ON THE EMPIRICS OF EFFECTIVENESS OF OFFICIAL DEVELOPMENT ASSISTANCE (ODA) IN GROWTH IN VIET NAM

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Abstract

This paper explores a new angle on effectiveness of ODA in growth of the Vietnam economy of Vietnam by employing growth accounting framework to calculate the contribution of ODA in economic growth in the period of 1993-2006. This paper is structured as follows: part I will highlight some major developments and statistics of ODA up to date; part II will present empirical estimation of the contribution of ODA in the growth accounting framework; part III will present major findings and concluding remarks.

1. ODA in Social and Economic Development Plan (SEDP)

1.1 Objective

ODA effectiveness has long been an interested topic for the government and donors alike. While many qualitative reports on ODA effectiveness have been produced by donors and the government of Vietnam, none have figured out the quantitative effectiveness of ODA on the economy of Vietnam. Therefore, this article will make an exploration to calculate the empirical contribution of ODA on growth in Vietnam in the period of 1993-2006. Findings will serve as background for policy makers, donors in making ODA strategy for Vietnam.

1.2 Data Update

ODA plays a significant role in the social and economic development strategy of the government of Vietnam. According to the socio-economic targets set out in the Five-Year Plan 2006-2010, to ensure an economic growth rate of 7.5-8% annually, a total amount of US$140 billion[1], or equivalent to 40% of GDP should be mobilized, in which US$11 billion is sourced from ODA[2].

During the period of 1993-2005, US$32.5 billion was committed, US$ 22.6 billion was signed, and US$15.9 billion was disbursed[3]. ODA accounts for 16% of central government outlays (as high as 24.3 percent in 1999 and as low as 16 percent in 2002), and an average 11% of national investment[4]. These indicators distinguish Vietnam from other borrowing countries in the way that ODA is important for the country's development, but Vietnam is not dependent on ODA: some even speculate that Vietnam may do well without ODA at the moment.

2. Estimation of contribution of ODA on growth from 1993 to 2006

This part will calculate the contribution of ODA on growth in Vietnam since the time Vietnam implemented its reform program in 1986 by applying growth accounting framework that follows two steps: (1) the contribution of capital input on growth will be calculated; (2) the contribution of capital then will be decomposed into various sources such as contribution of aid, contribution of domestic investment, and contribution of TFP. The decomposed contributions of various sources of capital will represent the contribution of foreign aid to growth directly.

1. Theoretical Framework of Growth Accounting

[1] The main external financial resources for Vietnam are foreign aid (ODA), foreign direct investment (FDI), a growing level of foreign indirect investment (FII) and remittances of overseas Vietnamese. While FDI and other inflows are implemented by foreign investors and private firms and only invested in the profitable sectors, aid inflows are the assistance of developed countries or international organizations and allocated to public and infrastructure investment, aiming at building a foundation for sustainable development, and paving ways for private investment.

[2] SEDP 2006-2010

[3] Strategic Framework for Official Development Assistance Mobilization and Utilization 2006-2010

[4] World Development Indicators CD-Rom, 2006

Growth accounting framework was first presented by Solow (1957), then Kendrick (1961), Denison (1962), and Jorgenson and Griliches (1967). The theoretical framework of growth accounting for Vietnam during the period from 1986 to 2007 in this paper is referred to Barro and Sala-i-Martin (Growth, 2004, chapter 10) as follows:

Assume that an economy follows a production function as $Y = F(T, K, L)$ (1) in which Y is aggregate output or gross domestic product, T is the level of technology, K is capital stock and L is labor stock. It is well understood that there are various kinds of labor (primary education attainment, technical education attainment, university education attainment) and various kinds of capital (long-lived, short-lived).

Taking log of (1) and then taking the first order derivatives with respect to time of both sides results:

$$\frac{\dot{Y}}{Y} = \left(\frac{F_T T}{Y}\right)\left(\frac{\dot{T}}{T}\right) + \left(\frac{F_K K}{Y}\right)\left(\frac{\dot{K}}{K}\right) + \left(\frac{F_L L}{Y}\right)\left(\frac{\dot{L}}{L}\right) \qquad (2)$$

where are the factor (social) marginal products and $g = \left(\frac{F_T T}{Y}\right)\left(\frac{\dot{T}}{T}\right)$ is the growth contributed by technological progress or the so-called Total Factor Productivity (TFP). The equation (2) literally implies that the growth rate of GDP can be decomposed into three components of factor inputs: capital, labor and technology. In particular, it implies that the decomposition is a weighted average of the growth rates of the three inputs, where the weights are given by the relative contributions of each of the factors to GDP or the social marginal products times the amount of input divided by GDP.

