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MODIFIED LQ AND DYNAMIC ECONOMIC BASE

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ABSTRAK

Basis ekonomi merupakan konsep penting dalam perencanaan pembangunan daerah. Makalah ini terdiri dari tiga bagian; teori, alat analisis dan studi kasus dari basis ekonomi daerah. Pertama, kita meninjau teori dan langkah-langkah empiris berbagai basis ekonomi. Location Quotient (LQ) umumnya digunakan dalam karya-karya empiris dalam perencanaan ekonomi daerah yaitu basis ekonomi. Kedua, kita menunjukkan beberapa kekurangan dalam LQ sebagai alat analisis untuk basis ekonomi. Berdasarkan karya Vollrath (1991), Laursen (1998) dan Dalumn et al (1998), Wörz (2005), kami mengusulkan versi modifikasi dari LQ, yaitu simetris LQ (SLQ), yang cocok untuk menganalisis spesialisasi dinamis menggunakan ekonometrik model. Ketiga, kami menerapkan alat analisis untuk menganalisis dinamika basis ekonomi dalam kasus kabupaten/kota di Daerah Istimewa Yogyakarta, Indonesia.

Kata kunci: Symmetric Location Quotient, Dynamic Economic Base. JEL Classification: R10; R11, R12.

ABSTRACT

Economic Base is an important concept in the regional development planning. This paper consists of three parts; theory, analytical tool and case studies of regional economic base. Firstly, *we review the theory and various empirical measures of economic base. Location Quotient (LQ) is commonly used in the empirical works in regional economic planning i.e. economic base.* Secondly, *we point out some shortcomings in LQ as an analytical tool for economic base. Based on works of Vollrath (1991), Laursen (1998) and Dalumn et al (1998), Wörz (2005), we propose a modified version of LQ, namely symmetric LQ (SLQ), which is suitable for analyzing dynamic specialization using econometric models.* Thirdly, *we apply the analytical tool to analyze the dynamics of economic base in the cases of districts in Special Region of Yogyakarta, Indonesia*.

Key words: *Symmetric Location Quotient, Dynamic Economic Base. JEL Classification: R10; R11, R12.*

INTRODUCTION

Research attempting to know base sector in a region is important to be done, especially for knowing what better sector which one will be chose as a superior sector. It is caused that almost countries in all over the world choose uneven development strategy because of resource lack. The uneven development strategy has elected as rational option. After knowing and understanding which the nicest sector become base sector (leading sector), an action needs to be done. The fact shows that there is a change in factors indicating economic growth among territory and environment change; it is labor indicator. Labor indicator, such as a change in productivity pay (productive wage) and unemployment, becomes the main measuring instrument as used on origin Location Quotient (LQ) measurement experience. Market liberalization, one thing that induces on labor market, changes economic environment. It makes territorial bounds get blur. Therefore, the criterions assuming existence region bounds get sharp criticisms.

This paper aims to review the concept and empirical measures of district/municipality/province comparative advantage (specialization). Location Quotient (LQ) is commonly implemented to analyze the comparative advantage of districts/municipalities/provinces. Based on works of Vollrath (1991), Laursen (1998) and Dalumn et al (1998), Wörz (2005), this paper propose a modified version of LQ, namely Symmetric Location Quotient (SLQ), which is suitable for analyzing the dynamic specialization of districts/municipalities/provinces. The modified version is applied to analyze the dynamic specialization of districts/municipalities in the specific region of Yogyakarta (DIY) and provinces in Indonesia. This paper consists of five parts. Part two describes briefly literature review on the theory of economic Base. Part three presents various empirical measures of economic Base. In Part four, we propose an analytical tool of economic Base, namely SLQ. Part five describes the application of the analytical tool. Finally, several conclusions are presented in Part 6.

MUNICIPALITY/DISTRICT COMPARATIVE ADVANTAGE: GRAPHICAL REPRESENTATION

Suppose that there are two municipalities A and B. Let us assume there is an increasing marginal cost in production. This assumption is represented by the concavity[1] of PPF. Suppose two municipalities A and B have production possibility frontiers (PPF) and community indifference curves[2] (CICs) shown by Panels (a) and (b) in Figure 1. Let us denote P_X and P_Y are prices of X and Y. The autarky equilibriums of production and consumption are at point E_A with the relative prices $(P_X/P_Y)_A$ in the case of the municipality A and at E_B with the relative prices $(P_X/P_Y)_B$ in the case of the municipality B. In Figure 2, $(P_X/P_Y)_A$ is higher than $(P_X/P_Y)_B$, the municipality A will specialize in Y, while the municipality B will specialize in X[3]. Both municipalities A and B can gain from trade with applying possible terms of trade (TOT_{Int}): $(P_X/P_Y)_B \leq TOT_{Int} \leq (P_X/P_Y)_A$. With this TOT_{Int}, both countries A and B could reach higher CICs. It is clearly shown that the autarky equilibriums are determined by PPF and CIC. The volume of trade is shown by the shaded triangles.

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[1] The function f is concave if $f(\bar{x}) \geq \alpha f(x') + (1-\alpha) f(x'')$ where $\bar{x} = \alpha x' + (1-\alpha)x''$ and $\alpha \in [0,1]$. It is strictly concave if the strict inequality holds when $\alpha \in [0,1]$ (Hoy *et al.*,1996).

[2] Community utility function shows the aggregate individuals' utilities into social utilities. There are some examples such as purely Utilitarian type, CIC=uL+uK; non-symmetric Utilitarian type, CIC= β_1uL+ β_2uK; Maximin or Rawlsian type, CIC=Min{uL,uK}; Generalized utilitarian type; CIC= f_1(uL)+ f_2(uK), where f_1 and f_2 are concave functions; Constant elasticity type, $CIC = \left(uL^{1-\rho} + uK^{1-\rho}\right)^{\frac{1}{1-\rho}}$ for $\rho \neq 1$ and CIC=ln(uL)+ln(uK) for $\rho=1$. See Mas-Colell *et al.* (1995) for detailed explanation.

[3] This price ratio also represents individual country's comparative advantage. The assumption of perfect competition markets implies that price equals marginal cost (MC). Therefore, the expression $(px/py)_A > (px/py)_B$ can also be presented as:
$(MC_x/MC_y)_A > (MC_x/MC_y)_B$ or
$((wL * MP_L^x + wK * MP_K^x)/(wL * MP_L^y + wK * MP_K^y))_A > ((wL * MP_L^x + wK * MP_K^x)/(w$
. Where wL and wK are prices of Labor and Capital, respectively; MP_L and MP_K are marginal products for Labor and Capital, respectively. Country A has comparative advantage in product y and country B has comparative advantage in product x.

