EFFECT OF ODA IN INFRASTRUCTURE IN ATTRACTING FDI INFLOWS IN VIETNAM

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Structure

I. Objectives

II. Review

1. Definition
2. ODA in infrastructure and FDI
3. Previous Studies

III. Current situation in Vietnam

IV. Methodology

V. Regression result

VI. Policy implication and conclusion

I. Objective

- The role of foreign capital for developing countries - ODA and FDI

- Infrastructure and FDI attraction

- ODA in infrastructure investment

- The empirical studies

- The real situation in Vietnam

- The expected outcome of the paper

II. Overview

1. Definition

- **Foreign Direct Investment (FDI):** *A long-term investment by a foreign direct investor in an enterprise resident in an economy other than where the foreign direct investor is based*
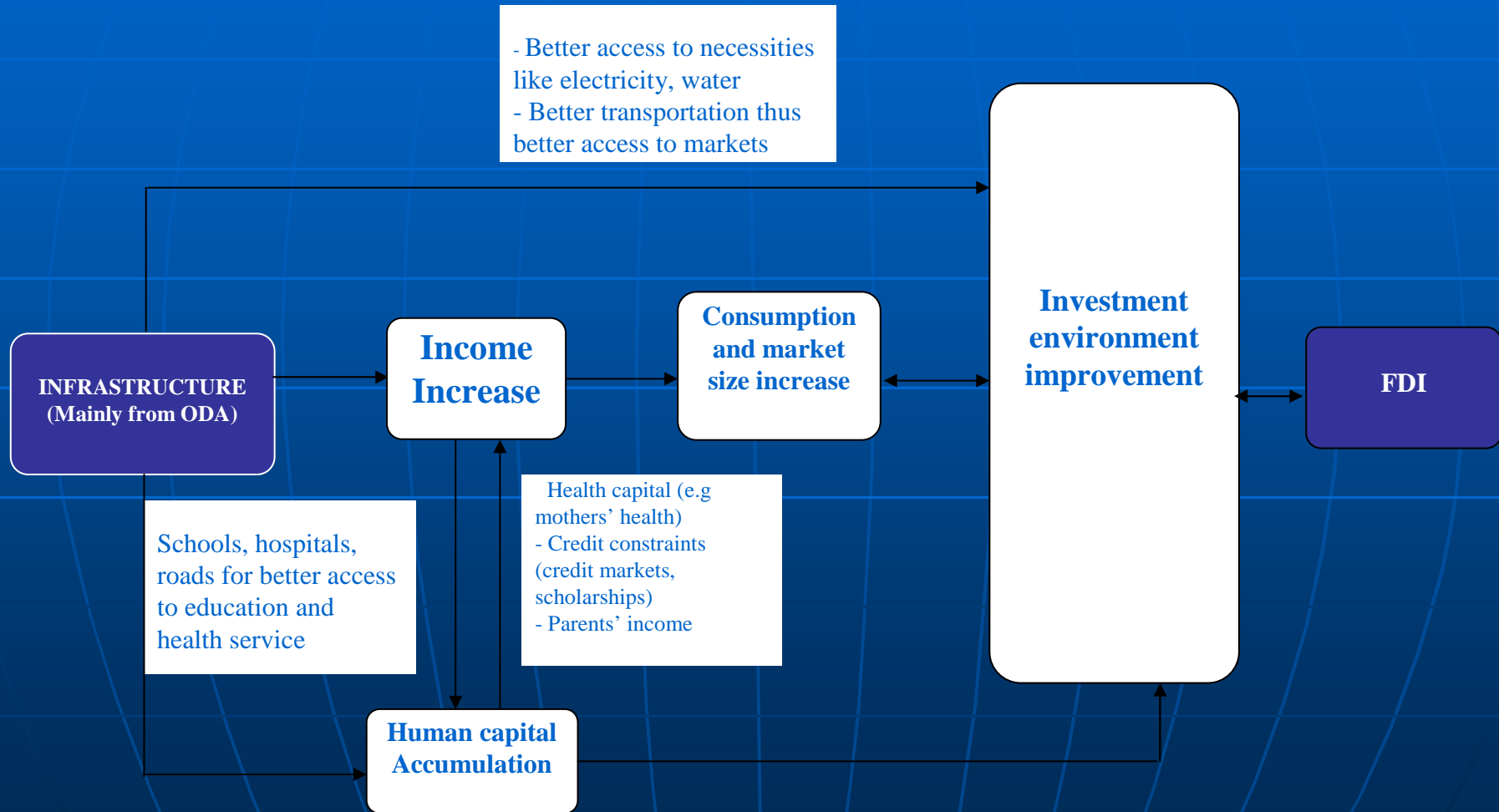
  FDI location is determined by ownership advantage, location advantage and transaction costs

