

Hamanaka, Shintaro; Tafgar, Aiken; Ico, Ronald

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Constructing a Bias-Free Trade Governance Indicator: Revealing the Biases of Existing Survey Indicators

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CONSTRUCTING A BIAS-FREE TRADE GOVERNANCE INDICATOR: REVEALING THE BIASES OF EXISTING SURVEY INDICATORS

Shintaro Hamanaka, Aiken Tafgar, and Ronald Ico

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Shintaro Hamanaka, Aiken Tafgar,
and Ronald Ico

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Shintaro Hamanaka (shamanaka@adb.org) is Economist at the Economic Research and Regional Cooperation Department, Asian Development Bank (ADB). Aiken Tafgar (aikentafgar@yahoo.com) and Ronald Ico (ronaldo.ico@gmail.com) were consultants at the former Office of Regional Economic Integration, ADB.

Asian Development Bank
6 ADB Avenue, Mandaluyong City
1550 Metro Manila, Philippines
www.adb.org

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ABSTRACT

Governance is one of the key factors that shape the economic performance of an economy in terms of economic and trade growth. However, accurately measuring the quality of governance is not an easy task. Research typically uses governance indicators from surveys, which may have biases and inherent errors. In this paper, we attempt to construct an alternative governance indicator, which is free from perception and subjective biases. Our exercise is based on the inference that economies with good trade governance can compile high quality trade statistics; the latter being a close proxy for the former. This study comes up with a global ranking of the quality of (trade) governance. The paper also compares our bias-free indicator against existing survey governance indicators.

Keywords: bias, corruption, governance, indicators, perception, survey, trade

JEL Classification: F14, F15

I. INTRODUCTION

Governance is one of the key issues that shape the economic performance of an economy in terms of economic and trade growth. However, accurately measuring the quality of governance is not an easy task. Research typically uses survey governance indicators, which are assumed to accurately capture the state of governance in tested economies. However, it is very likely that these survey indicators contain biases (Kurtz and Schrank 2007).

Given the popularity of governance indicators, several recent studies have examined the degree of consistency among them (Langbeina and Knackb 2010). While these studies help us understand what exactly the indicators attempt to measure, they have one critical limitation: it is difficult to assess the actual status of governance through comparative analysis. Even if we observe inconsistencies, it is difficult to conclude which indicators nearly approximate the actual status of governance. Moreover, consistency between two sets of indicators does not necessarily mean that the two are accurate. It is possible that the two have similar biases, therefore, they appear consistent with each other.

In this paper, rather than cross-checking consistency among existing indicators, we will examine their relevance by comparing them against the real status of governance, which is a bias-free trade governance indicator we have constructed, reflecting the quality of trade statistics. The quality of trade statistics reflects the quality of governance in terms of regulations and corruption issues. When customs agencies and other agencies involved in trade transactions are able to implement regulations efficiently, and if rules and procedures are clear, then compiled trade statistics will likely be of higher quality.

The paper is structured as follows. In Section II, we review studies that attempt to examine the bias of existing indicators. The paper, then, explains the methodology for constructing the bias-free governance indicators in Section III. The world ranking based on the bias-free governance indicator is provided in Section IV. Section V conducts a preliminary comparison between the new indicators and existing survey indicators. The final section considers the policy implications of this study as well as the possible use of our indicators in future studies.

II. REVIEW OF INDICATORS AND LITERATURE

A. Review of Indicators

Governance indicators (Table 1) can be classified according to the scope of their contents: multiaspect or aspect-specific. Transparency, voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and corruption are examples of aspects of governance. If the indicator measures one aspect of governance only, then it is called an aspect-specific indicator. Examples of aspect-specific indicators are the six World Governance Indicators (WGIs),¹ the Global

¹ Voice and accountability captures perceptions of the extent to which an economy's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and media freedom. Political Stability and Absence of Violence and Terrorism measures perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism. Government effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Regulatory quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Rule of law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, particularly the quality of contract enforcement, property rights, the police, and the courts; as well as the likelihood of crime and violence.

