

Mapping of Leading Livestock Subsector in East Java Province

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ABSTRACT

Livestock subsector contributes substantially to the economy of East Java Province. This study was conducted to identify and mapping the leading livestock subsector in 38 districts/cities in East Java province based on data GDRB in 2009-2013. The analytical method used is Location Quotient (LQ), Shift-Share (SS), and Klassen typology. LQ analysis results indicate that the livestock subsector is a bases sector ($LQ > 1$) in 26 districts/cities and the non base ($LQ < 1$) in 12 districts/cities. SS analysis showed that the growth of the livestock subsector is progressive ($SS > 0$) in 7 districts/cities, while in 31 districts/cities is slow ($SS < 0$). Based on analysis Klassen typology this research concluded that the livestock subsector is the leading sector ($LQ > 1$ and $SS > 0$) in 7 districts/cities, namely Bojonegoro, Madiun, Mojokerto, Pacitan, Pasuruan, Trenggalek, and Tuban.

Key Words: Livestock Subsector, Location Quotient, Shift-Share, Klassen Typology

INTRODUCTION

Recent development of livestock is based on the vision to create competitive and sustainable livestock by optimizing local resource to improve the supply and security of animal food and also the welfare of farmers (Ditjen PKH, 2011). Three key words stay around this vision: competitive livestock, local resource optimization, and farmer welfare. Competitive livestock means that the output of livestock has a leading capacity either in competitive or comparative advantage. Local resource optimization means that the resource shall be derived from many regions in Indonesia, including its genetic resource (livestock, food, master seed, and vaccine prime), and livestock technology based on agro-ecosystem and socio-economic conditions of Indonesia. Farmer welfare means those farmers are able to fulfill the economic necessities of their household.

East Java Province is the production center of various livestock commodities in Indonesia, such as meat, milk and egg. Beef, milk, and egg in East Java Province contribute orderly for 22%, 53%, and 23% to the production of beef, milk and egg in Indonesia (BPS, 2015). Great contribution of livestock commodities from East Java Province to national production is indicating that livestock subsector have quite strong contribution to local economic, either for food source, workforce absorbance, industrial raw material, or local income to the community and region. Given great contribution of livestock subsector to national production and local economic, it can be said that these subsector is very potential to become the leading sector in economic development of East Java Province.

This research attempts to identify and to develop the mapping of the leading livestock subsector in 38 regencies/towns of East Java Province based on GDRP data in period 2009-2013. Result of research may then be useful as the consideration base in formulating the policy of livestock development in East Java Province or all Regencies/Towns in East Java Province.

MATERIAL AND METHOD

Material

Research area is determined purposively (Sugiyono, 2009), resulting in 38 Regencies/Towns in East Java Province. The background of area selection is that East Java Province is the production center for various livestock commodities such as meat, milk, and egg. Secondary data are used and the type is time-series data of Gross Domestic Regional Product (GDRP) from 38 Regencies/Towns in East Java Province on period 2009-2013. Data source is obtained from BPS of East Java Province.

Method

Location Quotient (LQ)

Location Quotient analysis is conducted to identify base and non-base sectors in a region. This technique attempts to compare the capacity of a region to produce a commodity with another region which produces similar commodity (Heijman and Schipper, 2010). In this research, LQ is formulated as follows:

$$LQ = [v_i/v_t] / [V_i/V_t]$$

where :

v_i = GDRP rate from livestock subsectors in various regencies/towns

v_t = GDRP total of various regencies/towns

V_i = GDRP rate from animal husbandry subsectors in province

V_t = GDRP total of province.

$LQ > 1$ means that livestock subsectors are classified as the base sector in a region. The production of subsectors can fulfill the demand of a region and possibly be exported to outside. $LQ < 1$ signifies that livestock subsectors are not the base sector. The production of livestock commodities in a region cannot fulfill self-demand and thus, it always relies on external supply or import. $LQ = 1$ means that there is self-sufficiency among livestock subsectors in a region. The production is only sufficient to fulfill the demand of the region but without capacity for export (Budiharsono, 2001).