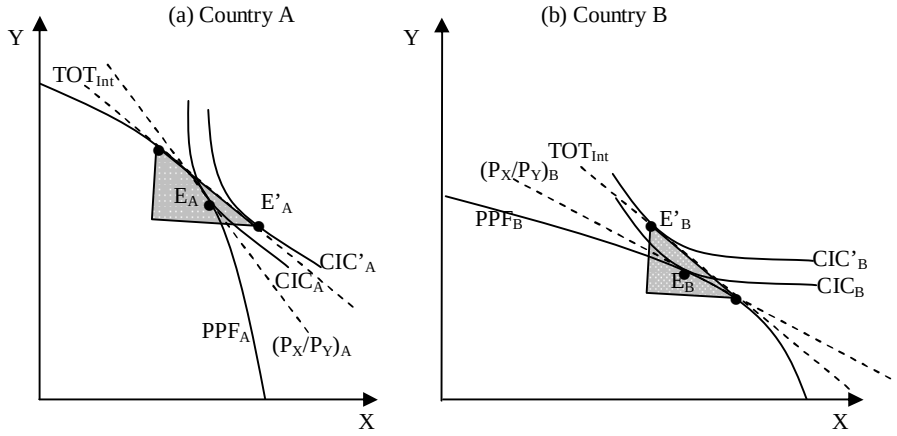

Figure 1. District/Municipality Specialization

A municipality's comparative advantage might change due to the changes in supply and demand sides in both the municipalities' domestic itself and other municipalities' (international) markets. The supply side is related to PPF; while, the demand side is related to community preferences. On this matter, Echevarria (2008) finds that in the long run, comparative advantage is driven by total factor productivity (TFP) differential. This explains the fact that less developed countries are likely to export primary commodities even though they are not less capital-intensive. In addition, non-homothetic preferences imply fewer countries export only or mostly primary commodities as the global economy develops.

To describe dynamic comparative advantage, let us suppose a small municipality (as price taker in international market, consequently) uses its available inputs labor (L) and capital (K) to produce competing outputs X (*labor-intensive* good) and Y (*capital-intensive* good). Let us assume the municipality is relatively a labor-abundant municipality. In addition, the municipality has a production possibility frontier (PPF) and a community indifference curve (CIC), as depicted by PPF_0 and CIC_0 in Figure 2, respectively. The international term of trade is $(P_X/P_Y)_{Int}$. The initial equilibriums in both production and consumption are at points A and B, respectively. The volume of international trade is depicted by the triangle ABC i.e. exports of X (quantity: CA) for the imports of Y (quantity: CB).

With economic growth, the PPF shifts outward, allowing the municipality to choose different production combinations of X and Y. The various new possible equilibriums in production are located within the regions fixed by the mini-axes drawn through the original production equilibrium at point A. If the new equilibrium in production lies on the straight line 0P, the economic growth is *product-neutral*, since productions of the export good and the import competing good have increased in the same rate. If the new equilibrium lies in region I_P, it is *protrade-biased* (reflecting the relatively greater availability of the export good); in region II_p, it is *ultra-protrade-biased*; in region III_P, it is *antitrade-biased* (reflecting the relatively greater availability of the import-competing good); and in the region IV_P, it is *ultra-antitrade-biased* (Appleyard and Field, 2001).

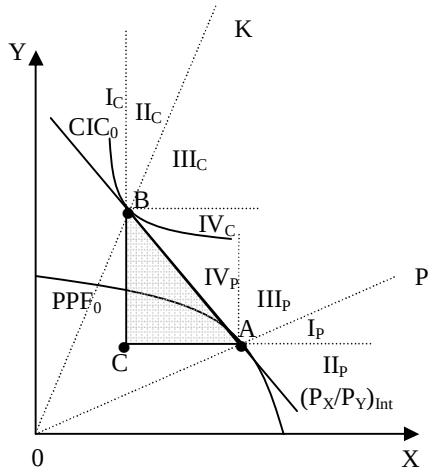

Figure 2. Equilibriums in Production and Consumption

In addition, the economic growth will also affect the consumption equilibrium. The consumption effect of growth on trade can be isolated by the mini-axes whose origin is at initial consumption equilibrium B. If the new equilibrium point is on the straight line 0K, consumption of both goods X and Y will increase proportionally and the consumption trade effect will be *neutral*. If the new consumption equilibrium point falls in region I_C, it is *a pro-trade consumption* effect; in region II_C, it is an *ultra-protrade consumption* effect; in region III_C, it is an *anti-trade consumption* effect; and in region IV_C, it is *ultra-antitrade consumption* effect (Appleyard and Field, 2001). The changes in either PPF or CIC are basically sources of the dynamics in districts/municipalities' comparative advantage.

SYMMETRIC LQ AND DYNAMIC SPECIALIZATION

Economic Base Models

Tiebout (1962) mentions that base economic model its posses many problem: 1) Improper in measurement unit purpose, 2) Irrelevancies (imprecise) in identification sector. 3) Poor assumption for base ratio stability/ service (base and not base). 4) Considerate deep problems in times lag.

Measurement Unit problem

Generally, economic base measurement utilizes total employment because employment variable is a target of planner (increase laboring absorption). Employment used to be a proxy of economy activity in common. Income and production will evoke two problems: a) changing in number employment on bass sector does not figure distinctive deep wage rate on difference sector. Then, an increase in income will increase local consumption expenditure until it creates higher multiplier effect (Keynes type). b) Employment often cannot detect economy expansion because of a change in technology that cannot detect an increase in expenditure relative to an increase in employment, particularly, if it happens in innovating on laboring savings balance condition (on balance labor saving).

There are several remedial to the weakness of employment such as using total reward (pay-roll) to purpose measuring instrument to identify base sector. There is a benefit of using pay-roll in accordance with employment level. We can do analysis of distinctive fix effect estimation on distinctive effect industry of deep wage rate. But then, pay-roll does not detect the effect of the difference on non pay (non-wage). For example, property income or transfer income (transfer payment) that gets role in push multiplier effect. Total sales can also use as supplementary employment, but it will evoke double extrapolation (double counting) intercompany. Leven (1956) advises a value added purpose (Value added), as an analogy of original national income (national income originating) to remove double extrapolation and also good in measuring income non pay. Wilson (1955) utilizes the income

payment to measure base sector. In his study at Tucson (Arizona) shows that comparable multiplier as familiar as employment purpose.

