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Lino Briguglio and Gordon Buhagiar

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A COMPOSITE INDEX OF COMPETITION[1]

Lino Briguglio and Gordon Buhagiar[2]

1. Introduction

The measurement of competition in a given country is an issue of great importance given the widely-held belief that competition helps allocate resources efficiently, resulting in improved consumer welfare. Competition might contribute significantly to growth and equitability in the distribution of income (Mehta, 2002). The Competition Index (CI) proposed and constructed in this paper will take into account the variables that are thought to have a bearing on the nature of competition within a country's markets.[3]

There are various benefits that could be derived from the constructing of a CI. Such an index could gauge the extent of competition that exists within a country's markets and for across country comparisons. If measure over time, it could indicate the extent to which a country is enhancing competition within its domestic market. Also since the index proposed here is a composite one, the individual components would give an indication as to areas of competition strengths and weaknesses.

2. The Structure of the Competition Index

The index proposed in this paper combines (a) the quality of a competition authority's activities and (b) the competition constraints existing in a given country.

Six variables were considered, namely:

1. Length of time for which Competition Policy has been in place
2. Enforcement of Competition Law
3. Independence of the Competition Authority
4. Competition Advocacy
5. Barriers to Trade
6. Competition Culture

The reasons for including the six variables are given below.

The data was obtained by means of a survey which contained five questions relating to the first five variables listed above. The respondents were asked to assign a score of 1 to 5, with 1 indicating the lowest possible incidence and 5 the highest possible. The fifth variable was constructed from an independent sources, as explained below.

The responses to the survey came from different types of competition authorities, with some respondents being officials of an autonomous entity and others representing government departments responsible for competition policy. In all 32 authorities

[1] This paper summarises and extends the implications of the findings of the MA (Economics) dissertation (University of Malta), authored by Gordon Buhagiar and supervised by Lino Briguglio, the two authors of this paper

[2] Lino Briguglio is head of the Economics Department at the University of Malta. Gordon Buhagiar is Technical Attaché at the Permanent Representation of Malta to the EU

[3] The construction of such an index was first proposed in Briguglio and Buttigieg (2003)

responded by the end of August 2004, which was the cut-off date point for the purposes of this study.[4].

3. The Variables and the Responses

Time period for which Competition Law has been in Force

This variable seeks to gauge the level of experience of a country's Competition Authority. It is expected that the longer the competition law has been in force the more experience the competition authority will be to the nature of competition in its domestic markets. Such experience should make the implementation of the law more effective and relevant to the country's economic development, the pattern of international trade and other economic variables. Such changes to a jurisdiction's competition law can only be introduced following direct experience with the effects of implementation.

The score of 1 was allocated to a time period of up to five years, two to a period of between 6 and 10 years, 3 to a period of between 11 and 20 years, 4 to a period between 21 and 30 years and 5 to a period of over 30 years. Table 1 shows the length of time for which competition legislation has been in force in the countries that responded to the survey.

Table 1. Experience in Competition Legislation

Over 30 Years	United Kingdom, Canada, the United States of America, Japan, Finland, Norway, Denmark, Austria, and Pakistan.
21 to 30 Years	Australia, New Zealand, France, Greece and Portugal.
11 to 20 Years	Italy, Sweden, Taiwan, Belgium, Slovakia, Estonia, Slovenia, and Cyprus.
6 to 10 Years	The Netherlands, Mexico, Switzerland, Costa Rica, Malta and Zambia.
0 to 5 Years	South Africa, Barbados, Morocco and Serbia.

Extent of Competition Policy Enforcement

Enforcement is the key to the effectiveness of any legislation. Competition law is no exception. It is assumed here that sanctions are directly related to enforcement. Sanctions are intended to ensure the cessation of an activity which is in breach of the law and to signal to potential offenders that their actions will be costly.

