

# How do Export Structure and Competitiveness Evolve Since Trade Liberalization? An Overview and Assessment of Indonesian Manufacturing Export Performance

Rudy Rahmaddi and Masaru Ichihashi

**Abstract**—The paper aims to elucidate the evolution of competitiveness and quantifies the contribution of the geographical and commodity composition on Indonesian manufacturing exports classified by factor intensity for period of 1987 to 2008. Using constant market share (CMS) analysis and Revealed Comparative Advantage (RCA) indicators, we reveal that while mostly enjoying benefits from world export growth, Indonesia exports performance were deteriorated by the negative contribution of commodity composition and market distribution, and the role of competitiveness in manufacturing export performance, which was improved significantly right after trade liberalization policy unleashed in 1986 has been diminishing in recent years. In addition, most of Indonesian manufacturing exports were still concentrated in natural resource- and unskilled labor-intensive manufacturing commodities.

**Index Terms**—Exports performance, specialization pattern, Indonesia, constant market share analysis, revealed comparative advantage.

## I. INTRODUCTION

After the collapse in oil price in the mid-1980s, Indonesia started to embark on trade liberalization era represented by an outward-oriented or export promotion (EP) strategy to replace import substitution industrialization (ISI) strategy, which was spurred by the oil windfall profit during the mid 1970s. Study by Rahmaddi and Ichihashi [1] indicates that growth of GDP during this EP era was dominated by real exports or *seemingly* export-led growth. The portion of exports of manufactured commodities structure in total exports structure increased overtime outperforming natural resource-intensive (NRI) exports and reached its peak of 68% in 2007. During 1987 to 2008, Indonesia manufactured exports (SITC 5 to 8) grew at 15 percent on average with more than 50% of total exports went to Japan, US, NIEs (the Newly Industrializing Economies comprised of Hong Kong, Korea and Singapore), and ASEAN3 (Malaysia, Thailand and Philippines). At the same period, world trade has experienced dramatic structural changes in terms of its composition by product category, with a significant increase in the share of high-technology products and a corresponding decrease in that of low-technology commodities [2].

In regards with export performance, Leamer and Stern [3] point out that changes in a country's exports performance can

be influenced by (a) world export demand; (b) geographical destination; (c) product composition; and (d) by changes in country's competitiveness. With respect to exports commodity structure, ADB Institute [4] argued that upgrading export structure of an economy toward more productive activities plays a critical role in export-led development and sustained high export growth. Therefore, assessing export performance based on its factor determinants and structure is deemed necessary to formulate an effective and competitive trade policy in Indonesia.

The purpose of our study is to elucidate the evolution of exports structure and competitiveness of Indonesian manufacturing exports since trade liberalization policy unleashed in 1986 by quantifying the contribution of the geographical (market) and commodity composition on Indonesian manufacturing exports as well as their comparative advantage. In so doing, we employ Constant Market Share (CMS) analysis and Revealed Comparative Advantage (RCA) indicators on more disaggregated level of manufacturing commodities classified by factor intensity. To the best of our knowledge, previous studies for Indonesia's case have sparsely taken such combined issues into account.

The rest of paper is organized as follows. Section II provides an overview of Indonesia exports performance and structure. Section III reviews theoretical framework and selected empirical literatures on factor determinants of export performance, followed by the description of methodology and data used in this study in section IV. The penultimate section V elucidates the empirical results and discussions. Section VI provides some concluding remarks.

## II. OVERVIEW OF INDONESIA'S MANUFACTURING EXPORTS

The era of EP strategy in Indonesia was embarked in the aftermath of the decline in oil price in the mid-1980s. During this period, the Indonesian economy began to feel the impact of rapid increases in foreign direct investment owing to bold and decisive series of liberal economic reforms introduced from the mid-1980s onward. The reform covered the exchange rate management, which was including two large nominal depreciations, in 1983 and 1986; prudent fiscal policy; comprehensive tax reform; a more open posture towards foreign investment; and financial deregulation including in banking sector [5; 6]. Private sectors and exports became the main engine of manufacturing sector development for the first time ever. Exports of manufactures grew five-fold over 9 years from that of 1985 owing to a string of liberalization packages on trade and investment,

Manuscript received May 18, 2012; revised July 10, 2012.

R. Rahmaddi and M. Ichihashi are with the Graduate School for International Development and Cooperation, Hiroshima University, 739-0025 Japan (e-mail: rudyrasmaddi@hiroshima-u.ac.jp).

including the relaxation of restrictions on foreign investment, tariff cuts and the abolition of non-tariff trade barriers such as import restrictions.

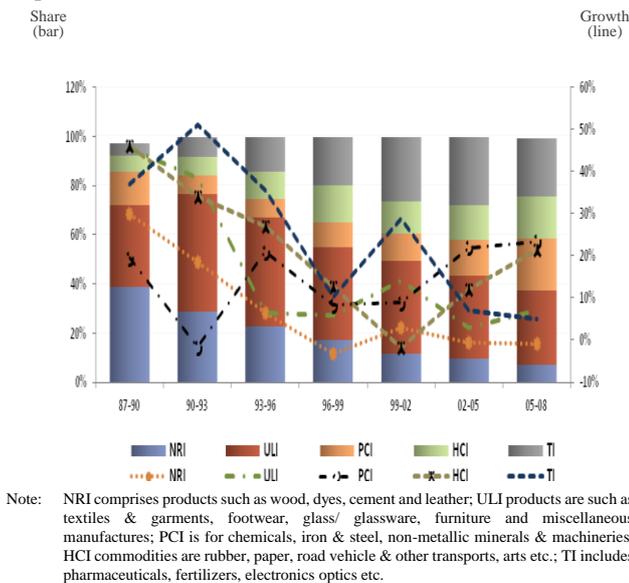


Fig. 1. Share major manufactured exports destinations 1987–2008 (Source: Authors' calculation based on UN-COMTRADE)

