Economies of Scale for Local Governance in the Northeast Region of Thailand*

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Abstract

This case study is set for two objectives. First, to test the hypothesis of economies of scale in local administration with a focus on the Northeast region of Thailand. We assume there are potentials gain from local amalgamation and that the benefit may outweigh costs of transformation. An econometric model is used to estimate the relationship of the cost of local public goods; specifically, i) staff per 1,000 population ii) personnel expenses relative to the population iii) service expenditure per population are treated as dependent variables and tested against a set of explanatory variables. The second objective is to obtain data on the progress of three local units in Ubon Ratchathani province that have planned to merge: Khamyai Tambon Municipality, Patum Tambon Municipality and Rainoi Sub-District Organization. We use quantitative and qualitative information from site visits and interviews with top administrators about the motivations, expectations, and process of amalgamation. The research findings show that increases in population size may lead initially to a reduction in local administrative organizations' costs, resulting in economies of scale; moreover, larger local administrative organizations may enjoy greater economies of scale than is the case for smaller local administrative organizations.

Keywords: Economies-of-scale, amalgamation process, citizenry referendum, local administration in Northeast Thailand

การประหยัดจากขนาดขององค์กรปกครองส่วนท้องถิ่นในภาคตะวันออกเฉียงเหนือ

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บทคัดย่อ

งานวิจัยเรื่องการประหยัดจากขนาดและศักยภาพในการควบรวมองค์กรปกครองส่วนท้องถิ่น ใช้วิธีวิจัยแบบผสมระหว่างเชิงปริมาณและเชิงคุณภาพ เพื่อศึกษาใน 2 วัตถุประสงค์หลักคือ 1) เพื่อ ทดสอบสมมติฐานการประหยัดจากขนาดในการบริหารท้องถิ่นในภาคตะวันออกเฉียงเหนือ งานวิจัยใช้ แบบจำลองเศรษฐมิติโดยให้ความสำคัญกับตัวชี้วัดต้นทุนและนำไปทดสอบข้อสันนิษฐานการประหยัด จากขนาด ประกอบด้วย ก) จำนวนบุคลากรต่อประชากรพันคน ข) รายจ่ายบุคลากรต่อประชากร ค) ค่าใช้จ่ายการจัดบริการประชาชนต่อจำนวนประชากร 2) เพื่อศึกษาข้อมูลการดำเนินการควบรวม ขององค์กรปกครองส่วนท้องถิ่นโดยศึกษากรณีการควบรวมองค์กรปกครองส่วนท้องถิ่นในจังหวัดอุบลราชธานี ซึ่งประกอบด้วย เทศบาลตำบลปทุม เทศบาลเมืองขามใหญ่ องค์การบริหารส่วนตำบลไร่น้อย ผลการศึกษา พบว่า หากองค์กรปกครองส่วนท้องถิ่นมีจำนวนประชากรมากขึ้นระดับหนึ่งอาจทำให้ค่าใช้จ่ายในการดำเนินงาน ต่อจำนวนประชากรลดลงในช่วงแรกและเกิดการประหยัดจากขนาด เมื่อองค์กรมีขนาดเหมาะสมจะ เกิดการประหยัดขนาด และค่าใช้จ่ายการจัดบริการต่อประชากรน้อยกว่าองค์กรขนาดเล็ก

คำสำคัญ: การประหยัดจากขนาด การควบรวม ประชามติ

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Introduction

There has long been an observation that hundreds of local administrative organizations in Thailand are too small in size, measurable by population, area under responsibility, and financial capacity to generate sufficient revenue for public service provision. This issue caught intense public attention when the National Reform Steering Assembly, (hereafter referred to as NRSA) formally proposed local amalgamation. The NRSA, which was appointed by the present Government after the coup d'état in 2014, proposed that small-size local administrative units should undergo a process of amalgamation. According to the NRSA proposal, those local units whose population are less than 7,000 people and whose financial revenue (before annual budgetary grant) was less than 20 million baht, would undergo amalgamation (The National Reform Steering Assembly, 2016). It is, however, unclear if the proposal is meant to be voluntary or compulsory. Nevertheless, the subject matter that NRSA proposed is highly interesting and worth serious consideration. In theory, local amalgamation is part of the public administrative reform that has the potential to generate social benefits from "economies-of-scale" (Oates, 1972). Previous studies in economically developed countries that underwent amalgamation process suggest there are potential gains from cost reduction from merging -- yet the results remain mixed. Cost reduction is highly possible in the category of wage and salary and personnel compensation. Meanwhile, Steiner et al. (2016) show that the most important outcomes associated with amalgamation reforms in European countries, are improved service quality and cost saving. Despite the potential benefits, there are opponents to local amalgamation. Since amalgamation could result in the number of council seats and local administrators being reduced, amalgamation local politicians may oppose the amalgamation plan. There are also concerns about job loss for government officials due to a reduction in number of "high ranking officer" like the department head, the relationship between citizens and local councils may also be diluted in larger organization. Furthermore, people participation in local affairs, such as voting, may be reduced when the organization is enlarged. According to Steiner et al. (2016), during amalgamation processes, the conflicts between small and large municipalities can be occurred.

