



KDI International Conference

**Empirical Evaluations on the  
Government Financial Assistances  
toward SMEs in Korea**

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Dongsoo KANG

Korea's Leading Think Tank



# C O N T E N T S



**Overview**

**Data and Methodology**

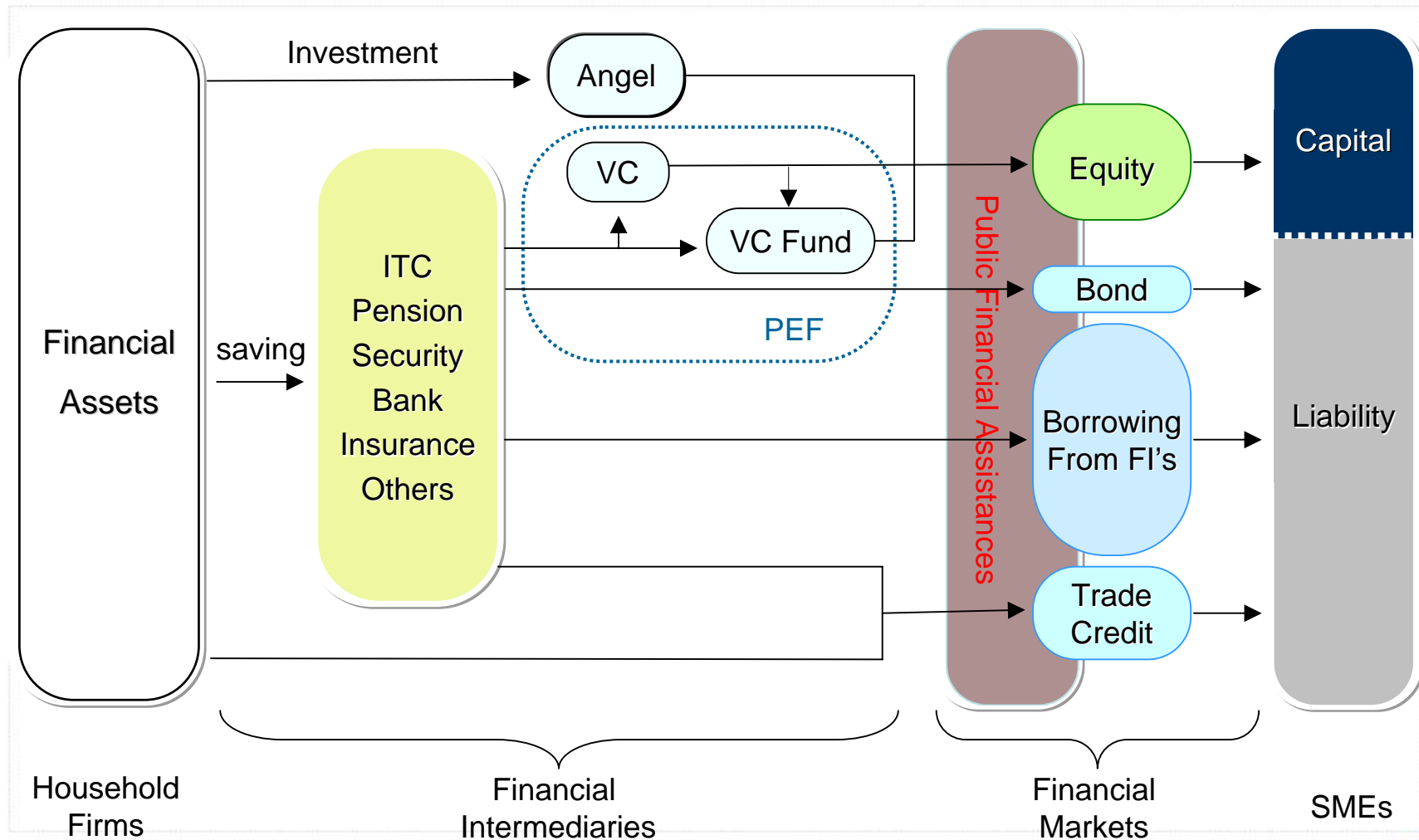
**Empirical Results**

**Concluding Remarks**

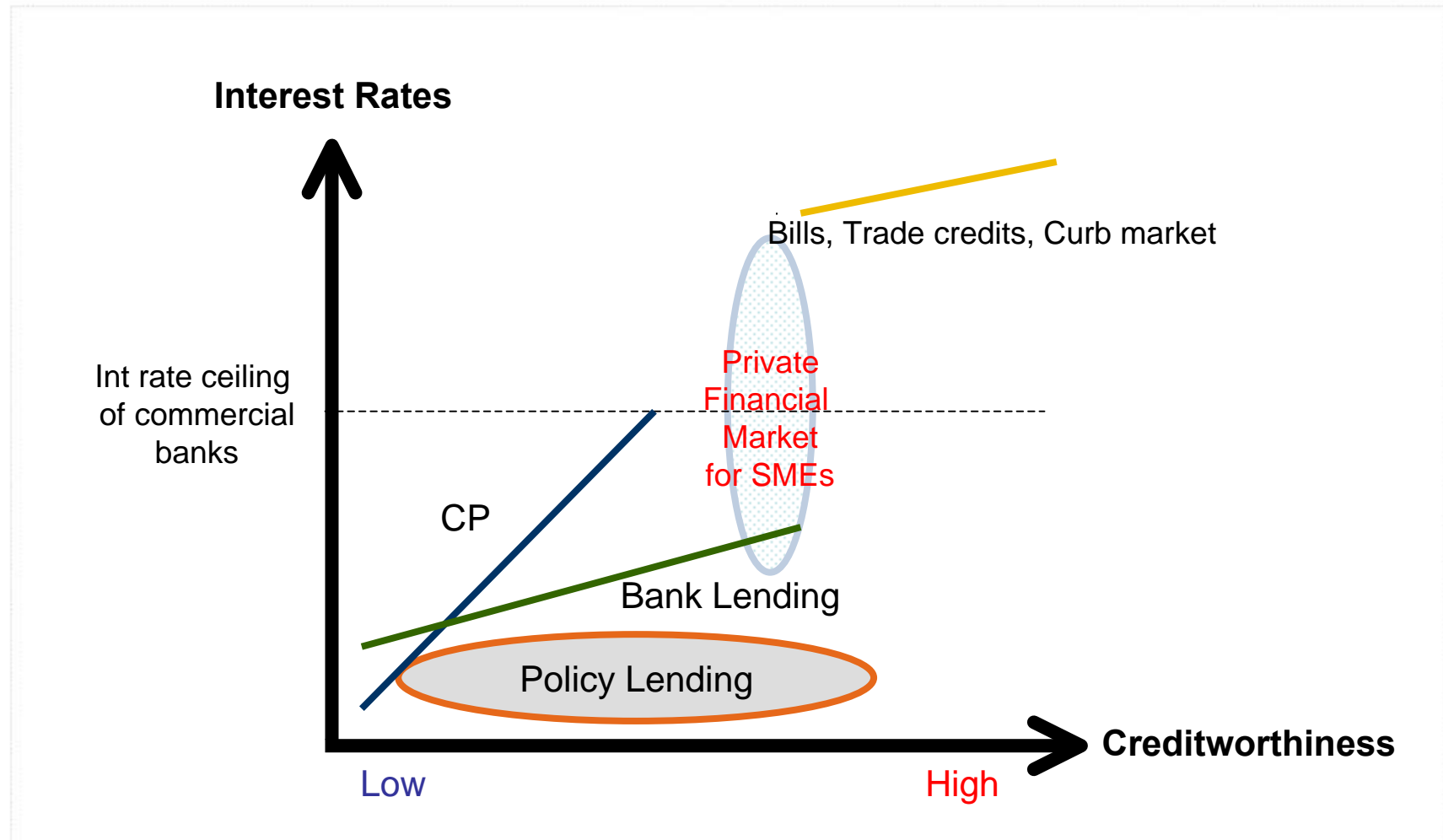
Part-01 | **Overview**

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# Structure of SME Financial Markets in Korea