From equation (2), it is clear that if are known, the weights of contributions of capital and labor on growth can be determined. In fact, in practice, researchers have found some ways to determine empirically based on data of factor prices such as (the rental price of capital) and (the wage rate), while the contribution of the growth rate of technological progress can be estimated indirectly by the following equation

$$g = \left(\frac{\dot{Y}}{Y}\right) - \left(\frac{F_K K}{Y}\right)\left(\frac{\dot{K}}{K}\right) - \left(\frac{F_L L}{Y}\right)\left(\frac{\dot{L}}{L}\right) \qquad (3)$$

Furthermore, once are determined, then the fraction of GDP is paid for capital $s_K = \frac{F_K K}{Y}$ is and the fraction of GDP is paid for labor is,

$s_L = \frac{F_L K}{Y}$ thus (2) can be rewritten as

$$\frac{\dot{Y}}{Y} = g + s_K\left(\frac{\dot{K}}{K}\right) + s_L\left(\frac{\dot{L}}{L}\right) \quad (4)$$

In addition, if only labor and capital are only the two factor inputs involved in the production process, then this condition must be held: $s_K + s_L = 1$, thus (4) can be rewritten as

$$\frac{\dot{Y}}{Y} = g + s_K\left(\frac{\dot{K}}{K}\right) + (1 - s_K)\left(\frac{\dot{L}}{L}\right) \quad (5)$$

2.2 Application of Growth Accounting Framework

To estimate capital stock, we assign an arbitrary guess of the initial capital stock K(0) and then the Perpetual Inventory Method is used to estimate the accumulated capital stock in the subsequent years. It is undoubted that the accumulated capital stock is sensitive during the first few years due to the arbitrary guess of the initial capital stock K(0), however, it will be depreciated off and the estimated capital stocks will be more accurate.

The capital stock together with labor and growth rate of GDP will be used to estimate the TFP growth rate for each year based on formula (5).

The next step is to decompose the capital stock into various sources and the numerical contributions of various capital sources will also be calculated.

2.3 Data

The dataset for the growth accounting exercise in this study is drawn from various sources: (1) Asian Development Bank Key Indicators 2005, (2) World Development Indicators 2004, (3) Statistical Year Book of GSO

Variables and Data Sources for Growth Accounting

Variable	Source
GDP growth at 1994 constant prices	ADB 2006, WDI 2006
Labor Input as employment number	ADB 2006, WDI 2006
Gross Fixed Capital Formation	ADB 2006, WDI 2006
Deprecation Rate	Assumed an arbitrary number of 0.06
Foreign Aid Disbursement	Ministry of Planning and Investment of Vietnam, ADB

2.4 Estimation Results and Discussion

Assumptions

- The annual depreciation rate is 0.06. This rate is applied by the Government of Vietnam for 27 economic sectors, and is also in line with other studies
- For sensitive analysis, the share of labor in the production function is assumed to take values of 0.5, 0.6, and 0.7 [5]
- For the purpose of initial capital stock estimation, the ratio of initial capital-output to what is assumed an ad-hoc level of 2:1 [6]

The first step is to estimate the capital stock (the initial capital stock is assumed to take an arbitrary value such that K/Y(0)=2) then the PIM method is used to estimate the capital stock in the subsequent years. The series of estimated capital stock for the economy of Vietnam is presented in Table 4 (the last column).