This case study is set for two modest objectives. First, to test the hypothesis whether or not there exists economies-of-scale in local administration. Here, we shall limit the scope of the study to the Northeast region, Thailand. In the quantitative

section we use an econometric model as tool to estimate the relation between unit cost of staff and servicing against the set of explanatory variables. Second, we are interested in tracking "policy implementation", that is to say, we explore the process of amalgamation. At least three local units in Ubonrachathani Province have plans to merge. Even more so, they have submitted a formal proposal to the Ministry of Interior and are willing to follow the eleven steps to complete an amalgamation process. We are particularly interested in motivations and rationales for local merging from the bottom up. The local amalgamation requires a referendum prior to a formal approval by the Minister of Interior and a public announcement in the Royal Gazette.

Conceptual Framework and Institutional Context

Local amalgamation is not novel to the rest of the world – but in Thailand, local mergers are relatively new. Many advanced economies have undergone the process of local amalgamation before for different reasons. "Economies-of-scale" is frequently cited, which assumes that there exists an optimal scale of production or scale of operation for districts. Below the optimal scale, the unit cost is extremely high and inefficient; and beyond an optimal scale the unit cost has a tendency to increase as well and, again, inefficient. Another concept "returns to scale" is also often cited. It is related with production function, which may be written as $y = c\,L^a\,K^b$, where y = output, L and K are factor inputs (say, labor and capital), economies-of-scale does exist if a+b>1. When the scale of operations are enlarged, the total cost has a tendency to increase less than proportionally, and hence, the unit cost decreases.

Economies-of-scale is a widely known concept and commonly taught in economic and management classes. In the business world, owners or entrepreneurs normally dedicate their efforts to minimizing cost and the unit cost is commonly observed. Public agencies are however different from private enterprises because they are operating in different environments, and with different incentives, motivations, and remunerations. As a consequence, measuring economies-of-scale in practice is not an easy task. In advanced economies there are a number of studies on the subject of economies-of-scale in public organizations, including local governments. The results appear mixed. According to Allers and Geertsema (2016) Belgium underwent a process of merging 2359 municipalities to 596 in 1977. New Zealand restructured its local governments and the process reduced the number of local administrations from 230 units to 74 territorial local authorities in 1989. In 2003 Israel amalgamated 23 out of a total of 264 municipalities into 11 new municipalities. Denmark similarly reformed its local governments, and reduced the number

of municipalities from 270 to 98. In theory, larger size of local government may be able to attract 'capable' administrators and thus improve service level, usually by increasing the scale of local operations reduce spillovers, and from which promote allocative efficiency (Oates, 1972). On the other hand, some scholars argue that larger scale may increase agency and information costs. Furthermore, larger organization requires more planning, better monitoring and reporting system than smaller local units—suggesting that costs cannot be reduced as claimed. There are reports in case of Israel that found reduced spending in cases of Israel (Reingewertz, 2012) and Germany (Blesse & Baskarn, 2013)

Institutional Context

Local administrative organizations in Thailand are recognized in the Constitution. Municipality (M) and sub-district administrative organization (SAO) are grouped under "second-tier" local administrations. In the Northeast region alone, there are 2,947 units according to figures from the Department of Local Administration in FY2016. According to the Ministerial Rule, if different local units plan to merge they are required to undergo an amalgamation procedure which includes a statement of intent to supervisory agencies (district head or provincial governor, and higher office), and they are required to get consent from the people through a "citizen referendum" or "vote", after which is case will proceed to the Department of Local Administration, and finally to the Ministry of Interior prior to a public announcement in the Royal Gazette: essentially, a public announcement that local unit A will be amalgamated with local unit B, and that the properties of two agencies will be merged into one, the boundary area under responsibility will be rewritten and name of organization may be changed (or remain the same).

Policy study, explains why policy change can be time-consuming. In most cases, policy changes tend to be gradual and involve different phases. According to Dye (1978), the process includes: policy identification, development of a policy agenda, policy implementation, and policy evaluation. Regarding the topic of local amalgamation, the NRSA proposal implies that they identified a need for public reform, and explicitly propose that too small-sized local administrative units should be merged. The NRSA has been the leading agency that has brought case onto the "public agenda", with a meaning that there must be law amendment regarding the legitimate size of local administration. However the NRSA was abolished after the Constitution of B.E. 2560 (2017) came to effect. As a consequence, the next step, "policy implementation", must be carried out by other agencies. It remains unclear if the NRSA proposal suggested local amalgamation should be a voluntary or compulsory basis. If ones interpret the NRSA proposal strictly

that all local units whose population is less and 7,000 and their financial capability below a certain level (20 million baht) then over 4,000 units that are either municipalities or sub-district administrative organizations will have to undergo amalgamation in the Kingdom. 1,681 units are situated in the Northeast region (Patamasiriwat et al., 2018).

We assume that two agencies will be responsible for overseeing and supervising local administration will carry out the "policy implementation" phase of the NRSA proposal. Two agencies in question are the Department of Local Administration under Ministry of Interior and the National Decentralization Committee, which is comprised 36 members that represent government bureaucracy, local representative, academician and is chaired by Prime Minister or a representative of the Prime Minister. The NRSA proposal has been included as part of new law under the process of enactment as "collective codes of local administration".

To test the hypothesis of economies-of-scale there were two approaches the study considered using. The first approach estimates the marginal product against an increase in the scale of local operation. The second approach estimates the marginal cost against an increase in the scale of operation. After reviewing data and situation in Thai context, we opt for the latter approach on ground that cost or expense of local administration are observables and officially reported in the income-expenditure statement – it is difficult to measure (multiple) outputs with varying degree of quality in public services.

