	16.5%	31.05	24.87	19.9%
30 Peru	8.51	9.01	5.9%	16.48	13.41	18.6%
31 Philippines	10.88	10.34	5.0%	9.24	10.56	14.3%
32 Portugal	12.25	9.98	18.5%	18.47	12.41	32.8%
33 Romania	16.14	14.87	7.9%	14.42	15.98	10.8%
34 Syria	1.73	2.01	17.3%	2.44	3.56	45.9%
35 Thailand	6.93	8.02	15.7%	13.49	9.94	26.3%
36 Tunisia	23.84	22.91	3.9%	25.08	29.43	17.3%
37 Turkey	14.43	12.06	16.4%	16.08	18.38	14.3%
38 Uruguay	10.35	9.87	4.6%	13.79	10.38	24.7%
39 Yugoslavia	18.43	16.44	10.8%	11.51	13.47	19.4%
40 Zambia	4.48	4.01	10.4%	2.02	1.34	33.7%
Average values over all countries	17.71	15.98	21.07%	18.74	16.07	26.46%

[a]The equation used to undertake the ex post forecasts for the 40 developing countries is shown in table 4.

Table 6
Ex post forecasts of IDA credits (commitments per capita) for 1981 and 1982.[a]

Nr. Country	Actual value 1981	Predicted value 1981	Absol. perc. deviation	Actual value 1982	Predicted value 1982	Absol. perc. deviation
01 Bangladesh	3.77	4.56	21.0%	4.42	4.96	12.7%
02 Benin	12.65	10.30	18.6%	7.00	9.32	33.1%
03 Burma	1.58	2.86	81.0%	2.87	3.24	12.9%
04 Burundi	13.66	11.27	17.5%	5.17	9.47	83.2%
05 Central African Republic	3.91	4.78	22.5%	7.83	5.23	66.8%
06 Ethopia	2.41	1.84	23.7%	0.97	0.43	44.3%
07 Guinea	8.52	6.57	22.9%	3.52	4.99	41.8%
08 Guyana	10.00	8.47	15.3%	2.50	4.54	81.6%
09 Haiti	4.20	3.21	23.6%	3.60	3.02	16.1%
10 Kenya	3.14	3.89	23.9%	3.83	4.11	7.3%
11 India	1.90	2.11	11.0%	1.34	1.02	23.9%
12 Liberia	2.11	2.86	35.5%	13.42	6.46	48.1%
13 Madagaskar	5.17	6.21	20.1%	2.38	3.99	67.6%
14 Malawi	12.13	10.38	11.4%	1.85	4.59	148.1%
15 Mali	3.00	2.90	3.3%	2.86	2.13	25.5%
16 Mauritania	10.00	9.47	5.3%	8.47	7.02	17.1%
17 Nepal	4.25	3.86	9.2%	2.06	3.42	66.0%
18 Niger	4.15	4.99	20.2%	4.93	4.02	18.5%
19 Pakistan	2.46	2.87	16.7%	2.08	2.99	43.7%
20 Papua New Guinea	9.00	6.76	24.9%	0.67	3.47	417.9%
21 Rwanda	4.42	5.43	22.9%	7.87	6.03	23.4%
22 Senegal	4.56	5.47	20.0%	3.42	4.63	35.4%
23 Sierra Leone	8.86	9.67	9.1%	1.43	6.56	357.3%
24 Somalia	2.56	2.02	21.1%	3.84	2.46	64.1%
25 Sri Lanka	11.36	9.99	12.1%	5.85	7.47	27.7%
26 Sudan	3.90	3.47	11.0%	3.00	2.89	3.7%
27 Tanzania	4.97	5.87	18.1%	4.01	4.99	24.4%
28 Togo	10.40	9.47	8.9%	2.20	3.43	55.5%
29 Upper Volta	10.16	11.74	15.6%	5.41	7.46	37.9%
30 Yemen Arabic Republic	5.85	5.02	14.2%	6.00	5.38	10.3%
31 Yemen PDR	12.63	10.57	8.4%	10.26	9.53	7.3%
32 Zaire	1.03	1.51	46.6%	3.56	3.03	14.9%
Average values over all countries	5.82	5.94	19.9%	4.33	4.75	53.6%