Shift Share (SS)

Shift Share analysis is performed to identify sources or components of regional growth. The result of analysis helps the reader to understand the development of a certain sector in a region to ensure whether this sector is slow or fast performer if relatively compared with other sectors. SS analysis differentiates regional production change into three components, respectively *national growth component* (abbreviated as PN), *proportional growth component* (abbreviated as PP), and *regional share growth* (abbreviated as PPW) (Budiharsono, 2001). Three components of growth are explained as follows:

$$\Delta Y_{ij} = PDRB2 - PDRB1 = PN_{ij} + PP_{ij} + PPW_{ij}$$

$$\Delta Y_{ij} = PN_{ij} + PB_{ij}$$

$$PB_{ij} = PP_{ij} + PPW_{ij}$$

where:

ΔY_{ij} = regional economic growth

PDRB1 = PDRB on the early year of calculation

PDRB2 = PDRB on the late year of calculation

PN_{ij} = regional growth effect

PP_{ij} = proportional shift

PPW_{ij} = differential shift

PB_{ij} = net growth

$PP_{ij} > 0$ means that livestock subsectors in a certain region has experienced fast growth, whereas $PP_{ij} < 0$ signifies for slow. $PPW_{ij} > 0$ means that livestock subsectors in a region has competing

ability, while $PPW_{ij} < 0$ signifies for the lacking of competing ability. $PB_{ij} > 0$ means that the growth of livestock subsectors in a region is progressive, whereas $PB_{ij} < 0$ relates with laggardness.

Klassen Typology

Klassen Typology is used to obtain the description of the pattern and structure of sector-based growth in a region. This analysis involves assigning the sector into proper group based on its growth and contribution to PDRB of a region (Widodo, 2006). According to Klassen Typology, a certain sector can be assigned to 4 categories such as: (1) *Prime Sector (Leading)* with $LQ > 1$ and $SS > 0$; (2) *Potential Sector* with $LQ > 1$ and $SS < 0$; (3) *Developing Sector* with $LQ < 1$ and $SS > 0$; and (4) *Undeveloped Sector* with $LQ < 1$ and $SS < 0$ (Adhitama, 2012).

RESULT AND DISCUSSION

Base Sector and Non-Base Sector

Result of Location Quotient analysis shows that livestock subsector is considered as the base sector ($LQ > 1$) in 26 Regencies/Towns and is classified into non-base sector ($LQ < 1$) in 12 Regencies/Towns (Table 1). The average rate of LQ for East Java Province is 1.62. This LQ rate means that livestock subsector is the base sector in East Java Province. The production of livestock commodities in East Java Province not only satisfies the regional demand of East Java population but also has been potentially for trade with outside or has export capacity. Livestock commodities that are tradable to another region are beef, broiler meat, egg, and milk.

Subsector Growth

Result of Shift Share analysis shows that net growth of livestock subsector that is considered as progressive ($SS > 0$) is only found in 7 regencies/towns, whereas in 31 regencies/towns the growth is slow ($SS < 0$). Net growth average of livestock subsector in East Java Province is 15.10 (Table 1). Negative sign means that during period 2009-2013, livestock subsector have experienced slow growth in most regencies/towns in East Java Province. Slow growth of livestock subsector is related to the fact that the number of animals provided for slaughtering and trade to other region is greater than those born and trade into East Java Province.

Leading Subsector

Based on the analytical results of Location Quotient, Shift Share, and Klassen Typology, it is found that livestock subsector considered as the Leading Sector (Prime Sector) are found in 7 regencies, such as Bojonegoro, Madiun, Mojokerto, Pacitan, Pasuruan, Trenggalek, and Tuban (Table 2). In these regencies, livestock subsector have a greater contribution to GDRP than livestock contribution in provincial level ($LQ > 1$). These livestock subsector have faster growth than that in provincial level ($SS > 0$). Some livestock subsector classified as Potential Sector are evident in 19 regencies, such as Bangkalan, Banyuwangi, Blitar, Bondowoso, Jember, Jombang, Kediri, Blitar City, Lumajang, Magetan, Malang, Nganjuk, Ngawi, Pamekasan, Ponorogo, Probolinggo, Situbondo, Sumenep, and Tulungagung. All these regencies have their livestock subsector with greater contribution than that in provincial level ($LQ > 1$), but the growth is slower than provincial level ($SS < 0$). Some livestock subsector considered as Undeveloped Sector are observed in 12 regencies/towns such as Gresik, Batu City, Kediri City, Madiun City, Malang City, Mojokerto City, Pasuruan City, Probolinggo City, Surabaya City, Lamongan, Sampang and Sidoarjo. The undeveloped sectors are marked by the contribution and growth in regency/town level that are lower than those in provincial level ($LQ < 1$ and $SS < 0$).

