

# When is High-Power Incentive System is High-Performance

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- This Paper studies the effects of high-power incentive system on different kinds of products.
- The high-power incentive system has significantly positive effect on new-innovative product, but it has no significantly effect on old-ordinary product.
- The high-power incentive system and powerful incentive instrument itself both can improve the productivity of new product.

- Theoretic: Holmstrom and Milgrom(1991,1994), Milgrom and Roberts(1990,1994,1995), Kandel and Lazear(1992) and Baker,Gibbons and Murphy(1994)all point out that high-power incentive instruments are complementary for motivating workers, and such instruments can be expected to covary positively in cross-sectional data.
- Subjective-Measure-Emperical: Huselid(1995), Delaney and Huselid(1996), Ichniowski, Shaw and Prenzushi(1997), Boning, Ichniowki and Shaw(2001), Bartel, Ichniowki and Shaw(2003) and Bresnahan, Brynjolfsson and Hitt(2002) all find that the high-power incentive system significant improves productivity, and it roots in that there is the complemetarity among different incentive instruments.

- Objective-Measure-Emperical: Black and Lynch(2000,2001) find that the incentive instructment itself has no effect on productivity, but incentive instructment and union together have positive effect on produtivity, but Jones and Kato (1995) and Lazear(1995) find emperical evidences that incentive instrument itself has significant positive effect on produtivity.
- Shortcoming: not directly confirm the complementarity among different incentive instrument, not cinfirm when they are complementary.

- Source: the Annual Survey of Over-Scale Industrial Firms (ASIF)+Our Survey on Firm's incentive system
- Our survey: 2500 firms, 77%, 63.6%
- check one: 300 recall, 5%
- check two: 5.1%, 8.2%, 6.3%

- Performance-Measure: ordinary product sales, new product sales
- Incentive-Instrument-Measure:
  - $\text{whold} = (\text{the shareholding non-managerial employee}) / (\text{the total employee})$
  - $\text{wincen} = (\text{the performance-base-payment non-managerial employee}) / (\text{the total employee})$
  - $\text{job} = (\text{the multi-task non-managerial employee}) / (\text{the total employee})$
  - $\text{part} = (\text{the self-managed non-managerial employees}) / (\text{the total employee})$
- Data summary

- the high-power incentive system has not any significant effect on old-ordinary product, but it significantly improves the productivity of new-innovative product.
- the powerful incentive system as well as the powerful incentive instrument itself significantly improve productivity.

- Omit Variable: +managerial employee's incentive system
- Omit Variable: +characteristic of entrepreneur
- Implemented Mechanism: +union\*cooperation



- Innovation Capacity: +patents
- Innovation Capacity: fixed-effect

- The high-power incentive system has significantly positive effect on new-innovative product, but it has no significantly effect on old-ordinary product.
- The high-power incentive system and powerful incentive instrument itself both can improve the productivity of new product.

Table-1: Data Summary

Variable	Obs	Mean	Std
Old-Sale	3750	13235	33153
New-Sale	3046	3358	12476
Asset	3763	13583	42468
Employee	3786	439	676
pcnum	3758	35	59
Coll	3653	12.5	13.4
R&D	3341	301	1090
Whold	3186	2.1	10.0
Wincent	3242	32.5	39.4
Job	3175	9.8	20.0
Part	3307	7.8	14.7

**Table-2a: Regression on old-product**

Variable	(1)	(2)	(3)	(4)
Whold	-0.0014** (0.0006)	-0.0012 (0.0002)	-0.0006 (0.0012)	-0.0012 (0.0010)
Wincent	-0.00001 (0.0002)	-0.00004 (0.0002)	-0.00005 (0.0002)	-0.00004 (0.0002)
Job	-0.0001 (0.0003)	-0.0002 (0.0003)	-0.00002 (0.0003)	-0.0002 (0.0003)
Part	0.00003 (0.0005)	-0.000003 (0.0005)	0.00003 (0.0005)	-0.00001 (0.0005)
Whold*Wincent		-0.0001 (0.0012)	-0.0008 (0.0014)	-0.0001 (0.0013)
Whold*Job		-0.0016 (0.0028)	-0.0077 (0.0072)	-0.0018 (0.0036)
Wincent*Job		0.0001 (0.0001)	0.0001 (0.0001)	0.0001 (0.0001)
Whold*wincent*Job			0.0070 (0.0076)	
Whold*wincent *Job *Part				0.0008 (0.0122)
Obs	2393	2393	2393	2393
R-Square	0.9489	0.9489	0.9489	0.9489

Control variable: fix-asset, labor, material, scale, R&D, coll, pcnum,  
union, industry, time, firm-type

\*\*\* p<0.01    \*\* p<0.05    \* p<0.1.

