Development of Regional Product Mapping Model to Enrich Trade Analysis in East Java

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Abstract
Regional economic development requires cooperation with other regions in the form of interregional trade. Competition in interregional trade is very difficult to win because each region gives its best to offer high quality products in the market. To win competition in interregional trade, the local government of a region ought to identify its leading export product and leading sector. The Regional Product Mapping model is urgently needed.

1) How does analyse and identify a leading export product using Regional Product Export model?
2) How does analyse and identify a leading export economy sector using Regional Product Export model?
3) How does analyse labor in leading export economy sector using Regional Product Export model?

Key Words: Trade, Regional Product Mapping Model, Growth.

Introduction
Trade happens because an individual unable to fulfill his/her needs by his/her own. Trade also has motives to increase earnings in a certain region/state because trade represents a very important factor in improving the economy of a region/state (Romer, 1994). Trade can be implemented at the scale of individual/region/state. With the existence of trade, the availability of services and goods will be abundant. Abundance of service and goods represent indicator prosperity of society (Prapti, 2003).

Balance of trade is vital because activities in regional/international trade which in the form of import and export is registered in balance of trade. Balance of trade has the character of vis-a-vis where exporting to a region represents import to its partner trade. Conversely, import from trade partner is import to a region. In managing balance of trade there are 3 possibilities of form trade balance. First, surplus form of trade balance where export value exceeds import value. Each form of trade balance has its different impact to economy of a region/state. Surplus form of trade balance can encourage inflation motivation. Second, deficit where import value exceeds export value. Deficit form of trade balance can cause decreasing of region’s income or foreign exchange. Third, well-balanced form of trade balance where export value is equal to import value. Well-balanced form of trade balance represents best form but very difficult to be obtained. For the reason from 3 possibilities form of trade balance, well-balanced form of trade balance is an ideal form which represent the target of every managed interregional trade activities (Prapti, 2003).

A region/state conduct trade with other region/state because of economic reason. But there are so many impact of trade more than just economic reason. Because trade can also strengthen relationship between
regions. If trade conducted internationally than it called international trade. In international trade there are activities of export and import. Trade earn also happened in interregional scale, so that export and import activities taken as movement of goods and services interregionally. In this research, usage of export and import terms refer to interregional trade.

At this time, regional autonomy era in each sub-province area make every sub-province becomes more independent and it encourage competition among sub-province are to increase their own in regional income. Because every sub-province area establish their own regulation, manage their own regional income and development. Hence interregional trade also has impact in regional development. Regional policies is also being established by local government to regulate economy activities within a region which may effect other region which becomes its trade partner. Positive income will be earned by a region with surplus balance of trade, and inverse. Surplus balance of trade becomes most regions’ objective from interregional trade. Negative income will be paid by a region with deficit balance of trade. Therefore, the existence of surplus export is very important to increase regional income. It needs a lot of effort to define leading export product in detail through Regional Product Mapping model.

Regional leading export products yielded by certain economy sectors which which have its own unique labour composition that has to be identified to analyse its productivity. Hence, identifying regional leading export products not only desisting at certain product, but have to be continued exhaustively until economy sectoral level. It required Regional Product Mapping model. Regional Product Mapping model is developed by research team to identify regional leading export products from certain sub-province area, identifying leading sector labour and productivity, measuring strength of interregional trade and regional balance of trade.

Review result of theoretical study and empirical phenomenon above gives inspiration to our research team. We construct implementation of SLQ and TBI to fill interesting research gaps and develop new finding. Some research gaps are: First, product export proportion to total domestic export value does not indentified yet. To do that, TBI (Trade Balance Index) need to be employed. Second, regional product mapping using TBI and SLQ never been done yet eventhough it very required to analyse leading export product. Leading export product is product which owning high exporting proportion to total national export. Third, there is no Regional Product Mapping model to analyse several features of interregional trade in a row. Interregional trade analysis using Regional Product Mapping model identifies regional leading export product, regional leading economy sector, sectoral labour, and regional balance of trade balance hollistically.