- **Infrastructure:** *Infrastructure is the basic physical systems of a country's or community's population, including roads, utilities, water, sewage, etc*

  Infrastructure is characterized by (1) Capital intensive and exhibits economies of scale; (2) Lumpy rather than incremental; (3) Long lasting with space and use specific; (4) Complicated

- **Official Development Assistance (ODA):** *The flow of official financing administered with the promotion of economic development and welfare of developing countries as the main objective, and which are concession in character with a grant element of at least 25 percent (using a fixed 10 percent rate of discount)*

2. ODA in infrastructure and FDI

- Better access to necessities like electricity, water
- Better transportation thus better access to markets

INFRASTRUCTURE (Mainly from ODA)

Income Increase

Consumption and market size increase

Investment environment improvement

FDI

Schools, hospitals, roads for better access to education and health service

Health capital (e.g mothers' health)
- Credit constraints (credit markets, scholarships)
- Parents' income

Human capital Accumulation

3. Previous studies

1. FDI determinants studies

2. The effects of infrastructure on investment and economic growth

3. The effects of foreign aid on investment and aggregate growth

| FDI determinants	Effects of infrastructure on investment and growth	Effects of ODA on investment and growth
Determinants include labor costs, market size, human capital, FDI policy and infrastructure	102 studies conducted over the last 15 years	Until 2005, there are 43 papers
Most studies find positive effects of the level of development, market size and economic growth on FDI	The majority find positive impacts. In the case of developing countries, all studies find positive impacts	ODA first has an impact on savings and investment and then savings and investment will have impacts on growth accumulation
+ Harms and Lutz (2006) find that the effect of aid on FDI is generally insignificant but significantly positive for countries in which private agents face heavy regulatory burdens. + Karakaplan et al. (2005) also find an insignificant effect of aid on FDI, but in contrast to the finding of Harms and Lutz (2006), their results suggest that good governance and developed financial markets lead to a positive effect of aid		

