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1 Introduction

Market access matters. Greater market access means increased trade and from increased trade comes greater income growth. But exactly which countries in the world enjoy the greatest market access? There is no simple answer to this question. First, there exists no single agreed measure of market access. Second, there exists no agreed and commonly accepted definition of market access. Third, there has tended to be too narrow a focus upon what market access involves.

The compelling contribution of this paper is to provide, for the first time, an index of market access for a large sample of the world's economies. The creation of this index, the market access index (MAI), enables the creation of a league table or rank order of countries in terms of market access. This enables the following question to be answered: which are the countries of the world enjoying the greatest market access?

Market access has traditionally been analyzed from a very narrow international trade perspective. In the trade policy literature, market access is an umbrella term aimed at including analysis of a number of measures that a country may use to restrict imports. There is a long list of such measures, including tariffs on imported goods, and non-tariff barriers such as technical standards, anti dumping actions, import quotas, and import licensing, among others. Market access restrictions also include regulation of imported services. For example, some countries may limit the number of foreign service suppliers in a sector, or limit the number of service transactions a foreign supplier may perform.

Over the past half century, the World Trade Organization (WTO) and its predecessor the General Agreement on Tariffs and Trade (GATT) have gradually increased market access as a series of outcomes from the various 'Rounds' of trade negotiations. As a consequence of tough negotiations on market access during the Uruguay Round, most countries cut tariffs significantly, and adopted tariff bindings - levels above which tariffs may never rise - for almost all imports. More recently, WTO members agreed at the 2001 Doha Ministerial conference that more aggressive negotiations should begin toward the goal of increasing market access in recognition that the main purpose of the original GATT was to ultimately eliminate tariffs on industrial goods.

However, there is considerable unevenness in market access outcomes across countries, due, largely, to the varied attempts at trade liberalization over time and the complex discriminatory regulatory framework that currently exists in many countries. There have been several attempts by researchers to assess the success of trade liberalization in enhancing greater market access. However, these attempts confront a major obstacle; market access is a slippery concept to define and an even more difficult concept to measure. This is because, essentially, market access is a latent concept that is not directly observable. As a consequence researchers have generally attempted to proxy it by using either a variety of trade policy variables, or exogenous instrumental variables.

However, measuring market access in terms of trade policy alone may result in misleading inferences with regards to the importance of market access for economic growth, because market access involves much more than trade policy and trade regulations.

The traditional trade policy approach to market access is, we argue, unhelpfully narrow. Market access is a much broader concept and involves other drivers beyond the right trade policy environment. Indeed, a conducive trade policy regime may be a necessary condition for greater market access but it is not a sufficient condition. A country may have in place liberal trade policies, but that does not guarantee that its suppliers will have greater access to world markets, nor that its consumers will have greater access to products sourced from the rest of the world. Trade policy is but one ingredient in the mix that is necessary to deliver greater market access.

In this paper we argue that market access is a broad concept that manifests itself in three sets of separate but related elements. Greater market access results from an economy possessing the right set of public institutions, an appropriate regulatory environment, and the requisite network industries. Trade policy forms part of public institutions and the regulatory environment, however, market access is a concept that goes much beyond its traditional narrow trade policy construction.

This paper integrates the role of public institutions and network industries, in addition to the regulatory environment, to determine market access. The paper then suggests that it is possible to measure market access in broader terms than has hitherto been undertaken and in doing so create a Market Access Index (MAI). The advantage of the MAI is that it can enable the creation

of a league table or, rank order, of countries in terms of market access. Given that the MAI and its constituent composites are all latent variables we employ the statistically robust method of structural equation modeling (SEM) to construct the MAI. SEM is a powerful statistical technique that enables the allocation of appropriate weights to each of the three constituent components of market access: public institutions; regulatory environment; and network industries. A compelling outcome of this approach is the importance that network industries play in determining the value of MAI and hence, in enhancing market access. The SEM generated weights suggest that network industries are the most fundamental determinant of market access. To construct the MAI using SEM, the paper employs a dataset created by the World Economic Forum (WEF). This dataset provides key market access data on 117 countries that comprise 97% of world output. Using these data, SEM generates a MAI for each country in the sample and creates a league table of market access, enabling cross-country comparisons.

The paper is structured as follows. Section 2 briefly surveys the literature on the regulatory environment, public institutions and network industries. Section 3 redefines market access and constructs a model to measure the MAI. Section 4 uses SEM to model the MAI, whilst Section 5 discusses the weights generated by SEM and ranks the country's into a MAI league table. Section 6 offers concluding comments.

2 Brief Literature Survey

According to Bagwell and Staiger (2001), "Market access is interpreted in GATT to reflect the competitive relationship between imported and domestic products" (p. 71). For example, when a government agrees to reduce its import tariff on a particular product, it alters the competitive relationship between imported and domestic units of the product in favor of imported units, and it thereby provides greater market access to foreign producers. By agreeing to lower its tariff, the government is effectively agreeing to engineer an outward shift of its import demand curve - that is, all else equal, a greater volume of imports will be demanded at any given price from foreign exporters - and as a result, foreign exporters can expect to enjoy an increase in sales into the

domestic market and to receive a higher price. This interpretation of market access acknowledges that there are many ways to alter the competitive relationship between imported and domestic products. However, hitherto the majority of the literature has tended to focus narrowly on the formal, legal barriers to trade determined by the regulatory environment.

This paper argues that market access matters but also that market access is a broader concept than has traditionally been considered. Greater market access leads to greater income growth. The theoretical justification for this proposition comes from the three constituent components of market access. Since greater market access leads to greater income growth, the accurate measurement of market access requires the identification and inclusion of the range of factors that impact market access. Figure 1 provides a set-diagram representation of market access proposed in this paper. Each of the three components of market access: regulatory environment; public institutions; and network industries has a strong theoretical foundation.

2.1 Regulatory Environment

The theoretical justification for the impact that the regulatory environment has on growth stems from the 'openness' literature. That openness leads to economic growth theoretically emanates from classical, neoclassical and, more recently, endogenous growth theory (Romer, 1990). Good summaries of this literature can be found in Dowrick (1994) and Wang et al. (2004). Essentially, endogenous growth theory emphasizes that knowledge spillovers generate increasing returns, which contribute to long run growth. The knowledge spillovers come from the capital accumulation process and its endogeneity with increases in productive capacity. Capital accumulation can be in any, or all, of three forms: physical capital; human capital; and disembodied knowledge. International trade can facilitate this capital accumulation process in three ways: international transmission of ideas; international flows of goods and services; and international flows of capital (Grossman and Helpman, 1991). Export expansion can lead to increases in real output (Helpman and Krugman, 1985), whilst import expansion may lower production costs (Markusen et al., 1995).

Many studies have empirically tested the relationship between openness, measured as trade intensity (ratio of exports and/or imports to GDP), and income growth. However, given the

inherent problems of endogeneity most can confirm a positive correlation at best; asserting that in general, richer countries have more trade intensive economies. More recently, in an attempt to overcome endogeneity problems, Frankel and Romer (1999) construct a trade intensity measure derived from standard gravity regressions of bilateral trade flows. By allowing for the geographic component of trade and income, they find that trade intensity does indeed raise income by spurring physical and human capital accumulation.

