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КАРТИРОВАНИЕ ПРОДУКТОВ СТАНДАРТНЫХ ГРУПП ГАРМОНИЗИРОВАННОЙ СИСТЕМЫ И ВЫБОР ГРУПП АРМЕНИЕЙ ДЛЯ ИМПОРТОЗАМЕЩЕНИЯ И ПРОДВИЖЕНИЯ ЭКСПОРТА

Аннотация. *Цель:* путем классификации стандартных групп Гармонизированной системы на четыре группы определить группы со сравнительными преимуществами и/или экспортной специализацией; и те группы, которые приводят к торговому дефициту, для того чтобы выявить группы для продвижения экспорта и выделить основной подход к стратегии импортозамещения в Армении. *Методология:* модифицированная версия инструмента "Картирование продуктов", предложенная Уллой и Казуо (2012) и первоначально разработанная Видодо (2008), используется для классификации стандартных групп продуктов Гармонизированной системы. Для классификации товарных групп использованы средние значения индекса Нормализованных выявленных сравнительных преимуществ и индекса относительного чистого экспорта за период 2012-2016 гг. **Результаты:** Из 97 товарных групп всего 11 групп товаров имели экспортную специализацию и сравнительные преимущества. Десять стандартных групп товаров продемонстрировали способность конкурировать на внешних рынках, однако им не хватает экспортной специализации. Только одной группе товаров удалось продемонстрировать некоторую степень экспортной специализации, однако ей не хватает конкурентоспособности на мировом рынке. Остальные 75 группы товаров не имели ни экспортную специализацию, ни конкурентные преимущества. **Выводы:** стратегия правительства в отношении импортозамещения и стимулирования экспорта может стать следующим в среднесрочной перспективе: продолжать усилия по продвижению экспорта, и меры в отношении товарных групп, включенных в группу А; разрабатывать и осуществлять такие меры, которые позволят товарные группы включены в группы В поднять степень экспортной специализации и усилить конкурентные позиции на внешних рынках, что обеспечит одновременно рост экспорта и снижение импорта, что повлечет за собой укрепление торгового баланса; уделять приоритетное внимание тем товарным группам, включенным в группу D, которые могут начать приобретать экспортную специализацию и становиться более конкурентоспособными на внешних рынках и/или будут способствовать развитию и росту экспорта продуктов, включенных в группы А и В. **Практическое применение:** выводы статьи могут быть использованы Министерством экономического развития и инвестиций Республики Армения и Фондом развития Армении при разработке стратегий поощрения экспорта и импортозамещения для различных отраслей.

Ключевые слова: Картирование продуктов, экспорт, импорт, индекс относительного чистого экспорта, индекс нормализованных выявленных сравнительных преимуществ, Армения

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MAPPING OF PRODUCTS OF STANDARD GROUPS OF A HARMONIZED SYSTEM AND CHOOSING GROUPS BY ARMENIA FOR IMPORT SUBSTITUTION AND EXPORT PROMOTION

Abstract. *The goal:* through a classification of standardized groups of a Harmonized system into four groups to determine the groups with comparative advantages and/or export specialty; as well as those groups that lead to having a trade deficit, in order to find out the groups for export promotion and distinguish the main approach to a strategy of import substitution in Armenia. **The meth-**

odology: a modified version of the tool of “Mapping of products” suggested by Ullah and Kazuo (2012) and originally developed by Widodo (2008), is used to classify standard product groups of a Harmonized system. In order to classify product groups we have used average values of the index of Normalized detected comparative advantages and the index of a relatively pure export over the period of 2012-2016. **The results:** Out of 97 product groups, 11 groups of products in total had export specialty and comparative advantages. Ten standard groups of products demonstrated an ability to compete in international markets, however they lack having export specialization. Only one group of products managed to demonstrate a certain degree of export specialty, however, it lacks being able to compete in the world market. The other 75 groups of products did not have either export specialty or competitive advantages. **The conclusions:** the strategy of the government regarding import substitution and promoting export may become the following in the mid-term perspective: continuing efforts promoting export, as well as measures towards product groups included in group A; developing and implementing the measures that will allow product groups included in group B to lift the degree of export specialty and increase their competitive position in the international markets which will, at the same time, provide for the growth in export and reduction in import, which will lead to strengthening of the trade balance; providing priority attention to those product groups included in group D which may start acquiring export specialty and become more competitive in international markets and/or will contribute to the development and growth of export of products included in groups A and B. **The practical application:** the conclusions of the manuscript may be used by the Ministry of Economic Development and Investments of the Republic of Armenia and the Development Fund of Armenia when developing strategies of supporting export and import substitution for different industries.