Corruption Barometer (GCB),² and Irregular Payment for Trade (IPT).³ Each WGI is an aggregate measure constructed through averaging together data from the underlying sources that correspond to the aspect of governance being measured.⁴ For example, the control of corruption component of WGI is an aggregate measure of corruption derived from different data sources such as the Economic Intelligence Unit and Political Risk Services Group. GCB reflects, mainly, the experience of people with corruption, specifically paying bribes to the police, judiciary, registry and permit services, tax revenue agencies, land services, and education services, among others. IPT also asks respondents about bribery, but its scope is limited to the trade sector only. Specifically, IPT asks how common it is for firms to make bribes connected with imports and exports.⁵

On the other hand, multiaspect indicators cover various governance issues of either the entire economy or a specific sector. The Corruption Perception Index (CPI) is an example of a multiaspect indicator, covering the entire economy.⁶ Though its name includes “corruption,” CPI also covers other governance issues such as transparency and accountability (Transparency International 2013). Experts are asked to rate an economy’s transparency (access of civil society to information on public affairs), accountability (accountability of the executive to oversight institutions and public employees for their performance) and corruption (state capture by narrow vested interests) on a scale of 1 (very weak for 2 or more years) to 6 (very strong for 3 or more years). Our proposed alternative Trade Governance Indicator (TGI) is also multiaspect, but it covers the trade sector only. As this paper will reveal in Section V, TGI is multiaspect in the sense that its scope is not limited to the corruption component of governance.

Further, indicators are classified in terms of data collection methodology, which to a degree reflects the credibility and accuracy of the indicators. An indicator that is constructed from an opinion poll survey such as the CPI is subjective to respondents’ perceptions. Another set of data is from a fact-finding survey, which are usually aspect-specific. The GCB and IPT, which mainly reflect bribery as discussed above, are aspect-specific, fact-finding indicators. Since trade governance and efficiency in trade-related services and infrastructure are interrelated factors, we also include the World Bank’s Logistics Performance Index (LPI)—customs (cust), infrastructure (infra), shipments (ship), timeliness (time), tracking (track), and logistics quality (LQ).⁷ Though these datasets from fact-finding surveys

² Transparency International’s Global Corruption Barometer is the only worldwide public opinion survey on views and experiences of corruption. The Global Corruption Barometer asks for people’s views on corruption in their economy generally, and in which institutions the problem of corruption is most severe. It also provides a measure of people’s experience of bribery in the past year across eight different services. The survey asks people how effective they think the government has been in stopping corruption and probes their willingness to get involved personally in the fight against corruption. See methodology details at www.transparency.org/gcb2013/in_detail

³ The scope of the WGIs and GCB encompasses the entire economy, while IPT covers the trade sector only.

⁴ See WGI aggregation methodology at info.worldbank.org/governance/wgi/index.aspx#doc-methodology

⁵ IPT is part of the World Economic Forum’s survey. It asks a respondent to estimate how common it is for firms to make undocumented extra payments or bribes connected with imports and exports.

⁶ The CPI scores and ranks economies and territories based on how corrupt an economy’s public sector is perceived to be. It is a composite index, a combination of surveys and assessments of corruption collected by a variety of reputable institutions. The CPI is the most widely used indicator of corruption worldwide. See more at http://CPI.transparency.org/CPI2013/in_detail/#myAnchor1

⁷ The LPI is a multidimensional assessment of logistics performance, rated on a scale from 1 (worst) to 5 (best), except for question 15, where 1 is hardly ever and 5 is nearly always. Among the six components of the LPI, customs refers to the efficiency of the clearance process (e.g., speed, simplicity, and predictability of formalities) by border control agencies, including customs departments. Infrastructure refers to the quality of trade- and transport-related infrastructure (e.g., ports, railroads, roads, information technology). Shipments refer to the ease of arranging competitively priced shipments. Timeliness refers to the timeliness of shipments in reaching a destination within the scheduled or expected delivery time. Tracking refers to the ability to track and trace consignments. Logistics quality refers to the competence and quality of logistics services (e.g., transport operators, customs brokers).

are supposed to convey facts, they are not free from perceptions and other inherent errors (e.g., respondents are not able to correctly answer the survey question.) An ideal indicator is one that is perception-free and that directly measures governance. However, it is difficult to come up with a direct measure. This paper tries to fill such a gap by constructing a bias-free indicator based on trade statistics.