If a competition authority is too lenient with offenders, it would encourage further breaches of competition law. Also, undertakings and/or consumers that suffer the

[4] The questionnaire was mailed to over a hundred different competition authorities. The responding countries were:
From the Americas:Barbados, Canada, Costa Rica, Mexico and United States of America
From Europe: Austria, Belgium, Cyprus, Denmark, Estonia, Finland, France, Greece, Italy, Malta, The Netherlands, Norway, Portugal, Serbia, Slovakia, Slovenia, Sweden, Switzerland and the United Kingdom.
From Africa: Morocco, South Africa and Zambia
From Asia: Japan, Pakistan and Taiwan
From Oceania: Australia and New Zealand.

consequences of anti-competitive behaviour would tend to reluctant to complain to the Competition Authority of such behaviour if they feel that very little will be done by the Authority. On the other hand, if an authority is known to impose sanctions when necessary, firms and/or consumers would be encouraged to complain, thereby improving the Competition Authority's ability to enforce competition law more effectively.

Respondents were asked to rate the level of enforcement of competition law that is implemented in their jurisdictions, using the imposition of sanctions as a guide to the chosen rating. Thus, if no sanctions are imposed, respondents were to check box one for "Little or no Enforcement", whilst if sanctions are imposed frequently they were to check box five for "Very Strong Enforcement". The questionnaire contained a guide to respondents to improve comparability of the responses. The different degrees of enforcement of the different countries, indicated by the respondent themselves, are shown in Table 2.

Table 2. Degree of Enforcement of Competition Law

Very strong enforcement	UK, Canada, USA, Australia, Mexico, The Netherlands and South Africa
Strong enforcement	Japan, New Zealand, Finland, Norway, France, Italy, Slovakia, and Taiwan.
Moderate enforcement	Denmark, Portugal, Estonia, Greece, Sweden, Belgium, Costa Rica, Cyprus, Morocco, Zambia and Malta.
Mild enforcement	Austria, Slovenia, Pakistan, Switzerland and Barbados.
Little or no enforcement	Serbia.

In the comments concerning enforcement that were submitted by respondents, mention was made of recent improvements to competition legislation that strengthened enforcement by means of stronger sanctions against violations. A number of countries use a variety of means to enforce the law, including divestiture orders for concentrations, investigations and asking for remedies to be made prior to the authorization of a concentration, as well as the imposition of fines for entities breaching the law. Among the problems faced by different countries in enforcing the provisions of competition law, a shortage of staff seemed to be an issue with more than one jurisdiction. In other instances, respondents mentioned that enforcement in their country was mild due to the competition authority not being empowered to impose fines.

Degree of Autonomy

This variable seeks to define the level of independence that a competition authority enjoys from government interference. There seem to be mixed views concerning this aspect of competition policy. The International Competition Network (2003) identifies two models in this regard.

The first model involves complete integration within the national administration of the body responsible for competition policy implementation. This model seems to be associated with "strong formal powers (being given) to the competition authority to intervene in legislation" (Capacity Building and Technical Assistance, 2003: 31).

The second model is one that is fully independent from the government and decisions made by the competition authority are virtually free from government influence. The ICN report views this model as having a weak influence on competition policy, as a result of its separation from the government, and its ability to influence state policy is seen as depending on its advocacy activities.

For the purposes of this study, it is assumed that the more independent a competition authority is the greater will be its contribution to competition within is jurisdiction. As Shyam Khemani (1997: 25) put it, “The best watchdog of competition is an impartial, independent competition law enforcement agency”.

Thus, respondents were instructed to select a ranking of one for a very low level of independence up to a ranking of five for a totally independent authority.

Only four countries responded that they have a low degree of independence of their national competition authority. These are Morocco, Pakistan, Malta and Serbia. The rest have competition authorities that are considered to be either ‘totally independent’ or ‘very independent’.

Among the comments submitted for this component of the index, it emerged that most of the respondents’competition law-implementing bodies, even if these are government departments and not autonomous entities, enjoy a degree of freedom of action, but depend on the national administration for funding.

Sixteen countries with a high degree of independence also registered high scores in the areas of advocacy and enforcement. This would seem to suggest that an independent competition authority is able to adopt a strong enforcement stance and liberally advocate to all sectors and institutions in society, including the government.

However, thirteen countries show a high score in the independence of the competition authority yet low scores of three or less in one or both of the fields of enforcement and advocacy. The evidence is therefore not conclusive as to the importance of the degree of independence to an authority’s ability in carrying out its responsibilities.

