

# CAUSAL LINKAGE BETWEEN INSTITUTIONS-TAXATION AND ECONOMIC GROWTH: EVIDENCE FROM 60 PROVINCES IN VIETNAM.

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## Abstract:

To investigate the relationship between institutions-tax revenue and economic growth, this research manipulated the Granger causality test over the panel data of 60 provinces in Vietnam during the period from 2006 to 2014; consequently, there is a bi-direction causality relationship among the mentioned variables. Furthermore, utilization of two-step System Generalized Method of Moments, the research discovers that tax revenue has significantly positive impacts on economic growth. Nonetheless, the sub-institutions have effect on economy fluctuates. In particular, the informal charges index reduces one point, the increment of income per capita up to four million VND. Hence, unfair competitive environment index has a negative impact on growth. Especially, the interaction of sub-institutions and structure of tax revenue can affect the economic growth in many different levels. In fact, the sub-institutions interrelate to personal income tax has a significantly negative impact on economic growth. On the other hand, the interaction of sub-institutions and FDI corporation tax revenue can create a contrary impact. Eventually, there is an addition of consistent convergence in all estimation models suggesting that the authority planners among provinces should be cautious when introducing policies related to institutions and taxations due to the fact that those bi-direction effects can be extremely advantageous to the economy.

**Key words:** Institutions, tax revenue, economic growth, Causality Granger test, panel data, System GMM

**JEL classification:** O43, H27, C33, C40

## 1. INTRODUCTION

There have been many research papers pinpointing that the effects of institutions or taxation on economic growth are quite complicated and controversial; as a result, there grows a demand of further investigation to clearly measure these effects and correlation (Barro, 1991; Lim&Decker, 2007; Acemoglu *et al.*, 2005; Acemoglu & Robinson, 2010; Acemoglu & Robinson, 2012; Law *et al.*, 2013; Helms, 1985; Engen & Skinner, 1996; Batina & Ihuri, 2008; Hemmelgarn & Teichmann 2013; Lien, 2015). The correlation of institutions and economic growth is reliant on how institutions interact with other variables whilst how taxation affects economic growth depends on the efficaciousness of the policies established by the authorities (Ogilvie & Carus, 2014; Sachs, 2003; Ahmed, 2012; Lee & Kim, 2009; Vieira *et al.*, 2012; Helms, 1985; Engen & Skinner, 1996; Batina & Ihuri, 2008; Hemmelgarn & Teichmann, 2013; Canicio & Zachary, 2014.)

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In addition, developing countries have to suffer from bribery and corruption which in turn contribute to the loss of tax (Richupan, 1984; Alm *et al.*, 1992; Bird, 1990 and 1992; Krugman *et al.*, 1992; Gupta, 2007; Syadullah & Wibowo, 2015; Lien, 2015.) Moreover, in order to achieve sustainable development, the government are expected to come up with establishment and practice of optimal taxation (Mankiw *et al.*, 2009).

Furthermore, the competency of the authority proves to be the key element of the success in economic development among developing countries in South East Asia (Johnson, 1982; Amsden, 1989; Wade, 1990; and Evans, 1995.) Acemoglu *et al.* (2015), likewise, states that the efficiency of the authority at provincial level holds a very essential role in the growth of economy.

Base on aforementioned arguments, with a view to elucidating how the linkage between interaction of institutions – tax revenue and economic growth is taking place at provincial level in Vietnam, this research study comes to existence with a title as “**Causal linkage between Institutions-taxation and economic growth: Evidence from 60 provinces in Vietnam**”.

The research is set out to attain these following goals:

- (1) Evaluate the relationship between the interaction of sub-institution – structure of tax revenue and economic growth in 60 provinces in Vietnam during the period from 2006 to 2014.
- (2) Measure the degree of effects of this interaction on economic growth during the relative period.