Table 1: Governance Indicators

Type	Multiaspect	Aspect-Specific
Opinion poll	<p><i>Corruption Perception Index (CPI)</i></p> <p>Experts are asked to rate an economy's transparency, accountability, and corruption on a scale of 1 (very weak for 2 or more years) to 6 (very strong for 3 or more years).</p>	<p><i>World Government Indicators (WGIs)</i></p> <ul style="list-style-type: none"> • control of corruption • rule of law • regulatory quality • government effectiveness • political stability • voice and accountability <p>Each of the above is an aggregate measure constructed by averaging together data from the underlying sources that correspond to the concepts of governance being measured.</p>
Fact-finding	NA	<p><i>Irregular Payment for Trade (IPT)</i></p> <p>IPT asks how common is it for firms to make bribes connected with imports and exports.</p> <p><i>Global Corruption Barometer (GCB)</i></p> <p>GCB asks if anyone in a household has paid a bribe for one of eight services in the last year.</p> <p><i>Logistics Performance Index (LPI)</i></p> <ul style="list-style-type: none"> • customs • infrastructure • shipments • timeliness • tracking • logistics quality <p>Respondents are asked to rate each of the above indicator on a scale of 1 (worst) to 5 (best).</p>
Observed measure	<i>Trade Governance Indicator (TGI)</i>	

NA = not applicable.

Source: Authors' compilation.

B. Review of Literature

Since governance indicators have been popular in recent years, several attempts have been made to examine the level of consistency among them, particularly the six WGI indicators, CPI, and GCB. There are three factors that may affect consistency: specificity, noise, and perception bias. Langbeina and Knackb (2010) examine indicators included in the WGIs and find that such indicators purportedly measure distinct concepts of control of corruption, rule of law, government effectiveness, rule quality, political stability, and voice accountability. However, they appear to be measuring the same broad concept of governance. Brewer, Choi, and Walker (2007) find that some of the subindicators under WGIs are correlated, and argue that this implies their reliability as opposed to their validity. This means that subindicators are not distinct, and all of them broadly measure “good governance.” Thus, we can say that their study focuses on specificity and noise, and confirm that they are negligible (various survey indicators are consistent because they are not specific and do not contain much noise). In the case of WGIs, however, it can also be argued that since they cover different components of governance, the indicators are either inadequate or unrepresentative in describing a general governance measure.⁸ Similarly, Behar (2010) compares the World Bank’s Doing Business Survey and Enterprises Survey and finds that the two are very different in terms of results even though the two surveys asked almost the same question to firms. This study mainly tests the impact of noise. Due to noise, the survey results differ despite similar questions and methodology.

Several studies emphasize that corruption perception indices are based on biased opinions rather than on actual corruption experiences such as citizens being asked to pay bribes. Donchev and Ujhelyi (2013) reveal such a relationship through regression analysis that tests the significance of experience-based corruption in explaining corruption perception indices.⁹ Their economy-level regressions suggest that economic development, Protestant traditions, and—to some extent—democratic institutions and centralized (nonfederal) governments lead to an economy being perceived as less corrupt for a given level of corruption experience. They conclude that the corruption experiences of both households and firms are not a significant determinant of CPI. Interestingly, CPI is sensitive to the number of corruption experiences (absolute level of corruption), rather than on the percentage of population affected by corruption, which implies that perceptions tend to be biased upward for larger economies. The study demonstrates that CPI exhibits diminishing sensitivity to corruption experiences, which means that as corruption experiences occur more, the effects on perception indices diminish. This implies that perception indices may be a better proxy for actual corruption in economies with a low incidence of corruption than in economies with a high incidence of corruption. All these economy-level results are reinforced by individual and firm level results, which imply that, holding corruption experiences constant, corruption perception indices are sensitive to individual factors such as education, age, and employment status, and firm-level characteristics such as competition and layoffs.