III. Current situation in Vietnam

The Amount of Registered Foreign Direct Investment in Vietnam, 1991 – 2004
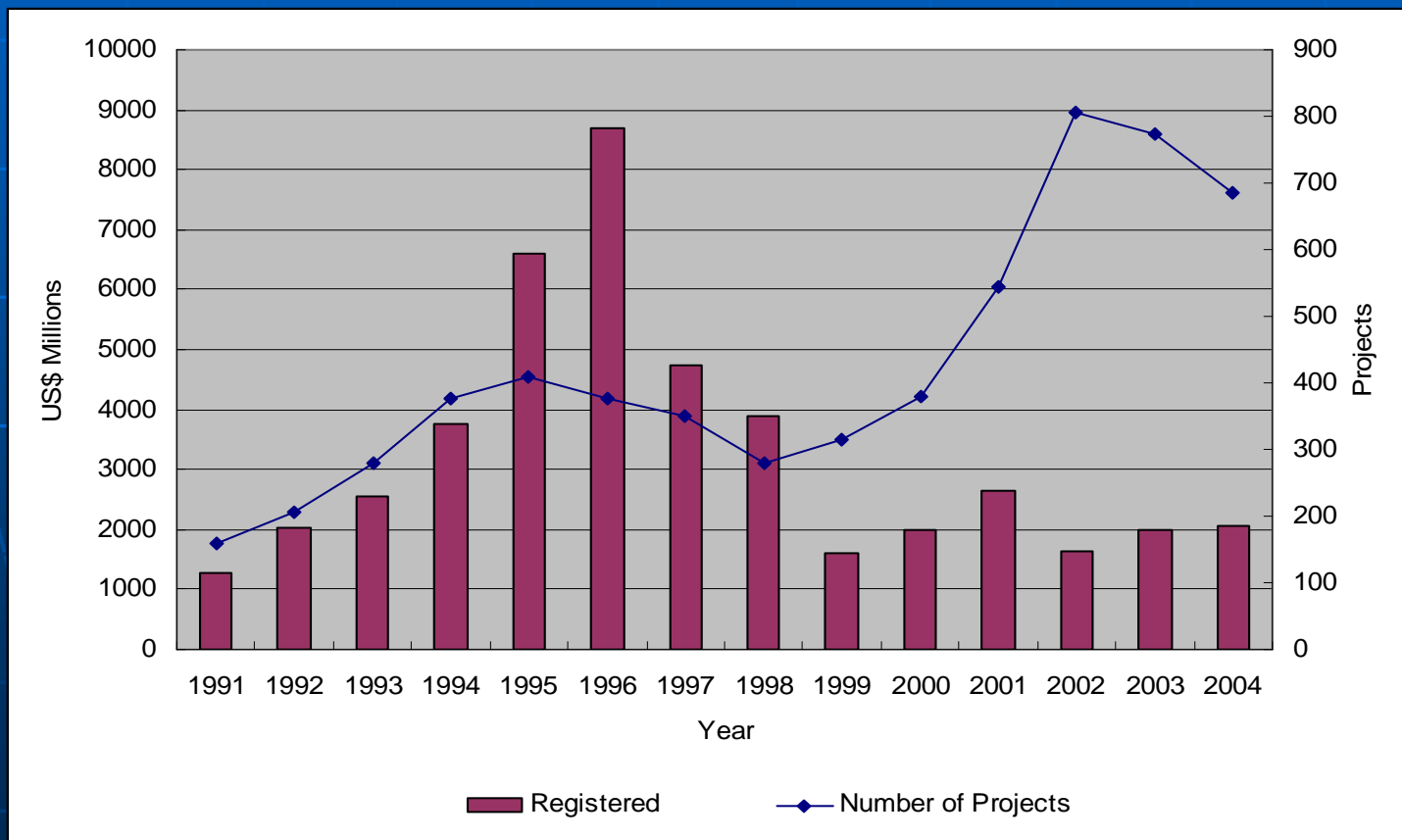
Registered Foreign Direct Investment and Committed Official Development Assistance in Provinces of Vietnam, sum in 1988-2004
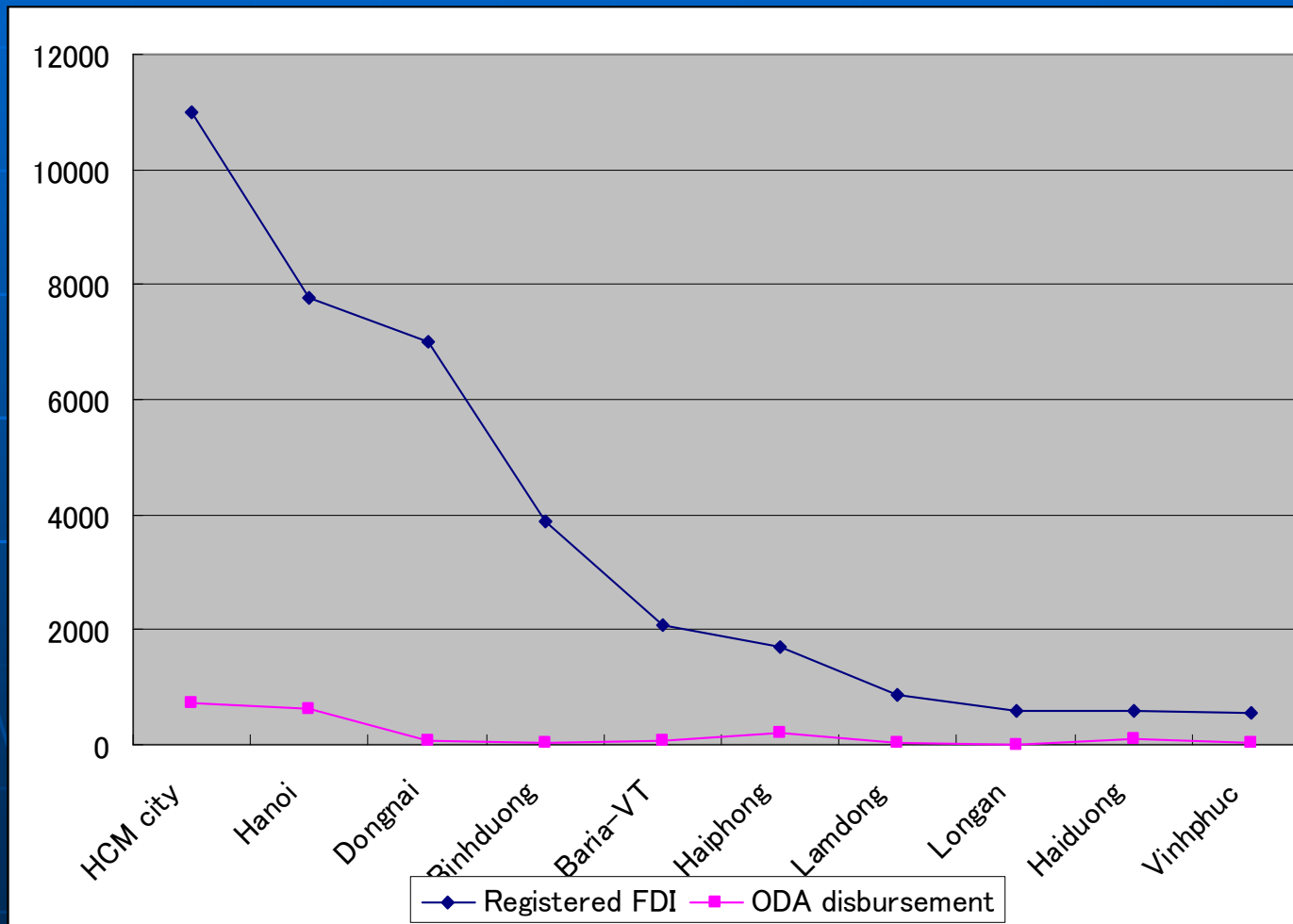
Hypothesis

