*Research Article*

# Trade competitiveness: approaches of assessment (The case of Armenia)

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## Abstract

**Competitiveness is a relative concept and leads many to see competitiveness policy as a zero-sum game. Improving competitiveness is the process of creating appropriate conditions that allow an economy to allocate scarce resources where opportunities arise as external and internal conditions change. Thus, the analysis and assessment of a country's international trade competitiveness becomes an important issue. In this regard, creation of not only bilateral but also multilateral trade relations with different countries and integration units become essential to create and maintain comparative advantages. Moreover, development and diversification of the export potential of the country is one of the most important directions of the international trade policy of the authorities. As a consequence, thorough analysis and not only quantitative, but also qualitative assessment of the role of international trade in maintaining competitiveness becomes an important issue. This allows to determine how certain factors influence on the formation of export capacity in the country. The objective of the paper is to determine the importance of trade competitiveness in the process of competitive advantages formation. The most outstanding feature of the research is that its main findings and conclusions arising from it can be used in assessing trade competitiveness of different countries or groups of countries. The outcomes and implication of the research can be used to improve the competitiveness of goods and services in the global market.**

**Keywords:** Trade; Correlation; Development; Competitiveness; Index; Revealed; Assessment; Method; Data; Comparative advantage; Diversification; Export; Centralization.

## INTRODUCTION

Competitiveness of a national economy is an elusive concept, that attracts the attention of both academics and policymakers worldwide. This phenomenon refers to a nation securing and maintaining a trade advantage vis-a-vis the rest of the world. International trade creates an ideal environment not only for firms but also for regions and nations to create, use and develop their comparative advantages. Trade investigation, in this regard is another base for national competitiveness (Sargsyan A, 2018).

Various international organizations, research groups and individual researchers focus their work towards the assessment of the interrelation between certain factors with competitiveness. With this regard, assessing the particular nation's engagement and role in international trade they first try to determine the figures and indicators representing its export and import. Ultimately, the aim of trade is a sustainable economic growth, continuous development of national economy, which leads to prosperity and poverty reduction. The analysis of trade competitiveness requires a deep understanding of all factors contributing or constraining it. These factors

are often highly endogenous, that is why a comprehensive approach to understanding the constraints and how they impact on the trade sector is necessary.

## TRADE COMPETITIVENESS: FRAMEWORK AND METHODS TO ASSESS

There are different theories and models viewing international trade as the fundamental basis for national competitiveness. Some of the most outstanding and widely used theories have been proposed by Adam Smith, David Ricardo (absolute and comparative advantages), Eli Heckscher and Bertil Ohlin (H-O model), etc. (Figure 1).



| Macro incentives alignment | •Removing economic biases arising from tariff and non-tariff barriers, real exchange rate misalignment, and distortive tax regimes ensuring overall fiscal health of the economy, efficient labor market operation, product and factor market conditions, property rights protection, effective regulation, and ease of firm entry and exit. |
| --- | --- |
| Backbone services improvement and transactions costs reduction | •Improving backbone services and inputs such as energy, telecommunications, finance, and other services inputs; improving capacity and coordination of government agencies at the border, international transit arrangements, regional and multilateral agreements, and policy reforms that ensure more competitive markets for international transport, logistics, and other services that facilitate trade transactions |
| Proactive policies for overcoming government and market failures | •Promoting technology creation and adaptation, streamlining product standards and certifications, providing trade finance, supporting industry clusters, facilitating special economic zones and other spatial developments, and ensuring coordination of economic actors and linkages and spillovers to the local economy. |

**Figure 1:** Trade competitiveness framework.

**Source:** Reis JG, Farole T (2012).

As already mentioned above, trade competitiveness is rather controversial and multidimensional concept. Analyzing international trade provides a better understanding of the competitive dynamics of not only at the industry level, but also at the country level as examining the degree of specialization for a given industry can identify the comparative advantages or disadvantages of a national industry; an industry-level analysis enables comparative analysis with other industries and countries and industry-specific analysis permits international comparisons of an industry's degree of specialization and rate of growth. There are different methods and approaches in assessment of trade competitiveness; it can be measured by analyzing one or several factors of the country's export, creating composite indices, analyzing factors and conditions which stimulate the international trade, etc. Let us introduce and take a look at several methodologies measuring trade competitiveness (Table 1).

