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The Relative Impacts of Foreign Direct Investment vs. Long Term Debt Capital on Domestic Investment in Morocco: An Econometric Assessment*

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This paper measures the relative impacts of foreign direct investment vs. long term debt capital inflows on the level of domestic investment in the LDC host economy of Morocco. Least squares direct effect estimates are compared to the overall effects of the inflows obtained by fitting two stage least squares to a simultaneous equations model. The results show that the net effect of the aggregate inflow is weakly complementary to domestic investment. But the aggregate effect camouflages a surprising asymmetry between the separate effects of direct and debt capital inflows into Morocco.

I. Introduction

Long term foreign resource inflows into Morocco in the form of direct investment and long term debt capital has increased substantially during the last two decades.[1] Its significance as a proportion of total investment has more than doubled during the eighties as compared to the sixties. What roles have these external resources played in the economic development of Morocco? Have direct investment and debt capital contributed uniformly to the economic growth of the country by stimulating complementary domestic investment? Or has growth been retarded because of

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[1] According to IMF statistics there has been little or no net inflow of long term portfolio capital into Morocco during the period 1960-1986.

the substitution of competing domestic investment? Unfortunately, economic theory alone cannot answer these questions. Empirical analysis is necessary to determine whether foreign resource inflows stimulates, stifles or leaves unchanged the level of domestic investment.

The purpose of this paper is to conduct a systematic econometric analysis of the impact of long term foreign capital inflows on the level of domestic investment in Morocco. The paper will assess the relative desirability of foreign direct vs. debt capital by measuring their separate impacts on the level of domestic capital formation. It is hoped that by exposing the significant channels by which these alternative sources of foreign capital impinge on domestic investment, the analysis will shed light on ways to contrive appropriate policy changes.

The impact of long term capital inflows on the LDC host economy is a controversial subject among economists. According to some authors, foreign capital inflows provide both resources and inducement for expanding domestic investment in the capital receiving country. Others believe that such inflows merely replace domestic investment and thus contribute little to the capital stock and the long run growth of the host country. There is also no agreement on the question of whether direct vs. debt capital inflows exert a uniform impact on the host economy. Early writings on the subject simply assumed that each dollar of long term resource inflow, direct or debt, augments import and investment in the host country by a dollar (Chenery and Strout, 1966; Rosenstein-Rodan, 1961). However, microtheoretic analysis suggests that an inflow of foreign capital into low income countries is likely to be split between an increase in investment and an increase in consumption (Griffin, 1970). Current thinking on the subject seems to support the view that while both direct and debt capital inflows are likely to impinge on domestic investment through micro as well as macroeconomic channels, the net impact of one may be substantially different from that of the other. Each may cause total investment in the host country to rise by more than the amount of the inflow, less than the amount of the inflow or by just the amount of the inflow (Committee for Economic Development, 1988; Caves and Reuber 1971).

Section II presents a theoretical discussion of the alternative channels through which long term foreign resource inflows may influence domestic investment. Section III develops an empirical framework for assessing the net impacts of direct and long term debt capital inflows. Section IV presents and interprets the empirical results. Section V concludes the paper. An appendix at the end of the paper provides additional notes on data sources, variable definitions and constructed variables.

II. Theoretical Considerations

Economic theory points to both direct and indirect channels through which long term capital inflows may affect domestic investment in the capital receiving country. Both direct and debt capital inflows may influence the investment plans of domestic entrepreneurs directly via their sectoral linkage effects or indirectly through the effects on aggregate expenditures. Each of these effects may be positive or negative and their joint effect determines whether external resource inflows will stimulate or stifle domestic investment and by how much.