This research is structured as followed: Part 1 is to provide general introduction of the research, Part 2 makes mention to previous research, part 3 presents models, data, and research methodology, Part 4 shows research results, and part 5 draws the conclusion and implication.

## **2. LITERATURE REVIEW:**

Conducting the case study in Korea, Taiwan and Japan, Amsden (1989) posited that economic activities rely on the way the authorities impose policies, standard and taxation upon the activities of private firms and grants.

With a research modeled on Game theory about the authorities in Colombia, Acemoglu *et al.* (2015) also agreed that the competence to maintain law and order, the competence to furnish products and public service as well as the competence to establish locally economic activities in one community can demonstrate the efficiency of its authority whilst there appears to have some governments lacking those competences, which accounts for the underdevelopment.

Phan (2013) similarly conducted panel data about provincial competitiveness in Vietnam (Institutions) during the period from 2006 to 2014. As a result, he proved that the improvement in some criteria about institutions such as the right to access land, business support service, proactivity, and reducing of informal charges could positively affect the business performance of firms and indirectly influencing the growth of economy.

Experimenting panel data collected from corporations in America, William (2013) found out that big cities can offer more opportunities for corporations more than small cities or

provinces, whereas the business charges spent in some head office in big cities is much more than that in small provinces.

Knutsen (2013) investigated the panel data of sub-Sahara countries in Africa from 1984 to 2004 with the OLS, PSCE, and FE models and indicated that the impacts of democracy on economic growth depend on capacity of local provincial authorities. Specifically, the places with weak governmental administration has strong democracy and it has a positive impact on the growth of economy, in the meanwhile, high administration in other places belittles the influence of democracy on economic growth.

Moreover, Dincecco & Katz (2012) explored the panel data of provinces from 11 countries in Europe, consequently, they have argued that modern authorities are able to exploit well and gain positive impacts on economic activities. In long term, the governments at provincial level are key success factors to boost the economy.

Guerrero & Parker (2012) employed the Causality Granger test to verify Wagner's hypothesis about the government expenditure and governmental economic growth among American states. The results show that the governments' great expenditure could lead to faster economic growth.

From the previous research, this article is able to summarize the following analytic framework:

First, Causality test follow to Granger (1969) has been exploited by many experimental researchers so as to verify whether there exists a cause-and-effect relationship among variables (Im *et al.*, 2003; Hurlin, 2004; Westerlund *et al.*, 2011; Guerrero & Parker, 2012; Yousefi, 2015) with null hypothesis:

$$H_0: \beta_i^{(k)} = \beta_j^{(k)} \forall i = 1, \dots, N, \forall k = 1, \dots, K$$

$$H_1: \beta_i^{(k)} \neq \beta_j^{(k)}, k \in \{1, \dots, p\}, \exists (i, j) \in \{1, \dots, N\}$$

Second, economic growth is often measured with Gross domestic products per capita (GDP per capita)

Third, the influence of institution, taxation and other control variables on economic growth differs according to their interaction with one another (Johnson, 1982; Amsden, 1989; Wade, 1990; and Evans, 1995; Phan, 2013; William, 2013; Knutsen, 2013; Acemoglu *et al.* 2015.)

### 3. METHODOLOGY AND RESEARCH DATA

#### 3.1. Research data:

The research utilized the panel data of provincial competitiveness (institution assessment) of 60 provinces throughout Vietnam during the period from 2006 to 2014. The data was extracted from Vietnam provincial competitiveness index provided by Vietnam Chamber of Commerce and Industry (VCCI) with the support of United States Agency for International Development (USAID/Vietnam).

Data related to Government tax revenue, poverty rate, and student rate was retrieved from the website of General Statistic Office of Vietnam.

In terms of the number of provinces, despite consisting of official 64 provinces by 2014, there were some newly-merged or newly-split provinces, thus it was impossible to attain

complete set of data about those provinces. Consequently, this research could merely work on dataset of 60 provinces (see appendix A1 – List of 60 provinces in Vietnam).