Table 1. Location quotient, shift share, and klassen typology analysis of livestock subsector in east java

No	Regencies/Towns	Location Quotient		Shift Share		Klassen Typology
1	Bangkalan	1,43	Base	-41,74	Slow	Potential Sector
2	Banyuwangi	1,60	Base	-22,08	Slow	Potential Sector
3	Blitar	7,23	Base	-21,83	Slow	Potential Sector
4	Bojonegoro	1,41	Base	17,95	Progressive	Leading Sector
5	Bondowoso	2,95	Base	-16,14	Slow	Potential Sector
6	Gresik	0,49	Non Base	-12,51	Slow	Undeveloped Sector
7	Jember	2,68	Base	-16,25	Slow	Potential Sector
8	Jombang	1,85	Base	-8,46	Slow	Potential Sector
9	Kediri	2,61	Base	-3,56	Slow	Potential Sector
10	Kota Batu	0,90	Non Base	-18,75	Slow	Undeveloped Sector
11	Kota Blitar	1,21	Base	-33,68	Slow	Potential Sector
12	Kota Kediri	0,02	Non Base	-26,23	Slow	Undeveloped Sector
13	Kota Madiun	0,09	Non Base	-58,53	Slow	Undeveloped Sector
14	Kota Malang	0,03	Non Base	-16,84	Slow	Undeveloped Sector
15	Kota Mojokerto	0,05	Non Base	-60,37	Slow	Undeveloped Sector
16	Kota Pasuruan	0,71	Non Base	-31,87	Slow	Undeveloped Sector
17	Kota Probolinggo	0,43	Non Base	-51,94	Slow	Undeveloped Sector
18	Kota Surabaya	0,00	Non Base	-35,57	Slow	Undeveloped Sector
19	Lamongan	0,59	Non Base	-8,88	Slow	Undeveloped Sector
20	Lumajang	3,06	Base	-21,12	Slow	Potential Sector
21	Madiun	1,89	Base	9,91	Progressive	Leading Sector
22	Magetan	2,09	Base	-3,04	Slow	Potential Sector
23	Malang	1,82	Base	-7,24	Slow	Potential Sector
24	Mojokerto	2,16	Base	10,90	Progressive	Leading Sector
25	Nganjuk	2,98	Base	-29,68	Slow	Potential Sector
26	Ngawi	1,27	Base	-6,09	Slow	Potential Sector
27	Pacitan	2,68	Base	43,36	Progressive	Leading Sector
28	Pamekasan	3,63	Base	-10,74	Slow	Potential Sector
29	Pasuruan	1,34	Base	10,72	Progressive	Leading Sector
30	Ponorogo	1,52	Base	-0,06	Slow	Potential Sector
31	Probolinggo	1,52	Base	-8,05	Slow	Potential Sector
32	Sampang	0,84	Non Base	-33,79	Slow	Undeveloped Sector
33	Sidoarjo	0,14	Non Base	-23,64	Slow	Undeveloped Sector
34	Situbondo	1,10	Base	-2,25	Slow	Potential Sector
35	Sumenep	1,45	Base	-39,53	Slow	Potential Sector
36	Trenggalek	2,64	Base	4,54	Progressive	Leading Sector
37	Tuban	1,43	Base	0,05	Progressive	Leading Sector
38	Tulungagung	1,65	Base	-0,64	Slow	Potential Sector
	Jawa Timur	1,62	Base	-15,10	Slow	Potential Sector

Table 2. Klassen typology of livestock subsector in east java

Klassen Typology		Sectoral Growth	
		SS>0 (Progressive Growth)	SS<0 (Slow Growth)
Sectoral Contribution	LQ>1 (Base Sector)	Leading Sector: Bojonegoro, Madiun, Mojokerto, Pacitan, Pasuruan, Trenggalek, and Tuban	Potential Sector: Bangkalan, Banyuwangi, Blitar, Bondowoso, Jember, Jombang, Kediri, Kota Blitar, Lumajang, Magetan, Malang, Nganjuk, Ngawi, Pamekasan, Ponorogo, Probolinggo, Situbondo, Sumenep, and Tulungagung
	LQ<1 (Non Base Sector)	Developing Sector:	Undeveloped Sector: Gresik, Kota Batu, Kota Kediri, Kota Madiun, Kota Malang, Kota Mojokerto, Kota Pasuruan, Kota Probolinggo, Kota Surabaya, Lamongan, Sampang, and Sidoarjo

CONCLUSION

According to Klassen Typology, it is concluded that livestock subsector is the Leading Sector (LQ>1 and SS>0) in 7 regencies, respectively Bojonegoro, Madiun, Mojokerto, Pacitan, Pasuruan, Trenggalek, and Tuban.

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