Equation 1: staff per 1,000 population
Equation 2: personnel expense per capita
Equation 3: service expense per capita

These dependent variables are to be tested against explanatory variables, which include population, density, per capita revenue, types of organization, and regional dummies

Empirical Evidence

Table 1 provides a bird eye's view of local administration in the Northeast region. Altogether there are 2,947 local units, largely consisted of sub-district administrative organizations (2,058 units) and sub-district municipalities or *tambon* municipalities (847 units). If we follow the recommendation made by the NRSA that local units with a population less than 7,000 should be amalgamated, then 1228 units of SAO and 453 units of *tambon* municipality would be obligated to undergo the amalgamation process.

Table 1. Local Administration in the Northeast Region and their basic statistics as of FY2016

Types of local administrative organization	Frequency (unit)	Population (person)	Area (sq.km.)	Revenue Own-revenue	Shared taxes
				(million baht)	
SAO*	2,058	6,883	61.72	1.03	16.96
nakorn municipality	5	103,182	42.96	183.28	418.78
muang municipality	37	24,844	20.59	31.35	89.09
tambon municipality	847	7,328	44.91	2.42	21.64
Total/average	2,947	7,400	56.34	2.12	19.89

Source: Department of Local Administration, Ministry of Interior (2016)*SAO denotes the sub-district administrative organization.

Next, we report an econometric estimate of the relationship to infer the economies of scale. The first equation refers to

As shown in Figure 1 with a mark by vertical line at 7,000 people, a large number of local administration will undergo the amalgamation process.
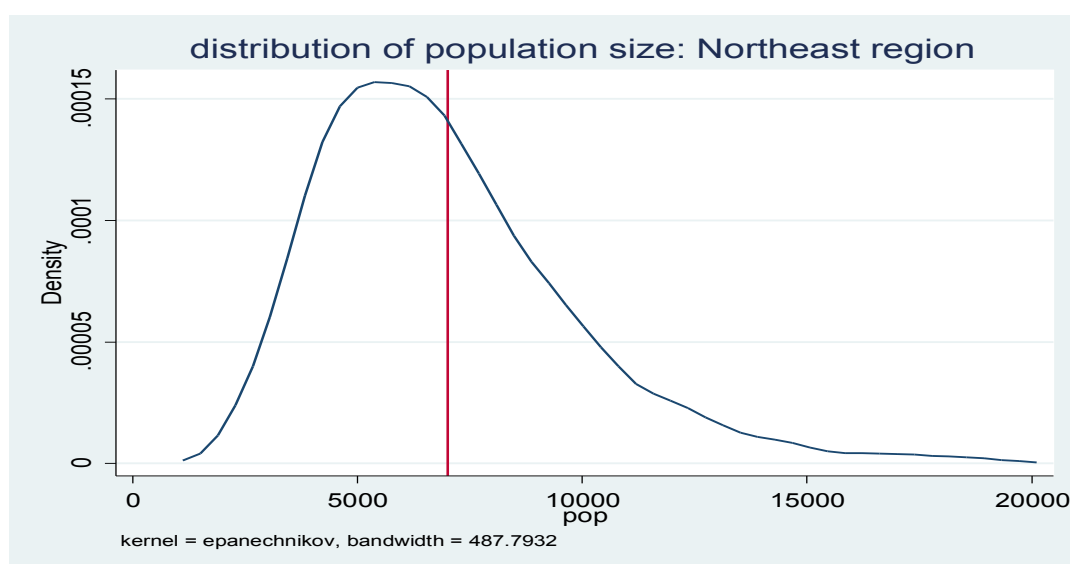

Figure 1. Distribution of Population in the Northeast Region Local Administration.

Table 2 reports a regression estimate of staff per 1,000 population as a dependent variable and test it against a set of explanatory variables. It is clear that the coefficient of population is negative and that of population squared positive sign and statistically significant—these coefficients lend support to an economies-of-scale hypothesis with a tendency that staff per 1,000 population will be downward sloping at least in the initial phase (small number of population)

Table 2. Regression Estimate: Staff per 1000 Population as Dependent Variable

```
. regress staffpop1000 pop100 pop100sq density selffin tao if reg==1

      Source |       SS           df       MS            Number of obs   =      2,947
-------------+----------------------------------         F(5, 2941)      =     604.78
       Model | 10184.9758          5   2036.99517        Prob > F        =     0.0000
    Residual | 9905.70253       2,941   3.36814095        R-squared       =     0.5070
-------------+----------------------------------         Adj R-squared   =     0.5061
       Total | 20090.6784       2,946   6.81964643        Root MSE        =     1.8352
```

```
 staffpop1000 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
--------------+----------------------------------------------------------------
       pop100 |  -.0378883   .0011199    -33.83   0.000    -.0400841   -.0356924
     pop100sq |    .000027   1.14e-06     23.72   0.000     .0000247    .0000292
      density |   .0015916   .0000781     20.38   0.000     .0014384    .0017447
      selffin |    .151716   .0103991     14.59   0.000     .1313258    .1721062
          tao |  -1.946425   .0808825    -24.06   0.000    -2.105017   -1.787833
        _cons |   8.718908   .1090207     79.97   0.000     8.505144    8.932673
```

```
. fitstat

Measures of Fit for regress of staffpop1000

Log-Lik Intercept Only:      -7009.948    Log-Lik Full Model:         -5967.970
D(2941):                     11935.939    LR(5):                       2083.957
                                          Prob > LR:                      0.000
R2:                              0.507    Adjusted R2:                    0.506
AIC:                             4.054    AIC*n:                      11947.939
BIC:                        -11558.366    BIC':                       -2044.015
```

Similarly the hypothesis of economies-of-scale is confirmed in Table 3, where staff expenditure per capita is a dependent variable and again in Table 4 with the service expenditure per capita as the dependent variable.