Level of Competition Advocacy

Advocacy is an essential tool for the fostering an understanding of competition policy and law. Mehta (2002) noted that poor performance of competition policy and law in the Asia-Pacific region resulted mainly from a failure to understand the importance of competition advocacy. When used well, advocacy plays a preventative role by discouraging anti-competitive practices and is therefore crucial for the effectiveness of a competition authority. As a guide to respondents in this question, reference was made to the list of advocacy activities in the International Competition Network’s Advocacy Toolkit (ICN, 2002) available on its website, and respondents were asked to rate the level of competition advocacy practiced by their competition authority. As usual, they were instructed to select one for “no advocacy”, two for “very limited advocacy” and so on until a ranking of five for a “very high level of advocacy”.

Only three countries gave themselves the top score of five for their level of advocacy whilst twenty-one countries chose a score of four, six countries gave it a three and three countries gave their advocacy practices a score of two, as shown in Table 3.

Table 3. Level of Advocacy

Very high level of advocacy	UK, USA and Mexico.
High level of advocacy	Canada, Australia, Japan, New Zealand, Finland, Norway, Denmark, France, Italy, Portugal, Slovakia, The Netherlands, Sweden, Taiwan, Costa Rica, Slovenia, South Africa, Morocco, Switzerland and Zambia.
Moderate advocacy	Austria, Estonia, Greece, Belgium, Cyprus and Malta.
Very Limited advocacy	Pakistan, Barbados and Serbia.

Only three countries gave themselves the top score of five for their level of advocacy whilst twenty-one countries chose a score of four, six countries gave it a three and three countries gave their advocacy practices a score of two. Table 4 displays the different levels of advocacy practiced by the participating countries.

The respondents who commented on this area mentioned a number of advocacy activities carried out in their country. One of the most common of these activities is the submission of comments by the competition authority to ministries on the competition issues concerning legalisation. Publications and conferences that promote the benefits of competition are also widely used by the countries that participated in the CI.

Table 4. Level of Advocacy

Very high level of advocacy	UK, USA and Mexico.
High level of advocacy	Canada, Australia, Japan, New Zealand, Finland, Norway, Denmark, France, Italy, Portugal, Slovakia, The Netherlands, Sweden, Taiwan, Costa Rica, Slovenia, South Africa, Morocco, Switzerland and Zambia.
Moderate advocacy	Austria, Estonia, Greece, Belgium, Cyprus and Malta.
Very Limited advocacy	Pakistan, Barbados and Serbia.

Entry and Import Barriers

The survey question on this variable attempted to gauge the opinions of respondents about the nature of barriers to entry of new firms in their country's markets as well as barriers to imports. This was the most difficult question for respondents to answer for the simple reason that barriers to entry are likely to vary considerably from one market to another. Respondents were instructed to use their experience in giving a general definition of how strong or otherwise they felt that barriers to trade were in their country. Both barriers to the entry of new firms and barriers on imports are considered as being detrimental to competition within a country's markets.

Strong links are known to exist between barriers to entry and the competitive behaviour of firms in many industries (Bain, 1956). The stronger the barriers to the entry of new firms into markets, the more concentrated are those markets will tend to be, with negative effects on competition.

The same can be said about barriers to trade, especially those intended to protect local firms, since these reduce substitution possibilities for the consumer, and enable the protected firms to control prices of products competing with imports (Khemani, 1997).

Again the data for the variable "entry and trade barriers" was obtained from the survey responses. Respondents were instructed to assign a score of one if they felt that their country had "very high barriers to entry", two if there were "high barriers to trade" and so on up to five for "minimal or non-existent barriers to entry".[5]

The scores assigned by the respondents with regards to entry and trade barriers are shown in Table 4.

Table 4. Entry and Trade Barriers

Minimal or non-existent barriers	New Zealand and Estonia.
Low barriers	UK, Canada, USA, Australia, Japan, Norway, Denmark, France, Italy, Austria, The Netherlands, Sweden, Greece, Portugal, Taiwan, Belgium, Slovakia, Slovenia, Morocco and Pakistan.
Moderate barriers	Finland, Mexico, Costa Rica, Malta and Barbados.
High barriers	Cyprus, Switzerland, South Africa, Zambia and Serbia.

Many respondents expressed difficulty in assigning a general score to this area, since barriers to the entry of new firms are different for different sectors.

