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The Changing Pattern of Export Structure and Competitiveness in Indonesia's Manufacturing Sectors: an Overview and Assessment

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Abstract. The paper aims to elucidate the evolution of export structure and competitiveness in Indonesia's manufacturing sectors from 1987 to 2008. 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 is deteriorated by negative contributions of commodity composition, market distribution, and competitiveness effects. In addition, export competitiveness in manufacturing commodities has been diminishing in recent years and Indonesia still specializes in NRI and ULI manufacturing exports even though world demand growth of those commodities is lower than that of commodities with highly technology-embedded. Thus, the current paper emphasizes on the importance of competitiveness enhancing measures and development of more advanced technology-embedded commodities.

Keywords: Exports performance; specialization pattern; Indonesia; constant market share analysis; revealed comparative advantage.

1. Introduction

After the collapse in oil price in mid-1980s, Indonesia started to embark on trade liberalization era represented by an outward-oriented or export promotion (EP) strategy replacing import substitution industrialization (ISI) strategy, which was spurred by the oil windfall profit during mid 1970s. GDP growth during 1986-2008 was dominated by real exports or *seemingly* export-led growth, and the portion of manufactured commodities in total exports structure increased overtime outperforming natural resource-intensive (NRI) exports reaching its peak of 68% in 2007. During 1986 to 2008, Indonesia manufactured exports grew at 15% on average with more than 50% of total exports went to Japan, USA, newly industrializing economies or NIEs, and ASEAN3 (Malaysia, Thailand and Philippines). As regards of export performance, Leamer and Stern (1970) point out changes in a country's exports performance can be influenced by (a) world export demand; (b) geographical destination; (c) product composition; and (d) changes in country's competitiveness. In addition, ADB (2002) argued that assessing exports from its structure may reveal upgrading process of an economy's exports toward more productive activities, which plays a critical role in export-led development and sustained high export growth. Therefore, identifying the evolution of export structure and impacts of factor determinants on export performance are deemed necessary in supporting the export-led development in Indonesia.

Theoretical foundation in analyzing the contribution of factor determinants in terms of commodity composition, market distribution and competitiveness effects on export performance is well explained in literatures (Leamer and Stern, 1970; Richardson 1971). It is drawn from the idea that demand for exports in a given market from competing sources is a function of the relative prices (elasticity of substitution). This justify the application of Constant Market Share (CMS) analysis which assumes that exports share will remain unchanged over time except as relative price varies. Thus, changes in exports beyond the constant share norm can be attributed to price changes or changes in competitiveness level which captures changing market share effect. CMS analysis pioneered by Tyszynski (1951) has been used widely on assessing the international trade flows by many economists. Some, especially for developing countries case, are presented

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here. Lloyd and Taguchi (1996) analyzed changes in exports competitiveness of China, Korea and Indonesia. Tran (2011) analyzes Vietnam's export performance in face of China's emergence as a major competitor in world market by employing CMS and Revealed Comparative Advantage (RCA). Both studies found that competitiveness is the most contributed factor on export performance compared to commodity composition and market distribution effects for those countries. Empirical studies on Indonesia's case have been sparse, yet some are worth mentioning. Juswanto and Mulyanti (2003) and Sambodo (2004) examined Indonesia manufacturing exports using one- and two-digit SITC level, respectively. Both studies revealed that Indonesia export performance suffered from negative contribution of commodity composition and low response to world demand. Nevertheless, none did they consider the existence of European economies (EU) and other significant markets such as China. They did not explain as well the evolution of Indonesia manufactured export structure. The latter point may enable one to link the analysis with specific policy implication on targeted export-oriented industries. Our study attempts to fill these gaps.

Our study aims to elucidate the changing pattern of exports structure and competitiveness in Indonesia's manufacturing sectors by quantifying the contribution of the geographical (market), commodity composition and competitiveness effects on export performance. In so doing, we employ analyses of CMS and RCA on disaggregated level of manufacturing commodities classified by factor intensity for period 1987 to 2008. To the best of our knowledge, previous studies for specific case of Indonesia have not taken such combined issues into account. The rest of paper is organized as follows. Section II reviews methodology and data used in this study. The penultimate section III elucidates empirical results and discussions. Section V provides some concluding remarks.

2. Analytical Model and Data

2.1. Analytical model

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 (1970), among others, the following export-based CMS identity decomposes actual change in a country's exports between two periods as follows:

$$V' - V \equiv \underbrace{\sum_i rV_{i.}}_{\text{(i)}} + \underbrace{\sum_i (r_i - r)V_{i.}}_{\text{(ii)}} + \underbrace{\sum_i \sum_j (r_{ij} - r_i)V_{ij}}_{\text{(iii)}} + \underbrace{\sum_i \sum_j (V'_{ij} - V_{ij} - r_{ij}V_{ij})}_{\text{(iv)}} \quad (4)$$

where V (V') is country A's exports value in period 1 (2), $V_i(V_i')$ is country A's exports value of commodity *i* in period 1 (2), $V_{ij}(V'_{ij})$ is country's A exports value of commodity *i* to country *j* in period 1 (2), r is the percentage growth in total world exports from period 1 (2), r_i is the percentage growth in total world exports of commodity *i* from period 1 (2), r_{ij} is the percentage growth in total world exports of commodity *i* to country *j* from period 1 (2). The four expressions of the identity (4) decompose a country's exports growth into four effects respectively, as follows. (i) world trade effect, which relates any change in country A's actual exports to general rise is the world exports; (ii) commodity composition effect, which measures the extent to which A's export differential is due to specializing in specific commodity where its export demand is growing faster world average; (iii) market distribution effect, which measures whether concentration on market destination of country A's exports are growing relatively faster than world average; (iv) competitiveness term, an 'unexplained' residual, which reflects the difference between actual and hypothetical exports increase if country A had maintained its share in each commodity group.