Trade openness or trade intensity is, however, an economic outcome. This paper is predominantly interested in the drivers of market access and how to achieve openness, therefore, it is the regulatory environment, the economic policy which affects trading decisions, that is of particular interest. Trade policy openness has been advocated, at least since the contribution of Krueger (1978) who argued that trade policy matters. She identified that those countries that adopt outward-oriented trade policies instead of inward-oriented, import substitution policies grow faster. Outward-oriented trade policy leads to improvements in trade intensity which leads to enhanced economic growth. However, the challenge for trade policy openness advocates has always been how to measure trade policy openness. Attempts at measurement have been many and varied and have included creative attempts to capture a country's policy processes, and orientation toward and access to the rest of the world. A famous example is Sachs and Warner (1995) whereby they subjectively classify countries as either open or closed on the basis of a five-policy test. The five policies include: non-tariff barriers; average tariff rates; black market exchange rate; socialist economic system; and state-owned export monopoly. "We define an open economy as one in which none of the five conditions applies" (Sachs and Warner, 1995, p. 24). In a similar vein, Harrison (1995) measures openness using seven different proxies for trade and exchange rate policies. A broader attempt to measure trade policy openness occurs in Edwards (1998) who uses nine openness indexes of which three deal with trade policies and the remaining six measure the extent of trade policy-induced distortions. Edwards (1998) is a particularly important paper. Using a large cross-country sample, Edwards regresses total factor productivity on a range of policy variables, including the Sachs and Warner index, using an instrumental variables approach to overcome en-

dogeneity problems. Edwards concludes that "more open countries have indeed experienced faster productivity growth" (p. 396).

Rodriguez and Rodrik (1999) take a less sanguine view of the empirical studies investigating the relationship between trade policy and economic growth. They are critical of Sachs and Warner (1995) and Edwards (1998) in particular. Essentially their criticisms boil down to objections about the contrived nature of the openness proxies used in these studies, their lack of precision and their likely correlation with alternative equally plausible explanations of economic growth.

Romalis (2005) is also interested in the relationship between per capita income and trade openness, particularly for developing countries and regresses real per capita GDP on trade intensity. To overcome endogeneity problems between trade and growth he uses the US MFN tariff as an instrumental variable for market access because of its exogeneity with income growth for the lesser developed countries he samples. Romalis concludes that improved access to developed countries' markets improves developing country's income growth.

This brief survey highlights two important points. First, it is difficult to measure trade policy openness. Second, for trade policy openness to impact economic growth it must do so by increasing trade intensity, i.e. there must be a trade related outcome that leads to income growth. Importantly, to the extent that trade policy openness forms a part of market access, then improved market access that results from greater trade policy openness, should, all other things equal, lead to greater income growth.

2.2 Public Institutions

The broadening of the openness-growth literature has been facilitated by some researchers seeking to identify just how important trade is to income growth given the existence of alternative equally plausible explanations. In the same way that openness seems to matter, so do public institutions.

A different view of what influences economic growth is put forward by North (1990) who claims that countries with better public institutions will ultimately invest more in physical and human capital resulting in a more efficient use of resources and higher income levels. The literature on public institutions is broad and its effects on growth are theoretically and empirically analyzed by

a host of economists, such as Engerman and Sokoloff (2000) and Acemoglu et al. (2001, 2002). Rodrik et al. (2002) use a modeling framework that adds geography to both trade and public institutions to explain growth. Rodrik et al. (2002) argue there are three 'deep' determinants of income: geography; institutions; and integration (trade intensity). "How much of the astounding variation in cross-national incomes around the world can geography, integration, and institutions explain?" (Rodrik et al., 2002, p.4). To test their research question they regress per capita income on three variables: institutional quality, trade intensity and geography using a two-stage least squares model where institutional quality is instrumented by mortality rates (following Acemoglu et al., 2002), and trade intensity is instrumented by geography (following Frankel and Romer, 1999) in the second stage regressions. From their empirical results they conclude that the quality of institutions "trumps" everything else; their results emphasize the supremacy of institutional quality over both trade intensity and geography for economic growth.

Similarly, the question of what determinant of income growth matters most between trade intensity or public institutions has also been considered by Dollar and Kraay (2002). These authors draw together the openness-growth and institutions-growth literature in an "attempt to isolate the partial effects of trade and institutions on growth" (p. 3). However, they are confronted with an endogeneity challenge since countries that trade more have better institutions. They find in their cross-section regressions that institutions and trade are jointly significant, but it is difficult to identify the strength of the individual effects. To try and overcome the problems of endogeneity Hall and Jones (1999) measure "social infrastructure" as a curious composite of the Sachs-Warner index and a government anti-diversion policy measure to assess the importance of institutions on income growth. They find that differences in "social infrastructure" can explain large changes in capital accumulation, productivity and ultimately income.

It is clear from the literature that good quality public institutions are positively associated with economic growth. Public institutions have generally been integrated into the growth literature as a competing explanatory variable. More recently papers such as Rodrik et al. (2002) have stipulated that the two variables are endogenously related. However, there exists a small literature which

examine the direct effect that public institutions have on trade and market access.

Intuitively, poor quality public institutions act as a hidden barrier to trade in the form of increased costs of trading, similar to a hidden tax or tariff barrier, and therefore reduces the accessibility to markets. Anderson and Marcouiller (2000) propose that poor quality institutions are associated with insecurity in international exchange. The cost of corruption, lack of enforcement of contracts and bribe extortion are likely to influence trading decisions and therefore the accessibility of markets. By fitting a structural model to the data they conclude that the "transaction costs which are associated with insecure exchange significantly impede international trade" (p. 16). Economic policy which lacks either transparency or impartiality and legal systems which fail to enforce commercial contracts adequately, significantly increase the price of trade and act as a formal constraint. They suggest that the disparities in the quality of public institutions between the rich and lesser developed economies offers a rationale to why the richer countries tend to trade more amongst themselves. More recently, Mavisakalyam (2004) employs the gravity model to demonstrate the importance of public institutions. Included in transaction costs, is the cost associated with insecurity and risk when the institutions fail to protect against diversion. He concludes that "good institutions protecting against public diversion help stimulate trade" (p. 369).

2.3 Network Industries

According to Limao and Venables (1999), "Remoteness and poor transport and communications infrastructure isolate countries, inhibiting their participation in global production networks" (p. 1). Transport and communications infrastructure are network industries. Network industries are those that help realize network effects (Shy, 2001). To realize network effects there must exist a network of some sort. Networks take many forms. There are telecommunications and broadcasting networks, transport and logistics networks, computing and information sharing networks, social and cultural networks. Well established and efficient network industries enhance the rest of the world's access to domestic markets as well as enhancing a country's access to world markets. In some instances the networks are real, tangible and measurable, whilst in other situations the networks

may be intangible and virtual. In each case there are particular features of the network that have important economic characteristics, effects and consequences that enhance market access either domestically or internationally. The more prevalent and better are network industries, the greater the opportunities to use those network industries to increase market transactions. Access to markets is enhanced by better network industries. However, for the current exercise in constructing a MAI it is only feasible to include the tangible components of network industries; that is those network industries relating to domestic infrastructure.