Regional economic development requires cooperation with other region in the form of interregional trade. Competition in interregional trade is very difficult to win because each region gives its best to offer high quality product in the market. To win competition in interregional trade, local government of a region ought to identify its leading export product and leading sector. Regional Product Mapping model is urgently needed.

**Literature Review**

Researcher had analized international product mapping concept in her tested dissertation. It also published in international journal “The Product Mapping Analysis of Manufacturing Industry Products in Bilateral Trade between Indonesia and China in 1995–2011” which revealed strengths and weaknesses of Indonesia’s leading export products to China.

Kitson and his research team reported evaluation of increasing focus on regions as the key domain for the organisation and governance of economic growth and wealth creation. It is certainly possible to derive measures of regional productivity either from firm-based micro-data or from aggregate regional output
figures, and such measures provide valuable information on a region’s standard of living, both through time and relative to other regions. But although regional productivity is certainly a useful indicator of what might be termed ‘revealed regional competitiveness’, there are empirical problems in measuring it accurately as well as conceptual issues as to how to interpret what is actually meant by regional productivity. All of the problems associated with measuring and interpreting national or sectoral productivity carry over the regional case (Kitson, 2007).

This research is different with past research in terms of international trade activities. In this research will be develop regional product mapping model in context of regional autonomy.

**Research Questions**

1. How does analyse and identify a leading export product using Regional Product Export model?
2. How does analyse and identify a leading export economy sector using Regional Product Export model?
3. How does analyse labor in leading export economy sector using Regional Product Export model?

**Theoretical Framework**

Concept of Regional product mapping model raised from small open macroeconomy identity

\[ Y = C + I + G + (X - M) \]

\[ \text{........................ (1)} \]

Y is output, C is consumption, I is investment, G is government expenditure, X is export, and M is import. The small open macroeconomy identity includes balance trade \((X - M)\) as a factor of output growth \((Y)\). From that side, it can be concluded that increasing of export can support its share to output growth. Hence, export product is very important to gain foreign exchange.

Concept of trade in small open macroeconomy identity can be interpret as trade among nations or trade among regions. Trade will happened when both parties get advantage or benefit. Trade can be done by two individuals, two groups, people in two areas, or in a State. In narrow meaning, commerce is a trade process referring to interregional commodity transfer. Without commerce, people in each region consume their own products (Salvatore, 1997). In certain circumstances, people in a region sometime can not fulfill their own needs yet, so that have to buy goods and service from other region.

In international trade product mapping model only able to analyse internationally leading exported products because its indicators are limited to employ with product data only. So team research try to develop a model which able to analyse trade among region using Location Quotient (SLQ) and Trade Balance Index (TBI).

**Symmetric Location Quotient (SLQ)**

In regional economic theory there are Location Quotient (LQ) indicator which able to be reference to determine base sector/pre-eminent sector. Indicator LQ is trying to measure concentration from sector activities by calculating contribution of economy sector in certain region and compare it with the same economy sector in broader region (McCann, 2001).

For example contribution of agriculture sector in East Java compared to contribution of the same agriculture sector in Indonesia. Generally LQ method is representing comparison between productivity/labour proportion in certain region (region j) to productivity/labour proportion in the same sector (sector i) at national level.
Variable \( v_i \) (\( L_i \)) represents Gross Domestic Product (or labour) in certain sector i at region j, \( v_t \) (\( L_t \)) represents total GDP (or total labour) at region j, \( V_i \) (\( L_i \)) represents GDP (or labour) in certain sector i at state level, and \( V_t \) (\( L_t \)) represents total GDP (or total labour) at state level.

Rules of SLQ interpretation are

1. If \( LQ \geq 1 \), hence can be concluded that the sector is basis/leading sector compared to state level. Because the sector able to fulfill demand domestic in its region and export to other region.

2. If \( LQ < 1 \), hence can be concluded that the sector is not basis/leading sector compared to state level. Because the sector is unable to fulfill demand domestic in its region and import from other region.