**Table 1:** Various methods of assessment of trade competitiveness.

| Author | Type of Method | Steps |
| --- | --- | --- |
| D'Cruz and Verbeke | Double diamond | • Incorporates multinational activities; <br> • Enables make a comparison of the sizes and shapes of the domestic and International diamonds and show major strategic differences; <br> • Includes government as an important variable, as it influences the four determinants of the Porter's Model. |

| | | |
|---|---|---|
| | | •     Combines the domestic diamond and international diamond |
| Bela Balassa | Balassa Index or Revealed Comparative Advantage (RCA) | $$BI_j^A = \frac{share\ of\ industry\ j\ in\ country\ A\ export}{share\ of\ industry\ j\ in\ reference\ country\ A\ export}$$<br>If $BI_j^A > 1$, country A has a revealed comparative advantage in industry j.<br>If $BI_j^A < 1$, the country is said to have a comparative disadvantage in the industry. |
| | Trade Intensity Index | $$T_{ij} = (x_{ij}/X_{it})/(x_{wj}/X_{wt})$$<br>$x_{ij}$ and $x_{wj}$ are the values of country i's exports and of world exports to country j.<br>$X_{it}$ and $X_{wt}$ are country's total exports and total world exports respectively. When $T_{ij} > 1$, the bilateral trade flow that is larger than expected, given the partner country's importance in world trade. $T_{ij} < 1$ shows, that the bilateral trade flow that is smaller than expected, given the partner country's importance in world trade. |
| | Trade Complementarity Index | $$TC_{ij} = 100(1 - sum(|m_{ik} - x_{ij}|/2))$$<br>Where $x_{ij}$ is the share of good i in global exports of country j.<br>$m_{ik}$ is the share of good i in all imports of country k. If TC=0 - no goods are exported by one country or imported by the other.<br>In case TC=100 the export and import shares exactly match. |
| | Export Diversification (or Concentration) Index. | $$DX_j = (sum\ |h_{ij} - x_i|)/2$$<br>Where $h_{ij}$ is the share of commodity i in the total exports of country j.<br>$x_i$ is the share of the commodity (i.e. industrial goods, oil, etc.) in world exports. |
| | Hirschman Herfindahl Index | $$H_j = sqrt\ [sum\ (x_i/X_t)^2]$$<br>Where $x_i$ is country j's exports of product i (at the three-digit classification). $X_t$ is country j's total exports. The maximum value of the index is 239(the number of individual three digit products in SITC revision 2), and its minimum (theoretical) value is zero, for a country with no exports. The lower the index, the less concentrated are a country's exports. |
| | Export Specialization Index | $$ES = (x_{ij}/X_{it})/(m_{kj}/M_{kt})$$<br>Where $x_{ij}$, $X_{it}$ are export values of country i in product j, respectively.<br>$m_{kj}$, $M_{kt}$ are the import values of product j in market k and total imports in market k.<br>A value of ES less than unity indicates a comparative disadvantage and a value above unity represents specialization in this market. |

**Source:** Sardy M, Fetscherin M (2009).

There are many other measures assessing trade competitiveness taking into account various determinants and factors of international trade. Some key indicators lying in the basis of the measurement are listed below (Chandran BPS 2010, Bernard M);

•     Country's Share of World Exports - the share of a country's total exports in the world's total exports. The ratio is used to assess the change of the country's share of the world market over time (Hummels D 2005).

•     Share of Product in Total Exports - the share of each export product in the country's total exports

(Xiang C 2007).

- Share of Market in Total Exports - the share of exports sold in each foreign country in the home country's total exports. This ratio can be defined as the share of the partner country in the total exports of the country considered.

- Index of Export Market Penetration - the share of the actual number of export relationships forged by a particular country in the maximum possible number of export relationships it can form given the number of its exports Beleska-Spasova E (2014). The denominator is calculated by summing the number of import partners of the country observed.

## METHODOLOGY

For the purpose of determining indicators that have significant influence in formation of competitive advantages in international trade, we have made regression analysis of the many indexes related to trade and competitiveness. For measuring the interrelation between indexes, we have taken the sample results for 30 countries. The dependent variable is The Global Competitiveness index (results for 2017-2018). As variables that influence on international competitiveness we have assessed the enabling trade index.

It must be mentioned that the proposed methodology can be applied for many indexes and number of countries. Thus, in order to determine the strength of relationship between the observed indexes, we have measured the coefficient of correlation between X factor (enabling trade index) and Y factor (global competitiveness index). The data collected for 30 countries observed are presented in Table 2 below