Similarly, Treisman (2007) finds that highly developed, long-established liberal democracies—with a free and widely read press, a high share of women in government, and a history of openness to trade—are perceived as less corrupt. Economies that depend on fuel exports or have intrusive business

⁸ Moreover, Arndt and Oman (2006) argue that governance indicators, the WGIs in particular, also lack transparency and comparability over time and suffer from selection bias.

⁹ Donchev and Ujhelyi (2013) used the World Bank’s Governance Indicators database, the CPI of Transparency International, and the corruption index of the Political Risk Services International economy Risk Guide for corruption indicators. For corruption experience, the study used data from the United Nations’ Interregional Crime and Victimization Survey, which includes information on individuals’ experience with and perceptions of corruption.

regulations and unpredictable inflation are judged to be more corrupt.¹⁰ Further, Razafindrakoto and Roubaud (2010) compare household surveys on corruption experiences with an expert opinion survey for eight economies in Africa and find errors in the assessment of experts. They also find evidence for ideological biases, with experts tending to rank economies based on their own political preferences, and the existence of an erroneous implicit cultural model of “how Africa works.” In relation to this, Kurtz and Schrank (2007) also emphasize how perceptions affect corruption perception indices. They argue that WGIs are largely perceptual and that a strong economy can elicit strong responses affirming good governance.

III. METHODOLOGY FOR CONSTRUCTING THE TRADE GOVERNANCE INDICATOR

Our indicator measures the quality of trade governance, which is proxied by the quality of trade statistics. The basic inference is that an economy with good trade governance is able to compile high quality (accurate) trade statistics. Good administrative capacities at trade and customs offices are necessary to compile accurate trade statistics; poor governance may lead to a poorer quality of trade statistics.

We follow the methodology established by Fertő and Soós (2009), ranking European economies in terms of the accuracy of their trade statistics. They first check the consistency of trade statistics for bilateral pairs. The consistency between the two values is assessed in terms of a correlation coefficient at the 2-digit level classification. A high correlation signifies high consistency between the trade values of a bilateral pair. They then convert the consistency specific to each bilateral pair into economy-specific accuracy scores, considering that an economy whose statistics at the 2-digit classification level are consistent with its mirror statistics among many other economies is considered to have good quality trade statistics. In other words, the accuracy score given to each economy is the average of consistency (correlation coefficient) between it and all other partners. In order to compute the quality of trade statistics of European economies, this study compares the trade statistics of all European economies against all other European economies. Thus, for example, Germany’s accuracy score is the average of correlation coefficients between Germany and other European economies.

In this study, we will construct the indicator for trade governance (proxied by quality of trade statistics) of almost all economies in the world and come up with global rankings. To do so, we will compare trade statistics of 159 economies in the world against those of G20 economies. We compute a simple arithmetic average, the correlation coefficients between test economies and each of the G20 member economies to determine accuracy scores in three categories: (i) as exporters, (ii) as importers, and (iii) as both exporters and importers (average of the two). There are mainly three reasons why G20 data are used as mirror statistics. First, data for 20 economies are manageable. When the global ranking includes 159 economies, we examine around 3,180 bilateral pairs. Second, G20 economies are geographically dispersed. This controls for geographical bias, with geographically proximate economies having more consistent trade statistics than geographically distant pairs. Third, it seems reasonable to assume that G20 economies compile relatively accurate statistics. Although we should not prejudge the quality of trade statistics compiled by each economy, it is unreasonable to include very unreliable

¹⁰ Treisman (2007) used CPI by Transparency International and control of corruption by the World Bank, and the experienced-based corruption indices of the World Business Environment Survey, United Nations Interregional Crime and Justice Research Institute, and Transparency International’s Global Corruption Barometer.

statistics (e.g., sub-Saharan economies) as the benchmark of comparison. Hence, the comparison of “all economies against all economies” is not a good idea because (i) it is not manageable (there are 25,281 bilateral pairs for the group of 159 economies), and (ii) the reliability and quality of the mirror statistics are low. The comparison of all economies against G7 economies is also not a good idea because economies close to Europe may have an upward bias since more than half of G7 members are European economies.