[5] Two other variables were initially considered for inclusion in the CI together with Barriers to Trade: an index of Import Concentration (UNCTAD, 2003) and an index of the ratio of transport costs to balance-of-payments (Briguglio, 2003) for each of the countries that responded to the survey. Each of these variables was considered to have an important influence on competition in a country but since they can both be assumed to be related to barriers to imports and barriers to new firm entry, they are therefore assumed to be represented by the variable Barriers to Trade and have not been included as separate variables in the Index.

The Extent of Competition Culture

The existence of a competition culture is considered to be fundamental for the active participation of all the affected sectors in society, whether consumers, businesses or regulatory bodies, in ensuring that competition prevail freely in a country's markets.

The "competition culture" variable could be considered as the other side of the coin of the advocacy variable in the sense that the latter has more to do with the action of the competition authority, whereas the former has more to do with society in general. For this reason, it was decided that the competition authority was not the right respondent for a question on Competition.

Instead, a proxy variable was used to indicate the likely nature of the competition culture in a country. The variable chosen for this purpose was per capita GDP. The reason for this choice is that countries with a low GDP per capita are likely to be more protection oriented, as is the case in most Least Developed Countries (LDCs), whereas countries with the highest GDP per capita (including North American and Western European Countries) are likely to be more pro-competition. Admittedly this is assumption is somewhat arbitrary, since it *a priori* assigns high scores to high income countries.[6]

The rankings assigned to each country in terms of competition culture was again 1 to 5, based on 2001 figures on GDP per capita. Countries with a GDP per capita of $13,000 or higher were given a score of 5. GDP per capita $9,000 to $12,999 was given a score of 4, whereas that between $5,000 and $8,999 was given a score of 3. The score of 2 was assigned to the range of $ 2,000 to $4,999 and the score of 1 to a GDP per capita under $2,000. The source of the data was UNCTAD (2003). These results are summarised in Table 5.

Table 5. Competition Culture

Very Strong Competition Culture	UK, Canada, USA, Australia, Japan, New Zealand, Finland, Norway, Denmark, France, Italy, Austria, The Netherlands, Sweden, Belgium and Switzerland.
Strong Competition Culture	Greece, Portugal, Taiwan, Slovenia, Cyprus, Malta, Barbados.
Moderate Competition Culture	Mexico
Weak Competition Culture	Slovakia, Estonia, Costa Rica, South Africa
Very Weak Competition Culture	Morocco, Pakistan, Zambia and Serbia.

[6] An alternative composite index computed without the "competition culture" variable gave similar results to the index presented in this paper, and both indices were highly correlated. However it was decided to retain the "competition culture" component due to the fact that such a component was considered to be important. Obviously, it would be much better if an indicator of competition culture could be derived more directly.

4. The Composite Index of Competition

The Composite Index of Competition was computed as a simple average of the six components, as shown in Table 6.

Table 6. The Competition Index

	Legislation	Enforcement	Independence	Advocacy	Barriers to Entry	Competition Culture	CI Score	Rank
UK	5	5	5	5	4	5	4.83	1
Canada	5	5	5	4	4	5	4.67	2
USA	5	5	4	5	4	5	4.67	3
Australia	4	5	5	4	4	5	4.50	4
Japan	5	4	5	4	4	5	4.50	5
New Zealand	4	4	5	4	5	5	4.50	6
Finland	5	4	5	4	3	5	4.33	7
Norway	5	4	4	4	4	5	4.33	8
Denmark	5	3	4	4	4	5	4.17	9
France	4	4	4	4	4	5	4.17	10
Italy	3	4	5	4	4	5	4.17	11
Austria	5	2	5	3	4	5	4.00	12
Netherlands	2	5	4	4	4	5	4.00	13
Sweden	3	3	5	4	4	5	4.00	14
Greece	4	3	5	3	4	4	3.83	15
Mexico	2	5	5	5	3	3	3.83	16
Portugal	4	3	4	4	4	4	3.83	17
Taiwan	3	4	4	4	4	4	3.83	18
Belgium	3	3	4	3	4	5	3.67	19
Slovakia	3	4	5	4	4	2	3.67	20
Estonia	3	3	5	3	5	2	3.50	21
Slovenia	3	2	4	4	4	4	3.50	22
Cyprus	3	3	5	3	2	4	3.33	23
Switzerland	2	2	5	4	2	5	3.33	24
Costa Rica	2	3	5	4	3	2	3.17	25
Malta	2	3	3	3	3	4	3.00	26
South Africa	1	5	4	4	2	2	3.00	27
Barbados	1	2	4	2	3	4	2.67	28
Morocco	1	3	3	4	4	1	2.67	29
Pakistan	5	2	2	2	4	1	2.67	30
Zambia	2	3	4	4	2	1	2.67	31
Serbia	1	1	1	2	2	1	1.33	32