Table 3. Regression Estimate with Staff Expenditure per Capita as Dependent Variable.

```
. regress capxstaff pop100 pop100sq density selffin tao if reg==1
```

Source	SS	df	MS		
				Number of obs	= 2,947
				F(5, 2941)	= 436.28
Model	823283779	5	164656756	Prob > F	= 0.0000
Residual	1.1100e+09	2,941	377409.929	R-squared	= 0.4259
				Adj R-squared	= 0.4249
Total	1.9332e+09	2,946	656227.556	Root MSE	= 614.34

capxstaff	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
pop100	-11.77923	.3748726	-31.42	0.000	-12.51426	-11.04419
pop100sq	.0091524	.0003804	24.06	0.000	.0084065	.0098983
density	.4897156	.0261469	18.73	0.000	.4384474	.5409837
selffin	35.48063	3.481023	10.19	0.000	28.65514	42.30611
tao	-496.7886	27.07485	-18.35	0.000	-549.8761	-443.701
_cons	2667.992	36.49391	73.11	0.000	2596.436	2739.549

```
. fitstat
```

Measures of Fit for regress of capxstaff

Log-Lik Intercept Only:	-23917.558	Log-Lik Full Model:	-23099.951
D(2941):	46199.902	LR(5):	1635.215
		Prob > LR:	0.000
R2:	0.426	Adjusted R2:	0.425
AIC:	15.681	AIC*n:	46211.902
BIC:	22705.597	BIC':	-1595.272

Table 4. Regression Estimate with Service Expenditure per Capita as Dependent Variable.

```
. regress capxserv pop100 pop100sq density selffin tao if reg==1

      Source |       SS           df       MS      Number of obs   =     2,947
-------------+----------------------------------   F(5, 2941)      =    175.25
       Model |  1.0194e+09          5   203876271   Prob > F        =    0.0000
    Residual |  3.4214e+09      2,941  1163338.01   R-squared       =    0.2296
-------------+----------------------------------   Adj R-squared   =    0.2282
       Total |  4.4408e+09      2,946  1507385.75   Root MSE        =    1078.6


    capxserv |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      pop100 |  -8.583682   .6581578   -13.04   0.000    -9.874179   -7.293185
    pop100sq |   .0060481   .0006679     9.06   0.000     .0047385    .0073577
     density |   .6483884   .0459058    14.12   0.000     .5583778    .7383991
     selffin |    47.7362   6.111575     7.81   0.000      35.7528     59.7196
         tao |  -573.3683   47.53487   -12.06   0.000    -666.5733   -480.1634
       _cons |    2974.85   64.07176    46.43   0.000      2849.22     3100.48


. fitstat

Measures of Fit for regress of capxserv

Log-Lik Intercept Only:    -25142.957    Log-Lik Full Model:      -24758.695
D(2941):                    49517.389    LR(5):                       768.525
                                         Prob > LR:                     0.000
R2:                             0.230    Adjusted R2:                   0.228
AIC:                           16.807    AIC*n:                     49529.389
BIC:                        26023.084    BIC':                       -728.582
```