Within the market access literature the cost of transportation as a natural, non-tariff barrier to trade is both widely recognized and well researched. Authors have tended to concentrate on the geographical positioning and proximity of countries whilst a smaller faction recognizes that in fact transportation costs are a function of a countries' geographical positioning and its infrastructure. Given that geographical positioning is exogenous, it is the impact of infrastructure that is integral in assessing a market's overall accessibility.

Bougheas et al. (1997) introduce the role of infrastructure into the theoretical and empirical literature on transport costs and trade. They examine the relationship between the stock of infrastructure and the volume of trade by hypothesizing that the costs of transportation is inversely related to the development of domestic and international transport and telecommunications infrastructure. They demonstrate that by introducing infrastructure, as a cost reducing technology, into a two-country Ricardian model there is a welfare gain as a result of the reduced price of imports from the reduction in transport costs. Additionally, Bougheas et al. (1997) employ a gravity model to conduct a cross-country analysis on the importance of infrastructure in trade. Rather than transport costs merely being a function of distance, they include an 'infrastructure' variable measured by the stock of public capital and the length of the motorway networks within each country. Results confirm their hypothesis that there exists a positive relationship between infrastructure and the volume of trade. However, at high levels of investment in infrastructure Bougheas et al. (1997) warn that there is potentially a trade-off resulting from the loss in volume of goods produced and thus, final output. Limao and Venables (1999), similarly, empirically show

that "poor own and partner infrastructure increase transport costs significantly" (p. 9), reporting that the inclusion of infrastructure measures explains more than double the variation in transportation costs than using distance or a landlocked dummy. They estimate the elasticity of trade flows with respect to transport costs at -2.95 for within country infrastructure and -2.34 for their transit infrastructure measure. Bond (2005) also examines the importance of public goods, namely ports, airports, and road and rail networks, on the level of transport costs and ultimately trade volumes. Bond employs a two period partial equilibrium trade model to examine the relationship between trade liberalization and infrastructure investments, with particular attention to the effects of co-operative investments levels. He concludes that the "benefits of these investments (transportation infrastructure investments) is related to the volume of trade between the two countries" (p. 24).

Dollar et al. (2003) interestingly investigate the significant disparity between the trade intensity of four Latin American countries; Brazil, Peru, Honduras and Nicaragua. The endowments and sectoral structure of each economy is fairly homogeneous and since the mid-1980s all four countries have liberalized their trade policy, reducing tariffs substantially. However, changes in the ratio of trade to GDP between countries are not as would be expected according to the majority of market access literature. For example, Honduras has experienced the most significant fall in tariff rates yet experienced a decline in trade to GDP ratio through the 1990s. Therefore, Dollar et al. (2003) hypothesize that the removal of formal trade barriers must be complemented by a sound investment climate. They concentrate on both the role of infrastructure as representative of the investment climate and the quality of institutions in place. Employing a cross-firm analysis, Dollar et al. (2003) empirically conclude that market access within the narrow definitional framework of tariff rates, is insufficient in explaining changes and differences in the ratio of trade to GDP. "We find that a sound investment climate - as reflected in low customs clearance times, reliable infrastructure, and good financial services - makes it more likely that firms in a location will export" (p. 17).

3 An Empirical Model of Market Access

The previous discussion highlights the point that an appropriate regulatory environment, suitable public institutions and efficient and extensive network industries each contributes to enhanced international trade opportunities. That is, each of these three set of characteristics contribute to and represent greater market access for any given country. However, hitherto there is inconsistency and confusion concerning exactly what market access means in much of the literature, mainly because of the emphasis placed upon the trade regulatory environment to the exclusion of the other two market access drivers. Since it is not well defined, market access is proxied in rather imprecise and contrived ways. An important contention of this paper is, that, it is market access that facilitates greater trade openness and economic growth and that market access is a concept broader than trade regulations. The more accessible are world markets, the greater will be trade intensity. Similarly, the easier is access to a domestic market from the rest of the world, then the greater will be trade intensity. Greater trade intensity means greater income growth.

Therefore this paper redefines and broadens the term 'market access' to reflect its true nature. Market access as a measure should not be confined to trade policy but should encompass all determining factors. In particular, there are three sets of characteristics that will facilitate greater access to domestic markets on the one hand and international markets on the other. The three sets of characteristics include public institutions, the regulatory environment, and network industries. An important contribution of this paper is to include network industries explicitly in acknowledgment of the important role they play in creating increasing returns to market transactions via network effects.

Figure 1 visually displays the hypothesized relationship between market access and its three constituent parts: network industries; public institutions; and the regulatory environment which are theoretically and empirically justified within the literature on income growth. The shaded areas in Figure 1 represent the aspects of each of public institutions, the regulatory environment and network industries, which determine market access. For example, in the public institutions set of Figure 1, the shaded area will include the aspects of public institutions which traders take

into account, such as the autonomy of the government officials and the independence of the judicial system, whereas 'X' represents a characteristic which is formally part of the public institutions of an economy, but is most likely not taken into consideration by traders, for example, the quality of the education system.

As Figure 1 makes clear, any economy possesses network industries, public institutions and a regulatory environment. However, only certain aspects of each are relevant to market access. Market access will involve key components of each of these three sets. In building a measure of market access, the challenge for the researcher is to identify the proxy variables that represent each of these key components and then to find data for each. To operationalize market access we suggest the construction of a MAI. The hypothesized MAI is therefore comprised of three sub-indexes; the public institutions sub-index (PISI); the regulatory environment sub-index (RESI) and the network industries sub-index (NISI). For each constituent sub-index four observed variables are chosen to represent the latent construct.

In this study, the variables chosen to represent the PISI are indicative of what constitutes high quality public institutions; autonomy within the judicial system; the independence of government officials; and the efficiency and effectiveness of the legal framework. Such variables are purely indicative of favorable public institutions' qualities rather than attempting to fully encompass the broad and multifaceted nature of institutions. This is consistent with Kaufmann et al. (1999) who note that all aspects of governance may have a strong causal relationship with trade.

The RESI variables selected are only those aspects of the regulatory environment that impact on trading decisions. For example, whether the regulatory environment is unnecessarily bureaucratic and cumbersome? Or to what extent regulations hinder or facilitate trade between countries? Or whether efficient trade flows are severely hampered by rigid economic activity from excessive regulation? Or whether regulatory or policy distortions are directing resources inappropriately?

When an economy is subjected to strict government regulation, goods and services are prevented from flowing efficiently, thus raising the cost of doing business and reducing trade incentives. The importance of trade barriers as an indicative observed variable is well understood and justified

within the market access literature. Similarly, the cost of agricultural policy is equally as justified as an indicator given the attention it receives, especially at the WTO Rounds. The burden of government regulation as a variable encompasses the multitude of aspects which influence trading decisions for both domestic and foreign traders. Finally, restrictions on foreign ownership is indicative of a domestic economy's approach to foreign goods and firms and overall openness to foreign direct investment.

The variables chosen to represent NISI cover such things as the quality of roads, ports, air transport and electricity supply and are all clear indicators of the overall quality of domestic infrastructure and representative of the tangible and measurable aspects of network industries.

These three sets of characteristics determine market access. That is, they affect the rest of the world's access to a particular domestic market, or they affect the ability of a country to interact and access international markets. A better regulatory environment combined with better public institutions will increase trade intensity and this will be further enhanced by productive and efficient network industries. This will occur either directly, or indirectly via enhanced economic growth.