Keywords: Mapping of products, export, import, the index of relatively pure export, the index of normalized detected comparative advantages, Armenia

Introduction. Despite the fact that imports of capital and intermediary goods enable domestic producers to report increase in local production (especially in the case of new technology), thus resulting in the increase in productivity (Zang and Bainbridge, 2012: 368-369) [1, pp.368-369]; exporters of labor-intensive products (in case of developing nations) to become more productive (Thangavelu and Rajaguru, 2004: p.1084) [2, p.1084]; and exporters of various items to report increase in exports since the significant fraction of export growth is associated with the increase in imports (Awokuse, 2008:161) [3, p.161] and etc., import growth needs to be curbed by ensuring stable flows of the foreign exchange, namely by increase in exports (Fosu, 2001:80) [4, p.80]. Hence, balancing the imports and exports is required, since trade balance plays a crucial role in ensuring the stability of economic growth (Pacheco-López, 2005: 613-614) [5, 613-614].

Although Armenia’s trade balance had started improving since 2012 and in 2016 reached the lowest trade deficit level (1,015 million US dollars), it still remained high and accounted for about 10% of Armenia’s GDP (see table 1). In 2016, imports comprised about 42.7% of the GDP, while exports amounted to 33.1% ([15], [18], author’s own calculations).

Changes in trade deficit were mainly explained by the changes in imports of goods (see table 1), thus stressing the need for initiating and designing the import substitution policy along with making the export promotion efforts the highest priority. Hence, Armenia could face 2 alternative development strategies: transition to the second phase of import substitution (see table 2) or export-led industrial development (mainly by producing and exporting manufactured items) as various nations did upon completing the first phase of import-substitution during which the governments of those nations had been mainly focused on developing low (labor-intensive) and medium technology sectors of the economy (Balassa, 1981:6) [14, p.6]. Therefore, by somehow ensuring the development of the industries considered the main government support-recipient industries during the first phase of import substitution (see table 2), Armenia currently faces such choice as well.

Hence, the purpose of this article is by utilizing the modified version of the “Products Mapping” tool proposed by Ullah and Kazuo (2012:476-477) [9, 476-477] and originally constructed by Widodo (2008:204-205) [8, 204-205], to categorize the Harmonized System [17] standard groups into four ones to identify the groups with comparative advantage and/or export specialization; and those that result in trade deficit to reveal the groups for export promotion and highlight the main approach to import substitution strategy in Armenia.

Table 1:

Armenia's Trade Balance from 2012 to 2016 (million US dollars)

	2012	2013	2014	2015	2016
Trade Balance	-2,214.0	-2,321.1	-2,168.9	-1,281.8	-1,015.8
<i>Percent of GDP</i>	-20.8%	-20.9%	-18.7%	-12.1%	-9.6%
Goods and Services					
<i>Credit</i>	2,917.4	3,155.3	3,318.3	3,136.3	3,500.4
<i>Debit</i>	5,131.4	5,476.4	5,487.3	4,418.2	4,516.2
Goods					
<i>Credit</i>	1,515.7	1,635.9	1,698.1	1,623.9	1,890.7
<i>Debit</i>	3,627.6	3,832.0	3,753.6	2,810.3	2,835.1
Services					
<i>Credit</i>	1,401.7	1,519.4	1,620.2	1,512.4	1,609.7
<i>Debit</i>	1,503.8	1,644.4	1,733.7	1,607.9	1,681.1

Source: [18], [15], author's own calculations.