**Table 2:** The relationship between the global competitiveness and enabling trade indexes.

| Country | X | Y | $X^2$ | $Y^2$ | X*Y |
|---|---|---|---|---|---|
| Azerbaijan | 4.30 | 4.70 | 18.49 | 22.09 | 20.21 |
| Argentina | 4.00 | 4.00 | 16.00 | 16.00 | 16.00 |
| Armenia | 4.30 | 4.20 | 18.49 | 17.64 | 18.06 |
| Australia | 5.10 | 5.20 | 26.01 | 27.04 | 26.52 |
| Austria | 5.50 | 5.20 | 30.25 | 27.04 | 28.60 |
| Canada | 5.20 | 5.30 | 27.04 | 28.09 | 27.56 |
| China | 4.50 | 5.00 | 20.25 | 25.00 | 22.50 |
| Croatia | 4.80 | 4.20 | 23.04 | 17.64 | 20.16 |
| Czech | 5.10 | 4.80 | 26.01 | 23.04 | 24.48 |
| Denmark | 5.40 | 5.40 | 29.16 | 29.16 | 29.16 |
| Estonia | 5.30 | 4.80 | 28.09 | 23.04 | 25.44 |
| Georgia | 4.80 | 4.30 | 23.04 | 18.49 | 20.64 |
| Great Britain | 5.50 | 5.40 | 30.25 | 29.16 | 29.70 |
| Greece | 4.60 | 4.00 | 21.16 | 16.00 | 18.40 |
| Hungary | 4.90 | 4.30 | 24.01 | 18.49 | 21.07 |
| Iran | 3.20 | 4.30 | 10.24 | 18.49 | 13.76 |
| Italy | 4.90 | 4.50 | 24.01 | 20.25 | 22.05 |
| Kazakhstan | 4.00 | 4.30 | 16.00 | 18.49 | 17.20 |
| Kyrgyzstan | 3.80 | 3.90 | 14.44 | 15.21 | 14.82 |
| Moldova | 4.20 | 4.00 | 17.64 | 16.00 | 16.80 |
| Poland | 5.00 | 4.60 | 25.00 | 21.16 | 23.00 |
| Russia | 3.80 | 4.60 | 14.44 | 21.16 | 17.48 |
| Singapore | 6.00 | 5.70 | 36.00 | 32.49 | 34.20 |

| | | | | | |
|---|---|---|---|---|---|
| Slovenia: | 5.00 | 4.50 | 25.00 | 20.25 | 22.50 |
| Switzerland | 5.40 | 5.30 | 29.16 | 28.09 | 28.62 |
| Tajikistan | 3.70 | 4.10 | 13.69 | 16.81 | 15.17 |
| Turkey | 4.50 | 4.40 | 20.25 | 19.36 | 19.80 |
| Ukraine | 4.00 | 4.10 | 16.00 | 16.81 | 16.40 |
| USA | 5.20 | 5.90 | 27.04 | 34.81 | 30.68 |
| Vietnam | 4.30 | 4.40 | 18.49 | 19.36 | 18.92 |
| TOTAL: | 140.30 | 139.40 | 668.69 | 656.66 | 659.90 |

**Source:** World economic forum.

In the first stage of the research we have calculated the parameters of regression (means, dispersion, standard deviation etc.) with the use of the following formulas;

1. Means

$$\bar{X} = \frac{\sum X_i}{n}$$

$$\bar{Y} = \frac{\sum Y_i}{n}$$

$$\overline{XY} = \frac{\sum X_i Y_i}{n}$$

2. Dispersion

- $$S^2(X) = \frac{\sum X_i^2}{n} - \overline{X^2}$$

- $$S^2(Y) = \frac{\sum Y_i^2}{n} - \overline{Y^2}$$

3. Standard deviation

- $$S(X) = \sqrt{S^2(X)}$$

- $$S(Y) = \sqrt{S^2(Y)}$$

In the second stage we have calculated the R correlation coefficient using the following formula;

$$r_{xy} = \frac{\overline{XY} - \bar{X} * \bar{Y}}{S(X) * S(Y)}$$

## ESTIMATION RESULTS

Application of the above-mentioned formula to the data presented in the Table 2 showed the following results, that use the notation $r_{xy}$ (correct). Using the data presented in Table 2 (for Y and X) the following results have been obtained.

**Table 3:** Descriptive statistics.

| | Mean | Std. Deviation | N |
|---|---|---|---|
| Y | 46467 | 0.55444 | 30 |
| X | 46467 | 0.65794 | 30 |

**Table 4:** Correlations.

|  |  | Y | X |
|---|---|---|---|
| Pearson Correlation | Y | 1000 | 754 |
|  | X | 754 | 1000 |
| Sig. (1-tailed) | Y | . | 0 |
|  | X | 0 | . |
| N | Y | 30 | 30 |
|  | X | 30 | 30 |

Thus, the results show, that the sited p-value (Sig.) is an unbiased indicator as to whether the correlation is significant for any conventional level of significance (Tables 3 and 4).

**Table 5**: Coefficients[a] (dependent variable: Y).

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig |
|---|---|---|---|---|---|
|  | B | Std. Error | Beta |  |  |
| 1 (Constant) | 1677 | 0.494 |  | 3.393 | 0.002 |
| X | 0.635 | 0.105 | 0.754 | 6.067 | 0.000 |

We observe, that the coefficient of the explanatory variable is highly significant, since the corresponding p-value is equal to zero (Table 5).