Under the direct effect, if total investment rises by more than the size of the inflow, then foreign resource inflows may be said to have caused complementary effects. Both direct and debt capital inflows may induce such complementary domestic investments since the operation of both foreign and domestic firms may encourage local entrepreneurship by their purchases from or subcontracts to local suppliers and/or by their supplies of lower cost inputs for local industries. Critics of foreign direct investment in LDCs however claim that foreign firms do not generate enough of these linkages (Singer 1960). Reuber et. al (1973) have argued that to the extent that foreign firms engage in labour intensive processing of components for exports they will make few local purchases of inputs. These authors also investigated forward linkages based on a sample survey and found that most of the respondents in their survey reported none. Among the few statistical studies of linkage effects of foreign investment that exist for LDCs the weight of the evidence seems to support the view that foreign firms purchase a larger proportion of their inputs from abroad than do local firms (Biersteker 1978; Cohen 1973). For a more recent and more elaborate survey of these studies see Caves (1988).

Besides the linkage effects, foreign resource inflows may also encourage or discourage domestic investment through other types of incentive effects. Thus, to the extent that foreign firms help train workers and local managers in new skills and technical know-how, direct investment is likely to exert a larger positive effect on domestic investment than debt capital (Globerman, 1979). However, several others have argued that instead of stimulating, direct investment may actually stifle domestic investment (Lubitz 1971; and Papanek, 1972). According to these authors possible offsets to domestic investment may occur through various channels. Foreign firms may suppress nascent local entrepreneurship (a) due to their technological superiority (b) by preempting scarce domestic capital or of some other bottleneck resource and thus depriving indigenous firms of their main source of finance or other critical inputs (c) by their superior

tax and import advantages over local firms and (d) by creating effective entry barriers through the monopolistic exploitation of market power and control of patents and trademarks (The Committee for Economic Development, 1988). Since these advantages are usually associated with foreign direct investment as opposed to foreign debt capital, the substitution argument applies primarily to the former rather than to the latter type of capital inflows.

There are also several macro-mechanisms through which capital inflows may affect domestic investment. Like the direct effects the indirect macroeconomic effects of direct vs. debt capital inflows may be substantially different from each other. The first and the most well known of these indirect channels is the Keynesian accelerator mechanism. According to this principle, deviations of aggregate spending from capacity output is a driving force of domestic capital formation. Thus, to the extent that the direct and debt capital inflows are able to alter the level of aggregate expenditures, both may have an additional indirect effect on domestic investment. Second, capital inflows in either form may reduce domestic investment if there exists a negative causal relationship between foreign resource inflows and domestic savings. Bhagwati (1978), Weisskopf (1972) and many others have developed the negative savings argument. The underlying rationale for this hypothesis is that as an economy receives more foreign capital, it supplements its available resources, thus it is reasonable to assume that some part of the additional resources will be expended on increasing current consumption. With current consumption rising at a given level of income current domestic savings would then fall. Third, foreign resource inflows either in the form of direct or debt capital may also exert an indirect effect on domestic investment via its impact on exports and imports of the capital receiving country. If income changes are insufficient to completely requite the capital inflow in real terms, prices or exchange rates are likely to adjust inducing additional changes in exports and imports. Which of these mechanisms will dominate depends on the prevailing exchange rate regime, the flexibility of domestic wages and prices and the initial level of employment in the capital receiving country (Penner, 1962; Faroque and Veloce, 1990).

III. Empirical Model and Testable Hypotheses

The impact of foreign on domestic investment is studied first in the context of a single equation regression model for total investment and then within a simultaneous system for the Moroccan economy. Following the strategy proposed by Caves and Reuber (1971) and later applied by

Van Loo (1979), it is assumed that all foreign resource inflows are exogenous to the host economy and the factors which determine such inflows are not identical to the factors that determine domestic investment.[2,3] Preliminary estimates of the direct effects of direct vs. debt capital inflows are obtained by applying least squares to the following Keynesian accelerator form of the investment model:

$$(1) \qquad I_t = \alpha_0 + \alpha_1(\text{TREND}) + \alpha_2 \text{YDIF}_t + \alpha_3 R_{t-1} + \alpha_4 Y_{t-1} + \alpha_5 DI_t + \alpha_6 PI_t + U_t$$

where,

I_t = real gross fixed capital formation in period t
Y_t = real gross national product in period t
YDIF_t = $Y_t - Y_{t-1}$, it represents the accelerator[4] in period t
R_t = the interest rate in Morocco in period t.
DI_t = net real direct investment in Morocco during period t
PI_t = net real long term debt capital inflow into Morocco during period t.
TFI_t = $DI_t + PI_t$, total long term capital inflows in period t