The portion of manufacturing commodities in total exports increased overtime and reached its peak of 68% in 2007. Meanwhile, their value recorded the highest of USD 57.65 billion in 2008. At the beginning of trade liberalization era (1987-1990), natural resource- intensive (NRI) and unskilled labor-intensive (ULI) exports were the two most dominant manufacturing exports commodities, with share as to 39% and 33%, respectively. However, share of NRI commodities on total manufactured exports has been diminishing continuously due to their declining growth, and started from 1990 ULI exportable had been the most dominant exports yet also with declining growth. Meanwhile, shares of commodities under physical capital-intensive (PCI), human capital-intensive (HCI) and technology- intensive (TI) were still negligible at the earlier stage of EP period (see Fig. 1).

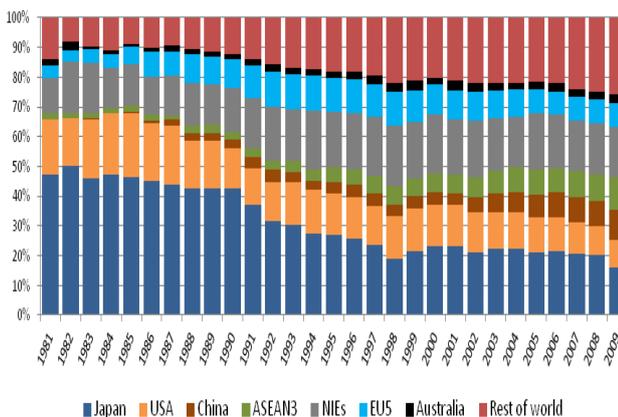


Fig. 2. Share major manufactured exports destinations 1987–2008 (Source: Authors' calculation based on UN-COMTRADE)

In terms of market distribution structure, more than 60% of manufactured exports went to five selected countries/regions comprised of Japan, US, NIE, ASEAN3 and EU5 (see Fig. 2). As a result, the performance of those markets played a significant role in determining overall performance of

Indonesia's manufactured exports.

### III. THEORETICAL FRAMEWORK AND EMPIRICAL REVIEW

The theoretical foundation in analyzing the contribution of factor determinants in terms of commodity composition, market distribution and competitiveness effects is well explained in Leamer and Stern [3]. It is drawn from the idea that demand for exports in a given market from competing sources is a function of relative prices (elasticity of substitution).

$$\frac{q_1}{q_2} = f\left(\frac{p_1}{p_2}\right) \quad (1)$$

where  $q$  and  $p$  represent quantity and price of exports, while subscript 1 and 2 represent country 1 and its competitors, respectively.

Equation (1) is recognized as the basic form of elasticity of substitution. Multiplying both sides by  $p_1/p_2$  will obtain

$$\frac{p_1 q_1}{p_2 q_2} = \frac{p_1}{p_2} \cdot f\left(\frac{p_1}{p_2}\right) \quad (2)$$

Equation (2) implies that

$$\begin{aligned} \frac{p_1 q_1}{p_1 q_1 + p_2 q_2} &= \left(1 + \frac{p_2 q_2}{p_1 q_1}\right)^{-1} \\ &= \left(1 + \left[\frac{p_1 f(p_1/p_2)}{p_2}\right]^{-1}\right)^{-1} \\ &= g\left(\frac{p_1}{p_2}\right) \end{aligned} \quad (3)$$

Equation (3) indicates that exports share will remain unchanged (constant) over time except as relative price varies. This is as the structural term, which later can be divided into three parts, namely (a) the world term; (b) the commodity term; (c) the market term, all of which represents demand factor phenomenon [7; 8; 9]. Thus, changes in exports beyond the constant share norm can be attributed to price changes –or changes in the level of competitiveness, which captures the effect of changing market shares.

In their endeavor for enriching the theoretical foundation of CMS in analyzing factor determinants of export growth, Merkies and Meer [8] attempted to link the analysis using a two-stage constant elasticity of substitution (CES) demand model. This formalizes the demand interpretation of the effects of world export growth and market distribution on export growth. They point out that competitiveness term is interpreted as demand reaction to given price changes, which implicitly assumes it as supply-determined. In contrast to customary knowledge considering commodity effect as a demand-determined, they argue that it should be given as a supply phenomenon. Later, they applied such analysis for the case of US and the Economic and Social Commission for Asia and the Pacific (ESCAP) countries.

Study on assessing competitiveness and sectoral

specialization (market distribution and commodity composition) effects on export performance have been done by many economists using Constant Market Share (CMS) analysis, which was initially applied in international trade by Tyszynski [10] for analyzing countries' market share of manufactured exports from 1899-1950. Bowen and Pelzman [11] utilized CMS to analyze whether the declining US exports growth is attributed to competitiveness effect. They found that the structural effects played roles in compensating decline in competitiveness effect. Fagerberg and Solie [12] employed a new extension of CMS to review sources of export growth in 20 OECD countries during 1961-1983. Their finding indicates that competitiveness effect is the most important determinants for export growth.

In empirical studies of CMS on the East Asian Economies, Lloyd and Taguchi [13], among others, analyzed the competitiveness manufactured exports for China, Korea and Indonesia between 1980 and 1993. They argued that competitiveness was the most contributed factor on those countries' export performance compared to commodity composition and market distribution effect. Tran [14] analyzed Vietnam's export performance in face of China's emergence as a major competitor in world market by employing CMS and RCA. The author argued that China's exports did not crowd-out Vietnam's exports even though it became a huge competitor in similar areas with Vietnam.