To compute for the correlation coefficient between a test economy and each G20 member economy, we use the 2-digit level classification of trade values in United States dollars from the United Nations Comtrade Constructing a Bias-Free Trade Governance Indicator: Revealing the Biases of Existing Survey Indicators | 7 database. We use economies under SITC Rev. 3 in 2009, including the classification and the most recent year with the highest number of economies that reported trade values.

IV. RESULTS: ECONOMY RANKINGS FOR GOOD TRADE GOVERNANCE

Table 2 provides world rankings for the quality of trade governance, observed as the quality of trade statistics. From Table 2, we can confirm that the (i) average correlation coefficients of trade flows indicate a positive relationship between the test economies’ statistics and G20 statistics, except for Iraq; and (ii) 126 out of 160 economies have correlation coefficients (accuracy scores) greater than 0.5, indicating a strong relationship between the test economies and G20 statistics. The high consistency between G20 economies and test economies suggests that our attempt is a useful exercise to assess the quality of trade statistics. In addition, it is useful to confirm that the quality of trade statistics of G20 economies are relatively good, which suggests that they constituted a qualified benchmark. With the notable exceptions of Turkey and Saudi Arabia, G20 economies’ scores are very high.

However, trade governance indicators computed as the quality of trade statistics also seem to have some weaknesses. Certain economies tend to have lower scores brought about by their particular physical features. For such economies, trade statistics do not necessarily reflect the quality of governance. First, the scores of economies that host transit ports tend to score very low because a large portion of their trade comprises reimports and reexports. This may explain the relatively low scores of Hong Kong, China; Panama; and Singapore. Second, landlocked economies are in a disadvantageous condition in this exercise. It is widely known that recoding the real destination of trade is confusing for landlocked economies where the immediate direction of trade is, usually, assumed to be with neighbors (especially, in the case of land transportation). In relation to this, landlocked transiting economies such as Luxembourg and Switzerland also seem to have similar tendencies to transiting ports. Third, economies whose trade is dominated by a limited number of commodities tend to have higher scores. Examples include Cambodia (garments) and Peru (copper). Fourth, economies that conduct the majority of their trade with a limited number of partners tend to have high scores.