Problem Identifies to Sector

Second problem is to identify base sector and sector which is not base (service), therefore economist solves it with five ways: **1st method:** Assuming that base industry (sector) is regular (given) (Hoyt 1933). Assume that industrial sector, mining, and agricultural are base sector, and another traditional service sectors are non base. Its problem is inaccurate assumption (e.g. food manufacture, print shop and publication, often get local orientation). Besides, financial service and the other flanks (as insurance and banking) often service more market outer intemperate territorial. The benefit of this method is quick and a bargain. **2nd method:** Purpose *`Location Quotient* `or *`Coefficient of Specialization`*, that is formulated as follows:

$$LQ_{ij} = \left(GDRP_{ij} / GDRP_{in}\right) / \left(GDRP_{rj} / GDRP_{rn}\right)$$

where LQ_{ij} represents location quotient (comparative advantage) of municipality/district *i* for sector/subsector *j*; and $GDRP_{ij}$ denotes value of Gross Domestic Regional Product (GDRP) of municipality/district *i* sector/sub-sector *j*. Following Vollrath (1993) defines subscript *r* to all municipalities/districts except municipality/district *i*, and subscript n refers to all sectors/subsectors except sector/subsector *j*. The values of the index vary from 0 to infinity ($0 \leq LQ_{ij} \leq \infty$). If the value of LQ_{ij} is greater than one, It means that municipality/district *i* has comparative advantage in sector/subsector j. In contrast, if the value of is LQ_{ij} less than one, it implies that municipality/district *i* has comparative disadvantage in sector/subsector *j*. WE assume that overproduction will be exported out of region. This method has benefits. It can measure direct export and also indirect export.

There are weaknesses of using LQ. LQ has implicit assumption of uniform pattern consumption and national production. LQ assumes that productivity is same for whole nation. Then, LQ is assumed that there are no international exports and import (closed economy). The last, LQ is assumed that local requisition is to be accomplished by local production. It is also not happening "cross-hauling".

3rd method , Ulman and Decey (1960) introduce a method called Minimum requirement technical (MRT). MRT requires full scale of employment on fourteen employment category. Employment unit purposed upon MRT means that the region gets export orientation strategy. The weakness of this method is uniform assumption pattern of consumption and production among territorial. Eventually, each region has to export, but does not do import. Greytak (1969) evaluates LQ and MRT. The result of his evaluating shows that there is a systemic error. In conclusion, MRT` is better appealed than LQ, but both of them are not good at measuring the current condition. to

4th method : Regression analysis (Hilderbrand and Mace 1950) (Thomson 1959) (Sasaki 1963) (Weiss and Goading 1969). This method assumes that local employment (Et) is logistic linear from total lag employment (Et*i.*, *i*=0, 1, 2, 3). It also prescribes exogenous exports employment (Eb), its estimation equation is:

$$E_{t0} = a_0 + a_1 E_{t-1} + a_1 E_{t-2} + a_1 E_{t-3} + a_1 E_b + u$$
$$, \quad a>0$$

Last, 5th **method:** Interview method by going to firm (Alexander 1953). It has expensive cost although it is more accurate because firms have precious data.

Stabilization problem on base sector and non base and Considerate Problem

In long term ratio, the constant assumption of sector base/non base will not accurate, since import substitution within territorial grows. In-stabilization of base ratio or non succeeding base is known as "shift share analysis". The economic growth in national level will induce economy spatial dispersion. It also shifts from the bigger region to smaller region.

Considerate problem will happen because base ratio or non base may not become on balance zoom and it maybe will be fitting. Walter Isard (1960) says that the concept of economic multiplier base is right (valid), but it just shows short-run phenomenon. The weaknesses of the concepts of multiplier base sector are: a) Multiplier is determined by total local goods

production used as input goods for export. b) Keynesian Multiplier defined as current local income and custom consumption c) There is an aforesaid thing that should be remembered. Multiplier average the base sector as a whole that cannot be applied to another sector.

From LQ to Symmetric LQ

In this sub-section, we present our analytical tool, namely Symmetric Location Quotient (SLQ) which is only a simple decreasing monotonic transformation of Location Quotient (LQ); it is formulated as follows[4]:

$$LQ_{ij} = \left(GDRP_{ij} / GDRP_{in}\right) / \left(GDRP_{rj} / GDRP_{rn}\right) \quad (1)$$

where LQ_{ij} represents location quotient (comparative advantage) of municipality/district i for sector/subsector j; and $GDRP_{ij}$ denotes value of Gross Domestic Regional Product (GDRP) of municipality/district i sector/sub-sector j. Following Vollrath (1993), we define subscript r to all municipalities/districts except municipality/district i, and subscript n refers to all sectors/subsectors except sector/subsector j. The values of the index vary from 0 to infinity ($0 \leq LQ_{ij} \leq \infty$). If the value of LQ_{ij} is greater than one, it means that the municipality/district i has comparative advantage in sector/subsector j. In contrast, if the value of LQ_{ij} is less than one, it implies that municipality/district i has comparative disadvantage in sector/subsector j.

Since LQ_{ij} turns out to produce values that cannot be compared on both sides of one, following Dalum *et al* (1998) and Laursen (1998) we propose a modified version of LQ, namely Symmetric Location Quotient (SLQ) index, which is formulated as follows:

$$SLQ_{ij} = \left(LQ_{ij} - 1\right) / \left(LQ_{ij} + 1\right) \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

The values of SLQ_{ij} index can vary from minus one to one (or $-1 \leq SLQ_{ij} \leq 1$). If the value of SLQ_{ij} is greater than zero, it implies that municipality/district i has comparative advantage in sector/subsector j. In contrast, if the value of SLQ_{ij} is less than zero, it implies that municipality/district i has comparative disadvantage in sector/subsector j.

Dynamics of Specialization

Following Dalum *et al*., 1998; Laursen, 1998; and Wörz, 2005, we propose a simple econometric model (1) to examine the dynamics of municipality/district specialization:

$$SLQ_{ij,T} = \alpha + \beta\ SLQ_{ij,0} + \varepsilon_{ij} \quad \ldots.(3)$$

where $SLQ_{ij,T}$ and $SLQ_{ij,0}$ are symmetric location quotient index of municipality/district i in sector/subsector j for years T and 0, respectively, and ε_{ij} denotes white noise error term[5]. The value of coefficient β shows whether the existing municipality/district specialization has been reinforced or not during the observation (Dalum *et al*., 1998; Laursen, 1998; and Wörz, 2005). In the case of β is not significantly different from one ($\beta=1$), there is no change in the overall trade specialization. In the case that $\beta>1$, it indicates that there is an increase in specialization. Finally, $0<\beta<1$ indicates the de-specialization –it means that a municipality/district has gained comparative advantage in sectors/subsectors where it do not specialize and loss competitiveness in those other sectors/subsector where it was initially heavily specialized. In the event of $\beta \leq 0$, no reliable conclusion can be drawn on purely statistical grounds; the specialization pattern is either random, or it has been reversed.

To measure dynamic change in specialization among territorial municipality, sector's city and squire, and subsector, therefore,

[4] In international trade, this formula is similar with Revealed Comparative Advantage (RCA) index by Balassa (1965: $\mathrm{RCA}_{ij} = \left(x_{ij} / x_{in}\right) / \left(x_{rj} / x_{rn}\right)$ where RCA_{ij} stands for revealed comparative of country i for group of products (SITC) j and x_{ij} denotes total exports of country i in group of products (SITC) j. Subscript r represents all countries without country i, and subscript n refers all groups of products (SITC) except group of product j. The index represents a comparison of national export structure (the numerator) with the world export structure (the denominator). The values of the index vary from 0 to infinity ($0 \leq RCA_{ij} \leq \infty$). RCA_{ij} greater than 1 implies that country i has comparative advantage in group of products j. In contrast, RCA_{ij} less than 1 means that country i has comparative disadvantage in product j.