The model presented above controls for all of the major variables which by the predictions of orthodox theories are likely to exert a causal influence on domestic investment.[5] These include the accelerator, lagged

2 There exists an interesting causality debate among economists concerning the issue as to whether economic growth attracts capital inflows or whether it is foreign capital inflows that causes economic growth (Kindleberger, 1987), Caves and Reuber (1971) view capital inflows as "shocks" which are independent of developments within the host country. By contrast, conventional macroeconomic models in the tradition of Mundell-Fleming (1962, 1963) adopt the view that capital inflows are induced by government policies of the host economy. However, neither of these theoretical approaches to capital inflows lead to clear cut predictions about the behaviour of output and employment in the capital receiving country (see, Faroque and Veloce, 1990).

3 A regression of total long term capital inflows (TFI) on the set of explanatory variables that are used to explain gross domestic capital formation (see equation 1) yielded a value of $\bar{R}^2 = 0.40$ and a Durbin Watson statistic of 0.78. These results strongly suggest that explaining/forecasting foreign resource inflows is much more complex and requires models other than those employed to explain/forecast domestic capital formation.

4 In the absence of a time series measure of potential output for Morocco, we have chosen to define the accelerator variable as the yearly deviations in actual output. Pindyck and Rubinfeld (1981) proposed this same variable as proxy for the accelerator. The trend output might have been used as a proxy for potential output. However, the computation of trend based on the short time series that is at our disposal might have resulted in serious measurement problem.

5 For an excellent recent survey of the theories of investment see Gordon and Veitch (1986).

interest rate and a lagged output variable. A time trend is also included in order to capture the systematic influence of left out variables. The novelty of the model is that it includes foreign direct investment (DI) and long term debt capital (PI) as additional explanatory variables. It is the coefficients of these latter variables that are of primary interest to us. We wish to test two specific hypotheses with respect to these parameters and the Moroccan economy. *Hypothesis one* concerns the issue of whether foreign resource inflows induce complementary domestic investment. Formally, this is tested by conducting two separate parametric tests, namely: $H_1{:}\alpha_5 = 1$ and $H_2{:}\alpha_6 = 1$. Acceptance of H_1 implies that other things remaining the same, a dollar inflow of direct investment causes total investment to rise by a dollar. This in turn implies that domestic investment is independent of DI. Rejection of H_1 in favour of the alternative $\alpha_5 > 1$, or $\alpha_5 < 1$ implies that direct investment complements or substitutes for domestic investment respectively. A similar interpretation can be given to the test pertaining to long term debt capital inflow H_2. *Hypothesis two* examines whether DI and PI have an identical effect on domestic investment. This involves testing the joint hypothesis $H_3{:}\alpha_5 = \alpha_6 = 1$. Acceptance of H_3 implies that domestic investment is independent of both forms of long term capital inflows. If so, it would mean that equation (1) could be simplified by replacing the variables DI and PI with the single variable TFI (where TFI = DI + PI) without any loss of information. Rejection of H_3 would establish that DI and PI have non uniform impacts on domestic investment and thus ought to be treated as separate explanatory variables in equation (1).

To test for the indirect effects of foreign resource inflows following a simultaneous system is employed.

$$(2) \qquad I_t = \alpha_0 + \alpha_1(\text{TREND}) + \alpha_2(Y_t - Y_{t-1}) + \alpha_3 R_{t-1} + \alpha_4 Y_{t-1} + \alpha_5 DI_t + \alpha_6 PI_t + U_{it}$$

$$(3) \qquad C_t = \beta_1 + \beta_1(\text{TREND}) + \beta_2 C_{t-1} + \beta_3 Y_t + \beta_4 DI_t + \beta_5 PI_t + U_{ct}$$

$$(4) \qquad X_t = \gamma_0 + \gamma_1(\text{TREND}) + \gamma_2 Y_{wt} + \gamma_3 TOT_t + \gamma_4 DI_t + \gamma_5 PI_t + U_{xt}$$