Table 2: World Rankings of Trade Governance

Economy	TGI	Economy	TGI	Economy	TGI	Economy	TGI
Chile	0.95	Hong Kong, China	0.82	Lebanon	0.69	Togo	0.52
Japan	0.93	Jamaica	0.82	Trinidad and Tobago	0.69	Venezuela	0.51
Peru	0.93	Mexico	0.81	Oman	0.69	Qatar	0.51
People's Republic of China	0.91	Syria	0.81	Iceland	0.68	Republic of Moldova	0.51
Thailand	0.91	Madagascar	0.80	Costa Rica	0.68	Macau, China	0.50
Spain	0.91	El Salvador	0.80	Switzerland	0.68	Turkey	0.50
Brazil	0.91	Australia	0.80	Honduras	0.68	Cyprus	0.49
Viet Nam	0.90	Norway	0.80	Guyana	0.66	Saudi Arabia	0.48
Republic of Korea	0.90	Greece	0.80	Senegal	0.66	Gambia	0.48
Argentina	0.89	Uruguay	0.80	Estonia	0.66	United Arab Emirates	0.48
Germany	0.89	Czech Republic	0.80	Belarus	0.65	Dominica	0.47
Pakistan	0.89	United Kingdom	0.79	Nicaragua	0.65	Republic of Macedonia	0.47
Sweden	0.88	The Netherlands	0.79	New Caledonia	0.65	Palestinian Territories	0.46
Canada	0.88	Philippines	0.79	Georgia	0.64	Sao Tome and Principe	0.46
Egypt	0.87	Portugal	0.78	Nepal	0.64	Burkina Faso	0.45
New Zealand	0.87	Slovakia	0.78	Yemen	0.64	Rwanda	0.45
Sri Lanka	0.87	Maldives	0.78	French Polynesia	0.64	Ghana	0.45
Ukraine	0.87	Jordan	0.78	Azerbaijan	0.64	Cape Verde	0.44
Italy	0.87	Cameroon	0.78	Benin	0.63	Mayotte	0.43
India	0.87	Malawi	0.77	Montenegro	0.63	Congo	0.43
Hungary	0.87	Lithuania	0.76	Albania	0.63	Tonga	0.41
Colombia	0.87	Kazakhstan	0.76	Faeroe Islands	0.62	Lesotho	0.41
Israel	0.86	South Africa	0.76	Central African Republic	0.62	Suriname	0.39
Malaysia	0.86	Grenada	0.76	Bermuda	0.62	Kyrgyz Republic	0.39
Morocco	0.86	Kenya	0.75	Barbados	0.62	Bahamas	0.38
France	0.85	Slovenia	0.75	Mauritania	0.61	Afghanistan	0.35
Indonesia	0.85	Ethiopia	0.75	Bahrain	0.61	Aruba	0.34
Guatemala	0.85	Gabon	0.75	Latvia	0.61	Panama	0.33
Poland	0.85	Paraguay	0.74	Luxembourg	0.60	Saint Vincent and the Grenadines	0.32
Cambodia	0.85	Austria	0.74	Malta	0.60	Antigua and Barbuda	0.31
Belgium	0.85	Côte d'Ivoire	0.73	Serbia	0.59	Samoa	0.29
Romania	0.85	Singapore	0.73	Uganda	0.58	Montserrat	0.28
Ecuador	0.84	Croatia	0.73	Belize	0.57	Bhutan	0.26
Algeria	0.84	Mauritius	0.72	Bosnia Herzegovina	0.56	Kiribati	0.26
Finland	0.83	Bolivia	0.72	Armenia	0.56	Niger	0.19
Ireland	0.83	Tanzania	0.70	Turks and Caicos Islands	0.55	Djibouti	0.17
Denmark	0.83	Bulgaria	0.70	Zimbabwe	0.54	Fiji	0.05
Tunisia	0.83	Sudan	0.70	Mozambique	0.54	Kuwait	0.03
United States	0.83	Nigeria	0.69	Botswana	0.54	Iraq	-0.02
Russian Federation	0.83	Dominican Republic	0.69	Zambia	0.53		

Source: Authors' computations.

V. SURVEY INDICATORS VERSUS OBSERVED MEASURES: A PRELIMINARY COMPARISON

In this section, we will conduct a preliminary assessment of TGI in comparison with existing indicators, based on the methodologies used in the literature. Studies like Donchev and Ujhelyi (2013), Treisman (2007), and Razafindrakoto and Roubaud (2010) reveal the biases in existing governance indicators through regression analyses, testing if variations in the indicators of corruption experience explain the variations in corruption perception indices. They use WGI and CPI, among others, as indicators for corruption perceptions and find that corruption perception indices are influenced by other factors (e.g., economic development, democracy, and Protestant tradition) rather than by actual corruption experiences.

We test if TGI is a good indicator for governance in trade by asking whether it comprehensively captures the quality of trade governance and is bias-free. First, we test whether TGI captures governance in trade (Section 5.1). Second, we test whether TGI is bias-free (Section 5.2). Finally, we test the determinants of TGI (Section 5.3). This flow of analysis is reflected in the figure below, which reflects that trade governance is greatly determined by factors outside the confines of governance-related issues.