Empirical studies devoted to analyze the specific case of Indonesia have been sparse. Some are worth mentioning here. Juswanto and Mulyanti [15] analyzed Indonesia manufacturing exports (SITC 5-8) during 1990s using one-digit SITC level. The analysis revealed that Indonesia export performance suffered from negative contribution of commodity composition and low response to world demand. Sambodo [16] using two-digit SITC level examined a broader category of Indonesia exports commodities in US, Japan and Singapore markets during 1962 to 2002. The study indicated that Indonesia lost its market share in Japan and Singapore markets and suffers from negative composition effect on US market. The latter implied that Indonesia was not successful in differentiating its export commodities. Nevertheless, neither did two aforementioned studies capture the existence of European economies (EU) and other significant market such as China, nor did they elucidate the evolution of export structure in their analysis. In addition, they did not classify commodities into main category based on factor intensity, approach of which enabled one to link the analysis with sector-based policy.

The present study attempts to fill the gap by proposing more comprehensive assessment in analyzing the underlying factors of exports growth and revealing the changing pattern in Indonesian manufactured export structure classified by factor intensity. In so doing, it may propose specific policy implication to certain designated export-oriented industries.

#### IV. ANALYTICAL MODEL AND DATA

##### A. Analytical models

In revealing underlying domestic export capabilities in terms of gains in export market share and the upgrading

export structure, two respective standard, complementary export performance indicators, namely CMS trends and RCA indices are calculated.

Following Leamer and Stern [3], among others, the following export-based CMS identity decomposes actual change in a country's exports between two periods as follows:

$$V^1 - V^2 = \sum_i r V_i + \sum_i (r_i - r) V_i + \sum_i \sum_j (r_{ij} - r_i) V_{ij} + \sum_i \sum_j (V_{ij}^1 - V_{ij}^2 - r_{ij} V_{ij}^2) \quad (4)$$

(i)                      (ii)                      (iii)                      (iv)

where:

$V(V^1)$  = country A's exports value in period 1 (2)

$V_i(V_i^1)$  = country A's exports value of commodity  $i$  in period 1 (2)

$V_{ij}(V_{ij}^1)$  = country's A exports value of commodity  $i$  to country  $j$  in period 1 (2)

$r$  = percentage growth in total world exports from period 1 (2)

$r_i$  = percentage growth in total world exports of commodity  $i$  from period 1 (2)

$r_{ij}$  = percentage growth in total world exports of commodity  $i$  to country  $j$  from period 1 (2)

On the right-hand side, four expressions of Identity (4) decompose the actual change in a country's exports into four following effects:

- 1) the world trade effect, which relates any change in country A's actual exports to general rise in the world exports. Positive sign of this effect implies that A has maintained its exports share in foreign market *vis-à-vis* the world and *vice versa*.
- 2) the commodity composition effect, which measures the extent to which A's export differential is due to specializing in specific commodity, where demand for exports is growing more rapidly than world average. Positive sign of this effect indicates that A's exports are concentrated in favorable commodities, whose demands are growing fast and *vice versa*.
- 3) the market distribution effect, which measures whether concentration on market destination of country A's exports are growing relatively faster than world average. Positive sign of this effect indicates that A's exports are concentrated in favorable markets, whose demands are growing fast and *vice versa*.
- 4) the competitiveness term, an 'unexplained' residual, reflects the difference between actual and hypothetical export increase if country A had maintained its share with regard to each commodity group.

Merkies and Meer [9] define (i) to (iii) as the structural term, while (iv) as the competitiveness term. In contrast to the interpretation of such effects under structural term, the interpretation of competitiveness term is not as straight forward. Beside influenced by relative price, export competitiveness is also determined by several non price-factors such as exports differentiation and new product development, time-delivery, and efficient financing and marketing measures. For detailed explanation on competitiveness effect, see [3], [17].

Richardson [17] points out some conceptual and empirical shortcomings of CMS application, some of which are (a) export quantity rather than its value as an appropriate measure of export share, (b) application of country's focused

competitors rather than same world standard, and (c) some variations due to arbitrary aggregation level on commodity and market distribution. Despite of aforementioned limitations, CMS approach has been a commonly accepted procedure to assess underlying sources of a country's export growth, depending on the availability of data [14]. Along with other complementary indicators such as RCA index, CMS analysis may reveal underlying sources of export performance in terms of gain (loss) in export market share and the upgrading process in a country's export structure [4].

In order to supplement former CMS analysis to reveal the evolution pattern of changing competitiveness strength in export commodity, which represents the dynamics of export structure, the present study employs Balassa's [18] export-based RCA index using the following formula:

$$RCA_j^i = \left[ X_i^k / X_{tot}^k \right] \left[ X_i^w / X_{tot}^w \right] \quad (5)$$

where:

$X_i^k$  = value of Indonesia's exports of commodity  $i$  in period  $t$   
 $X_t^k$  = value of Indonesia's exports of total commodity in period

$X_i^w$  = value of world exports of commodity  $i$  in period  $t$   
 $X_t^w$  = value of world exports of total commodity in period

RCA index is one of the most widely used measures of trade competitiveness. The RCA index of a given product is measured by the commodity's share in the country's exports relative to its share in world. It reveals the relative pattern of export specialization for an economy relative to worldwide patterns. The greater a sector's RCA, the more an economy specializes in that sector's exports relative to world specialization patterns indicating a high comparative advantage in that sector. Tracking the structure of RCAs over time reveals an economy's comparative advantage development and export upgrading process [4].

### B. Data Specification

CMS export growth decomposition and RCA indicators as indicated by Equation (4) and (5), respectively, are computed using compiled data from UN-COMTRADE in annual basis at two- to three-digit SITC commodity level (rev. 2) of manufactured exports. In order to link the findings with specific policy implication to targeted export-oriented industries, we categorize such export commodities based on factor intensity into five main category-classes namely NRI, ULI, PCI, HCI and TI.