Second, based on a set of assumptions on various indicators and available dataset of the economy of Vietnam, the growth accounting for Vietnam during the period from 1986 to 2006 is carried out by using the growth accounting formula $GY = g + s_K GK + (1 - s_L)GL$; in which GY is the growth rate of GDP, g is the growth rate of labor, GK is the growth rate of capital stock. The results in Table 5 show a number of significant results: (1) since the implementation of the reform program, Vietnam has maintained a high growth rate, despite the minimal impacts of the Asian financial crisis in 1997, the averaged growth rate for the whole period of 1986-2006 is amounting to 7%; (2) the growth rate of labor is stable for the whole period at about 2%; (3) the growth rate of capital stock was small during the beginning of the transition period since 1986, but it has maintained a stable growth rate at around 11% during the later years; (4) the growth rate of Total Factor Productivity (TFP) was high prior to 1997, then went down to negative levels and then is slowly recovering but it is still lower than the period before 1997. It can be observed that the high growth rate of output before 1997 was due to high growth rate of TFP, while that of output after 1997 was mainly due to high levels of capital accumulation or high levels of investment.

[5] For the industrial countries, the share of labor is usually assumed to take the value of 0.7 for various studies of growth accounting for industrial countries

[6] In fact, it is very difficult to estimate the capital stock of an economy and currently there is no universal method of estimation. It is clear that the initial level of capital stock will be drained off due to depreciation and the investment data becomes more and more important and the longer the time span, the more accurate the capital stock.

Furthermore, the contributions of labor, capital and TFP to the growth of output is estimated, also based on the growth accounting formula, as $GY = g + s_K GK + (1 - s_L)GL$. Thus the specific formulas to estimate the contributions of labor, capital and TFP on growth of output are g/GY, s_K/GK, $s_L GL$ respectively. The estimation results are presented in Table 5. As can be seen, for the whole period from 1987 to 2006, the contribution of labor to growth is stable at 20 percent; the contribution of TFP was high at the beginning of the implementation of the reform program and low from 1998; while the contribution of capital stock to growth has accounted for more than half of the growth since 1996. It is clear again that the growth rate of the economy of Vietnam has been mainly due to the accumulation of capital stock through the high rate of investment since 1997.

Finally, the last step is to decompose the contribution of ODA to the growth rate of output. The data on ODA is sourced from the database released from the Ministry of Planning and Investment (MPI). The original data of annual ODA inflows in $US billion is converted to VND billion at 1994 constant prices, then the PIM Perpetual Inventory Method: $K(t+1) = (1-\delta)K(t) + I(t+1)$ is applied to estimate the stock of ODA over the studied period 1993-2006. For ODA capital stock, the deprecation rate is also assumed to take the value of 0.06.

Table 7 shows the contribution of ODA to the growth rate of output as well as the proportion of foreign aid stock in total capital, and the ODA inflow as a proportion of total gross domestic investment over the studied period. As can be seen, ODA has played an increasingly important role in capital stock accumulation as well as in gross domestic investment and growth of output: ODA accounted for a minimal contribution of 0.73 percent on growth of output in 1993, reaching 10 percent on growth on output in 1999, and then stabilizing at around 8 percent until 2006; the contribution of ODA to gross domestic investment and as a proportion of capital stock has been significant for the whole period, averaging 15 percent and 11 percent respectively.

It is also observed that the contribution of ODA to growth is sensitive to the assumption of the share of labor in the production function; however, this sensitivity is quite minimal. As can be seen in table 5, the averaged contributions of ODA stock on growth of output for the period of 1993-2006 with the assumption of share of labor of 0.5, 0.6 and 0.7 are 8.7 percent, 6.5 percent, and 4.9 percent respectively.

3. Discussion and Issues

3.1 The reliability of Growth Accounting Framework

There is unsettled debate in the literature about the reliability of growth accounting framework in general and of the TFP in particular. In fact, the growth accounting exercise above merely takes into account only the change in quantity of factor inputs rather than quality of factor inputs, due to unavailability of data. As pointed out by Jorgenson and Griliches (1967) and Jorgenson, Gollop, and Fraumeni (1987), the accuracy of the estimation of growth accounting framework can be improved if the factor inputs can be disaggregated by quality classes; this will result in more practical technological progress or the Solow residual. For example, labor input can be disaggregated into n vectors that contain the level of education attainments, age, sex, and region (technical training, university, or no education, male, rural, urban) as $GL = \sum S_{L,it} GL_{it}$; $\sum S_{L,it} = 1$ where GL is the growth rate of labor, is the growth rate of sub-category of labor, and is the share of subcategory of labor. This formula suggests that if the quality of labor input is improving over time, but the estimation of labor input fails to capture such quality, improvement will lead to overestimation of TFP.