Furthermore, the period from 2006 to 2014 witnessed the United States real estate bubble burst which affected tremendously those countries importing and exporting goods from and to America. Vietnam was also not an exception, suffering from disadvantageous influences.

**Table 3.1. the stastical description of research variables**

<b>Variable</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
Rgdp (income per capita) (Million VND)	567	26.583	36.832	3.51	393.93
Tare (Total tax revenue)(billion VND)	567	12123.84	28054.24	277.64	282953.4
TareFDI (Tax revenue from FDI firms) (billion VND)	528	1120.86	3600.349	0.01	34326
PITare (Personal income tax collection) (billion VND)	539	2472.969	204.23	1797.44	3075.12
PETare (tax revenue for protection of environment (billion VND)	522	2500.735	107.797	2163.96	2864.26
CAPTare (Property Tax revenue) (billion VND)	524	2635.923	122.999	1970.16	3030.79
Stdtrate (Student rate) (%)	540	0.040	0.127	0.000	1.172
Povrate (povety rate) (%)	540	15.654	10.332	0.01	58.2
PVCi General provincial competitiveness index with weighted) (Index)	540	57.000	6.078	36.759	77.197
<b>Sub-provincial competitiveness index (index) (PCI<sub>1</sub>-PCI<sub>10</sub>)(Sub-institutions)</b>					
PCI <sub>1</sub> = Ent (entry cost)	539	7.950	0.894	4.955	9.598
PCI <sub>2</sub> =LRgt (Land access &Tenure)	540	6.328	0.909	3.037	8.842
PCI <sub>3</sub> =Tran (Transparency)	540	5.840	.844	2.457	8.854
PCI <sub>4</sub> = Tcs (Time cost)	540	6.004	1.129	2.638	8.929
PCI <sub>5</sub> =Inc (Informal charges)	540	6.330	0.953	3.243	8.943
PCI <sub>6</sub> = Plb (Policy bias)	540	5.555	1.494	1.753	8.858
PCI <sub>7</sub> = Pro (Proactivity)	540	5.055	1.3796	1.387	9.389
PCI <sub>8</sub> = Bss (Business Support Services)	540	4.801	1.345	1.397	9.620
PCI <sub>9</sub> = Lbt (Labor policy)	540	5.126	0.975	1.921	9.597
PCI <sub>10</sub> = Lin (Legal institutions)	540	4.846	1.196	1.996	7.909

Table 3.1 shows Ba Ria Vung Tau is a province with highest income per capita at 393.93 million VND whilst Ha Giang stood at the bottom of the column. The province with the highest PVCI was Binh Duong with 77.197 points, and the lowest score, 36.759, went to Lai Chau (This index is a general index with weighted). In term of tax revenue, while Ho Chi Minh City topped the table with more than 282 thousand billions VND, Dak Nong obtained the least number at 277.64 billions VND. Ho Chi Minh city exceeded the table as the province with the highest collection level of Tax revenue from FDI firms, environment protection tax and tax from personal income. Ha Noi is the highest province with collection of proverty tax. As for student rate, Long An got the highest result when Hau Giang was a province with the lowest score. Eventually, the greatest poverty rate was found in Lai Chau while Ho Chi Minh City got the lowest percentage.

### 3.2. Research method:

In order to investigate the relationship of interaction between institutions – tax revenue and economic growth, this study performs the Causality Granger test by following to the approach of Hurlin (2004) for below equations:

$$IN_{it} = \alpha_i + \sum_{k=1}^K \gamma_i^{(k)} IN_{jit-1} + \sum_{k=1}^K \beta_i^{(k)} Rgdp_{it} + \varepsilon_i + \epsilon_{it} \quad (1.1)$$

$$Rgdp_{it} = \alpha_i + \sum_{k=1}^K \gamma_i^{(k)} Rgdp_{it-1} + \sum_{k=1}^K \beta_1^{(k)} IN_{jit} + \varepsilon_i + \epsilon_{it} \quad (1.2)$$