4 Data and Modeling Framework

4.1 The Data and Variables

To empirically measure market access,this paper uses the cross-sectional data provided by the WEF for 117 countries. All the data used in this study come from the *Global Competitiveness Report 2005-2006* published by Lopez-Claros et al. (2005). The survey data are gathered from executive opinion survey forms which are completed annually by business leaders and decision makers and compiled by the WEF. The survey data is expressed in the form of indexes measured on a scale of 1 to 7. Table 1 provides details of the variables chosen from the WEF dataset to represent each of the PISI, RESI and NISI characteristics needed to construct MAI.

SEM assumes that all data for each variable follow multivariate normal distributions. All of the observed variables used from the dataset to construct the MAI are survey responses which follow a multivariate normal distribution and exhibit no outliers. Use of ordinal or dichotomous

measurement, as in this case, is generally considered a violation of SEM's underlying assumptions. However, Bentler and Chou (1987) argue that given the ordinal data is normally distributed "continuous methods can be used with little worry when a variable has four or more categories" (p.88). The variables included in this model fulfill the normality assumption and have seven categories. As a result estimates produced by SEM in the MAI will not be biased.

The benefit of using the WEF survey data lies in its ability to quantitatively capture nonexistent or scarce data. Other important advantages of the WEF dataset are that it provides data on a range of public institutions, regulatory environment, and network industry variables which are useful indicators of market access and not normally available to researchers. Hence, the observed variables chosen for this study originate from answers to a series of questions pertaining to a particular aspect of business operations within a specific country in terms of public institutions, the regulatory environment, and network industries. The questions that generated these variables are listed in Table 1. Questions are designed by WEF in a way that makes higher numbers designate a more positive outcome.

Accurate specification of the model based on strong theoretical foundations is essential for SEM to produce an explanatory model. Similarly, it is necessary for the model to be adequately identified as SEM is an iterative maximum likelihood process and therefore requires positive degrees of freedom for the model to converge and produce significant regression estimates.[1]

SEM also requires a complete dataset. Unfortunately, there is missing data for some variables for four countries: East Timor; Egypt; Kazakhstan; and Tajikistan hence these four countries are eliminated. This therefore reduces the sample size from 117 to 113 countries. SEM requires a *reasonable* sample size to produce accurate parameter estimates. However, there is some ambiguity within the literature as to what constitutes a *reasonable* sample size. According to Stevens (1996) 15 times the number of the observed variables is a good rule of thumb. Loehlin (1992) suggests that with over 10 variables the sample should be greater than 200. However, Bentler and Chou (1987) explain that provided the observed variables are perfectly *well behaved* then SEM requires

[1] 'Adequately identified' requires every parameter to be identified and at least one parameter to be overidentified.

no more than 5 cases per observed variable.[2] Given that there are 12 observed variables in the MAI model it is evident that it is a necessary condition for our data to be *well behaved* for the model to produce stable estimates and generate unbiased model fit results.

4.2 Modeling Framework

SEM provides a statistical methodology to quantify and test the hypothesized market access model. The specification of the hypothesized model can be seen in Figure 2. SEM exhibits properties similar to multiple regression modeling, but more robustly takes into account relationships between (a group or sub-group of) latent variables, including correlations, covariances, nonlinearities, and error terms (correlated and uncorrelated).

SEM has two steps; the first validates the measurement model and the second fits the structural model. Confirmatory factor analysis on the 'measurement model' acts as a preliminary check that the chosen observed variables have high loadings on their predicted factors.[3] Should an observed variable load significantly onto two or more latent variables it is clear that the model must be respecified. We choose four variables to represent each latent sub-index based on theoretical foundations discussed in Section 2. Once the measurement model is well specified and achieves high *goodness of fit* indicators, then the structural model is fitted, in this case by incorporating MAI into the model specification and reintroducing the directional linear relationships.

Using the methodology described by Raykov and Marcoulides (2000), the following system of equations represents the MAI's constituent components:

$$\begin{aligned} PISI &= \lambda_1 MAI + \epsilon_1 \\ RESI &= \lambda_2 MAI + \epsilon_2 \\ NISI &= \lambda_3 MAI + \epsilon_3 \end{aligned} \tag{1}$$

where λ_1 through λ_3 are the factor loadings and ϵ_1 through ϵ_3 are the error terms. The observed variables listed in Table 1 are used to estimate the parameters of each of the sub-indexes above.

[2] Variables are *well behaved* when normally distributed, when no data are missing or in the absence of outliers.

[3] A model where all the directional linear relationships between the latent variables are removed and replaced with co varying relationships between the latent sub-indexes only.

Since all of these variables are latent, they can be expressed with respect to observed variables. From these systems of equations, we can derive a variance-covariance matrix by deriving a series of covariances as follows:

$$\begin{aligned} Cov(PISI, RESI) &= Cov(\lambda_1 MAI + \epsilon_1, \lambda_2 MAI + \epsilon_2) \\ &= \lambda_1\lambda_2 Cov(MAI, MAI) + \lambda_1 Cov(MAI, \epsilon_2) \\ &\quad + \lambda_2 Cov(\epsilon_1, MAI) + Cov(\epsilon_1, \epsilon_2) \\ &= \lambda_1\lambda_2 \end{aligned} \tag{2}$$

SEM provides the best estimates of the freely varying parameters based on minimizing a function and records how well the model fits subject to the constraint defined. The 'goodness of fit' measures determine whether the model being tested should be accepted or rejected. If the model is accepted the researcher looks to the estimates of the parameters in the model specification and their respective standard errors to establish the significance of particular paths within the model specification.

5 Results

The specified model converged to a minimum, producing estimates and respective standard errors with no further amendments necessary in the specification of the model.[4] The Model Fit Summary indicates that overall the data fits the specified model fairly well, although the relatively small sample size requires that occasionally the goodness of fit measures which are sensitive to sample size are biased downwards. For example, the significance value of chi-squared means we reject the hypothesized model, however the relative chi-squared indicator, which is less dependent on sample size, produces a ratio of 2.27:1.[5] Carmines and McIver (1981) state that the model is accepted if it lies within the range of 2:1 and 3:1 (p. 80), which the MAI model does.

Similarly, the Goodness of Fit Index (GFI) which measures the percentage of observed covariances explained by the covariances in the model is 0.87. By convention, GFI should be greater than

[4] No modification indices or standardized residual covariances were significant.
[5] The ratio of chi-squared to degrees of freedom

0.90 to accept the model, however GFI is subject to downward bias when the sample size is small. Steiger (1989) recommends adjusting the GFI to:

$$G\hat{F}I = \frac{p}{p + 2\hat{F}} \tag{3}$$

where $\hat{F} = (\chi^2 - df)/(n-1)$ and df represents the degrees of freedom, p is the number of parameters and n is the sample size. The MAI records a $G\hat{F}I$ of 0.96, which is clear evidence that the MAI model fits the data well.

The root mean square residual (RMR) and standardized root mean square residual (SRMR) are also indicative of a 'good fit' as both are close to zero, at 0.05 and 0.04 respectively; the closer these tests are to zero the better the sample variances and covariances correspond to the estimated variances and covariances. Additionally, both the comparative (CFI) and normed fit indexes (NFI) have values that exceed the 0.90 cut-off, at 0.95 and 0.92 respectively. Thus indicating that 95% of the covariation in the data can be reproduced by the MAI model and that 92% of the MAI model is an improved fit compared to the the null model which uses random variables.