- Ho : ODA in infrastructure has no positive impact on FDI

  H1 : ODA in infrastructure has positive impact on FDI

- Ho : ODA in infrastructure of one donor has no positive and strong impact on FDI from that particular country.

  H1 : ODA in infrastructure of one donor has positive and stronger impact on FDI from that particular country

IV. Methodology

1. Data:

- **Period:** 2002 – 2004 (Number of observations = 192)

- **Source:**
+ ODA disbursement data and FDI from Ministry of Planning and Investment of Vietnam (MPI) at provincial level
+ Other data from Ministry of Labor and Social Affair and National Statistical Office

2. Model

2.1. General

- Simple linear regression is applied

- Variables are transferred into logarithm form to minimize the excessive variations in the value of ODA and FDI

- A small value of 0.001 is added to each observation when they are being transformed into logarithm form to escape from losing obs problem (some obs has 0 value)

2.2. Model forms:

- Two stage least square to correct:

+ Two-way relationship between ODA variable and endogenous variable (FDI)

+ Possible correlation between the error term and explanatory variables

+ The Model pass all necessary tests

- Fixed effects/Random effects Model to correct:

+ Omitted variables problem

+ Arbitrary correlation between the unobserved constant effects and the explanatory variable

+ Fixed effects/Random effects Model will be chosen based on the result of Hausman test