Table 2:

The phases of import substitution or inward orientation

	Phase I	Phase II
Industries	Textiles, leather goods, wood products, processed foods	Consumer durables, industrial intermediates, steel, chemicals, capital goods
Plant size/Economies of scale	Small	Medium-large
Technology	Low-medium	Medium-high
Capital required	Low	Medium-high
Ownership	Private sector entrepreneurs	Family conglomerates, SOEs, multinational firms
Market opportunities	Domestic	Domestic, permits required Buy out other firms

Source: Scott, 2011:343 [13, p.343]

Design/methodological approach

The "Products Mapping" analytical tool was first developed and introduced by Widodo (2008:204-205) [8, pp. 204-205] by combing two variables: the Revealed Symmetric Comparative Advantage (RSCA) index constructed by Laursen (1998:2) [11, p.2], Dalum et al. (1998:427-428) [20, pp.427-428], [10, p.5], and the Trade Balance Index (TBI) proposed by Lafay (1992) [6] and/or the Relative Net Export (RNX) Index (UNIDO, 1982) [19], [10, p.10]. The "Products Mapping" tool constructed by Ullah and Kazuo (2012:476-477) [9, pp. 476-477] combines the Trade Balance Index and/or Relative Net Export Index with the Normalized Revealed Comparative Advantage Index (NRCA) developed by Yu et al. (2009:270-272) [7, pp. 270-272]. For the purpose of this study the "Products Mapping" tool developed by Ullah and Kazuo (2012:476-477) [9, pp. 476-477] is applied.

The TBI and/or RNX is defined as the following

$$RNX_{i,c,t} = \frac{X_{i,c,t} - M_{i,c,t}}{X_{i,c,t} + M_{i,c,t}} \quad (1), [10, p. 10]$$

where:

$X_{i,c,t}$ is the value of exports of commodity i of a country c in year t [10, p.5];

$M_{i,c,t}$ is the value of imports of commodity i of a country c in year t ;

$RNX_{i,c,t}$ is the value of the Relative Net Export Index score of commodity i of a country c in year t .

The value of the index score ranges from -1 to +1. If the value equals to -1 that implies that the given country only exports the given commodity, while the value of +1 implies that the nation only exports the given commodity. The positive value of the index score implies that the given country is a "net-exporter", while the negative value implies that the given country is a "net importer". The index

cannot be defined when given nation neither imports nor exports the given commodity.

The Normalized Revealed Comparative Advantage Index is defined as the following:

$$NRCA_j^i = E_j^i / E = E_j^i / E - E_j E^i / EE \quad (2) \quad [7, p.271]$$

where:

E_j^i is the value of exports of commodity j of country i ;

E_j is the value of the world exports of commodity j ;

E^i is the value of the total exports of country i ;

E is the value of the total world export

$NRCA_j^i$ is the Normalized Revealed Comparative Advantage Index of commodity j of country i .

The index “measures the degree of deviation of a country’s actual export from its comparative-advantage-neutral level in terms of its relative scale with respect to the world export market” (Yu et al., 2009:270) [7, p. 270]. If the value of the index score is higher than 0, that implies the actual export of commodity j of a country i “is higher than its comparative-advantage-neutral level” Ullah and Kazuo (2012:476) [9, p. 476], which means that country i has a comparative advantage in commodity j , meanwhile the negative value of the index score implies that the actual export of commodity of j is lower than its comparative-advantage-neutral level, which means that country i has comparative disadvantage in producing commodity j . The higher the value of the index is, the stronger the comparative advantage of country i is in producing commodity j , and the opposite. “The possible distribution of NRCA scores is symmetrical, ranging from $-1/4$ to $+1/4$ with 0 being the comparative-advantage-neutral point” (Yu et al., 2009:273) [7, p. 273].

Figure 1 demonstrates the Products Mapping constructed by Ullah and Kazuo (2012:477) [9, p.477].