We follow commodity categorization proposed by Aswicahyono and Pangestu [19] in order to maintain consistency with national statistics level (BPS). Details of commodity classification under five main category classes are provided in Appendix Table A.1. Accordingly, we construct Indonesia's 15 concentrated markets of major destination for manufactured exports, which can be classed into 4 individual countries (Japan, US, China and Australia) and 4 regions comprised of NIE (Hong Kong, Korea and Singapore), ASEAN3 (Malaysia, Philippines and Thailand), EU5 (France, Germany, Italy, Netherlands, and UK) and rest of world (ROW).

To track the evolution of export structure and competitiveness in manufacturing exports performance since

trade liberalization unleashed in 1986, export data of 1987 to 2008 will be classed within seven 4 year-period intervals.

## V. RESULTS AND DISCUSSION

### A. Export Growth Decomposition

Fig. 3 provides CMS results for some period intervals from 1987 to 2008. Trade liberalization drove positive contribution on all factors of both structural term and competitiveness term of export performance. Yet, such a constructive driver only lasted until beginning of 1993. Started from 1993, Indonesia suffered from loss in market share of its manufactured commodities. Even though it had time for regaining its competitiveness between 1996 until 2002, it could not maintain its market share from 2002 until 2005.

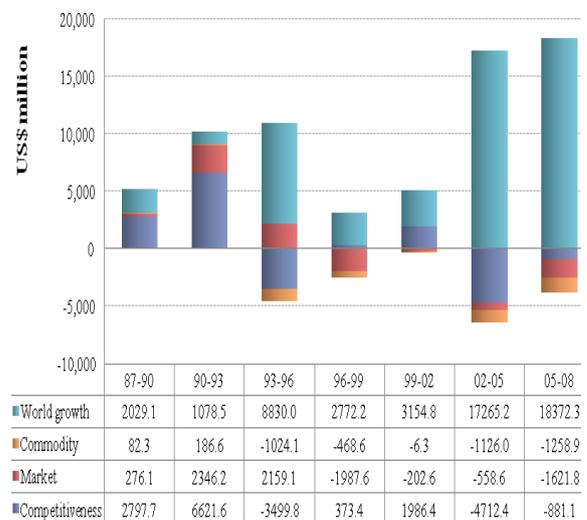


Fig. 3. CMS decomposition 1987-2008 (Source: Authors' calculation based on UN-COMTRADE)

During 1987-2008, Indonesia manufactured export performance was mainly contributed by positive effect of growth of world export, especially world exports growth effect of ULI exports. Eventhough growth of NRI and ULI commodities has been relatively slower than those of PCI, HCI and TI products, the domination of NRI and ULI in total manufactured exports provides larger weights to total export growth (see Table I) resulting in dominant world export growth effect of those commodities. In recent years, there have been a significant positive contribution of world exports growth of advanced technology, high value-added commodities such as TI, PCI and HCI products on total manufactured exports. Nevertheless, such positive gains were masked by lesser weights due to their relatively smaller proportion on total exports compared to those of NRI and ULI commodities.

On the other hand, CMS decomposition result reveals that there has been a continuous negative contribution of commodity effect during period under study indicating that commodity composition factor seems to be the main problem for growth of Indonesia manufactured exports. Fig. 4 provides results of disaggregated CMS decomposition, which enable us to scrutinize the contribution of export structure and competitiveness effects in each commodity

class.