[5] White noise means that the error terms fulfill all the classical regression assumptions. Error terms are normally independently distributed (NID) with zero mean (0) and constant variance (σ^2) i.e. $\varepsilon_{ij} \sim \mathrm{NID}(0, \sigma^2)$.

we will change on equation 3 such as:

$$SLQ_{ij,T} = \alpha + \phi SLQ_{ij,0} + \sum_{i=1}^{m} \gamma_i (D_i^m SLQ_{ij,0}) + \sum_{j=1}^{s} \delta_j (D_j^s SLQ_{ij,0}) + \varepsilon_{ij} \quad (4)$$

where $SLQ_{ij,T}$ and $SLQ_{ij,0}$ are symmetric location quotient index of municipality/district *i* in sector/subsector *j* for years T and 0, respectively, and ε_{ij} denotes white noise error term[6]. Coefficient γ_i is dummy's coefficient to municipality/city, D_i^m is dummy variable for municipality and city of municipality/city until municipality/city for amount municipality and city a number 5, which is:

$$D_1^m = \begin{cases} 1 = Kulonprogo \\ 0 = Otherwise \end{cases}$$

$$D_2^m = \begin{cases} 1 = Bantul \\ 0 = Otherwise \end{cases}$$

$$D_3^m = \begin{cases} 1 = Gunungkidul \\ 0 = Otherwise \end{cases}$$

$$D_4^m = \begin{cases} 1 = Sleman \\ 0 = Otherwise \end{cases}$$

Hereafter, δ_j is dummy variable for sector and sub-sector from sector j until with sector s for sector's amount and sector's sub to amount to 47, that is:

$$D_1^s = \begin{cases} 1 = Sector1 \\ 0 = Otherwise \end{cases}$$

.....etc……..

$$D_{46}^s = \begin{cases} 1 = Sector46 \\ 0 = Otherwise \end{cases}$$

For equation 4 above, variable β are the summation of coefficients ($\beta = \phi + \gamma_i + \delta_j$) **.** To test statistically whether β equals one or not, we apply the Wald test. The statistic of the test is formulated as follows[7]:

$$F_W = \frac{\left(R^2_{UR} - R^2_R\right)}{\left(1 - R^2_{UR}\right)} \frac{n-k}{m} \quad \text{.....5)}$$

where R^2_{UR} and R^2_R are the coefficients of determination of the unrestricted regression and the restricted regression, respectively[8]; n is the number of observations (data); k is the number of coefficients (including constant), and m is the number of restrictions. The statistic (ratio) F_W is distributed by following the *F* distribution with m and n-k degree of freedom.

For the econometric model (3), by following several researchers, such as Dalum *et al.* (1998), Laursen (1998) and Wörz (2005), we have noted some shortcomings of LQ index, especially when it is applied in an econometric model for analyzing municipality/district dynamic comparative advantages. *First*, LQ is basically not comparable on both side of unity since the index ranges from zero to infinity. A municipality/district is said not to be specialized in a given sector/subsector if the index varies from zero to one. In contrast, a municipality/district is said to be specialized in a given sector/subsector if the index ranges from one to infinity. *Second*, if LQ is used in estimating the econometric model, one might obtain biased estimates. LQ has disadvantage of an inherent risk of lack of normality. A skewed distribution violates the assumption of normality of the error term in regression analysis, thus not providing reliable inferential statistic. *Third*, the use of LQ in regression analysis gives much more weight to values above one, when compared to observation below unity.

EMPIRICAL RESULTS

To show the empirical relevance of the modified version of LQ, namely SLQ, and the econometric model, we apply them to scrutinize the dynamic specialization in the case of municipalities/districts in the special region of Yogyakarta, Indonesia.

Data

We employ data on Gross Domestic Regional Product (GDRP) by sub-sector from the

[6] White noise means that the error terms fulfill all the classical regression assumptions. Error terms are normally independently distributed (NID) with zero mean (0) and constant variance (σ^2) i.e. $\varepsilon_{ij} \sim NID(0, \sigma^2)$.

[7] See Intriligator *et al*. (1996) for the detailed explanation about the Wald coefficient restrictions test.

[8] The Wald test calculates the test statistic by estimating the unrestricted regression (subscript UR) and the restricted regression (subscript R)- without and with imposing the coefficient restrictions specified by the null hypothesis, H_o. The hypothesis are H_o:β=1 and H_o:β≠1. The Wald statistic measures how close the unrestricted estimates come to satisfying the restriction under the null hypothesis. If the restrictions are in fact true, then the unrestricted estimates should come close to satisfying the restrictions.

Indonesian Statistic Bureau (*Badan Pusat Statistik*, BPS). The data that is utilized to test LQ measurement method and SLQ is cross section data. The data that is utilized on year 2004 and 2008 at municipalities/districts/city that is on provincial area at Yogyakarta region. Data used is Gross of Product Domestic Regional (PDRB) according to industrial origin (sector), by using year 2000 as the constant price. Meanwhile, sectors analyzed to be base are divided into a sector and subsector commensurate with the data published by Center of Statistical Bureau (BPS). Total sector and standard sector sub publication by BPS are as much forty seven main sectors and its subsectors.

Municipalities/Districts Comparative Advantage

The observation result by using of LQ count model and SLQ can be seen in table 1 and table 2. The results by using LQ and SLQ are consistent. LQ method can figure the comparison between region and national (in example at LQ attachment table Yogyakarta City financial sector year 2008 up to 50). SLQ method has a benefit. It has a poised scale among -1 until with 1. It makes us easy to read, even though we only need to group among sector base and be not base.

Measurement result by using of LQ and SLQ method , period 2004 until 2008, shows that there is not a shifting between compartments regions (Municipality/city) to national (Province). Based on table 2, we can see that there is a shifting happened in among sector at each region. In Kulonprogo Municipality, there are only these subsectors shifting; those are: 1) Services allied Communication, 2) Bank, and 3) Non-Bank Financial Institution. In Bantul Municipality, there are only these subsectors shifting; those are: 1) Livestock & its Product, 2) Non-Oil and Gas Manufacturing, 3) Electricity, 4) Road Transportation, and 5) Non-Bank Financial Institution. Gunungkidul Municipality on at only subsector 1) Service allied Communication. In Sleman Municipality, there are only these subsectors shifting; those are: 1) Estates, and 2) Electricity. In Yogyakarta City, there is only this subsector shifting. This is "Other Government services".