# Thin Private Financial Markets



# Objective of Analyses

- **Dominance of public financial assistances in Korea**
  - SMEs heavily dependent on government support in financing
  - Government shouldering credit risks of SMEs
- **Efficiency of public finance related to resource allocations**
  - Do profitable and creditworthy SMEs get funded?
  - Inefficiency of public assistances distorting financial markets
- **Necessity of **general** and **dynamic** evaluations**
  - Previous evaluations based on suppliers database
  - So far remained as partial and static evaluations

Part-02 | **Data and Methodology**

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# Sample Firms

- 1) Manufacturing firms established during 1995 and 1998
- 2) Asset > 300 million KRW
- 3) financial statements available at 3rd, 4th and 5th years after establishment

## Brief snapshot of sample SMEs

(unit: no. of firms)

	Establishment year				Total
	1995	1996	1997	1998	
Externally audited SMEs	112 (15.5%)	167 (23.2%)	209 (29.0%)	233 (32.3%)	721 (100.0%)
Non-externally audited SMEs	870 (20.6%)	953 (22.6%)	1,101 (26.1%)	1,299 (30.8%)	4,223 (100.0%)
<b>Total</b>	<b>982</b>	<b>1,120</b>	<b>1,310</b>	<b>1,532</b>	<b>4,944</b>