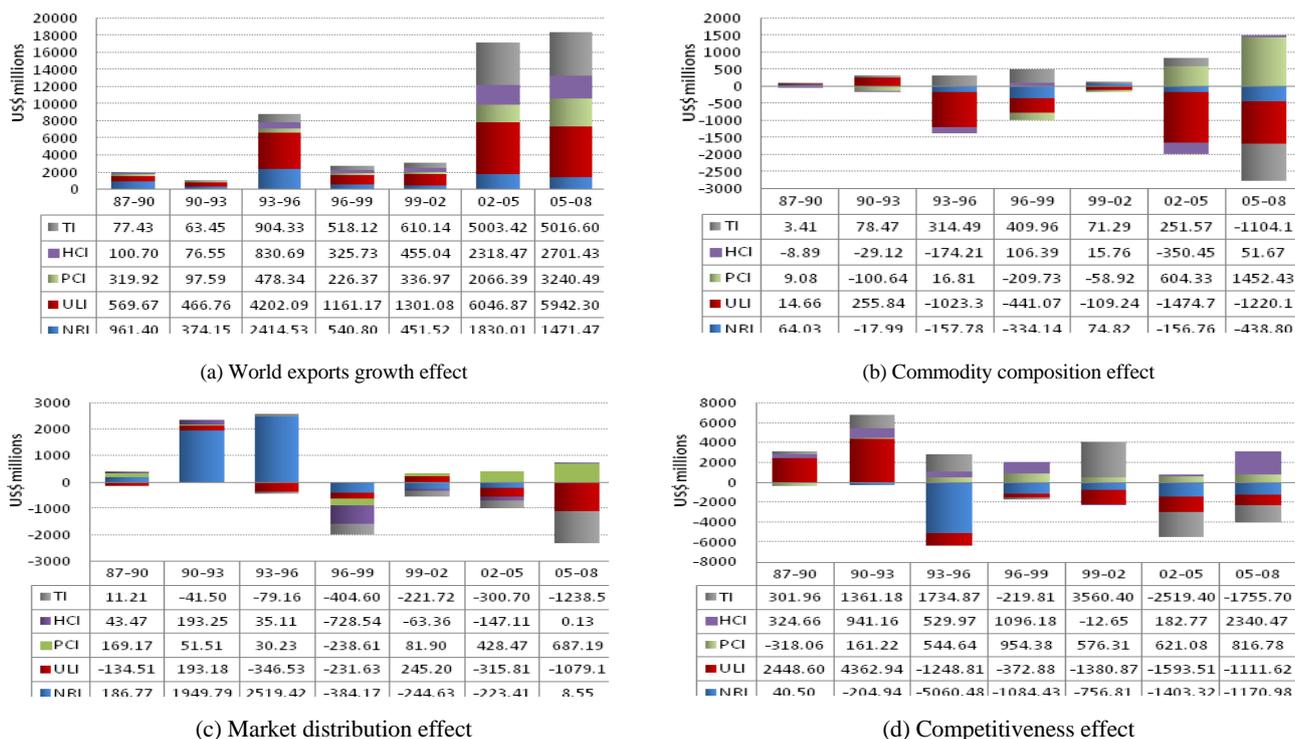


Fig. 4. Disaggregated CMS decomposition of manufacturing exports (Author's calculation).

From the distribution of each effect based on commodity class, CMS shows evidence that such a negative effect of commodity composition is due to continuous negative commodity effect in most major commodities under ULI category classes especially textile, garment and footwear started from 1993 to 2008. Since these commodities dominate not only in ULI category class, but also in overall manufactured exports performance, such negative impacts are transmitted into overall export performance with heavy weights. Average shares of textile, garment, and footwear commodities to total manufactured exports from 1987 to 2008 amount to 10.56%, 14.05%, and 5%, respectively. In overall, ULI commodity class contributes 37.25% share to total exports of manufactures during similar period. However, average world exports growth for ULI commodities of 6.76% is the slowest than those of other commodity classes (Table I).

TABLE I: EXPORTS SHARE AND GROWTH OF MANUFACTURED COMMODITY

No.	Product category	Avg. share	World growth (1996-2008)
1.	Natural resource-intensive	19.40%	7.04%
2.	Unskilled labor-intensive	37.25%	6.76%
3.	Physical capital-intensive	12.66%	9.67%
4.	Human capital-intensive	12.17%	8.41%
5.	Technology-intensive	17.57%	8.93%

Source: Authors' calculation based on UN-COMTRADE

The parallel condition also occurs in commodities under NRI category class. Major NRI commodities, such as wood and cork (mainly plywood) products, contribute 17.62% share to total manufactured exports providing impetus for 19.40% share of NRI to total export of manufactures. Unfortunately, world demand for this commodity class

merely grows slightly better than that of ULI, but is still lower than those of PCI, HCI and ULI commodities. During 1996 to 2008, world exports growth for NRI products was growing at 7.04% p.a. on average.

The contrasting conditions are performed by export commodities of advanced technology, high value-added products of PCI, HCI and TI. In detailed analysis on sectoral level, commodities of PCI, HCI and TI classes positively contributes to export growth in recent period, while those of NRI and ULI had deteriorating effect on export growth. Export of manufactures under these category classes played important role in compensating negative commodity effect of NRI and ULI during 1993-2008.

In some years after trade liberalization unleashed in 1986, Indonesia's manufactured exports performance had been contributed by positive commodity composition effect from impressive export performance of TI commodity (mainly electronics) from minuscule number of US\$ 3.41 million during 1987-1990 to US\$ 410 million in 1996 to 1999 –120 times fold in 13 years. Even though the number declined precipitously to below US\$ 100 million during recovery period following 1997/1998 economic crisis, it resumed to US\$ 252 million during 2002-2005. PCI exports commodity (mainly non-ferrous metals and iron & steels) also recorded impressive performance of during 2005-2008, which contributed to US\$ 1.5 billion positive commodity effect, the highest among four other commodity classes. Modest, yet positive commodity composition effect is shown by exports of HCI manufactures, which is mainly contributed by impressive export performance of rubber manufactures, road vehicle, and jewelry and other precious materials.

Such a positive commodity effect of PCI, HCI and TI exports is attributed to higher world exports growth of 9.67%, 8.41%, and 8.93% compared to 7.04% and 6.76%

demand growth of NRI and ULI commodities, respectively. Despite of their aforementioned impressive performance, the positive commodity effects of PCI, HCI and TI has only been transmitted with small weights to total manufactured exports growth due to their smaller portions on total manufactured exports value compared to those of NRI and ULI. The shares of PCI, HCI and TI exports in 1996-2008 were 12.66%, 12.17%, and 17.57%, lower than 19.40% and 37.25% of NRI and ULI, respectively. Accordingly, larger extent amounted to 57% share of negative commodity effect of NRI and ULI due to their slower growth, was transmitted to total manufacture exports growth resulting in overall negative performance of commodity effect from 1993 to 2008.

On average, world demand growth for NRI and ULI exports commodities is slower than that of PCI, HCI and TI products. According to Lall [20], such a slow demand growth is triggered by low economies of scale, undifferentiated products, more vulnerable to easy substitution by technical change and market shift, all of which are attributable to middle to low- and low-level of technology characteristic of NRI and ULI commodities. On the other hand, export commodities under PCI, HCI, and TI are products characterized by medium to high- and high technology level and high value-added, all of which result in high income elasticity of exports demand for those commodities. Despite of their slow world demand growth, Indonesia still maintains heavy reliance on NRI and ULI export commodities resulting in retarded overall manufactured exports performance.

CMS decomposition also points to the negative role of market distribution effect, which exhibits larger extent than that the product composition effect in most over observation period. This negative contribution is generally because of lower exports demand growth throughout Indonesia major export destination countries (mainly Japan and US) compared to other regions (China, Australia and rest of world) especially on commodities under NRI and ULI category (Table II). More than 58% Indonesian manufactured exports such as of textile, garment, and electronics have been towards its traditional export markets such as Japan, US, NIEs and ASEAN. Nevertheless, these countries recorded slower import growth from world markets during 1996-2008 compared to that of other markets such as China and Australia.