Based on table 2 , we can see what dominant sectors in each municipality are. Kulonprogo Municipality is dominant in several sectors. Those are :a) agricultural , b) Mining and Quarrying, c) Manufacturing Industry, d) Transportation and Communication, e) Financial Ownership and Business Service, and f) Services. The dominant sectors in Bantul Municipality are : a) Agricultural, b) Mining and Quarrying, and c) Manufacturing industry. The dominant sectors in Gunungkidul Municipality are : a) Agricultural sector, and b) Mining & Quarrying**.** The dominant sectors in Sleman Municipality are : a) Manufacturing industry, b) Construction, c) Trade Hotel and Restaurant, d) Financial Ownership and Business, and e) Services. Meanwhile, the dominant sectors in Yogyakarta City are : a) Electricity, b) Gas and Water supply, c) Construction, d) Trade Hotel & Restaurant, e) Transportation and Communication, f) Financial Ownership and Business Service, and g) Service. In general, it can be conclude that Yogyakarta province still has economy pattern that lies on to primary sector, except for Yogyakarta City.

Dynamics of Municipalities/Districts Specialization

Table 3 shows the result of dummy variable of municipality region/city and dummy sector. Dummy variables utilized are DDK for Kulonprogo, DDB for Bantul, DDG for Gunungkidul, DDS for Sleman, and Yogyakarta's City as bench mark. Dummy variable of sector is DD1 until DD46 and sector forty seven as a bench mark. Based on table 3, we can see that there are only few variables detected to be significant. Those are variable SLQ04, DD6 (sector 6 which is fishery), DD7 (mining and quarrying), DD10 (quarrying), DD14 (electricity, gas & water supply), DD17 (water supply), DD33 (service allied to communication), and DD43 (other government service).

Based on table 4 and 5, we can see the dynamic LQ's mapping result, period 2004 until 2008 on municipality/city at Yogyakarta's provincial area. In general, there are only few sectors that tend to be specialization. The first one is agricultural sector in Municipality Bantul, Gunungkidul, and Sleman. The second one is construction sector that show an indication

specialization for all municipality/city. The last is transportation and communication sector that also show a trend of specialization for all municipalities and city, except Yogyakarta. Based on the mapping result, it can be concluded that there is a specialization trend in municipality in Yogyakarta that leads economic growth.

CONCLUSIONS

This paper discusses the theory, empirical measures and case studies of municipality/district specialization (comparative advantage). We have made a modified version of LQ, namely SLQ which is suitable for analyzing the dynamics of municipality/district specialization by using an econometric model. We also have employed the index and econometric model in the case of municipalities/districts in the special region of Yogyakarta. The result shows that all municipalities/districts perform de-specialization, instead of specialization as the theory suggests.

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Table 1
Sector (Industrial Origin) Base and Non Base 2004 and 2008
Via SLQ count (Symmetric Location Quotient)
in DI Yogyakarta

Industrial Origin	Kulon progo		Bantul		Gunung kidul		Sleman		Yogya-karta City	
	2004	2008	2004	2008	2004	2008	2004	2008	2004	2008
1. Agriculture	**0.21**	**0.22**	**0.17**	**0.18**	**0.45**	**0.46**	**-0.05**	**-0.06**	**-0.95**	**-0.97**
a. Food Crops	0.13	0.13	0.25	0.24	0.40	0.43	-0.01	-0.03	-1.00	-1.00
b. Estates	0.61	0.66	0.06	0.01	0.13	0.12	0.01	-0.02	-0.99	-0.99
c. Livestock and Its Product	0.38	0.38	-0.01	0.08	0.44	0.45	-0.11	-0.14	-0.75	-0.83
d. Forestry	0.39	0.44	-0.69	-0.63	0.89	0.87	-0.92	-0.92	-1.00	-1.00
e. Fishery	0.13	0.06	-0.30	-0.37	-0.04	-0.13	0.57	0.65	-0.91	-0.98
2. Mining and Quarrying	**0.11**	**0.19**	**0.22**	**0.20**	**0.64**	**0.55**	**-0.41**	**-0.22**	**-0.98**	**-0.99**
a. Crude Petrolium and Natural Gas	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
b. Non Oil and Gas Mining	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
c. Quarrying	0.11	0.19	0.22	0.20	0.64	0.55	-0.41	-0.22	-0.98	-0.99
3. Manufacturing Industry	**0.02**	**0.06**	**0.17**	**0.11**	**-0.15**	**-0.13**	**0.07**	**0.09**	**-0.16**	**-0.15**
a. Oil and Gas manufacturing	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
b. Non Oil dan Gas Manufacturing	0.02	0.06	0.17	0.11	-0.15	-0.13	0.07	0.09	-0.16	-0.15
4. Electrisity, Gas & Water Supply	**-0.23**	**-0.21**	**-0.03**	**-0.03**	**-0.34**	**-0.31**	**-0.05**	**-0.01**	**0.30**	**0.25**
a. Electrisity	-0.24	-0.22	0.01	-0.01	-0.35	-0.33	-0.02	0.02	0.26	0.23
b. City Gas	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
c. Water Supply	-0.08	-0.02	-0.44	-0.40	-0.20	-0.07	-0.46	-0.39	0.61	0.52
5. Construction	-0.29	-0.34	0.04	0.15	**-0.04**	**-0.09**	**0.14**	**0.11**	**-0.08**	**-0.10**
6. Trade, Hotels & restaurant	**-0.12**	**-0.11**	**-0.04**	**-0.04**	**-0.20**	**-0.20**	**0.04**	**0.04**	**0.15**	**0.13**
a. Wholesale and Retail Trade	0.28	0.28	0.04	0.04	0.10	0.10	-0.12	-0.11	-0.14	-0.14
b. Hotels	-1.00	-0.99	-0.73	-0.72	-0.91	-0.90	0.32	0.27	0.48	0.51
c. Restaurant	-0.71	-0.71	-0.02	-0.03	-0.46	-0.49	0.10	0.13	0.29	0.27
7. Transport & Communication	**0.02**	**0.01**	**-0.22**	**-0.23**	**-0.21**	**-0.21**	**-0.35**	**-0.35**	**0.47**	**0.48**
a. Transportation	0.16	0.17	-0.11	-0.12	-0.07	-0.05	-0.28	-0.28	0.28	0.27
1) Railway Transportation	-0.27	-0.17	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	0.96	0.95
2) Road Transportation	0.27	0.28	0.01	0.00	0.04	0.07	-0.17	-0.17	-0.01	-0.03
3) Sea Transportation	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
4) Inland Water Transportation	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
5) Air Transportation	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	1.00	1.00
6) Service Allied to Transportation	-0.40	-0.41	-0.15	-0.09	-0.15	-0.17	-0.26	-0.26	0.46	0.44
b. Communication	-0.58	-0.61	-0.55	-0.51	-0.69	-0.73	-0.54	-0.51	0.80	0.79
1) Pos & Telecommunication	-0.55	-0.73	-0.57	-0.52	-0.79	-0.81	-0.58	-0.55	0.83	0.82
2) Service Allied to Communication	-1.00	0.09	-0.41	-0.40	0.00	-0.13	-0.11	-0.15	0.46	0.38
8. Financial, Ownership&Bussiness Serv	**-0.22**	**-0.21**	**-0.23**	**-0.25**	**-0.39**	**-0.37**	**0.09**	**0.09**	**0.31**	**0.30**
a. Bank	0.05	-0.03	-0.07	-0.23	-0.11	-0.09	-0.30	-0.36	0.33	0.45
b. Non Bank Financial Institution	-0.03	0.02	0.03	0.14	-0.27	-0.30	0.02	0.02	0.12	0.03
c. Service Allied to Financial	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-0.73	-0.77	0.95	0.96
d. Building Rental	-0.31	-0.30	-0.31	-0.33	-0.48	-0.46	0.18	0.21	0.30	0.27
e. Business Servive	-0.42	-0.42	-0.46	-0.43	-0.46	-0.50	-0.31	-0.33	0.66	0.66
9. Services	**0.02**	**0.02**	**-0.16**	**-0.15**	**-0.14**	**-0.14**	**0.02**	**0.02**	**0.16**	**0.15**
a. General Government	0.10	0.10	-0.14	-0.11	-0.02	-0.02	-0.04	-0.04	0.10	0.08
1) Government Adm&Defence	0.10	0.11	-0.14	-0.11	-0.02	-0.02	-0.04	-0.04	0.10	0.08
2) Other Government Services	-1.00	0.08	-1.00	-0.11	-1.00	-0.01	-1.00	-0.04	-1.00	0.09
b. Private	-0.23	-0.23	-0.23	-0.23	-0.49	-0.50	0.15	0.14	0.28	0.29
1) Social & Community Services	-0.05	-0.05	-0.06	-0.04	-0.54	-0.55	-0.06	-0.08	0.34	0.34
2) Amussement&Recreatiaon Serv	-0.37	-0.34	-0.20	-0.33	-0.39	-0.34	-0.17	-0.17	0.50	0.52
3) Personal & Household	-0.46	-0.46	-0.47	-0.47	-0.46	-0.48	0.38	0.37	0.17	0.18
Total										