A. Does the Trade and Governance Indicator Capture Governance in Trade?

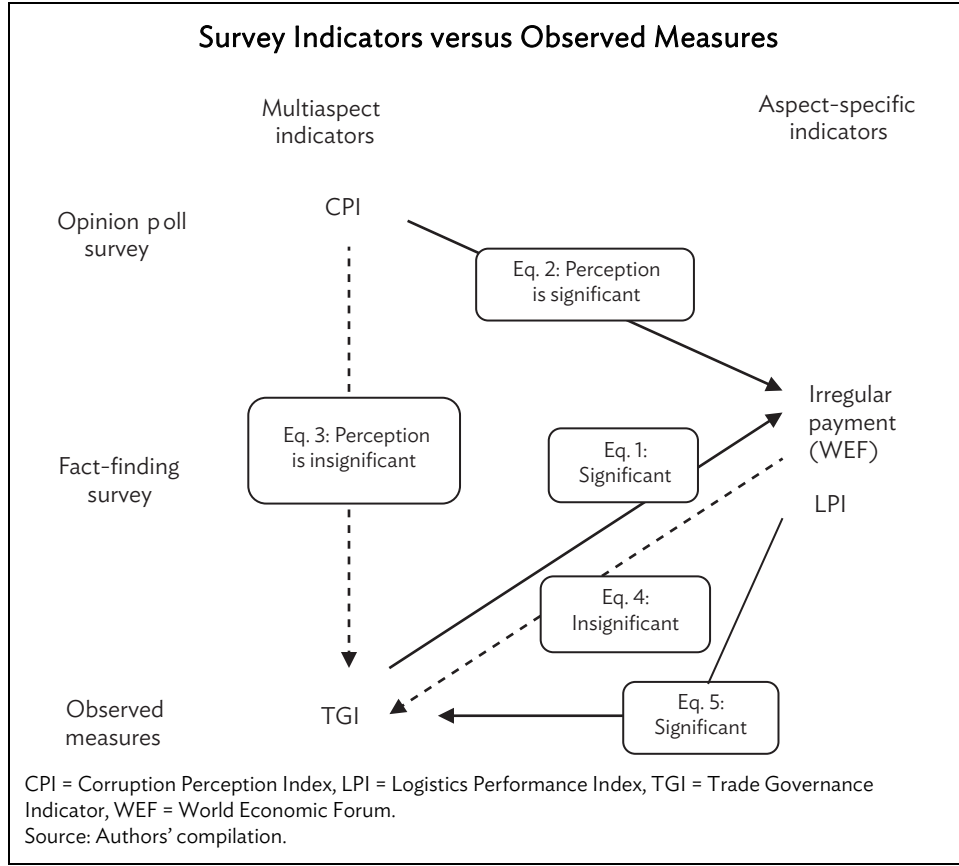
First, we test whether TGI captures the quality of governance in trade. To do this, we test whether TGI explains irregular payment (IPT), which is the existing indicator for trade governance. We, therefore, use TGI as an independent variable in an equation where IPT is the dependent variable (Equation 1). Other independent variables used are WGI's control of corruption (CC), regulatory quality (RQ), religion dummy (RD), gross domestic product (GDP) per capita, and Democracy Index (DI). β s denote the coefficients of the independent variables.

$$IPT = \alpha + \beta_1 TGI + \beta_2 CC + \beta_3 RQ + \beta_4 RD + \beta_5 GDP + \beta_6 DI + \mu \quad (1)$$

We find two pieces of evidence that TGI captures the corruption component of governance in trade. First, TGI is significant in the equation, implying that it can be used as an alternative to irregular payment. Second, we find that RD and GDP per capita are not significant, implying that the high R^2 (87%) of Equation 1 can be attributed to the strong explanatory power of TGI, rather than on the income effects, which is a typical result in existing models that test widely used perception-based governance indicators against the indicator of actual experience of corruption gathered through fact-finding surveys.

Therefore, although both IPT and TGI can be used as indicators of governance in trade, the former has three problems. First, IPT has inherent errors as it is drawn from a fact-finding survey. Second, it captures the corruption aspect of trade governance only when, in fact, trade governance should also cover regulatory aspects, among others. Third, using Equation 2, we find that IPT has a perception bias. Equation 2 tests whether CPI affects IPT.

$$IPT = \alpha + \beta_1 TGI + \beta_2 CPI + \beta_3 CC + \beta_4 RQ + \beta_5 RD + \beta_6 GDP + \beta_7 DI + \mu \quad (2)$$



Further, it is possible to argue that there are two subfactors that affect the corruption component of trade governance: actual status of governance and perception. In terms of the extent of the effects of these two factors on IPT, we find that TGI has a slightly higher coefficient; however, CPI appears strongly significant at the 5% level, while TGI is significant at 10%.

Moreover, other factors like democracy and WGI's regulatory quality and control of corruption also significantly explain trade governance. Such positive effects imply that even general reforms on regulations and general efforts to curb corruption have significant impacts on trade governance.