TABLE II: SHARE AND GROWTH OF EXPORT DESTINATION

No.	Product category	Avg. share	World growth (1996-2008)
1.	JAPAN	13.26%	5.68%
2.	US	17.53%	6.85%
3.	NIE	19.06%	7.92%
4.	ASEAN	8.54%	6.17%
5.	CHINA	3.80%	13.89%
6.	EU5	12.00%	7.08%
7.	AUSTRALIA	2.29%	8.86%
8.	REST OF WORLD	23.53%	10.73%

Source: Authors' calculation based on UN-COMTRADE

China's import demand recorded impressive average growth of 14% p.a. over 1996-2008, the highest among other Indonesia's major destination countries, with most

commodities imported are those of TI and PCI products such as plastics in primary forms (33.4%) and inorganic chemicals (21.27%). Yet, China market took only 3.8% of Indonesia's total manufacturing exports, where most export commodities were concentrated on products with slower world export growth in 1996-2008, such as woods and corks, organic chemicals, and paper and paperboard. In similar manner, exports to Australia also depicted minuscule portion to total manufactured exports with commodities are again mainly concentrated in slow demand growth of NRI and ULI commodities such as textile, woods, and furniture. Overall exports data of 1996-2008 periods revealed that impressive growing markets, such as China, Korea, Australia and EU5 countries, mostly imported advanced technology, high value-added export commodities under PCI and TI category. Unfortunately, mismatched problems of commodity composition to major export destinations with high import growth and slow world exports growth in such traditional markets resulted in negative market distribution effect to overall Indonesia manufactured exports performance from 1996 to 2008.

There has been a significant decline in shares of competitiveness gain in manufactured exports after period of 1993 indicating that Indonesia failed to maintain its export market share by losing price and/or non price advantage relative to its competitors on each commodity to each export destination country. During period of recovery following Asian 1998 crisis, Indonesia had time to regain its competitiveness until 2002. Nevertheless, since that period up to recent years, the progress in competitiveness has been mild.

From the distribution of competitiveness effect among industries, it reveals that from the onset of trade liberalization in 1986 most of competitiveness gain were contributed by PCI, HCI and TI sectors. In contrast, competitiveness in NRI and ULI commodities has continuously declined since 1993 onward. This phenomenon suggests that future development of industrialization should focus on the development of commodities with highly technology, more value-added commodities. In addition, the government of Indonesia should put more emphasis on competitiveness enhancing measures.

### *B. Comparative advantage and competitiveness*

The RCA index reveals that Indonesia still specializes in NRI and ULI both of which are characterized with low value-added. Most of the time, exports of highly comparative advantage are mainly dominated by wood and corks, footwear, garments and textiles. The main drivers of competitiveness of these export categories mostly come from natural resource endowments and low wages from unskilled labor for the former and the latter, respectively. However, world specialization pattern exhibits continuous growth of import demand in high value-added commodities under PCI, TI and HCI class. As Lall [21] argues, this is due to typical advanced technology, high value-added characteristics of those commodity classes, which provides more competitive advantage compared to those of NRI and ULI products. As a result, export demand for such commodities grows more than proportionate as income increases.

Improvement in comparative advantage for advanced technology, high value-added export commodities has been mild. RCA indicators provide evidence that number of commodities of PCI category exhibiting upgraded RCA index over five interval period from 1987 to 2008 was merely 1 out of 10 commodities (non ferrous metal). In HCI category, 4 out of 10 products (paper and paperboards, rubber manufactures, other transport equipment, and jewelry and other precious materials) were enjoying higher export market share indicated by their upgraded comparative advantage. Finally, 2 out of 10 commodities of TI sector (manufactured fertilizers and telecommunication equipments) were having upgraded RCA.

Summary of RCA indicators (Table III) indicates that:

- 1) The evolution of export structure (RCA >1) from 1987 to 2008 are still concentrated (50% to 71%) in commodities under ULI category, even though growth of world demand of these commodities tend to continuously decline. These commodities include garments, textiles, footwear and other low-technology embedded commodities.
- 2) Though such RCA numbers exceed unity, there has been a recurrent decline in the magnitude implying a loss in

sector's comparative advantage (market share) relative to its competitors in world market.

- 3) There has not been significant improvement in productive activities of commodities under PCI, HCI and TI categories, which is represented by no upgrading RCA in such categories either intensively or extensively takes place.
- 4) In contrast, number of downgraded products (RCA less than unity) after 2002 has been continuously increasing.

Based on RCA indicators, it seems that Indonesia still maintains heavy reliance on ULI commodities, which were characterized by low technology- and medium to low technology-embedded, and had a problem in upgrading its exports structure toward more productive activities and commodities. Porter [22] argues that if such problem persists, it can be a disadvantage towards a country's sustained growth and export-led development. In regards with this matter, government of Indonesia should put more emphasis on continuously upgrading its export structure by facilitating and enhancing the development of advanced technology, high valued-added commodities.