Graphical analysis are also displayed as shown in Figures 2-5 for municipalities and sub-district administrative organizations in the Northeast. Apparent from these figures is that the unit cost at initial phase (small size of population) is high, and the unit costs move downward when the scale of operation increased.
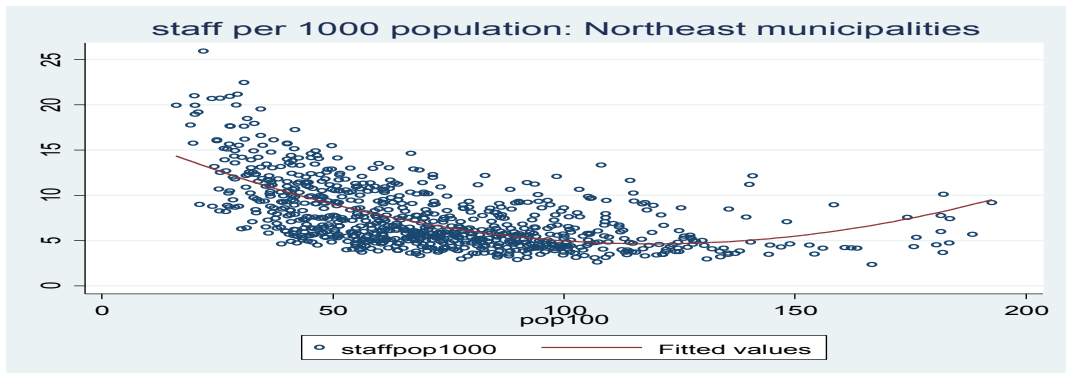
Figure 2. Staff per 1000 Population in the Case of Municipalities in Northeast.
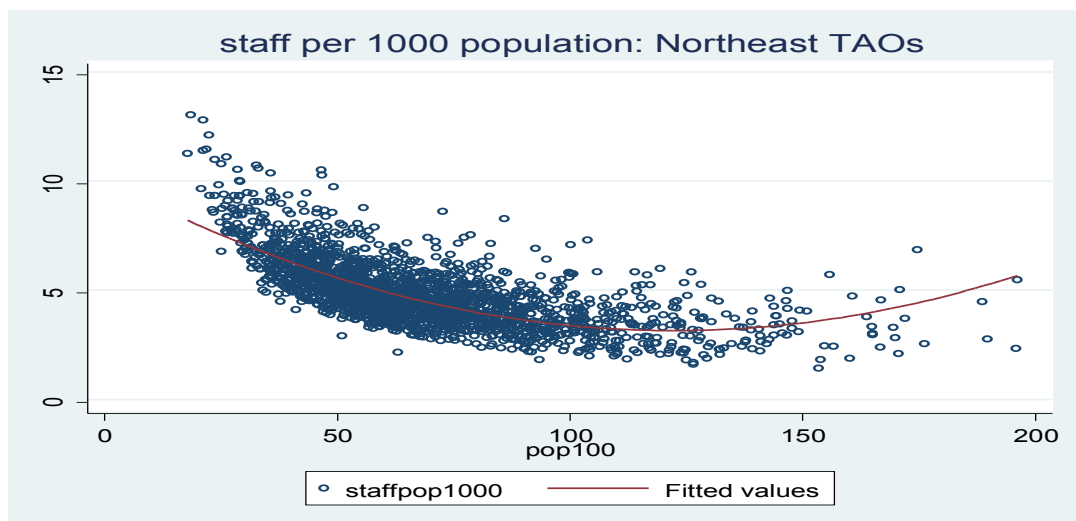

Figure 3. Staff per 1,000 Population in the Case of Sub-district Organization or *Tambon Administrative Organization (TOs)* in Northeast.

The evidence clearly indicates that small-sized measures of population result in high unit costs (measurable in terms of staff per 1,000 population and personnel expenditure per capita). In addition, costs tend to decrease noticeably once the population size is enlarged up to about 10,000 population.
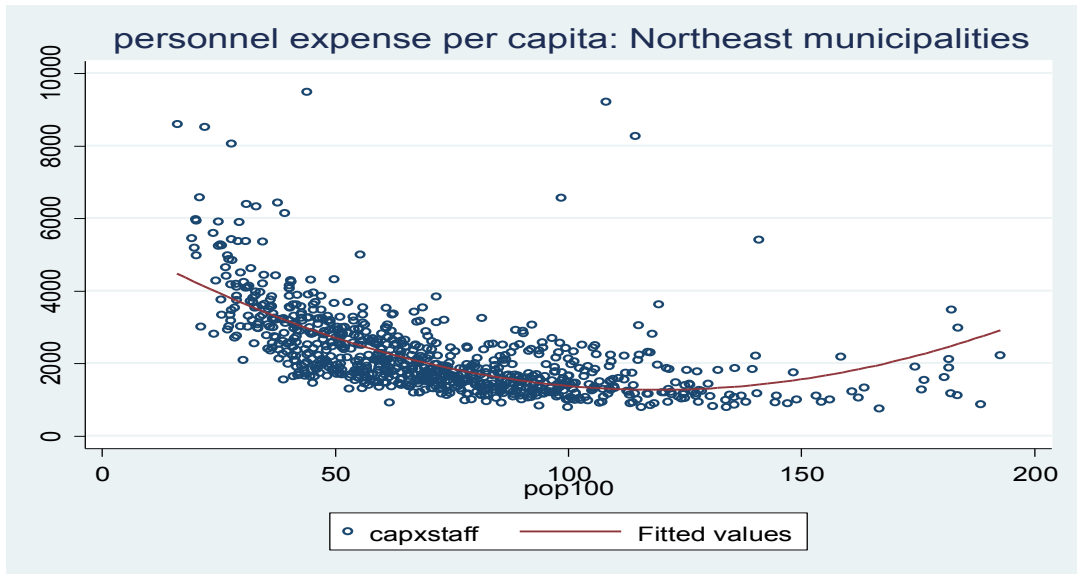
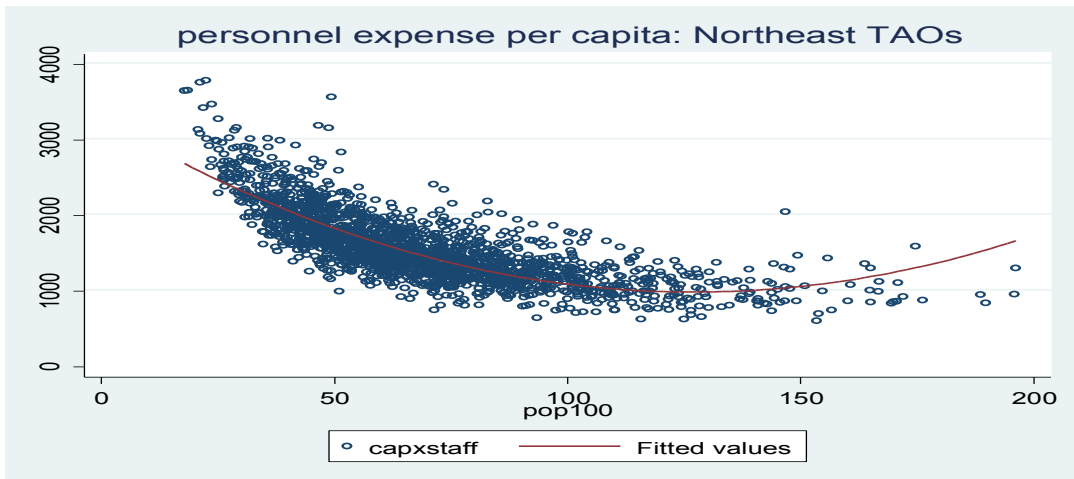**Figure 4.** Personnel Expense per Population in Case of Municipalities in Northeast.