$IN_{jit}$  [(j:1,...4), (i: 1,...N) and (t: 1, ...T)] is interaction between few sub-institutions and different kind of tax revenue within tax structure as below:

$$(1) IN_{1it} = Pv\_Hm_{it} = (PCI_9 + PCI_{10})_{it} * PITare_{it}$$

$$(2) IN_{2it} = Pv\_Cap_{it} = (PCI_1 + PCI_2 + PCI_3 + PCI_4)_{it} * CAPTare_{it}$$

$$(3) IN_{3it} = Pv\_Pe_{it} = (PCI_3 + PCI_5)_{it} * PETare_{it}$$

$$(4) IN_{4it} = Pv\_TaFDI_{it} = (PCI_1 + PCI_6 + PCI_{10})_{it} * TareFDI_{it}$$

$Rgdp_{it}$ : denotes the real income per capita.

Owing to the fact that this paper utilizes the dynamic unbalanced panel data with “large N and small T”, this research employes two-step System Generalized method of moments (SGMM). The method is expected to be a proper tool for dealing with panel data and to eliminate the bias of endogenous (Hsiao, 2003; Baltagi, 2005; Wooldridge, 2010).

The equations for estimating the effects were experimented with three following equations:

$$\Delta Rgdp_{it} = \alpha_0 + \alpha_1 Rgdp_{it-1} + \alpha_2 Tare_{it} + \alpha_3 PCI_{jit} + X_{it} \alpha'_4 + \varepsilon_i + \epsilon_{it} \quad (2.1)$$

$$\Delta Rgdp_{it} = \beta_0 + \beta_1 Rgdp_{it-1} + \beta_2 Tare_{it} + \beta_3 PVCI_{it} + \beta_4 IN_{jit} + X_{it} \beta'_5 + \varepsilon_i + \epsilon_{it} \quad (2.2)$$

$\Delta Rgdp_{it}$  indicates the first-difference of real income per capita.

$PCI_{jit}$  representing the sub-institutions which starts with  $PCI_{1it}$  to  $PCI_{10it}$  (Appendix A2 – List of subinstitutions)

$PVCI_{it}$  is the general provincial competitiveness index (with weighted) of 60 province for annual ranking by VCCI..

$X_{it}$  stands for control variables: student rate and poverty rate

Equation 2.1 aims to measure the influence of tax revenue, and all sub-institution index on economic growth.

Equation 2.2 estimates the impact of interaction between few sub-institutions and few criteria of tax revenue within tax structure. For instance, the interaction between tax collection from FDI firms and two sub-institutions:  $PCI_6$  and  $PCI_{10}$  created  $Pv\_TaFDI$  variable (see (1), (2), (3), and (4) in above point 3.2).

Due to the purpose of this research to consider the influence of institutional criteria on various segments of taxation (Lien, 2015), those interactions were then taken into account.

To verify the robustness of restriction of these models, this paper also applies the Hansen test in order to eliminate endogenous phenomenon when null hypothesis was accepted. In addition, it also assessed the null hypothesis of Arrelanno Bond test AR(2) to make sure that model did not contain any phenomenon of “serial auto-correlation of residuals”.