Given that the specified MAI model fits the data well on a variety of 'goodness of fit' indicators, we know that the regression estimates are generated from a model representative of the data. All of the regression estimates are statistically significant at the 1% level. The regression estimates can be used to determine different weights for each parameter. This is done by simply summing up the different λs in a system of equations with the same independent variable, and assigning the ratios as weights. SEM estimations, as shown in Figure 2, have assigned the following values: $\lambda_1 = 0.84$, $\lambda_2 = 0.31$, and $\lambda_3 = 1.02$ for the system of equations in SEM. The weights are therefore calculated as:

$$\begin{aligned} w_1 &= \frac{\lambda_1}{\sum_{i=1}^{3} \lambda_i} = \frac{0.84}{2.17} = 0.39 \\ w_2 &= \frac{\lambda_2}{\sum_{i=1}^{3} \lambda_i} = \frac{0.31}{2.17} = 0.14 \\ w_3 &= \frac{\lambda_3}{\sum_{i=1}^{3} \lambda_i} = \frac{1.02}{2.17} = 0.47 \end{aligned} \tag{4}$$

where w_1, w_2, and w_3 represent the weights assigned respectively to PISI, RESI, and NISI in the composition of the MAI.

Figure 3 shows that within the model the allocation of weights within the sub-index observed variables are fairly uniform, with each of the observed variables reflecting roughly a quarter of their respective latent construct. The cost of agricultural policy as a representative variable for the regulatory environment is smaller than average at 18%, whilst the prevalence of trade barriers is attributed more weight at 34%. Intuitively this makes sense as the cost of agricultural policy is a more country specific indicator of the regulatory environment than the overall prevalence of barriers to trade. Similarly, within the PISI judicial independence is attributed above average weight, whereas the favouritism in the decisions of government officials recieves less. Once again this is intuitively compelling as the behaviour of government officials is more specific than the overall judiciary system. The fact that the observed variables represent relatively equal parts of their respective latent sub-indexes adds validity to the observed variables chosen as indicators.

The weight for NISI, w_3, indicates that having good network industries is the most important component in achieving good market access, as it accounts for 47% of the MAI. w_1 and w_2 reveal the importance of public institutions and the regulatory environment respectively in the MAI, PISI determines 39% of the MAI and RESI only 14%. Once again these results are compelling in light of the theoretical and empirical literature to date. Whereas the importance of network industries is almost unamimously found to be important to market access, there remains a thriving debate and mixed empirical and case study evidence on the impact and importance of the regulatory environment. Without sufficient infrastructure in place, and the public institutions to facilitate and support this, the regulatory environment is unable to influence market access decisions significantly.

5.1 MAI League Table

The weights generated by SEM enable the MAI to be calculated and ranked for the 113 countries included in the sample. Table 2 displays the rank and score of the latent variables included in the MAI. According to the index Denmark is characterised as the economy with the best market access, with a score of 6.11. This is predominantly as a result of its PISI and NISI which score 5.96 and 6.54 respectively, and both rank first out of the 113 countries included in the model. Chad has the worst MAI out of the sampled countries, scoring 2.09 out of a theoretical maximum 7.

Singapore has the highest scoring RESI, at 5.82 and ranks 2nd in the world on its overall MAI, as both PISI and NISI also rank consistently well at 3rd and 2nd place respectively. Similarly, Hong Kong has extremely liberal trade policies, ranked 2nd in the world. Zimbabwe has the worst performing regulatory environment out of the sampled countries, however the former Commonwealth of Independent States (CIS) countries Kyrgyz Republic, Moldova, Russia and Ukraine also score and rank poorly on the RESI, all ranked in the bottom 10 of countries sampled.

A more detailed perusal of the RESI scores and ranks reveals that some of the richest countries in the world have relatively poor scoring regulatory environments and some of the poorest have high scoring RESIs. For example, Norway is the second richest country out of the 113 sampled, yet ranks 63rd on its RESI. Similarly, Japan, Switzerland and Italy rank an unimpressive 63rd, 62nd and 61st place respectively. Given the weight allocations generated by SEM these poor RESI scores are not always reflected in the MAI; Japan, Switzerland and Italy rank 13th, 8th and 54th place on the overall MAI. Conversely however, Ghana ranks 12th internationally and The Gambia ranks 24th despite their GDP per capita ranking them 101st and 93rd respectively. Other countries with uncharacteristic RESI scores and ranks include Chile, The Russian Federation and Hungary. The RESI perfectly captures the fact that a liberalised economy, where trade barriers are low, does not guarantee accessibility to markets and visa versa, a market can be relatively accessible despite not fully liberalising its trade policy. Relying solely on tariff rates as proxies for 'market access' could therefore lead to misleading inferences.

Denmark and Singapore achieve 1st and 2nd place on both their NISI and subsequent MAIs. As expected the European countries score particularly well on the NISI, with 6 of the top ten scores achieved by Western European countries. These countries tend to benefit from their geographical proximity and the benefits of a successful economic hub. Chad has the worst NISI scoring 1.66 which, given the weight allocations produced by SEM, dramatically influences the overall accessibility of goods to and from its market. Out of the 18 Sub-saharan African countries sampled by the WEF only 5 receive a NISI score better than their PISI and RESI, thus indicating that for these 13 countries 'market access' is hindered by the quality of their public infrastructure. For example,

Uganda and Malawi both score and rank relatively well on their PISI and RESI. Uganda ranks 62nd and 49th and Malawi ranks 54th and 50th respectively. Both countries have successfully implemented liberalisation strategies and are dedicated to improving the quality of their public institutions in order to instill trust from the international business community. Both countries' are landlocked and geographically isolated from economic clusters. These natural barriers to trade are, however, severely exacerbated by poor network industries which substantially inhibit accessibility to world markets. Uganda ranks 111th on its NISI and Malawi ranks 110th. Similarly, Ghana's successful liberalisation policies previously discussed also go somewhat unrecognised as a result of its poor domestic infrastructure, ranked 67th and negatively impacting the overall MAI at 43rd place.

As mentioned before Denmark scores highest on the PISI, scoring 5.96, closely followed by New Zealand in 2nd place with a score of 5.71. Most of the best quality public institutions belong to the richest countries in the world. Singapore ranks in 3rd place, the United Kingdom in 4th place, the United States in 16th place and Australia in 7th. Ghana and Botswana appear to be two obvious exceptions, ranking in 20th and 22nd place respectively. Similarly, a few of the Middle Eastern economies have improved their MAI score as a result of high quality public institutions. Qatar, Kuwait and Jordon rank 24th, 29th and 35th place respectively. The United Arab Emirates (UAE) are however disadvantaged as a result of their public institutions, PISI ranks 41st, whereas RESI and NISI rank 14th and 22nd place respectively. The Latin American economies in general appear to have the lowest quality public institutions; Peru, the Dominican Republic, Nicaragua, Paraguay, Venezuela and Ecuador receive the 6 lowest scores of the 113 countries sampled by the WEF.

The MAI league table is an important contribution to the current literature on market access as it formally acknowledges that in order to make markets internationally accessible liberalisation of the regulatory environment is not sufficient, it should be complemented by improvements in the quality of public institutions and most importantly high quality network industries. We feel that a composite measure of market access, MAI, produces a more accurate portrayal of a country's market accessibility than the narrow trade policy proxies previously employed.