2SLS model

1. First stage:

(1) lnODA = f(lnlagODA, lnODA*lnSCHOOL , lnINDUS, lnSCHOOL, lnGDPPC, lnPOP, lnTAX, Y03, Y04, lnPATIENTBED, MOUNTAINOUS)

- **lnODA:** ODA in infrastructure, the disbursement of ODA in infrastructure system including transportation, telecommunication, electricity.
- **lnlagODA** : long-term impact of ODA in infrastructure on the FDI inflows.
- lnODA*lnSchool: captures indirect impacts of ODA in infrastructure and FDI inflows
- **Induszone:** the area of industrial zones or export-processing zones
- **LnSchool:** The secondary school enrollment is uses as a proxy for human capital formulation
- **lnGDPPC:** Nominal GDP per capita of each province divided by inflation rate at national level. This is the proxy of level of wage rate in Vietnam
- **LnPOP:** Represents potential market size of these provinces
- **LnTAX**: The Proxy for favorable policy of provinces to attract FDI in Vietnam

    Taxratio = Tax revenue/Total turnover of the project

- **Y03, Y04:** Year dummies
- **LnPATIENTBED:** The number of patient beds in hospitals of provinces of Vietnam
- **MOUNTAINOUS:** The dummy for mountainous province (=1 if it is moutainous province and =0 if otherwise.

2SLS model

Second Stage

$$lnFDI = f(lnODAhat, lnlagODA, lnODAhat*lnSCHOOL, lnINDUS, lnSCHOOL, lnGDPPC, lnPOP, lnTAX, Y03, Y04)$$

- **lnFDI:** Foreign direct investment, FDI commitment according to provinces of Vietnam in the period 2002 – 2004

- **LnODAhat:** predicted value of ODA from the first stage

Fixed effects/Random effects Model

(3)   lnFDI = f(lnODAhat, lnlagODA, lnODA*lnSCHOOL, lnSCHOOL, lnGDPPC, lnPOP, lnTAX,a)

- a: capture all time-invariant factors

V. Regression Results

Variables	Name of the variables	Coefficients (2SLS)	
ODA in infrastructure	lnODA	Coef.	t-value
Lag of ODA in infrastructure	lnlagODA	0.68	3.75**
ODA*School	ODA*SCHOOL	0.45	4.01**
Area of industry zones	lnInduszone	0.02	1.69
Secondary school enrollment	LnSchool	-0.81	-1.02
Income per capita	lnGDPPC	-1.14	-0.02
Population	lnPopulation	2.15	0.89
Tax ratio	lnTaxation	0.69	0.78
Year Dummy for 2003	Y03	23.01	1.01
Year dummy for 2004	Y04	21.67	1.23
Number of patient beds per person in hospital of the province	PATIENTBED	-2.26	-1.97**
Dummy for Mountainous province	MOUTAINOUS	0.08	1.96*
Constant term	Cons	-14.52	-1.68

Variables	Name of the variables	Coefficients (2SLS)		Coefficients (Fixed effects)	
Foreign Direct Investment inflows	lnFDI	Coef.	t-value	Coef.	t-value
Predicted ODA	lnODAhat	1.36	1.43	2.04	1.79*
Lag of ODA in infrastructure	lnlagODA	.85	1.97*	1.50	2.12**
lnSchool*lnODAhat	ODAhat*SCHOOL	.14	1.99*	.135	0.81
Area of industry zones	lnInduszone	.32	1.69*		
Secondary school enrollment	Lnschool	2.03	2.42**	3.36	2.33**
Income per capita	lnGDPPC	1.87	1.96*	1.26	1.98*
Population	lnPopulation	-1.98	-2.24**	-1.86	-1.29
Tax ratio	lnTaxation	-1.51	3.0**	.87	0.02
Year Dummy for 2002		2.91	0.93		
Year dummy for 2003		1.29	0.19		
Constant term	Cons	-19.20	-0.54	-19.48	-0.59