**Table-2b: Regression on new-product**

Variable	(1)	(2)	(3)	(4)
Whold	0.0001 (0.0031)	-0.0015 (0.0052)	0.0027 (0.0054)	0.0017 (0.0054)
Wincent	0.0025** (0.00098)	0.0020** (0.0010)	0.0018* (0.0010)	0.0019* (0.0010)
Job	0.0071*** (0.0020)	0.0061*** (0.0023)	0.0062*** (0.0023)	0.0064*** (0.0023)
Part	-0.0027 (0.0024)	-0.0031 (0.0024)	-0.0039 (0.0025)	-0.0041* (0.0025)
Whold*Wincent		0.0053 (0.0058)	-0.0011 (0.0066)	0.0019 (0.0060)
Whold*Job		-0.0124 (0.0315)	-0.0584 (0.0384)	-0.0427 (0.0347)
Wincent*Job		0.0012** (0.00058)	0.0012** (0.00058)	0.0012** (0.00058)
Whold*wincent*Job			0.1066** (0.0507)	
Whold*wincent*Job*Part				0.1108** (0.0534)
Obs	981	981	981	981
R-Square	0.4857	0.4873	0.4891	0.4890

Control variable: fix-asset, labor, material, scale, R&D, coll, pcnum,  
union, industry, time, firm-type

\*\*\* p<0.01    \*\* p<0.05    \* p<0.1.

**Table-3a-Omit Variable: Regression on old-product**

Variable	(1)	(2)	(3)
Whold	-0.0016 (0.0016)	-0.00004 (0.0019)	-0.0016 (0.0017)
Wincent	-0.0003 (0.0003)	-0.0004 (0.0003)	-0.0004 (0.0003)
Job	-0.0003 (0.0004)	-0.0001 (0.0004)	-0.0003 (0.0004)
Part	0.0013 (0.00096)	0.0011 (0.00096)	0.0013 (0.0010)
Whold*Wincent	-0.00006 (0.0012)	-0.0012 (0.0017)	-0.00007 (0.00127)
Whold*Job	-0.0023 (0.0029)	-0.0134* (0.0077)	-0.0024 (0.0038)
Wincent*Job	-0.00014 (0.00019)	-0.00018 (0.00019)	-0.00014 (0.00019)
Whold*wincent*Job		0.0124 (0.0082)	
Whold*wincent *Job *Part			0.0007 (0.0131)
Union*Wincent	0.00012 (0.00007)	0.00013* (0.00007)	0.00012 (0.00007)
Union*Part	-0.00042 (0.00026)	-0.00039 (0.00026)	-0.0004 (0.0003)
Obs	2302	2302	2302
<b>R-Square</b>	<b>0.9486</b>	<b>0.9486</b>	<b>0.9485</b>

+Control variable: managerial employee's incentive system

+Control variable: characteristic of entrepreneur

+Control variable: enforcing mechanism

**Table-3b-Omit Variable: Regression on new-product**

Variable	(1)	(2)	(3)
Whold	0.0090 (0.0151)	0.0114 (0.0152)	0.0100 (0.0151)
Wincent	0.0093*** (0.0021)	0.0085*** (0.0021)	0.0084*** (0.0021)
Job	0.0014 (0.0040)	0.0018 (0.0040)	0.0014 (0.0040)
Part	-0.0088* (0.0050)	-0.0113** (0.0053)	-0.00121** (0.0054)
Whold*Wincent	0.0045 (0.0058)	-0.00009 (0.0068)	0.0022 (0.0062)
Whold*Job	-0.0139 (0.0375)	-0.0197 (0.0443)	-0.0078 (0.0402)
Wincent*Job	0.0062*** (0.0013)	0.0058*** (0.00058)	0.0057*** (0.0013)
Whold*wincent*Job		0.0797 (0.0557)	
Whold*wincent*Job*Part			0.0910*** (0.0602)
Union*Wincent	-0.0021*** (0.0005)	-0.0019*** (0.0005)	-0.0019*** (0.0005)
Union*Part	0.0024* (0.0013)	0.0030** (0.0014)	0.0031** (0.0014)
Obs	950	950	950
R-Square	0.4922	0.4928	0.4929

+Control variable: managerial employee's incentive system

+Control variable: characteristic of entrepreneur

+Control variable: enforcing mechanism

**Table-4-Omit Variable: Regression on new-product**

Variable	(1)	(2)	(3)
Whold	-0.0015 (0.051)	0.0027 (0.0055)	0.0016 (0.0054)
Wincent	0.0020** (0.0010)	0.0019* (0.0010)	0.0019* (0.0010)
Job	0.0061*** (0.0023)	0.0063*** (0.0023)	0.0064*** (0.0023)
Part	-0.0030 (0.0024)	-0.0039 (0.0025)	-0.0041 (0.0025)
Whold*Wincent	0.0054 (0.0058)	-0.0008 (0.0066)	0.0022 (0.0060)
Whold*Job	-0.0124 (0.0315)	-0.0569 (0.0384)	-0.0415 (0.0347)
Wincent*Job	0.0012** (0.00058)	0.0012** (0.00058)	0.0012** (0.000058)
Whold*wincent*Job		0.1031** (0.0508)	
Whold*wincent *Job *Part			0.1065** (0.0535)
Obs	981	981	950
R-Square	0.4876	0.4893	0.4929

+Control variable: firm's innovation capacity