Figure 1:

Products Mapping by Ullah and Kazuo (2012)

Normalized Revealed Comparative Advantage Index	NRCA>0	Group B: NRCA>0 and RNX<0	Group A: NRCA>0 and RNX>0
	NRCA<0	Group D: NRCA<0 and RNX<0	Group C: NRCA<0 and RNX>0
		RNX<0	RNX>0
		Relative Net Export Index	

Source: Ullah and Kazuo (2012:477) [9, p.477].

Group A consists of those products that represent “the most vital export products since they upbeat global competition and strengthen country’s balance of payments” if “product mapping is done for export basket of a country” Ullah and Kazuo (2012:476) [9, p.476]. Group B consists of products that are competitive; however, the given country lacks specialization with respect to the given products. Group C comprises those products that the given country possesses specialization with respect to the groups, whoever these products are not competitive in terms of comparative advantage. Group D includes those products that lack both export specialization and “competitiveness in global market” and result in increase in trade deficits with respect to these products, “since the country is a net importer” (Ullah and Kazuo, 2012:476) [9, p.476]. Hence, Group B and C could be considered “potential products to raise export earnings but require dissimilar strategies for future resource allocation decision” (Ullah and Kazuo, 2012:476-477) [9, pp.476-476].

In the case of Armenia, for the purpose of constructing the “Products Mapping” tool, the data on HS Standard Product Groups of Commodities at a 2-digit level were retrieved from the United Nations’ Comtrade Database [16]. The Average values of Normalized Revealed Comparative Advantage Index and Relative Net Export Index scores for the period 2012-2016 were used to categorize the product groups into above-mentioned 4 groups.

Results. Out of 99 product groups (according to HS Standard Product Groups of Commodities at a 2-digit level), only 11 product groups (Group A) proved to both possess export specialization and comparative advantage (see figure 2). In 2016, the share of these products accounted for about 78.5% of the total export ([16], author’s own calculations). The export of these groups included in Group A is a very significant source of the foreign exchange thus, resulting in the strengthening of the trade balance.

Ten standard groups of commodities (Group B) demonstrated the ability to compete in foreign markets (possess comparative advantage), however, they lack export specialization. Only one product group (Group C) managed to report some export specialization, however lacking competitiveness in the global market. The remaining 77 product groups demonstrated neither comparative advantage nor export specialization (Group D), thus seriously weakening the trade balance and causing a trade deficit.

Due to positive NRCA score values the products included in Group B could compete in foreign markets, however owing to negative trade balance (negative RNX score values) the commodities are not meeting the domestic demand, and this demand is covered by the imported items (Ullah and Kazuo, 2012:481) [9, p.481]. Therefore, “if these products are nurtured to gain export specialization two benefits will accrue, i.e. (i) exports will increase and (ii) import demand will decline” (Ullah and Kazuo, 2012:481) [9, p.481]. However, in the case of Armenia, the scale effects and increase in productivity could be reported only when Armenia would start deepening the export specialization and report higher export growth rates, since the size of Armenia’s domestic market is relatively small (ranked 115th (WEF, 2017) [21]) and only foreign markets can serve as substitutes for the domestic market under the globalization (WEF, 2014:8) [12], thus enabling the local producers to ensure higher rates of productivity growth and benefit from the scale effects. With respect to Group C the strategy would be either to implement measures to strengthen the comparative advantage of the commodities of HS Standard Product Group 88 (see figure 2) or to channel the resources to other competitive sectors of the economy, since the product group could become competitive in the long-run (Ullah and Kazuo, 2012:481-482) [9, pp.481-482].

From the point of view of import substitution strategy product groups incorporated in Group D could be considered those groups that the Government of Armenia needs to support the development of thereof. However, the priority needs to be given to those groups that have a potential to start gaining export specialization and becoming more competitive in foreign markets and/or would assist the development and export growth of products incorporated in both Group A and B.