Figure 5. Personnel Expense per Population in Case of Sub-district organization or *Tambon Administrative Organization (TAOs)* in Northeast.

The Process of Local Administrative Amalgamation in Thailand: The Case of Ubonratchathani

According the rules and regulations involving local amalgamation in Thailand, those local administrative units would have to proceed various steps and procedures, start from letter of intention to their respective supervisor (District Chief and Provincial Governor) before the goal accomplished with formal announcement in the Royal Gazette. The followings describe the steps that three administrative units in Ubonratchathani had undergone with specified dates to fully understand institutional process and cost of local amalgamation.

First step: All three local units submitted letter of intent to their respective supervisors (District Chief); this was all done by September 2017.

Second step: In November 2017, their supervisors responded by formally inform the procedures that the local administrative units had to undergo.

Third step: All three local administrators brought the case for amalgamation to their local councils and their proposals were consented; these were taken in February and March 2018.

Fourth step: All three local units informed of the consent by their local councils and requested their supervisors to set the plan and date for citizen survey (or referendum)

Fifth step: All three local units jointly met to determine new boundary map, logo and symbol of the new organization to be adopted after amalgamation. By March 2018, this step was completed.

Sixth step: In April 2018, their supervisors announced the date of referendum survey.

Seventh step: The referendum date was publicly announced in April 2018.

Eigth step: All local administration compiled the result of citizen survey to their supervisor by April 2018.

Ninth step: The district level supervisors submit the case for local amalgamation to the Provincial Governor, and the proceeded the case to the Ministry of Interior.

Tenth step: The Ministerial's legislative committee considered the case and passed on to the Minister of Interior. To the authors' understanding, all ten steps were passed.

Eleventh step: A formal announcement of local administrative amalgamtion by written document in the Royal Gazette—this is not yet done.
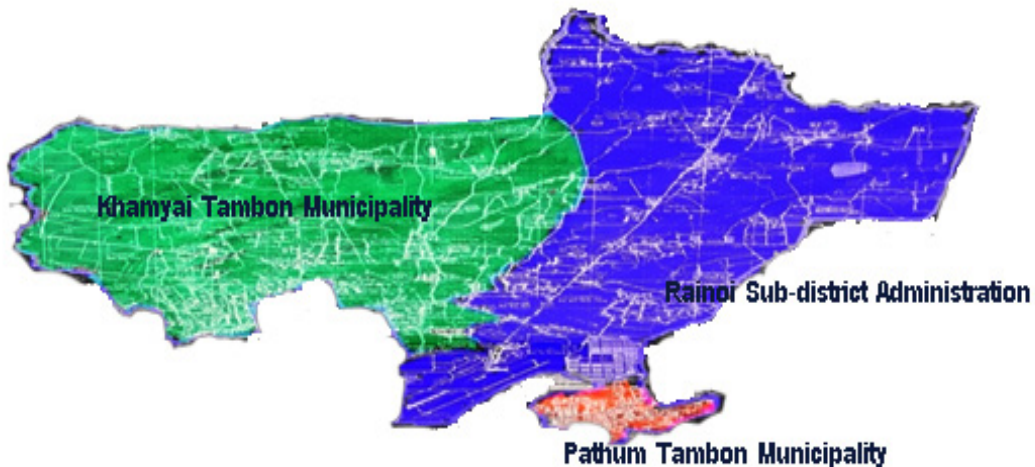
Figure 6. Map of Khamyai Tambon Municipality, Pathum Tambon Municipality, and Rainoi Sub-district Administration.

Amalgamation Process

The authors learned during their visit and from discussion with top administrators that there are ten steps that the local administrative organizations need to follow if they would like to amalgamate.

1)   A submission of intention and proposal to amalgamate to the supervisory level, e.g., district chief or provincial governor. In this case they had formally submitted an intention in September 2017;

2)   The district chief then informs all relevant units (in this case three) about the procedure to follow. The districts received a written document on 24 November 2017;

3)   The executives of all three units then make a proposal for approval from their Councils. This was completed in January-February 2018;

4)   All three local units then inform their district chiefs to conduct a survey of their citizens in the form of a referendum. This occurred in April 2018;

5)   Following the referendum, there was a joint meeting of all three local units to draft the operational plans, including mapping a new boundary area, coming up with a new name for the unit, and a logo to be used once amalgamation completed – tasks that were completed in March 2018;

6)   The referendum was conducted in March 2018 with District chiefs overseeing, the procedure follow the rules; So when was the referendum conducted March or April? Does it matter?