6 Conclusion

Market access seems to matter. However, market access has hitherto been analysed from a very narrow trade perspective, concentrating upon the regulatory environment and trade policy that limit market access by invoking barriers to trade. However, in this paper we argue that market access is a broader concept that involves three sets of characteristics: the regulatory environment; public institutions; and network industries. An important contribution of this paper is to identify the key role played by network industries in facilitating market access.

Having identified the three constituent elements of market access, the paper then uses an important dataset provided by the WEF to produce a measure of market access for a sample of 113 countries. The WEF's annual surveys are a unique and valuable data source which enable usually unobservable variables to be captured and measured. The data is particularly valuable for constructing a market access measure as it avoids compiling complicated proxies using tariff rates, quotas etc. across countries but generates a measure based upon an amalgamation of a world-wide sample of the global business community's opinion.

By using the robust statistical method of SEM, the paper produces a MAI and RESI, PISI and NISI for each of the 113 countries which enables the creation of a rank order, or league table of market access. According to evidence presented in this paper, Denmark is the country ranked first in the world in terms of market access. A compelling contribution of this paper is the identification of the importance that network industries play in enhancing market access. The statistically robust weights produced by SEM indicate that network industries are the most influential component in determining market access. Network industries and public institutions are apparently more important than the regulatory environment in achieving greater market access. This finding has important implications for trade policy and economic development initiatives in particular. Interestingly, the regulatory environment, encompassing trade policy indicators and the formal barriers to trade, is found to be the least significant component; liberalising formal barriers to trade does not guarantee market accessibility. This finding therefore directly challenge and undermine, to some extent, the use of trade policy instruments as the key to enhancing market

access.

Given the strong theoretical basis for the link between market access and income growth, the findings of this paper suggest that improvements in the quality of transport, logistics and communication infrastructure, so called network industries, coupled with improvements in public institutions such as property rights, the rule of law and the integrity of the judicial system are more important than traditional trade related regulations. If market access is important for income growth, then greater market access will be achieved via better network industries, and public institutions, rather than a more liberal trade policy regime. That is not to say that a liberal trade policy is irrelevant, particularly if a more liberal trade policy leads to greater investment in network industries. However, on the evidence of this paper greater trade flows will result from greater market access triggered by better network industries.