To reveal the evolution pattern of changing comparative advantage in export commodity, which represents the dynamics of export structure, this study employs Balassa (1989) export-based RCA index using the following formula:

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

where X_i^k is Indonesia's exports value of commodity *i* in period t, X_t^k is value of Indonesia's exports of total commodity in period t, X_i^w is world exports value of commodity *i* in period t, and X_t^w is world exports value of total commodity in period t

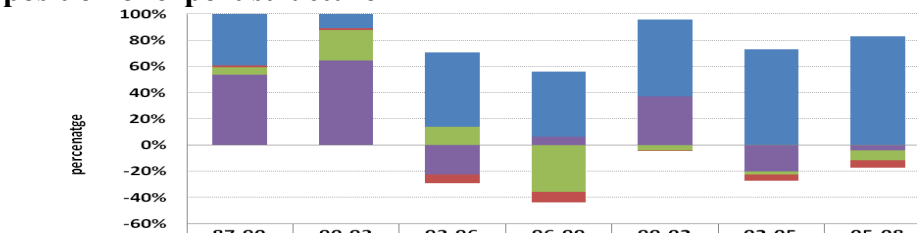
The RCA index of a given product is measured by the commodity's share in the country's exports relative to its share in world. It reveals the relative pattern of export specialization for an economy relative to worldwide patterns. The greater a sector's RCA, the more an economy specializes in that sector's exports relative to world specialization patterns revealing a stronger comparative advantage in that sector. Tracking the structure of RCAs over time reveals an economy's comparative advantage development and export upgrading process (ADB, 2002).

2.2. Data Description

CMS decomposition and RCA indicators using formula (4) and (5), respectively, are computed using data from UN-COMTRADE in annual basis at two- to three-digit SITC commodity level (Rev. 2) of manufactured exports. Utilizing such disaggregated data enables one to chase the structural impact of factor determinants on more disaggregated export commodities and link the analysis with targeted export-oriented industries. Following Aswicahyono and Pangestu (2000), we categorize manufactured export commodities classified by factor intensity into five main category-classes namely natural resource-intensive (NRI), unskilful labour-intensive (ULI), physical capital-intensive (PCI), human capital-intensive (HCI), and technology-intensive (TI). Accordingly, we construct Indonesia's 15 major export destination markets, 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).

3. Results and Discussion

3.1. Decomposition of export structure



	87-90	90-93	93-96	96-99	99-02	02-05	05-08
World growth	2029.1	1078.5	8830.0	2772.2	3154.8	17265.2	18372.3
Commodity	82.3	186.6	-1024.1	-468.6	-6.3	-1126.0	-1258.9
Market	276.1	2346.2	2159.1	-1987.6	-202.6	-558.6	-1621.8
Competitiveness	2797.7	6621.6	-3499.8	373.4	1986.4	-4712.4	-881.1

Fig. 1: CMS Decomposition 1987–2008 (numbers are in US$ millions)

Fig. 1 provides CMS results for some period intervals during 1987 to 2008. Trade liberalization drove positive contribution on all factors of both structural and competitiveness terms. Unfortunately, the constructive drivers only lasted until beginning of 1993. Started from 1993, Indonesia lost in some of market share of its manufactured commodities. Even though export competitiveness regained between 1996 and 2002, Indonesia could not maintain its market share from 2002 until 2005. Changes in Indonesia manufactured exports were mainly contributed by world export growth especially that of ULI commodities. In addition, there has been a continuous negative contribution of commodity effect indicating commodity composition seems to be the main problem for Indonesia manufactured exports. 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 effect in most major commodities under ULI category classes (textile, garment and footwear). Since these commodities dominate not only in ULI category class, but also in overall export performance (37.25% on average), such negative impacts are transmitted into overall export performance with heavy weights. The similar condition also applies for commodities under NRI category class. [1] In contrast, commodities under HCI (road vehicles) and PCI (chemicals) classes positively contribute

[1] For the sake of brevity, we do not provide figures of CMS analyses depicting distribution of structural effects across industries. Detailed CMS decomposition results across industries can be obtained from authors upon request.

to export growth in recent period. This can be explained by the fact that world exports growth rate in such commodity classes is higher than that of NRI and ULI during 1996 – 2008 (**Table 1 panel a**). This is plausibly because export commodities under PCI, HCI, and TI are products with medium to high- and high-technology embedded levels, which tend to have high income elasticity of exports demand (Lall, 2000). Commodities under these category classes play important role in compensating negative contribution of commodity effect from NRI and ULI during 2002 to 2008. CMS decomposition also points to the negative role of market distribution effect, which exhibited larger extent than that of product composition effect. Such negative effect was partly because of lower import demand growth throughout Indonesia major export destinations (Japan and US) compared to other regions such as China and Australia (**Table 1 panel b**).