#### 4. RESEARCH RESULTS

#### 4.1. Results of the Granger causality test

Before the use of the Granger Causality test, this research carried out the unit root test with Dickey – Fuller test and Phillip&Perrson verification. The result are displayed in the table 4.1

**Table 4.1 the result of unit root test for dataset of 60 province in Vietnam from 2006 to 2014**

Lags	Variables	Dickey-Fuller (F-values)				Phillip & Perron (F-value)			
		Non-trend		Trend		Non-trend		Trend	
1	Rgdp	168.716	0.002***	158.229	0.011**	267.131	0.000***	1227.550	0.000***
2		63.788	1.000	347.018	0.000***	265.744	0.000***	1192.703	0.000***
1	Pvci_Hm	193.292	0.000***	91.159	0.977	411.30	0.000***	218.557	0.000***
2		279.445	0.000***	247.362	0.000***	477.671	0.000***	273.278	0.000***
1	Pvci_Cap	329.478	0.000***	231.741	0.000***	327.074	0.000***	293.656	0.000***
2		235.834	0.000***	534.198	0.000***	372.425	0.000***	385.253	0.000***
1	Pvci_tare	284.609	0.000***	184.674	0.000***	367.857	0.000***	263.931	0.000***
2		443.314	0.000***	260.116	0.000***	381.425	0.000***	327.912	0.000***

\*\*\*, \*\* and \* stand for significance at 1%, 5% and 10% respectively.

Table 4.1 illustrates that all variables have the same stationary point with a lag of 1, thus research calculates all the statistic for the k=1. The unit root test results suggest that the first difference variables in above table will remove all potential of non-stationary, so this study used the first different variable for analysis.

Then this paper runs Pairwise Granger Regression to reconsider the bi-direction causal linkage of each pair of variables.

H <sub>0</sub> : Interaction PVCi-Pitare does not Granger cause Rgdp ( $\Delta Rgdp$ )	Obs.	F - Stat	Prob.	H <sub>0</sub> : Rgdp does not Granger cause Interaction PVCi-Pitare ( $\Delta Pv_Hm$ )	Obs.	F - Stat	Prob.
<b>Pv_Hrm → Rgdp</b>	480	.004	0.000***	<b>Rgdp → Pv_Hm</b>	479	-9.905	0.000***
H <sub>0</sub> : Interaction PVCi-Cap does not Granger cause Rgdp ( $\Delta Rgdp$ )	Obs.	F - Stat	Prob.	H <sub>0</sub> : Rgdp does not Granger cause Interaction PVCi-Cap ( $\Delta Pv_Cap$ )	Obs.	F - Stat	Prob.
<b>Pv_Cap → Rgdp</b>	464	.002	0.001***	<b>Rgdp → Pv_Cap</b>	464	22.786	0.000***
H <sub>0</sub> : Interaction PVCi-TaFDi does not Granger cause Rgdp ( $\Delta Rgdp$ )	Obs.	F - Stat	Prob.	H <sub>0</sub> : Rgdp does not Granger cause Interaction PVCi-TaFDi ( $\Delta Pv_Cap$ )	Obs.	F - Stat	Prob.
<b>Pv_TaFDi → Income</b>	479	.001	0.002***	<b>Rgd → Pv_TaFDi</b>	479	16.967	0.001***

\*\*\*, \*\* and \* stand for significance at 1%, 5% and 10% respectively.

Consequently, the interaction of sub-institutions and Tax revenue from FDI firms, personal income tax collection, property taxation, and environmental protection tax all presents bi-direction causality linkage with economic growth. This finding reminds the policy planners that they should be extremely cautious when imposing those policies involved with institutions and taxation to reduce the adverse effects of this linkages.

#### 4.2. Robustness check

Not only to achieve the goal of measuring the degree of impact of interaction of sub-institutions and structure of tax revenue on economic growth but also to experiment the robustness of the above models, the research employs Two-step System Generalized method of Moments (SGMM) for analyzing panel data of 60 provinces in Vietnam from 2006 to 2014. The results are displayed in the below tables.