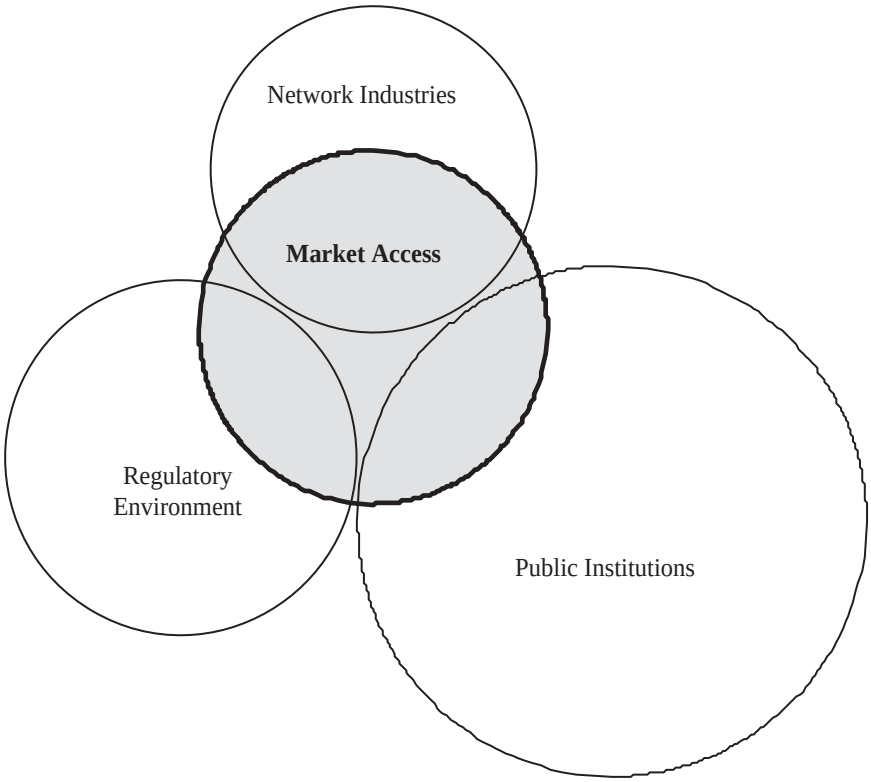

Figure 1: Components of Market Access Index

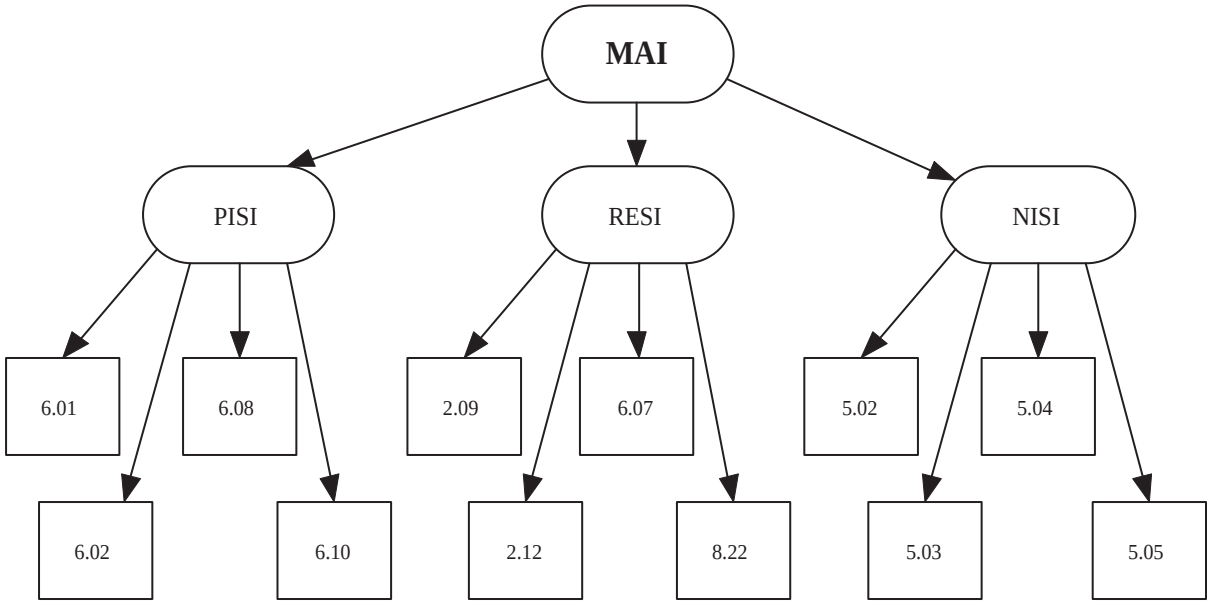

Figure 2: Market Access Index Model

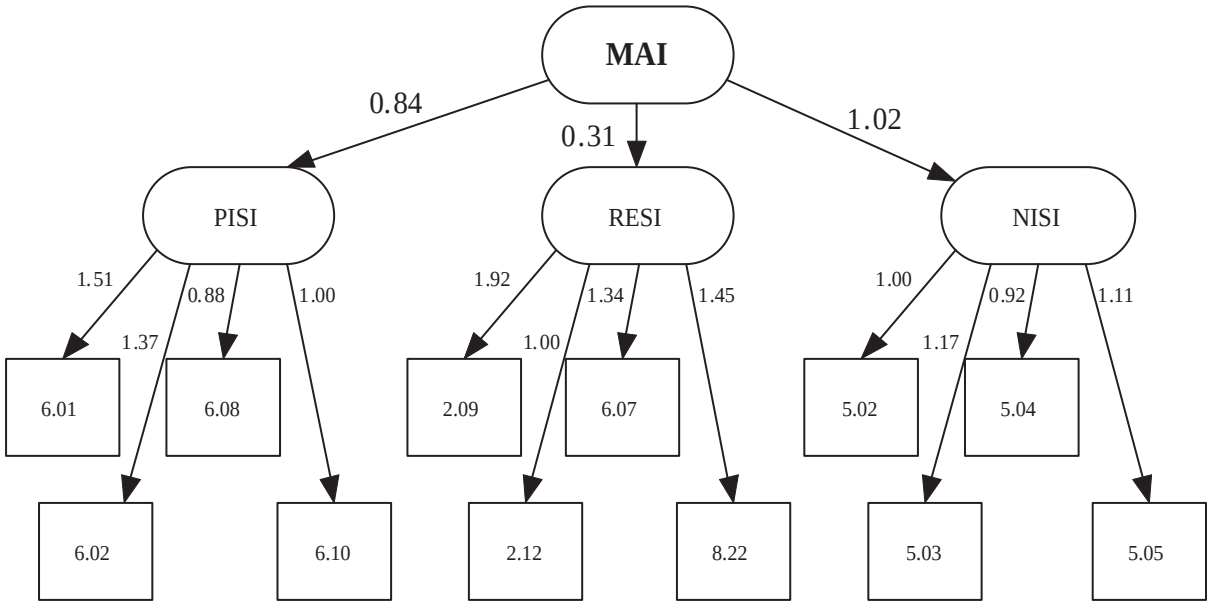

Figure 3: Market Access Index with λs generated by SEM

Table 1: Descriptions of the Variables

	Public Institutions	
6.01	Judicial Independence	Is the judiciary in your country independent from political influences of members of government, citizens, or firms? (1 = no, heavily influenced, 7 = yes, entirely independent)
6.02	Efficiency of Legal Framework	The legal framework in your country for private businesses to settle disputes and challenge the legality of government actions and/or regulations (1 = is inefficient and subject to manipulation, 7 = is efficient and follows a clear, natural process)
6.08	Favouritism in Decisions of Government Officials	When deciding upon policies and contracts, government officials (1 = usually favor well-connected firms and individuals, 7 = neutral)
6.10	Effectiveness of Law-making Bodies	How effective is your national parliament/congress as a law-making and oversigt institution?(1 = very ineffective, 7 = very effective - the best in the world.)
	Regulatory Environment	
2.09	Prevalence of Trade Barriers	In your country, tariff and nontariff barriers significantly reduce the ability of imported goods to compete in the domestic market (1 = strongly agree, 7 = strongly disagree)
2.12	Agricultural Policy Costs	Agricultural policy in your country (1 = is excessively burdensome for the economy, 7 = balances the interests of tax-payers, consumers and producers)
6.02	Burden of Government Regulation	Complying with administrative requirements (permits, regulations, reporting) issued by the government in your country is (1 = burdensome, 7 = not burdensome)
8.22	Foreign Ownership Restrictions	Foreign Ownership of Companies in your Country is (1 = rare, limitted to minority stakes and often prohibited in key sectors, 7 = prevalent and encouraged.)
	Network Industries	
5.02	Railroad Infrastructure Development	Railroads in your country are (1 = underdeveloped, 7 = as extenisve and efficient as the world's best)
5.03	Port Infrastructure Quality	Port facilities and inland waterways in your country are (1 = underdeveloped, 7 = as developed as the world's best)
5.04	Air Transport Infrastructure Quality	Passenger air transport in your country (1 = infrequent and inefficient, 7 = as extensive and efficient as the world's best)
5.05	Quality of Electricity Supply	The quality of electricity supply in your country (in terms of lack of interruptions and lack of voltage fluctuations) is (1 = worse than in most other countries, 7 = meets the highest standards in the world)

Table 2: Market Access Index

	MAI		PISI		RESI		NISI		PCRGDP	
Country	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Denmark	1	6.11	1	5.96	9	5.07	1	6.54	6	33089
Singapore	2	6.08	3	5.65	1	5.82	2	6.51	22	26799
Finland	3	5.83	6	5.50	5	5.31	8	6.26	14	29305
Germany	4	5.79	11	5.38	30	4.56	3	6.50	18	28889
Netherlands	5	5.76	8	5.45	27	4.61	7	6.35	15	29253
Hong Kong SAR	6	5.64	21	4.78	2	5.56	6	6.38	10	30558
France	7	5.57	19	4.86	26	4.61	4	6.45	21	27913
Switzerland	8	5.49	10	5.39	62	4.01	10	6.01	8	31690
United States	9	5.47	16	5.03	19	4.76	9	6.04	3	39498
Malaysia	10	5.46	14	5.24	11	5.05	13	5.78	49	10423
New Zealand	11	5.45	2	5.71	3	5.37	21	5.25	24	23925
United Kingdom	12	5.43	4	5.52	21	4.70	16	5.57	16	28968
Japan	13	5.41	23	4.76	65	3.99	5	6.38	12	29906
Australia	14	5.37	7	5.47	16	4.90	20	5.44	13	29682
Canada	15	5.31	17	4.87	22	4.68	12	5.87	7	32921
Austria	16	5.25	15	5.09	15	4.91	18	5.48	9	31406
Sweden	17	5.23	18	4.86	13	4.93	14	5.62	19	28205
Luxembourg	18	5.22	12	5.37	4	5.33	24	5.07	1	63609
Norway	19	5.22	13	5.36	63	4.00	19	5.47	2	40005
Iceland	20	5.15	5	5.51	45	4.30	23	5.12	5	33269
Belgium	21	5.13	32	4.37	43	4.33	11	6.01	11	30062
Taiwan	22	5.04	33	4.33	10	5.05	15	5.61	23	25614
Ireland	23	5.00	9	5.41	7	5.15	36	4.62	4	37663
Israel	24	4.80	25	4.71	25	4.65	28	4.93	27	22077
Portugal	25	4.80	31	4.52	17	4.81	26	5.03	33	19038
Korea Republic	26	4.78	42	4.01	37	4.47	17	5.52	28	21305
UAE	27	4.71	41	4.03	14	4.92	22	5.22	25	23818
Estonia	28	4.69	34	4.32	6	5.17	30	4.85	38	15217
Tunisia	29	4.68	28	4.59	31	4.54	31	4.79	58	7732
South Africa	30	4.67	26	4.67	39	4.40	32	4.76	48	10603
Chile	31	4.54	40	4.13	8	5.10	33	4.71	47	10869
Spain	32	4.50	44	3.84	32	4.52	25	5.06	26	23627
Cyprus	33	4.49	27	4.66	36	4.47	40	4.35	31	19633
Thailand	34	4.44	38	4.18	38	4.42	35	4.67	57	7901
Qatar	35	4.44	24	4.73	33	4.51	46	4.18	17	28919
Czech Republic	36	4.42	52	3.64	34	4.51	27	5.03	35	18357
Kuwait	37	4.35	29	4.56	68	3.96	42	4.28	36	16066
Namibia	38	4.33	43	3.93	51	4.15	34	4.71	67	6449
Slovenia	39	4.32	48	3.71	46	4.18	29	4.87	30	20306
Botswana	40	4.31	22	4.77	29	4.56	57	3.85	51	10169