Figure 2:

Armenia’s Products Mapping for the period 2012-2016

Normalized Revealed Comparative Advantage Index	NRCA>0	<p>Group B: NRCA>0 and RNX<0</p> <ul style="list-style-type: none"> – Live animals; – Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included; – Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage; – Edible vegetables and certain roots and tubers; – Edible fruit and nuts; peel of citrus fruit or melons; – Coffee, tea, maté and spices; – Salt; sulphur; earths and stone; plastering materials, lime and cement; – Articles of apparel and clothing accessories, not knitted or crocheted; – Articles of stone, plaster, cement, asbestos, mica or similar materials; – Glass and glassware. <p>(1, 4, 6, 7, 8, 9, 25, 62, 68, 70)*</p>	<p>Group A: NRCA>0 and RNX>0</p> <ul style="list-style-type: none"> – Fish and crustaceans, molluscs and other aquatic invertebrates; – Preparations of vegetables, fruit, nuts or other parts of plants; – Beverages, spirits and vinegar; – Tobacco and manufactured tobacco substitutes; – Ores, slag and ash; – Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad with precious metal and articles thereof; imitation jewellery; coin; – Iron and steel ; – Copper and articles thereof; – Aluminium and articles thereof; – Other base metals; cermets; articles thereof; – Clocks and watches and parts thereof. <p>(3, 20, 22, 24, 26, 71, 72, 74, 76, 81, 91)</p>
	NRCA<0	<p>Group D: NRCA<0 and RNX<0</p> <p>The rest of the HS Standard Product Groups of Commodities</p> <p>(2, 5, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 23, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 63, 64, 65, 66, 67, 69, 73, 75, 78, 79, 80, 82, 83, 84, 85, 86, 87, 89, 90, 92, 94, 95, 96, 97, 99)</p>	<p>Group C: NRCA<0 and RNX>0</p> <ul style="list-style-type: none"> – Aircraft, spacecraft, and parts thereof (88)
	RNX<0	RNX>0	
Relative Net Export Index			

Source: [16]. Author’s own calculations.

Note: *the numbers in the parentheses correspond to the codes of HS Standard Product Groups of Commodities at 2-digit level.

Conclusion. Out of 97 product groups only 11 product groups (Fish and crustaceans, molluscs and other aquatic invertebrates; Preparations of vegetables, fruit, nuts or other parts of plants; Beverages, spirits and vinegar; Tobacco and manufactured tobacco substitutes; Ores, slag and ash; Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad with precious metal and articles thereof; imitation jewellery; coin; Iron and steel; Copper and articles thereof; Aluminium and articles thereof; Other base metals; cermets; articles thereof; Clocks and watches and parts thereof) proved to both possess export specialization and have comparative advantage. Ten standard groups of commodities (Live animals; Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included; Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage; Edible vegetables and certain roots and tubers; Edible fruit and nuts; peel of citrus fruit or melons; Coffee, tea, maté and spices; Salt; sulphur; earths and stone; plastering materials, lime and cement; Articles of apparel and clothing accessories, not knitted or crocheted; Articles of stone, plaster, cement, asbestos, mica or similar materials; Glass and glassware) demonstrated the ability to compete in foreign markets, however, they lack export specialization. Only one product group (Aircraft, spacecraft, and parts thereof) managed to report some export specialization however lacking competitiveness in the global market.

Hence, the government's strategy with respect to import substitution and export promotion could be the following in the medium-term:

1. to continue export promotion efforts and measures initiated and undergone by various state institutions with respect to product groups included in Group A;

2. to design and implement such measures that would enable the product groups incorporated in Group B to gain export specialization and strengthen competitive position in foreign markets, thus ensuring simultaneously export growth and import decline resulting in the strengthening of the trade balance;

3. to give priority to those product groups included in Group D that have a potential to start gaining export specialization and becoming more competitive in foreign markets and/or would assist the development and export growth of products incorporated in both Group A and B

Practical Implications. The findings of the article could be used by the Ministry of Economic Development and Investments of the Republic of Armenia, and the Development Foundation of Armenia in designing the export promotion and import-substitution strategies for various industries of the economy.

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