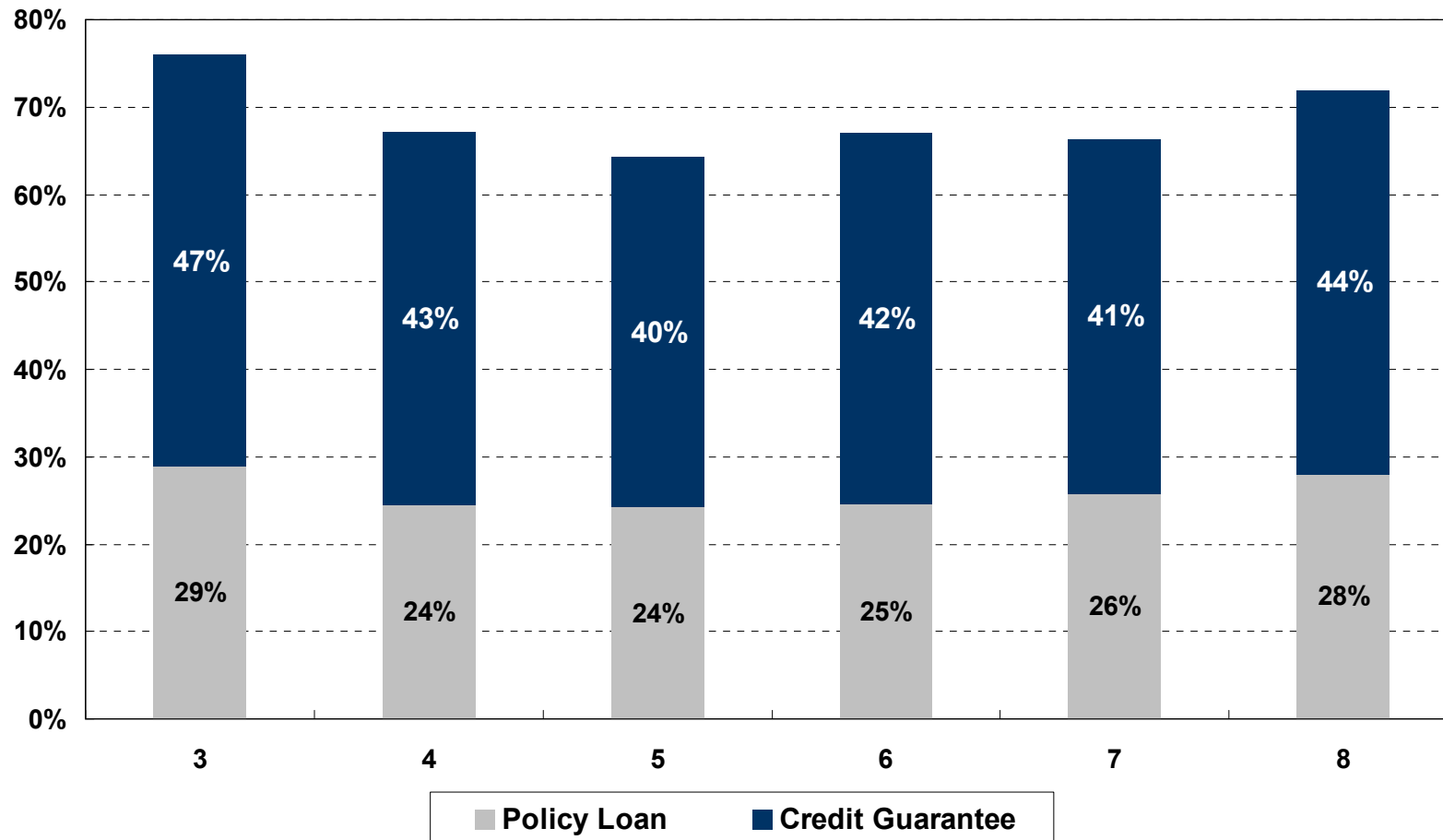
# Data Construction

Data	Sources
Financial Statements	Korea Investors Services, Inc. (KIS)
Borrowing	Ministry of Finance and Economy (MOFE) Korea Federation of Banks (KFD)
Credit Guarantees	Ministry of Finance and Economy (MOFE) Korea Credit Guarantee Fund (KCGF) Korea Technology Credit Guarantee Fund (KOTEC)
Policy Loans	Small and Medium Business Administration (SMBA) Small Business Corporation (SBC)
Venture Capital Investments	Small and Medium Business Administration (SMBA) Korea Venture Capital Association (KVCA)

# Public Financial Assistances to Sample SMEs

Years after establishment		3	4	5	6	7	8
Total sample firms (A)		4,944	4,944	4,944	3,412	2,102	982
PL borrowing firms (B)		1,037	1,319	1,490	1,115	711	337
Policy Loan	PL firm ratio (B/A)	21.0%	26.7%	30.1%	32.7%	33.8%	34.3%
Average PL amount per the borrowed		578.8	597.7	673.5	749.5	818.5	839.9
CG using firms (C)		3,491	3,543	3,545	2,320	1,297	549
Credit Guarantee	CG firm ratio (C/A)	70.6%	71.7%	71.7%	68.0%	61.7%	55.9%
Average CG amount per the guaranteed		643.4	754.1	867.9	981.7	1,011.0	1,075.7
VC invested firms (D)		187	241	283	186	93	31
Venture Capital Investment	VC firm ratio (D/A)	3.8%	4.9%	5.7%	5.5%	4.4%	3.2%
Average VC amount per the invested		1,398.3	1,307.6	1,304.3	1,266.2	1,150.5	1,424.7

# Policy Loan and Credit Guarantee



# Performance Measures and Regression

## ● Performance Measures

- Operating profits, Sales turnover, Economic value-added growth relative to asset growth
- Explanatory variables: Policy loans (*PL*), Credit guarantees (*CG*), Venture Capital Investment (*VC*)
- Early assistances (up to 3 years) vs. Additional assistances
- Controls: Industry performance, Firm specific (borrowing ratio)