B. Is the Trade and Governance Indicator Bias-Free?

Using Equation 3, we test whether CPI explains TGI. Here, we find that the R^2 is too low to be able to make conclusions based on the statistical results. This result suggests that TGI is bias-free, which supports the evidence above that TGI is a good alternative measure of governance in trade.

$$TGI = \alpha + \beta_1 IPT + \beta_2 CPI + \beta_3 CC + \beta_4 RQ + \beta_5 RD + \beta_6 GDP + \beta_7 DI + \mu \quad (3)$$

C. What are the Determinants of the Trade and Governance Indicator?

Given the strong evidence above that TGI is a good measure of trade governance, we test TGI's possible determinants. Using Equation 4, we test whether IPT, which is the corruption component of trade governance, has a huge effect on the actual status of trade governance. We find that this equation is not significant with very low R^2 . This result reveals that the actual corruption experience in

trade transactions may only be one aspect of governance in the trade sector. The important implication of this result is that TGI, which is deemed to capture the actual status of trade governance, is comprehensive enough to capture other factors apart from, for example, corruption in trade transactions. It is likely that TGI is also determined by customs and logistics quality.

$$TGI = \alpha + \beta_1 IPT + \beta_2 CC + \beta_3 RQ + \beta_4 RD + \beta_5 GDP + \beta_6 DI + \mu \quad (4)$$

Given the above results, we test TGI against customs (cust), infrastructure (infra), shipments (ship), timeliness (time), tracking (track), and logistics quality (LQ) from the World Bank's LPI, using Equation 5. We find that TGI is sensitive to soft infrastructure such as customs, tracking, and logistics quality. This implies that the quality of statistics, and hence the quality of trade governance, increases with improvements in customs clearance processes by border control agencies, the ability to track and trace consignments, and the quality of logistics services offered by transport operators and customs brokers. While LPI, which is a kind of fact-finding survey, may also not be free from perception bias, the survey that is related to administrative soundness and efficiency impacts TGI rather than the survey of corruption-related issues.

$$TGI = \alpha + \beta_1 IPT + \beta_2 CC + \beta_3 RQ + \beta_4 RD + \beta_5 GDP + \beta_6 DI + \beta_7 cust + \beta_8 infra + \beta_9 ship + \beta_{10} time + \beta_{11} LQ + \beta_{12} track + \beta_{13} CPI + \mu \quad (5)$$

VI. CONCLUSION

In this study, we constructed a bias-free indicator that reflects the quality of governance in the area of trade. Our exercise is based on the inference that economies with good trade governance can compile high quality trade statistics; the latter being a close proxy for the former. While indicators based on existing surveys are not free from perception bias, our method allows us to directly observe the quality of governance. We statistically confirm that TGI captures the quality of trade governance but is not affected by perceptions. TGI is a comprehensive (multiaspect) governance indicator, which means that it captures various aspects of governance in one figure, not a single aspect such as corruption. TGI is strongly influenced by soft infrastructure, including the efficiency and soundness of government policy, especially border agencies such as customs.

Using TGI, perception biases of existing survey indicators can be revealed. First, not only opinion poll surveys (e.g., “do you think ...?”), but also fact-finding surveys (e.g., “how often are you asked to pay a bribe?”) are impacted by perception bias, as we confirmed by the case of IPT and the CPI. Second, fact-finding surveys are affected by both the real status of governance and related perceptions, while opinion poll surveys are less factually based.

TGI has the potential to improve economic analysis of trade and beyond. By avoiding the endogeneity problem, we can assess the true impact of governance on trade using TGI. One of the reasons why the relationship between governance and trade is unclear is the lack of appropriate governance indicators; TGI can fill such a gap. In addition, TGI does not need to be limited to trade and can be used as a bias-free proxy for an economy's governance in general. TGI can be also used for development.

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Constructing a Bias-Free Trade Governance Indicator: Revealing the Biases of Existing Survey Indicators

Governance indicators based on surveys may have biases and inherent errors. This study produces a bias-free governance indicator and comes up with a global ranking of the quality of (trade) governance. Our inference is: economies with good trade governance can compile high quality trade statistics.

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6 ADB Avenue, Mandaluyong City

1550 Metro Manila, Philippines

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