So LQ index is changed into index Symmetric Location Quotient (SLQ) to match with TBI in Regional Product Mapping model. The formulation of SLQ is

\[
SLQ = \frac{(LQ - 1)}{(LQ + 1)} \quad \ldots \ldots (3)
\]

Calculation of SLQ index can be done by employing sectoral labour and GDP data. Result of SLQ calculation employing labour data can be used to analyse sectoral productivity at certain region. Meanwhile result of SLQ calculation employing market price or constat GDP data can be used to analyse leading sector at certain region. SLQ calculation is also been done by using trade product data so that it will assist to identify leading product analysis of a region.

Trade Balance Index (TBI)

Lafay (1992) explained Trade Balance Index (TBI) concept to analyse region specialty in trade activities. A region becomes a net-exporter if the export product value is bigger than its import value. And a region becomes a net-importer if the import product value is bigger than its export value for the group of specific product according to SITC (Standart International Trade Classification). Value of TBI range from -1 until +1. If TBI is equal to -1 hence the region is a net-importer. Reversely, if value of TBI is equal to +1 hence the region is a net-exporter. TBI can also be earned by using GDP data. TBI formulation shall be as follows

\[
TBI_{ij} = \frac{(x_{ij} - m_{ij})}{(x_{ij} + m_{ij})} \quad \ldots \ldots (4)
\]

TBI : trade balance index for region i product group j

\( x_{ij} \) : export product group j from region i

\( m_{ij} \) : import product group j from region i
Regional Product Mapping Model divides export products into 4 groups in 4 quadrant. Group A consists of export product with positive SLQ and positive TBI (high export specialization). Group B consists of export product with positive SLQ but negative TBI (no export specialization). Group C consists of export product owning exporting specialization with positive TBI but have negative SLQ. Group D consists of product with SLQ and also of TBI negative.

Analysis

Analysis in Regional Product Mapping Model is very required by Province East Java because it is in line with objectives of East Java interregional trade.

1. Improving internal trade efficiency through effective and efficient regional distribution system in order to increasing export products competitiveness, maintaining stable and fair price level in Indonesia to extend marketing of domestic product and improve domestic entrepreneur’s role specially in middle low economy.

2. Improving domestic entrepreneur’s role by establishing policy to reduce and eliminate trade bureaucracy obstacles in business activity so that domestic corporate will expand.

3. Providing goods and services to fulfill society’s needs which adapted to production pattern and society consumption which supported by defrayal system, transportation service, and settled distribution network (www.eastjava.com).

Government also prepare adequate human resources to attain interregional trade objectives. Efforts to increase quality of trade service are reducing licensing process, increasing support, motivation and tuition as well as possible to domestic corporate world so that interregional trade objectives can be reached optimally.

1. Interregional trade objectives include effective and efficient national distribution system able to improve flow of goods and services interregionally. It will improve availability of market goods and services at the competent price which profitable for producers and reasonable for consumers’ purchasing power. That process will be improve prosperity of society as consumers, producers and distributors.

2. Price difference, which can be occurred because of existence of distance and time length, can be reduced as low as possible (to protect importance of producer and consumer). Progressive goods (raw and benefactor materials) and services’ flow will guarantee the continuity of production and the
wide-speding of domestic market to increase regional economic activities. Existence of good distribution, controlled commodity will lessen price convulsion and realize more dynamic institute.

3. Existence of various government policy can maintain conducive economic climate to give broader room specially for interregional trade activities so that can improve quantity and quality of trade entrepeneurs of private sector, government sector and co-operation (www.eastjava.com).

Development of Regional Product Mapping model is expected to able to enrich analysis regional trade. Development procedures of Regional Product Mapping model are

a) Literature and field research to collect data needed.

b) Model construction to compile Regional Product Mapping model containing stages, steps and analysis of interregional trade.

c) Validation of Regional Product Mapping model which conducted by experts in model development and future user (such as student, lecturer and research practitioner).

Development process of Regional Product Mapping model requires formulation of clear target, compilation of appropriate items, establishing of media and method to assist better development and knowledge transfer.