The same treatment is also applied for capital input, since there are various categories of capital such as short lived capital (machinery) and long lived capital (buildings), which have different rate of returns. Failure to capture the change in the structure of capital input will lead to inaccurate estimation in growth accounting and TFP.

For the case of Vietnam, it is evident that the country has experienced a significant improvement in education as well as in the structure of capital over the studied period from 1986 to 2006. However, due to lack of data for various kinds of labor input and capital input, it is impossible to capture for the dynamics over time. Therefore, it is expected that the estimated TFP contains a portion of labor input quality improvement and the change of the structure of capital input rather than true TFP. Further estimation should be carried out if more dataset becomes available.

3.2 The contribution of ODA to Growth

The estimated results based on the growth accounting framework have shown that ODA has played a significant role in contributing to the growth of output with an averaged contribution of 6.5 percent for the period from 1993 to 2006. In addition, the majority of ODA inflows into Vietnam during the studied period have been allocated for the establishment of a foundation for long run and sustainable economic development in sectors such as education, infrastruc-

ture development, and health care, among others[7]. It is worthwhile to note that the estimated contribution of foreign aid to growth of output only reflects short-run contributions on capital accumulation and growth, while the long run contributions and spillover effects are still neglected and they are also very difficult capture empirically. Therefore, it is expected that the total contribution of ODA to growth of output far outweighs the estimated one.

3. Orientation for ODA

Vietnam is now among the highest ODA recipients in the developing world (UNDP, 2005). However, it is clear that this important financial resource will not last long due to the following reasons: (1) the major donors such as Japan, IBRD, ADB are facing financial constraints in recent years, (2) demand for ODA

Table 1. Aid Commitment, Signed Agreement and Disbursement in Vietnam 1993-2007 (Unit: $US Billion)

Year	Commitment	Signed Agreement	Disbursement	Disbursement Rate
1993	1.81	0.57	0.413	0.23
1994	1.94	2.02	0.725	0.37
1995	2.26	1.44	0.737	0.33
1996	2.43	1.59	0.9	0.37
1997	2.4	1.7	1	0.42
1998	2.2	2	1.242	0.56
1999	2.1	1.41	1.35	0.64
2000	2.4	1.75	1.65	0.69
2001	2.4	2.12	1.5	0.63
2002	2.4	1.78	1.55	0.65
2003	2.5	1.86	1.41	0.56
2004	2.83	2.1	1.8	0.64
2005	2.9	2.3	1.8	0.62
2006	3.2	2.7	2.2	0.69
2007*	4.45		2.2	0.69

Source: Ministry of Planning and Investment, 2006, (*) estimation for 2007

[7] For details, see Overview of ODA in Vietnam, 2004, UNDP Vietnam

is still high and enormous in other developing countries, (3) the economy of Vietnam has achieved significant milestones during the last 20 years and will continue to do so in the coming years. Therefore, it is very important for Vietnam to prepare to make a transition from concessional to non-concessional and sovereign loans and to diversify its external financial sources in the direction of FDI, government bonds, company bonds, and portfolio investments. Policies should be designed and implemented to sustain stable macroeconomic environment and establish an institutional framework with enhanced transparency in the public, corporate and financial sectors.

Table 2. Distribution of ODA (2001 - 2005)(Unit: $US million)

Sectors	Total Aid Signed Agreement Value	Loans	Grants	Share
Agriculture and rural development in association with poverty reduction	1,607	1,300	308	16.0 %
Industrial and Power sectors	1,582	1,536	46	15.8 %
Transportation - Post & Telecommunication	2,541	2,445	96	25.4 %
Science, Technology and Environment	1,005	726	280	10.0 %
Health care – Education – Social areas	1,063	484	579	10.6 %
Other Sectors	2,219	1,805	414	22.2%
Total	10,018 (*)	8,295	1,722	100.0 %