Name of the variables	Japan				EU			
	Coefficients (2SLS)		Coefficients (Random effects)		Coefficients (2SLS)		Coefficients (Fixed effects)	
lnFDI	Coef	t-value	Coef.	t-value	Coef.	t-value	Coef.	t-value
lnODAhat	1.03	1.89*	1.47	2.52**	1.3	2.78**	1.64	0.24
lnlagODA	2.00	3.55**	2.03	2.03**	.61	1.60	.21	0.96
ODAhat*SCHOOL	2.35	1.97*	3.31	2.34**	.20	2.92**	.06	2.92**
Lnschool	1.63	0.56	2.73	3.67**	2.35	2.47**	2.47	3.38**
lnGDPPC	3.15	2.30**	3.45	2.31**	0.18	0.39	0.39	0.16
lnPopulation	0.063	0.42	0.024	0.77	-1.28	-0.2	0.20	0.91
lnTaxation	-4.32	1.99*	-4.24	-0.75	-1.48	-3.51**	-3.51	-0.58
lnInduszone	0.69	1.96*	0.15	1.13	3.27	0.92	.92	2.22**
Year 02	1.55	0.76						
Year03	.35	0.11			-8.94	-1.04		
Cons	1.39	0.07	1.91	0.09	-89.11	-1.66	25.13	0.83

Interpretation

1. First stage of 2SLS model

- The positive correlation with the number of patient beds in provincial hospitals implies that aid allocation is also influenced by the level of development of public service in that province

- The dummy variable (Moutainous) does have minor significant impact on the level of ODA in infrastructure. Moreover, GDPPC variable does not have significant impact on ODA level. Thus, ODA in infrastructure in Vietnam does not necessarily flows to poor provinces, but rather to enhance basic infrastructure needed for FDI inflows

Interpretation

2. The second stage:

- The effect of aid in infrastructure is statistically significant and positively affects the FDI inflows in fixed effects model

- In both the two models, the positive coefficients of lag of ODA in infrastructure are statistically significant proving the long-term impact of ODA in infrastructure and FDI inflows

- Interaction term implies that ODA in infrastructure enhances FDI inflow through indirect channel by improving the human capital in that province but the indirect effects of ODA in infrastructure on FDI inflows are not large compared to other factors

- Income per capita to is positive correlated with FDI inflows. The potential market size of the province has the positive impact on the FDI inflows.

- Number of secondary school pupils also has a positive correlation with FDI. The quality of labor force of each province has played a decisive role in attracting FDI flows

- Population has opposite sign with the expectation. This prevails that population does not appropriately represent the purchasing power or the market size of provinces.
- The government tax incentives have not provided any significant effects on attracting FDI flows in mountainous or remote province

- The area of industrial zones also has significant impact on FDI inflows but the magnitude of the coefficient is small implying that the effects of industrial zones to FDI inflows is not large

Interpretation

3. ODA from Japan and EU

- The effects of Japanese aid on own FDI in both direct and indirect channel are significant and substantial in size and the long-term effects of ODA on the FDI inflows are even larger

- The effects of ODA in infrastructure from EU countries on FDI inflows are minor and ambiguous

The effects of ODA in infrastructure of each country on FDI inflows of that country vary, depending largely on the policy and targets of aid allocation that respective country

VI. Conclusion and policy implication

1. Conclusion

FDI flows in Vietnam have been allocated unevenly between provinces and regions, which is attributed to (1) the infrastructure, (2) quality of the labour force and (3) the local market of each province.

ODA in infrastructure has contributed to the attraction of FDI in provinces of Vietnam not only by direct channel but also by indirect channel

Japanese ODA, rather than ODA from other bilateral donors have positive and significant impact on the allocation of FDI of Japanese private investors

2. Policy implication

- Adjust government priority policy in ODA mobilization towards attracting more aid in infrastructure.

- Further enhancement of ownership in ODA mobilization and disbursement will improve the impact of ODA to FDI attraction and economic development of Vietnam

- Government policies also should focus on development of human capital through universal secondary school graduate programs as well as vocational training programs, rather than provide tax-incentive policy to promote FDI to mountainous areas

THANK YOU