**Table 6:** Model summary[b].

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|---|---|---|---|---|---|
| 1 | 0.754[a] | 0.568 | 0.553 | 0.37087 | 2,312 |

[a]Predictors: (constant), X.

[b]Dependent variable: Y.

The R seeing above is actually the correlation coefficient $r_{xy}$ in this particular case. The value of $R^2$ (coefficient of determination=0.568) is rather satisfactory, since cross sectional data have been considered. This implies that the explanatory power of the model is quite good. Additionally, proper test is required considering the value of the Durbin-Watson d statistic (2.312), and particularly the value (4-d), to test for possible first order negative autocorrelation. Further, additional tests are required to test whether any heteroscedastity problem exists, that it is very common in cross section data. Thus, the results reveal that there is a high positive correlation between competitiveness and enabling trade indexes, hence the indicators used in the ETI are applicable for measuring competitiveness in a given country (Table 6). As already mentioned, the method presented above can be applied for other indexes and countries as well, depending on the purpose and scope of the research.

## TRADE COMPETITIVENESS: INDICATORS OF THE REPUBLIC OF ARMENIA

For the purpose of assessing the trade competitiveness of Armenia, we have created a database of trade indicators for the period of 2012-2017. The Figure 2 presents the results of Armenia according to the Global competitiveness index and Enabling trade index for 2012-2017.
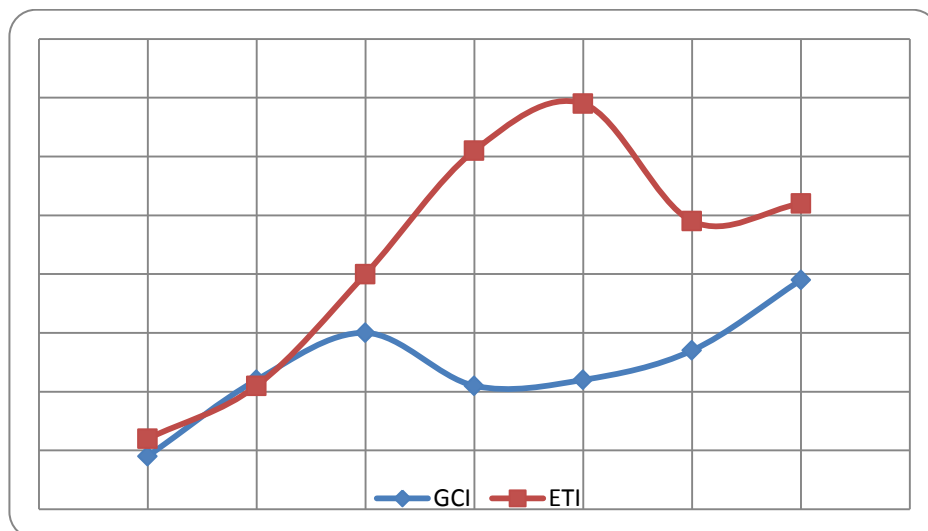
**Figure 2:** The results of Armenia according to the GCI and ETI, trend for 2012-2017.

The figure above represents that the fluctuations of the scores of observed indexes are relatively proportional to each other.

The research of the two indexes show, that Armenia's trade competitiveness is relatively weak, which is due to the low level of export competitiveness, and there is a need for an addressed, stabilized and purposeful policy towards improving it. Improving export competitiveness is vital for creating a unique and safe environment for creating and doing business, investing and working in a country.

With this regard, stabilized and focused competitiveness improvement policy will lead to a more stable economic growth and development, which, in turn, will help improving wellbeing and prosperity of the nation.

One of the outstanding features of the methodology is that it can easily be applied for making more thorough analysis about the competitiveness of national economy. The outcomes and methods that will be used depend on the purpose of the research and the data available.

**CONCLUDING REMARKS**

• The methods discussed in the article can be applied for any country, for a certain period of time. Their practical application will give reliably true data on the country's performance in the global marketplace.

• The findings, methodological approaches introduced in the article provide a useful basis for making appropriate policy recommendations for fostering competitiveness. For creating and maintaining basis for sustainable and high levels of competitiveness achieving the required legislative and institutional framework, market liberalization and a stable macroeconomic environment are necessary. They are conditions for ensuring continued economic growth, the achievement of sustainable development.

• The most outstanding advantage of the research is that it is useful for evaluating social, political or economic policies in a given country, thus its results can be applied in the process of policymaking.

• Another distinguishing feature is that it allows us to add more indicators to existing ones and make the research broader - depending on the purposes and given circumstances.

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