[a]The equation used to undertake the ex post forecasts for the 32 developing countries is shown in table 4.

important, at least for France and the United States. The analysis further indicates that 'dependence' is also relevant in the sense of donor countries exporting to developing countries and therefore being interested in having them receive credits which enable them to pay for the exports. The politico-economic-model of World Bank behaviour has then been used to forecast the distribution of IBRD loans and IDA credits among the developing countries, with satisfactory results.

In a future politico-economic analysis of the World Bank the following aspects could be taken into account:

(a) The possible interaction between the economic and political conditions in the recipient countries; for example, that bad economic conditions may lead to political instability. This could be modelled along the lines suggested for industrialized countries; see, for example, Frey and Schneider (1978).

(b) The amount of credit given by the donor countries to the World Bank may be assumed to depend both on the Bank's as well as on the recipient countries' behaviour, i.e., it should be treated as an endogenous variable. (This applies particularly to IDA.)

(c) The credits granted by the World Bank may be expected to influence economic conditions in the recipient countries. If this is true, there is an interdependence between what in this paper are considered determinants and credits. In this case, simultaneous estimation techniques may be in order.

This paper should be seen as a first step toward a more comprehensive analysis of the behaviour of the World Bank and, more generally, toward a positive study of international organizations.

Appendix: Definition of variables and sources of data

IBRD loans: US$ per capita, average over 1972–81, received by 60 developing countries. *Source: World Bank Annual Report 1982*, Washington, DC, 1982.

IDA commitments: in US$ per capita, average over 1972–81, received by 60 developing countries. *Source: IDA in Retrospect*, Statistical Appendix, Oxford University Press, Oxford, 1982.

Income: GNP per capita in US$ in real terms, average over 1972–81. *Source: World Development Reports 1972–82*, Oxford University Press, Oxford, 1972 to 1982.

Inflation: percentage rate of GNP-deflator, average over 1972–81. *Source:* see income.

Balance of payments: balance of current account, (+ = surplus, − = deficit) in US$ per capita, average over 1970–79. *Source: IMF, Balance of Payments Statistics*, Volume 32/1, Washington, DC, 1981.

Budget surplus/deficit: overall surplus (+), respectively, deficit (−), as percent of GDP, average over 1971–1980. *Source:* IMF, *Government Finance Statistics Yearbook*, Volume VI, 1982, Washington, DC, 1982.

External debt:	in US$ per capita, average over 1970–79. Due to unreliable data restricted to external *public* debt. *Source:* see income.
Past growth:	percentage rate of growth of GNP, average over 1970–79. *Source:* see income.
'Capitalist climate':	dummy variable taking the value 1 if a country is classified as a 'pure capitalist state', otherwise 0. *Source:* Gastil (1979).
Political instability:	measured by the number of political strikes and riots, average over 1972–77. *Source:* Jodice and Taylor (1981).
Past colonies and dominions:	dummy variable taking the value 1 if an LDC was a colony of the United Kingdom or France, or was dominated by the United States. Domination is measured by the index proposed by Richardson and Kegley (1980). *Source:* A. Banks and W. Overstreet, *Political Handbook of the World*, McGraw-Hill, New York, 1981.
Share of exports from a donor country to a recipient LDC:	dummy variable, taking the value of average exports in US$ to an LDC over the period 1970–79 if the share exceeds 1% of a donor country's total exports, otherwise the variable takes the value 0. *Source:* IMF, *Directions of Trade*, Annual 1970–76, and *Yearbooks* 1980, 1981 and 1982, Washington, DC.

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