$$(5) \qquad M_t = \delta_0 + \delta_1(\text{TREND}) + \delta_2 Y_t + \delta_3 TOT_t + \delta_4 DI_t + \delta_5 PI_t + U_{mt}$$

plus the GNP identity

$$(6) \qquad Y_t = C_t + I_t + G_t + X_t - M_t$$

where,

C_t = real personal consumption expenditure in period t
X_t = real exports of goods and services in period t
M_t = real imports of goods and services in period t
Y_{wt} = index of world output in period t (see data appendix)
TOT_t = ratio of the index of Morocco's GNP deflator in period t, P_{mt}, to an index of the world GNP deflator in period t, P_{wt}. (For more details see the appendix)
G_t = real government expenditures in period t

The specification of each equation in the system is in accord with economic theory. To allow for differential indirect effects of DI and PI, these variables are included as separate exogenous variables in each equations. By influencing consumption, imports and exports, the foreign resource variables bring about changes in aggregate expenditures which via identity (6) and the accelerator in equation (2) cause a second round effect on investment. The total (direct + indirect) effects of PI and DI on investment are calculated by solving for the reduced form for the model. The reduced form coefficients of DI and PI in the investment equation measure the net impacts of these variables on investment and are the best indicators of the relative desirability of these two sources of long term foreign capital.

IV. Empirical Results

As a first step toward an understanding of the immediate reaction of Moroccan investors to foreign resource inflows we estimated three different versions of model (1) by applying least squares. The first (1a) excluded all foreign resources from the model, the second (1b) included the sum of all long term capital inflows as a single explanatory variable (TFI) and the third (1c) replaced the aggregate variable TFI by its direct (DI) and debt components (PI). A comparison of the results of (1a) and (1b) manifests the impact of the aggregate foreign resources variable, while a comparison of versions (1b) and (1c) reveals whether it is appropriate to aggregate over foreign resources into a single variable.

(1a) $I_t = -1.9652 + 0.4282(\text{TREND}) + 0.2536\text{YDIF}_t - 0.4669R_{t-1}$
t-ratio (−0.725) (1.409) (1.943) (−0.601)

$+ 0.1484Y_{t-1}$
(0.897)

$\bar{R}^2 = 0.846$ D.W. = 0.607 SEE = 2.286

(1b) $I_t = -0.8702 + 0.2764(\text{TREND}) + 0.1569\text{YDIF}_t + 0.0604Y_{t-1}$
t-ratio (0.142) (2.552) (2.222) (0.998)

$0.1688R_{t-1} + 1.0541\text{TFI}_t$
(0.457) (9.496)

$\bar{R}^2 = 0.966$ SEE = 1.065 D.W. = 1.487
$H_0: \alpha_5 = 1$ F(1, 20) = 0.237 P-value = 0.85

(1c) $I_t = -1.8829 + 0.2324(\text{TREND}) + 0.1389\text{YDIF}_t + 0.1849R_{t-1}$
t-ratio (−1.786) (2.028) (2.800) (0.626)

$+ 0.0940Y_{t-1} - 5.6740\text{DI}_t + 1.2489\text{PI}_t$
(1.498) (−2.998) (10.609)

$\bar{R}^2 = 0.978$ SEE = 0.851 D.W. = 2.150
$H_0: \beta_5 = 1.0$ F(1, 19) = 7.48 P-value = 0.01
$H_0: \beta_6 = 1.0$ F(1, 19) = 4.12 P-value = 0.05
$H_0: \beta_5 = \beta_6 = 1.0$ F(2, 19) = 3.97 P-value = 0.03

Even a cursory examination of the results of regressions (1a) and (1b) reveals the import of foreign resource inflows for the explanation of investment in Morocco. Model (1a) which a priori restricts the coefficient of the foreign resource variable to zero, gives a much poorer fit. Not only does this version explain a smaller fraction of investment volatility but also the estimated Durbin-Watson statistics reveals a significant pattern of first-order serial correlation among the residuals. This suggests that perhaps this version of the model is misspecified due to omitted variables (Granger and Newbold, 1986). Possible misspecification is also suggested by the general pattern of insignificance (low t ratios) of the estimated coefficients. By contrast, when the foreign resource variable TFI is included in the model the results improve substantially. The model (version 1b) now accounts for more than 96% of the fluctuation in investment. The Durbin-Watson statistics falls in the inconclusive region so that the null hypothesis that the disturbances are random cannot be rejected. The coefficient of the lagged interest rate variable R_{t-1} has the wrong sign but its statistical insignificance suggests that the unexpected sign may be the result of sampling error. All other variables have the theoretically correct signs.