7)   All three local units submit the results of the referendum, with a majority voting in all three units agreeing with to the proposal to merge;

8)   District chiefs submit the reports and related documents to the Ubonratchathani Provincial Governor [not done as of yet];

9)   The committee in charge of law enactment under the Ministry of Interior will then consider the proposal and examine the documents and evidences it receives, after which a report will be drafted with recommendations to the Minister of Interior for approval and to be announced in the Ministerial Decree;

10) The last step is a formal announcement in the *Royal Gazette* with a statement that local units (......) will be merged, which means the transfer of property, personals, assets and liability, and change of boundary area.

Detailed information acquired from interviews with top administrators:

- Top administrators found it strategically beneficial to initiate the amalgamation process on their own rather than waiting from orders from above, because they are uncertain whether the amalgamation will be compulsory or voluntary.

- They believe that amalgamation will help increase efficiency, save costs, and strengthen their financial capacity. Crucially, they also believe it will increase their bargaining power (Documents Or Bor 54501/38 Tambon Khamyai Municipality.

- They anticipate further urbanization in their area and they have observed the establishment of new properties (e.g., housing, apartment) in their territory.

- Wastewater management is connected between the three municipalities. Water flows from Rainoi and Khamyai, with problems concentrated in Pathum. Top administrators argue that wastewater management is best done jointly, rather than separately.

- Differences in quality of public services are also apparent. Top administrators mentioned that Ubon Nakorn municipality has more capacity to perform its functions. Amalgamation among themselves would boost the chance for services to reach the same quality as "Nakorn municipality."

- At present they can handle small- or medium sized projects, but not "big ones" due to financial limitations. By merging, the financial capabilities will be enhanced and "big" projects can be undertaken

- They realize that the "national" politicians play an important role in helping local administration, especially through the use the of persuasion power with the Government or bureaucratic agencies. Through merging they see a chance to contact with "higher level" politicians and increase their bargaining power.

- The administrators also believe the becoming a bigger organization will enhance "organizational reputation" and "image"; they mentioned about a transfer of public school (from the Ministry of Education) to local administration. In Khamyai area, there are 12 public schools but only one belongs to the local administration, the rest are under the Ministry of Education. In Rainoi area there are nine public schools but none belong to the local administration. In Pathum there are two public schools, neither of which belongs to local administration. The whole area consists of 23 public schools, only one of which belongs to local administration (Khamyai)

Concluding Notes

This case study highlights two important findings. First, from econometric cost estimate and the graphical analysis, it is clear that there is economies-of-scale, suggesting that small-sized local administrations have higher unit cost than their larger counterparts. This lends support to local amalgamation, at least from an analytical viewpoint. Yet this does not necessarily mean that amalgamation will be a certainty. Although new opportunities are open which lower the cost of some items, and could increase efficiency, there is resistance to change from those who could potentially lose their job and position. Second, up to now, there has been no case of local amalgamation in the Northeast region report — yet, there is at least one attempt to merge. The illustrated case of the three local units is interesting and rather surprising because all three units are not "small-sized" as recommended by NRSA, but they voluntarily agreed to merge as they see opportunities and benefits to merging. They submitted the plan according to the rules set by the Ministry of Interior. Thus far the majority of citizens have voted in favor of amalgamation, and the case has now proceeded to the Ministry of Interior already. Meanwhile, they realize that there are adverse impacts for government officer and local politician. For example, after the merger, position of Municipal Clerk from each local administrative organization must be reduced to just one position. The number of council members decreased. Thus, it may reasonable for government to provide special compensation to those who are adversely affected from local amalgamation.

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Appendix:

Table A1. List of small-sized local administration in the Northeast region and they are also in the national list of 500 smallest-sized local units.