## ● Regression Equation

$$\begin{aligned} - \Delta y_{t+3}^i = & \text{const} + \alpha_1 (PL_3^j / A_3^j) + \alpha_2 (CG_t^i / A_3^j) + \alpha_3 (VC_t^i / A_3^j) \\ & + \beta_1 (PL_{t+3}^j - PL_3^j) / A_{t+3}^j + \beta_2 (CG_{t+3}^j - CG_3^j) / A_{t+3}^j + \beta_3 (VC_{t+3}^j - VC_3^j) / A_{t+3}^j \\ & + \gamma_1 \text{Ind} - P_{t+3} + \gamma_2 \text{Ind} - P_3 + \gamma_3 (B_t^i / A_3^j) + \varepsilon_{t+3}^j \end{aligned}$$

$$\Delta y_{t+3}^j \equiv P_{t+3}^j - P_3^i$$

Part-03 | **Empirical Results**

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# Results (1) : One-year Ahead OP

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
const	-0.01 (0.00)	-0.01 (0.00)	-0.01 (0.00)	-0.01 (0.00)	-0.00 (0.00)	-0.01 (0.01)	-0.03 (0.01)
PL_early	0.00 (0.02)			0.00 (0.02)	-0.00 (0.02)	-0.01 (0.02)	-0.04 (0.02)
VC_early		-0.04 (0.04)		-0.03 (0.04)	-0.06 (0.04)	-0.03 (0.04)	-0.01 (0.04)
CG_early			0.01 (0.01)	0.01 (0.01)	0.00 (0.01)	0.00 (0.01)	-0.02 (0.01)
PL_add					-0.07 (0.04)	-0.07 (0.04)	-0.09 (0.04)
VC_add					-0.21 (0.06)	-0.2 (0.06)	-0.19 (0.06)
CG_add					-0.04 (0.02)	-0.04 (0.02)	-0.04 (0.02)
Ind_ROA4						0.40 (0.08)	0.35 (0.08)
Ind_ROA3						-0.38 (0.08)	-0.33 (0.08)
BOA3							0.07 (0.01)
No. of obs	4,074	4,074	4,074	4,074	4,074	4,074	4,074
R2	0.00	0.00	0.00	0.00	0.01	0.01	0.03
Adj. R2	-0.00	0.00	-0.00	-0.00	0.00	0.01	0.03
F-value	0.01	0.97	0.50	0.46	4.51	7.22	13.76

Note: ,  and  are statistically significant within 1%, 5% and 10%, respectively

# Results (2) : Three-year Ahead OP

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
const	0.01 (0.00)	0.01 (0.00)	0.01 (0.00)	0.00 (0.00)	0.00 (0.00)	-0.02 (0.01)	-0.03 (0.01)
PL_early	0.01 (0.03)			0.01 (0.03)	0.01 (0.03)	-0.00 (0.03)	-0.01 (0.27)
VC_early		0.14 (0.05)		0.14 (0.05)	0.21 (0.05)	0.23 (0.05)	0.24 (0.05)
CG_early			0.01 (0.01)	0.01 (0.01)	0.00 (0.01)	0.00 (0.01)	-0.01 (0.01)
PL_add					0.03 (0.03)	0.03 (0.03)	0.03 (0.03)
VC_add					0.25 (0.05)	0.25 (0.05)	0.25 (0.05)
CG_add					-0.03 (0.01)	-0.03 (0.01)	-0.03 (0.01)
Ind_ROA6						0.63 (0.08)	0.62 (0.10)
Ind_ROA3						-0.23 (0.10)	-0.22 (0.10)
BOA3							0.03 (0.01)
No. of obs	3,417	3,417	3,417	3,417	3,414	3,414	3,414
R2	0.00	0.00	0.00	0.00	0.01	0.03	0.03
Adj. R2	-0.00	0.00	-0.00	0.00	0.01	0.03	0.03
F-value	0.17	9.58	0.19	3.40	6.35	12.94	11.07