**Table 4.2 Impact of tax revenue and each sub-institution on economic growth following the equation 2.1 (Dependent variable:  $\Delta$  Rgdp)**

Variables	Coef.	Pvalue
Rgdp (-1) (Million VND)	<b>-.943</b>	<b>0.000<sup>***</sup></b>
Tare (Billion VND)	<b>.412</b>	<b>0.000<sup>***</sup></b>
PCI <sub>1</sub> = Ent (Index)	1.719	0.287
PCI <sub>2</sub> =LRgt (Index)	-3.714	0.343
PCI <sub>3</sub> =Tran (Index)	-9.991	0.255
PCI <sub>4</sub> = Tc (Index)	-.012	0.993
PCI <sub>5</sub> =Inc (Index)	<b>4.189</b>	<b>0.061<sup>*</sup></b>
PCI <sub>6</sub> = Plb (Index)	<b>-4.16</b>	<b>0.000<sup>***</sup></b>
PCI <sub>7</sub> = Pro (Index)	<b>3.117</b>	<b>0.066<sup>*</sup></b>
PCI <sub>8</sub> = Bss (Index)	1.020	0.638
PCI <sub>9</sub> = Lbt (Index)	-.096	0.975
PCI <sub>10</sub> = Lin (Index)	-.772	0.391
Stdtrate (%)	-.072	0.145
Povrate (%)	<b>-2.23</b>	<b>0.000<sup>***</sup></b>
year	8.186	0.000 <sup>***</sup>
_cons	-16041.6	0.000 <sup>***</sup>
Obs.		471
Number of instruments		55
Number of groups		60
AR(2) test		0.951
Hansen test		0.315

<sup>\*\*\*</sup>, <sup>\*\*</sup> and <sup>\*</sup> stand for significance at 1%, 5% and 10% respectively.

**Table 4.3 impact of tax revenue and interaction of sub-institutions and sub-tax collection following the equation 2.2 (Dependent variable  $\Delta Rgdp$ )**

<b>Variables</b>	<b>Coef.</b>	<b>Pvalue</b>
Rgdp (-1) (Million VND)	<b>-0.911</b>	<b>0.000<sup>***</sup></b>
<b>Tare</b>	<b>.148</b>	<b>0.047<sup>**</sup></b>
<b>PVCI</b>	<b>2.055</b>	<b>0.006<sup>***</sup></b>
<b>Pv_Hm</b>	<b>-0.002</b>	<b>0.002<sup>***</sup></b>
Pv_Cap	.000	0.723
Pv_Pe	-.001	0.542
<b>Pv_TaFdi</b>	<b>.0004</b>	<b>0.020<sup>**</sup></b>
stdrate3	-.0547	0.404
<b>povrate</b>	<b>-2.130</b>	<b>0.000<sup>***</sup></b>
year	14.218	0.000 <sup>***</sup>
_cons	-27550.89	0.000 <sup>***</sup>
Obs.		453
Number of instruments		52
Number of groups		60
AR(2) test		0.862
Hansen test		0.118

<sup>\*\*\*</sup>, <sup>\*\*</sup> and <sup>\*</sup> stand for significance at 1%, 5% and 10% respectively.

Table 4.2 and table 4.3 share a consistent result about high convergence at 1%. In other words, it could be referred that most authorities in many provinces have made efforts to innovate and build up development plans to catch up with better-off cities.

Notably, both taxation and general institution index have a significantly positive impact on growth of economy. Poverty rate, in other hand, always causes negatively impact on economic growth with significance at 1%. Hence, the diminution of poverty has been of great demand to protect growth of economy. The effects and influence on economic growth diversely fluctuate when based on separate institution criteria. While  $PCI_5$  and  $PCI_7$  have significantly positive impacts on economic growth at 10%,  $PCI_6$  in turn affects negatively with significance at 1% (Increasing an index of  $PCI_6$ , then income per capita should be down more than 4 million VND). Clearly presented, this fact suggests that the authorities should create fair and equal competitive environment for a purpose of improving per capita income.