Source: Data for legislation, enforcement, independence, advocacy and barriers to entry are taken from responses to survey. Data on competition culture is based on GDP per capita and derived from UNCTAD (2003) Handbook of Development and Trade Statistics

It can be seen from Table 6 that the highest scores pertain to Western European Countries, USA, Canada, Australia and New Zealand, with the UK obtaining the top ranking.

Five respondents are new EU member states, and it is surprising that the Eastern/Central European ones (Slovakia, Estonia and Slovenia) registered higher scores than the Mediterranean ones (Malta and Cyprus).

Relationship between the C.I. Scores, GDP per Capita and Population Size

The C.I. scores obtained for the 33 participating countries were regressed against the countries' Gross Domestic Product and their population in order to establish whether any relation existed with these variables.

It was found that a statistically significant correlation exists between the C.I. scores and GDP, with a relatively high correlation coefficient ($R^2 = 0.8$) and a t-statistic on the gradient equal to 6.9. This is a plausible result.[7]

With regard to the relationship between the CI scores and population size, a positive correlation was detected, but the correlation coefficient ($R^2 = 0.24$) and the t-statistic on the gradient ($t = 1.33$) indicated that the relationship was not statistically significant.

5. Some Weaknesses of the Competition Index

The main weakness of this CI is its reliance on the method of self-assessment, which does not provide as objective an analysis as would be desired. However, this weakness was to an extent minimised by providing respondents with guidelines for the rankings that they were to select for each of the five survey questions. These guidelines were intended to render the responses as comparable as possible.

Another shortcoming of the CI is its limited coverage of countries. Out of over seventy member countries of the International Competition Network, only the 32 countries that responded to the survey submitted for this study were included in the CI. Whilst these 32 countries hail from all continents, thus representing a broad perspective of experiences in the field of competition, the inclusion of more jurisdictions would have allowed a more meaningful comparison.

The subjective choice of variables included in the computation of the CI is another weakness of this study. However, subjectivity is a characteristic of all composite indices.

Another weakness of the index relates to the choice of scoring scale for measuring the components of the index. The choice of the 1 to 5 range was subjective. A narrow range would have rendered the dispersion too narrow to be of value, whereas a wider range, though desirable, would have created a more meaningful dispersion, but would have rendered the responses more difficult. A five-point scale was considered the best for the purpose of this exercise.

The weighting chosen was also subjective. There is not scientific was in which to assign weights. One may consider assigning different weights, depending for example, on what some average weighting suggested by the respondents in terms of the importance of the

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[7] A high correlation was also found between GDP per capita and the composite index with five variables only, ie excluding the competition culture variable which, as already explained, was based on GDP per capita.

components. But this raises additional problems, particularly if the respondents have divergent views as to what weighting to assign.

Finally, the competition culture variable was assumed to be directly related to GDP per capita. It should be stated here that the results would not have differed much if this variable was excluded. As already explained, however, it was decided to retain this variable in this study to emphasise its importance in the index.

6. Conclusion

This paper, and the dissertation on which this paper is based, attempted to construct a competition index based on responses to a questionnaire by 32 countries. The major conclusions that can be derived from this study are that (1) competition is multifaceted and an index which measures competition should contain a number of components which foster competition; (2) countries with the highest competition scores are those considered as advanced in economic terms; and (3) there does not seem a statistically significant correlation between country size and competition scores.

The results are interesting, but they have to be interpreted with great caution, given the weaknesses described in section 5. It is hoped that further study on this subject will produce a more reliable index based on data which are more objectively constructed, and covering a wider range of countries.

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