Table 2
Sector (Industrial Origin) Base and Non Base 2004 and 2008
Via SLQ count (Symmetric Location Quotient)
in DI Yogyakarta

Industrial Origin	Kulon progo		Bantul		Gunung kidul		Sleman		Yogya-karta City	
	2004	2008	2004	2008	2004	2008	2004	2008	2004	2008
1. Agriculture	**Base**	**Base**	**Base**	**Base**	**Base**	**Base**	-	-	-	-
a. Food Crops	Base	Base	Base	Base	Base	Base	-	-	-	-
b. Estates	Base	Base	Base	Base	Base	Base	Base	-	-	-
c. Livestock and Its Product	Base	Base	-	Base	Base	Base	-	-	-	-
d. Forestry	Base	Base	-	-	Base	Base	-	-	-	-
e. Fishery	Base	Base	-	-	-	-	Base	Base	-	-
2. Mining and Quarrying	**Base**	**Base**	**Base**	**Base**	**Base**	**Base**	-	-	-	-
a. Crude Petrolium and Natural Gas	-	-	-	-	-	-	-	-	-	-
b. Non Oil and Gas Mining	-	-	-	-	-	-	-	-	-	-
c. Quarrying	Base	Base	Base	Base	Base	Base	-	-	-	-
3. Manufacturing Industry	**Base**	**Base**	**Base**	**Base**	-	-	**Base**	**Base**	-	-
a. Oil and Gas manufacturing	-	-	-	-	-	-	-	-	-	-
b. Non Oil dan Gas Manufacturing	Base	Base	-	Base	-	-	Base	Base	-	-
4. Electrisity, Gas & Water Supply	-	-	-	-	-	-	-	-	**Base**	**Base**
a. Electrisity	-	-	Base	-	-	-	-	Base	Base	Base
b. City Gas	-	-	-	-	-	-	-	-	-	-
c. Water Supply	-	-	-	-	-	-	-	-	Base	Base
5. Construction	-	-	Base	Base	-	-	**Base**	**Base**	-	-
6. Trade, Hotels & restaurant	-	-	-	-	-	-	**Base**	**Base**	**Base**	**Base**
a. Wholesale and Retail Trade	Base	Base	Base	Base	Base	Base	-	-	-	-
b. Hotels	-	-	-	-	-	-	Base	Base	Base	Base
c. Restaurant	-	-	-	-	-	-	Base	Base	Base	Base
7. Transport & Communication	**Base**	**Base**	-	-	-	-	-	-	**Base**	**Base**
a. Transportation	Base	Base	-	-	-	-	-	-	Base	Base
1) Railway Transportation	-	-	-	-	-	-	-	-	Base	Base
2) Road Transportation	Base	Base	Base	-	Base	Base	-	-	-	-
3) Sea Transportation	-	-	-	-	-	-	-	-	-	-
4) Inland Water Transportation	-	-	-	-	-	-	-	-	-	-
5) Air Transportation	-	-	-	-	-	-	-	-	Base	Base
6) Service Allied to Transportation	-	-	-	-	-	-	-	-	Base	Base
b. Communication	-	-	-	-	-	-	-	-	Base	Base
1) Pos & Telecommunication	-	-	-	-	-	-	-	-	Base	Base
2) Service Allied to Communication	-	Base	-	-	Base	-	-	-	Base	Base
8. Financial, Ownership&Bussiness Serv	-	-	-	-	-	-	**Base**	**Base**	**Base**	**Base**
a. Bank	Base	-	-	-	-	-	-	-	Base	Base
b. Non Bank Financial Institution	-	Base	Base	-	-	-	Base	Base	Base	Base
c. Service Allied to Financial	-	-	-	-	-	-	-	-	Base	Base
d. Building Rental	-	-	-	-	-	-	Base	Base	Base	Base
e. Business Servive	-	-	-	-	-	-	-	-	Base	Base
9. Services	**Base**	**Base**	-	-	-	-	**Base**	**Base**	**Base**	**Base**
a. General Government	Base	Base	-	-	-	-	-	-	Base	Base
1) Government Adm&Defence	Base	Base	-	-	-	-	-	-	Base	Base
2) Other Government Services	-	Base	-	-	-	-	-	-	-	Base
b. Private	-	-	-	-	-	-	Base	Base	Base	Base
1) Social & Community Services	-	-	-	-	-	-	-	-	Base	Base
2) Amussement&Recreatiaon Serv	-	-	-	-	-	-	-	-	Base	Base
3) Personal & Household	-	-	-	-	-	-	Base	Base	Base	Base
Total										