Source: Ministry of Planning and Investment

Table 3. Average Terms of New Commitments of New Loans in Vietnam 1990-2005

New Loans Terms	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Interest (% p.a.)	5.7	3.1	1.7	2	2.7	3.3	2.5	3.2	2.4	2.3	1.4	1	1.3	1.9	1.6	1.8
Maturity (years)	9.6	12.7	24.4	30.5	26.3	26.3	29.6	27.1	29.1	34	36.1	38.7	35	28	31	32
Grace period (years)	4.2	5.7	8.2	8.2	7.8	7.9	8.6	7.6	8.2	9.1	9.6	9.7	9.4	7.7	8.2	8.7

Source: ADB Key Indicator 2005

Table 4. Basic Statistics for Growth Accounting of Vietnam 1986-2006

Year	Y (Billion VND 1994)	GY	L(employed, Million People)	GL	I (Billion VND) 1994	K (K/Y=2)
1986	109189	2.79	27	1.35	6005.4	218378
1987	113154	3.58	28.5	1.37	8486.55	212521.29
1988	119960	5.14	28.5	1.58	12955.68	210491.13
1989	125571	7.36	28.9	1.4	14063.95	211371.48
1990	131968	5.1	29.4	1.73	16582.89	214012.61
1991	139634	5.96	30.1	2.38	21043.31	219984.96
1992	151782	8.65	30.9	2.66	26774.56	230694.79
1993	164043	8.07	31.6	2.27	39789.12	250134.95
1994	178534	8.84	32.3	2.22	45483	277762.91
1995	195567	9.54	33	2.26	53085.18	310381.23
1996	213833	9.34	33.8	2.21	60093.27	348347.58
1997	231264	8.15	34.5	2.17	65446.75	390216.73
1998	244596	5.76	35.2	2.14	71055.04	435054.62
1999	256272	4.77	36	2.11	70807.33	479882.53
2000	273666	6.79	37.6	4.51	81032.27	527009.37
2001	292535	6.89	38.4	2.13	91191.27	581500.58
2002	313247	7.04	39.5	2.86	104062.3	644237.35
2003	336243	7.3	40.5	2.53	113724.8	714476.68
2004	362093	7.7	41.6	2.72	128374.7	792657.82
2005	392871	8.5	42.2	2.68	144183.6	881377.49
2006	424301	8.2	43.8	2.73	159112.7	980143.01

Source: ADB Key Indicators 2005, World Development Indicators 2004, Vietnam Statistical Year Book (various issues), and Author's calculation

(*) estimation for 2006

Table 5. Growth Accounting in Vietnam (1987-2006)

Scenario 1: capital-output ratio=2; share of labor=0.6
Scenario 2: capital-output ratio=2; share of labor=0.5
Scenario 3: capital-output ratio=2; share of labor=0.7

	K/Y=2; Share of Labor=0.5				K/Y=2; Share of Labor=0.6				K/Y=2; Share of Labor=0.7			
Year	GY	GL	GTFP	GK	GY	GL	GTFP	GK	GY	GL	GTFP	GK
1986	2.79	1.35	n/a!	n/a	2.79	1.35	n/a	n/a	2.79	1.35	n/a	n/a
1987	3.58	1.37	4.24	-2.68	3.58	1.37	3.83	-2.68	3.58	1.37	3.43	-2.68
1988	5.14	1.58	4.82	-0.96	5.14	1.58	4.57	-0.96	5.14	1.58	4.32	-0.96
1989	7.36	1.4	6.45	0.42	7.36	1.4	6.36	0.42	7.36	1.4	6.26	0.42
1990	5.1	1.73	3.61	1.25	5.1	1.73	3.56	1.25	5.1	1.73	3.51	1.25
1991	5.96	2.38	3.38	2.79	5.96	2.38	3.42	2.79	5.96	2.38	3.46	2.79
1992	8.65	2.66	4.88	4.87	8.65	2.66	5.1	4.87	8.65	2.66	5.33	4.87
1993	8.07	2.27	2.73	8.43	8.07	2.27	3.34	8.43	8.07	2.27	3.96	8.43
1994	8.84	2.22	2.21	11.05	8.84	2.22	3.09	11.05	8.84	2.22	3.97	11.05
1995	9.54	2.26	2.54	11.74	9.54	2.26	3.49	11.74	9.54	2.26	4.43	11.74
1996	9.34	2.21	2.12	12.23	9.34	2.21	3.12	12.23	9.34	2.21	4.12	12.23
1997	8.15	2.17	1.06	12.02	8.15	2.17	2.04	12.02	8.15	2.17	3.03	12.02
1998	5.76	2.14	-1.05	11.49	5.76	2.14	-0.12	11.49	5.76	2.14	0.82	11.49
1999	4.77	2.11	-1.43	10.3	4.77	2.11	-0.61	10.3	4.77	2.11	0.21	10.3
2000	6.79	4.51	-0.38	9.82	6.79	4.51	0.15	9.82	6.79	4.51	0.68	9.82
2001	6.89	2.13	0.66	10.34	6.89	2.13	1.48	10.34	6.89	2.13	2.3	10.34
2002	7.04	2.86	0.22	10.79	7.04	2.86	1.01	10.79	7.04	2.86	1.8	10.79
2003	7.3	2.53	0.62	10.9	7.3	2.53	1.46	10.9	7.3	2.53	2.3	10.9
2004	7.7	2.72	0.86	10.94	7.7	2.72	1.68	10.94	7.7	2.72	2.5	10.94
2005	8.5	2.68	1.56	11.19	8.5	2.68	2.41	11.19	8.5	2.68	3.27	11.19
2006*	8	2.73	1.03	11.21	8	2.73	1.88	11.21	8	2.73	2.73	11.21
Average	6.91	2.28	2.01	7.91	6.91	2.28	2.56	7.91	6.91	2.28	3.12	7.91