Among the explanatory variables included in the model, the accelerator (YDIF), and the foreign resource variable (TFI) exert a significant causal influence on investment. It is apparent that foreign resources play a dominant role in the investment process in Morocco. The coefficient of TFI is estimated with the greatest precision in the entire model. The size of its

coefficient 1.054 suggests that other things remaining the same, each dollar of foreign capital inflow causes total investment to rise by a dollar and five cents and thus stimulates domestic investment by five cents on the dollar. However, a formal test reveals that there is a 63.2% probability that a coefficient of 1.0541 or more could have been obtained from a population where the true value of the parameter is 1.0. Thus, the seeming complementarity between foreign and domestic investment is not statistically significant.

Turning to a comparison of regressions (1b) and (1c) we note that the treatment of DI and PI as separate explanatory variables results in a general improvement in all of the summary statistics that are traditionally utilized for model discrimination. Thus, in moving from version (1b) to (1c) the standard error of regression (SEE) declines from 1.066 to 0.851 and the Durbin-Watson statistic rises from the inconclusive region to a level which strongly favours the hypothesis that the disturbances are truly random. Moreover, the treatment of DI and PI as separate explanatory variables causes a general improvement in the precision of all of the estimated coefficients in the model. Thus there appears to be sufficient evidence to suggest that model (1c) represents a superior specification than model (1b).[6]

The evidence presented above strongly suggests that foreign resources do not have a uniform impact on domestic investment. A formal test of the hypothesis (based on model 1c) that the coefficients of DI or PI is individually equal to unity is strongly rejected by the data. A further test shows that there is no more than 3.0% probability that the estimated coefficients of DI and PI could have been obtained from a population where the true values of each of these coefficients are simultaneously equal to unity. These results signify that while both direct and debt capital inflows exert a statistically significant impact on domestic investment, the size of their effects are by no means uniform. Indeed, regression (1c) reveals the surprising results that while PI wields a significant positive influence on investment, the influence of DI is strongly ***negative.*** Other things remaining the same, each dollar inflow of PI increases total investment by 1.2489 dollars and thus ***stimulates*** domestic investment by

[6] The changes in the regression results that occur in moving from version (1b) to (1c) cannot be attributed to a problem of intercorrelation among the regressors. The correlation between DI and PI is no greater than 0.40. However, with more than two explanatory variables it is possible for the simple correlation between a pair of regressors to be low and yet the multicollinearity problem may be serious (Maddala, 1977). To test for this, we regressed each right hand side variable on the remaining ones. In each of these regressions the R^2 was found to be significantly less than the R^2 for the investment models thus satisfying the condition for Klein's rule of thumb for the absence of serious multicollinearity problem.

24.89 cents on the dollar. By contrast, each dollar inflow of DI stifles or *substitutes* for 4.67 dollars worth of domestic investment. In spite of the strong negative impact of DI, foreign resource inflows in the aggregate TFI, mildly stimulates domestic investment. This is so because almost 90% of the total inflow TFI during the sample period was in the form of PI whose impact on investment is positive.

The indirect effects of DI and PI were estimated by applying two-stage least squares to the simultaneous system (2)-(5). For purposes of comparison the model was also estimated by excluding the foreign resource variables.[7] Table 1 and Table 2 present these results. Table 1 shows that the two-stage estimates for the investment equation are very much similar to the single stage (least squares) estimates indicating that simultaneous equation bias is not an issue. The signs of the coefficients on DI and PI confirm that direct investment stifles and long term debt capital inflows stimulates domestic capital formation. The size of the coefficients on both DI and PI are somewhat smaller than before, with each dollar of direct investment replacing an additional 4.12 dollars worth of domestic investment while an equal inflow of debt capital promotes an additional 0.24 dollars worth of domestic investment.