Note: ,  and  are statistically significant within 1%, 5% and 10%, respectively

# Results (3) : One-year Ahead Sales

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
const	-0.09 (0.01)	-0.08 (0.01)	-0.03 (0.02)	-0.04 (0.02)	0.01 (0.02)	0.19 (0.07)	-0.01 (0.07)
PL_early	0.31 (0.14)			0.36 (0.14)	0.31 (0.14)	0.28 (0.14)	0.03 (0.14)
VC_early		0.31 (0.24)		0.27 (0.24)	0.05 (0.24)	0.07 (0.24)	0.24 (0.24)
CG_early			-0.30 (0.07)	-0.30 (0.07)	-0.38 (0.07)	-0.37 (0.07)	-0.55 (0.07)
PL_add					-0.95 (0.24)	-0.99 (0.24)	-1.09 (0.24)
VC_add					-1.40 (0.39)	-1.40 (0.39)	-1.29 (0.39)
CG_add					-1.02 (0.11)	-0.99 (0.11)	-0.94 (0.11)
Ind_SOA4						0.29 (0.09)	0.27 (0.09)
Ind_SOA3						-0.44 (0.08)	-0.40 (0.08)
BOA3							0.59 (0.06)
No. of obs	4,065	4,065	4,065	4,065	4,065	4,065	4,065
R2	0.00	0.00	0.00	0.01	0.04	0.04	0.07
Adj. R2	0.00	0.00	0.00	0.01	0.04	0.04	0.07
F-value	4.98	1.66	18.63	8.74	25.58	23.03	29.84

Note: ,  and  are statistically significant within 1%, 5% and 10%, respectively

# Results (4) : Three-year Ahead Sales

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
const	-0.21 (0.02)	-0.19 (0.02)	-0.14 (0.02)	-0.18 (0.02)	-0.14 (0.02)	0.00 (0.10)	-0.38 (0.10)
PL_early	0.81 (0.19)			0.86 (0.19)	0.81 (0.19)	0.76 (0.019)	0.27 (0.18)
VC_early		1.03 (0.32)		1.03 (0.32)	0.92 (0.33)	0.72 (0.33)	0.96 (0.32)
CG_early			-0.20 (0.09)	-0.21 (0.09)	-0.37 (0.10)	-0.32 (0.10)	-0.63 (0.10)
PL_add					-0.13 (0.20)	-0.17 (0.20)	-0.27 (0.20)
VC_add					-0.09 (0.37)	-0.01 (0.36)	-0.19 (0.35)
CG_add					-0.61 (0.10)	-0.51 (0.10)	-0.45 (0.10)
Ind_SOA6						0.46 (0.08)	0.44 (0.08)
Ind_SOA3						-0.60 (0.08)	-0.53 (0.08)
BOA3							1.05 (0.08)
No. of obs	3,413	3,413	3,413	3,413	3,410	3,410	3,410
R2	0.01	0.00	0.00	0.01	0.02	0.04	0.09
Adj. R2	0.01	0.00	0.00	0.01	0.02	0.03	0.09
F-value	19.07	10.58	4.91	12.05	12.42	16.24	33.12