Source: Author's calculations, (*) estimation for 2006

Table 6. Contributions (%) of Capital, Labor and TFP on Growth in Vietnam 1986-2006

Scenario 1: capital-output ratio=2; share of labor=0.5
Scenario 2: capital-output ratio=2; share of labor=0.6
Scenario 3: capital-output ratio=2; share of labor=0.7

	K/Y=2; Share of Labor=0.5			K/Y=2; Share of Labor=0.6			K/Y=2; Share of Labor=0.7		
Year	Kcon	Lcon	TFPcon	Kcon	Lcon	TFPcon	Kcon	Lcon	TFPcon
1986	n/a	24.2	n/a	n/a	29.04	n/a	n/a	19.36	n/a
1987	-37.42	19.12	118.31	-29.94	22.94	107	-22.5	26.8	95.7
1988	-9.3	15.38	93.92	-7.44	18.46	88.98	-5.6	21.5	84.0
1989	2.84	9.53	87.63	2.27	11.43	86.29	1.7	13.3	85.0
1990	12.25	16.96	70.79	9.8	20.35	69.85	7.3	23.7	68.9
1991	23.41	19.97	56.62	18.73	23.97	57.31	14.0	28.0	58.0
1992	28.15	15.37	56.48	22.52	18.44	59.03	16.9	21.5	61.6
1993	52.19	14.03	33.78	41.75	16.84	41.41	31.3	19.6	49.0
1994	62.48	12.53	24.99	49.98	15.04	34.98	37.5	17.5	45.0
1995	61.54	11.85	26.6	49.24	14.23	36.54	36.9	16.6	46.5
1996	65.48	11.83	22.68	52.39	14.2	33.41	39.3	16.6	44.1
1997	73.72	13.31	12.97	58.98	15.97	25.06	44.2	18.6	37.1
1998	99.67	18.6	-18.27	79.73	22.32	-2.05	59.8	26.0	14.2
1999	107.93	22.09	-30.01	86.34	26.5	-12.84	64.8	30.9	4.3
2000	72.34	33.26	-5.6	57.88	39.91	2.21	43.4	46.6	10.0
2001	74.98	15.43	9.59	59.98	18.52	21.5	45.0	21.6	33.4
2002	76.6	20.34	3.06	61.28	24.41	14.31	46.0	28.5	25.6
2003	74.26	17.24	8.5	59.41	20.69	19.9	44.6	24.1	31.3
2004	71.17	17.66	11.17	56.93	21.2	21.87	42.7	24.7	32.6
2005	65.84	15.76	18.4	52.67	18.92	28.41	39.5	22.1	38.4
2006	70.04	17.06	12.9	56.03	20.48	23.5	42.0	23.9	34.1
Average	52.41	17.22	30.72	41.93	20.66	37.83	31.4	24.1	44.9