Table 2 presents the results from applying two-stage least squares to the augmented model. The evidence that the inclusion of DI and PI generally improves the statistical fit of each equation in the model. Out of the possible six indirect channels through which foreign variables may influence investment only the effect of PI on imports and the effect of DI on exports are statistically significant. The negative sign on the coefficient of PI suggests that debt capital inflows encourage the substitution of local resources for imports. This in turn causes aggregate expenditures to rise which via the accelerator exerts a second round positive influence on domestic investment. The effect of DI on exports is significant only at the 10% error level. The positive coefficient on DI in the exports equation suggests that the indirect effect of DI on investment is positive and it tends to counteracts its negative direct effect. Finally, it is interesting to note that the coefficients on both DI and PI in the consumption equation are positive but statistically insignificant. The positive signs suggest a negative causal association between foreign resource inflows and domestic savings but the insignificance of the coefficients imply that these links are weak and can be ignored for all practical purposes. The results of the

7 This strategy is also expected to correct for any simultaneous equation bias that may exist in the least squares estimates of the direct effects of foreign resources. One potential source of such a bias is due to the possible correlation between the income variable and the error term.

Table 1

RESULTS FROM TWO-STAGE LEAST SQUARES ESTIMATION OF THE SIMULTANEOUS MODEL

Explanatory Variables	Equations			
	I	C	X	M
CONST	−1.7151	5.1336	6.5711	−18.700
	(1.424)	(1.732)	(0.838)	(1.161)
TREND	0.2331	0.3784	0.1681	2.0242
	(1.932)	(1.201)	(0.458)	(2.756)
YDIF	0.1423	—	—	—
	(2.861)			
C_{-1}	—	0.7281	—	—
		(4.339)		
Y_{-1}	0.1099	0.0034	—	—
	(2.094)	(0.046)		
R_{-1}	0.0643	—	—	—
	(0.461)			
Y	—	—	—	0.3673
				(1.524)
Y_w	—	—	0.0848	—
			(0.757)	
TOT	—	—	−15.593	40.504
			(0.961)	(1.169)
DI	−5.1232	—	—	—
	(2.289)			
PI	1.2369	—	—	—
	(10.59)			
$\bar{R}^2$	0.978	0.983	0.773	0.902
SEE	0.855	1.369	1.716	2.333
D.W.	2.125	1.759	1.619	1.902

* : Values in parenthesis are t-statistics
SEE : Standard error of regression
D.W. : Durbin-Watson statistic

estimated consumption and investment equations confirm that long term foreign capital inflows into Morocco are entirely utilized for productive investment purposes. They corroborate the more general finding of Levy (1986) based on a cross section of 46 countries that external resource in-

Table 2

THE EFFECT OF LONG TERM FOREIGN RESOURCE INFLOWS

Explanatory Variables	Equations			
	I	C	X	M
CONST	−1.7151	4.8659	4.9256	−12.3079
	(1.424)	(1.512)	(0.605)	(1.043)
TREND	0.2331	0.3741	0.0047	1.5004
	(1.932)	(1.127)	(0.011)	(2.859)
YDIF	0.1423	—	—	—
	(2.861)			
C_{-1}	—	0.7392	—	—
		(4.134)		
Y_{-1}	0.1099	—	—	—
	(2.094)			
R_{-1}	0.0643	—	—	—
	(0.461)			
Y	—	0.0059	—	0.2664
		(0.077)		(1.519)
Y_w	—	0.1285	—	—
		(1.065)		
TOT	—	—	−15.464	23.902
			(0.939)	(0.998)
DI	−5.1232	0.0937	7.1275	−2.3273
	(2.289)	(0.028)	(1.385)	(0.487)
PI	1.2369	0.0657	0.2782	1.1209
	(10.59)	(0.342)	(0.810)	(3.391)
$\bar{R}^2$	0.978	0.982	0.759	0.952
SEE	0.855	1.439	1.766	1.636
D.W.	2.125	1.781	1.699	1.733

* : Values in parenthesis are t-statistics
SEE : Standard error of regression
D.W. : Durbin-Watson statistic

flows into low income countries are not dissipated into current consumption.