The impact of interaction of institutions and tax revenue on economic growth is complicated. While interaction of sub-institutions and tax revenue of personal income has a significantly negative impact on growth of economy at 1%, interaction of sub-institutions and tax collection from FDI firms has a significantly positive impact on economic growth at 5%. The finding indicates that the process of applying policies about personal taxation should be done with great meticulousness. As mentioned in the optimal taxation theory by Mirrlees (1971) up till the 21<sup>st</sup> century, it is evident that the increase in taxation income might be able to diminish working motivation of those people with high income. Besides, it is conclusive, up to some certain extent, that the redistribution of salary can booster the

inequality in payment and prohibit economic growth. Furthermore, the results cause the authorities to awake to the fact that they should bring in more effective plans and policies to collect FDI corporation tax and eliminate tax avoidance by means of transfer the prices to reinforce the economy.

## 5. CONCLUSION

This research with a use the Graner Causality test of the interaction of institutions-tax revenue and economic growth for panel data from 60 provinces in Vietnam has come up with postulate that there is an existing causal relationship of each respective pair of these variables.

Second, applying Two-step System Generalized Method of Moments, this paper has pointed out the robustness of positive impact on the economic growth of tax revenue variable and general institutions together with the negative impact caused by Poverty rate in 60 provinces in Vietnam. The findings recommended that the provincial governments pay more attention to building up solutions to poverty eradication and introducing some approaches to improve the quality of institutions as well as conducting effective taxation system for a purpose of improving each province's the income per capita.

Last but not least, the outcomes gained from the process of analyzing the effect of institutions and its related criteria on taxation, which is distinctly presented in part 4.2, provide a valuable lesson for policy makers in terms of establishing legal documents related to institutions about constructing fair competitive environment, cutting off informal charges or offering firms the right to access easily to land and setting up the effective solution to collect taxation from FDI firms for higher income per capita in their provinces.

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## Appendix

**Table A1 The list of 60 Vietnamese Provinces**

Province	ID	Province	ID	Province	ID	Province	ID
An Giang	1	Dong Thap	17	Lam Dong	33	Son La	49
Bac Giang	2	Gia Lai	18	Lang Son	34	Tay Ninh	50
Bac Kan	3	Ha Giang	19	Lao Cai	35	Thai Binh	51
Bac Lieu	4	Ha Nam	20	Long An	36	Thai Nguyen	52
Ben Tre	5	Ha Noi	21	Nam Dinh	37	Thanh Hoa	53
Binh Dinh	6	Ha Tinh	22	Nghe An	38	Tien Giang	54
Binh Duong	7	Hai Duong	23	Ninh Binh	39	Tra Vinh	55
Binh Phuoc	8	Hai Phong	24	Ninh Thuan	40	TT-Hue	56
Binh Thuan	9	Hau Giang	25	Phu Tho	41	Tuyen Quang	57
BRVT	10	HCMC	26	Phu Yen	42	Vinh Long	58
Ca Mau	11	Hoa Binh	27	Quang Binh	43	Vinh Phuc	59
Can Tho	12	Hung Yen	28	Quang Nam	44	Yen Bai	60
Cao Bang	13	Khanh Hoa	29	Quang Ngai	45		
Da Nang	14	Kien Giang	30	Quang Ninh	46		
Dak Lak	15	Kon Tum	31	Quang Tri	47		
Dong Nai	16	Lai Chau	32	Soc Trang	48		

**Table A2 The list of Provincial Competitiveness Index (Sub-Institutions)**

Coding	Meaning
PCI <sub>1</sub> = Ent	Entry cost
PCI <sub>2</sub> =LRgt	Land access
PCI <sub>3</sub> =Tran	Transparency
PCI <sub>4</sub> = Rec	Time cost
PCI <sub>5</sub> =Inc	Informal Charges
PCI <sub>6</sub> = Plb	Policy bias (support state firms more than private firms)
PCI <sub>7</sub> = Pro	Proactivity
PCI <sub>8</sub> = Bss	Business support service
PCI <sub>9</sub> = Lbt	Labor training
PCI <sub>10</sub> = Lin	Legal institutions