**Discussion**

Validators already examined Regional Product Mapping Model and gave some suggetion to be beased of model development. Validator Dr. Hadi Sumarsono is model validator from Universitas Negeri Malang, Dr. Diah Wahyuningsih is model validator from Trunojoyo University, and Agni Alam Awirya is validator from Indonesia Bank (Indonesia’s central bank) as future user.

1. Dr. Hadi Sumarsono, S.T., M.Si

   • Impression of Dr. Hadi to the Regional Product Mapping Model

   This model is able to predict tendency of product specialization in future time, which not found in any previous trade models. Regional Product Mapping Model have strong quantitative analysis because the product grouping process based on numbers. So the interpretation of this model have to strengthen by the fact from real economy condition. Regional Product Mapping Model is similar with method of Tipologi Klassen from Boston Consultant Group (BCG).

   • The difference of Regional Product Mapping Model with other model/method:

   Variables used in Regional Product Mapping Model differ from variables in Klassen Typology.

   • Excellence of Regional Product Mapping Model

   Developed variables in Regional Product Mapping Model give proper identification about value of leading product which to be measured in global market activities. This model gives broader picture of analysis than older model (that is Input-Output).

   • Validator’s suggestion for Regional Product Mapping Model
The model developers should enhance analysis which more capable to see the condition of economy fluctuations that happened in real world. For example implementation model in Forum Group Discussion (FGD).

As model validator and lecturer, Dr. Hadi compare Regional Product Mapping Model with other models which have similar usage.

2. Dr. Diah Wahyuningsih, S.E., M.Si

- Impression of Dr. Diah to the Regional Product Mapping Model

Regional Product Mapping Model can be analysed using SLQ. Leading export Product from a region is the result of abundance production and will be export to other region. So that trade balance will experience surplus trade. While a region which don't have abundance production will import from other region.

- The difference of Regional Product Mapping Model with other model/method:

If the model compare with Inter Regional Input-Output (IRIO), there are equation similarity related to solution aspect between one region to others which can be seen by value of its output multiplier. The difference is analysis of Regional Product Mapping Model not only using one indicator, but there are two indicator of SLQ and TBI.

- Excellence of Regional Product Mapping Model

This model can identify in detail economy sector and sub sector which has became leading sector in a region and can be seen by the value of deficit or surplus.

- Validator’s suggestion for Regional Product Mapping Model

Regional Product Mapping Model should be tested in various regions who has unique characteristics, so that it can show unique phenomenon according to basic character of each region.

Dr. Diah is a lecturer and researcher whose very interested in trade topic. Dr. Diah is curious whether the model could analyse region with specific characteristics.

3. Agni Alam Awirya, S.E., M.Si.

- Impression of Agni to the Regional Product Mapping Model

This model can be used, but still employ conventional method.

- The difference of Regional Product Mapping Model with other model/method:

Division of according to typology is common to group analysis unit. Usage of Trade Balance Index can be positive innovation for the model.

- Excellence of Regional Product Mapping Model

Enumeration process which relative modest and base on availability data in all area in Indonesia make this model applicable.
• Validator’s suggestion for Regional Product Mapping Model

Model still based on conventional method so that less popular among policy maker. The model can be enriched with more modern approach to increase its popularity among researches and policy maker. As researcher, Agni looking forward opmalization of Regional Product Mapping Model in the future.

Responses from 3 validators are quite different from many sides of the model. These responses become basis of development model. This model already developed by adding qualitative interpretation in the model.

Conclusion

Regional Product Mapping Model has similarity and differences from international product mapping model. Similarity of Regional Product Mapping Model and international product mapping model raises from policy condition of its region/state. Now, autonomy policy already implied in Indonesia. Every region has to compete with other region for trade. This healthy competition makes regional relationship similar to international relationship in trade.

The difference of Regional Product Mapping Model and international product mapping model is in Regional Product Mapping Model not only identify regional leading export product, but the model ables to identify productivity and labour in leading sector, strength of regional trade and regional balance trade holistically.

References


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