Name of Local Administrative Organization	Name of Province	Population (person)	Area (sq.km.)
Nongkae tambon municipality (ทต.หนองแก)	Khon Kaen	1604	2.50
Nongbua sub-district organization (อบต.หนองบัว)	Sakon Nakhon	1773	24.00
Sangpha sub-district organization (อบต.แสงภา)	Loei	1840	165.86
Makha tambon municipality (ทต.มะค่า)	Nakhon Ratchasima	1912	4.80
Meuangti tambon municipality (ทต.เมืองที)	Surin	1965	4.90
Sanjaopor tambon municipality (ทต.ศาลเจ้าพ่อ)	Nakhon Ratchasima	2000	2.37
Nahaeo tambon municipality (ทต.นาแห้ว)	Loei	2004	115.50
Nongbuakok tambon municipality (ทต.หนองบัวโคก)	Chaiyaphum	2005	2.71
Sai-or sub-district organization (อบต.สายออ)	Nakhon Ratchasima	2070	23.51
Thali tambon municipality (ทต.ท่าลี่)	Loei	2084	5.00
Naphung sub-district organization (อบต.นาพึง)	Loei	2103	126.00
Sakaew sub-district organization (อบต.สระแก้ว)	Buri Ram	2109	30.30
Sakaew tambon municipality (ทต.สระแก้ว)	Khon Kaen	2113	36.69
Khoyai sub-district organization (อบต.ค้อใหญ่)	Roi Et	2179	17.02
Amnat tambon municipality (ทต.อำนาจ)	Amnat Charoen	2196	4.40
Ladkang sub-district organization (อบต.ลาดค่าง)	Loei	2227	86.54
Naka sub-district organization (อบต.นาเข)	Nakhon Phanom	2245	27.08
Nasaard sub-district organization (อบต.นาสะอาด)	Udon Thani	2302	25.50
Kudjik sub-district organization (อบต.กุดจิก)	Nakhon Ratchasima	2330	4.00
Wangpho sub-district organization (อบต.วังโพธิ์)	Nakhon Ratchasima	2356	26.00
Laokohok sub-district organization (อบต.เหล่ากอหก)	Loei	2362	118.00
Meuangkong tambon municipality (ทต.เมืองคง)	Nakhon Ratchasima	2367	3.15
Noncom tambon municipality (ทต.โนนคอม)	Khon Kaen	2393	17.38
Chumphonburi tambon municipality (ทต.ชุมพลบุรี)	Surin	2430	1.50
Sungkom sub-district organization (อบต.สังคม)	Nong Khai	2440	72.00
Khumyai sub-district organization (อบต.คำใหญ่)	Kalasin	2464	31.00
Kamcha ee sub-district organization (ทต.คำชะอี)	Mukdahan	2479	13.00
Sumrongthab tambon municipality (ทต.สำโรงทาบ)	Surin	2492	4.00
Khumbok sub-district organization (อบต.คำบก)	Mukdahan	2498	31.00
Tallian sub-district organization (อบต.ตาลเลียน)	Udon Thani	2505	58.00
Srithat sub-district organization (อบต.ศรีธาตุ)	Udon Thani	2510	28.00
Nongbualai tambon municipality (ทต.หนองบัวลาย)	Nakhon Ratchasima	2529	3.03
Wongsawan tambon municipality (ทต.วังสวรรค์)	Khon Kaen	2534	57.00

Table A1. List of small-sized local administration in the Northeast region and they are also in the national list of 500 smallest-sized local units (continued).

Name of Local Administrative Organization	Name of Province	Population (person)	Area (sq.km.)
Hadsaikao sub-district organization (อบต.หาดทรายขาว)	Loei	2553	34.08
Chanod tambon municipality (ทต.ชะโนด)	Mukdahan	2555	11.00
Pannanikom tambon municipality (ทต.พรรณานิคม)	Sakon Nakhon	2558	1.54
Tungkratadpatthana sub-district organization (อบต.ทุ่งกระตาดพัฒนา)	Buri Ram	2584	19.45
Nafai sub-district organization (อบต.นาฝาย)	Khon Kaen	2594	29.00
Saithong sub-district organization (อบต.ทรายทอง)	Kalasin	2596	38.00
Huaytaptan sub-district organization (อบต.ห้วยทับทัน)	Si Sa Ket	2607	28.02
Kongyang sub-district organization (อบต.โค้งยาง)	Nakhon Ratchasima	2618	4.40
Khorat sub-district organization (อบต.โคราช)	Nakhon Ratchasima	2620	7.20
Khowang sub-district organization (อบต.ค้อวัง)	Yasothon	2623	9.80
Phrathat sub-district organization (อบต.พระธาตุ)	Roi Et	2630	26.94
Nikomprasat tambon municipality (ทต.นิคมปราสาท)	Surin	2635	12.12
Banlueam sub-district organization (อบต.บ้านเหลื่อม)	Nakhon Ratchasima	2635	33.75
Nakham sub-district organization (อบต.นาคำ)	Yasothon	2641	30.00
Kutchik tambon municipality (ทต.กุดจิก)	Nakhon Ratchasima	2656	5.92
Banniwet tambon municipality (ทต.บ้านนิเวศน์)	Roi Et	2677	2.36
Puwong tambon municipality (ทต.ภูวง)	Mukdahan	2684	38.00
Samhnong tambon municipality (ทต.สามหนอง)	Amnat Charoen	2702	23.22
Dongbung sub-district organization (อบต.ดงบัง)	Mahasarakham	2704	23.16
Dontan tambon municipality (ทต.ดอนตาล)	Mukdahan	2714	4.50
Khampom sub-district organization (อบต.ขามป้อม)	Ubon Ratchathani	2727	23.00
Waeng tambon municipality (ทต.แวง)	Roi Et	2731	52.00
Nongbua sub-district organization (อบต.หนองบัว)	Loei	2737	162.59
Kokthong sub-district organization (อบต.กกทอง)	Loei	2740	64.00
Si tambon municipality (ทต.สิ)	Si Sa Ket	2747	11.20
Banbak tambon municipality (ทต.บ้านบาก)	Roi Et	2753	18.31
Naduang sub-district organization (อบต.นาด้วง)	Loei	2757	51.38
Phusing tambon municipality (ทต.ภูสิงห์)	Kalasin	2763	35.60
Waritchaphum tambon municipality (ทต.วาริชภูมิ)	Sakon Nakhon	2770	4.00
Phana tambon municipality (ทต.พนา)	Amnat Charoen	2771	2.80
Thasala sub-district organization (อบต.ท่าศาลา)	Loei	2774	183.41
Bandankhongjeam tambon municipality (ทต.บ้านด่านโขงเจียม)	Ubon Ratchathani	2780	2.00
Thepsiri sub-district organization (อบต.เทพคีรี)	Nong Bua Lam Phu	2781	25.88