Note: ,  and  are statistically significant within 1%, 5% and 10%, respectively

# Results (5) : One-year Ahead EVA

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
const	-0.02 (0.00)	-0.02 (0.00)	-0.02 (0.01)	-0.02 (0.01)	-0.01 (0.01)	-0.04 (0.02)	-0.11 (0.02)
PL_early	0.07 (0.04)			0.07 (0.04)	0.06 (0.04)	0.06 (0.04)	-0.03 (0.04)
VC_early		-0.07 (0.07)		-0.07 (0.07)	-0.11 (0.07)	-0.04 (0.07)	0.02 (0.07)
CG_early			-0.02 (0.02)	-0.02 (0.02)	-0.04 (0.02)	-0.04 (0.02)	-0.10 (0.02)
PL_add					-0.26 (0.07)	-0.27 (0.07)	-0.31 (0.07)
VC_add					-0.26 (0.12)	-0.22 (0.11)	-0.19 (0.11)
CG_add					-0.19 (0.03)	-0.19 (0.03)	-0.17 (0.03)
Ind_EVOA4						0.541 (0.09)	0.48 (0.08)
Ind_EVOA3						-0.42 (0.09)	-0.33 (0.09)
BOA3							0.21 (0.02)
No. of obs	4,076	4,076	4,076	4,076	4,076	4,076	4,076
R2	0.00	0.00	0.00	0.00	0.02	0.03	0.06
Adj. R2	0.00	0.00	0.00	0.00	0.01	0.02	0.06
F-value	2.70	0.89	0.97	1.61	10.75	13.06	26.28

Note: ,  and  are statistically significant within 1%, 5% and 10%, respectively

# Results (6) : Three-year Ahead EVA

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
const	-0.06 (0.01)	-0.06 (0.01)	-0.05 (0.01)	-0.06 (0.01)	-0.05 (0.01)	-0.10 (0.02)	-0.19 (0.03)
PL_early	0.17 (0.06)			0.18 (0.06)	0.17 (0.06)	0.16 (0.06)	0.04 (0.06)
VC_early		0.07 (0.09)		0.07 (0.10)	0.17 (0.10)	0.22 (0.10)	0.29 (0.10)
CG_early			-0.05 (0.03)	-0.05 (0.03)	-0.09 (0.03)	-0.09 (0.03)	-0.17 (0.03)
PL_add					-0.04 (0.06)	-0.04 (0.06)	-0.07 (0.06)
VC_add					0.48 (0.11)	0.50 (0.11)	0.483 (0.11)
CG_add					-0.17 (0.03)	-0.16 (0.03)	-0.15 (0.03)
Ind_EVOA6						0.60 (0.10)	0.54 (0.10)
Ind_EVOA3						-0.35 (0.10)	-0.25 (0.10)
BOA3							0.26 (0.02)
No. of obs	3,420	3,420	3,420	3,420	3,417	3,417	3,417
R2	0.00	0.00	0.00	0.00	0.02	0.03	0.03
Adj. R2	0.00	-0.00	0.00	0.00	0.02	0.03	0.02
F-value	9.71	0.55	2.85	4.62	10.72	12.80	13.28

Note: ,  and  are statistically significant within 1%, 5% and 10%, respectively

# Summary of Results

	Sales turnover	Operating profits	Economic value added
Credit Guarantee	- → -	▲ → ▲	- → -
Policy Lending	+ → +	▲ → ▲	▲ → +
Venture Capital	▲ → +	▲ → +	▲ → +

Note: + Positive effect; ▲ Statistically insignificant effect; - Negative effect.

# Policy Loan in Detail

Type of loans	Sales turnover	Operating profits	Economic value added
Restructuring	▲ → -	▲	▲
SME Venture	- → ▲	+	▲ → +
Cooperation	- → ▲	▲ → +	▲ → -
Export Financing	-	▲	-
R&D	+	+	+

Note: + Positive effect; ▲ Statistically insignificant effect; - Negative effect.  
 Source: Korea Development Institute (2006), rearranged.

Part-04 | **Concluding Remarks**

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# Policy Implications

- **Venture capital investment performs best in various measures**
  - Need to assist equity type of financial assistances to SMEs
  - Should take optimal size of VC investments into account
- **Policy loans have served policy objectives**
  - Policy loans contributed to generate economic value-added
  - But the loans should be reallocated toward R&D and venture firms
- **Should reform credit guarantee scheme**
  - Due to lack of thorough credit examinations, performance worst
  - More specific targeting for technology and innovative SMEs

# Limitation of Analyses