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 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, there has been small progress in competitiveness indicator. From the distribution of competitiveness effect across industries, CMS decomposition reveals that from the onset of trade liberalization in 1986 most of competitiveness gains were contributed by PCI, HCI and TI sectors. In contrast, there has been a continuous decline of competitiveness in NRI and ULI industries.

Table 1. Share and Growth of Manufactured Exports 1996-2008 (Authors' calculation)

Product category	Avg. share	World growth
NRI	19.40%	7.04%
ULI	37.25%	6.76%
PCI	12.66%	9.67%
HCI	12.17%	8.41%
TI	17.57%	8.93%

(a) Product category

Market destination	Avg. share	World growth
JAPAN	13.26%	5.68%
US	17.53%	6.85%
NIE	19.06%	7.92%
ASEAN	8.54%	6.17%
CHINA	3.80%	13.89%
EU5	12.00%	7.08%
AUSTRALIA	2.29%	8.86%
REST OF WORLD	23.53%	10.73%

(b) Market destination

3.2. Exports Structure and Comparative advantage

The RCA indices reveal that Indonesia still specializes in NRI and ULI both of which are characterized with fewer added values and main drivers of competitiveness come from natural resource endowments in the former one and low wages in the latter. However, world specialization pattern exhibits continuous growth of export demand in more highly added value commodities under PCI, TI and HCI class (**Table 1 panel a**). Summary of RCA indicators (**Table 2**) indicates that (1) exports products with high comparative advantage (RCA numbers > 1) are still concentrated in commodities under ULI category, even though growths 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 much improvement in productive activities of commodities under PCI, HCI and TI categories represented by no upgrading RCA in such categories either intensively or extensively; (4) in contrast, number of products downgraded (RCA less than unity) after 2002 were continuing.

Based on RCA indicators, it indicates that Indonesia still maintains heavy reliance on low technology- and medium to low technology-embedded commodities (NRI and ULI), and is less successful in upgrading its exports structure toward more productive activities and commodities. Porter (1990) argues that if such problem persists, it could be a disadvantage towards a country's sustained growth and export-led development. Thus, government of Indonesia should put more emphasis on continuously upgrading its export structure by facilitating and enhancing the development of commodities with more advanced technology- embedded. This can be done by promoting more R&Ds to improve product quality in export-oriented industries and encouraging more FDI inflow in highly technology industries. Such measures need to be combined by providing sound infrastructures and supply logistics to promote export competitiveness.

Table 2: The Changing Pattern of RCA Indicators (RCA>1)

No	SITC	1987	SITC	1990	SITC	1993	SITC	1996	SITC	1999	SITC	2002	SITC	2005	SITC	2008
1	63	22.1	63	21.2	63	21.7	63	15.8	63	11.3	63	9.29	63	6.23	63	4.13
2	68	1.33	85	2.6	85	4.65	85	5.1	85	4.28	85	2.79	85	2.62	85	2.43
3	56	1.21	56	2.04	84	2.59	897	2.69	82	2.45	82	2.53	82	2.21	64	2.35
4	84	1.08	84	1.97	65	2.23	84	2.25	84	2.41	64	2.2	84	2.1	84	1.93
5			65	1.48	82	2.01	82	2.01	65	2.3	84	2.11	65	1.97	65	1.66
6			665	1.25	56	1.63	65	1.92	64	2.27	65	2.03	64	1.95	68	1.6
7			82	1.24	665	1.49	56	1.6	666	1.39	666	1.42	666	1.61	82	1.57
8					897	1.39	665	1.39	56	1.39	76	1.29	68	1.59	666	1.55
9							666	1.37	665	1.27	664	1.27	62	1.28	62	1.33
10							76	1.11	664	1.14	56	1.14	664	1.21	79	1.15
11							64	1.01	83	1.03	665	1.1	665	1.00		
12											62	1.08				
13											68	1.02				
SITC upgraded			65, 665, 82		897		666, 76, 64		664, 83		76, 62, 68				79	
SITC downgraded			68						76				56, 76		664, 665	

4. Concluding remarks

Using CMS and RCA analyses, our study reveals that mostly enjoying benefits from world export growth, Indonesia exports performance were deteriorated by the negative contribution of commodity composition and market distribution. 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, Indonesia still specializes in NRI and ULI manufacturing exports indicated from high comparative advantage in those sectors even though world demand growth of those commodities is relatively slower than that of commodities with highly technology-embedded. This is as evidence that Indonesia needs to continuously upgrading its exports towards highly technology-embedded commodities. Thus, it is suggested for the government of Indonesia to put more integrated efforts on competitiveness enhancing measures and the development of commodities with more advanced technology-embedded for future development of export-oriented industries in Indonesia

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