TABLE III: THE EVOLUTION OF EXPORTS' COMPARATIVE ADVANTAGE BASED ON RCA INDICATORS (RCA>1)

No.	1987		1990		1993		1996		1999		2002		2005		2008	
	SITC	RCA	SITC	RCA	SITC	RCA	SITC	RCA	SITC	RCA	SITC	RCA	SITC	RCA	SITC	RCA
1	W	22.09	W	21.16	W	21.71	W	15.83	W	11.32	W	9.29	W	6.23	W	4.13
2	NM	1.33	F	2.60	F	4.65	F	5.10	F	4.28	F	2.79	F	2.62	F	2.43
3	FER	1.21	FER	2.04	GAR	2.59	JEL	2.69	FUR	2.45	FUR	2.53	FUR	2.21	P	2.35
4	GAR	1.08	GAR	1.97	TEX	2.23	GAR	2.25	GAR	2.41	P	2.20	GAR	2.10	GAR	1.93
5			TEX	1.48	FUR	2.01	FUR	2.01	TEX	2.30	GAR	2.11	TEX	1.97	TEX	1.66
6			GSW	1.25	FER	1.63	TEX	1.92	P	2.27	TEX	2.03	P	1.95	NM	1.60
7			FUR	1.24	GSW	1.49	FER	1.60	POT	1.39	POT	1.42	POT	1.61	FUR	1.57
8					JEL	1.39	GSW	1.39	FER	1.39	TEL	1.29	NM	1.59	POT	1.55
9							POT	1.37	GSW	1.27	GS	1.27	RUB	1.28	RUB	1.33
10							TEL	1.11	GS	1.14	FER	1.14	GS	1.21	OT	1.15
11							P	1.01	TRV	1.03	GSW	1.10	GSW	1.00		
12											RUB	1.08				
13											NM	1.02				
Upgraded			TEX, GSW, FUR		JEL		POT, TEL, P		GS, TRV		TEL, RUB, NM				OT	
Downgraded			NM						TEL				FER, TEL		GS, GSW	

Source: Authors' calculation

### C. Policy Implication

Findings of the present study suggest some implications. Government should put more emphasis to enhance exports of PCI, HCI and ULI to take advantage of highly world demand growth under those commodities. The enhancement process can be as wider product differentiation and diversification as well as product technology deepening. All these efforts do not necessarily mean that such development is conducted by neglecting exports of NRI and ULI, commodities of which traditional comparative advantage lies. But in fact, more export promotions towards PCI, HCI and TI products are to support ULI and NRI exports, whose comparative advantage has already been depleted. Development of these high value-added export commodities requires improvement in industrial capabilities. Thus, government is worth promoting technological upgrading process towards higher value-added activities by facilitating more FDI toward PCI, HCI and TI sectors. This has to be supported by persistently sound

macro- and microeconomic measures to enhance export competitiveness (i.e. competitive exchange rate management, provision of excellent industrial infrastructure etc.). Since CMS result also indicates negative effect of market distribution effect, market diversification toward more growing export destination countries is also required.

## VI. CONCLUSION

Using Constant Market Share (CMS) analysis and Revealed Comparative Advantage (RCA) indicators, our study reveals that, while mostly enjoying benefits from world export growth, Indonesia exports performance were deteriorated by negative contribution of commodity composition and market distribution effect. The competitiveness role in manufacturing export performance, which was improved significantly right after trade liberalization unleashed in mid 1980s, has also been

diminishing in recent years. In addition, most of Indonesian manufacturing exports were still concentrated in NRI and ULI manufacturing commodities, whose world demand growth is relatively slower than that of advanced technology, highly value-added commodities. Thus, the present study

puts emphasis on integrated efforts to enhance export competitiveness and to further develop export structure towards advanced technology, highly value-added commodities for future development of export-oriented industries in Indonesia.

APPENDIX

APPENDIX TABLE A.1 MANUFACTURING EXPORTS COMMODITIES CLASSIFIED BY FACTOR INTENSITY

No	Manufacturing Industry	Abb.	SITC (rev. 2)	No	Manufacturing Industry	Abb.	SITC (rev. 2)		
1.	Natural resource-intensive	NRI	66 excl. 664, 665, 666	4.	General industrial machinery	GIM	74		
	Dyeing/tanning materials	DYE			53	Office machines	OM	751	
	Leather manufactures	L			61	Human capital intensive	HCI		
	Wood manufactures	W			63	Perfume/cosmetics	COS	55	
	Cement	C				Rubber manufactures	RUB	62	
2.	Unskilled labor-intensive	ULI	89 excl. 896, 897	5.	Paper/paperboard	P	64		
	Textiles	TEX			65	Metal manufactures	MET	69	
	Glass	GS			664	Household appliances	HOU	775	
	Glassware	GSW			665	Road vehicles	RV	78	
	Pottery	POT			666	Other transport equipment	OT	79	
	Sanitary, heating and lighting	SAN			81	Watches and clocks	WAT	885	
	Furniture	FUR			82	Works of arts	ART	896	
	Travel goods and bags	TRV			83	Jewelry and other precious	JEL	897	
	Garments	GAR			84	Technology-intensive	TI		
	Footwear	F			85	Medicine and pharmaceuticals	MP	54	
	Miscellaneous manufactures	OI				Manufactured fertilizers	FER	56	
	3.	Physical capital-intensive			PCI		Plastics in primary forms	PF	57
		Organic chemicals			OC		51	Plastics in non-PF i.e. cellulose	NPF
Inorganic chemicals		IC	52	Chemicals materials n.e.s	CM		59		
Iron and steel		IS	67	Automatic data processing	ADP		752, 759		
Nonferrous metal		NM	68	Telecommunication equipments	TEL		76		
Power-generating equipment		POW	71	Electrical machinery	ELE		77 excl. 775		
Machineries		M	72	Photographic and optical goods	PHO		88 excl. 885		
Metalworking machinery		MM	73						

Source: UN Statistics Commodity Trade database.