Table 3. Estimation Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.004284	0.009547	0.448672	0.6542
SLQ04*	0.952271	0.058434	16.29655	0.0000
DDK	0.045546	0.073223	0.622023	0.5347
DDB	0.074900	0.073704	1.016225	0.3109
DDG	0.063182	0.071935	0.878318	0.3809
DDS	0.055483	0.073163	0.758349	0.4492
DD1	0.001184	0.043494	0.027215	0.9783
DD2	0.009821	0.065623	0.149663	0.8812
DD3	0.050939	0.044728	1.138862	0.2562
DD4	0.008292	0.039183	0.211612	0.8326
DD5	-0.030033	0.033231	-0.903753	0.3673
DD6*	0.131269	0.048768	2.691728	0.0078
DD7*	-0.216853	0.092980	-2.332261	0.0208
DD8	-0.007765	0.017927	-0.433136	0.6654
DD9	-0.007765	0.017901	-0.433786	0.6650
DD10*	-0.216853	0.093499	-2.319309	0.0215
DD11	-0.225315	0.120075	-1.876444	0.0622
DD12	-0.007765	0.017891	-0.434014	0.6648
DD13	-0.225315	0.120622	-1.867938	0.0634
DD14*	-0.084183	0.031971	-2.633122	0.0092
DD15	-0.058800	0.025728	-2.285390	0.0234
DD16	-0.007765	0.017974	-0.432012	0.6662
DD17*	-0.184024	0.066836	-2.753362	0.0065
DD18	0.153783	0.113646	1.353174	0.1777
DD19	-0.032430	0.045757	-0.708740	0.4794
DD20	-0.018932	0.045733	-0.413977	0.6794
DD21	-0.016975	0.021692	-0.782554	0.4349
DD22	0.029639	0.024334	1.218011	0.2248
DD23	0.028795	0.029499	0.976138	0.3303
DD24	0.018424	0.026234	0.702290	0.4834
DD25	-0.020701	0.021029	-0.984412	0.3262
DD26	0.032555	0.036521	0.891407	0.3739
DD27	-0.007765	0.017974	-0.432019	0.6662
DD28	-0.007765	0.018014	-0.431053	0.6669
DD29	-0.007765	0.018033	-0.430598	0.6673
DD30	0.012720	0.056434	0.225389	0.8219
DD31	-0.003368	0.039071	-0.086206	0.9314
DD32	0.042657	0.078974	0.540146	0.5898
DD33*	-0.922940	0.220206	-4.191259	0.0000
DD34	-0.028027	0.041605	-0.673648	0.5014
DD35	0.201707	0.128312	1.572004	0.1177
DD36	0.137758	0.061300	2.247289	0.0258
DD37	-1.21E-05	0.020757	-0.000581	0.9995
DD38	-0.009835	0.036135	-0.272186	0.7858
DD39	0.003630	0.046673	0.077781	0.9381
DD40	-0.058326	0.059709	-0.976842	0.3299
DD41	-0.102445	0.070991	-1.443062	0.1507
DD42	-0.055809	0.104127	-0.535972	0.5926
DD43*	-0.989550	0.039687	-24.93361	0.0000
DD44	0.006501	0.018245	0.356289	0.7220
DD45	0.018027	0.022562	0.799020	0.4253
DD46	-0.012326	0.113327	-0.108763	0.9135

R-squared	0.972161	Mean dependent var	-0.231082
Adjusted R-squared	0.964402	S.D. dependent var	0.504660
S.E. of regression	0.095216	Akaike info criterion	-1.672885
Sum squared resid	1.659092	Schwarz criterion	-0.907359
Log likelihood	248.5640	F-statistic	125.3030
Durbin-Watson stat	2.060680	Prob(F-statistic)	0.000000

Di	Industrial Origin
1	**1. Agriculture**
2	a. Food Crops
3	b. Estates
4	c. Livestock and Its Product
5	d. Forestry
6	e. Fishery
7	**2. Mining and Quarrying**
8	a. Crude Petrolium and Natural Gas
9	b. Non Oil and Gas Mining
10	c. Quarrying
11	**3. Manufacturing Industry**
12	a. Oil and Gas manufacturing
13	b. Non Oil dan Gas Manufacturing
14	**4. Electrisity, Gas & Water Supply**
15	a. Electrisity
16	b. City Gas
17	c. Water Supply
18	**5. Construction**
19	**6. Trade, Hotels & restaurant**
20	a. Wholesale and Retail Trade
21	b. Hotels
22	c. Restaurant
23	**7. Transport & Communication**
24	a. Transportation
25	1) Railway Transportation
26	2) Road Transportation
27	3) Sea Transportation
28	4) Inland Water Transportation
29	5) Air Transportation
30	6) Service Allied to Transportation
31	b. Communication
32	1) Pos & Telecommunication
33	2) Service Allied to Communication
34	**8. Financial, Ownership&Bussins Serv**
35	a. Bank
36	b. Non Bank Financial Institution
37	c. Service Allied to Financial
38	d. Building Rental
39	e. Business Servive
40	**9. Services**
41	a. General Government
42	1) Government Adm&Defence
43	2) Other Government Services
44	b. Private
45	1) Social & Community Services
46	2) Amussement&Recreatiaon Serv
47	3) Personal & Household
	DDK = D Kulonprogo
	DDB = D Bantul
	DDG = D Guningkidul
	DDS = D Sleman

Note: We apply Newey-West HAC Standard Errors & Covariance (lag truncation=4) to deal with autocorrelation and heteroscedaticity problems.

Table 4
Value of Coefficient β on Dummy's Variable
Sector and Sub sector at Municipality/City
in Yogyakarta's Province Region
2004-2008