Table 2: Market Access Index (Continued)

	MAI		PISI		RESI		NISI		PCRGDP	
Country	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Jordan	41	4.26	35	4.28	35	4.51	47	4.17	77	4383
Greece	42	4.24	45	3.83	40	4.39	37	4.54	29	20362
Ghana	43	4.22	20	4.79	12	4.94	67	3.53	93	2475
Malta	44	4.20	36	4.26	28	4.60	52	4.03	32	19302
India	45	4.10	30	4.55	47	4.18	63	3.71	87	3029
Hungary	46	4.07	46	3.74	20	4.73	49	4.15	37	15546
Latvia	47	4.04	61	3.35	42	4.34	38	4.53	45	11845
Bahrain	48	4.02	56	3.43	23	4.67	41	4.32	34	18817
Uruguay	49	3.96	39	4.16	64	4.00	60	3.78	54	9107
Jamaica	50	3.93	50	3.69	44	4.32	53	4.01	79	4327
Mauritius	51	3.91	51	3.66	99	3.55	44	4.21	44	12215
Slovak Republic	52	3.89	67	3.16	18	4.79	43	4.23	39	15066
Lithuania	53	3.82	71	3.06	54	4.12	39	4.36	40	12919
Italy	54	3.76	65	3.20	61	4.03	48	4.15	20	28172
Azerbaijan	55	3.72	68	3.13	86	3.77	45	4.19	82	3968
Poland	56	3.70	69	3.12	56	4.09	51	4.07	43	12244
China	57	3.68	55	3.52	57	4.09	64	3.70	68	5642
El Salvador	58	3.62	73	2.98	41	4.37	55	3.94	78	4379
Tanzania	59	3.60	37	4.24	67	3.97	83	2.96	112	673
Morocco	60	3.58	64	3.25	89	3.75	59	3.81	80	4227
Turkey	61	3.58	53	3.52	70	3.96	70	3.51	60	7503
Indonesia	62	3.54	60	3.38	55	4.12	69	3.52	86	3622
Costa Rica	63	3.53	47	3.73	81	3.81	74	3.29	52	9887
Panama	64	3.50	78	2.80	73	3.91	54	3.96	62	6997
Trinidad & Tobago	65	3.44	59	3.40	48	4.18	75	3.26	41	12794
Colombia	66	3.41	66	3.16	76	3.89	71	3.47	63	6959
Mexico	67	3.40	72	3.06	72	3.93	68	3.53	53	9666
Croatia	68	3.38	75	2.95	82	3.80	65	3.62	46	11568
Romania	69	3.35	86	2.63	84	3.78	58	3.82	59	7641
Russian Federation	70	3.34	96	2.49	110	3.21	50	4.09	50	10179
Ukraine	71	3.34	79	2.69	109	3.26	56	3.90	66	6554
Gambia, The	72	3.31	58	3.40	24	4.66	90	2.84	101	1903
Brazil	73	3.27	76	2.95	90	3.73	72	3.41	56	8328
Pakistan	74	3.25	85	2.64	60	4.04	66	3.53	94	2404
Bulgaria	75	3.25	94	2.51	92	3.67	61	3.74	55	8500
Sri Lanka	76	3.23	74	2.95	80	3.84	73	3.29	83	3882
Vietnam	77	3.23	57	3.40	102	3.48	82	3.02	92	2570
Argentina	78	3.21	101	2.33	66	3.97	62	3.72	42	12468
Nigeria	79	3.19	63	3.26	83	3.80	84	2.96	106	1120
Algeria	80	3.19	70	3.11	100	3.54	77	3.14	65	6722

Table 2: Market Access Index (Continued)

	MAI		PISI		RESI		NISI		PCRGDP	
Country	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Mali	81	3.04	49	3.70	53	4.14	109	2.16	109	1024
Kenya	82	3.03	81	2.68	75	3.90	80	3.07	108	1075
Georgia	83	3.02	84	2.65	71	3.94	81	3.05	89	2774
Malawi	84	2.97	54	3.52	50	4.15	110	2.16	113	569
Honduras	85	2.97	93	2.57	95	3.62	78	3.10	90	2682
Philippines	86	2.95	89	2.62	77	3.87	86	2.95	75	4561
Moldova	87	2.94	83	2.66	108	3.26	79	3.08	97	2119
Mozambique	88	2.93	91	2.61	69	3.96	89	2.90	105	1247
Macedonia, FYR	89	2.86	95	2.50	94	3.62	87	2.92	61	7237
Uganda	90	2.85	62	3.35	49	4.16	111	2.05	103	1728
Madagascar	91	2.85	77	2.85	79	3.86	100	2.55	110	854
Bangladesh	92	2.82	90	2.61	58	4.07	94	2.63	102	1875
Serbia & Montenegro	93	2.76	87	2.62	85	3.78	99	2.56	73	4858
Peru	94	2.74	108	2.13	91	3.71	85	2.95	71	5298
Cambodia	95	2.72	97	2.48	87	3.76	95	2.61	98	2074
Ethiopia	96	2.72	92	2.58	97	3.58	98	2.57	111	814
Armenia	97	2.68	99	2.41	74	3.90	101	2.54	85	3806
Guatemala	98	2.67	103	2.24	107	3.31	91	2.83	81	4009
Benin	99	2.67	80	2.68	78	3.86	106	2.29	107	1094
Zimbabwe	100	2.66	100	2.36	113	3.02	92	2.81	95	2309
Bolivia	101	2.65	104	2.18	103	3.47	93	2.79	88	2902
Cameroon	102	2.63	88	2.62	52	4.14	107	2.19	96	2176
Venezuela	103	2.59	112	1.59	106	3.38	76	3.18	69	5571
Mongolia	104	2.56	102	2.33	104	3.46	102	2.49	100	1918
Dominican Republic	105	2.56	109	2.12	96	3.62	96	2.60	64	6761
Bosnia & Herzegovina	106	2.55	98	2.46	101	3.48	105	2.35	70	5504
Kyrgyz Republic	107	2.44	106	2.15	111	3.19	104	2.45	99	1934
Guyana	108	2.43	105	2.16	59	4.06	108	2.18	74	4579
Ecuador	109	2.41	113	1.54	112	3.15	88	2.92	84	3819
Albania	110	2.40	82	2.66	88	3.75	112	1.78	72	4937
Nicaragua	111	2.38	110	1.72	98	3.55	97	2.58	91	2677
Paraguay	112	2.34	111	1.68	93	3.67	103	2.49	76	4553
Chad	113	2.09	107	2.14	105	3.40	113	1.66	104	1555

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