REFERENCES

- [1] R. Rahmaddi, and M. Ichihashi, "Exports and Economic Growth in Indonesia: a Causality Approach based on Multivariate Error Correction Model," *Journal of International Development and Cooperation*, vol. 17, no. 2, pp. 53-74, 2011.
- [2] A. Finecelli, S. Macimmo, and A. Zaghini, "A Disaggregated Analysis of the Exports Performance of Some Industrial and Emerging Economies," *MPRA Paper*, no. 11000, pp. 1-20, 2008.
- [3] E. E. Leamer and R. M. Stern, *Quantitative International Economics*, 3rd ed., London: Aldine Transaction, 1970, pp. 171-183.
- [4] Asian Development Bank Institute, "Did East-Asian Economies Lose Export Competitiveness in the Pre-Crisis 1990s? Assessing East-Asian Export Performance from 1980 to 1996," *ADB Institute Research Paper Series*, no. 34, pp. 1-41, 2002.
- [5] H. Hill, "Indonesia's Industrial Policy and Performance: Orthodoxy Vindicated," *Economic Development and Cultural Change*, vol. 45, no. 1, pp. 147-174, 1996.
- [6] M. Ishida, "Industrialization in Indonesia since the 1970s," *IDE-Jetro Research Paper*, 5, pp. 1-65, 2003.
- [7] J. M. Fleming and S. C. Tsiang, "Changes in Competitive Strength and Export Shares of Major Industrial Countries," *IMF Staff Papers*, vol. 5, pp. 218-248, 1956.
- [8] H. B. Junz, and R. R. Rhomberg, "Price Competitiveness in Export Trade among Industrial Countries," *American Economic Review*, vol. 63, pp. 412-418, 1973.
- [9] A. H. Q. M. Merckies and T. van der Meer, "A Theoretical Foundation for Constant Market Share Analysis," *Empirical Economics*, vol. 13, pp. 65-80, 1988.
- [10] H. Tyszynski, "World Trade in Manufacturing Commodities, 1989-1990," *The Manchester School*, vol. 14, pp. 272-304, 1951.
- [11] P. Bowen and J. Pelzman, "US Export Competitiveness," *Applied Economics*, vol. 16, pp. 461-473, 1984.
- [12] J. Fagerberg and G. Sollie, "The Method of Constant Market Share Analysis Reconsidered," *Applied Economics*, vol. 19, pp. 1571-1583, 1987.
- [13] P. J. Iloyd and H. Taguchi, "East Asian Export Competitiveness: New Measures and Policy Implications," *Asian Pacific Economic Literature*, vol. 10, no. 2, pp. 1-15, 2005.
- [14] T. A. Tran, "Vietnam's Export in the face of China's Competition: An Overview and Assessment," *Comparative Economic Studies*, vol. 52, pp. 405-427, 2010.
- [15] W. Juswanto and P. Mulyanti, "Indonesia's Manufactured Exports: A Constant Market Share Analysis," *Jurnal Keuangan and Moneter*, vol. 6, no. 2, pp. 97-105, 2003.
- [16] M. T. Sambodo, "Indonesia's Export Performance: A decomposed Constant Market Share Analysis 1962-2002," *Jurnal Ekonomi dan Pembangunan*, vol. 12, no. 1, pp. 36-59, 2004.
- [17] J. D. Richardson, "Constant Market Share Analysis of Export Growth," *Journal of International Economics*, vol. 1, pp. 227-239, 1971.
- [18] B. Balassa, "Revealed Comparative Advantage Revisited," in *Comparative Advantage, Trade Policy and Economic Development*, B. Balassa, Ed. New York University Press, New York, 1989, pp. 63-79.
- [19] H. Aswicahyono and M. Pangestu, "Indonesia's Recovery: Exports and Regaining Competitiveness," *The Developing Economies*, vol. 38, no.4, pp. 454-489, 2000.

- [20] S. Lall, "Exports of Manufactures by Developing Countries: emerging Patterns of Trade and Location," *Oxford Review of Economic Policy*, vol. 14, no. 2, pp. 54-73, 1998.
- [21] S. Lall, "The Technological Structure and Performance of Developing Country Manufactured Exports, 1985-98," *Oxford Development Studies*, vol. 28, no. 3, pp. 337-369, 2000.
- [22] M. Porter, "The Competitive Advantage of Nations," *New York: The Free Press*, 1990.



**Rudy Rahmaddi** is a PhD candidate of Graduate School for International Development and Cooperation. He serves his professional work as an officer of the Ministry of Finance of the Republic of Indonesia. He obtained his Bachelor in Economics from Faculty of Economics, University of Indonesia in 1999. In 2004, he earned his MBA in Finance from Faculty of Economics, University of Indonesia with distinction of *cum laude*. His research interests are in International Trade and Development, Export and Economic Growth, and FDI and Industrialization Development. He is a member of Japan Society for International Development (JASID). His works are published in *Modern Economy* and *Journal of International Development and Cooperation*. His collaborative work with Prof. Masaru Ichihashi titled "The Changing Pattern of Export Structure and Competitiveness in Indonesia Manufacturing Sectors: An Overview and Assessment" earned the best paper award in 2<sup>nd</sup> International Conference on Economics, Trade and

Development – ICETD 2012.



**Masaru Ichihashi** was born in Japan on February 6, 1962. He obtained his undergraduate degree 1985 from Department of Economics, Shizuoka University. He accomplished his master from Kyoto University in 1989. He earned his PhD from Kumamoto University. He is a Professor at Graduate School for International Development (IDEC) Hiroshima University since 2007. His specialization is in Comparative Economic Development, Japanese Economic System, Input-Output Analysis, International and Regional Studies of Economy, and Quantitative Economic Analysis. He is also a member of Japanese Economic Association and many others. Prof Masaru Ichihashi's works are published in various journals: *Economics Bulletin*, *The Japanese Economy*, *Chinese Business Review*, *Modern Economy*, *Journal of International Development and Cooperation*, *Studies on Regional Economics*, and *Studies on Social Science*.