Source: Author's calculations, (*) estimation for 2006

Table 7. Contribution of Aid on Capital Stock and Growth in Vietnam 1993-2006

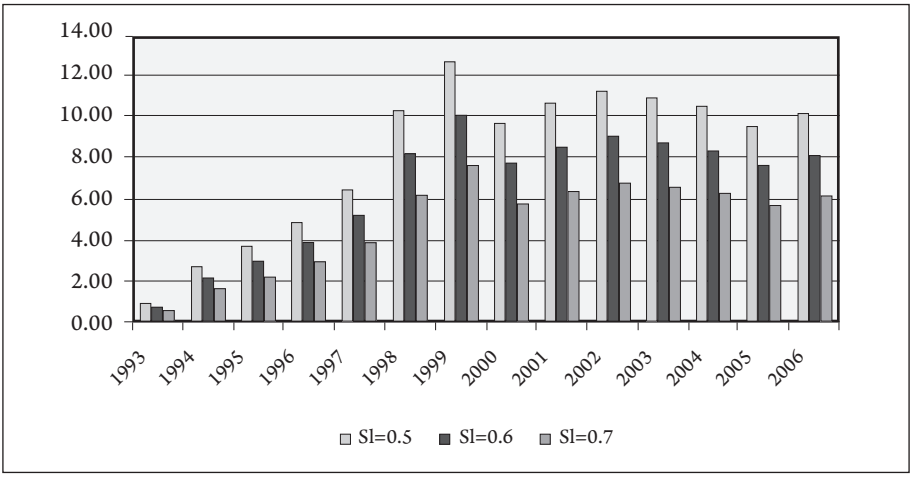
Scenario 1: capital-output ratio=2; share of labor=0.5
Scenario 2: capital-output ratio=2; share of labor=0.6
Scenario 3: capital-output ratio=2; share of labor=0.7

($US and VND Billion, 1994 constant price)

Year	K (K/Y=2)	Aid ($US Billion)	Aid (1994 VND Billion)	Aid Stock (1994VND Billion	Aid Stock/K (%)	Aid/I (%)	Aid Contribution (%) on Growth of Output		
1986	218378						Share of Labor		
1987	212521						0.5	0.6	0.7
1988	210491								
1989	211371								
1990	214013								
1991	219985								
1992	230695								
1993	250135	0.413	4394.73	4394.73	1.76	0.11	0.92	0.73	0.55
1994	277763	0.725	7950.13	12081.18	4.35	17.48	2.72	2.17	1.63
1995	310381	0.737	7382.24	18738.55	6.04	13.91	3.72	2.97	2.23
1996	348348	0.9	8523.04	26137.28	7.50	14.18	4.91	3.93	2.95
1997	390217	1	9719.88	34288.92	8.79	14.85	6.48	5.18	3.89
1998	435055	1.242	12715.17	44946.75	10.33	17.89	10.3	8.24	6.18
1999	479883	1.35	13932.88	56182.83	11.71	19.68	12.64	10.11	7.58
2000	527009	1.65	17576.47	70388.33	13.36	21.69	9.66	7.73	5.80
2001	581501	1.5	16670.04	82835.07	14.25	18.28	10.68	8.54	6.41
2002	644237	1.55	17186.67	95051.63	14.75	16.52	11.3	9.04	6.78
2003	714477	1.41	15219.06	104567.59	14.64	13.38	10.87	8.69	6.52
2004	792658	1.8	18720.30	117013.84	14.76	14.58	10.51	8.4	6.30
2005	881377	1.8	18063.04	128056.05	14.53	12.53	9.57	7.65	5.74
2006	980143	2.2	21685.65	142058.34	14.49	13.63	10.15	8.12	6.09
Average	434792	1.306	13552.81	66910.08	10.80	14.91	8.17	6.54	4.90

Source: Author's calculations, (*) estimation for 2006

Figure 2. Contribution of Foreign Aid as Percentage on Growth of Output in Vietnam 1993-2006#



This estimation shows that aid is one of contributors to growth of output, among labor, capital, and TFP

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