To assess the overall impacts of foreign resources on domestic investment, impact multipliers for DI, PI and TFI are calculated. These multipliers correspond to the coefficients of these foreign resource

variables in the reduced form for the investment equation obtained by solving the estimated structural model presented in table 2.[8] Two sets of multipliers are calculated for each foreign resource variable, namely the classical and the Bayesian multipliers. The classical impact multipliers correspond to the reduced form of the model obtained by setting all of the statistically insignificant coefficients to zero, and the Bayesian multipliers are calculated by retaining all of the estimated coefficients. The results show that the classical-Bayesian impact multipliers lie respectively between −5.5804 and −5.1890 for DI, between 1.4786 and 1.7142 for PI, and between 1.0846 and 1.1049 for the aggregate variable TFI. These results imply that while aggregate long term foreign capital inflows is mildly stimulating for domestic investment, every dollar of direct investment replaces between 4.1890 and 4.5804 dollars worth of domestic investment and by contrast, each dollar of long term debt capital inflow stimulates between 0.4786 and 0.7142 dollars worth of domestic investment.

V. Conclusion and Policy Implications

This paper measures the relative impacts of foreign direct investment vs. long term debt capital inflows on the level of domestic investment in Morocco. Theoretical considerations suggest that the impact of either type of capital inflows on domestic investment may be positive, negative or neutral. The paper first estimates the direct effects of these inflows by applying least squares and compares them with the overall effects obtained by fitting two stage least squares to a simultaneous equations model. The evidence reveals that on average each dollar of long term foreign capital inflow causes total investment to rise by between 1.08 and 1.10 dollars. However, this aggregate impact camouflages the vastly different impacts of direct and debt capital inflows. Disaggregation exposes the surprising result that long term debt capital inflows into Morocco which comprises nearly 90% of the total inflow, stimulates between 0.48 to 0.74 dollars worth of additional domestic investment per dollar inflow. By sharp contrast, foreign direct investment has a highly negative impact on local investment and in spite of the moderating effect of its indirect effects, on balance each dollar of direct investment replaces between 4.19 and 4.58 dollars worth of domestic investment. These results demonstrate how

[8] The impact multipliers for the aggregate foreign resource variable TFI, was derived by re-estimating the structural model (2)-(5) using the 2-stage least squares with the variable TFI replacing the variables DI and PI in each equation in the system.

serious the loss of information can be as a result of inappropriate aggregation. They highlight the fact that there is no universal causal law between foreign resource inflows and economic growth of the LDC host country. The impact is likely to depend both on the type of the capital inflow and also the characteristics of the particular host country in questions. Finally, it should be noted that limitations arising from both data imperfections and specificity of the model used to interpret the data qualify the results of the paper.

Appendix

All data are yearly covering the period 1960-1986 and are expressed in real terms. Real measures for gross fixed capital formation, direct investment and long term debt capital are obtained by deflating the corresponding nominal measures with the implicit price index for capital goods (1980 = 100). In all other cases the GNP deflator was used to derive real measures. Data pertaining to the Moroccan economy including information on foreign direct investment and long debt capital inflows were obtained from the 1988 issue of *The International Financial Statistics, International Monetary Fund, Washington, D.C.* The indices for world output Y_w and world price P_w are constructed variables. Y_w was constructed as the weighted average of the real GNPs of Morocco's largest trading partners where the weights were the output proportions of each partner for the year 1977. The countries include France, W. Germany, Italy, U.K., Luxembourg, Netherlands, Japan, Canada and the U.S.A. The world price index was constructed in a similar way as the weighted average of the implicit GNP deflators for the same countries (1967 = 100). The weights were again the output proportions for the year 1977. Data required for the construction of the variables Y_w and P_w were obtained from various issues of *Eurostat, Review, Statistical Office of the European Communities, Luxembourg.* All computations were done using the PC RATS 3.1 program.

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