Industrial Origin	Kulon progo	Bantul	Gunung kidul	Sleman	Yogya karta
1. Agriculture	1.00	**1.03**	**1.02**	**1.01**	0.95
a. Food Crops	1.01	1.04	1.03	1.02	0.96
b. Estates	1.05	1.08	1.07	1.06	1.00
c. Livestock and Its Product	1.01	1.04	1.02	1.02	0.96
d. Forestry	0.97	1.00	0.99	0.98	0.92
e. Fishery	1.13	1.16	1.15	1.14	1.08
2. Mining and Quarrying	0.78	0.81	0.80	0.79	0.74
a. Crude Petrolium and Natural Gas	0.99	1.02	1.01	1.00	0.94
b. Non Oil and Gas Mining	0.99	1.02	1.01	1.00	0.94
c. Quarrying	0.78	0.81	0.80	0.79	0.74
3. Manufacturing Industry	0.77	0.80	0.79	0.78	0.73
a. Oil and Gas manufacturing	0.99	1.02	1.01	1.00	0.94
b. Non Oil dan Gas Manufacturing	0.77	0.80	0.79	0.78	0.73
4. Electrisity, Gas & Water Supply	0.91	0.94	0.93	0.92	0.87
a. Electrisity	0.94	0.97	0.96	0.95	0.89
b. City Gas	0.99	1.02	1.01	1.00	0.94
c. Water Supply	0.81	0.84	0.83	0.82	0.77
5. Construction	**1.15**	**1.18**	**1.17**	**1.16**	**1.11**
6. Trade, Hotels & restaurant	0.97	0.99	0.98	0.98	0.92
a. Wholesale and Retail Trade	0.98	1.01	1.00	0.99	0.93
b. Hotels	0.98	1.01	1.00	0.99	0.94
c. Restaurant	1.03	1.06	1.05	1.04	0.98
7. Transport & Communication	**1.03**	**1.06**	**1.04**	**1.04**	0.98
a. Transportation	1.02	1.05	1.03	1.03	0.97
1) Railway Transportation	0.98	1.01	0.99	0.99	0.93
2) Road Transportation	1.03	1.06	1.05	1.04	0.98
3) Sea Transportation	0.99	1.02	1.01	1.00	0.94
4) Inland Water Transportation	0.99	1.02	1.01	1.00	0.94
5) Air Transportation	0.99	1.02	1.01	1.00	0.94
6) Service Allied to Transportation	1.01	1.04	1.03	1.02	0.96
b. Communication	0.99	1.02	1.01	1.00	0.95
1) Pos & Telecommunication	1.04	1.07	1.06	1.05	0.99
2) Service Allied to Communication	0.07	0.10	0.09	0.08	0.03
8. Financial, Ownership&Bussiness Serv	0.97	1.00	0.99	0.98	0.92
a. Bank	1.20	1.23	1.22	1.21	1.15
b. Non Bank Financial Institution	1.14	1.16	1.15	1.15	1.09
c. Service Allied to Financial	1.00	1.03	1.02	1.01	0.95
d. Building Rental	0.99	1.02	1.01	1.00	0.94
e. Business Servive	1.00	1.03	1.02	1.01	0.96
9. Services	0.94	0.97	0.96	0.95	0.89
a. General Government	0.90	0.92	0.91	0.91	0.85
1) Government Adm&Defence	0.94	0.97	0.96	0.95	0.90
2) Other Government Services	0.01	0.04	0.03	0.02	-0.04
b. Private	1.00	1.03	1.02	1.01	0.96
1) Social & Community Services	1.02	1.05	1.03	1.03	0.97
2) Amussement&Recreatiaon Serv	0.99	1.01	1.00	1.00	0.94
3) Personal & Household	1.00	1.03	1.02	1.01	0.95
Total					

Table 5
Value of Coefficient β on Dummy's Variable
Sector and Sub sector at Municipality/City
in Yogyakarta's Province Region
2004-2008

Industrial Origin	Kulon progo	Bantul	Gunung kidul	Sleman	Yogya karta
1. Agriculture	DE-	**SPECLZ**	**SPECLZ**	**SPECLZ**	DE-
a. Food Crops	SPECLZ	SPECLZ	SPECLZ	SPECLZ	DE-
b. Estates	SPECLZ	SPECLZ	SPECLZ	SPECLZ	SPECLZ
c. Livestock and Its Product	SPECLZ	SPECLZ	SPECLZ	SPECLZ	DE-
d. Forestry	DE-	DE-	DE-	DE-	DE-
e. Fishery	SPECLZ	SPECLZ	SPECLZ	SPECLZ	SPECLZ
2. Mining and Quarrying	DE-	DE-	DE-	DE-	DE-
a. Crude Petrolium and Natural Gas	DE-	SPECLZ	SPECLZ	DE-	DE-
b. Non Oil and Gas Mining	DE-	SPECLZ	SPECLZ	DE-	DE-
c. Quarrying	DE-	DE-	DE-	DE-	DE-
3. Manufacturing Industry	DE-	DE-	DE-	DE-	DE-
a. Oil and Gas manufacturing	DE-	SPECLZ	SPECLZ	DE-	DE-
b. Non Oil dan Gas Manufacturing	DE-	DE-	DE-	DE-	DE-
4. Electrisity, Gas & Water Supply	DE-	DE-	DE-	DE-	DE-
a. Electrisity	DE-	DE-	DE-	DE-	DE-
b. City Gas	DE-	SPECLZ	SPECLZ	DE-	DE-
c. Water Supply	DE-	DE-	DE-	DE-	DE-
5. Construction	**SPECLZ**	**SPECLZ**	**SPECLZ**	**SPECLZ**	**SPECLZ**
6. Trade, Hotels & restaurant	DE-	DE-	DE-	DE-	DE-
a. Wholesale and Retail Trade	DE-	SPECLZ	DE-	DE-	DE-
b. Hotels	DE-	SPECLZ	DE-	DE-	DE-
c. Restaurant	SPECLZ	SPECLZ	SPECLZ	SPECLZ	DE-
7. Transport & Communication	**SPECLZ**	**SPECLZ**	**SPECLZ**	**SPECLZ**	DE-
a. Transportation	SPECLZ	SPECLZ	SPECLZ	SPECLZ	DE-
1) Railway Transportation	DE-	SPECLZ	DE-	DE-	DE-
2) Road Transportation	SPECLZ	SPECLZ	SPECLZ	SPECLZ	DE-
3) Sea Transportation	DE-	SPECLZ	SPECLZ	DE-	DE-
4) Inland Water Transportation	DE-	SPECLZ	SPECLZ	DE-	DE-
5) Air Transportation	DE-	SPECLZ	SPECLZ	DE-	DE-
6) Service Allied to Transportation	SPECLZ	SPECLZ	SPECLZ	SPECLZ	DE-
b. Communication	DE-	SPECLZ	SPECLZ	SPECLZ	DE-
1) Pos & Telecommunication	SPECLZ	SPECLZ	SPECLZ	SPECLZ	DE-
2) Service Allied to Communication	DE-	DE-	DE-	DE-	DE-
8. Financial, Ownership&Bussiness Serv	DE-	DE-	DE-	DE-	DE-
a. Bank	SPECLZ	SPECLZ	SPECLZ	SPECLZ	SPECLZ
b. Non Bank Financial Institution	SPECLZ	SPECLZ	SPECLZ	SPECLZ	SPECLZ
c. Service Allied to Financial	DE-	SPECLZ	SPECLZ	SPECLZ	DE-
d. Building Rental	DE-	SPECLZ	SPECLZ	DE-	DE-
e. Business Service	SPECLZ	SPECLZ	SPECLZ	SPECLZ	DE-
9. Services	DE-	DE-	DE-	DE-	DE-
a. General Government	DE-	DE-	DE-	DE-	DE-
1) Government Adm&Defence	DE-	DE-	DE-	DE-	DE-
2) Other Government Services	DE-	DE-	DE-	DE-	DE-
b. Private	SPECLZ	SPECLZ	SPECLZ	SPECLZ	DE-
1) Social & Community Services	SPECLZ	SPECLZ	SPECLZ	SPECLZ	DE-
2) Amussement&Recreation Serv	DE-	SPECLZ	SPECLZ	DE-	DE-
3) Personal & Household	DE-	SPECLZ	SPECLZ	SPECLZ	DE-
Total					

Note: De- means de-specialization; SPECLZ means specialization.